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The Honorable Cynthia T. Brown
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This submission is the AAR forecast of the second quarter 2024 All-Inclusive Index and Rail Cost Adjustment Factor, filed in Ex Parte No. 290 (Sub-No. 5) (2024-2) *Quarterly Rail Cost Adjustment Factor*. The versions of RCAF-related indices covered in this filing are: the All-Inclusive Index (initiated in the second quarter of 1985), the Unadjusted RCAF (produced since October 1982), the Adjusted RCAF (first published in the second quarter of 1989), and the RCAF-5 (created by the STB in its Ex Parte No. 290 (Sub-No. 7) decision served October 3, 1996). The table below summarizes the second quarter 2024 results and compares to the previous quarter. Both quarters are shown on a 4Q\2022=100 base.

| | <u>2024Q1</u> | <u>2024Q2</u> | <u>% Change</u> |
|--------------------------------|---------------|---------------|-----------------|
| All-Inclusive Index | 98.1 | 97.8 | -0.3 |
| Preliminary RCAF | 0.981 | 0.978 | -0.3 |
| Forecast Error Adjustment | -0.007 | 0.008 | |
| RCAF (Unadjusted) | 0.974 | 0.986 | 1.2 |
| Productivity Adjustment Factor | 2.5430 | 2.5499 | |
| RCAF (Adjusted) | 0.383 | 0.387 | 1.0 |
| PAF-5 | 2.6566 | 2.6749 | |
| RCAF-5 | 0.367 | 0.369 | 0.5 |

March 5, 2024

In its October 3, 1996 decision in Ex Parte No. 290 (Sub-No. 7), *Productivity Adjustment - Implementation*, the STB noted its intent to publish, in addition to the RCAF (Unadjusted) and RCAF (Adjusted), an RCAF-5 (i.e., a calculation of the productivity adjusted RCAF values as if the agency had always used a 5-year rolling average to calculate the productivity adjustment). In response to a request by STB staff, the AAR is including a calculation of the RCAF-5 in its quarterly RCAF filing. The AAR and its members, however, do not believe the publication of a third RCAF index is required or permitted by the applicable statute (49 U.S.C. § 10708) and do not endorse its publication.

Our quarterly non-proprietary work papers underlying this submission are e-filed herewith, in accordance with the ICC's order in Ex Parte No. 290 (Sub-No. 2), *Railroad Cost Recovery Procedures*, served February 8, 1990. We have notified Pedro Ramirez, in the STB office handling this proceeding, of our plan to e-file the submission and non-proprietary work papers. A second copy of the submission and non-proprietary work papers, plus selected highly confidential work papers, will be provided to Mr. Ramirez's Data Collection and Auditing Team. All work papers are available for STB inspection. Questions should be directed to me or Kiara Carter (202 639-2327) of this office.

Sincerely,



Rand Ghayad

Attachments

**Second Quarter 2024
All-Inclusive Index**

Ex Parte No. 290 (Sub-No. 5) (2024-2)

**Quarterly Rail Cost Adjustment Factor
Surface Transportation Board**

**Policy and Economics Department
Association of American Railroads**

March 5, 2024

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Introduction

On January 2, 1985, the Interstate Commerce Commission (ICC) adopted the All-Inclusive Index as the basis for the Rail Cost Adjustment Factor (RCAF). The quarterly projection of railroad costs, as documented herein, employs the All-Inclusive Index as required by the regulations. Also presented in this submission is the RCAF, both Adjusted and Unadjusted, as required by the ICC in its decision in Ex Parte No. 290 (Sub-No. 4), Rail Cost Recovery Procedures - Productivity Adjustment, served March 24, 1989. In addition, the AAR has included the RCAF-5, which was instituted by a Surface Transportation Board decision served October 3, 1996 in Ex Parte No. 290 (Sub-No. 7), *Productivity Adjustment - Implementation*. The AAR and its members do not believe the additional productivity-adjusted index is required or permitted by the applicable statute, and do not endorse its publication.

This quarter's projection of railroad costs is for the second quarter 2024. Calculations for the productivity adjustment decision, served January 18, 2024, have been utilized to update productivity adjustment factors listed on page 5 herein.

Index Weights

In the Ex Parte No. 290 (Sub-No. 2) final rules, issued in April 1981, the Interstate Commerce Commission mandated that the weights of each major cost component be updated annually. These "external" weights are calculated using expense data from Schedules 410 and 210 of the R-1 annual report filed with the Surface Transportation Board by the Class I railroads. The weights are typically updated with the fourth quarter projection.

The 2022 (current) and 2021 (previous) weights are shown below. Weights calculated from 2021 data were used for the fourth quarter of 2022 through the third quarter of 2023. Beginning with the fourth quarter of 2023, weights calculated using 2022 data are used. The component with the biggest change in weight was Fuel, which increased by 6.2 percentage points. Labor and Depreciation fell by 2 and 2.3 percentage points, respectively. Materials & Supplies increased .2 percentage points. The weight for Other decreased 1.3 percentage point, Equipment Rents decreased by .5 percentage points, and Interest decreased by .3 percentage points.

| Weights for RCAF's All-Inclusive Index | | |
|---|-------------|-------------|
| | 2022 | 2021 |
| Labor | 29.4 % | 31.4 % |
| Fuel | 20.4 | 14.2 |
| Materials & Supplies | 4.7 | 4.5 |
| Equipment Rents | 4.4 | 4.9 |
| Depreciation | 15.2 | 17.5 |
| Interest | 2.1 | 2.4 |
| Other | 23.8 | 25.1 |
| Total | 100.0 | 100.0 |

Reweightings of the index is accomplished by calculating both the current quarter (normally the fourth) and prior (normally the third) quarter indexes with the new weights. The relative change between the two quarters is then multiplied times the prior quarter (usually the third) *linked* index. Use of this method ensures that the weight change, by itself, does not cause a change in the level of the All-Inclusive Index.

Internal weights in the labor and equipment rents components are updated at the same time as the external weights. When these weights are changed, they are also linked using the procedure described above in order to eliminate the effect of the change in weighting.

All-Inclusive Index

Second Quarter 2024

The components and values of the current and previous All-Inclusive Indexes are shown below. Details of the construction of each component of the index are contained in the Appendices.

| | 2022 Weights | Forecast | | Percent Change |
|------------------------|-----------------|--------------------|--------------------|-------------------|
| | | Previous 2024Q1 | Current 2024Q2 | |
| 1. Labor | 29.4% | 526.4 | 527.0 | 0.1 % |
| 2. Fuel | 20.4% | 368.9 | 350.4 | -5.0 |
| 3. M&S | 4.7% | 337.5 | 367.1 | 8.8 |
| 4. Equipment Rents | 4.4% | 266.9 | 279.8 | 4.8 |
| 5. Depreciation | 15.2% | 238.4 | 240.2 | 0.8 |
| 6. Interest | 2.1% | 51.0 | 51.0 | 0.0 |
| 7. Other | 23.8% | 291.6 | 292.4 | 0.3 |
| 8. Weighted Average | | | | |
| a. 1980 = 100 | | 364.3 | 363.2 | |
| b. 1980 = 100 (linked) | | 335.8 | 334.8 ¹ | |
| c. 4Q22 = 100 | | 98.1 | 97.8 ² | -0.3 |

¹ Index80 = (Current Index / Previous Index) * the Previous Quarter Linked Index
= (363.2 / 364.3) x 335.8
= 334.8

² To calculate the 4Q22 = 100 index:
Index4Q22 = (Current Linked Index / 4Q22 Basing Factor) * 100
= 334.8 divided by 342.3 times 100
= 97.8

Indexes based on other periods:
4Q17 based index = 334.8 / 264.5 x 100 = 126.6
4Q12 based index = 334.8 / 297.6 x 100 = 112.5
4Q07 based index = 334.8 / 245.9 x 100 = 136.2
4Q02 based index = 334.8 / 192.1 x 100 = 174.3
4Q97 based index = 334.8 / 173.2 x 100 = 193.3
4Q92 based index = 334.8 / 156.9 x 100 = 213.4

Forecast vs. Actual All-Inclusive Index

Fourth Quarter 2023

Because of data availability, the forecast error adjustment has a two-quarter lag from each filing. As shown below, the fourth quarter actual index of 103.8 is 0.8 index points above the forecast value of 103.0. Therefore, the forecast error adjustment for second quarter 2024 is 0.8 index points.

| | 2022 Weights | Fourth Quarter 2023 | | Amt Difference |
|---------------------------------|-----------------|---------------------|--------------------|-------------------|
| | | Forecast | Actual | |
| 1. Labor | 29.4% | 581.2 | 581.2 | |
| 2. Fuel | 20.4% | 387.9 | 402.2 | |
| 3. M&S | 4.7% | 342.5 | 342.5 | |
| 4. Equipment Rents ¹ | 4.4% | 263.6 | 261.4 | |
| 5. Depreciation | 15.2% | 238.4 | 239.4 | |
| 6. Interest | 2.1% | 51.0 | 51.0 | |
| 7. Other | 23.8% | 283.9 | 287.4 | |
| | | | | |
| 8. Weighted Average | | | | |
| a. 1980 = 100 | | 382.6 | 386.4 | |
| b. 1980 = 100 (linked) | | 352.7 | 355.2 ² | |
| c. 4Q22 = 100 ³ | | 103.0 | 103.8 | 0.8 |

Forecast error \longrightarrow **0.8 index points**

| 1 | 2022 Weights | Fourth Quarter 2023 | |
|---------------------------|-----------------|---------------------|--------|
| | | Forecast | Actual |
| Car-Hire | 68.1% | 226.1 | 226.2 |
| Lease Rentals | 31.9% | 283.9 | 287.4 |
| Weighted Average | | 244.5 | 245.7 |
| Weighted Average (linked) | | 263.6 | 261.4 |

² Linked actual index = (actual index / previous actual index) x previous linked actual index.

$$355.2 = 386.4 / 370.6 \times 340.7$$

³ The 4Q22 based indexes are 1980 based indexes divided by the 4Q22 basing factor (342.3/100).
 Other basing factors are: 4Q22 = 264.5; 4Q12 = 297.6; 4Q07 = 245.9; 4Q02 = 192.1; 4Q97 = 173.2; and 4Q92 = 156.9.

Productivity

On January 18, 2024, the Surface Transportation Board served a decision which proposed to adopt 1.1 percent as the geometric average productivity change for the five most recent years available. Their five year rolling geometric average calculation added the year 2022 and removed the year 2017. The components of this average annual value are shown on the following table in ratio format – therefore, 1.011 is the same as an increase of 1.1 percent. Productivity changes are calculated by multiplying each of the five productivity changes together and taking the result to the one-fifth power. The productivity adjustment factors (PAF) for each quarter are calculated by increasing the previous quarter's PAF by quarterly versions of the annual rate, which are the fourth root of the geometric average annual growth rate. The difference between the PAF and the PAF-5 is the timing of the five-year productivity trend.

| Comparison of Output, Input, & Productivity | | | |
|---|---------------------|--------------------|-----------------------------|
| 2018 - 2022 | | | |
| Year | Output Index (1) | Input Index (2) | Productivity Changes (3) |
| 2018 | 1.032 | 1.004 | 1.028 |
| 2019 | 0.968 | 0.961 | 1.007 |
| 2020 | 0.923 | 0.904 | 1.021 |
| 2021 | 1.028 | 0.999 | 1.029 |
| 2022 | 0.992 | 1.020 | 0.972 |
| Average | | | 1.011 |
| Previous Average (2017-2021) | | | 1.028 |

| Calculation of PAF and PAF-5 | | | |
|---|------|--------|--------|
| For 2018-2022, use fourth root of avg. productivity change = 1.0027 | | | |
| For 2017-2021, use fourth root of avg. productivity change = 1.0069 | | | |
| Quarter | Year | PAF | PAF-5 |
| Q1 | 2024 | 2.5430 | 2.6566 |
| Q2 | 2024 | 2.5499 | 2.6749 |
| Q3 | 2024 | 2.5568 | 2.6934 |
| Q4 | 2024 | 2.5637 | 2.7120 |
| Q1 | 2025 | 2.5706 | 2.7193 |

Annotations: Arrows point from '2017-2021' to the PAF-5 value for Q1 2024 (2.6566) and from '2018-2022' to the PAF-5 value for Q3 2024 (2.6934).

Rail Cost Adjustment Factor

Second Quarter 2024

Four RCAF values are presented in this filing. Two are not modified for productivity (Preliminary RCAF and RCAF Unadjusted), and two incorporate a productivity calculation (RCAF Adjusted and RCAF-5). The All-Inclusive Index and all four RCAF values, plus the percent change for each, are shown below. Note that beginning with the 2023Q1 index, the All-Inclusive Index was rebased to a 2022Q4=100 basis as required in the applicable statute.

| | Previous 2024Q1 | Current 2024Q2 | Percent Change |
|---|--------------------|-------------------|-------------------|
| All-Inclusive Index ¹ | 98.1 | 97.8 | -0.3 % |
| Preliminary RCAF ² | 0.981 | 0.978 | -0.3 |
| Forecast Error Adjustment ³ | -0.007 | 0.008 | |
| RCAF (Unadjusted) ⁴ | 0.974 | 0.986 | 1.2 |
| Productivity Adjustment Factor ⁵ | 2.5430 | 2.5499 | |
| RCAF (Adjusted) ⁶ | 0.383 | 0.387 | 1.0 |
| PAF-5 ⁷ | 2.6566 | 2.6749 | |
| RCAF-5 ⁸ | 0.367 | 0.369 | 0.5 |

¹ See All-Inclusive Index on page 3.

² All-Inclusive Index divided by the All-Inclusive Index in the base period (100.0).

³ The current figure is from Forecast vs. Actual All-Inclusive Index in this filing (page 4). The previous quarter figure is shown in a similar section of the previous quarter's filing.

⁴ Preliminary RCAF plus the forecast error adjustment.

⁵ See Productivity on page 5.

⁶ RCAF (Unadjusted) divided by the Productivity Adjustment Factor (PAF).

⁷ See Productivity on page 5.

⁸ RCAF (Unadjusted) divided by the PAF-5.

Appendixes

Labor

Second Quarter 2024

The second quarter 2024 Labor Index is 0.1 percent higher than the previous quarter. The increase in back pay, from new independent contracts, is primarily responsible for this quarter's higher Labor Index.

Wage Rate Index

The Wage Rate Index portion of the Labor Index increased by 0.2%.

Wage Increases: There are no national wage increases currently scheduled for the second quarter. There were new contracts for independent groups that included retroactive increases and increased the wage rate index.

Lump Sums: The second quarter lump sum rate fell 6.4%. One amount was fully amortized and removed, and it was replaced by one new similar amount.

Back Pay: The back pay increased from \$0.009 to \$0.100. The previous back pay amount from national contracts and a few independent contracts were removed in Q1 and Q2, respectively, and there is a new backpay added from new independent contacts. As always, back pay amounts will be removed from the index after they have been amortized for four quarters.¹

Other: In wages, "Other" contains the amortization of incentive compensation payments (similar to lump sums) that one railroad makes each year to its dispatchers, yardmasters, and locomotive engineers. The second quarter rate is unchanged from the prior quarter.

¹ Index procedure, decided by the Interstate Commerce Commission in 1988, is to amortize lump sums and/or back pay over four quarters using the rates for 13-week (a.k.a. 3-month) U.S. Treasury bills.

Labor

Second Quarter 2024

Supplements Index

The Supplements Index decreased 0.1 percent this quarter. All of the components of the supplements index remained relatively unchanged, with the exception of the Other category.

Health & Welfare: The Health & Welfare rate was relatively flat with zero percent change. There was an update to employee contributions for independent contacts which caused an insignificant increase.

Railroad Retirement: The Railroad Retirement rate increased 0.2 percent due to higher wages in second quarter.

Unemployment Insurance: The Unemployment Insurance rate remained unchanged.

Other: The "Other" category is a reflection of all other fringe benefits, and currently contains known employer contributions to employee 401(k) accounts and employer contributions to employee stock plans that are recorded as fringe benefits. The second quarter rate is 18.7 percent lower than last quarter.

Labor Index Calculation

As shown in Table A-1 on the next page, the 0.2 percent increase in the Wage Rate Index and the 0.1 percent decrease in the Supplements Index combined to cause the Labor Index to be 0.1 percent higher than the previous quarter. The linked second quarter 2024 Labor index is 527.0, which is 7.6 percent lower than one year ago.

Labor
Second Quarter 2024

Table A-1 Labor Index

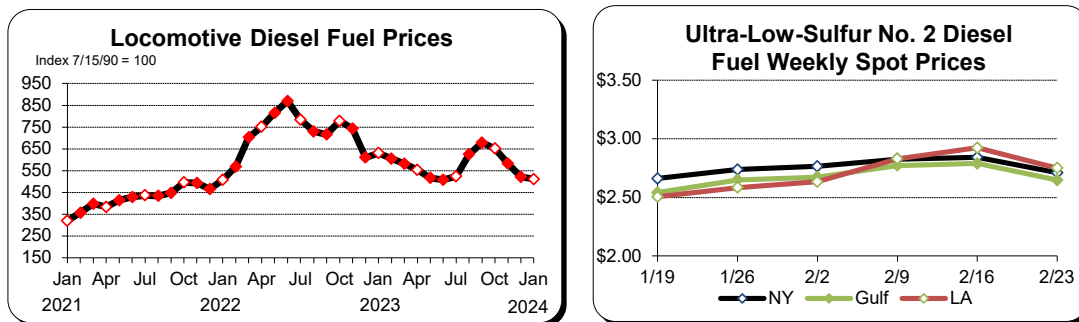
| | 2024Q1 | 2024Q2 | Change | |
|---|-----------------|-----------------|---------|----------|
| | | | Percent | Amount |
| Base Wage – Straight Time & Pay For Time Not Worked | \$52.833 | \$52.909 | 0.1% | \$0.076 |
| Adjustments: | | | | |
| Lump Sum | 0.611 | 0.572 | -6.4% | -\$0.039 |
| Back Pay | 0.009 | 0.100 | 1011.1% | \$0.091 |
| Other | 0.220 | 0.220 | 0.0% | \$0.000 |
| Total Wages | <u>53.673</u> | <u>53.801</u> | 0.2% | \$0.128 |
| | | | | |
| Health & Welfare Benefits | 9.261 | 9.263 | 0.0% | \$0.002 |
| RR Retirement & Medicare | 11.527 | 11.547 | 0.2% | \$0.020 |
| Unemployment Insurance | 0.038 | 0.038 | 0.0% | \$0.000 |
| Other | 0.241 | 0.196 | -18.7% | -\$0.045 |
| Total Supplements | <u>\$21.067</u> | <u>\$21.044</u> | -0.1% | -\$0.023 |
| | | | | |
| Total Labor (as info only) | \$74.740 | \$74.845 | | |
| | | | | |
| Wage Index ¹ | 459.3 | 460.4 | 0.2% | |
| Supplements Index ² | 778.5 | 777.7 | -0.1% | |
| | | | | |
| Total labor Index, 2022 Weights ³ | 549.0 | 549.6 | | |
| Labor Index (linked) ⁴ | 526.4 | 527.0 | 0.1% | |

¹ 1980 wage rate \$11.685
² 1980 supplements rate \$2.706
³ 2022 weights: wages, supplements 71.9% 28.1%
⁴ 2024Q2 linked Index = 2024Q1 linked x (2024Q2 / 2024Q1)
= 526.4 x 549.6 / 549.0

Fuel Second Quarter 2024

The forecast for fuel is based on: (1) a survey of railroad fuel purchasing officers concerning current price and volume levels, (2) expectations of railroad purchasing officers based on their own forecast models and discussions with their major suppliers, and (3) a consensus of petroleum industry experts and general business publications. Fuel purchases are assumed to remain in inventory for 30 days before the fuel is consumed (and therefore expensed). Therefore, prices *paid* in the first month of each quarter are for fuel *expensed* in the second (or middle) month of the quarter, and the middle month expensed is used to represent each quarter.

The average locomotive diesel fuel price hit a peak point in June 2022, but has trended downward with fluctuations. While average prices for locomotive diesel fuel are available only through January 2024, data through four weeks of February are available for related fuel types. According to the Energy Information Administration, the daily spot price as of February 26 for Ultra-Low-Sulfur Diesel Fuel* is an average of 4.9 percent lower than the average for January. The chart below (on left) shows the AAR's Monthly Locomotive Diesel Fuel Price Index through January 2024. The second chart (on right) shows recent spot prices for Ultra-Low-Sulfur No. 2 Diesel Fuel as reported by the Energy Information Administration.



Using information from the EIA, prices towards the end of February are higher than prices that actually occurred in January. Railroads that responded to the AAR's forecast survey expect prices to decrease by April (Q2) compared to prices that actually occurred for January (Q1). The second quarter 2024 forecast is 5.0 percent lower than the previous quarter forecast, and 11.0 percent higher than the prior quarter actual.

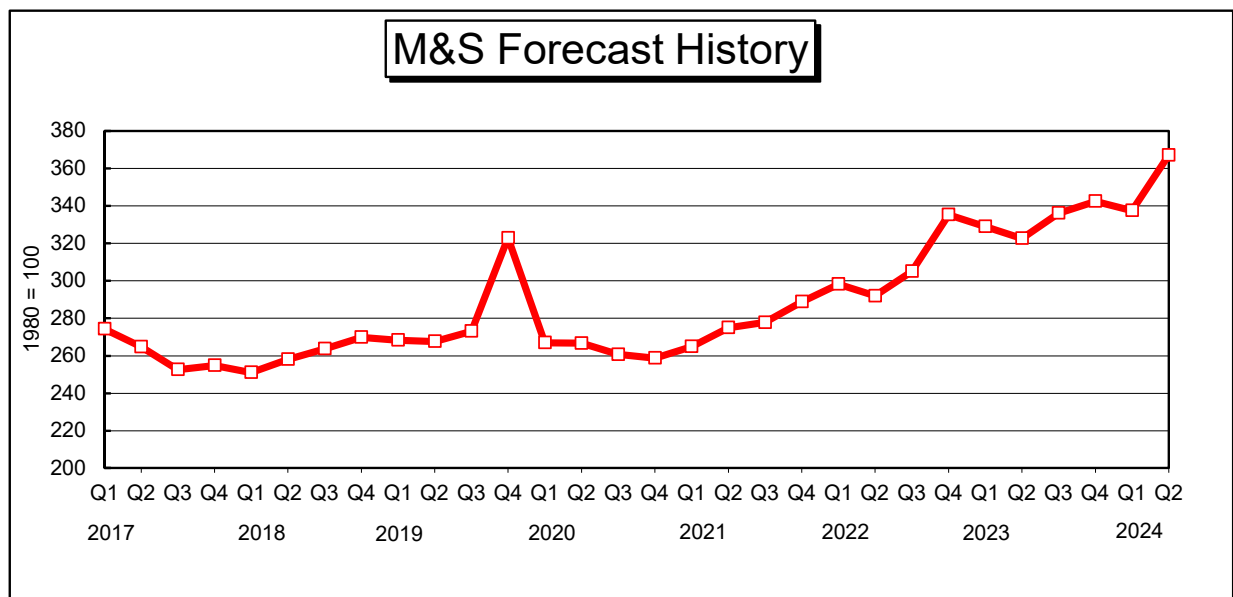
| | |
|---------------------------------------|-------|
| Forecast Fuel Index (1980 = 100) | 350.4 |
| Change from previous quarter forecast | -5.0% |
| Change from previous quarter actual | 11.0% |

* Heating oil, Ultra-Low-Sulfur No. 2 Diesel Fuel, and locomotive diesel fuel are part of a group of closely related products, commonly labeled as distillates, that differ mostly by their sulfur content. Because of these similarities, these fuels are produced together and have similar pricing trends.

Materials & Supplies Second Quarter 2024

The second quarter 2024 Materials & Supplies Index increased 8.8 percent from the previous quarter. Prices increased for Miscellaneous, Metal, and Forest Products.

| | | |
|--------|------------------------------|-------------------|
| 2024Q2 | Materials & Supplies Index = | 367.1 |
| 2024Q1 | Materials & Supplies Index = | 337.5 |
| | Difference | 29.6 basis points |
| | | or |
| | | 8.8 % |



Equipment Rents

Second Quarter 2024

The Equipment Rents Index consists of two components – car hire and lease rentals. The methodologies used to create these two components, and the final Equipment Rents Index, are explained below.

Car Hire

The car hire component is indexed using data from the Car Hire Accounting Rate Master (CHARM) file. Car hire rates for the forecast quarter are estimated based on data for active freight cars using the most recent data available. For the first quarter, December 1 of the previous year is typically used. For the second, third and fourth quarters; March 1, June 1, and September 1 are usually used, respectively. Using data retrieved from the latest CHARM file, an average rate per car is developed. Next, those average rates are grouped into four car type categories to create an overall summary of car hire rates. The summary rates are then compared from quarter to quarter, and weighted, to determine the Car Hire Index.

Lease Rentals

The lease rentals portion of the Equipment Rents Index uses the Producer Price Index for Industrial Commodities less Fuel and Related Products and Power (PPI-LF). The Commission adopted this surrogate in its decision served March 13, 1987. The AAR uses six years of historical data to derive its forecast for the PPI-LF. The forecast is used not only for lease rentals, but also for the "Other" component of the All-Inclusive Index. Appendix G discusses the forecast in more detail.

Equipment Rents Index Calculation

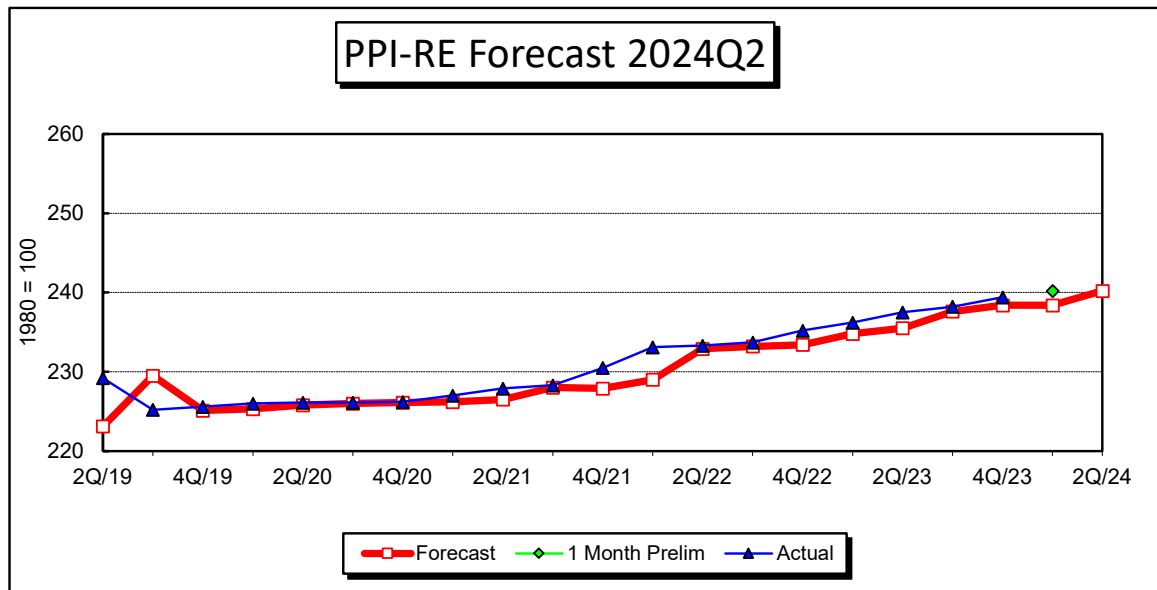
The table below calculates the Equipment Rents Index. The second quarter Car Hire portion of the Index increased 7.6 percent as the latest rates for private-owned cars were higher compared to three months ago. A 0.3 percent increase in the projected PPI-LF (See Appendix G) used as a proxy for Lease Rentals, combined with the 7.6 percent increase for Car Hire, caused the Equipment Rents Index to increase by 4.83 percent – rounded to 4.8 percent in the table below.

| | 2022 | 2024Q1 | 2024Q2 | Percent |
|---------------------------|--------|--------|--------|---------|
| | Weight | | | Change |
| Car Hire | 68.1% | 227.0 | 244.2 | 7.6 % |
| Lease Rentals | 31.9% | 291.6 | 292.4 | 0.3 |
| Weighted Average | | 247.6 | 259.6 | 4.8 |
| Weighted Average (Linked) | | 266.9 | 279.8 | 4.8 |

Depreciation Second Quarter 2024

The Producer Price Index for Railroad Equipment (PPI-RE) is used to index depreciation expense. The PPI-RE is forecast using an ARIMA (Auto-Regressive Integrated Moving Average) process where a statistical package picks the model that best fits the historical data set (see next page), and that model is then used for the forecast. The historical data set contains 6 years of monthly data (a sample size of 72), where the most recent available data point is the first month of the quarter prior to the forecast quarter. For a first quarter forecast, the most recent month of data available would be for October of the prior year. For a second quarter forecast, January would normally be the most recent period available. April and July would be the most recent months available for third and fourth quarter forecasts, respectively. The output from the forecast model is shown on page 2 of this appendix on a 1982=100 basis. The figure forecast by the model increased 1.1 percent from the previous quarter's forecast.

| | |
|--|--------------|
| Forecast of Depreciation Index (1982=100) | 217.1 |
| Forecast of Depreciation Index (1980=100) | 240.2 |
| Change from previous quarter forecast | 0.8% = 0.76% |
| Change from actual first month of previous quarter | 0.0% = 0.00% |
| Change from same quarter of prior year (actual) | 1.1% |



Depreciation Second Quarter 2024

PPI RAILROAD EQUIPMENT

Expert Analysis

Using rule-based logic I have narrowed down the choice to exponential smoothing or Box-Jenkins. I will perform an out-of-sample test to select between these two approaches.

The cumulative MAD for Exponential smoothing was 1.54 and for Box-Jenkins was 1.51. The rolling out-of-sample test used a maximum horizon of 12 and generated 78 forecasts for each method.

Based on the lower MAD, I will use Box-Jenkins.

Model Details

Expert selection

Box-Jenkins
ARIMA(0, 1, 0)

Within-Sample Statistics

| | | | |
|----------------|--------|----------------|-------------|
| Sample size | 72 | No. parameters | 0 |
| Mean | 207.41 | Std. deviation | 4.81 |
| R-square | 0.97 | Adj. R-square | 0.97 |
| Durbin-Watson | 2.13 | Ljung-Box(18) | 18.5 P=0.58 |
| Forecast error | 0.83 | BIC | 0.83 |
| MAPE | 19.00% | SMAPE | 19.00% |
| RMSE | 0.83 | MAD | 0.39 |
| MAD/Mean Ratio | 0 | | |

Actual Values for the Most Recent 6 Periods:

Actual

| | |
|----------|-------|
| 2023-Aug | 215.4 |
| 2023-Sep | 215.5 |
| 2023-Oct | 215.3 |
| 2023-Nov | 217 |
| 2023-Dec | 217.0 |
| 2024-Jan | 217.1 |

Forecasted Values

| Date | 2.5 Lower | Forecast | 97.5 Upper |
|----------------|------------------|-----------------|-------------------|
| 2024-Feb | 215.470 | 217.100 | 218.73 |
| 2024-Mar | 214.795 | 217.100 | 219.405 |
| 2024-Apr | 214.278 | 217.100 | 219.922 |
| 2024-May | 213.841 | 217.100 | 220.359 |
| 2024-Jun | 213.456 | 217.100 | 220.744 |
| QTR AVG | 213.858 | 217.100 | 220.342 |

Interest Second Quarter 2024

The Interstate Commerce Commission, in its decision served February 28, 1989, revised the All-Inclusive Index methodology to include a specific interest component, which is to track changes in the average interest rate from year to year. The interest rate is essentially the embedded cost of debt, i.e., total interest expense divided by average total long term debt.

The interest rate is calculated for the most recent year and used until the next year's figures are finalized. The source data are from a summary of the annual reports (Form R-1) submitted by each of the Class I railroads. Although the data set is received at the end of March, it is not used until the September filing. This enables data to be entered into a database and reviewed – and any revisions made, if necessary, before the data are used in the Index. The current Interest Index is based on 2022 data, and was updated in the Q4 filing submitted on September 5, 2023. The Interest Index based on 2022 increased from 50.1 in 2021 to 51.0 in 2022.

The R-1 source for interest expense is Schedule 210, column b. The lines currently used are listed below. The source for average total debt is Schedule 200. The sums of data from columns b and c (ending and beginning balances) are combined and divided by 2 to compute an average balance. The line numbers listed below account for the line number changes effective beginning with the 2016 annual report.

Interest Expense (Schedule 210)

| | |
|------|-----------------------------------|
| Line | |
| 42 | Total Fixed Charges |
| 44 | Contingent Interest |
| less | |
| 22 | Release of Premium on Funded Debt |

Average Total Debt (Schedule 200)

| | |
|------|--|
| Line | |
| 29 | Current Liabilities, Loans and Notes Payable |
| 38 | Equipment Obligations and Other Long Term Debt Due Within One Year |
| 40 | Non-Current Liabilities: Funded Debt Unmatured |
| 41 | Non-Current Liabilities: Equipment Obligations |
| 42 | Non-Current Liabilities: Capitalized Lease Obligations |
| 43 | Non-Current Liabilities: Debt in Default |
| 44 | Non-Current Liabilities: Accounts Payable: Affiliated Companies |
| 45 | Non-Current Liabilities: Unamortized Debt Premium |

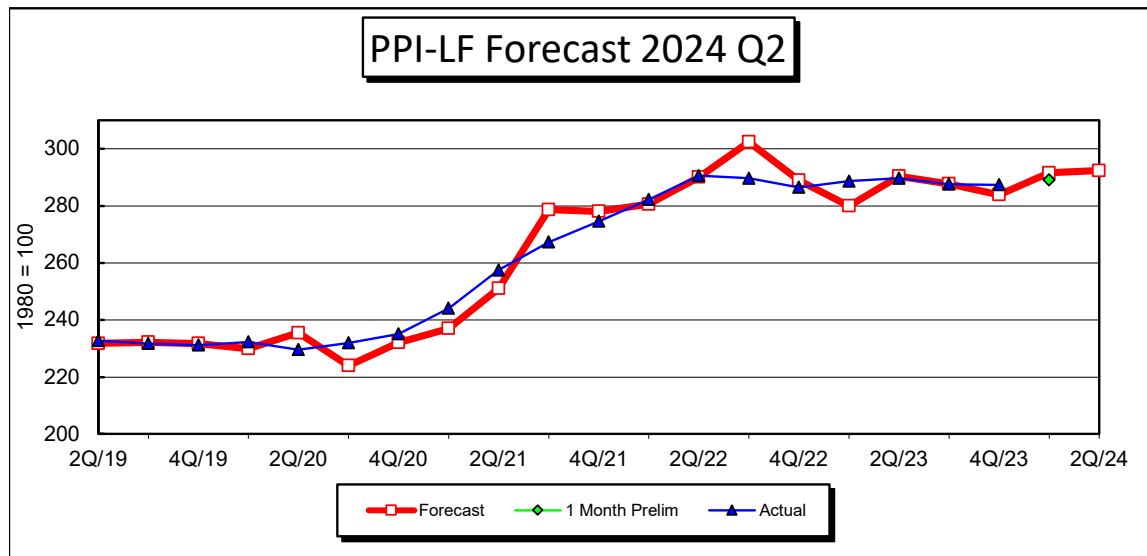
| | | |
|---------------|-----------------------|-------------|
| 2022 | Interest Rate | 4.00% |
| 1980 | Interest Rate | 7.85% |
| 2024Q2 | Interest Index | 51.0 |
| 2024Q1 | Interest Index | 51.0 |
| | Percent Change | 0.0% |

Other Expenses Second Quarter 2024

The Producer Price Index for Industrial Commodities less Fuels and Related Products and Power (PPI-LF) is used to index purchased services, casualties and insurance, loss and damage, taxes (other than income and payroll), general and administrative expenses, and lease rentals. These expenses, when grouped together, are usually called "Other" expenses.

Like the PPI-RE, the PPI-LF is forecast using an ARIMA process on 6 years of monthly data (a sample size of 72) with the most recent available monthly data being the first month of the quarter prior to the forecast quarter. For a first quarter forecast, the most recent month of data available would be for October of the prior year. For a second quarter forecast, January would normally be the most recent month available. April and July would be the most recent months available for third and fourth quarter forecasts, respectively. The output from the forecast model is shown on page 2 of this appendix for 1982=100. The figure forecast by the model is 0.9 percent higher than the prior quarter forecast.

| | |
|--|-------|
| Forecast of Other Expense Index (1982=100) | 260.8 |
| Forecast of Other Expense Index (1980=100) | 292.4 |
| Change from previous quarter forecast | 0.3% |
| Change from actual first month of previous quarter | 1.1% |
| Change from same quarter of prior year (actual) | 0.9% |



Other Expenses Second Quarter 2024

**PPI INDUSTRIAL COMMODITIES LESS FUEL
AND RELATED PRODUCTS AND POWER**

Expert Analysis

Using rule-based logic I have narrowed down the choice to exponential smoothing or Box-Jenkins. I will perform an out-of-sample test to select between these two approaches.

The cumulative MAD for Exponential smoothing was 4.14 and for Box-Jenkins was 3.37. The rolling out-of-sample test used a maximum horizon of 12 and generated 78 forecasts for each method.

Based on the lower MAD, I will use Box-Jenkins.

Model Details

Expert selection

Box-Jenkins

ARIMA(0, 2, 0)*(1, 0, 0)

| Term | Coefficient | Std. Error | t-Statistic | Significance |
|-------|-------------|------------|-------------|--------------|
| A[12] | 0.3936 | 0.1104 | 3.564 | 0.9993 |

Within-Sample Statistics

| | | | |
|----------------|--------|----------------|-------------|
| Sample size | 72 | No. parameters | 1 |
| Mean | 228.65 | Std. deviation | 23.08 |
| R-square | 1 | Adj. R-square | 1 |
| Durbin-Watson | 2.16 | Ljung-Box(18) | 21.4 P=0.74 |
| Forecast error | 0.84 | BIC | 0.86 |
| MAPE | 0.27 | SMAPE | 0.27 |
| RMSE | 0.84 | MAD | 0.62 |
| MAD/Mean Ratio | 0 | | |

Actual Values for the Most Recent 6 Periods:

Actual

| | |
|----------|-------|
| 2023-Aug | 256.4 |
| 2023-Sep | 256.5 |
| 2023-Oct | 256.4 |
| 2023-Nov | 256.3 |
| 2023-Dec | 256.6 |
| 2024-Jan | 257.9 |

Forecasted Values

| Date | 2.5 Lower | Forecast | 97.5 Upper |
|----------|-----------|----------|------------|
| 2024-Feb | 257.145 | 258.806 | 260.468 |
| 2024-Mar | 255.800 | 259.516 | 263.232 |
| 2024-Apr | 254.087 | 260.304 | 266.522 |
| 2024-May | 251.794 | 260.896 | 269.997 |
| 2024-Jun | 248.81 | 261.133 | 273.457 |
| QTR AVG | 251.564 | 260.778 | 269.992 |

Railroad and Union Abbreviations

Second Quarter 2024

Railroads

| | |
|------|--|
| BLE | Bessemer & Lake Erie Railroad (Part of CN's Grand Trunk Corp.) |
| BNSF | BNSF Railway Company |
| CC | Chicago, Central & Pacific (Part of CN's Grand Trunk Corp. Sometimes noted as CC&P.) |
| CN | Canadian National Railway (Commonly known as CN, owns Grand Trunk Corporation.) |
| CNGT | AAR's abbreviation for Grand Trunk Corporation (Almost all of CN's U.S. operations.) |
| CP | Canadian Pacific (Also noted as CPR. Owns the U.S. Class I railroad Soo Line.) |
| CPSL | AAR's abbreviation for Soo Line Corporation (CP's U.S. operations including SOO, D&H, and DME.) |
| CSX | CSX Transportation |
| D&H | Delaware & Hudson (Part of Canadian Pacific's U.S. operations, included beginning 2011Q4.) |
| DME | Dakota, Minnesota & Eastern (Part of Canadian Pacific's U.S. operations, included beginning 2011Q4.) |
| CMQ | Central Maine & Quebec (Part of Canadian Pacific's U.S. operations, included beginning 2021Q4.) |
| GTW | Grand Trunk Western Railroad (Part of CN's Grand Trunk Corp.) |
| IC | Illinois Central Railroad (Part of CN's Grand Trunk Corp.) |
| KCS | Kansas City Southern Railway |
| NS | Norfolk Southern Combined Railroad Subsidiaries (a.k.a. Norfolk Southern Railway or NS Rail) |
| SOO | Soo Line Railroad (The largest part of Canadian Pacific's U.S. operations.) |
| UP | Union Pacific Railroad |
| WC | Wisconsin Central and subsidiaries (Part of CN's Grand Trunk Corp.) |

Major Unions Involved with Railroads

| | |
|------------|--|
| ATDA | American Train Dispatchers Association |
| BLET | Brotherhood of Locomotive Engineers and Trainmen Div. of the International Brotherhood of Teamsters |
| BMWED | Brotherhood of Maintenance of Way Employees Division of the International Brotherhood of Teamsters |
| BRS | Brotherhood of Railroad Signalmen |
| IAM | International Association of Machinists and Aerospace Workers |
| IBBM | International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers & Helpers |
| IBEW | International Brotherhood of Electrical Workers |
| NCFO | National Conference of Firemen and Oilers |
| SMART-TD | International Association of Sheet Metal, Air, Rail, and Transportation Workers - Transportation Division* |
| SMART-MD | International Association of Sheet Metal, Air, Rail, and Transportation Workers - Mechanical Division** |
| TCU | Transportation Communication International Union |
| TCU-Carmen | Brotherhood of Railway Carmen Division of the Transportation Communications International Union |

Predecessor Unions (Some AAR databases use these old abbreviations.)

| | |
|---------|---|
| BLE | Brotherhood of Locomotive Engineers (predecessor to BLET) |
| BMWE | Brotherhood of Maintenance of Way Employees (predecessor to BMWED) |
| BRC | Brotherhood of Railway Carmen (predecessor to TCU-Carmen) |
| IBFO | International Brotherhood of Firemen and Oilers (predecessor to NCFO) |
| SMW | Sheet Metal Workers' International Association (see SMART-MD) |
| UTU | United Transportation Union (merged into SMART) |
| UTU-YMD | United Transportation Union Yardmaster Department (see SMART-TD) |

* Represents employees formerly represented by the UTU (conductors and brakemen) and also has a separate yardmasters department.

** Represents employees formerly represented by the SMW (steel workers)