CHAPTER III

PROJECTING CONRAIL'S NET OPERATING INCOME

Chapter Summary. The forecasts of Conrail's traffic from Chapter II provide the basis for estimating the net operating income Conrail will earn from carrying that traffic. By combining the tonnage forecast with assumptions about Conrail's ability to price its services, estimates of Conrail's operating revenue are obtained. Similarly, combining the tonnage forecast with assumptions about Conrail's costs and its rate of productivity growth produces estimates of Conrail's operating expenses. Operating revenues less operating expenses yields estimates of Conrail's net operating income--that is, income derived solely from the transportation operations of the company. Under CBO's baseline macroeconomic forecast and conservative assumptions for estimating operating revenues and expenses, Conrail's net operating income is projected to rise steadily from $418 million in 1986 to $640 million in 1992 and to remain at approximately this level through 1995. This amount compares with net operating income in the years 1983 through 1985 of $285 million, $450 million, and $388 million, respectively. The projected levels of net operating income indicate that Conrail will be able to maintain its traffic base, meet its operating expenses, and remain profitable over the next decade.

Net operating income is the difference between the revenue derived from transportation services and the expenses incurred in providing them. It does not incorporate such expenditures as taxes or capital improvements, but it nonetheless indicates the financial strength of Conrail. In this chapter, Conrail's revenue and expenses first are estimated separately and then are combined into a projection of net operating income.

Estimating Conrail's revenues and expenses for the forecast period is a more subjective process than forecasting its traffic. The principal factors affecting Conrail's potential traffic do not change dramatically over the historical and forecast periods. Factors affecting revenues and costs, however, have changed so significantly between 1976 and 1985 that they cannot be reliably forecast using an econometric model. Projections of operating revenues and expenses are therefore based on assumptions concerning Conrail's competition and costs over the 1986-1995 period.

OPERATING REVENUES

Estimates of operating revenue depend on the forecast of Conrail's tonnage by commodity from the traffic model, the revenue per ton by commodity received by Conrail in 1985, projected inflation over the forecast period, and assumptions concerning the competition and therefore the pricing constraints that Conrail will face in the future.

Revenue is calculated using the tonnage for each commodity, as estimated by the traffic model. In using this measure, CBO made several assumptions about the nature of the traffic hauled over the 10-year forecast period. First, the actual shipment mix of specific commodities is assumed to remain constant within the individual commodity groupings used in Chapter II. This assumption is necessary because of the lack of more detailed data on the commodities hauled by Conrail. Second, the average length-of-haul for shipments within each commodity group is assumed to be constant and, therefore, the relationship between tons and ton-miles is constant as well. This assumption is in accord with the recent stability in Conrail's overall average length-of-haul.

The prices, or rates, for each commodity are based on 1985 revenue by commodity. Revenue per ton by commodity is calculated from 1985 data and is used as a base on which to project rate increases resulting from inflation. Prices are raised at a rate equal to a uniform percentage of inflation. The measure of inflation used to calculate rate increases is CBO's forecast of the percentage change in the GNP deflator, presented in Table 3.

Conrail's ability to raise rates in response to inflation is determined largely by the degree of price and service competition provided by trucks, barges, and other railroads. The percentage of inflation-induced cost increases that can be recovered by raising rates is called the tariff recovery rate. This rate is a function of the assumptions made about Conrail's relative service quality and price levels. A tariff recovery rate of 0.8, for example, means that Conrail will raise its prices to recoup 80 percent of its cost inflation.

In this analysis, Conrail is viewed as a price-taker on a systemwide basis--that is, the prices it can charge are largely determined by the transportation markets. Theoretically, if Conrail were faced with more efficient and cost-cutting competitors, it could be forced to set a tariff recovery rate as low as zero. In such a case, real rates would decline to compete with the

efficient operations and services provided by those competitors. On the other hand, if Conrail were not faced with more efficient competitors that forced it to hold down its rates, Conrail could fully recover cost increases caused by inflation by setting its tariff recovery rate equal to one.

The choice of which tariff recovery rate to use in projecting Conrail's revenue depends on the level of expected competition in the Conrail service area, since competitive markets restrain Conrail's pricing. Over the 1980-1984 period, the average tariff recovery rate for the railroad industry was 82 percent (.82). In recent years, Conrail has forecast a tariff recovery rate equal to 80 percent of inflation (0.8) in years of economic growth and 50 percent of inflation (0.5) in recessions. The lower value in recessions reflects the belief that Conrail would attempt to moderate price increases during recession years in an effort to preserve its market share. In Conrail's most recent five-year outlook of June 1985, the tariff recovery rate was projected at 0.8 in each year.

The forecast of operating revenue used in this analysis is based on a tariff recovery rate of 70 percent in the base case and 50 percent in the low case. The assumption of a 0.7 tariff recovery rate suggests that competition will restrain Conrail's pricing over the forecast period more than it has in the recent past, but that the ability of efficient competitors to undercut Conrail's rates will not change dramatically. Although there is no immediate reason to believe that Conrail's competitive position will deteriorate in this fashion, a tariff recovery rate of 0.7 is employed simply to provide a conservative estimate of Conrail's ability to recoup cost increases resulting from inflation. The low case assumes greater real price-cutting and competition during and after the recession. This assumption also is conservative, given that the economy expands steadily after the 1987-1988 recession under the low case.

The level of projected operating revenue, then, depends on the level and mix of commodities hauled (derived from the traffic model), the rate of inflation (from the macroeconomic forecast), and the value chosen for the tariff recovery rate. The percentage increase in the tariff rate for all commodities is calculated by multiplying the tariff recovery rate by the inflation forecast for the year. Then, on a commodity-by-commodity basis, this percentage change is applied to the revenue per ton realized in the previous year, yielding the current year's revenue per ton. The tonnage forecast for each commodity group is then multiplied by its revenue per ton to produce revenue by commodity. Summing all revenues by commodity yields total operating revenue.

Various tariff recovery rates and the resulting levels of operating revenue in 1990 and 1995 are presented in Table 6 for both the base and low macroeconomic cases. With full recovery of inflation-related cost increases, revenues are over 50 percent higher in 1995 than 1985 in the base case, and almost 25 percent higher in the low case. Without any rate increases, the higher levels of operating revenue in the base case reflect solely the changes in the level and mix of commodities transported. In the low case, without any rate increases, operating revenue is below the 1985 level in both 1990 and 1995. This decline, while partly a result of lower traffic in each of those years, stems principally from changes in the composition of the goods hauled by Conrail. In the base case, the tariff recovery rate of 0.7 produces operating revenue of approximately $3.8 billion in 1990 and $4.3 billion in 1995. In the low case, using a tariff recovery rate of 0.5 produces operating revenue of approximately $3.3 billion in 1990 and $3.5 billion in 1995.

TABLE 6. PROJECTIONS OF OPERATING REVENUE UNDER ALTERNATIVE TARIFF RECOVERY RATE ASSUMPTIONS
(In millions of current dollars)

Tariff Recovery Rate	Actual	Base Case		Low Case	
	1985	1990	1995	1990	1995
0.0	3,162	3,347	3,259	3,054	3,024
0.2	3,162	3,483	3,533	3,155	3,190
0.3	3,162	3,553	3,677	3,206	3,276
0.5	3,162	3,696	3,983	**3,311**	**3,454**
0.7	3,162	**3,843**	**4,311**	3,418	3,641
0.8	3,162	3,919	4,484	3,473	3,738
1.0	3,162	4,073	4,848	3,585	3,938

SOURCE: For 1985, Conrail; for 1990 and 1995, Congressional Budget Office.

NOTE: Does not include subsidiaries.

OPERATING EXPENSES

Operating expenses consist of four major cost categories:

- **Maintenance of way and structures** entails the routine maintenance of the physical plant including track, buildings, bridges, and communications and signaling equipment.

- **Equipment maintenance and rents** include mechanical maintenance and heavy repair programs for locomotives and freight cars, car inspection and repairs in support of train operations, and net mileage and time charges for renting freight cars and locomotives.

- **Transportation expenses** include both the direct costs of operating trains and yards and the costs of support activities such as train dispatchers, supervisors, utilities, and supplies.

- **General and administrative costs** cover the expenses incurred from nonoperating functions such as salaries for management and support personnel, computer rents, legal fees, consultants, and pensions.

Conrail's operating expenses are estimated for each of these categories over the forecast period.

Since the nature of Conrail's costs has changed continuously and significantly over the historical period, estimating future expenses based on an analysis of historical relationships could be misleading. The rehabilitation of the system and equipment conducted during Conrail's early years, and the unreliability of equipment over that same period, raised unit costs in the 1970s. Passage of the Staggers Act in 1980 and NERSA in 1981 led to more efficient routing of traffic, the elimination of many uneconomic branch lines, the elimination of Conrail's responsibility for costly commuter services, the end to lifetime job protection for employees, the restructuring of Conrail's labor agreements, and a temporary reduction in labor costs. In effect, the physical rebuilding and restructuring of the railroad in the 1970s was followed by the restructuring and coordination of systemwide operations between 1980 and 1983. Because of these changes and their effects on future costs, an econometric analysis and forecast of Conrail's operating expenses was not used. Instead, Conrail's costs are projected based on its recent cost experience and on assumptions concerning future inflation rates and improvements in productivity.

Conrail's operating expenses vary with the number of tons hauled and with changes in both the quantities used and the prices of the components (such as labor, fuel, and materials) of each of the four expense categories. Only a portion of these expenses varies with output, however, and CBO's estimates of these percentages are shown below:

Category of Costs	Percentage that Varies with Output
Maintenance of Way and Structures	50
Equipment Maintenance and Rents	50
Transportation Expenses	70
General, Administrative, and Other	10

These percentages yield a systemwide average percentage of variable costs of approximately 55 percent. These percentages are important, since overstating the portion of costs that is variable would suggest that Conrail's expenses react more to changes in its output than in fact they do. Consequently, any under- or overstatement of variable costs would tend to make Conrail's profitability appear to depend either too heavily or too little, respectively, on the level of real GNP.

Changes in the price of Conrail's inputs such as labor or fuel are presumed to equal forecasted changes in the GNP deflator. Changes in the quantities of inputs used in the provision of transportation services are accounted for by projections of operating efficiencies. These efficiencies, or improvements in productivity, lead to reductions in the unit costs. The rate at which improvements in efficiency or increases in productivity occur depends on management goals and planning, including both technological and operational innovations. Therefore, to a large extent, the level of efficiencies assumed depends on the assumption made concerning Conrail's opportunities to economize on the use of inputs and on management's and labor's ability and willingness to exploit those opportunities.

In the years 1983 to 1985, Conrail's increases in productivity were 9.0 percent, 5.4 percent, and 4.5 percent, respectively. Conrail forecasts a 3.5 percent improvement in productivity in 1986 and has in recent years set as a management goal efficiencies of 2.0 percent to 3.0 percent a year. This study assumes a 1.5 percent rate of annual productivity increases in the base case and a 2.0 percent annual rate in the low case. A 1.5 percent rate

was chosen as a conservative estimate of Conrail's potential for increases in productivity in the forecast period given recent experience and Conrail's stated efficiency goals of 2.0 percent per year over the next four years. The higher efficiency level projected for the low case is based on the expectation that as traffic levels and revenue are reduced during the recession and afterward, the pressure on Conrail to economize on all aspects of operations would be greater and that the stated goal of efficiencies of 2.0 percent would be met in each forecast year.

Factors used to estimate operating expenses are the tonnage forecast from the traffic model, the rate of inflation from the macroeconomic forecast, and the level of expected efficiencies. The actual operating expenses incurred in 1985 serve as a base on which operating expenses are calculated in the forecast period. Operating expenses for 1985 reflect the first full year in which Conrail's operational and physical plant restructuring are essentially complete and its wage rates are restored to industrywide levels. 1/

To calculate operating costs in each expense category, the previous year's expenses are divided between their fixed and variable portions. The fixed portion of expenses is increased by the amount of inflation for the current year to account for changes in the price of inputs, and is then decreased by the rate of productivity growth for the year to account for efficiencies in the production process. The variable portion is calculated in the same way, except that the final amount is then multiplied by the ratio of the current year's tons to the previous years tons to account for changes in output levels. The sum of the two portions gives the current year's expense for each category. Summing expenses for the four categories yields total operating expense for the year.

Various annual efficiency rates and the resulting levels of operating expenses for the base case and low case are shown in Table 7. When the rate of productivity growth is zero, operating expenses in 1995 reflect the effects of increased tonnage and the full effects of inflation. As a result, real operating expense per ton is the same as it was in 1985. At the other extreme, as annual efficiencies rise above 4 percent, nominal operating expenses per ton in 1995 decline to below the 1985 level. The effects in the low case are similar except that operating expenses are lower because of the reduced traffic and inflation forecasts in this case. In addition, since the level of tons in 1995 is almost the same as that in 1985 under the low case, operating expenses in 1995 directly reflect the amelioration achieved by

1. Labor and management employees accepted three years of wage reductions from July 1981 to June 1984 in accordance with the provisions of NERSA.

efficiencies in the cost increases resulting from inflation. In the base case, using an efficiency rate of 1.5 percent produces operating expenses of approximately $3.2 billion in 1990 and $3.7 billion in 1995. In the low case, an efficiency rate of 2.0 percent produces operating expenses of approximately $2.9 billion in both 1990 and 1995.

NET OPERATING INCOME

Conrail's net operating income--the difference between operating revenues and operating expenses--depends on the combination of assumptions made concerning Conrail's tariff recovery rate and its rate of operating efficiencies. Lower tariff recovery rates, for example, would probably be accompanied by higher efficiencies; that is, if competitive pressure pro-

TABLE 7. PROJECTIONS OF CONRAIL'S OPERATING EXPENSES UNDER ALTERNATIVE EFFICIENCY RATE ASSUMPTIONS (In millions of current dollars)

Efficiency Rate (percent)	Actual	Base Case		Low Case	
	1985	1990	1995	1990	1995
0.0	2,774	3,502	4,267	3,219	3,597
0.5	2,774	3,415	4,058	3,139	3,421
1.0	2,774	3,330	3,859	3,061	3,253
1.5	2,774	**3,247**	**3,668**	2,985	3,092
2.0	2,774	3,165	3,486	**2,910**	**2,939**
2.5	2,774	3,086	3,312	2,836	2,792
3.0	2,774	3,007	3,146	2,764	2,652
3.5	2,774	2,931	2,988	2,694	2,519
4.0	2,774	2,855	2,837	2,625	2,391
4.5	2,774	2,782	2,692	2,557	2,270
5.0	2,774	2,710	2,555	2,491	2,153

SOURCE: For 1985, Conrail; for 1990 and 1995, Congressional Budget Office.

NOTE: Does not include subsidiaries.

hibited Conrail from recovering increases in its costs, then management would have stronger incentives to reduce costs. Costs could be lowered by obtaining reductions in labor and input expenses, but management may be unwilling to disrupt its relationships with labor and suppliers of materials unless economic pressures warrant doing so. Moreover, if Conrail is unable to recoup its cost increases, then it may be forced to eliminate some of its least profitable traffic, thus raising the productivity of the system as a whole.

Estimates of Conrail's net operating income over a range of tariff recovery rates and operating efficiencies are shown in Tables 8 and 9 for the base case and low case, respectively. Reading the values for the tariff recovery rate and the rate of productivity growth on the diagonal from lower left to upper right (80/1.0, 70/1.5, 50/2.0, 30/2.5, 20/3.0) provides a representative trade-off between the two parameters, although the rate at which they are traded off cannot be predicted with certainty. In the base case, for example, net operating income (in real 1985 dollars) ranges from a low of $384 million to a high of $490 million in 1990, and from a low of $245 million to a high of $432 million in 1995. In comparison, net operating income was $388 million in 1985.

The values for the tariff recovery rate and the rate of productivity growth used in this analysis in the base case are 70 percent and 1.5 percent, respectively. In the low case, given the system's lower expected traffic, it is assumed that Conrail maintains lower tariff rates and has higher rates of productivity growth. Thus, a tariff recovery rate of 50 percent and a productivity growth rate of 2.0 percent are used. The resulting levels of net operating income by case for each year in the forecast period can be seen in Table 10. In the base case, net operating income (in current dollars) reaches a plateau of around $640 million in the early 1990s, coinciding with the peak level of tons hauled. In the low case, net operating income is at a low point of $308 million in 1988, coinciding with the bottom of the recession, and steadily climbs back to $515 million by 1995.

On the basis of net operating income alone, Conrail appears to be quite viable over the forecast period. Certainly in the base case, Conrail's performance is strong even in the face of heavy competitive pressures and only moderate increases in productivity. In the low case, while net operating income is lower, the trough of the recession does not force an operating loss and, despite the lower level of tons and strong restraint on pricing throughout the period, the level of projected net operating income appears reasonable for Conrail's requirements.

TABLE 8. PROJECTIONS OF NET OPERATING INCOME OVER A RANGE OF TARIFF RECOVERY RATES AND OPERATING EFFICIENCIES: BASE CASE

Tariff Recovery Rate (percent)	Actual	Efficiency Rate (percent) 1.0		1.5		2.0		2.5		3.0	
	1985	1990	1995	1990	1995	1990	1995	1990	1995	1990	1995
In Millions of Current Dollars											
20	388	153	-325	236	-136	318	47	398	220	476	386
30	388	223	-181	306	9	388	191	467	365	546	531
50	388	366	124	449	315	531	497	610	670	689	836
70	388	513	452	**596**	**643**	678	825	758	998	936	1,164
80	388	589	625	672	816	754	998	833	1,171	912	1,337
In Millions of Real 1985 Dollars											
20	388	126	-218	194	-91	261	31	327	148	391	260
30	388	183	-122	251	6	318	128	384	245	448	357
50	388	300	83	369	211	436	334	502	451	566	562
70	388	422	304	**490**	**432**	557	554	623	671	769	783
80	388	484	420	552	548	619	670	685	787	749	899

SOURCE: For 1985, Conrail; for 1990 and 1995, Congressional Budget Office.

NOTE: Does not include subsidiaries.

TABLE 9. PROJECTIONS OF NET OPERATING INCOME OVER A RANGE OF TARIFF RECOVERY RATES AND OPERATING EFFICIENCIES: LOW CASE

Tariff Recovery Rate (percent)	Actual	Efficiency Rate (percent) 1.0		1.5		2.0		2.5		3.0	
	1985	1990	1995	1990	1995	1990	1995	1990	1995	1990	1995
In Millions of Current Dollars											
20	388	94	-63	170	98	245	251	319	398	391	537
30	388	145	23	222	184	297	337	370	484	442	624
50	388	250	201	326	362	**401**	**515**	475	662	547	802
70	388	357	388	434	549	509	702	582	849	654	989
80	388	412	485	489	646	564	799	637	946	709	1,086
In Millions of Real 1985 Dollars											
20	388	80	-48	145	75	209	193	272	305	333	412
30	388	124	18	189	141	253	259	315	371	377	479
50	388	213	155	278	278	**342**	**396**	405	508	466	615
70	388	304	298	370	421	433	539	496	652	557	759
80	388	351	372	416	496	480	613	543	726	604	833

SOURCE: For 1985, Conrail; for 1990 and 1995, Congressional Budget Office.

NOTE: Does not include subsidiaries.

TABLE 10. PROJECTIONS OF CONRAIL'S NET OPERATING INCOME, 1986-1995
(In millions of dollars)

	Actual 1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Base Case											
Current Dollars	388	418	489	529	537	596	625	640	643	642	643
Real 1985 Dollars	388	403	454	471	460	490	493	485	468	450	432
Low Case											
Current Dollars	388	400	369	308	348	401	430	458	476	495	515
Real 1985 Dollars	388	385	340	276	303	342	359	374	381	388	396

SOURCE: For 1985, Conrail; for 1986-1995, Congressional Budget Office.

NOTE: The base case assumes a tariff recovery rate of 70 percent and productivity growth of 1.5 percent. For the low case, the assumed rates are 50 percent and 2.0 percent. Does not include subsidiaries.

Net operating income is an important financial measure, but it does not indicate whether Conrail has the resources to meet its nonoperating commitments, such as reinvestment in providing rail services, and it does not include nonoperating income. Cash flow, on the other hand, includes these nonoperating, longer-term costs and revenues, and is a better indicator of Conrail's viability as a company. Using the measures of net operating income estimated here, and the estimates of Conrail's capital program (Chapter IV), CBO then projects Conrail's net income and cash flow in Chapter V.