Twelfth Valuation of the Railroad Retirement System: A Summary View

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In view of the present concern with the financial position of the railroad retirement system and the relationship of that system to the old-age, survivors, disability, and health insurance program, the latest actuarial valuation of the railroad retirement account merits attention. The article discusses this valuation, its scope and assumptions, and summarizes the valuation results. The author points out the need for alternative valuations because of recent legislative actions and focuses on the results of the principal valuation.

IN THE PAST several years, the growing actuarial imbalance of the railroad retirement system has been attracting much public attention. In response to predictions by the actuaries of the Railroad Retirement Board that the fund may become exhausted by the mid-1980's, Congress called into being a special commission (the Commission on Railroad Retirement) to study the railroad retirement system and recommend a program for dealing with its problems.

After a year and a half of intensive study, the Commission issued a report that in essence confirmed the findings of the Board's actuaries and recommended a restructuring of the system that would in effect provide railroad employees with a regular social security benefit plus a supplemental pension.[1]

In addition, Congress enacted temporary increases in railroad retirement benefits in 1970, 1971, and 1972 (prompted by those in social security benefits) and extended them through 1973 legislation to the end of 1974.

The Railroad Retirement Act requires that a valuation of the railroad retirement account, showing the financial condition of the railroad retirement system, be made for intervals not longer than 3 years. The most recent actuarial valuation of the system (the twelfth) covers the period from the end of 1968 through the end of 1971, with all pertinent legislation through the end of 1972 taken into account.[2] A discussion of this valuation, its scope, and assumptions is presented here, with a summary of the results of the principal valuation.

INTERVAL SINCE LAST VALUATION

Since December 1968—the end of the period of the last valuation—the situation of the railroad retirement system has changed significantly. The active membership declined by nearly 12 percent while the number of beneficiaries rose almost 3 percent. Benefit payments went up 34 percent, but the income from all sources (including the financial interchange) rose only 23 percent. The ratio of beneficiaries on the rolls to active members also rose dramatically. In December 1968, this ratio was 1.45 per 100; 3 years later it was 1.70. (In December 1971, the corresponding OASDI ratio was 0.38.) All these developments had an unfavorable effect on the financial condition of the system.

An event of major importance was the creation in 1970 of the special commission to study the railroad retirement system and to recommend ways and means for solving its structural and financial problems. In its report, issued as of June 30, 1972, the Commission on Railroad Retirement included among its major recommendations a plan for restructuring of the system into a two-tier system, with the first tier providing regular social security coverage (retroactive to 1937) and benefits financed and paid under the social security laws and the second tier providing a sepa-

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[1] Commission on Railroad Retirement, *The Railroad Retirement: Its Coming Crisis* (House Document 92-350), June 30, 1972. For excerpts from the main recommendations see the *Social Security Bulletin*, November 1972, page 20; see also A. M. Niessen, *Transactions of the Society of Actuaries*, No. 1, 1973, pages 520-24.

[2] The report on the valuation is included in the *Railroad Retirement Board Annual Report, 1973*.

rate supplemental pension plan to be worked out jointly by labor and management.

From 1970 to 1972, Congress enacted the three increases in railroad retirement benefits noted earlier (15 percent in 1970, 10 percent in 1971, and 20 percent in 1972)—all of them designated as temporary and, as of the end of 1972, scheduled to terminate on June 30, 1973. The first of these increases was made temporary in the expectation that by mid-1972 some new approaches toward dealing with railroad retirement matters would be well on their way. This expectation was not fulfilled, however, and the two additional temporary benefit increases were enacted, following further social security benefit rises. All three railroad retirement benefit increases were extended for a year and a half by 1973 legislation.

Other changes enacted in 1973 (noted later in the article) reflect the recommendations of the group studying the problems of the system under a 1972 mandate. Aware that further changes must be made before actuarial soundness can be achieved, Congress included in Public Law 93–69 (1) a provision for a labor-management committee to recommend 'ways to achieve this purpose and (2) a declaration that it intends to have the legislation for the needed changes in effect by the beginning of 1975:

> *Sec. 107(c)(1).* Not later than April 1, 1974, representatives of employees and representatives of carriers, acting through the group designated by them pursuant to subsection (a), shall submit to such committees a report containing their joint recommendations for restructuring the railroad retirement system in a manner which will assure the long-term actuarial soundness of such system, which recommendations shall take into account the specific recommendations of the Commission on Railroad Retirement.

> *Sec. 108.* The Congress hereby declares its intent to enact legislation in 1974, effective not later than January 1, 1975, which will assure the long-term actuarial soundness of the railroad retirement system.

SCOPE OF VALUATION

Traditionally, an actuarial valuation of a benefit program considers only the existing legal framework and does not concern itself with future amendments. Indeed, this approach was followed in all previous valuations of the railroad retirement system; the legal framework considered was the legislation already enacted by a specified cutoff date. For reasons explained below, such a course of action could not be followed in the twelfth valuation. Accordingly, the valuation project was expanded to include two alternatives to existing law. Thus, the twelfth valuation is in reality a set of three valuations, one of which pertains to the law on the books in June 1973 and the others to certain modifications thereof.

The main reason for considering alternative benefit structures was the provision that the three benefit increases of 1970, 1971, and 1972 were scheduled to expire on June 30, 1973. This cutoff would have meant reductions in three-fourths of all annuities currently payable, and in most cases the reductions would be around 30 percent. It was clear that such reductions in benefits would not be permitted to occur and that so long as the structure of the railroad retirement system remains as it is, these increases would not be rescinded. Because of this, the principal valuation was related to a modified legal framework differing from the existing one only with respect to the future of the temporary benefit increases. Specifically, the modification was geared to an assumption that the benefit increases will remain in effect indefinitely.

Another reason for an alternative valuation was the automatic adjustment mechanism for the OASDI benefit structure. Since all railroad retirement monthly benefits are subject to an overall 110-percent social security minimum guaranty,[3] all such minimum cases would automatically go up with the OASDI adjustment while the nonminimum cases would either go up less or not at all. If, for example, the OASDI adjustment is 5 percent, all cases 5 percent or more above the minimum would not go up. History has shown that such a situation will not be permitted to last for any length of time and that adjustments in the nonminimum benefits will be made by ad hoc legislation.

An even more curious difficulty would manifest itself if OASDI adjustments came in rapid succession. Under such conditions, a railroad retire-

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[3] In general terms, the guaranty provides that railroad retirement benefits will not be less than 110 percent of the benefits or additional benefits that the social security program would have paid on the basis of the railroad earnings involved.

ment annuity moderately above the minimum amount at accrual would remain stationary for a number of years and would begin going up only after the minimum takes over. In short, a benefit formula that is part static and part dynamic (by means of the minimum guaranty) is an anomaly whose permanence cannot be assumed. It was therefore considered advisable to make an alternative valuation for a totally dynamic benefit structure, the specifics for which were deliberately chosen in order not to duplicate or resemble the structure recommended by the Commission on Railroad Retirement.

The scope of the valuation was expanded to include actuarial appraisals of the following three legislative models:

(A) The June 1973 law under static conditions but assuming that the benefit increases will not be rescinded;

(B) the law on the books in June 1973, with the benefit increases terminating on June 30, 1973, and assuming static economic conditions;

(C) wholly dynamic benefit formulas similar in principle (but not in specifics) to the dynamic formula for OASDI.[4]

It should be noted that the OASDI automatic adjustment provisions were not pertinent in connection with models A and B, since under static economic conditions these provisions would be inoperative. The dynamic model was examined under two combinations of escalation rates: One combined a rate of 5 percent for wages with 2¾ percent for prices, and the other combination was 5 percent for wages with 3½ percent for prices.

VALUATION ASSUMPTIONS

As in the past, most major assumptions were based on the system's own experience. The rates of separation used (retirement, disability, withdrawal, and death) were either the same as those used in the preceding valuation or not much different from them. Material changes were made only in the assumptions relating to the interest rate and employment levels. The valuation interest rate was increased from 4.75 percent to 5.75

percent, and the employment assumption was lowered from an ultimate number of 575,000 full-time railroad jobs to 465,000.

The major assumptions are described below. Assumptions 3 and 4 are needed particularly in connection with the financial interchange operations. (A technical supplement to the full report contains greater detail on the assumptions, including complete tables of rates, factors, and the like.)

1. Of 100 long-service employees attaining age 65 in a given calendar year, 83 will retire before the end of that year. For short-service employees (less than 25 years), the corresponding rate of retirement will be 48 percent.[5]

2. Rates of disability retirement will range from less than 1 percent for ages 50 and under to 3–5 percent at ages 60–64.

3. Three out of 4 retirements for disability will meet the medical standards for a disabled-worker benefit under the social security system.

4. The incidence of dual benefits—OASDI benefits paid concurrently with railroad retirement benefits —will be high and the amount of the dual benefits large.

5 Family composition will be the same as that observed in recent years.

6. With the lessening of inflationary pressures, interest rates will recede to lower levels in such a manner that a long-term average rate of 5.75 percent will be obtained.

7. Railroad employment (in terms of average mid-month counts) will decline in stages from the 611,000 figure for 1971 to 465,000 for 1981 and remain level thereafter.

8 The longevity of annuitants will rise slightly, but in general their life expectancy will not be significantly different from that prevailing today.

9. For the static valuation, a continuation of late 1972 wage and price levels was assumed. For the dynamic projections, annual increases of 5 percent in wages and 2.75 or 3.5 percent in prices were used.

10. Future entrants will come in at a median age of 22.7, with 83 percent under age 30 at entry.

RESULTS OF THE VALUATIONS

Principal Valuation

Model A was used for the principal valuation —that is, it was based on existing law with the

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[4] For a more detailed description of this model, see Railroad Retirement Board, *Actuarial Note No. 4–73*, which makes it clear that the use of this particular model in the valuation did not constitute an endorsement of it by the Board or any of its officials.

[5] This experience reflects the fact that retirement at age 65 is one of the conditions for receiving a supplemental annuity. These special annuities are available only to employees with at least 25 years of railroad service.

TABLE 1.—Condensed actuarial balance sheet for regular railroad retirement program under present benefit structure and static economic conditions, with open-group and closed-group approaches [1]

[Amounts in millions, all calculated at 5 75-percent interest]

Item	Open-group valuation, perpetuity financing method			Closed-group valuation, 30-year financing		
	Present value	Amount per year [2]	Percent of payroll [3]	Present value	Amount per year [4]	Percent of payroll [5]
Liabilities	$56,121	$3,138	56 54	$45,324	$3,205	57 23
Railroad retirement benefits	43,380	2,426	43 70	39,826	2,816	50.28
Benefit payments	43,032	2,406	43 35	39,495	2,793	49.87
Administrative expenses	348	20	35	331	23	.41
Payroll taxes due OASDHI	12,741	712	12 84	5,498	389	6.95
OASDI	10,101	565	10 18	4,420	313	5.59
HI	2,640	147	2 66	1,078	76	1 36
Assets	49,867	2,788	50.24	36,311	2,568	45 84
Funds on hand	5,413	302	5 45	5,413	383	6 84
Tax collections	21,817	1,220	21.98	9,556	676	12 06
Retirement taxes	19,237	1,076	19 38	8,538	604	10 77
HI taxes	2,580	144	2 60	1,018	72	1.29
Benefit reimbursements under financial interchange with OASDI	22,637	1,266	22 81	21,342	1,509	26 94
Benefits [6]	22,379	1,252	22.55	21,101	1,492	26.64
Administrative expenses	258	14	.26	241	17	.30
Actuarial deficiency						
As of Dec 31, 1971	6,254	350	6.30	9,013	637	11.39
As of June 30, 1973	6,801	380	6.85	9,801	693	12 39

[1] Valuation for model A, relating to the law as amended through 1972, but modified on assumption that the temporary benefit increases will never be rescinded Data are as of Dec 31, 1971, unless otherwise specified
[2] Yearly amount into perpetuity equivalent to given present value assuming income and outgo in the middle of the year Equivalent level amount equals 5 592 percent of the corresponding present value
[3] Taxable payroll estimated at $5 55 billion per year on a level basis for the previous earnings base of $1,000 per month
[4] Under a method that calls for amortizing all costs over a 30-year period At

5 75-percent interest, the conversion factor from the present value to the yearly amount is 7 072 percent
[5] Relates to the equivalent level taxable payroll for all employees for the first 30 years ($5,600 million). For the closed group only, the corresponding payroll is $3,080
[6] After reduction for social security benefits paid to railroad retirement beneficiaries

Source *1973 Annual Report of the Railroad Retirement Board.*

temporary increases assumed to remain indefinitely and static economic conditions. Pertinent cost figures were developed under (1) an open-group approach that includes future entrants, with a valuation period of indefinite duration, (2) a closed-group approach that excludes future entrants, with the finite valuation period associated with it, and (3) an open-group approach with a 75-year valuation period. The principal results of these cost studies are presented in tables 1 and 2.

As table 1 indicates, the open-group valuation showed an actuarial deficiency of 6.30 percent of taxable payroll in the December 31, 1971, position and 6.85 percent in the June 30, 1973, position. When adjustments for the railroad retirement and social security amendments of July 1973 are made, the deficiency becomes 8.66 percent or $494 million per year on a level basis.

The results of the closed-group valuation are of special interest in connection with recently expressed opinions regarding the funding of the railroad retirement program. The substance of these opinions is that the program should be funded in essentially the same manner as are private pension plans—an approach that would involve an amortization of the unfunded liabilities

over a definite period such as 30 years.[6] Table 1 shows that the unfunded liabilities for the closed group were $34.4 ($39.8 − $5.4) billion before adjustment for the financial interchange and $18.6 ($45.3 − $5.4 − $21.3) billion after such adjustment. To fund the $18.6 billion over a 30-year period, an annual contribution of about $1.3 billion or more than 42 percent of the closed group's own payroll would be required.

A further analysis of the problem indicates that if a 30-year amortization of the unfunded liability were to be connected with entry-age normal contributions for all employees, the rate of contributions would have to be 28.32 percent of *total* taxable payrolls during the first 30 years and 14.55 percent thereafter. The addition of contributions for hospital insurance, the supplemental annuity program, and the unemployment insurance program would increase the combined contribution rate for the first 30 years to about 36 percent of taxable payroll (with $1,000 monthly limit) for all employees. The size of this figure casts serious doubt on the feasibility

[6] See pages 566–67 of the report of the Commission on Railroad Retirement, and see also A. M. Niessen, *Transactions of the Society of Actuaries,* op. cit., pages 523–24.

of such a funding arrangement for the railroad retirement system.

In any case, most authorities are of the opinion that amortization of unfunded liabilities is not required in the case of public plans. So long as the unfunded liabilities are kept from growing (through the timely payment of interest charges and normal costs), the plan may be considered sound. According to the open-group static valuation, such a criterion of actuarial soundness for the railroad retirement system required as of December 31, 1971, a contribution rate of 25.68 percent of taxable payroll (19.38 + 6.30), excluding hospital insurance taxes and contributions for the supplemental annuity program.

Additional information gleaned from the valuation follows:

- The entry-age normal cost of the railroad retirement benefits (before liberalizations of the July 1973 amendments) was found to be 6.48 percent of taxable payroll. It was determined, however, that the financial interchange with respect to future entrants will cost the railroad retirement system 8 07 percent of its payroll on a net basis.[7] Thus, the adjusted entry-age normal cost came to 14 55 percent of taxable payroll

- Total past service (before 1972) liabilities were $32 billion. A large portion of that might, of course, be considered "funded" through the financial interchange with OASDI, and the funds on hand would take care of a part of the remainder.

- The unfunded accrued liability of the system (liabilities minus funds on hand minus future contributions at entry-age normal rates) was $31.2 billion before adjustment for the effects of the financial interchange and $8 9 billion after such an adjustment. The difference of $22.3 billion might be considered a part of the unfunded accrued liability of the OASDI system.

Alternative Valuations

Using Model B.—If the 1970–72 benefit had been absolutely terminated on June 30, 1973, the system's costs would have been lower by 8.75 percent of taxable payroll, and an actuarial surplus instead of a deficiency would thus have been created. Although these increases are still being designated as temporary, their withdrawal at any

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[7] This percentage takes into account imputed OASDI benefits, based on railroad and nonrailroad earnings combined minus benefits actually payable by social security minus payroll contributions.

TABLE 2 —Progress of the railroad retirement account under present benefit structure and static economic conditions,[1] 1971–2045

[Amounts in millions, on a cash basis]

Calendar year	Taxable payroll	Taxes [2]	Benefits [3]	Financial interchange [4]	Net benefits [5] as percent of taxable payroll	Balance in fund at end of year [6]
Actual						
1971	$4,820	$1,012	$1,962	$626	27.7	$4,241
1972	5,370	1,016	2,128	749	25.7	4,046
Projection						
1973	6,006	1,153	2,509	802	28.4	3,688
1974	6,221	1,194	2,590	930	26.7	3,400
1975	6,031	1,158	2,638	1,016	26 9	3,098
1980	5,284	1,009	2,701	1,048	31.3	596
1985	5,184	990	2,671	965	32 9	----------
1990	5,184	990	2,568	874	32 7	----------
2000	5,184	990	1,939	467	28 4	----------
2020	5,184	1,099	1,379	−127	29.1	----------
2045	5,184	1,099	1,657	−63	33.2	----------

[1] Based on the law in effect in June 1973, with benefit increases assumed to remain indefinitely. Under static economic conditions, the automatic adjustment provisions for OASDI would be inoperative
[2] Combined rate for any year equals the OASDI rate plus 9½ percentage points
[3] Excludes administrative expenses at $20 million per year.
[4] Net amounts equal gross benefit reimbursements, minus dual benefit offsets, minus taxes due OASDI, minus the relatively small losses associated with the flow-through of hospital insurance taxes Calendar-year amounts relate to transactions for the fiscal year that ended in the preceding calendar year and include interest for the time lag as well as administrative expenses.
[5] Railroad retirement benefits minus net financial interchange.
[6] Includes interest earnings at a rate of 5 75 percent The fund becomes exhausted in 1981

Source *1973 Annual Report of the Railroad Retirement Board.*

time is extremely unlikely. A valuation that anticipates such withdrawal is therefore of only academic interest.

Using Model C.—If no steps are taken to improve the actuarial soundness of the railroad retirement system, its fund will be exhausted by 1980 or 1981. Two 75-year projections for a theoretical dynamic model [8] produced cost ratios of the same order of magnitude as those shown in table 2 that indicate exhaustion of the railroad retirement fund by 1980.

AFTER THE VALUATION PERIOD

Action in 1973

By the time the twelfth valuation was completed in June 1973, the railroad retirement situ-

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[8] This model introduces a lower annuity factor for the part of the average monthly compensation above $750 and an automatic cost-of-living adjustment mechanism similar in principle to the one in operation for OASDI. The dynamic assumptions for one of the projections were a 5-percent annual increase in wages and a 2.75-percent increase in prices; for the other, a combination of 5- and 3.5-percent increases was used.

ation was not any clearer than before, since labor and management had not yet produced solutions to the real problems of the system. The 1972 legislation had included a congressional mandate to railroad labor and management to jointly plan a program for solving the difficulties of the railroad retirement system, with consideration given to the recommendations of the Commission on Railroad Retirement. In the first labor-management report, due March 1, 1973, the negotiating parties asked for more time to complete the assignment.

At the same time, however, they recommended a change in the allocation of contributions between employees and employers, as well as the elimination of actuarial reductions in benefits for nondisabled men who retire after June 1974 at ages 60–64 with 30 or more years of railroad service. Other recommendations dealt with a pass-through arrangement for any increase in social security benefits granted between July 1973 and December 1974 and with freight-rate increases sufficient to offset the costs of the new allocation of railroad retirement contributions. These recommendations were accepted by Congress and were incorporated in Public Law 93–69, enacted July 10, 1973.

The "temporary" benefit increases are currently scheduled to expire December 31, 1974. Beginning with October 1973, the rates of contribution for railroad employees will generally be the same as the OASDI rates and the rates for railroad employers are to be 9½ percentage points above the corresponding OASDI rates. Since the total of both rates will be the same as before the new allocation, there will be no increase in the tax income of the fund. The outgo will be greater, however, because of the removal of actuarial reductions for those with 30 years' service and the disregarding of concurrent social security benefits (dual benefits) in determining the amount of the pass-through increase under the 1973 social security amendments.

Since these changes call for greater outgo from the fund without any increase in income, the actuarial condition of the railroad retirement account is actually not improved but aggravated. The present situation is generally viewed as transitional, however, pending definitive action to safeguard the future of the railroad retirement system. The language of sections 107 and 108 of Public Law 93–69, quoted earlier, makes it clear that such action is to be forthcoming.

Status of Railroad Retirement, Mid-1973

During fiscal year 1972–73, the balance in the railroad retirement account dropped from $4,613 million to $4,375 million—a decline of $238 million over the year. Further declines of varying amounts are expected in future years unless action is taken to prevent them. Benefit payments are now running at an annual rate of $2.5 billion

TABLE 3.—Number and average amount of railroad retirement benefits in current-payment status at end of June 1973 and benefits awarded in April–June 1973

Type of benefit	Benefits in current-payment status		Benefits awarded	
	Number	Average amount	Number	Average amount
Employee annuities				
Regular	447,550	$269	8,150	$300
Full age	286,563	284	3,367	310
Reduced age	61,427	215	1,691	230
Disability [1]	99,560	257	3,092	327
Immediate retirements [2]	349,086	300	5,537	371
Deferred retirement	98,464	158	2,613	151
Based on railroad retirement service of				
10–24 years	136,938	173	[3] 3,132	180
25–29 years	52,660	276	[3] 1,589	331
30 years of more	257,952	318	[3] 3,429	396
Supplemental [4]	105,706	66	3,160	65
Spouses' annuity	210,793	128	5,576	126
Full (unreduced)	92,212	135	2,077	137
Reduced	118,581	122	3,499	120
Survivor annuity	331,394	160	6,648	170
Aged widows	282,691	162	5,102	176
Disabled widows	3,936	143	164	144
Mothers and children	44,397	148	1,380	152
Annuity payable under minimum guaranty [5]				
Employees	24,838	264	24	323
Spouses	4,922	107	61	101
Aged widows	199,911	188	3,665	198
Other survivors	44,429	154	1,355	161
Concurrent social security benefits				
Employees	171,490	124	2,623	152
Spouses	131,075	97	3,669	112
Aged widows	111,514	117	1,582	123
Other survivors	3,487	96	70	114
Railroad retirement and social security benefits, combined [6]				
Employees	171,490	330	2,623	356
Spouses	131,075	212	3,669	230
Aged widows	111,514	226	1,582	250
Other survivors	3,487	182	70	209

[1] Regardless of present age These benefits are not converted to old-age benefits when beneficiary reaches age 65, as they are in the social security system

[2] Classified as immediate if the employee worked in the railroad industry in the year of his retirement or in the calendar year immediately preceding

[3] Partly estimated

[4] Payable concurrently with regular benefit, but subject to certain qualifying conditions

[5] Amount equal to 110 percent of what the social security program would have paid on the basis of railroad and nonrailroad earnings combined, minus social security benefits actually payable

[6] Combined amount for persons receiving dual benefits (benefits under both programs).

and tax collections (exclusive of hospital insurance benefits) at less than one-half of that amount. The highest monthly benefits possible as of September 1973 are $534 for a retiring worker, $188 for a wife, and $304 for a widow. The lump-sum death benefits payable under certain conditions have also grown to substantial amounts so that a residual payment (similar to the cash refund benefit under an individual annuity contract) of over $13,000 is possible. The number and average amount of benefits being received in mid-1973 are shown in table 3, by type.

Under the financial interchange with OASDI, current benefit reimbursements run at about 60 percent of the total railroad retirement benefit payments and the payroll taxes due to OASDI trust funds come to about 52 percent of the tax collections. The latest financial interchange figures available indicate that the benefit reimbursements for fiscal year 1971–72 amounted to 2.1 percent of the OASDI benefits paid under the social security system during that period. As of the middle of that fiscal year, the ratio of railroad retirement beneficiaries (excluding those not insured for financial interchange reimbursements) to OASDI beneficiaries was 3.5 percent.

It should be remembered that the transactions under the financial interchange arrangement are strongly influenced by the availability of concurrent social security benefits to railroad retirement beneficiaries. This is because benefit reimbursements are computed as the difference between (1) the benefits OASDI would have paid on the basis of railroad and nonrailroad earnings combined and (2) the benefits the social security system is actually paying to railroad retirement beneficiaires. The later, usually referred to as dual benefits, are now payable at a rate of $570 million per year and about 95 percent of that amount will enter the financial interchange as a subtractive item. The main problem is that the typical dual benefit is based on short and/or intermittent employment resulting in rather low average monthly earnings that in turn produce benefits way out of proportion to the covered earnings.