Actuarial Status of the HI and SMI Trust Funds

by Sol Mussey*

This article is adapted from a summary of the 1984 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. Although the Social Security Amendments of 1983 have made the HI program potentially less vulnerable to excessive rates of growth in the hospital industry by providing the Secretary of Health and Human Services some discretion over the level of payments to hospitals, the Board found the financing schedule for the HI program barely adequate to ensure the payment of benefits through the end of this decade 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 and the extent to which general revenues have become SMI's major source of financing. For both HI and SMI, the Board recommends that Congress consider ways to curtail the rapid growth in program costs.

This article presents an overview of the information contained in the annual Trustees Reports[1] 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; and

(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 to pay benefits to current beneficiaries. However, the HI program maintains a trust fund that provides a small reserve against fluctuations. This type of financing is generally known as pay-as-you-go financing. By contrast, the SMI program is financed on an accrual basis with a contingency margin. This means that its trust fund should always be somewhat greater than the claims that have been incurred by enrollees but not yet paid by the program. Both 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 the Treasury, Labor, and Health and Human Services serve as trustees of the HI and SMI Trust Funds. The Secretary of the 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

The HI Trust Fund is financed primarily by payroll taxes. The HI contribution rates applicable to taxable earnings in each of the calendar years 1982 and later are shown in table 1. The maximum taxable amounts of annual earnings are shown for 1982 through 1984. After 1984, the automatic increase provisions in section 230 of

*Director, Division of Medicare Cost Estimates, Office of Financial and Actuarial Analysis, Bureau of Data Management and Strategy, Health Care Financing Administration.

[1] **1984 Annual Report of the Board of Trustees of the Federal Hospital Insurance Trust Fund and 1984 Annual Report of the Board of Trustees of the Federal Supplementary Medical Insurance Trust Fund,** submitted to Congress April 5, 1984. Copies of the reports can be obtained from the Office of Public Affairs, Health Care Financing Administration, Room 658 East High Rise, 6325 Security Boulevard, Baltimore, Maryland 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
1982	$32,400	1.30	1.30
1983	35,700	1.30	1.30
1984	37,800	1.30	2.60
Changes scheduled in present law:			
1985	Subject to automatic increase	1.35	2.70
1986 and later		1.45	2.90

the Social Security Act determine the maximum taxable amount.

There were no major changes in the Social Security Act since the 1983 Trustees Report.

Operations of the HI Program

In calendar year 1983, about 26.5 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 117 million workers through payroll taxes. Payroll taxes during 1983 amounted to $37.3 billion, accounting for 83.7 percent of all HI income. About 9.7 percent of all income resulted from the lump-sum transfer from the general fund of the Treasury for military service credit, as provided by section 151 of Public Law 98-21, and reimbursements for benefits for certain uninsured persons. Interest payments to the HI fund amounted to 5.7 percent of all HI income for 1983. The remaining 0.9 percent was contributed through premiums paid by voluntary enrollees and taxes collected from railroad workers. Of the $39.9 billion in HI disbursements, $39.3 billion was for benefit payments and the remaining $0.5 billion was spent for administrative expenses. HI administrative expenses were 1.4 percent of total disbursements.

Table 2 displays the HI fund operations for calendar years 1977-83. In most years, the HI fund increased. However, the fund ratio (the fund at the beginning of the year divided by disbursements during the year) declined every year from 1977 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 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 should be approximately equal to annual outlays of the program plus an amount to maintain a balance in the trust fund equal to one-half year's disbursements. At the beginning of 1984, 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 remain at 20-40 percent through the late 1980's and then decline rapidly with complete exhaustion of the fund in 1991.

Under the more optimistic set of assumptions (Alternative I), the trust fund is projected to grow until about 1989, then to decline steadily until the fund is completely exhausted in 1995. Under the more pessimistic set of assumptions (Alternative III), the trust fund is projected to decrease steadily with complete exhaustion of the fund by 1989.

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 25-year valuation period (1984-2008) over the average cost of the program expressed as a percent of taxable pay-

Table 2.—HI Trust Fund operations, calendar years 1977-83

[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
1977	$15.9	$16.0	...	-$0.2	$10.4	66
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	-10.5	8.2	52
1983	44.5	39.9	...	4.7	12.9	21

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

Table 3.—Estimated operations of the HI Trust Fund during calendar years 1983–95, under alternative sets of assumptions

[Dollar 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 (optimistic):						
1983 [3]	$44.5	$39.9	...	$4.7	$12.9	21
1984	46.5	46.1	...	.4	13.3	28
1985	52.8	51.8	$0.4	1.3	14.6	26
1986	60.4	56.5	11.3	15.2	29.8	26
1987	65.2	61.7	.7	4.2	34.1	48
1988	69.8	67.4	...	2.4	36.5	51
1989	74.2	73.2	...	1.0	37.4	50
1990	77.7	78.5	...	−.8	36.6	48
1991	81.7	85.0	...	−3.2	33.4	43
1992	85.0	90.3	...	−5.3	28.1	37
1993	89.3	97.2	...	−7.9	20.2	29
1994	92.8	104.3	...	−11.5	8.8	19
1995	97.4	111.5	...	−14.1	(4)	8
Alternative II-A (intermediate):						
1983 [3]	44.5	39.9	...	4.7	12.9	21
1984	46.4	46.1	...	.3	13.2	28
1985	52.5	52.6	...	−.1	13.0	25
1986	60.1	58.2	7.0	8.9	21.9	22
1987	64.6	64.5	5.4	5.6	27.5	34
1988	68.9	71.6	...	−2.6	24.8	38
1989	72.9	79.1	...	−6.2	18.6	31
1990	76.9	87.4	...	−10.5	8.1	21
1991	80.2	96.1	...	−15.9	(5)	8
Alternative II-B (intermediate):						
1983 [3]	44.5	39.9	...	4.7	12.9	21
1984	46.3	46.1	...	.2	13.1	28
1985	52.5	52.7	...	−.2	12.9	25
1986	60.3	58.7	5.5	7.1	20.0	22
1987	65.1	65.5	6.9	6.6	26.6	31
1988	69.6	73.1	...	−3.5	23.1	36
1989	73.7	81.1	...	−7.4	15.7	28
1990	77.6	89.8	...	−12.2	3.5	17
1991	81.2	99.4	...	−18.2	(5)	4
Alternative III (pessimistic):						
1983 [3]	44.5	39.9	...	4.7	12.9	21
1984	45.9	46.1	...	−.2	12.7	28
1985	50.8	52.4	...	−1.7	11.0	24
1986	57.8	59.0	...	−1.2	9.8	19
1987	62.0	66.9	...	−5.0	4.8	15
1988	65.6	76.1	12.4	2.0	6.9	6
1989	69.0	86.2	...	−17.3	(6)	8

[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 disbursements during the year.

[3] Figures for 1983 represent actual experience.

[4] Trust fund depleted in calendar year 1995.

[5] Trust fund depleted in calendar year 1991.

[6] Trust fund depleted in calendar year 1989.

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

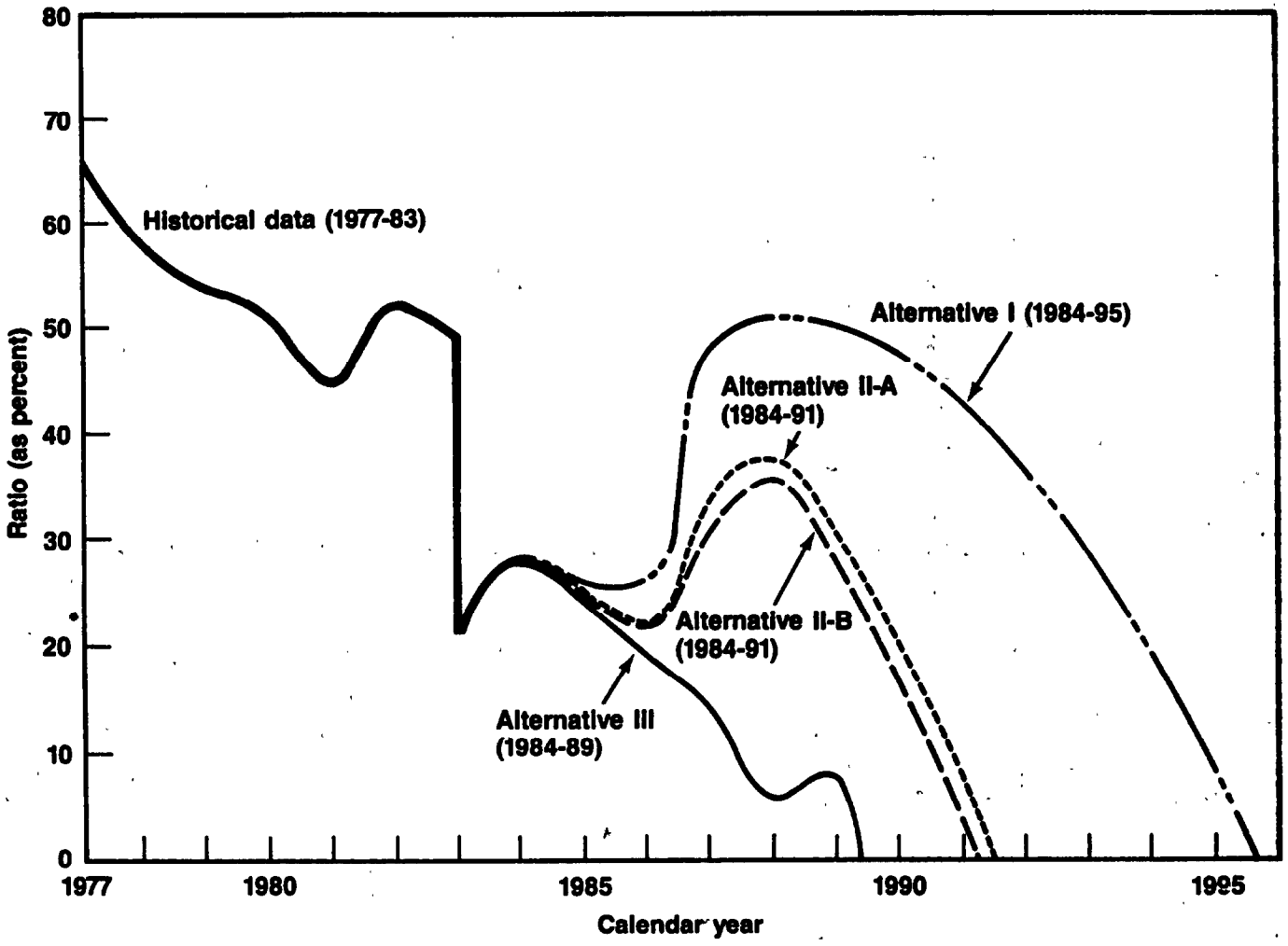
roll. The average tax rate for the 25-year period 1984–2008 is 2.88 percent. The average cost of the program under Alternatives II-A and II-B is 4.12 percent and 4.25 percent of taxable payroll, respectively. Table 4 compares the actuarial balance under each of the four sets of assumptions. Chart 2 shows 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.

It is noteworthy that under all four sets of assumptions used in the 1984 Trustees Report, the outlook for the HI Trust Fund is about the same as it was in the 1983 Report. Table 5 presents a comparison of the projected experience in the 1983 and 1984 Reports.

Conclusion

The present financing schedule for the HI program is barely adequate to ensure the payment of benefits through the end of this decade if the assumptions underlying the estimates are realized. The trust fund will be exhausted in 1991 under both Alternatives II-A and II-B. Under the more pessimistic assumptions, the fund will be exhausted in 1989. Even under the optimistic Alternative I, the present financing schedule will result in the fund being exhausted in 1995. In order to bring the

Chart 1. — Short-term HI Trust Fund ratios



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.

HI program into close actuarial balance for the 25-year projection period under Alternative II–B assumptions, either disbursements of the program will have to be reduced by 32 percent or income will have to be increased by 48 percent. Despite the short-term uncertainties, the enactment of the Tax Equity and Fiscal Responsibility Act in 1982 and Public Law 98-21 (the Social Security Amendments of 1983) has substantially reduced the

Table 4.—Actuarial balance of the HI program, under alternative sets of assumptions

[Figures in percents]

Item	Alternative			
	I	II-A	II-B	III
Average contribution rate, scheduled under present law [1]	2.88	2.88	2.88	2.88
Average cost of the program, for expenditures and for trust fund building and maintenance [2]	3.32	4.12	4.25	5.59
Actuarial balance [3]	−.44	−1.24	−1.37	−2.71

[1] Average for the 25-year period 1984–2008.

[2] Average for the 25-year period 1984–2008, expressed as a percent of taxable payroll. Taxable payroll is adjusted to take into account the lower contribution rates on tips and on multiple-employer "excess wages" as compared with the combined employer-employee rate.

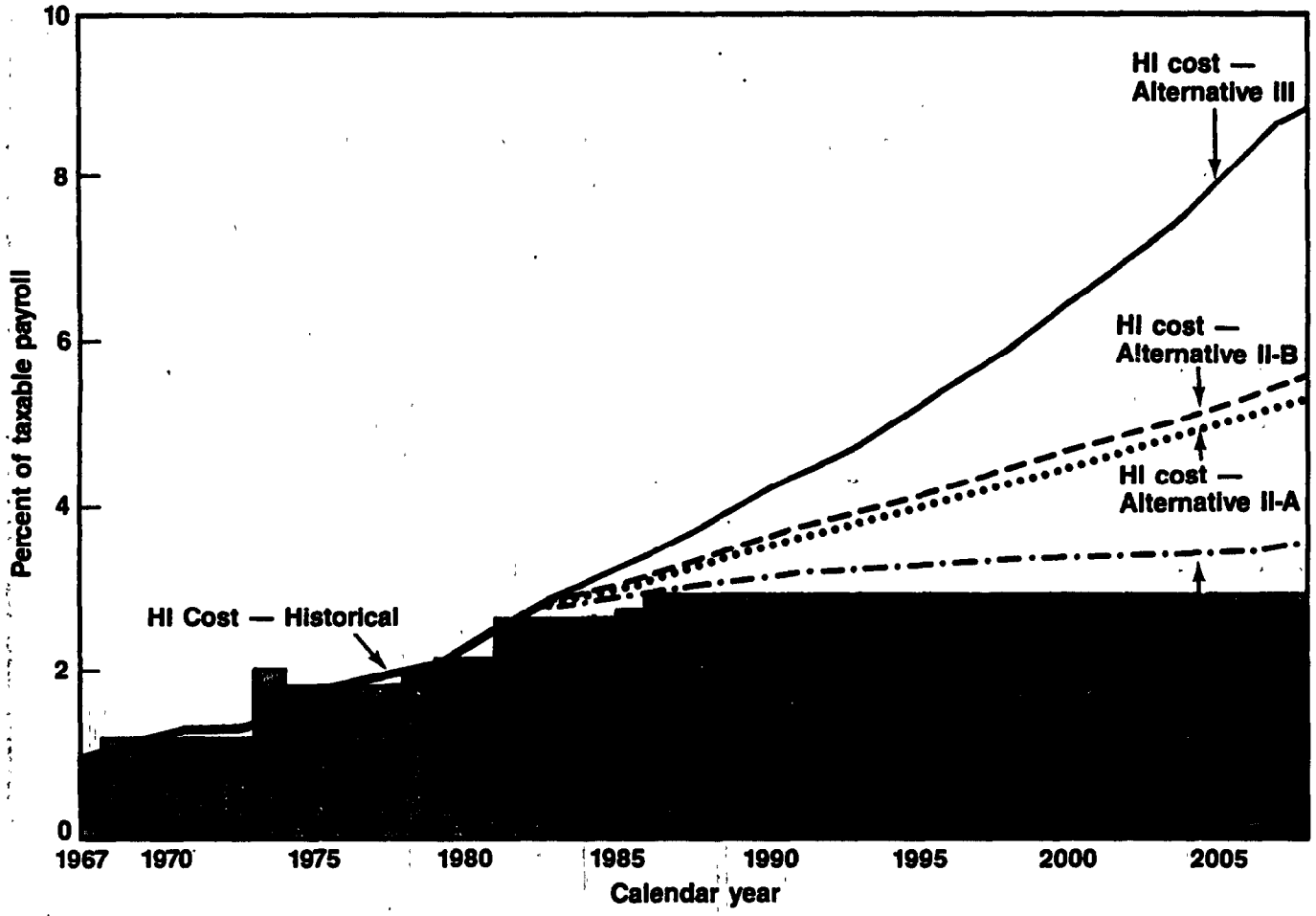
[3] The actuarial balance of the hospital insurance program is defined to be the excess of the average tax rate for the 25-year valuation period over the average cost of the program, expressed as a percent of taxable payroll, for the same period.

Table 5.—Status of the HI Trust Fund

Alternative assumptions	Year trust fund exhausted as published in—		Actuarial balance [1] as published in—	
	1983 Report	1984 Report	1983 Report	1984 Report
I (optimistic)	1996	1995	−0.34	−0.44
II-A (intermediate)	1991	1991	−1.10	−1.24
II-B (intermediate)	1990	1991	−1.24	−1.37
III (pessimistic)	1988	1989	−2.51	−2.71

[1] The actuarial balance of the HI program is defined to be the excess of the average tax rate for the 25-year valuation period over the average cost of the program, expressed as a percent of taxable payroll, for the same period.

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.

long-range deficit of the HI fund. More importantly, the prospective payments provisions of Public Law 98-21 have made the outlays of the HI program potentially less vulnerable to excessive rates of growth in the hospital industry by providing the Secretary of Health and Human Services with some discretion over the level of payments to hospitals.

The Board recommends that Congress consider further action to curtail the rapid growth in the cost of the HI program that has occurred in recent years and that is anticipated in the future.

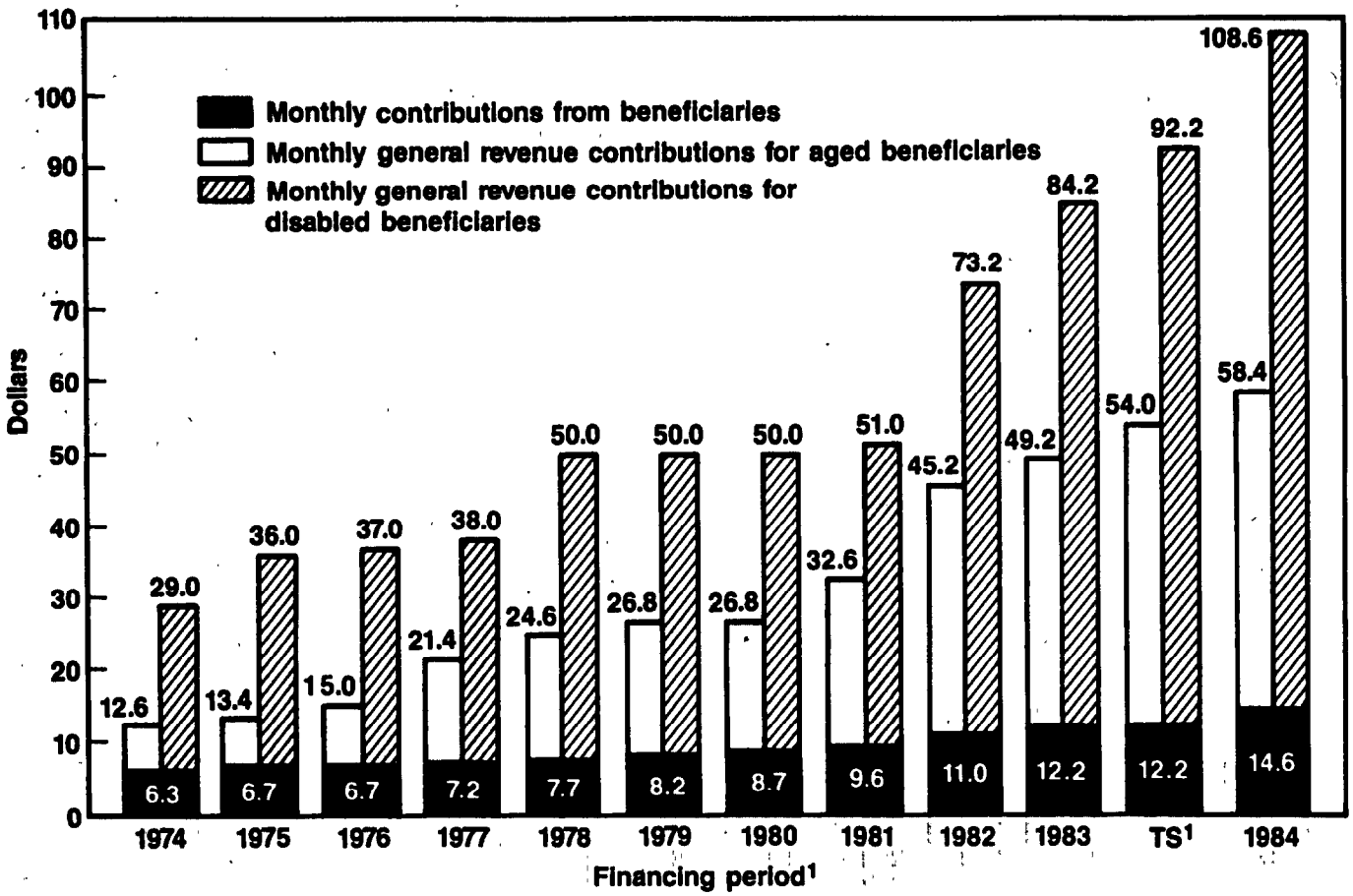
Supplementary Medical Insurance Trust Fund

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). Before 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 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, 1984. For calendar year 1984, the standard monthly premium rate is $14.60, and the monthly actuarial rates are $29.20 and $54.30 for the aged and disabled, respectively.

There were no major changes in the Social Security Act since the 1983 Trustees Report.

Chart 3. — SMI monthly per capita income



[1]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, the financing period is January 1 through December 31.

Operations of the SMI Program

In calendar year 1983, 28.8 million persons were covered under SMI. General revenue contributions during 1983 amounted to $14.9 billion, accounting for 75.0 percent of all SMI income. About 21.4 percent of all income resulted from the premiums paid by the participants, with interest payments to the SMI fund accounting for the remaining 3.6 percent. Of the $19.0 billion in SMI disbursements, $18.1 billion was for benefit payments and the remaining $0.9 billion was spent for administrative expenses. SMI administrative expenses were 4.6 percent of total disbursements. The historical operations of the SMI Trust Fund since calendar year 1977, as well as the projected operations of the fund for calendar years through 1986 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 1986. However, as the Trustees Report notes, the financial status of the SMI 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 that is used to determine the actuarial rates discussed above and that 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

Table 6.—SMI Trust Fund operations, calendar years 1977–86

[In billions]

Calendar year	Total income	Total disbursements	Net increase in fund	Fund at end of year
1977	$7.8	$6.5	$1.3	$3.1
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
Alternative II-A:				
1984.....	22.9	22.0	.9	7.9
1985.....	26.5	25.7	.9	8.8
1986.....	30.6	29.7	.9	9.7
Alternative II-B:				
1984.....	22.9	22.0	.9	7.9
1985.....	26.6	25.7	.9	8.9
1986.....	30.7	29.8	.9	9.8

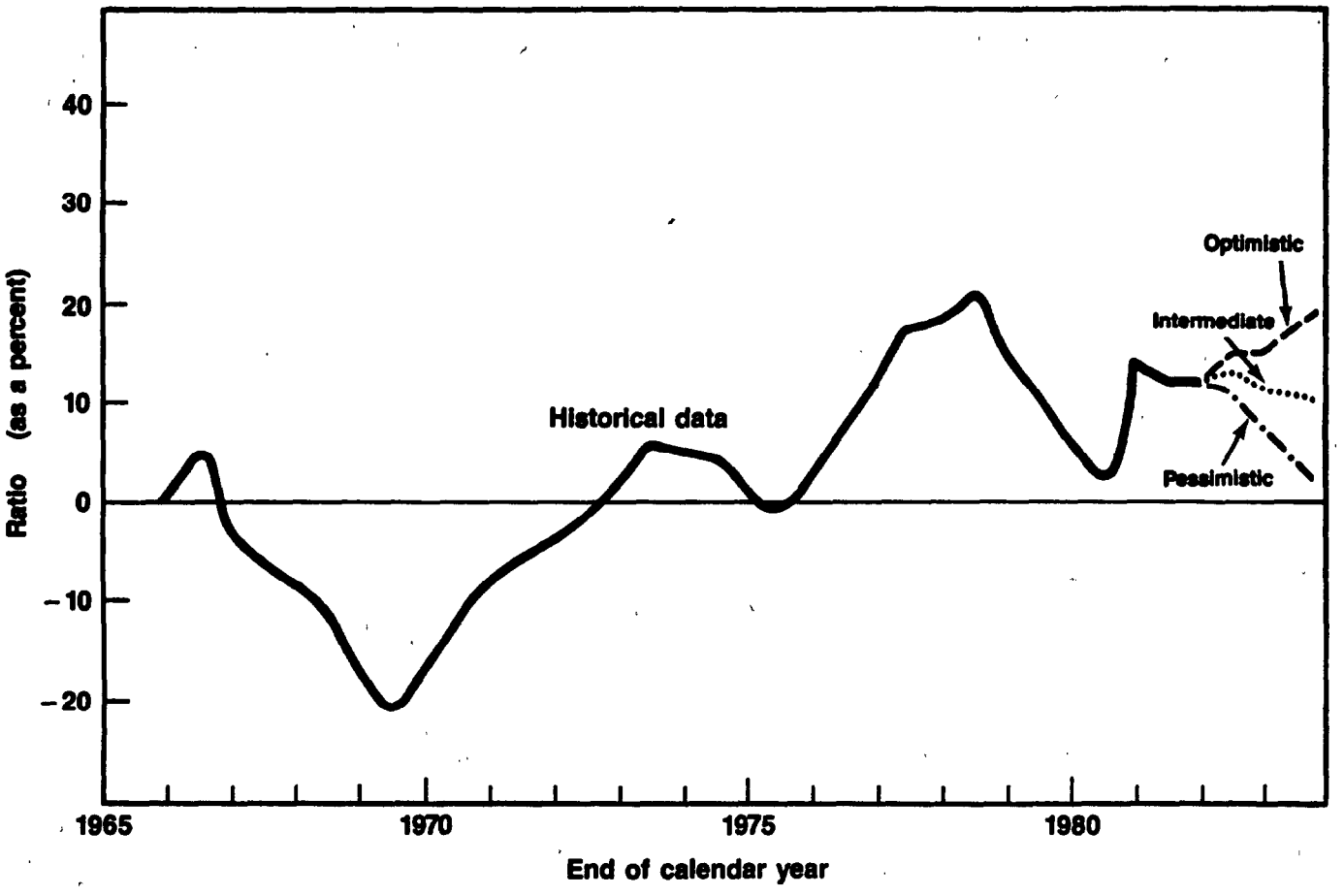
Note: Components may not add to totals due to rounding.

sufficient to meet the projected benefits and associated administrative expenses incurred for that period, and (2) assets be sufficient to cover projected liabilities that 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 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 initial 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 under the high-cost and low-cost sensitivity scenarios.

Financing applicable for the 6-month period ending December 31, 1983, was established to reduce assets to a

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's incurred expenditures.

more appropriate level than what was expected by June 30, 1983. As a result, the excess of assets over liabilities, both in the aggregate and as a ratio of the following 12-month projected incurred expenditures, declines from June 30, 1983, to December 31, 1983.

The actuarial rates for calendar year 1984 maintain this excess at about the same level. Although the aggregate amount increases slightly, the excess as a percentage of the following 12-month projected incurred expenditures declines slightly. Under more pessimistic assumptions as to cost increases, assets, based on financing already established, will still exceed liabilities, but only slightly.

Conclusion

The financing established through December 1984 is sufficient to cover projected benefit and administrative costs incurred through that time period, and to build a level of trust fund assets that is adequate to cover the impact of a moderate degree of projection error. Thus, the SMI program can be said to be actuarially sound.

Although the SMI program is financially sound, the Board notes with concern the rapid growth in the cost of the program and the extent to which general revenues have become the major source of financing for the program. The Board recommends that Congress take action to curtail the rapid growth in the SMI program.