Actuarial Notes

March 2022

Unfunded Actuarial Liability

This note provides information on the theoretical unfunded actuarial liability and normal cost for the closed group of present employees, former employees, annuitants and beneficiaries under the railroad retirement system. It is based on the data, benefit provisions, actuarial assumptions and methods used in the most recent 28th Actuarial Valuation. (This information was presented in Table 7 of the 27th Actuarial Valuation.) Note that experience different than anticipated could have a material impact on the results presented. Future valuations are likely to produce different results as experience develops and actuarial assumptions and methods change. In addition, changes in benefit provisions and applicable laws could have a significant impact on the cost.

The railroad retirement system is a social insurance program rather than a private pension plan. A private pension plan should build up funds in an orderly way over the working lifetimes of the participants. With a fully funded plan, the value of the accumulated assets will be sufficient to discharge all liabilities for the accrued benefits. Pay-as-you-go funding, where the pension costs are charged to the retirement years as the benefits are paid, is not acceptable for a private pension plan because it lacks participant security. Because private pension plans can terminate or the plan sponsor may become unable to provide funding support, they should, ideally, be fully funded to protect the rights of active and retired participants.

The situation is different for a social insurance program such as the railroad retirement system and full funding is not necessary. The program is expected to operate indefinitely. Because the program is compulsory, new entrants will constantly be entering the program, and they and their employers will continue paying taxes to support the program.

Unlike some other social insurance programs, the railroad retirement system relies on payroll taxes from the employers and employees of a single industry. Although the railroad retirement program is not subject to the funding standards of a private pension plan, it may still be of interest to calculate the actuarial liability and normal cost for the plan.

The following Table 1 illustrates what the funding requirements would be for the railroad retirement system based on the 28th Actuarial Valuation as of December 31, 2019, using the entry age normal actuarial funding method. Consistent results from the 27th Actuarial Valuation as of December 31, 2016, are shown for comparison.

The present value of future benefits and the present value of future administrative expenses for former and present employees are shown on lines 1 and 2, respectively. The portion of the actuarial present value of benefits assigned to a particular year is called the normal cost. For the entry age normal actuarial funding method, the normal cost rate is the average cost expressed as a level percentage of payroll (line 4) that would fund the average employee's benefits, including dependent benefits, and expenses over the employee's working lifetime. The approximate normal cost rate is 8.52% of tier 2 payroll, as developed in Table 2.

The actuarial liability for the system (line 6) is equal to the difference between the present value of benefits and administrative expenses for former and present employees and the present value of future normal costs. The unfunded actuarial liability (line 8) is the difference between the actuarial liability and the funds on hand as of the valuation date (line 6 minus line 7). This amount is needed, in excess of funds on hand and future normal costs, to fund railroad retirement system past-service benefits and expenses for former and present employees.

Table 1. Unfunded Actuarial Liability

(Dollar Amounts in millions)

	28th Valuation	27th Valuation
Valuation date	12/31/2019	12/31/2016
Discount Rate	6.5%	7.0%
1) Present value of future benefits for former and present employees (sum of below)	$99,116	$91,991
• Annuitants	53,489	50,195
• Active employees	43,448	40,161
• Inactive employees	2,143	1,590
• Lump sum payments	36	46
2) Present value of administrative expenses for former and present employees	3,037	2,785
3) Present value of tier 2 payroll for present employees	195,433	192,273
4) Approximate Normal Cost as a level percentage of tier 2 payroll (see Table 2)	8.52%	7.80%
5) Present value of future normal costs for present employees, (3) x (4)	16,651	14,997
6) Actuarial Liability, (1) + (2) – (5)	$85,502	$79,779
7) Funds on hand as of valuation date	29,112	28,488
8) Unfunded Actuarial Liability, (6) – (7)	$56,390	$51,291

All values are consistent with the results of the most recent Actuarial Valuations. In particular, the census data, benefits provisions, actuarial assumptions and methods reflected in the Actuarial Valuations are reflected in the results presented here.

Notes on each Table 1 line item

1) Present value of future benefits for former and present employees is shown in the Actuarial Valuation, Table 3. The present value includes tier 2 benefits, supplemental annuity benefits, and the portion of tier 1 benefits in excess of the social security level of benefits.

2) Present value of administrative expenses is a prorated allocation of the amount in the Actuarial Valuation, Table 6.

3) Present value of tier 2 payroll is based on the closed group of current active employees. No new entrants are anticipated.

4) Approximate Normal Cost percent is explained more fully in the following Table 2. The actual normal cost percent will be different depending on the actual age, service, and earnings of the present employees.

5) Present value of future normal costs for present employees is the estimated value of future benefit accruals for this closed group. It is estimated based on the approximate normal cost (see Table 2) times the present value of tier 2 payroll for the present employees.

6) Actuarial Liability is the remaining past service liability after subtracting future benefit accruals.

7) Funds on hand is the sum of the National Railroad Retirement Investment Trust, Railroad Retirement Account and Social Security Equivalent Benefit Account balances shown in the Actuarial Valuation, Table 5.

8) The unfunded actuarial liability is satisfied with additional payroll taxes and other revenue such as income taxes on benefits in excess of the future normal costs paid for current employees and future employees. The Actuarial Valuation includes three future employment scenarios (I-optimistic, II-moderate, III-pessimistic) that illustrate the ability of future payroll taxes to meet this obligation.

Table 2. Normal Cost Method

The normal cost percentage equals the level percentage tier 2 payroll cost of future benefits in aggregate for a single year group of new entrants with a 100-year projection period. It does not reflect the actual population of present active employees or a specific individual situation.

The new entrant distribution is based on actual entry experience over the prior four (4) years, as shown in the Actuarial Valuation, Table S-44. The projections reflect all of the same demographic assumptions (termination, disability, retirement, mortality, spousal coverage) and ultimate economic assumptions (investment return, salary growth, wage growth, inflation) from the Actuarial Valuation.

We completed separate 100-year projections for each age group of new entrants and developed aggregate present value results reflecting the new entrant distribution. As you can see in the table below, the normal cost percentage for individual groups varies depending on the entry age. This reason for this variation is because the entry age has a fairly significant impact on the future benefits paid. In particular, the railroad retirement system provides additional value through unreduced benefits with 30 years of service after reaching age 60, which is most valuable for those hired before age 35.

Age Group	New Entrant Distribution	Normal Cost % of Tier 2 Payroll
Under 20	2.4%	8.55%
20 – 24	21.7	9.38
25 – 29	24.2	10.44
30 – 34	17.7	7.78
35 – 39	12.8	6.11
40 – 44	8.4	6.47
45 – 49	6.1	6.92
50 – 54	3.8	7.27
55 & over	2.9	7.70
Aggregate	100.0%	8.52%

The aggregate normal cost percentage is higher using the 28th Actuarial Valuation assumptions (8.52%) compared to the 27th Actuarial Valuation assumptions (7.80%). This increase is primarily due to lowering the investment return and discount rate to 6.5% from 7.0% used in the prior valuation.