

SURFACE TRANSPORTATION BOARD

DECISION

Docket No. EP 558 (Sub-No. 25)

RAILROAD COST OF CAPITAL—2021

Digest:<sup>1</sup> The Board finds that the cost of capital for the railroad industry, which is calculated each year, was 10.37% for 2021. 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 2, 2022

One of the Board's regulatory responsibilities is to determine annually the railroad industry's cost of capital.<sup>2</sup> 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 11, 2022, to update the railroad industry's cost of capital for 2021. In that decision, the Board solicited comments from interested parties on the following issues: (1) the railroads' 2021 current cost of debt capital; (2) the railroads' 2021 current cost of preferred equity capital (if any); (3) the railroads' 2021 cost of common equity capital; (4) the 2021 capital structure mix of the railroad industry on a market value basis; and (5) the appropriate treatment of Kansas City Southern (KCS) in light of the merger transaction currently under consideration in Canadian Pacific Railway—Control—Kansas City Southern, Docket No. FD 36500. The Board received comments from the Association of American Railroads (AAR) providing the information used to calculate the annual

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<sup>1</sup> 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).

<sup>2</sup> 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.

cost-of-capital determination,<sup>3</sup> 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 KCS was not included in the 2021 sample because its stock was not listed in the New York Stock Exchange or NASDAQ for the entire year and therefore, it did not meet the Board’s criteria.<sup>4</sup> (AAR Opening 2-3.)

Western Coal Traffic League’s (WCTL) reply to AAR’s submission states that its review of AAR’s filing and associated workpapers did not reveal any mathematical or associated data errors and WCTL concurs in the removal of KCS from the composite sample. (WCTL Reply 2.) WCTL nonetheless expresses concern that the cost of capital is overstated due to the reliance by the Board on the Multi-Stage Discounted Cash Flow Model (MSDCF). (Id. at 1.) WCTL recommends the Board rely only on the Capital Asset Pricing Model (CAPM). (Id.) WCTL also argues that the cost of equity value produced by the CAPM, while overstated, is more realistic when viewed against independent benchmarks. (Id. at 3-7.) WCTL also asserts that precision scheduled railroading distorts MSDCF by effectively rewarding carriers for failing to invest in their operations. (Id. at 1, 11-12.)

AAR responded to WCTL’s reply, asserting that it followed the Board’s instructions to use the methodology from Railroad Cost of Capital—2020, EP 558 (Sub-No. 24) (STB served Aug. 5, 2020), and noting that WCTL acknowledges that AAR’s filing and associated workpapers did not contain mathematical or associated data 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 1-4.)

## DISCUSSION AND CONCLUSIONS

### *WCTL’s Reply*

WCTL asserts that AAR’s 10.37% cost-of-capital figure for 2021 represents a “substantial” and “inherently implausible” increase from the Board’s 2020 cost-of-capital figure of 7.89%. (WCTL Reply 2.) WCTL argues that the continuing pandemic, the economic recovery, and return of inflation do not provide an adequate explanation for the increase. (Id.) WCTL argues that MSDCF’s instability, and resulting cost of equity instability, results from the model’s excessive sensitivity to changes in the analyst growth rates, particularly with the absence of a transition in the second stage, and the failure to adjust for stock buybacks. (Id. at 3.)

WCTL asserts that the cost of equity produced by CAPM, while overstated, is much closer to the independent benchmark values that WCTL has identified in previous filings with

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<sup>3</sup> In Railroad Revenue Adequacy—2017 Determination, EP 552 (Sub-No. 22) et al. (STB served Dec. 6, 2018), the Board adopted a one-time adjustment to the 2017 annual cost-of-capital determination to remove the accounting impacts of the Tax Cuts and Jobs Act, Pub. L. 115–97, 131 Stat. 2054 (2017).

<sup>4</sup> See R.R. Cost of Cap.—1984, 1 I.C.C.2d 989, 1003-04 (1985); Revisions to the Cost-of-Cap. Composite R.R. Criteria, EP 664 (Sub-No. 3), slip op. at 3 (STB served Oct. 25, 2017).

the Board, although it is still “substantially overstated.” (*Id.* at 6.) WCTL presents four alternative cost-of-capital figures, ranging from 5.43% to 7.35%, using a variety of alternative methods. (See *id.* at 6-9.) WCTL also argues that precision scheduled railroading distorts MSDCF and results in higher MSDCF values, as railroads have been limiting their capital expenditures, avoiding volume growth in the interests of reducing their operating ratios, and achieving or expecting to achieve free cashflow conversion ratios approaching 100%. (*Id.* at 11-19.)

WCTL reiterates numerous critiques of the MSDCF and arguments in favor of the CAPM-only approach and its calculation of the cost of equity that have previously been rejected by the Board. See, e.g., Pet. of the W. Coal Traffic League to Inst. a Rulemaking Proceeding to Abolish the Use of the Multi Stage Discounted Cash Flow Model in Determining the R.R. Indus.’s Cost of Equity Capital, EP 664 (Sub-No. 2), slip op. at 1-2 (STB served Sept. 28, 2018) (rejected WCTL’s arguments against the use of the MSDCF in the agency’s estimation of the railroad industry’s cost of capital); Pet. of the W. Coal Traffic League, EP 664 (Sub-No. 2), slip op. at 2 (STB served Aug. 14, 2017) (rejected WCTL’s arguments against the use of the MSDCF in the agency’s estimation of the railroad industry’s cost of equity capital); Pet. of the W. Coal Traffic League, EP 664 (Sub-No. 2), slip op. at 2, 5, 9, 11-13 (STB served Apr. 28, 2017) (rejected WCTL’s arguments supporting a CAPM-only approach and WCTL’s position that the Board must incorporate a market-risk premium of five percent or lower); Pet. of the W. Coal Traffic League, EP 664 (Sub-No. 2), slip op. at 11, 14, 17-18, 20 (STB served Oct. 31, 2016) (explained that a methodology that uses multiple models is more robust than a methodology that utilizes only one model). The annual cost of capital proceeding is not an appropriate docket for proposals to modify the Board’s approach to calculating the cost of capital. The Board has previously stated 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 R.R. Cost of Cap.—2016, EP 558 (Sub-No. 20), slip op. at 9 & n.15 (STB served Aug. 7, 2017).

Furthermore, the Board has stated that the mere existence of alternative methodologies does not mean the Board’s methodology is flawed. See R.R. Cost of Cap.—2020, EP 558 (Sub-No. 24), slip op. at 3 (STB served Aug. 6, 2021); R.R. Cost of Cap.—2018, EP 558 (Sub-No. 22), slip op. at 2 (STB served Aug. 6, 2019), corrected (STB served Sept. 30, 2019). The Board has explicitly rejected many of WCTL’s alternative proposals in the past and WCTL’s alternative cost-of-capital figures are not properly before the Board here in any case.

The Board will accept AAR’s submission, which complies with the Board’s established methodology. The Board also accepts AAR’s determination not to include KCS in the 2021 sample because it did not meet the Board’s criteria. See infra note 5.

#### *2021 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).<sup>5</sup> 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 2021 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 2021 railroad cost of capital was 10.37%.

## DEBT CAPITAL

AAR developed its 2021 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 2021, for all issues (a total of 126) that were publicly traded during the year. (AAR Opening, V.S. Gray 9-10.) To develop the current (in 2021) market value of bonds, AAR used these traded bonds and additional bonds that were outstanding but not publicly traded during 2021. 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 \$61.34 billion (\$60.9 billion traded and \$0.44 billion non-traded). (*Id.*, V.S. Gray 10.) Based on the yields for the traded bonds, AAR calculated the weighted average 2021 yield for all bonds to be 2.585%. (*Id.*, V.S. Gray 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 Equipment Trust Certificates (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

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<sup>5</sup> 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).

with maturities similar to these ETCs as surrogates for developing yields. After calculating the 2021 yields for these government securities, AAR added basis points<sup>6</sup> to these yields to compensate for the additional risks associated with the ETCs.

There were four ETCs outstanding during 2021 for UPC. (AAR Opening, V.S. Gray 16.) Using the yield spreads, AAR calculated the weighted average cost of ETCs to be 1.692%<sup>7</sup> and their market value to be \$0.91 billion for 2021. (*Id.*, V.S. Gray 15-17, 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.

#### *Cost of Conditional Sales Agreements (CSAs)*

CSAs normally represent a small fraction (less than 1%) of total railroad debt. However, no CSAs were used to calculate the 2021 cost of debt because no CSAs are outstanding.<sup>8</sup> (AAR Opening, V.S. Gray 17.)

#### *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. (AAR Opening, V.S. Gray 18.) 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 (\$540.9) million for 2021.<sup>9</sup> (*Id.*, V.S. Gray 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 (\$540.9) million.

#### *Total Market Value of Debt*

AAR calculated the total market value for all debt during 2021 to be \$61.7 billion. (AAR Opening, V.S. Gray 18-19.) OE has examined AAR's calculations and, based on that review, the

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<sup>6</sup> A basis point equals 1/100th of a percentage point.

<sup>7</sup> This percentage is higher than the 2020 figure of 1.397%. See R.R. Cost of Cap.—2020, EP 558 (Sub-No. 24), slip op. at 5 (STB served Aug. 6, 2021).

<sup>8</sup> No CSAs have been modeled since 2010, and none have been outstanding since 2014. (AAR Opening, V.S. Gray 17.)

<sup>9</sup> This figure consists of \$351.1 million of capitalized leases and (\$891.99) million of miscellaneous debt. (*Id.*, App. D; see also id., V.S. Gray 18.) **Table 5** in the Appendix shows these figures.

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 2021, eight new issues were reported in four filings, with some filings reporting multiple new issues. (AAR Opening, V.S. Gray 22.) A simple average of the eight flotation cost figures is 0.060%. (*Id.*) AAR calculated the 2021 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. Gray 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. Gray 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 0.068%. (*Id.*, V.S. Gray 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,<sup>10</sup> for which a current cost of debt has not been determined.<sup>11</sup> AAR calculated that the flotation costs of debt increase the cost of debt by 0.060 percentage points. (*Id.*, V.S. Gray 24.)

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.<sup>12</sup> **Table 7** in the Appendix shows these calculations.

### *Overall Current Cost of Debt*

AAR concluded that the railroads' weighted cost of debt for 2021 was 2.63%.<sup>13</sup> (AAR Opening, V.S. Gray 24-25.) OE has verified that the percentage put forth by AAR is correct.

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<sup>10</sup> 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 2021. (AAR Opening, V.S. Gray 17 - 19.)

<sup>11</sup> 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. Gray 20.)

<sup>12</sup> AAR calculated the 2021 flotation costs for bonds using publicly available data from electronic filings with the SEC. (*Id.*, V.S. Gray 21.)

<sup>13</sup> This percentage is higher than the 2020 figure of 2.54%. See R.R. Cost of Cap.—2020, EP 558 (Sub-No. 24), slip op. at 7.

**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  $\beta$  (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 2021 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:

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

$\alpha$	=	constant term;
$R$	=	merger-adjusted stock returns for the portfolio of railroads that meet the screening criteria set forth in <u>Railroad Cost of Capital—1984</u> , 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 2021 for a 20-year U.S. Treasury Bond, consistent with Railroad Cost of Capital—2006, EP 558 (Sub-No. 10) (STB served Aug. 15, 2008), AAR calculated the 2021 risk-free rate to be 1.98%. (AAR Opening, V.S. Gray 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 Methodology to be Employed in Determining the Railroad Industry's Cost of Capital (Cost-of-Capital Methodology), EP 664, slip op. at 7-9 (STB served Jan. 17, 2008), AAR submitted data reflecting a market-risk premium of 7.46%. 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.<sup>14</sup> 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. Gray 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 AAR Opening, 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:  $R - SRRF = \alpha + \beta(RM - SRRF) + \epsilon$ . Applying the modified approach for assigning the new shares outstanding,<sup>15</sup> 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 1.0704.<sup>16</sup> (AAR Opening, V.S. Gray 37.)

AAR and WCTL disagree about how to interpret trends in beta calculated for the railroads. AAR asserts that the 2021 beta "is the lowest since 2009" and that 2021 "is the thirteenth consecutive year that the railroad beta has been above 1.0, further demonstrating that railroad stocks are consistently more volatile and are regarded as having more risk than does the market generally." (Id. at 36-37.) WCTL replies that AAR's claim regarding the volatility of railroad stocks is an "oversimplification." (WCTL Reply 9.)

The parties' conflicting interpretations of trends in beta are not material to an assessment of whether beta was calculated correctly for 2021. Indeed, WCTL does not dispute AAR's calculation of beta for 2021, and the Board finds that AAR used the proper method for its calculation. Therefore, 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 1.0704.

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<sup>14</sup> AAR notes that Duff & Phelps is now a Kroll Company. (AAR Opening, V.S. Gray 32.)

<sup>15</sup> 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.

<sup>16</sup> 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 2021." (AAR Opening, V.S. Gray 34.) AAR uses the SAS General Linear Model procedure to compute regression data. The Board uses a standard Excel regression method.



*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  $1.98\% + (1.0704 \times 7.46\%)$ , which equals 9.97%. **Tables 9** and **10** in the Appendix show the calculations of the cost of common equity using CAPM. (See also AAR Opening, V.S. Gray 38.)

To calculate the 2021 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 2021. (*Id.*, V.S. Gray 26.) AAR calculated the combined 52-week average market value of the railroads to be \$286.7 billion. (*Id.*, V.S. Gray 27.) OE has examined the data and determined that AAR's calculation is correct.

*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.

*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 2017-2021 periods by the total sales over the same periods. (AAR Opening, V.S. Gray 40-41.) To obtain the 2021 average cash flow, the cash-flow-to-sales ratio is multiplied by the sales revenue from 2021. (*Id.*, V.S. Gray 41.) The 2021 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. Gray 42.) According to AAR, the data inputs in the cash flow formula were retrieved from the railroads' 2017-2021 10-K filings. (*Id.*, V.S. Gray 42.)

### *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 Institutional Brokers Estimate System (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 (formerly Thomson ONE Investment Management). (AAR Opening, V.S. Gray 43-44.) The third-stage growth rate of 5.73% was calculated by using the sum of the figures for long-run expected growth in real output, 3.16%,<sup>17</sup> and long-run expected inflation, 2.57%. (*Id.*, V.S. Gray 47-48.)<sup>18</sup> 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 2021.

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<sup>17</sup> 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. (AAR Opening, App. M.) AAR calculated the growth rate using GDP in 2012 dollars. (*Id.*, V.S. Gray 46.)

<sup>18</sup> According to AAR, until the 2013 cost-of-capital determination, the long-run nominal growth rate used was that provided by Morningstar/Ibbotson in its Ibbotson SBBI Valuation Yearbook. (AAR Opening, V.S. Gray 45.) 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.*, V.S. Gray 46-47.) 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. Gray 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 2020 cost-of-capital determinations and has been used again for 2021. (*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.

*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 31, 2021, and shares outstanding from the 2021 Q3 10-Q reports filed with the SEC. (AAR Opening, V.S. Gray 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 2021 estimate of the cost of equity using the Morningstar/Ibbotson MSDCF are correct.

*Cost of Common Equity Capital Using MSDCF*

AAR estimates an MSDCF cost of equity of 14.09%. (AAR Opening, V.S. Gray 51.) Based on the verified inputs discussed above the Board adopts 14.09% 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 2021 was 12.03%. This figure is based on an estimate of the cost of equity using a CAPM of 9.97% and an MSDCF estimate of 14.09%. (AAR Opening, V.S. Gray 52 & *id.*, 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 stated that KCS, the one railroad company with preferred stock outstanding, no longer meets the criteria for inclusion in the sample, so there is no preferred stock in this year's calculation. Therefore, AAR computed the market value of preferred equity during 2021 to be \$0. (AAR Opening, V.S. Gray 6, Table 19.) AAR computed the cost of preferred equity to be 0%. (*Id.*, V.S. Gray 56.)

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 \$61.706 billion, \$286.702 billion, and \$0 respectively. The percentage share of debt decreased from 21.16% in 2020 to 17.71% in 2021. The percentage share of common equity increased from 78.84% in 2020 to 82.29% in 2021. 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 2021 capital structure mix.

#### COMPOSITE COST OF CAPITAL

Based on the evidence furnished in the record and the MSDCF, the 2021 composite after-tax cost of capital for the railroad industry, as set forth in **Table 16** in the Appendix, was 10.37%. 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 2021 cost of capital was 2.48 percentage points higher than the 2020 cost of capital (7.89%). See R.R. Cost of Cap.—2020, EP 558 (Sub-No. 24), slip op. at 12.

#### CONCLUSIONS

The Board finds that for 2021:

1. The cost of railroad long-term debt was 2.63%.
2. The cost of common equity was 12.03%.
3. The cost of preferred equity was 0%.
4. The capital structure mix of the railroads was 17.71% long-term debt, 82.29% common equity, and 0.00% preferred equity.
5. The composite railroad industry cost of capital was 10.37%.

It is ordered:

1. This decision is effective on September 5, 2022.
2. This proceeding is discontinued.

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

## APPENDIX

**Table 1**  
**2021 Traded & Non-traded Bonds**

<b>Railroad</b>	<b>Traded vs. Non-traded</b>	<b>Number</b>	<b>Market Value (\$000)</b>	<b>% Market Value to All Bonds</b>
CSX	Traded	31	\$18,978,132	97.73%
	Non-traded	2	\$441,679	2.27%
	Total	33	19,419,812	100.00%
NSC	Traded <sup>1</sup>	34	15,633,898	100.00%
	Non-traded	0	0	0.00%
	Total	34	15,633,898	100.00%
UPC	Traded <sup>2</sup>	61	26,287,202	100.00%
	Non-traded	0	0	0.00%
	Total	61	26,287,202	100.00%
<b>Composite</b>	Traded	126	\$60,899,233	99.28%
	Non-traded	2	\$441,679	0.72%
	Total	128	\$61,340,912	100.00%
<sup>1</sup> Includes 3 bonds issued during 2021, prorated based on date of issue. <sup>2</sup> Includes 10 bonds issued during 2021, prorated based on date of issue.				

**Table 2**  
**2021 Bonds, Notes, & Debentures**

<b>Railroad</b>	<b>Number of Traded Issues</b>	<b>Market Value Traded Issues (\$000)</b>	<b>Current Cost</b>	<b>Weighted Cost</b>
CSX	31	\$18,978,132	2.664%	0.830%
NSC	34	15,633,898	2.724%	0.699%
UPC	61	26,287,202	2.444%	1.055%
<b>Composite</b>	<b>126</b>	<b>\$60,899,233</b>		<b>2.585%</b>

**Table 3**  
**2021 Equipment Trust Certificates**

<b>Railroad</b>	<b>Number of Issues</b>	<b>Market Value (\$000)</b>	<b>Yield %</b>	<b>Weighted Yield (\$000)</b>
CSX	0	\$0	0.00%	\$0
NSC	0	\$0	0.00%	0
UPC	4	\$905,627	1.692%	15,321
<b>Composite</b>	<b>4</b>	<b>\$905,627</b>	<b>1.692%</b>	<b>\$15,321</b>

**Table 4**  
**2021 Conditional Sales Agreements**

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

**Table 5**  
**2021 Capitalized Leases & Miscellaneous Debt**

<b>Railroad</b>	<b>Capitalized Leases (\$000)</b>	<b>Miscellaneous Debt<sup>1</sup> (\$000)</b>	<b>Total Other Debt (\$000)</b>
CSX	\$34,152	(\$215,873)	(\$181,721)
NSC	16,223	(975,892)	(959,669)
UPC	300,719	299,776	600,495
<b>Composite</b>	<b>\$351,094</b>	<b>(\$891,989)</b>	<b>(\$540,895)</b>

<sup>1</sup> Miscellaneous debt includes unamortized debt discount.

**Table 6**  
**2021 Market Value of Debt**

<b>Type of Debt</b>	<b>Market Value of Debt (\$000)</b>	<b>Percentage of Total Market Value (Excluding Other Debt)</b>
Bonds, Notes, & Debentures	\$61,340,912	98.55%
ETCs	905,627	1.45%
CSAs	0	0.00%
Subtotal	62,246,539	100.00%
Capitalized Leases/Miscellaneous Debt	(540,895)	NA
<b>Total Market Value of Debt</b>	<b>\$61,705,644</b>	<b>NA</b>

**Table 7**  
**2021 Flotation Cost for Debt**

<b>Type of Debt</b>	<b>Market Weight (Excludes Other Debt)</b>	<b>Flotation Cost</b>	<b>Weighted Average Flotation Cost</b>
Bonds, Notes, & Debentures	98.545%	0.060%	0.059%
ETCs	1.455%	0.068%	0.001%
CSAs	0.000%	0.000%	0.000%
<b>Total</b>	<b>100.000%</b>		<b>0.060%</b>

**Table 8**  
**2021 Current Cost of Debt**

<b>Type of Debt</b>	<b>Percentage of Total Market Value (Excludes Other Debt)</b>	<b>Debt Cost</b>	<b>Weighted Debt Cost (Excludes Other Debt)</b>
Bonds, Notes, & Debentures	98.545%	2.585%	2.547%
ETCs	1.455%	1.692%	0.025%
CSAs	0.000%	0.000%	0.000%
Subtotal	100.000%		2.572%
Flotation Cost			0.060%
<b>Weighted Cost of Debt</b>			<b>2.632%</b>



**Table 9**  
**2021 Summary Output**

<b>Regression Statistics</b>					
Multiple R	0.773880				
R Square	0.598890				
Adjusted R Square	0.597342				
Standard Error	0.021881				
Observations	261				
<b>ANOVA</b>					
	df	SS	MS	F	Significance F
Regression	1	0.185151	0.185151	386.708620	2.67714E-53
Residual	259	0.124006	0.000479		
Total	260	0.309156			
	Coefficients	Standard Error	t Stat	P-value	
Intercept	0.001278	0.001364	0.936725	0.349773	
X-Variable	1.070352	0.054430	19.664908	2.67714E-53	

<b>Table 10</b>		
<b>2021 CAPM Cost of Common Equity</b>		
Risk-Free Rate (RF)		1.98%
RF+(Beta x Market Risk Premium)	1.98% + (1.0704 x 7.46%)	9.97%
<b>Cost of Equity</b>		<b>9.97%</b>

**Table 11**  
**2021 Cost of Equity Using STB's MSDCF**  
**(\$ in millions)**

<b>Company</b>	<b>CSX</b>		<b>NSC</b>		<b>UNP</b>	
<b>Initial Cash Flow</b>	\$3,002		\$2,180		\$5,211	
<b>Input for Terminal C.F.</b>	\$3,205		\$2,533		\$5,780	
<b>Stage One Growth</b>	17.70%		18.00%		16.99%	
<b>Stage Two Growth</b>	17.56%		17.56%		17.56%	
<b>Stage Three Growth*</b>	5.73%		5.73%		5.73%	
<b>Year</b>	<b>Value on 12/31 of Each Year</b>	<b>Present Value</b>	<b>Value on 12/31 of Each Year</b>	<b>Present Value</b>	<b>Value on 12/31 of Each Year</b>	<b>Present Value</b>
<b>1</b>	\$3,533	\$3,081	\$2,573	\$2,259	\$6,096	\$5,354
<b>2</b>	4,159	3,162	3,036	2,341	7,132	5,501
<b>3</b>	4,895	3,245	3,583	2,426	8,344	5,651
<b>4</b>	5,761	3,330	4,227	2,513	9,761	5,806
<b>5</b>	6,781	3,418	4,988	2,604	11,420	5,965
<b>6</b>	7,972	3,503	5,864	2,688	13,425	6,159
<b>7</b>	9,372	3,591	6,894	2,775	15,783	6,358
<b>8</b>	11,018	3,681	8,105	2,864	18,554	6,565
<b>9</b>	12,952	3,773	9,528	2,957	21,812	6,777
<b>10</b>	15,227	3,868	11,201	3,052	25,642	6,997
<b>Terminal</b>	\$191,901	\$48,744	\$168,687	\$45,967	\$369,495	\$100,826
<b>Sum of Present Value</b>	\$83,396		\$72,446		\$161,960	
<b>Market Value</b>	\$83,396		\$72,446		\$161,960	
<b>COE</b>	14.69%		13.88%		13.87%	
<b>Weighted COE</b>	3.85%		3.17%		7.07%	
<b>Industry COE</b>	14.09%					

**Table 12**  
**2021 Cost of Common Equity Capital**

<b>Model</b>	
Capital Asset Pricing Model	9.97%
Multi-Stage Discounted Cash Flow	14.09%
<b>Cost of Common Equity</b>	<b>12.03%</b>

**Table 13**  
**2021 Cost & Market Value of Preferred Stock**

<b>Railroad</b>	<b>Dividend</b>	<b>Value Per Share</b>	<b>Div. Yield %</b>	<b>Shares (000)</b>	<b>Market Value (\$000)</b>	<b>Market Weight</b>	<b>Weighted Yield</b>
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%
<b>Composite</b>					<b>\$0</b>	<b>0.00%</b>	<b>0.00%</b>

**Table 14**  
**2021 Average Market Value for Common Equity**

<b>Railroad</b>	<b>Average Market (\$000)</b>	<b>Average Market Weight</b>
CSX	\$74,089,164	25.84%
NSC	66,314,625	23.13%
UPC	146,298,018	51.03%
<b>COMPOSITE</b>	<b>\$286,701,807</b>	<b>100.00%</b>

**Table 15**  
**2021 Capital Structure Mix**

<b>Railroad</b>	<b>Type of Capital</b>	<b>Market Value (\$000)</b>	<b>Weight</b>
CSX	Debt	\$19,238,091	20.61%
	Equity	74,089,164	79.39%
	P. Equity	0	0.00%
NSC	Debt	14,674,229	18.12%
	Equity	66,314,625	81.88%
	P. Equity	0	0.00%
UPC	Debt	27,793,325	15.96%
	Equity	146,298,018	84.04%
	P. Equity	0	0.00%
Composite Weight	Debt	61,705,644	17.71%
	Equity	286,701,807	82.29%
	P. Equity	0	0.00%
<b>Total</b>		<b>\$348,407,451</b>	<b>100.00%</b>

**Table 16**  
**2021 Cost-of-Capital Computation**

<b>Type of Capital</b>	<b>Cost</b>	<b>Weight</b>	<b>Weighted Average</b>
Long-Term Debt	2.63%	17.71%	0.47%
Common Equity	12.03%	82.29%	9.90%
Preferred Equity	0.00%	0.00%	0.00%
<b>Composite Cost of Capital</b>		<b>100.00%</b>	<b>10.37%</b>