
Actuarial Status of the HI and SMI Trust Funds

by Sol Mussey*

This article is adapted from the Summary of the 1985 Annual Reports of the Medicare Board of Trustees. It presents the actuarial status of the Hospital Insurance (HI) and the Supplementary Medical Insurance (SMI) Trust Funds. Two actions favorably affecting the financial status of the HI Trust Fund have occurred since the publication of the 1984 Reports: (1) Fiscal year 1986 hospital payment rates will continue at the same level as in fiscal year 1985, and (2) the level of the annual increase in the rates that can be granted without specific justification has been reduced. Despite these two actions, the Board found that the present financing schedule is barely sufficient to ensure payment of benefits through the late 1990's if the assumptions underlying the estimates are realized. The Board found the SMI program to be financially sound, but it noted with concern the rapid growth in the cost of the program. For both HI and SMI, the Board recommends that Congress consider ways to curtail the rapid growth in program costs.

This summary presents an overview of the information contained in the Annual Reports of the Trustees¹ required under title XVIII of the Social Security Act, Health Insurance for the Aged and Disabled, commonly known as Medicare. There are two basic programs under Medicare:

- (1) **Hospital insurance (HI)**, which pays for inpatient hospital care and other related care of those aged 65 or older and of the long-term disabled.
- (2) **Supplementary medical insurance (SMI)**, which pays for physicians' services, outpatient hospital services, and other medical expenses of those aged 65 or older and of the long-term disabled.

The HI program is financed primarily by payroll taxes, with the taxes paid by current workers used primarily to pay benefits to current beneficiaries. However, the HI program maintains a trust fund to provide a small reserve against fluctuations and to anticipate

changes in the demographic makeup of the population. The SMI program is financed on an accrual basis with a contingency margin. This means that the SMI Trust Fund should always be somewhat greater than the claims that have been incurred by enrollees but not yet paid by the program. The trust funds hold all of the income not currently needed to pay benefits and related expenses. The assets of the funds may not be used for any other purpose; however, they may be invested in certain interest-bearing obligations of the U.S. Government.

The Secretaries of Treasury, Labor, Health and Human Services, and two public members serve as Trustees of the HI and SMI Trust Funds. The Secretary of Treasury is the Managing Trustee. The Administrator of the Health Care Financing Administration, the agency charged with administering the Medicare program, is the Secretary of the Board of Trustees.

Hospital Insurance Trust Fund

As mentioned in the introduction, the HI Trust Fund is financed primarily by payroll taxes. The HI contribution rates applicable to taxable earnings in each of the calendar years 1983 and later are shown in table 1. The maximum taxable amounts of annual earnings are shown for 1983 through 1985. After 1985, the automatic

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¹ 1985 Annual Report of the Board of Trustees of the Federal Hospital Insurance Trust Fund and 1985 Annual Report of the Board of Trustees of the Federal Supplementary Medical Insurance Trust Fund, submitted to Congress March 28, 1985. Copies of the Reports may be obtained from the Office of Public Affairs, Health Care Financing Administration, Room 658 East High Rise, 6325 Security Boulevard, Baltimore, Md. 21235.

Table 1.—Contribution rates and maximum taxable amount of annual earnings

Calendar year	Maximum taxable amount of annual earnings	Contribution rate (percent of taxable earnings)	
		Employees and employers, each	Self-employed
1983.....	\$35,700	1.30	1.30
1984.....	37,800	1.30	2.60
1985.....	39,600	1.35	2.70
Changes scheduled in present law:			
1986 and later.....	Subject to automatic increase	1.45	2.90

increase provisions in section 230 of the Social Security Act determine the maximum taxable amount.

The Social Security Act was amended during 1984. The major provisions among the many affecting the HI program are:

- (1) The Medicare secondary payor provision for workers and their spouses aged 65–69 who are covered by an employer’s group health insurance is extended to cases where the employee has not reached age 65 and has a spouse aged 65–69. Effective January 1, 1985.
- (2) The increase for hospital payments in fiscal year 1985 is equal to the increase in the hospital input price index (the cost of the mix of goods and services used to provide inpatient hospital services) plus one-fourth of 1 percent. However, budget neutrality continues to apply in fiscal year 1985. In fiscal year 1986, the rate of increase cannot exceed the increase in the hospital input price index plus one-fourth of 1 percent.
- (3) Reimbursement for capital on the change of ownership of a hospital or skilled-nursing facility is restricted to the lesser of the cost under Medicare to the owner of record (on July 18, 1984) or the purchase price. The costs of legal fees, negotiations, or settlement of the sale are no longer reimbursable. The recapture of depreciation up to the full value of the initial asset under Medicare is required.

- (4) Durable medical equipment provided by home health agencies as part of a covered home health service will no longer be reimbursed at 100 percent of cost. Reimbursement will be at no more than 60 percent of reasonable cost and the beneficiary will be responsible for a 20-percent coinsurance payment. Effective upon enactment.

Operations of the HI Program

In calendar year 1984, about 27 million persons aged 65 or older and almost 3 million disabled persons under age 65 were covered under HI, financed primarily by the contributions of 122 million workers through payroll taxes. Payroll taxes during 1984 amounted to \$42.3 billion, accounting for 90.5 percent of all HI income. About 2.1 percent of all income resulted from a lump-sum transfer from the general fund of the Treasury for military service wage credits, and reimbursements for benefits for certain uninsured persons. Interest payments to the HI fund amounted to 6.5 percent of all HI income for 1984. The remaining 0.8 percent was contributed through premiums paid by voluntary enrollees and taxes collected from railroad workers. Of the \$43.9 billion in HI disbursements, \$43.3 billion was for benefit payments while the remaining \$0.6 billion was spent for administrative expenses. The HI administrative expenses were 1.4 percent of total disbursements.

Table 2 displays the HI fund operations for calendar years 1978–84. In most years, the HI fund has increased. However, the fund ratio (the fund at the beginning of the year divided by disbursements during the year) declined every year from 1979 to 1981. The fund ratio increased slightly at the beginning of 1982, primarily due to the increase in the contribution rate in 1981. The fund ratio dropped dramatically at the beginning of 1983, primarily due to the interfund loan made to the [Federal Old-Age and Survivors Insurance] OASI Trust Fund.

Actuarial Status of the Trust Fund

The Board of Trustees has adopted the general financing principle that annual income to the HI program

Table 2.—HI Trust Fund operations, calendar years 1978–84

[Amounts in billions]

Calendar year	Total income	Total disbursements	Interfund borrowing transfers	Net increase in fund	Fund at end of year	Fund ratio (percent) at beginning of year
1978.....	\$19.2	\$18.2	...	\$1.0	\$11.5	57
1979.....	22.8	21.1	...	1.8	13.2	54
1980.....	26.1	25.6	...	.5	13.7	52
1981.....	35.7	30.7	...	5.0	18.7	45
1982.....	38.0	36.1	–\$12.4	–10.6	8.2	52
1983.....	44.6	39.9	...	4.7	12.9	21
1984.....	46.7	43.9	...	2.8	15.7	29

Note: Components may not add to totals due to rounding.

should be at least equal to annual outlays of the program plus an amount to maintain a balance in the trust fund equal to a minimum of one-half year's disbursements. At the beginning of 1985, the trust fund was far below this desired level. Projections were made under four alternative sets of assumptions: optimistic, two intermediate sets (Alternatives II-A and II-B), and pessimistic. Under both sets of intermediate assumptions, the trust fund ratio is projected to increase until about 1990 and then decline steadily until the fund is completely exhausted in the late 1990's.

Under the more optimistic set of assumptions (Alternative I), the trust fund is projected to grow steadily throughout the first 25-year projection period. Under the more pessimistic set of assumptions (Alternative III), the trust fund is projected to increase to a level of about 43 percent in 1989 and then decrease rapidly until the fund is exhausted in 1992.

Table 3 summarizes the estimated operations of the HI Trust Fund under the four alternative sets of assumptions. Chart 1 shows historic trust fund ratios for recent years and projected ratios under the four sets of assumptions.

The adequacy of the financing of the HI program on a long-range basis is measured by comparing on a year-by-year basis the actual tax rates specified by law with the corresponding total costs of the program, expressed as percentages of taxable payroll. The actuarial balance is defined to be the excess of the average tax for the valuation period over the average cost of the program expressed as a percent of taxable payroll. Table 4 compares the actuarial balance under each of the four sets of assumptions for the 75-year projection period 1985-2059. Chart 2 shows the year-by-year costs as a percent of taxable payroll for each of the four sets of assumptions, as well as the scheduled tax rates. The cost figures in table 4 and chart 2 include amounts for building and maintaining the trust fund at the level of a half year's disbursements as recommended by the Board of Trustees. Chart 2 emphasizes the inadequacy of the financing of the HI program by illustrating the divergence of the program costs and scheduled tax rates under each set of assumptions. Table 5 presents a comparison of the projected experience in the 1984 and 1985 Reports.

Conclusion

Two actions favorably affecting the financial status of the Hospital Insurance Trust Fund have occurred since the publication of the 1984 Report. First, the Secretary of Health and Human Services has tentatively decided to set the fiscal year 1986 hospital payment rates at the same level as the fiscal year 1985 rates. Second, legislation has been enacted reducing the annual increase in the rates that can be granted without specific justification from 1 percent plus the increase in the hos-

pital input price index to one-fourth of 1 percent plus the increase in the hospital input price index. Nevertheless, the present financing schedule for the HI program is barely sufficient to ensure the payment of benefits and maintain the fund at a level of one-half year's disbursements over the next 10-12 years if the assumptions underlying the estimates are realized. The trust fund is exhausted in the late 1990's under both Alternatives II-A and II-B. Under the more pessimistic assumptions, the fund is exhausted in 1992. Under the more optimistic Alternative I, the trust fund is solvent at least through the first 25-year projection period. In order to bring the HI program into close actuarial balance for the first 25-year projection period under Alternative II-B assumptions, either disbursements of the program will have to be reduced by 19 percent or income will have to be increased by 24 percent.

There are currently over four covered workers supporting each HI enrollee. By the middle of the next century, there will be only slightly more than two covered workers supporting each enrollee. Thus, it will be necessary to build a reserve to finance the program when current workers retire during the first half of the next century. Not only does the projected rate of growth in the program during the next several decades not allow for the building of the necessary reserve, but it results in the depletion of the fund during the late 1990's. Thus, current workers who retire in the next century will not only have to compensate for the shortfall due to high current outlays, but will also derive significantly fewer benefits from their contributions because of the shift in the demographic makeup of the population.

The Board recommends that Congress take further action to curtail the rate of growth in the HI program in order to increase equity among different generations of beneficiaries and covered workers.

Supplementary Medical Insurance Trust Fund

Financing for the SMI program is established annually on the basis of standard monthly premium rates (paid by or on behalf of all participants) and monthly actuarial rates determined separately for aged and disabled beneficiaries (on which general revenue contributions are based). Prior to the 6-month transition period (July 1, 1983, through December 31, 1983) these rates were applicable to the 12-month periods ending June 30. Beginning January 1, 1984, the annual basis was changed to calendar years. Monthly actuarial rates are equal to one-half the monthly amounts necessary to finance the SMI program. These rates determine the amount to be contributed from general revenues on behalf of each enrollee. Based on the formula in the law, the Government contribution effectively makes up the difference between twice the monthly actuarial rates and the standard

Table 3.—Estimated operations of the HI Trust Fund during calendar years 1984–2000, under alternative sets of assumptions

[Amounts in billions]

Calendar year	Total income	Total disbursements	Interfund borrowing transfers ¹	Net increase in fund	Fund at end of year	Ratio of assets to disbursements ² (percent)
Alternative I:						
1984 ³	\$46.7	\$43.9	...	\$2.8	\$15.7	29
1985	52.4	48.8	\$1.8	5.4	21.1	32
1986	59.7	50.3	8.4	17.7	38.9	42
1987	65.3	54.6	2.2	13.0	51.8	71
1988	70.5	59.4	...	11.1	62.9	87
1989	76.0	64.1	...	11.9	74.8	98
1990	81.2	69.0	...	12.2	87.0	108
1991	84.9	73.7	...	11.2	98.3	118
1992	89.9	78.5	...	11.4	109.7	125
1993	93.8	83.3	...	10.6	120.2	132
1994	99.2	88.6	...	10.7	130.9	136
1995	104.9	94.2	...	10.7	141.5	139
1996	110.9	100.1	...	10.8	152.3	141
1997	117.3	106.1	...	11.1	163.4	144
1998	124.0	112.5	...	11.5	174.9	145
1999	131.2	119.3	...	11.9	186.9	147
2000	138.7	126.1	...	12.6	199.5	148
Alternative II-A:						
1984 ³	46.7	43.9	...	2.8	15.7	29
1985	52.3	48.8	1.8	5.3	21.0	32
1986	60.2	50.5	6.2	15.9	37.0	42
1987	65.6	55.3	4.4	14.7	51.7	67
1988	70.7	60.9	...	9.8	61.4	85
1989	76.0	66.8	...	9.3	70.7	92
1990	81.0	73.1	...	7.9	78.6	97
1991	85.3	79.9	...	5.4	84.0	98
1992	89.8	86.6	...	3.2	87.2	97
1993	94.2	94.0	...	.2	87.4	93
1994	99.1	101.8	...	-2.7	84.7	86
1995	104.3	110.2	...	-5.9	78.8	77
1996	109.7	119.0	...	-9.4	69.5	66
1997	115.2	128.3	...	-13.1	56.4	54
1998	120.9	138.2	...	-17.3	39.1	41
1999	126.8	148.9	...	-22.1	17.0	26
2000	132.8	160.1	...	-27.3	(4)	11
Alternative II-B:						
1984 ³	46.7	43.9	...	2.8	15.7	29
1985	52.0	48.8	1.8	5.0	20.7	32
1986	59.7	50.6	5.0	14.2	34.9	41
1987	65.2	55.8	5.6	15.0	49.9	63
1988	70.5	61.9	...	8.6	58.5	81
1989	76.2	68.4	...	7.9	66.4	86
1990	81.7	75.5	...	6.2	72.6	88
1991	86.4	83.2	...	3.2	75.8	87
1992	91.4	90.9	...	.5	76.3	83
1993	96.3	99.5	...	-3.2	73.2	77
1994	101.8	108.7	...	-6.9	66.3	67
1995	107.2	118.5	...	-11.2	55.1	56
1996	112.8	128.9	...	-16.1	38.9	43
1997	118.5	139.9	...	-21.5	17.5	28
1998	124.2	151.8	...	-27.6	(5)	12
Alternative III:						
1984 ³	46.7	43.9	...	2.8	15.7	29
1985	51.1	49.1	1.8	3.8	19.5	32
1986	57.0	52.8	.3	4.6	24.1	37
1987	62.2	59.2	...	3.0	27.1	41
1988	66.3	66.5	4.6	4.4	31.5	41
1989	69.1	73.5	5.7	1.3	32.8	43
1990	73.4	82.9	...	-9.5	23.3	40
1991	77.3	93.9	...	-16.6	6.7	25
1992	81.4	105.6	...	-24.2	(6)	6

¹ A loan to the OASI Trust Fund would still be an asset of the HI Trust Fund. However, since these assets are not immediately available for payment of HI benefits, they are subtracted from the HI fund balance. A negative amount is a loan to the OASI Trust Fund; a positive amount is a repayment of principal to the HI Trust Fund.

² Ratio of assets in the trust fund at the beginning of the year to disburse-

ments during the year.

³ Figures for 1984 represent actual experience.

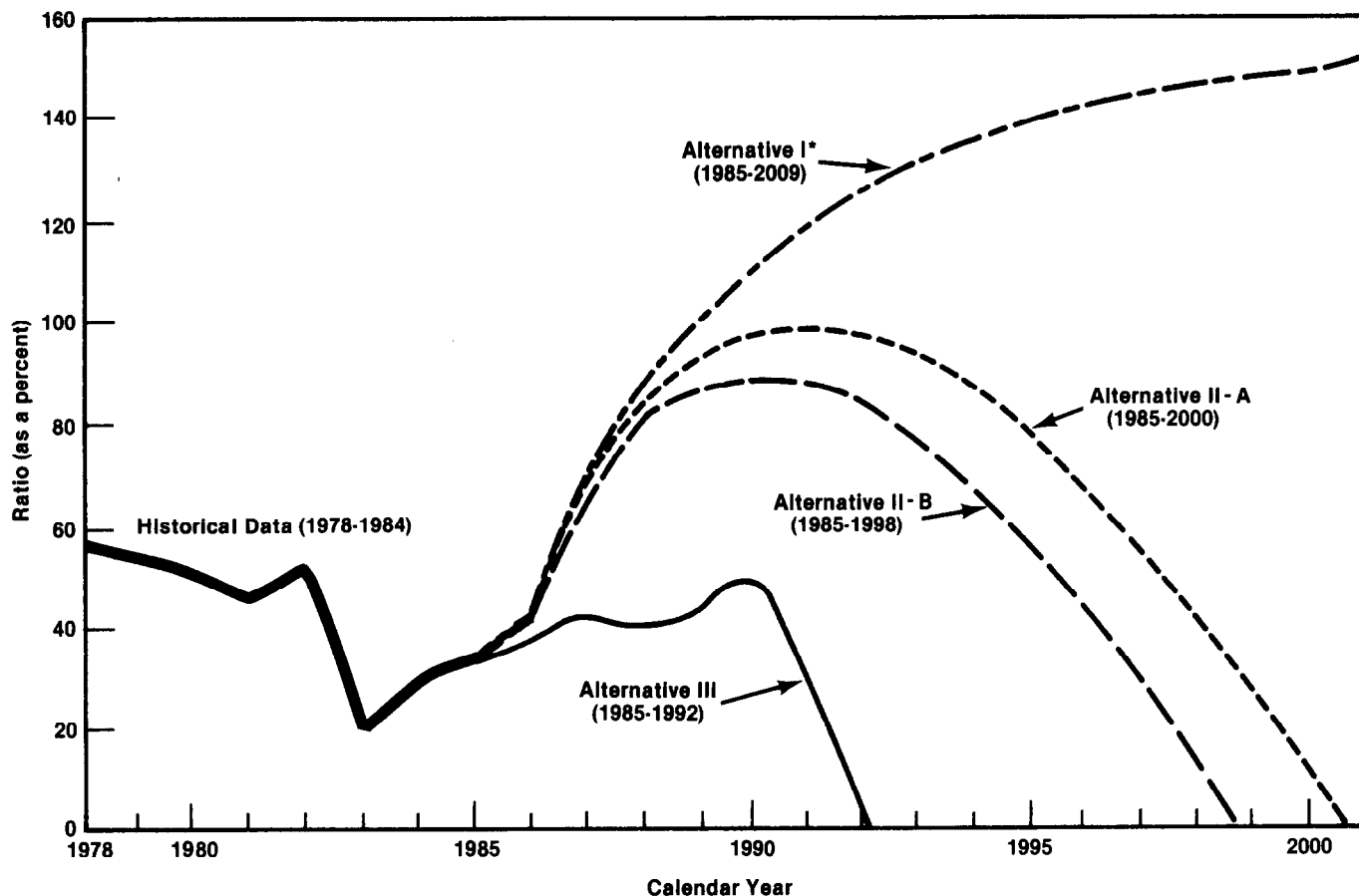
⁴ Trust fund depleted in calendar year 2000.

⁵ Trust fund depleted in calendar year 1998.

⁶ Trust fund depleted in calendar year 1992.

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

Chart 1. — Short-term HI Trust Fund ratios



* The trust fund ratio remains more than 100 percent under Alternative I during this 25-year projection period.
 Note: The trust fund ratio is defined as the ratio of assets in the trust fund at the beginning of the year to disbursements during the year.

monthly premium rate. Chart 3 presents these values for financing periods since 1974. The extent to which general revenue financing is becoming the major source of income for the program is clearly indicated in this chart.

Standard monthly premium rates and monthly actuarial rates have been announced for periods through December 31, 1985. For calendar year 1985, the standard monthly premium rate is \$15.50, and the monthly actuarial rates are \$31.00 and \$52.70 for the aged and disabled, respectively.

The Social Security Act was amended during 1984. The major provisions among those affecting the SMI program were:

- (1) The monthly premium rate for calendar years 1986 and 1987 will be set at one-half the actuarial rate for aged enrollees. In addition, the dollar increase in the SMI premium may not exceed the dollar amount of the social security COLA [cost-of-living adjustment].
- (2) For the 15-month period beginning July 1, 1984,

physicians' customary and prevailing charges are frozen at the levels in effect for the 12-month period ending June 30, 1984. In addition, a participating physician system, whereby physicians may voluntarily agree to accept assignment for all services to Medicare patients, is established. During the freeze period, participating physicians are allowed normal increases in their actual charges, and these increases will be reflected in future customary charges. Beginning October 1, 1985, customary and prevailing charges will be updated each October 1.

- (3) Beginning July 1, 1984, fee schedules will limit the reimbursement for diagnostic laboratory tests performed in independent laboratories, physicians' offices, and hospital laboratories for non-hospital patients. Initially the fees would be set on a State-wide, regional, or carrier-wide base. After 3 years, the payment will be based on a national fee schedule. At that time, lab services to hospital outpatients would revert back to being reimbursed on a reasonable cost basis.

Table 4.—Seventy-five-year actuarial balance of the HI program, under alternative sets of assumptions

[Figures in percents]

Item	Alternative			
	I	II-A	II-B	III
1985-2009:				
Average contribution rate ¹	2.89	2.89	2.89	2.89
Average cost of the program ²	2.85	3.41	3.57	4.86
Actuarial balance . . . . .	.04	-.52	-.68	-1.97
2010-2034:				
Average contribution rate ¹	2.90	2.90	2.90	2.90
Average cost of the program ²	3.17	5.45	5.89	11.66
Actuarial balance	-.28	-2.55	-2.99	-8.76
2035-2059:				
Average contribution rate ¹	2.90	2.90	2.90	2.90
Average cost of the program ²	3.83	7.05	7.62	16.10
Actuarial balance	-.93	-4.15	-4.72	-13.20
1985-2059:				
Average contribution rate ¹	2.90	2.90	2.90	2.90
Average cost of the program ²	3.28	5.30	5.69	10.87
Actuarial balance	-.38	-2.40	-2.79	-7.97

¹ As scheduled under present law.

² Expressed as a percent of taxable payroll. Includes amounts for trust fund building and maintenance.

Note: Taxable payroll is adjusted to take into account the lower contribution rates on tips and on multiple-employer "excess wages," compared with the combined employer-employee rate.

Table 5.—Status of the HI Trust Fund

Alternative assumptions	Year in which trust fund is exhausted as published in—		25-year actuarial balance of HI program ¹ (percent) as published in—		75-year actuarial balance of HI program (percent) as published in 1985 Report
	1984 Report	1985 Report	1984 Report	1985 Report	
	I (optimistic)	1995	(²)	0.44		0.04	-0.38
II-A (intermediate)	1991	2000	-1.24	-.52	-2.40
II-B (intermediate)	1991	1998	-1.37	-.68	-2.79
III (pessimistic)	1989	1992	-2.71	-1.97	-7.97

¹ The actuarial balance of the HI program is defined to be the excess of the average tax rate for the valuation period over the average cost of the program, expressed as a percent of taxable payroll, for the same period.

² The trust fund is solvent at least through the end of the first 25-year projection period.

Operations of the SMI Program

In calendar year 1984, 29.4 million persons were covered under SMI. General revenue contributions during 1984 amounted to \$17.1 billion, accounting for 73.6 percent of all SMI income. About 22.3 percent of all income resulted from the premiums paid by the participants, with interest payments to the SMI fund accounting for the remaining 4.1 percent. Of the \$20.6 billion in SMI disbursements, \$19.7 billion was for benefit payments while the remaining \$0.9 billion was spent for administrative expenses. SMI administrative expenses were 4.3 percent of total disbursements. The historical operations of the SMI Trust Fund since calendar year 1978, as well as the projected operations of the fund for calendar years through 1987 for both Alternative II-A

and Alternative II-B, are shown in table 6. As can be seen, income has exceeded disbursements for most of the historical years, and the trust fund balance is projected to continue to increase through calendar year 1985 and then to decrease through calendar year 1987. As the Report notes, the financial status of the program depends on both the total net assets and liabilities. It is, therefore, necessary to examine the incurred experience of the program, since it is this experience which is used to determine the actuarial rates discussed above and which forms the basis of the concept of actuarial soundness as it relates to the SMI program.

Actuarial Soundness of the SMI Program

The concept of actuarial soundness, as it applies to the SMI program, is closely related to the concept as it applies to private group insurance. The SMI program is essentially yearly renewable term insurance financed from premium income paid by the enrollees and from income contributed from general revenues in proportion to premium payments.

In testing the actuarial soundness of the SMI program, it is not appropriate to look beyond the period for which the enrollee premium rate and level of general revenue financing have been established. The primary tests of actuarial soundness, then, are that (1) income for years for which financing has been established be sufficient to meet the projected benefits and associated administrative expenses incurred for that period, and (2) assets be sufficient to cover projected liabilities which will have been incurred by the end of that time but will not have been paid yet. Even if these tests of actuarial soundness are not met, the program can continue to operate if the trust fund remains at a level adequate to

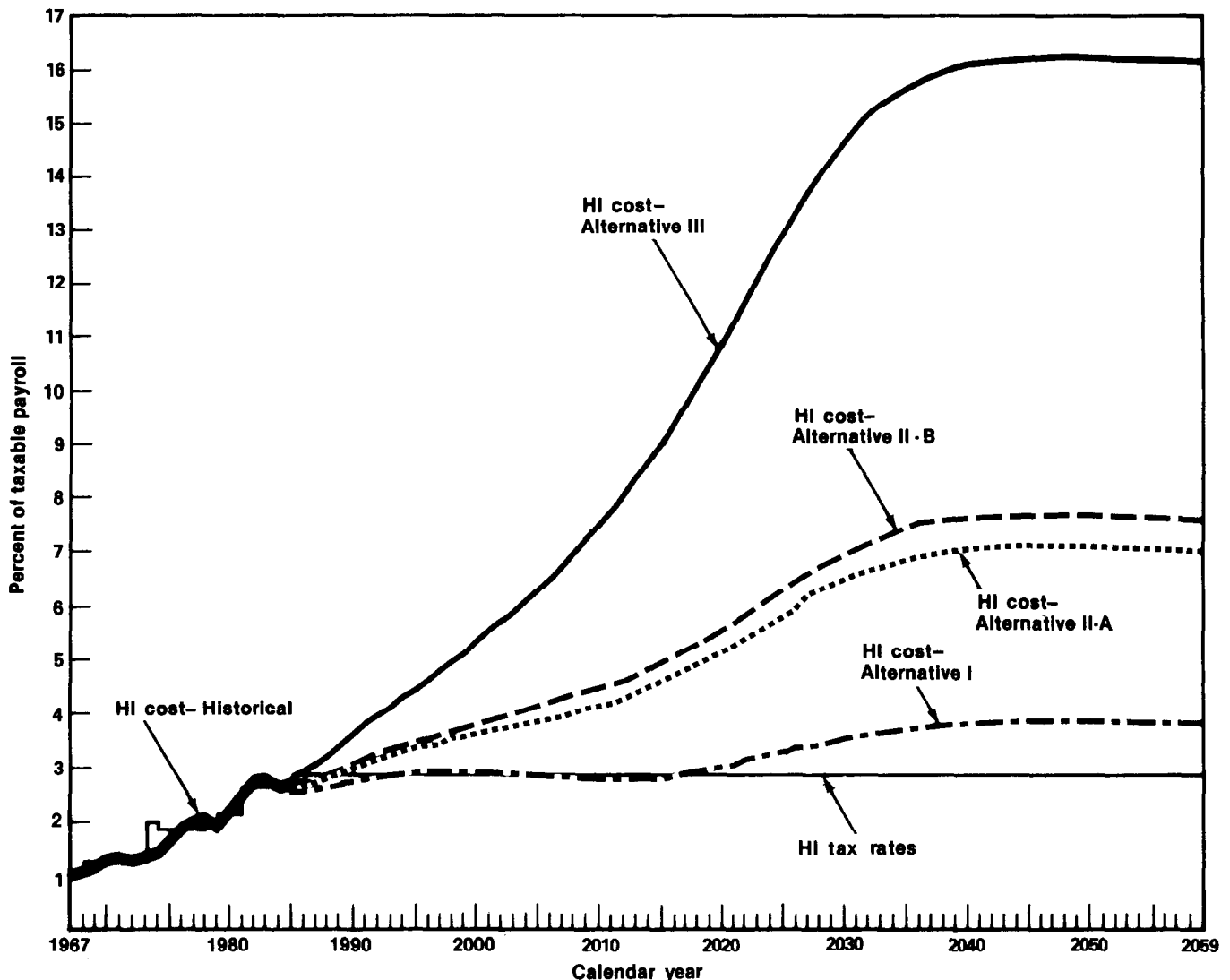
Table 6.—SMI Trust Fund operations, calendar years 1978-87

[Amounts in billions]

Calendar year	Total income	Total disbursements	Net increase in fund	Fund at end of year
1978	\$9.1	\$7.8	\$1.3	\$4.4
1979	9.8	9.3	.5	4.9
1980	10.9	11.2	-.4	4.5
1981	15.4	14.0	1.3	5.9
1982	16.6	16.2	.4	6.2
1983	19.8	19.0	.8	7.1
1984	23.2	20.6	2.6	9.7
Alternative II-A:				
1985	24.9	23.5	1.3	11.0
1986	25.6	27.1	-1.5	9.5
1987	28.3	30.1	-1.9	7.6
Alternative II-B:				
1985	24.9	23.5	1.3	11.0
1986	25.6	27.1	-1.6	9.5
1987	28.3	30.2	-1.9	7.6

Note: Components may not add to totals due to rounding.

Chart 2. — Estimated HI cost and tax rates



Note: HI projected cost includes an allowance for building and maintaining the trust fund balance at the level of a half year's outgo after accounting for the offsetting effect of interest earnings.

permit the payment of claims as presented. However, to protect against the possibility that cost increases under the program will be higher than assumed, assets should be sufficient to cover the impact of a moderate degree of projection error.

The primary tests for actuarial soundness and trust fund adequacy can be viewed by direct examination of absolute dollar levels. In providing an appropriate contingency or margin for error, however, there must be some relative measure. The relative measure or ratio used for this purpose is the ratio of net surplus or deficit to the following year's incurred expenditures. Chart 4 shows this ratio for historical years and for projected years under the intermediate assumptions (Alternative II-B), as well as high- and low-cost sensitivity scenarios.

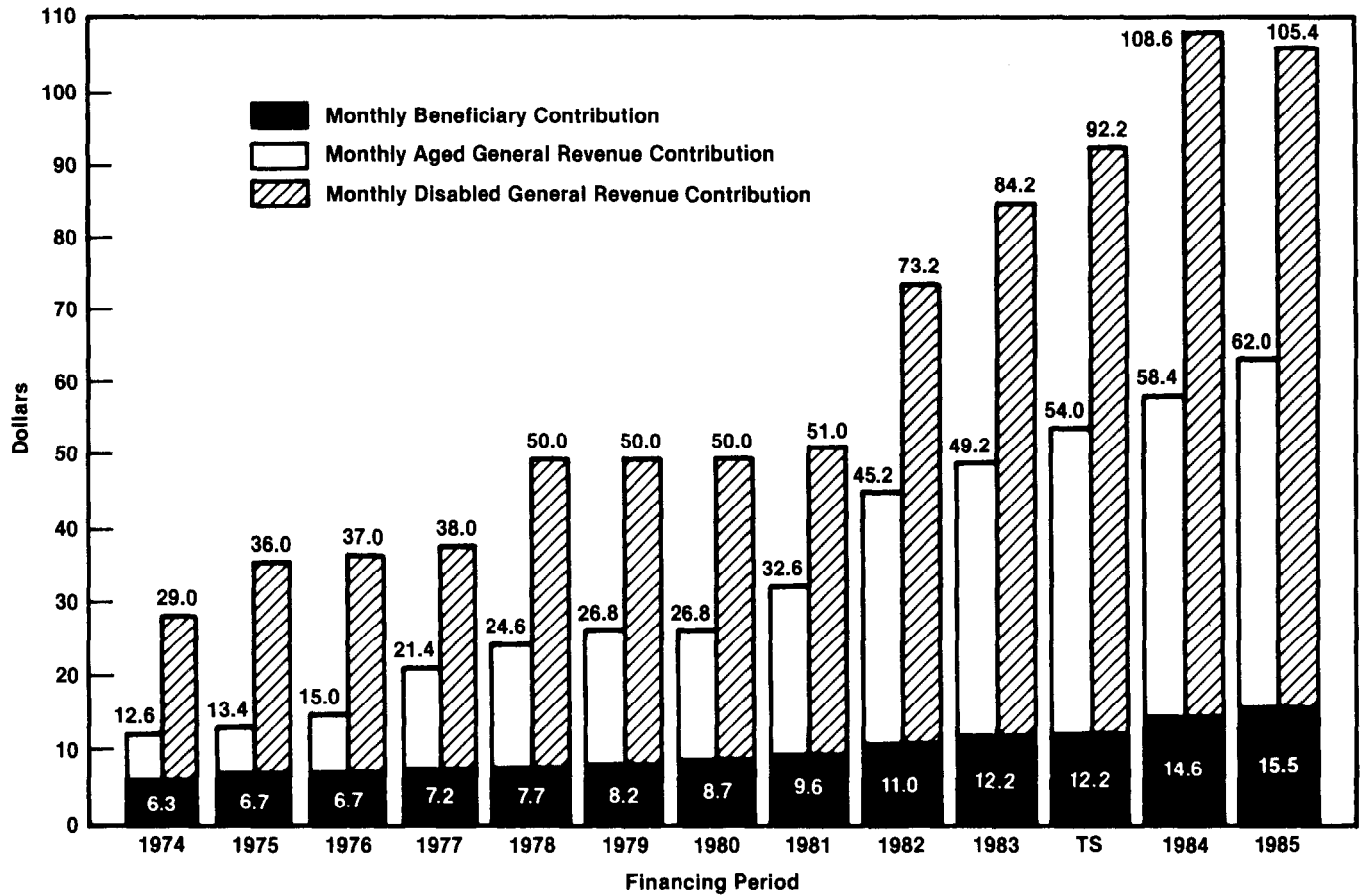
Financing for calendar year 1985 was established to reduce the excess of assets over liabilities to a more ap-

propriate level. However, as experience has developed, it appears that this excess will be greater than expected at the time the calendar year 1985 financing was determined. As a result, the excess of assets over liabilities increases in the aggregate but only slightly when viewed as the ratio of the following 12-month projected incurred expenditures from December 31, 1984, to December 31, 1985.

Conclusion

The financing established through December 1985 is more than sufficient to cover projected benefit and administrative costs incurred through that time period, and to build a level of trust fund assets that is more than adequate to cover the impact of a moderate degree of projection error. The SMI program can thus be said to

Chart 3. — SMI monthly per capita income



Financing Period:

For periods 1983 and earlier, the financing period is July 1 through June 30.

For the transitional semester (TS), the financing period is July 1, 1983, through December 31, 1983.

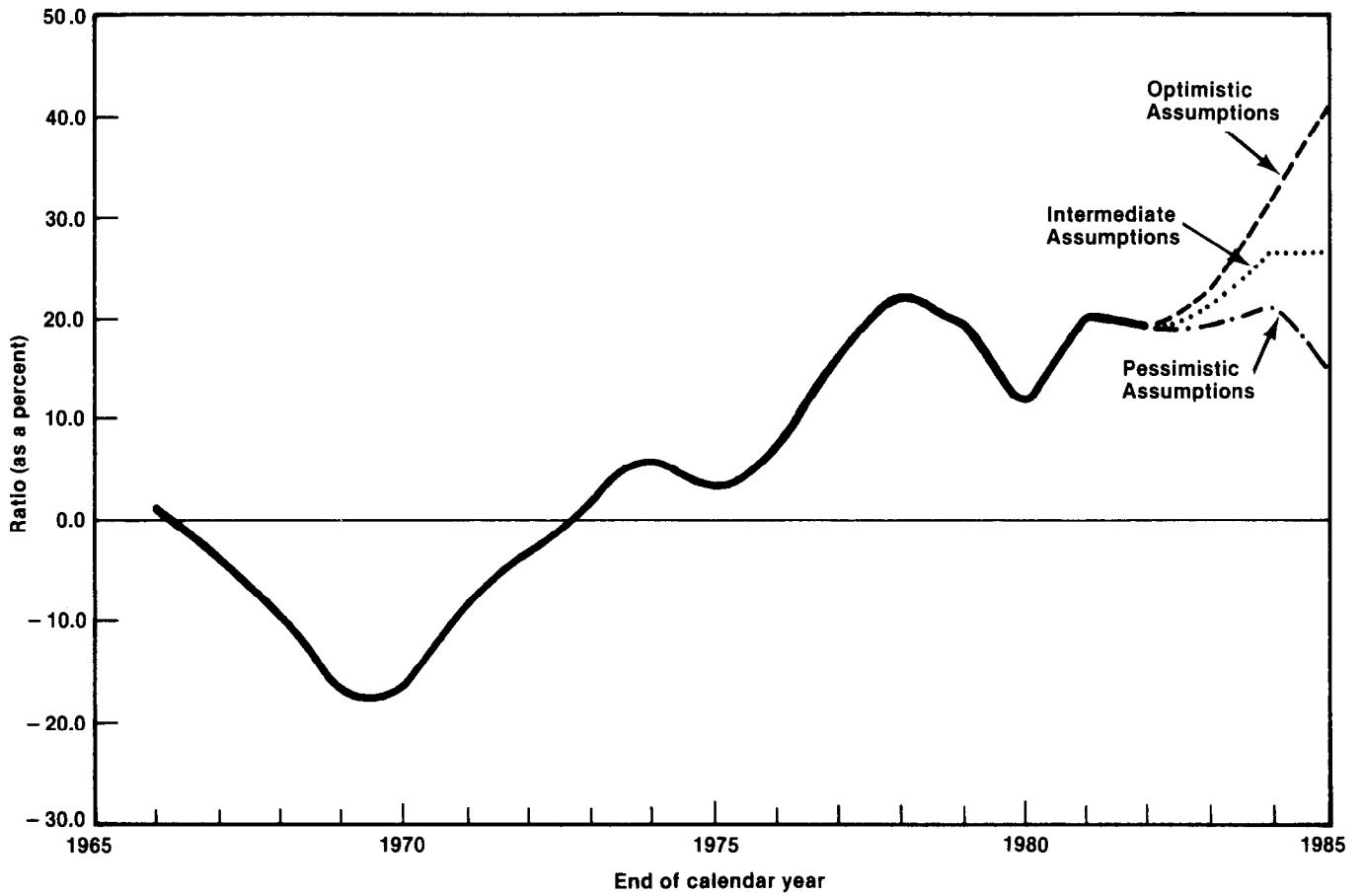
For 1984 and 1985, the financing period is January 1 through December 31.

be actuarially sound. Future financing needs to be established to reduce the excess to more appropriate levels.

Although the SMI program is financially sound, the

Board notes with concern the rapid growth in the cost of the program. The Board recommends that Congress take action to curtail the rapid growth in the SMI program.

Chart 4. — Actuarial status of the SMI Trust Fund



Note: The actuarial status of the SMI Trust Fund is measured by the ratio of the end of year surplus or deficit to the following year incurred expenditures.