

# Thirteenth Valuation of the Railroad Retirement System

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*The most recent valuation of the financial condition of the railroad retirement system reveals that an existing actuarial deficiency will become more pronounced over time unless corrective action is taken. After projecting the progress of the fund under present law and certain assumptions about the future, the Railroad Retirement Board has concluded that the present value of benefits can be maintained only if the tax rate—already considerably higher for employers than under the social security program—is raised. An immediate increase of 4.1 percent of taxable payroll is required to effect an actuarial balance. Alternatively, a rise of 2.6 percent would be sufficient to prolong the fund until the year 2001. If the present tax rate is not changed, the fund is projected to run out in 1986.*

ACTUARIES AT the Railroad Retirement Board have recently completed the thirteenth triennial valuation of the railroad retirement system, in compliance with a provision of the Railroad Retirement Act, which requires that the financial condition of the system be examined at intervals not to exceed 3 years. The first such assessment since the system was restructured by the Railroad Retirement Act of 1974, it shows the status of the railroad retirement account as of December 31, 1974, and projects the progress of the account well into the next century under present law and under certain alternatives. This article summarizes the valuation from the standpoint of assumptions, methodology, and results.

## CHANGES IN LAW

Major changes in the system brought about by the amendments of 1973 and the 1974 Act had to be taken into account. The following are among the more important:

1 The retirement tax is no longer split 50-50 between employer and employee. The employee

rate is the same as the employee rate under the social security program, the employer rate is the employee rate plus 9.5 percent. In 1976, for example, the employee rate was 5.85 percent and the employer rate was 15.35 percent. Both rates include 0.9 percent earmarked for hospital insurance benefits under Medicare.

2 When an employee with 30 years of service attains age 60, he is now entitled to retire at his full-formula annuity. No actuarial reduction is imposed for retiring before age 65.

3 The benefit formula divides the total benefit into three parts—tier 1, tier 2, and the “windfall.” Tier 1 is equal to (a) the social security benefit the employee would receive on his covered earnings if railroad earnings had always been covered minus (b) any benefit actually paid under the social security program. This definition of tier 1 eliminates dual benefits<sup>1</sup> other than those earned before 1975, which are considered vested and are payable under the windfall provision. Tier 2 is the staff or pure railroad component of the benefit; the formula for it is in the law. Windfall benefits are the excess portion of the amount payable because of the advantage gained by entitlement to both railroad retirement and social security benefits.

4 Tier 1 benefits rise with the cost of living at the same percentage rate as benefits under the social security program. A partial cost-of-living increase applies to tier 2 benefits. Windfall benefits are raised to keep pace with any social security cost-of-living increases between 1974 and the date of retirement, after which they are frozen. In some cases, the cutoff is earlier.

5 Windfall benefits are financed by appropriations from the general funds. Twenty-five annual appropriations are scheduled, the last for fiscal year 2000.

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<sup>1</sup> Under the Railroad Retirement Act of 1937, railroad employees could qualify for benefits under both the railroad retirement and social security programs. Entitlement to social security benefits was based on covered work performed in addition to railroad employment or at a different time.

## ASSUMPTIONS

The actuarial assumptions include rates of mortality, disability, remarriage, retirement, and withdrawal. These assumptions are based on continuing studies of Board data. In progressing from the raw data to the assumption, a certain amount of judgment is required. Future retirement rates at ages 60-64 for persons with 30 years of service, for example, are certain to be influenced very greatly by a provision of the 1974 law that permits early-retirement annuities without actuarial reduction. Since this provision did not become effective until July 1, 1974, the Board's experience was insufficient to provide the basis for a decision. The retirement rates were therefore derived from a combination of the Board's experience and the experience of other large pension plans containing similar provisions. Decisions on such economic assumptions as future payroll, inflation, and interest rates were made by a combination of extrapolation and judgment.

Since present law provides for cost-of-living increases for tier 2 benefits until 1980 only, an assumption was made that there would be no inflation after 1980. To make the interest and inflation assumptions consistent, new investments after 1980 were considered to draw interest at the rate of 3 percent. As a result, it was assumed that the fund's interest earnings will be 7.2 percent through 1980, decline gradually from 7.0 percent in 1981 to 3.1 percent in 1988-99, and then stabilize at 3.0 percent from 2000 onward.

## METHODOLOGY

To arrive at the results in the thirteenth valuation, four main steps were followed. It was necessary to (1) calculate the windfall appropriation, (2) project the progress of the railroad retirement fund to the year 2045, (3) calculate the present value of future benefits and future income, and (4) calculate the actuarial deficiency as a percent of future taxable payroll.

### Windfall Appropriation

The windfall appropriation was calculated by computing the present value of future windfall

benefits, computing the amount in the windfall fund, and solving the following equation for the level appropriation

$$\begin{aligned} &\text{Amount in fund} + \\ &\text{Present value of future level appropriations through} \\ &\quad \text{fiscal year 2000} = \\ &\text{present value of future windfall benefits} \end{aligned}$$

The present values were calculated at 3 percent. Using a different rate would have affected the answer only slightly because the windfall fund starts out negative on January 1, 1975, and never is very large.

The recommended appropriation was the future level appropriation obtained by solving the equation less the estimated annual gain to the fund from the liberalized investment rules in the 1974 Act. The result was then rounded.

### Fund Projection

Several time series were constructed to indicate the fund's income and outgo from all sources for each of the years 1975-2045. These series were combined in order to show the projected amount in the fund at the end of each year.

### Present Values

Present-value calculations were made for only a portion of the benefits—tier 2 and that part of tier 1 not reimbursed through the financial interchange with the social security program.<sup>2</sup> The reason is that the main purpose of the present-value calculations is to express the actuarial deficiency as a percentage of payroll. Since the windfall is financed from general funds and since about 85 percent of tier 1 is financed through the financial interchange, these benefits and their

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<sup>2</sup>The financial interchange provision (in existence since 1951) places the social security trust funds in the same positions they would have been in if railroad employment had been covered after 1938 under the Social Security Act by (1) crediting those trust funds each year with the social security taxes that would have been collected if railroad employment had been so covered and (2) crediting the railroad retirement account each year with the additional amounts of benefits (and administrative costs) that the social security system would thus have incurred on behalf of railroad beneficiaries. The net effect of the interchange has been a transfer over the years of \$8.2 billion from the social security system to the railroad retirement system.

financing will have no effect on the actuarial deficiency.

The question is whether the 9.5 percent by which the railroad retirement tax rate exceeds the social security tax rate is enough to finance the benefits it is supposed to finance and, if it is not enough, how much more is needed. The answer to the last question is the actuarial deficiency.

The present values were calculated at 3-percent interest on an open-group basis, with new members coming in for an indefinite period. The results of the projection were used to accumulate the fund to the year 2000 using the assumed varying interest rates and 3 percent. The difference between the two accumulations was discounted at 3 percent to the valuation date and called excess interest.

### Actuarial Deficiency

The actuarial deficiency on the valuation date was calculated, in dollars, as the present value of liabilities less the present value of assets. Dividing that amount by the decline that would be produced by a 1-percent increase in the tax rate gave the actuarial deficiency as a percent of future taxable payroll.

Another way to calculate the actuarial deficiency is to determine present values, at several rates of interest, of the various series needed to produce the projection. Except for small differences resulting from variations in the handling of details, this method gives the same answer for the actuarial deficiency as the percent-of-payroll approach. The chief advantage of the second method is that an actuarial deficiency expressed in dollars has a meaning. It is the single payment that would permit the present benefits to be supported by the present tax rate if all assumptions were proved true. No such interpretation is possible with the first method. The chief disadvantage of the second method is that it depends on a large number of infinite series.

## RESULTS

### Actuarial Deficiency

On December 31, 1974, the actuarial deficiency was 3.59 percent of taxable payroll. This defi-

ciency will increase with the passage of time unless corrective action is taken or some of the assumptions prove to be very pessimistic. The deficiency was projected to be 4.13 percent at the end of 1976 and 6.20 percent at the end of 1982.

Under the assumptions of this valuation, the practical meaning of the deficiency is that the present value of benefits can be maintained only if the tax rate is increased at some future time. An increase of 4.13 percent is required at the start of 1977, for example, to effect an actuarial balance. The actuarial deficiency calculations are summarized below.

<i>Item</i>	<i>Percent of payroll</i>
Total liabilities -----	15.60
Present retirement taxes -----	9.50
Funds and credits -----	2.51
Actuarial deficiency -----	3.59

### Projections

Table 1 gives projections of the railroad retirement account at three different tax rates. If the present rate (the social security rate plus 9.5 percent) is not changed, the fund will run out in 1986. If the tax rate is increased by 2.6 percent of taxable payroll, the fund will last until the year 2001. A 4.1-percent increase would cause the fund to last indefinitely. These projections assume that any tax increases take place at the beginning of 1977, that there are no changes in benefits, and that the actuarial and economic assumptions prove true.

It should be noted that the projections and the actuarial deficiency calculations are consistent with each other. They both say that the present taxes will not support the present benefits.

### Windfall Appropriations

The first calculations for the windfall appropriations were made in 1974. They indicated that \$250 million would be required for each of the 25 fiscal years 1976-2000. That amount actually was appropriated and placed in the railroad retirement account in February 1976. Calculations made for the thirteenth valuation indicate that \$350 million is needed for each of the next 24 years.

A large proportion of those entitled to wind-

TABLE 1—Progress of the railroad retirement account under present law and certain alternatives, 1975–2045

[Amounts in millions and on cash basis]

Calendar year	Taxable payroll	Taxes, present law	Financial interchange <sup>1</sup>	Other income <sup>2</sup>	Benefits <sup>3</sup>	Fund, <sup>4</sup> end of year, under—		
						Present law	Alternative 1 <sup>5</sup>	Alternative 2 <sup>6</sup>
1975	\$7,350	\$1,558	\$872	\$9	\$3 181	\$3,064	\$3 064	\$3 064
1976	7 640	1 620	948	206	3 418	2 652	2 652	2 652
1977	8,100	1,717	1,177	371	3,569	2 499	2,717	2 843
1978	8,470	1,830	1,560	375	3 735	2,681	3,143	3,409
1979	8,780	1,896	1,249	379	3 913	2,442	3 173	3,595
1980	9 160	1,979	1,292	383	4 091	2 136	3 166	3,761
1981	9 033	1,996	1,333	386	4,096	1 862	3 208	3,985
1982	8,961	1,980	1,286	387	4 061	1,532	3,204	4 169
1983	8,873	1,961	1,229	388	4,023	1,135	3,143	4 302
1984	8,794	1,944	1,179	389	4 007	658	3,005	4,359
1985	8 778	1 940	1,139	391	4,009	108	2,796	4,347
1986	8,761	1,962	1,107	394	3,998	—	2 566	4,314
1987	8,744	1,959	1,055	395	3,955	—	2,300	4,240
1988	8 728	1 955	1,006	396	3 901	—	2,022	4,155
1989	8 711	1 951	959	397	3,849	—	1,735	4,067
1990	8,717	1,953	912	397	3,791	—	1,453	3,990
1995	8,754	1,961	621	394	3,344	—	379	4 042
2000	8,809	1,973	375	387	2 928	—	82	5,057
2005	8 845	1 981	202	33	2 597	—	—	5,296
2010	8 856	1,984	107	32	2 428	—	—	6,164
2015	8,849	2 159	—99	33	2,430	—	—	7,475
2020	8 835	2,156	—48	35	2,549	—	—	8 445
2025	8,820	2 152	61	37	2,761	—	—	9 061
2030	8 813	2,150	187	40	2 978	—	—	9 227
2035	8,714	2,151	276	40	3 106	—	—	9,110
2040	8,820	2,152	309	40	3,133	—	—	8,932
2045	8,826	2,153	303	40	3,094	—	—	8,835

<sup>1</sup> Net amounts equal gross benefit reimbursements less dual benefit offsets and the taxes due the social security program. Includes reimbursements for administrative expenses and interest for the time lag between the transfer and the occurrence of events giving rise to the transfer. Data for 1978 includes 15 months because of the change in the beginning of the fiscal year.

<sup>2</sup> Appropriation to the funds dual benefit windfalls plus the transfer of taxes from the supplemental account.

<sup>3</sup> Includes tier 1, tier 2, and windfall benefit. Excludes administrative

expenses.

<sup>4</sup> The fund starts at \$3,602 million at the end of 1974. Interest is credited at a rate of 7.2 percent through 1980, grading down to 3.0 percent for years 2000 and later.

<sup>5</sup> Under alternative 1 the net railroad retirement tax rate is assumed to increase by 2.6 percent starting in 1977. Under alternative 2 the increase is assumed to be 4.1 percent (the actuarial deficiency updated to Jan 1, 1977).

fall benefits (a closed group) will either be receiving the windfall or will have died by the year 2000. Because such benefits are not subject to future cost-of-living increases once they are payable, the calculations should be reasonably

accurate in the later years. Any errors of estimation in the early years will be corrected in the later years provided that the final calculation, to be made late in this century, is reasonably accurate.

## Notes and Brief Reports

### Workers' Compensation Coverage, Payments, and Costs, 1975\*

Although fewer persons were in covered employment in 1975 than the year before (and "black lung" benefit payments remained stable), benefits under workers' compensation continued

to grow at a brisk pace during the year. Workers and survivors received \$6.5 billion in cash and medical care benefits during 1975 for work-related disabilities and deaths—13 percent more than the 1974 level, which in turn was also about 13 percent higher than the 1973 total. With the black lung program excluded, the 1975 increase was almost 16 percent.

The rises for 1975 and the preceding 2 years were the highest since 1940, the first year for which the Social Security Administration has compiled data. This rapid benefit growth was mainly the result of upward movements in the

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