

SERVICE DATE – AUGUST 7, 2024

SURFACE TRANSPORTATION BOARD

DECISION

Docket No. EP 558 (Sub-No. 27)

RAILROAD COST OF CAPITAL—2023

Digest:¹ The Board finds that the cost of capital for the railroad industry, which is calculated each year, was 9.87% for 2023. This figure represents the Board's Office of Economics' estimate of the average rate of return needed to persuade investors to provide capital to the freight rail industry.

Decided: August 6, 2024

One of the Board's regulatory responsibilities is to determine annually the railroad industry's cost of capital.² This determination is one component used in evaluating the adequacy of a railroad's revenue each year pursuant to 49 U.S.C. § 10704(a)(2) and (3). Standards for R.R. Revenue Adequacy, 364 I.C.C. 803 (1981), modified, 3 I.C.C.2d 261 (1986), aff'd sub nom. Consol. Rail Corp. v. United States, 855 F.2d 78 (3d Cir. 1988). The cost-of-capital finding may also be used in other regulatory proceedings, including (but not limited to) those involving the prescription of maximum reasonable rate levels, the proposed abandonment of rail lines, and the setting of compensation for use of another carrier's lines.

This proceeding was instituted by decision served on February 20, 2024, to update the railroad industry's cost of capital for 2023. In that decision, the Board solicited comments from interested parties on the following issues: (1) the railroads' 2023 current cost of debt capital, (2) the railroads' 2023 current cost of preferred equity capital (if any), (3) the railroads' 2023 cost of common equity capital, and (4) the 2023 capital structure mix of the railroad industry on a market value basis. The Board received comments from the Association of American Railroads (AAR) providing the information used to calculate the annual cost-of-capital determination, as established in Use of a Multi-Stage Discounted Cash Flow Model in

¹ The digest constitutes no part of the decision of the Board but has been prepared for the convenience of the reader. It may not be cited to or relied upon as precedent. See Pol'y Statement on Plain Language Digs. in Decisions, EP 696 (STB served Sept. 2, 2010).

² The railroad cost of capital determined here is an aggregate measure. It is not intended to measure the desirability of any individual capital investment project.

Determining the Railroad Industry’s Cost of Capital, EP 664 (Sub-No. 1) (STB served Jan. 28, 2009).³

Western Coal Traffic League (WCTL) replied to AAR’s submission, stating that its review of AAR’s filing and associated workpapers did not reveal any significant mathematical errors. (WCTL Reply 1.) Nevertheless, WCTL argues that the cost of capital is substantially overstated due to a miscalculation of the cost of equity, which stems from alleged flaws in the Multi-Stage Discounted Cash Flow model (MSDCF), and argues for the implementation of the Capital Asset Pricing Model (CAPM). As in previous years, WCTL recommends the Board rely only on CAPM, but with a 4.6% market-risk premium, to calculate the cost-of-equity portion of the cost of capital. (*Id.* at 5.)

AAR responded to WCTL’s reply, asserting that it followed the Board’s instructions to use the methodology from Railroad Cost of Capital—2022, EP 558 (Sub-No. 26) (STB served Aug. 3, 2023), and noting that WCTL acknowledges that AAR’s filing and associated workpapers had no significant mathematical errors. (AAR Rebuttal 1.) AAR asserts that WCTL’s arguments are collateral attacks on the Board’s cost-of-capital methodology and should therefore be rejected. (AAR Rebuttal 1-5.)

DISCUSSION AND CONCLUSIONS

WCTL’s Reply

According to WCTL, AAR’s 9.87% cost-of-capital figure for 2023 is “inaccurate and substantially overstated.” (WCTL Reply 1.) WCTL argues that AAR’s cost-of-equity calculation “deviates substantially” from other respected benchmarks because the Board miscalculates the cost of equity due to alleged flaws in the Board’s methodology. (*Id.* at 2-9.) WCTL also contests certain MSDCF data inputs and the sources used to calculate earnings per share growth rates. (*Id.* at 9-14.)

As in years prior, WCTL presents alternative cost-of-capital figures—this year ranging from 7.04% to 8%. (*Id.* at 2.) WCTL uses a variety of alternative methods and critiques the MSDCF while supporting the CAPM-only approach and its calculation of the cost of equity.⁴ As WCTL recognizes, the Board is not under an “immediate legal obligation to consider such matters in this particular proceeding.” (WCTL Reply 2.) Nevertheless, WCTL argues that the deviation between the cost-of-capital values derived by the Board and the values it presents “is

³ AAR originally submitted its comments on April 23, 2024, before amending them on the same day to correct certain errors. Throughout this decision, citations to AAR Opening refer to AAR’s amended comments.

⁴ Among those values, WCTL highlights the weighted average cost-of-capital values calculated by Morgan Stanley—values that WCTL claims the Board relied on in Canadian Pacific Railway Limited—Control—Kansas City Southern (CP/KCS Merger), Docket No. FD 36500 et al., slip op. at 150 (STB served Mar. 15, 2023). (WCTL Reply 3-4.)

more than worthy of a Board-initiated rulemaking proceeding.”⁵ (WCTL Reply 9.) The Board has previously directed in past annual cost-of-capital proceedings that challenges to the Board’s cost-of-capital methodology should be addressed in Docket No. EP 664 and not in the annual cost-of-capital proceeding. See, e.g., R.R. Cost of Cap.—2022, EP 558 (Sub-No. 26), slip op. at 3 (STB served Aug. 2, 2023). As the Board has stated, “requests to [change our methodology] must be brought (*in the form of a petition for rulemaking*) in a 664 proceeding, not in the annual 558 proceeding, in which we calculate the cost of capital for a particular year.” Methodology to Be Employed in Determining the R.R. Industry’s Cost of Cap. (Cost-of-Cap. Methodology), EP 664, slip op. at 18 (STB served Jan. 17, 2008), corrected (STB served Jan. 18, 2008) (emphasis added); see also WCTL v. STB, No. 23-1272, slip op. at 1 (D.C. Cir. Feb. 21, 2024) (affirming the Board’s use of the two-docket system). As WCTL appears to concede, (see WCTL Reply 2), its arguments are challenges to the Board’s methodology. Accordingly, they are not properly before the Board in this annual proceeding and are not being considered at this time.

The Board will accept AAR’s submission, which complies with the Board’s established methodology.

2023 Cost-of-Capital Determination

AAR calculated the cost of capital for a “composite railroad” based on criteria developed in Railroad Cost of Capital—1984, 1 I.C.C.2d 989 (1985), and modified in Revisions to the Cost-of-Capital Composite Railroad Criteria, EP 664 (Sub-No. 3) (STB served Oct. 25, 2017).⁶ According to AAR, the following three railroad holding companies meet these criteria: CSX Corporation (CSX), Norfolk Southern Corporation (NSC), and Union Pacific Corporation (UPC).

As discussed below, the Board’s Office of Economics (OE) has examined the procedures used by AAR to calculate the following components for the railroad industry’s 2023 cost of capital: (1) cost-of-debt capital, (2) cost of common equity capital, (3) cost of preferred equity capital, (4) capital structure, and (5) composite after-tax cost of capital. Based on that review, the Board estimates that the 2023 railroad cost of capital was 9.87%.

⁵ WCTL also argues that the Board should require the production of certain information. First, WCTL argues that “the Board should require CSX [Corporation] to identify the basis, assumptions, and data for its 8% [long-term cost-of-capital] figure.” (WCTL Reply 9.) Second, WCTL asks the Board to require AAR to provide, in its opening submission, analyst reports that contain earnings per share growth rate forecasts. (Id. at 12.) As WCTL makes these requests in connection with its arguments regarding methodology, they are not directly relevant to this proceeding determining the annual cost of capital and will not be addressed in this decision.

⁶ The composite railroad includes those Class I carriers that (1) are listed on either the New York Stock Exchange (NYSE) or Nasdaq Stock Market (NASDAQ), (2) paid dividends throughout the year, (3) had rail assets greater than 50% of their total assets, and (4) had a debt rating of at least BBB (Standard & Poor’s) and Baa (Moody’s).

DEBT CAPITAL

AAR developed its 2023 current cost of debt using bond price data from Bloomberg Professional (Bloomberg), a subscription service used since Railroad Cost of Capital—2011, EP 558 (Sub-No. 15) (STB served Sept. 13, 2012). AAR's cost-of-debt figure is based on the market-value yields of the major forms of long-term debt instruments for the railroad holding companies used in the composite. These debt instruments include (1) bonds, notes, and debentures (bonds); (2) equipment trust certificates (ETCs); and (3) conditional sales agreements (CSAs). The yields of these debt instruments are weighted based on their market values.

Cost of Bonds, Notes, and Debentures (Bonds)

AAR used data from Bloomberg for the current cost of bonds, based on monthly prices and yields during 2023, for all issues (a total of 135) that were publicly traded during the year. (AAR Opening, V.S. Ghayad 8-9.) To develop the current (in 2023) market value of bonds, AAR used these traded bonds and additional bonds that were outstanding but not publicly traded during 2023. Following the procedure in effect since 1988, AAR based the market value on monthly prices for all traded bonds and the face or par value (\$1,000) for all bonds not traded during the year. AAR computed the total market value of all outstanding bonds to be \$54.8 billion (\$54.2 billion traded and \$0.59 billion non-traded). (*Id.*, V.S. Ghayad 10.) Based on the yields for the traded bonds, AAR calculated the weighted average 2023 yield for all bonds to be 5.250%. (*Id.*, V.S. Ghayad 11.) OE examined AAR's bond price and yield data and determined that AAR's computations are correct. The calculations and data for all bonds are shown in **Tables 1** and **2** of the Appendix.

Cost of ETCs

ETCs are not actively traded on secondary markets. Therefore, their costs must be estimated by comparing them to the yields of other debt securities that are actively traded. Following the practice in previous cost-of-capital proceedings, AAR used government securities with maturities similar to these ETCs as surrogates for developing yields. After calculating the 2023 yields for these government securities, AAR added basis points⁷ to these yields to compensate for the additional risks associated with the ETCs.

There were four ETCs outstanding during 2023 for UPC. (*Id.*, V.S. Ghayad 15.) Using the yield spreads, AAR calculated the weighted average cost of ETCs to be 4.957%⁸ and their market value to be \$747.61 million for 2023. (AAR Opening, V.S. Ghayad 12-16, App. C.)

OE has examined AAR's ETC calculations and, based on that review, the Board accepts the cost and market value of the ETCs using AAR's data. **Table 3** in the Appendix shows a summary of the ETC computations.

⁷ A basis point equals 1/100th of a percentage point.

⁸ This percentage is higher than the 2022 figure of 3.742%. See R.R. Cost of Cap.—2022, EP 558 (Sub-No. 26), slip op. at 5.

Cost of CSAs

CSAs normally represent no more than a small fraction (less than 1%) of total railroad debt. This year, no CSAs were used to calculate the 2023 cost of debt because no CSAs are outstanding.⁹ (*Id.*, V.S. Ghayad 16.)

Capitalized Leases and Miscellaneous Debt

As in previous cost-of-capital determinations, AAR excluded the cost of capitalized leases and miscellaneous debt in its computation of the overall current cost of debt because these costs are not directly observable in the open market. (*Id.*, V.S. Ghayad 17.) Also, in keeping with past practice, AAR included the book value of capitalized leases and miscellaneous debt in the overall market value of debt, which is used to determine the railroads' capital structure mix. AAR calculated the book value (assumed market value) for the capitalized leases and miscellaneous debt to be (\$1,074.4) million for 2023.¹⁰ (*Id.*, V.S. Ghayad 17-18.) OE has examined AAR's calculations for the market value for capitalized leases and miscellaneous debt, and, based on that review, the Board accepts the market value using AAR's data. **Table 5** in the Appendix shows the calculations for capitalized leases and miscellaneous debt to be (\$1,074.4) million.

Total Market Value of Debt

AAR calculated the total market value for all debt during 2023 to be \$54.5 billion. (*Id.*, V.S. Ghayad 18-19.) OE has examined AAR's calculations and, based on that review, the Board accepts the total market value for all debt using AAR's data. **Table 6** in the Appendix shows a breakdown of the market value of debt.

Flotation Costs of Debt

AAR calculated flotation costs for bonds, notes, and debentures by first calculating a yield on a new issue that included flotation costs, and then deducting a yield that did not include flotation costs. The difference between the two yields is the flotation costs expressed in percentage points. For 2023, eight new issues were reported in five filings, with some filings reporting multiple new issues. (*Id.*, V.S. Ghayad 21.) A simple average of the eight flotation cost figures is 0.098%. (*Id.*) AAR calculated the 2023 flotation costs for bonds using publicly available data from electronic filings with the Securities and Exchange Commission (SEC). For the calculation of ETC flotation costs, AAR used a historical SEC study composed of railroad ETC data for the years 1951, 1952, and 1955. (*Id.*, V.S. Ghayad 22 (citing SEC, Cost of Flotation of Corp. Sec. 1951-1955 (1957))). AAR asserts that, in that study, the SEC determined that ETC flotation costs average 0.89% of gross proceeds. (*Id.*, V.S. Ghayad 22.) Using 0.89%

⁹ No CSAs have been modeled since 2010, and none have been outstanding since 2014. (AAR Opening, V.S. Ghayad 16.)

¹⁰ This figure consists of \$174.0 million of capitalized leases and (\$1,248.4) million of miscellaneous debt. (*Id.*, App. D; see also *id.*, V.S. Ghayad 17-18.) **Table 5** in the Appendix shows these figures.

for ETCs, and assuming that coupons are paid twice per year and that the duration for new ETCs is 15 years, yields flotation costs of 0.086%. (*Id.*, V.S. Ghayad 23.)

To compute the overall effect of the flotation cost on debt, the market value weight of the outstanding debt is multiplied by the respective flotation cost. The weight for each type of debt is based on market values for debt, excluding all other debt,¹¹ for which a current cost of debt has not been determined.¹² AAR calculated that the flotation costs of debt increase the cost of debt by 0.098 percentage points. (*Id.*, V.S. Ghayad 23.)

OE has reviewed AAR's calculations concerning flotation costs and has determined that AAR's computation is correct. Based on OE's analysis, the Board finds that the cost factors developed for the various components of debt are reasonable.¹³ **Table 7** in the Appendix shows these calculations.

Overall Current Cost of Debt

AAR concluded that the railroads' weighted cost of debt for 2023 was 5.34%.¹⁴ (AAR Opening, V.S. Ghayad 24.) OE has verified that the percentage put forth by AAR is correct. **Table 8** in the Appendix shows the overall current cost of debt.

COMMON EQUITY CAPITAL

The cost of common equity capital is estimated by calculating the simple average of estimates produced by a Capital Asset Pricing Model (CAPM) and the Morningstar/Ibbotson Multi-Stage Discounted Cash Flow Model (MSDCF).

CAPM

Under CAPM, the cost of equity is equal to $RF + \beta \times RP$, where RF is the risk-free rate, RP is the market-risk premium, and β (or beta) is the measure of systematic, non-diversifiable risk. In order to calculate the RF, the railroads were asked to provide the average yield to maturity in 2023 for a 20-year U.S. Treasury Bond. Similarly, the railroads were asked to provide an estimate for the RP based on returns experienced by the S&P 500 since 1926.

¹¹ All other debt represents capitalized leases, miscellaneous debt, non-modeled ETCs, and non-modeled CSAs. There were no non-modeled ETCs or non-modeled CSAs in 2023. (*Id.*, V.S. Ghayad 17-18.)

¹² Current costs can be determined for three of the four debt categories—bonds, ETCs, and CSAs. Usually, the weighted average cost of debt is based upon these three (of the four) debt categories, but in this instance only bonds and ETCs are present. (*Id.*, V.S. Ghayad 19.)

¹³ AAR calculated the 2023 flotation costs for bonds using publicly available data from electronic filings with the SEC. (*Id.*, V.S. Ghayad 20-21.)

¹⁴ This percentage is higher than the 2022 figure of 4.28%. See R.R. Cost of Cap.—2022, EP 558 (Sub-No. 26), slip op. at 6.

Finally, the railroads were asked to calculate beta using a portfolio of weekly, merger-adjusted railroad stock returns for the prior five years in the following equation:

$$R - SRRF = \alpha + \beta (RM - SRRF) + \varepsilon, \text{ where}$$

α = constant term;
 R = merger-adjusted stock returns for the portfolio of railroads that meet the screening criteria set forth in Railroad Cost of Capital—1984, 1 I.C.C.2d at 1003-04;
 $SRRF$ = the short-run risk-free rate, which we will proxy using the 3-month U.S. Treasury bond rate;
 RM = return on the S&P 500; and
 ε = random error term.

RF – The Risk-Free Rate

To establish the risk-free rate, AAR relies on the Federal Reserve website to retrieve the average yield to maturity for a 20-year U.S. Treasury Bond. Using the average yield to maturity in 2023 for a 20-year U.S. Treasury Bond, consistent with Railroad Cost of Capital—2006, EP 558 (Sub-No. 10) (STB served Apr. 15, 2008), AAR calculated the 2023 risk-free rate to be 4.26%. (AAR Opening, V.S. Ghayad 30.) OE has examined AAR's data and the data from the Federal Reserve's website and has determined that AAR's computation is correct.

RP – The Market-Risk Premium

Using the approach from Cost-of-Capital Methodology, EP 664, slip op. at 7-9, AAR submitted data reflecting a market-risk premium of 7.17%. The Ibbotson SBBI Classic Yearbook, published by Morningstar, which was previously used as the source of the market-risk premium for 2013 and 2014, has been discontinued. AAR replaced the former source with the Duff & Phelps' Valuation Handbook—U.S. Guide to Cost of Capital, as the source of the market-risk premium for 2015 and 2016. However, in 2018, Duff & Phelps discontinued the publication of that book in hardcover form and replaced it with an online tool called the Cost of Capital Navigator. According to AAR, the Cost of Capital Navigator uses the same method as that used by Ibbotson and provides the same data reflecting the market-risk premium. (AAR Opening, V.S. Ghayad 31-32.)

OE has verified that use of the 1926 base year, as used by the Cost of Capital Navigator, is a reasonable method of calculating the market-risk premium, (see *id.*, App. H), and has also determined that AAR's computation of the market-risk premium is correct.

Calculating Beta

Cost-of-Capital Methodology, EP 664, slip op. at 11, requires parties to calculate CAPM's beta using a portfolio of weekly, merger-adjusted stock returns for the prior five years in the following equation: $R - SRRF = \alpha + \beta (RM - SRRF) + \varepsilon$. Applying the modified

approach for assigning the new shares outstanding,¹⁵ as described in Railroad Cost of Capital—2010, EP 558 (Sub-No. 14), slip op. at 6 (STB served Oct. 3, 2011), AAR’s calculations estimate that the value of beta is 0.9858.¹⁶ (AAR Opening, V.S. Ghayad 37.)

To verify and calculate the value of beta, OE reviewed the stock prices recorded on Yahoo Finance and in AAR’s workpaper and noticed the end-of-week close stock prices and weekly close adjusted stock prices for NSC in the AAR Bloomberg spreadsheet were incorrect. After recalculating using the corrected data from Yahoo Finance, the Board finds that the value of beta is 0.9875. The revised stock prices and 0.9875 value of beta will be used.

Cost of Common Equity Capital using CAPM

Using the modified approach for assigning the new shares outstanding, the Board calculates the cost of equity as $RF + (\beta \times RP)$, or $4.26\% + (0.9875 \times 7.17\%)$, which equals 11.34%. **Tables 9 and 10** in the Appendix show the calculations of the cost of common equity using CAPM.¹⁷ (See also id., V.S. Ghayad 37-38.)

To calculate the 2023 market value of common equity for each railroad, AAR calculated each railroad’s weekly market value using data on shares outstanding from railroad 10-Q and 10-K reports filed with the SEC, multiplied by stock prices at the close of each week in 2023. (Id., V.S. Ghayad 25-26.) AAR calculated the combined 52-week average market value of the railroads to be \$241.8 billion. (Id., V.S. Ghayad 26.) OE has examined the data and determined that AAR’s calculation is correct. See Calculating Beta supra p. 7-8.

MSDCF

The cost of equity in a discounted cash flow model is the discount rate that equates a firm’s market value to the present value of the stream of cash flows that could affect investors. These cash flows are not presumed to be paid out to investors; instead, it is assumed that investors will ultimately benefit from these cash flows through higher regular dividends, special dividends, stock buybacks, or stock price appreciation. Incorporation of these cash flows and the expected growth of earnings are the essential elements of the Morningstar/Ibbotson MSDCF model.

¹⁵ For the purposes of determining the number of shares outstanding, new shares outstanding are assigned to the first Friday on or after the effective date listed in the carriers’ 10-Q and 10-K reports.

¹⁶ Bloomberg equity prices adjusted for dividends and splits were used in place of Yahoo Finance’s adjusted prices in the calculation of the carrier-specific returns, which are needed to calculate an industry beta. AAR states that due to “Yahoo data quality concerns in the prior years, [it] used Bloomberg stock price data for 2023.” (AAR Opening, V.S. Ghayad 34.) AAR uses the SAS General Linear Model procedure to compute regression data. (Id., V.S. Ghayad 36.) The Board uses a standard Excel regression method.

¹⁷ Because AAR used incorrect stock prices for NSC, the regression summary output in AAR’s workpapers does not match STB **Table 9**.

Cash Flow

The Morningstar/Ibbotson MSDCF model defines cash flows (CF) for the first two stages as income before extraordinary items (IBEI), minus capital expenditures (CAPEX), plus depreciation (DEP) and deferred taxes (DT), or

$$CF = IBEI - CAPEX + DEP + DT.$$

As noted above, the third-stage cash flow is based on two assumptions: depreciation equals capital expenditures, and deferred taxes are zero. That is, cash flow in the third stage of the model is based only on IBEI.

To obtain an average cash-flow-to-sales ratio, AAR divided the total cash flow in the 2019-2023 periods by the total sales over the same periods. (*Id.*, V.S. Ghayad 40-41.) To obtain the 2023 average cash flow, the cash-flow-to-sales ratio is multiplied by the sales revenue from 2023. (*Id.*, V.S. Ghayad 41.) The 2023 average cash flow figure is then used as the starting point of the Morningstar/Ibbotson MSDCF model. (*Id.*) The initial value of IBEI is determined through the same averaging process for the cash flows in stages one and two. (*Id.*, App. J.) According to AAR, the data inputs in the cash flow formula were retrieved from the railroads' 2019-2023 10-K filings. (*Id.*, V.S. Ghayad 40-41.)

Growth Rates

Growth of earnings is also calculated in three stages. These three growth-rate stages are what make the Morningstar/Ibbotson model a “multi-stage” model. In the first stage (years one through five), the firm’s annual earnings growth rate is assumed to be the median value of the qualifying railroad’s three- to five-year growth estimates, as determined by railroad industry analysts and published by the I/B/E/S. In the second stage (years six through 10), the growth rate is the average of all growth rates in stage one. In the third stage (years 11 and onwards), the growth rate is the long-run nominal growth rate of the U.S. economy. This long-run nominal growth rate is estimated by using the historical growth in real Gross Domestic Product (GDP) plus the long-run expected inflation rate.

AAR calculated the first- and second-stage growth rates according to the I/B/E/S data, which was retrieved from Refinitiv. (*Id.*, V.S. Ghayad 43-44.) The third-stage growth rate of 5.53% was calculated by using the sum of the figures for long-run expected growth in real output, 3.17%,¹⁸ and long-run expected inflation, 2.36%. (*Id.*, V.S. Ghayad 46-48.)¹⁹ OE has

¹⁸ The real GDP growth rate is a compound growth rate calculated from the Bureau of Economic Analysis (BEA) data beginning in 1929. BEA rebased the real GDP from 2005 dollars to 2009 dollars. Beginning in 2019, BEA began using 2012 dollars. (*Id.*, App. M.) AAR calculated the growth rate using GDP in 2012 dollars. (*Id.*, V.S. Ghayad 46.)

¹⁹ According to AAR, until the 2013 cost-of-capital determination, the long-run nominal growth rate used was provided by Morningstar/Ibbotson in its Ibbotson SBBI Valuation Yearbook. (*Id.*, V.S. Ghayad 45-46.) AAR states that this publication has been discontinued. However, for several years, another valuation reference book, the Ibbotson SBBI Classic

reviewed the evidence provided by AAR and determined that the growth rates are correct and consistent with the Board's approved methodology. Accordingly, they will be used in the Board's determination of the cost of equity for 2023.

Market Values for MSDCF

The final inputs to the Morningstar/Ibbotson MSDCF model are the stock market values for the equity of each railroad. To calculate these values, AAR used stock prices from Yahoo Finance for December 29, 2023, and shares outstanding from the 2023 Q3 10-Q reports filed with the SEC. (*Id.*, V.S. Ghayad 49.)

OE has reviewed AAR's evidence and found it to be accurate. Based on that review, the Board finds that the market values used in the 2023 estimate of the cost of equity using the Morningstar/Ibbotson MSDCF are correct. *See Calculating Beta supra* p. 7-8.

Cost of Common Equity Capital Using MSDCF

AAR estimates an MSDCF cost of equity of 10.44%. (*Id.*, V.S. Ghayad 51.) Based on the verified inputs discussed above, the Board adopts 10.44% as the MSDCF cost of equity. This estimate will be averaged with the cost of equity derived from the CAPM approach. **Table 11** shows the MSDCF inputs and the cost-of-equity calculation.

Cost of Common Equity

Based on the evidence provided and the recalculated MSDCF, the Board concludes that the railroad cost of equity in 2023 was 10.89%. This figure is based on an estimate of the cost of equity using a CAPM of 11.33% and an MSDCF estimate of 10.44%. (*Id.*, V.S. Ghayad 52, Table 17.) **Table 12** shows the costs of common equity for each model and the average of the two models.

Yearbook, was expanded to contain many of the statistics found in the Valuation Yearbook. (*Id.*) Using data from the Ibbotson SBBI Classic Yearbook, the Federal Reserve, and the BEA, AAR states that it replicated the Ibbotson calculations for real growth rates and long-term inflation for the 2013 and 2014 cost-of-capital determinations. (*Id.*, V.S. Ghayad 45-46.) Beginning with the 2015 cost-of-capital determination, AAR states the SBBI long-term government yields, an input into the long-run nominal growth rate, were no longer available because Morningstar discontinued publication of the Ibbotson SBBI Classic Yearbook. (*Id.*, V.S. Ghayad 47.) To replace the SBBI long-term government yields, AAR uses the 20-year U.S. Treasury Bond yields, which it contends are very close to the SBBI long-term government yields used by Ibbotson. (*Id.*) This methodology was accepted in the 2015 through 2022 cost-of-capital determinations and has been used again for 2023. (*Id.*) Appendix M in AAR's opening statement contains the calculations for the stage three growth rate. (*Id.*, App. M.) OE has reviewed AAR's approach and finds it to be reasonable.

PREFERRED EQUITY

Preferred equity has some of the characteristics of both debt and equity. Essentially, preferred stock issues are like common stocks in that they have no maturity dates and represent ownership in the company (usually with no voting rights attached). They are similar to debt in that they usually have fixed dividend payments (akin to interest payments).

AAR states that there is no preferred stock in this year's calculation; therefore, AAR computed the market value of preferred equity during 2023 to be \$0. (Id., V.S. Ghayad 52-53, Table 18.) AAR computed the cost of preferred equity to be 0%. (Id., V.S. Ghayad 53-54.)

OE has determined that AAR's computations are correct. Based on that review, **Table 13** shows the calculations of the cost of preferred equity.

CAPITAL STRUCTURE MIX

The Board will apply the same inputs used in the market value for the CAPM model to the capital structure.

OE has determined that the average market values of debt, common equity, and preferred equity are \$54.472 billion, \$241.768 billion, and \$0 respectively. The percentage share of debt increased from 18.28% in 2022 to 18.39% in 2023. The percentage share of common equity decreased from 81.72% in 2022 to 81.61% in 2023. Based on that review, **Table 14** in the Appendix shows the calculations of the average market value of common equity and relative weights for each railroad. **Table 15** in the Appendix shows the 2023 capital structure mix.

COMPOSITE COST OF CAPITAL

Based on the evidence furnished in the record and the MSDCF, the 2023 composite after-tax cost of capital for the railroad industry, as set forth in **Table 16** in the Appendix, was 9.87%. The procedure used to develop the composite cost of capital is consistent with the Statement of Principle established by the Railroad Accounting Principles Board: "Cost of capital shall be a weighted average computed using proportions of debt and equity as determined by their market values and current market rates." R.R. Accounting Principles Bd., Final Report, Vol. 1 (1987). The 2023 cost of capital was 0.71 percentage points lower than the 2022 cost of capital (10.58%). See R.R. Cost of Cap.—2022, EP 558 (Sub-No. 26), slip op. at 12.

CONCLUSIONS

The Board finds that for 2023:

1. The cost of railroad long-term debt was 5.34%.
2. The cost of common equity was 10.89%.
3. The cost of preferred equity was 0%.

4. The capital structure mix of the railroads was 18.39% long-term debt, 81.61% common equity, and 0.00% preferred equity.

5. The composite railroad industry cost of capital was 9.87%.

It is ordered:

1. This decision is effective September 6, 2024.

2. This proceeding is discontinued.

By the Board, Board Members Fuchs, Hedlund, Primus, and Schultz.

APPENDIX

Table 1
2023 Traded & Non-traded Bonds

Railroad	Traded vs. Non-traded	Number	Market Value (\$000)	% Market Value to All Bonds
CSX	Traded ¹	32	\$15,280,930	96.27%
	Non-traded	3	591,679	3.73%
	Total	35	15,872,609	100.00%
NSC	Traded ²	40	13,559,845	100.00%
	Non-traded	0	0	0.00%
	Total	40	13,559,845	100.00%
UPC	Traded ³	63	25,366,477	100.00%
	Non-traded	3	0	0.00%
	Total	66	25,366,477	100.00%
Composite	Traded	135	54,207,251	98.92%
	Non-traded	6	591,679	1.08%
	Total	141	\$54,798,930	100.00%
¹ Includes 1 bonds issued during 2023, prorated based on the date of issue. ² Includes 5 bonds issued during 2023, prorated based on the date of issue. ³ Includes 3 bonds issued during 2023, prorated based on the date of issue.				

Table 2
2023 Bonds, Notes, & Debentures

Railroad	Number of Traded Issues	Market Value Traded Issues (\$000)	Current Cost	Weighted Cost
CSX	32	\$15,280,930	5.268%	1.485%
NSC	40	13,559,845	5.451%	1.364%
UPC	63	\$25,366,477	5.131%	2.401%
Composite	135	\$54,207,252		5.250%

Table 3
2023 Equipment Trust Certificates

Railroad	Number of Issues	Market Value (\$000)	Yield %	Weighted Yield (\$000)
CSX	0	\$0	0.00%	\$0
NSC	0	0	0.00%	0
UPC	4	747,612	4.957%	37,061
Composite	4	\$747,612	4.957%	\$37,061

Table 4
2023 Conditional Sales Agreements

Railroad	Number of Issues	Market Value (\$000)	Current Cost	Weighted Cost
Composite	0	\$0		0.00%

Table 5
2023 Capitalized Leases & Miscellaneous Debt

Railroad	Capitalized Leases (\$000)	Miscellaneous Debt¹ (\$000)	Total Other Debt (\$000)
CSX	\$11,578	(\$314,261)	(\$302,683)
NSC	11,937	(933,488)	(921,551)
UPC	150,497	(633)	149,864
Composite	\$174,012	(\$1,248,382)	(\$1,074,370)

¹ Miscellaneous debt includes unamortized debt discount.

Table 6
2023 Market Value of Debt

Type of Debt	Market Value of Debt (\$000)	Percentage of Total Market Value (Excluding Other Debt)
Bonds, Notes, & Debentures	\$54,798,930	98.65%
ETCs	747,612	1.35%
CSAs	0	0.00%
Subtotal	55,546,542	100.00%
Capitalized Leases/Miscellaneous Debt	(\$1,074,370)	NA
Total Market Value of Debt	\$54,472,172	NA

Table 7
2023 Flotation Cost for Debt

Type of Debt	Market Weight (Excludes Other Debt)	Flotation Cost	Weighted Average Flotation Cost
Bonds, Notes, & Debentures	98.654%	0.098%	0.097%
ETCs	1.346%	0.086%	0.001%
CSAs	0.000%	0.000%	0.000%
Total	100.000%		0.098%

Table 8
2023 Current Cost of Debt

Type of Debt	Percentage of Total Market Value (Excludes Other Debt)	Debt Cost	Weighted Debt Cost (Excludes Other Debt)
Bonds, Notes, & Debentures	98.654%	5.250%	5.179%
ETCs	1.346%	4.957%	0.067%
CSAs	0.000%	0.000%	0.000%
Subtotal	100.000%		5.246%
Flotation Cost			0.098%
Weighted Cost of Debt			5.344%

Table 9
2023 Summary Output

Regression Statistics					
Multiple R	0.745497				
R Square	0.555766				
Adjusted R Square	0.554050				
Standard Error	0.024374				
Observations	261				
ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.192501	0.192501	324.0256	1.5377E-47
Residual	259	0.153870	0.000594		
Total	260	0.346370			
	Coefficients	Standard Error	t Stat	P-value	
Intercept	0.000267	0.001515	0.176302	0.860195	
X-Variable	0.987487	0.054858	18.000712	1.5377E-47	

Table 10
2023 CAPM Cost of Common Equity

Risk-Free Rate (RF)	4.26%	
RF+(Beta x Market Risk Premium)	4.26% + (0.9875 x 7.17%)	11.34%
Cost of Equity		11.34%

Table 11
2023 Cost of Equity Using STB's MSDCF
(\$ in millions)

Railroad	CSX		NSC		UPC	
Initial Cash Flow	\$3,726		\$2,179		\$5,869	
Input for Terminal C.F.	\$4,032		\$2,732		\$6,710	
Stage One Growth	5.89%		2.80%		6.36%	
Stage Two Growth	5.02%		5.02%		5.02%	
Stage Three Growth*	5.53%		5.53%		5.53%	
Year	Value on 12/31 of Each Year	Present Value	Value on 12/31 of Each Year	Present Value	Value on 12/31 of Each Year	Present Value
1	\$3,945	\$3,538	\$2,240	\$2,038	\$6,242	\$5,668
2	4,178	3,359	2,303	1,907	6,639	5,474
3	4,424	3,189	2,367	1,783	7,062	5,286
4	4,685	3,027	2,433	1,668	7,511	5,105
5	4,960	2,874	2,502	1,561	7,988	4,930
6	5,209	2,706	2,627	1,491	8,389	4,701
7	5,471	2,548	2,759	1,425	8,810	4,483
8	5,746	2,400	2,897	1,362	9,253	4,275
9	6,034	2,260	3,043	1,301	9,717	4,076
10	6,337	2,128	3,196	1,244	10,205	3,887
Terminal	\$120,578	\$40,484	\$96,807	\$37,674	\$267,403	\$101,845
Sum of Present Value	\$68,512		\$53,454		\$149,729	
Market Value	\$68,512		\$53,454		\$149,729	
COE	11.53%		9.90%		10.13%	
Weighted COE	2.91%		1.95%		5.58%	
Industry COE	10.44%					

Table 12
2023 Cost of Common Equity Capital

Model	
Capital Asset Pricing Model	11.34%
Multi-Stage Discounted Cash Flow	10.44%
Cost of Common Equity	10.89%

Table 13
2023 Cost & Market Value of Preferred Stock

Railroad	Dividend	Value Per Share	Div. Yield %	Shares (000)	Market Value (\$000)	Market Weight	Weighted Yield
CSX	\$0.00	\$0.00	0.00%	0	\$0	0.00%	0.00%
NSC	0.00	0.00	0.00%	0	0	0.00%	0.00%
UPC	0.00	0.00	0.00%	0	0	0.00%	0.00%
Composite					\$0	0.00%	0.00%

Table 14
2023 Average Market Value for Common Equity

Railroad	Average Market (\$000)	Average Market Weight
CSX	\$63,818,363	26.40%
NSC	49,566,540	20.50%
UPC	128,383,345	53.10%
COMPOSITE	\$241,768,248	100.00%

Table 15
2023 Capital Structure Mix

Railroad	Type of Capital	Market Value (\$000)	Weight
CSX	Debt	\$15,569,926	19.61%
	Equity	63,818,362	80.39%
	P. Equity	0	0.00%
NSC	Debt	12,638,294	20.32%
	Equity	49,566,540	79.68%
	P. Equity	0	0.00%
UPC	Debt	26,263,954	16.98%
	Equity	128,383,345	83.02%
	P. Equity	0	0.00%
Composite Weight	Debt	54,472,172	18.39%
	Equity	241,768,248	81.61%
	P. Equity	0	0.00%
Total		\$296,240,421	100.00%

Table 16
2023 Cost-of-Capital Computation

Type of Capital	Cost	Weight	Weighted Average
Long-Term Debt	5.34%	18.39%	0.98%
Common Equity	10.89%	81.61%	8.89%
Preferred Equity	0.00%	0.00%	0.00%
Composite Cost of Capital		100.00%	9.87%