52630
EB

SERVICE DATE – JULY 21, 2025

SURFACE TRANSPORTATION BOARD

DECISION

Docket No. EP 558 (Sub-No. 28)

RAILROAD COST OF CAPITAL—2024

Digest:[1] The Board finds that the cost of capital for the railroad industry, which is calculated each year, was 10.68% for 2024. 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: July 20, 2025

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 January 10, 2025, to update the railroad industry's cost of capital for 2024. In that decision, the Board solicited comments from interested parties on the following issues: (1) the railroads' 2024 current cost of debt capital, (2) the railroads' 2024 current cost of preferred equity capital (if any), (3) the railroads' 2024 cost of common equity capital, and (4) the 2024 capital structure mix of the railroad industry on a market value basis.

On April 14, 2025, 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 Determining the Railroad Industry's Cost of Capital, EP 664 (Sub-No. 1) (STB served Jan. 28, 2009). AAR states that, based on its calculations, the overall railroad industry cost of capital for 2024 should be 10.68%. (AAR Opening 2.)

---

[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.

Western Coal Traffic League (WCTL) replied to AAR's submission on May 5, 2025, 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 component. (Id.) According to WCTL, the cost of equity "error" stems from alleged flaws in the Multi-Stage Discounted Cash Flow model (MSDCF) and the implementation of the Capital Asset Pricing Model (CAPM). (Id. at 1-2.) Accordingly, as in previous years, WCTL recommends the Board rely only on CAPM (though modified, as discussed below) to calculate the cost of equity. (Id. at 4-5.)

AAR responded to WCTL's reply on May 22, 2025, asserting that it followed the Board's instructions to use the methodology from Railroad Cost of Capital—2023, EP 558 (Sub-No. 27) (STB served Aug. 7, 2024). (AAR Rebuttal 1.) AAR notes that WCTL acknowledges that AAR's filing and associated workpapers had no significant mathematical errors. (Id.) AAR asserts that WCTL's arguments are improper collateral attacks on the Board's cost-of-capital methodology, (id. at 2-3), and that WCTL attempts to "backdoor its reply as a petition for rulemaking," (id. at 3). Accordingly, AAR argues that the Board should deny WCTL's request to change the methodology. (Id. at 4.)

## DISCUSSION AND CONCLUSIONS

*WCTL's Reply*

According to WCTL, the Board's established cost-of-capital methodology is "inaccurate and substantially overstated" due to flaws in the Board's underlying MSDCF and CAPM methodologies. (WCTL Reply 1-2.) In support of its assertion, WCTL argues that AAR's costs of equity calculation (and therefore its capital calculation) "deviate sharply" from other respected benchmarks. (Id. at 2; see also id. at 3-6 (comparing AAR's cost-of-capital and cost-of-equity figures to those of other financial institutions and entities).)[3] WCTL also argues that the MSDCF improperly uses a carrier's earnings per share (EPS) as the basis for growth rates in the first two stages of the MSDCF. (Id. at 7-9.) WCTL claims that EPS figures overstate growth rates because they include the impact of stock repurchases (i.e., buybacks), which are not reflective of actual growth.[4] (Id. at 7-8.)

[3] In particular, WCTL highlights the weighted average cost-of-capital values calculated by Morgan Stanley, which WCTL notes that the Board relied on in Canadian Pacific Railway—Control—Kansas City Southern, FD 36500 et al., slip op. at 150 (STB served Mar. 15, 2023), (WCTL Reply 3-4), and notes that one rail carrier reported an "8% required return" in its 2024 10-K report, (id. at 6).

[4] WCTL claims that the railroads "have made no secret of their use of buybacks to boost [earnings per share]," referring to one railroad's testimony at the Board's hearings in Growth in the Freight Rail Industry, Docket No. EP 775. (WCTL Reply 8.) WCTL also cites expert testimony submitted in Atchison, Topeka & Santa Fe Railway—Operating Rights—Southern Pacific Transportation Co., Docket No. FD 22218, to support its contention that the railroads do not view their own MSDCF growth rates as realistic. (WCTL Reply 8-9.) WCTL argues that

As in years prior, WCTL presents an alternative cost-of-capital figure based only on CAPM to calculate the cost of equity. (Id. at 4.) In its CAPM calculation, WCTL applies a different market-risk premium and risk-free rate[5] than the ones used by AAR. (Compare AAR Opening 6 (providing a risk-free rate of 4.50% and market risk premium of 7.31%), with WCTL Reply 5, Table 2 (providing a risk-free rate of 4.18% and market risk premium of 4.07%).) WCTL's alternative cost of capital figure comes to 7.57%. (WCTL Reply 5, Table 2.) Although WCTL says that the Board "may perceive no immediate legal obligation to consider such matters in this particular proceeding," (id. at 2), WCTL nevertheless argues that the deviation between the cost-of-capital values derived under the Board's methodology and the alternative values WCTL presents "is more than sufficient to support a Board-initiated rulemaking proceeding," (id. at 6).

As the Board has previously directed, challenges to the Board's cost-of-capital methodology should be addressed in Docket No. EP 664 (via a petition for rulemaking) and not in the annual cost-of-capital proceeding. See R.R. Cost of Cap.—2023, EP 558 (Sub-No. 27), slip op. at 3 (STB served Aug. 7, 2024); Methodology to Be Employed in Determining the R.R. Industry's Cost of Cap. (Cost-of-Capital Methodology), EP 664, slip op. at 18 (STB served Jan. 17, 2008) ("[R]equests to [change our methodology] must be brought (*in the form of a petition for rulemaking*) in a 664 proceeding, not in the annual 558 proceedings, in which we calculate the cost of capital for a particular year.") (emphasis added), corrected, (STB served Jan. 18, 2008); 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.

*2024 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

---

the Board should not rely on a methodology that "even AAR members do not believe is realistic or accurate." (Id. at 9.)

[5] WCTL states that it relied on risk-free rate and market-risk premium figures recommended by Professor Aswath Damodaran at the Stern School of Business at New York University. (WCTL Reply 4-5.)

[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).

Corporation (CSX), Norfolk Southern Corporation (NSC), and Union Pacific Corporation (UPC). (AAR Opening 3.)

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 2024 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 2024 railroad cost of capital was 10.68%.

## DEBT CAPITAL

AAR developed its 2024 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 2024, for all issues (a total of 130) that were publicly traded during the year. (AAR Opening, V.S. Ghayad 8-9.) To develop the current (in 2024) market value of bonds, AAR used these traded bonds and additional bonds that were outstanding but not publicly traded during 2024. 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 $56.4 billion ($55.82 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 2024 yield for all bonds to be 5.176%. (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. (Id., V.S. Ghayad 13.) After calculating the 2024 yields for these government securities, AAR added basis points[7] to these yields to compensate for the additional risks associated with the ETCs. (Id.)

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

There were four ETCs outstanding during 2024 for UPC. (Id., V.S. Ghayad 15, Table 5.) Using the yield spreads, AAR calculated the weighted average cost of ETCs to be 5.069%[8] and their market value to be $716.48 million for 2024. (Id.; see also id., V.S. Ghayad, App. C.)

OE has examined AAR's ETCs 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.

*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 2024 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 ($1,114.9) million for 2024.[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 ($1,114.9) million.

*Total Market Value of Debt*

AAR calculated the total market value for all debt during 2024 to be $56.01 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.

[8] This percentage is higher than the 2023 figure of 4.957%. See R.R. Cost of Cap.—2023, EP 558 (Sub-No. 27), slip op. at 4.

[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 $123.5 million of capitalized leases and ($1,238.45) million of miscellaneous debt. (AAR Opening, V.S. Ghayad, App. D; see also id., V.S. Ghayad 17-18.) **Table 5** in the Appendix shows these figures.

*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. (Id., V.S. Ghayad 19-21.) The difference between the two yields is the flotation costs expressed in percentage points. For 2024, only one new issue was reported, which had a flotation cost of 0.061%. (Id., V.S. Ghayad 21.) AAR calculated the 2024 flotation costs for bonds using publicly available data from electronic filings with the Securities and Exchange Commission (SEC). (Id., V.S. Ghayad 20-21.) 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 21-22 (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. (AAR Opening, V.S. Ghayad 22.) Using 0.89% 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 22-23.)

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 0.061 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. **Table 7** in the Appendix shows these calculations.

*Overall Current Cost of Debt*

AAR concluded that the railroads' weighted cost of debt for 2024 was 5.24%.[13] (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.

[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 2024. (AAR Opening, 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. (AAR Opening, V.S. Ghayad 19.)

[13] This percentage is lower than the 2023 figure of 5.34%. See R.R. Cost of Cap.—2023, EP 558 (Sub-No. 27), slip op. at 6.

## COMMON EQUITY CAPITAL

The cost of common equity capital is estimated by calculating the simple average of estimates produced by the CAPM and the Morningstar/Ibbotson MSDCF methodologies.

*CAPM*

Under CAPM, the cost of equity is equal to RF + β × 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 2024 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. 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:

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

| | | |
|---|---|---|
| $\alpha$ | = | 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 |
| $\varepsilon$ | = | 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 2024 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 2024 risk-free rate to be 4.50%. (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 7.31%. (AAR Opening, V.S. Ghayad 32.) 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 30-32.)

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., V.S. Ghayad, App. H), and has also determined that AAR's computation of the market-risk premium is correct.

*Calculating Beta*

Pursuant to Cost-of-Capital Methodology, EP 664, slip op. at 11, parties are required 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,[14] 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 0.9478.[15] (AAR Opening, V.S. Ghayad 37.)

Based on OE's verification and calculation of the value of beta, the Board accepts AAR's calculated estimate that the value of beta is 0.9478.

*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 4.50% + (0. 9478 × 7.31%), which equals 11.43%. **Tables 9** and **10** in the Appendix show the calculations of the cost of common equity using CAPM. (See also id., V.S. Ghayad 37-38.)

To calculate the 2024 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 2024. (Id., V.S. Ghayad 25-26.) AAR calculated the combined 53-week average market value of the railroads to be $268.5 billion. (Id., V.S. Ghayad 26; see also id., V.S. Ghayad, App. G.) OE has examined the data and determined that AAR's calculation is correct. See *Calculating Beta* supra p. 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.

[14] 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. (AAR Opening, V.S. Ghayad 35 n.31.)

[15] 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 2024." (AAR Opening, V.S. Ghayad 34.) AAR uses the SAS General Linear Model procedure to compute regression data. (Id., V.S. Ghayad 36; see also id., V.S. Ghayad, App. I.) The Board replicated this model using Excel's linear regression model, arriving at equivalent results.

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.

*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 2020-2024 periods by the total sales over the same periods. (AAR Opening, V.S. Ghayad 40-41.) To obtain the 2024 average cash flow, the cash-flow-to-sales ratio is multiplied by the sales revenue from 2024. (Id., V.S. Ghayad 41.) The 2024 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., V.S. Ghayad, App. J.) According to AAR, the data inputs in the cash flow formula were retrieved from the railroads' 2020-2024 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 5.58% was calculated by using the sum of the figures for long-run expected growth in real

output, 3.13%,[16] and long-run expected inflation, 2.45%. (Id., V.S. Ghayad 46-48.)[17] OE has 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 2024.

*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 January 3, 2025, and shares outstanding from the 2024 Q3 10-Q reports filed with the SEC. (AAR Opening, 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 2024 estimate of the cost of equity using the Morningstar/Ibbotson MSDCF are correct. See *Calculating Beta* supra p. 8.

*Cost of Common Equity Capital Using MSDCF*

AAR estimates an MSDCF cost of equity of 12.20%. (AAR Opening, V.S. Ghayad 51.) Based on the verified inputs discussed above, the Board adopts 12.20% 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.

---

[16] 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 2024, BEA began using 2017 dollars. (AAR Opening, V.S. Ghayad, App. M.) AAR calculated the growth rate using GDP in 2017 dollars. (Id., V.S. Ghayad 46.)

[17] 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. (AAR Opening, 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 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.) 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. (AAR Opening, 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.) AAR states that this methodology was accepted in the 2015 through 2023 cost-of-capital determinations and so has been used again for 2024. (Id.; see also id., V.S. Ghayad, App. M (providing calculations for the stage three growth rate).) OE has reviewed AAR's approach and finds it to be reasonable.

*Cost of Common Equity*

Based on the evidence provided and the recalculated MSDCF, the Board concludes that the railroad cost of equity in 2024 was 11.82%. This figure is based on an estimate of the cost of equity using a CAPM of 11.43% and an MSDCF estimate of 12.20%. (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.

## 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 2024 to be $0. (Id., V.S. Ghayad 52.)

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 $56.014 billion, $268.483 billion, and $0, respectively. The percentage share of debt decreased from 18.39% in 2023 to 17.26% in 2024. The percentage share of common equity increased from 81.61% in 2023 to 82.74% in 2024. 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 2024 capital structure mix.

## COMPOSITE COST OF CAPITAL

Based on the evidence furnished in the record and the MSDCF, the 2024 composite after-tax cost of capital for the railroad industry, as set forth in **Table 16** in the Appendix, was 10.68%. 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 2024 cost of capital was 0.81 percentage points higher than the 2023 cost of capital (9.87%). See R.R. Cost of Cap.—2023, EP 558 (Sub-No. 27), slip op. at 11.

## CONCLUSIONS

The Board finds that for 2024:

1. The cost of railroad long-term debt was 5.24%.

2. The cost of common equity was 11.82%.

3. The cost of preferred equity was 0%.

4. The capital structure mix of the railroads was 17.26% long-term debt, 82.74% common equity, and 0% preferred equity.

5. The composite railroad industry cost of capital was 10.68%.

It is ordered:

1. This decision is effective August 20, 2025.

2. This proceeding is discontinued.

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

## APPENDIX

### Table 1
### 2024 Traded & Non-traded Bonds

| Railroad | Traded vs. Non-traded | Number | Market Value ($000) | % Market Value to All Bonds |
|---|---|---|---|---|
| CSX | Traded[1] | 32 | $16,122,984 | 96.46% |
| | Non-traded | 3 | 591,679 | 3.54% |
| | Total | 35 | 16,714,664 | 100.00% |
| NSC | Traded | 38 | 15,451,066 | 100.00% |
| | Non-traded | 0 | 0 | 0.00% |
| | Total | 38 | 15,451,066 | 100.00% |
| UPC | Traded | 60 | 24,246,936 | 100.00% |
| | Non-traded | 0 | 0 | 0.00% |
| | Total | 60 | 24,246,936 | 100.00% |
| **Composite** | Traded | 130 | 55,820,986 | 98.95% |
| | Non-traded | 3 | 591,679 | 1.05% |
| | Total | 133 | $56,412,666 | 100.00% |

[1] Includes 1 bond issued during 2024, prorated based on the date of issue.

**Table 2**
**2024 Bonds, Notes, & Debentures**

| Railroad | Number of Traded Issues | Market Value Traded Issues ($000) | Current Cost | Weighted Cost |
|---|---|---|---|---|
| CSX | 32 | $16,122,984 | 5.146% | 1.486% |
| NSC | 38 | $15,451,066 | 5.303% | 1.468% |
| UPC | 60 | $24,246,936 | 5.115% | 2.222% |
| **Composite** | **130** | **$55,820,986** | | **5.176%** |

**Table 3**
**2024 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 | 716,483 | 5.069% | 36,322 |
| **Composite** | **4** | **$716,483** | **5.069%** | **$36,322** |

**Table 4**
**2024 Conditional Sales Agreements**

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

**Table 5**
**2024 Capitalized Leases & Miscellaneous Debt**

| Railroad | Capitalized Leases ($000) | Miscellaneous Debt[1] ($000) | Total Other Debt ($000) |
|---|---|---|---|
| CSX | $5,476 | ($336,412) | ($330,936) |
| NSC | 8,416 | (901,808) | (893,392) |
| UPC | 109,615 | (233) | 109,382 |
| **Composite** | **$123,507** | **($1,238,453)** | **($1,114,946)** |

[1] Miscellaneous debt includes unamortized debt discount.

**Table 6**
**2024 Market Value of Debt**

| Type of Debt | Market Value of Debt ($000) | Percentage of Total Market Value (Excluding Other Debt) |
|---|---|---|
| Bonds, Notes, & Debentures | $56,412,666 | 98.75% |
| ETCs | 716,483 | 1.25% |
| CSAs | 0 | 0.00% |
| Subtotal | 57,129,148 | 100.00% |
| Capitalized Leases/Miscellaneous Debt | ($1,114,946) | NA |
| **Total Market Value of Debt** | **$56,014,202** | **NA** |

**Table 7**
**2024 Flotation Cost for Debt**

| Type of Debt | Market Weight (Excludes Other Debt) | Flotation Cost | Weighted Average Flotation Cost |
|---|---|---|---|
| Bonds, Notes, & Debentures | 98.746% | 0.061% | 0.060% |
| ETCs | 1.254% | 0.086% | 0.001% |
| CSAs | 0.000% | 0.000% | 0.000% |
| **Total** | **100.000%** | | **0.061%** |

**Table 8**
**2024 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 | 98.746% | 5.176% | 5.111% |
| ETCs | 1.254% | 5.069% | 0.064% |
| CSAs | 0.000% | 0.000% | 0.000% |
| Subtotal | 100.000% | | 5.175% |
| Flotation Cost | | | 0.061% |
| **Weighted Cost of Debt** | | | **5.236%** |

**Table 9**
**2024 Summary Output**

| **Regression Statistics** | | | | | |
|---|---|---|---|---|---|
| Multiple R | 0.729584 | | | | |
| R Square | 0.532293 | | | | |
| Adjusted R Square | 0.530487 | | | | |
| Standard Error | 0.024720 | | | | |
| Observations | 261 | | | | |
| | | | | | |
| ANOVA | | | | | |
| | df | SS | MS | F | Significance F |
| Regression | 1 | 0.180121 | 0.180121 | 294.765572 | 1.24E-44 |
| Residual | 259 | 0.158266 | 0.000611 | | |
| Total | 260 | 0.338387 | | | |
| | | | | | |
| | Coefficients | Standard Error | t Stat | P-value | |
| Intercept | -0.000650 | 0.001535 | -0.423224 | 0.672483 | |
| X-Variable | 0.947848 | 0.055208 | 17.168738 | 1.24E-44 | |

**Table 10**
**2024 CAPM Cost of Common Equity**

| | | |
|---|---|---|
| Risk-Free Rate (RF) | 4.50% | |
| RF+(Beta x Market Risk Premium) | 4.50% + (0.9478 x 7.31%) | 11.43% |
| **Cost of Equity** | | **11.43%** |

**Table 11**
**2024 Cost of Equity Using STB's MSDCF**
**($ in millions)**

| Railroad | CSX | | NSC | | UPC | |
|---|---|---|---|---|---|---|
| **Initial Cash Flow** | $3,386 | | $2,063 | | $5,870 | |
| **Input for Terminal C.F.** | $3,854 | | $2,664 | | $6,772 | |
| **Stage One Growth** | 7.35% | | 8.30% | | 10.60% | |
| **Stage Two Growth** | 8.75% | | 8.75% | | 8.75% | |
| **Stage Three Growth*** | 5.58% | | 5.58% | | 5.58% | |
| **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** | $3,634 | $3,220 | $2,234 | $2,002 | $6,492 | $5,789 |
| **2** | 3,902 | 3,062 | 2,419 | 1,944 | 7,180 | 5,710 |
| **3** | 4,188 | 2,912 | 2,620 | 1,887 | 7,942 | 5,631 |
| **4** | 4,496 | 2,769 | 2,837 | 1,832 | 8,783 | 5,554 |
| **5** | 4,827 | 2,634 | 3,073 | 1,778 | 9,714 | 5,477 |
| **6** | 5,249 | 2,537 | 3,342 | 1,733 | 10,564 | 5,312 |
| **7** | 5,708 | 2,444 | 3,634 | 1,690 | 11,489 | 5,151 |
| **8** | 6,208 | 2,355 | 3,952 | 1,647 | 12,494 | 4,995 |
| **9** | 6,751 | 2,269 | 4,298 | 1,606 | 13,587 | 4,844 |
| **10** | 7,342 | 2,186 | 4,674 | 1,565 | 14,776 | 4,698 |
| **Terminal** | $120,845 | $35,977 | $106,565 | $35,682 | $274,250 | $87,187 |
| | | | | | | |
| **Sum of Present Value** | $62,365 | | $53,365 | | $140,348 | |
| **Market Value** | $62,365 | | $53,365 | | $140,348 | |
| **COE** | 12.88% | | 11.56% | | 12.14% | |
| **Weighted COE** | 3.14% | | 2.41% | | 6.65% | |
| **Industry COE** | 12.20% | | | | | |

**Table 12**
**2024 Cost of Common Equity Capital**

| **Model** | |
|---|---|
| Capital Asset Pricing Model | 11.43% |
| Multi-Stage Discounted Cash Flow | 12.20% |
| **Cost of Common Equity** | **11.82%** |

**Table 13**
**2024 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**
**2024 Average Market Value for Common Equity**

| **Railroad** | **Average Market ($000)** | **Average Market Weight** |
|---|---|---|
| CSX | $67,455,125 | 25.12% |
| NSC | 55,015,323 | 20.49% |
| UPC | 146,012,884 | 54.38% |
| **COMPOSITE** | **$268,483,332** | **100.00%** |

**Table 15**
**2024 Capital Structure Mix**

| Railroad | Type of Capital | Market Value ($000) | Weight |
|---|---|---|---|
| CSX | Debt | $16,383,727 | 19.54% |
| | Equity | 67,455,125 | 80.46% |
| | P. Equity | 0 | 0.00% |
| NSC | Debt | 14,557,674 | 20.92% |
| | Equity | 55,015,323 | 79.08% |
| | P. Equity | 0 | 0.00% |
| UPC | Debt | 25,072,801 | 14.66% |
| | Equity | 146,012,884 | 85.34% |
| | P. Equity | 0 | 0.00% |
| Composite Weight | Debt | 56,014,202 | 17.26% |
| | Equity | 268,483,332 | 82.74% |
| | P. Equity | 0 | 0.00% |
| | **Total** | **$324,497,534** | **100.00%** |

**Table 16**
**2024 Cost-of-Capital Computation**

| Type of Capital | Cost | Weight | Weighted Average |
|---|---|---|---|
| Long-Term Debt | 5.24% | 17.26% | 0.90% |
| Common Equity | 11.82% | 82.74% | 9.77% |
| Preferred Equity | 0.00% | 0.00% | 0.00% |
| **Composite Cost of Capital** | | **100.00%** | **10.68%** |