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SURFACE TRANSPORTATION BOARD

DECISION

Docket No. EP 558 (Sub-No. 24)

RAILROAD COST OF CAPITAL—2020

Digest:[1] The Board finds that the cost of capital for the railroad industry, which is calculated each year, was 7.89% for 2020. 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 4, 2021

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 5, 2021, to update the railroad industry's cost of capital for 2020. In that decision, the Board solicited comments from interested parties on the following issues: (1) the railroads' 2020 current cost of debt capital; (2) the railroads' 2020 current cost of preferred equity capital (if any); (3) the railroads' 2020 cost of common equity capital; and (4) the 2020 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,[3] 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.

[3] 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.

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

Western Coal Traffic League (WCTL) replied to AAR's submission, expressing concern that the average market values for the debt of the Class I railroads included in the composite submitted by AAR differ significantly from the fair market values that those railroads report in their 10-K reports. (WCTL Reply 1.) WCTL states that AAR has attempted to reconcile those differences in its workpapers but argues that AAR should have used fair market values instead of book values in that reconciliation. (Id. at 2.) WCTL states that, aside from those concerns, its review of AAR's filing and associated workpapers did not reveal any mathematical or associated data errors. (Id. at 3.) However, WCTL argues that the cost-of-capital figure remains "somewhat overstated," and WCTL provides several alternative cost-of-capital calculations. (Id. at 3-7.) In addition, with respect to beta, WCTL argues that AAR's claim that railroad stocks are regarded as having more risk than the market generally is an "oversimplification" and an "overstatement." (Id. at 7.)

AAR responded to WCTL's reply, asserting that it followed the Board's instructions to use the methodology from Railroad Cost of Capital—2019, EP 558 (Sub-No. 23) (STB served Aug. 5, 2020), and noting that WCTL acknowledges that AAR's filing and associated workpapers did not reveal mathematical or associated errors. (AAR Rebuttal 1.) AAR argues that many of WCTL's arguments are collateral attacks on the Board's cost-of-capital methodology and should therefore be rejected. (Id. at 2-4.)

DISCUSSION AND CONCLUSIONS

WCTL's Reply[4]

WCTL asserts that AAR's 7.89% cost-of-capital figure for 2020 represents a "substantial" decrease from the Board's 2019 cost-of-capital figure of 9.34% and a "very sharp" decline from the Board's 2018 cost-of-capital figure of 12.22%, but states that it is skeptical that the cost-of-capital figure "could decline so precipitously in just two years." (WCTL Reply 3.) WCTL argues that these declines are largely caused by the instability of the Multi-Stage Discounted Cash Flow Model (MSDCF) used by the Board. (Id.) WCTL argues that MSDCF's 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, the redefinition of cash flows for the third stage, and the failure to adjust for stock buybacks. (Id.)

WCTL also contends that the cost-of-capital figure produced by the Board's methodology is much closer to the independent benchmark values that WCTL has identified in previous filings with the Board, although it remains "somewhat overstated." (Id.) WCTL

No. 115-97, 131 Stat. 2054 (2017), on rail carriers' deferred tax liability. AAR submitted comments and data in this proceeding that account for the adjustments made to the 2017 cost-of-capital determination. (AAR Opening, V.S. Gray 2, 40-41.)

[4] WCTL's specific concern regarding the value of market debt and objection to AAR's statements on beta are addressed later in this decision.

presents four alternative cost-of-capital figures, ranging from 5.27% to 7.34%, using a variety of alternative methods. (See id. at 4-6.)

The Board has previously stated that the mere existence of alternative methodologies does not mean the Board's methodology is flawed. See 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). Moreover, the Board has also 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). Therefore, because WCTL's alternative cost-of-capital figures are not properly before the Board, the Board will review AAR's submission under the Board's established methodology for calculating the railroad industry's cost of capital.

2020 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).[5] According to AAR, the following four railroad holding companies meet these criteria: CSX Corporation (CSX); Kansas City Southern (KCS); 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 2020 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 2020 railroad cost of capital was 7.89%.

DEBT CAPITAL

AAR developed its 2020 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.

[5] 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).

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 2020, for all issues (a total of 131) that were publicly traded during the year. (AAR Opening, V.S. Gray 9-10.) To develop the current (in 2020) market value of bonds, AAR used these traded bonds and additional bonds that were outstanding but not publicly traded during 2020. 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 $65.51 billion ($65.01 billion traded and $0.51 billion non-traded).[6] (Id., V.S. Gray 10.) Based on the yields for the traded bonds, AAR calculated the weighted average 2020 yield for all bonds to be 2.498%. (Id., V.S. Gray 11.)

In its reply, WCTL notes that AAR provides the average market value for the debt of the Class I railroads included in the composite sample, and that the fair market values that the Class I railroads supply in their 10-K reports are 13% greater than the values AAR provided. (WCTL Reply 1-2.) WCTL states that this variance may be because AAR uses average monthly market values and the 10-Ks present end-of-year values. (Id. at 2.) WCTL argues that AAR should provide some reconciliation. WCTL states that AAR's hardcopy workpapers do provide reconciliation of the AAR market values to the 10-K values, "but that reconciliation is made to the carrying or book values in the 10-Ks, and not to the fair (market) value." (Id.) WCTL further states that the need for reconciliation to the reported market values is increased because AAR uses proprietary, nondisclosed Bloomberg data to obtain the monthly prices and yields. (Id.) WCTL argues that, at a minimum, a reconciliation of the AAR Bloomberg December values to the 10-K end-of-year values should be feasible and should be provided. (Id. at 2-3.)

In response, AAR states that it used the average monthly market values because the Board directed it to do so. (AAR Rebuttal 5.) As to WCTL's requested reconciliation, AAR notes that such a reconciliation is not required under the Board's established procedure but notes that the workpapers do provide, as WCTL admits, a reconciliation of AAR's market values to the 10-K values. (Id.) AAR further states that the Board has previously found the use of Bloomberg subscription bond data to be appropriate, and the workpapers provide the underlying data to the extent possible without disclosing any proprietary data. (Id. at 5-6.)

The Board finds that AAR complied with the Board's established procedure and no further reconciliation is required. The Board notes that it has previously determined that AAR's use of Bloomberg subscription service bond data to be permissible and consistent with precedent. See R.R. Cost of Cap.—2011, EP 558 (Sub-No. 15), slip op. at 4 (STB served Sept. 13, 2012). Further, OE has examined AAR's bond price and yield data and has determined that AAR's computations are correct. The calculations and data for all bonds are shown in **Tables 1** and **2** of the Appendix.

[6] The total ($65.01 billion traded + $0.51 billion non-traded) does not match $65.51 because of rounding.

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 with maturities similar to these ETCs as surrogates for developing yields. After calculating the 2020 yields for these government securities, AAR added basis points[7] to these yields to compensate for the additional risks associated with the ETCs.

There were four ETCs outstanding during 2020 for UPC. (AAR Opening, V.S. Gray 15.) Using the yield spreads, AAR calculated the weighted average cost of ETCs to be 1.397%[8] and their market value to be $0.96 billion for 2020. (Id., V.S. Gray 15-16.)

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 2020 cost of debt because no CSAs are outstanding.[9] (AAR Opening, V.S. Gray 16-17.)

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 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 ($830.8) million for 2020.[10] (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

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

[8] This percentage is lower than the 2019 figure of 2.783%. See R.R. Cost of Cap.—2019, EP 558 (Sub-No. 23), slip op. at 3 (STB served Aug. 5, 2020).

[9] No CSAs have been modeled since 2010, and none have been outstanding since 2014. (AAR Opening, V.S. Gray 16-17.)

[10] This figure consists of $457.2 million of capitalized leases and ($1.3) billion of miscellaneous debt. (Id., App. D; see also id., V.S. Gray 17-18.) **Table 5** in the Appendix shows these figures.

Appendix shows the calculations for capitalized leases and miscellaneous debt to be ($830.8) million.

Total Market Value of Debt

AAR calculated the total market value for all debt during 2020 to be $65.6 billion. (AAR Opening, V.S. Gray 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 2020, nine new issues were reported in six filings, with some filings reporting multiple new issues. (AAR Opening, V.S. Gray 21.) A simple average of the nine flotation cost figures is 0.057%. (Id.) AAR calculated the 2020 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 0.067%. (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,[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 0.057 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.[13] **Table 7** in the Appendix shows these calculations.

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[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 2020. (AAR Opening, V.S. Gray 18-19.)

[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. Gray 19.)

[13] AAR calculated the 2020 flotation costs for bonds using publicly available data from electronic filings with the SEC. (Id., V.S. Gray 21.)

Overall Current Cost of Debt

AAR concluded that the railroads' weighted cost of debt for 2020 was 2.54%.[14] (AAR Opening, V.S. Gray 24-25.) 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 + 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 2020 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

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 2020 for a 20-year U.S. Treasury Bond, consistent with Railroad Cost of Capital—2006, EP 558 (Sub-No. 10), slip op. at 6 (STB served Apr. 15, 2008), AAR calculated the 2020 risk-free rate to be 1.35%. (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.

[14] This percentage is lower than the 2019 figure of 3.48%. See R.R. Cost of Cap.—2019, EP 558 (Sub-No. 23), slip op. at 6.

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 7.25%. 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. 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: $R - SRRF = \alpha + \beta(RM - SRRF) + \varepsilon$. 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 1.0741.[16] (AAR Opening, V.S. Gray 36.)

AAR and WCTL disagree about how to interpret trends in beta calculated for the railroads. AAR asserts that the 2020 beta "is the lowest since 2009" and that 2020 "is the twelfth 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" and an "overstatement." (WCTL Reply 7.)

[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 2020." (AAR Opening, V.S. Gray 33.) AAR uses the SAS General Linear Model procedure to compute regression data. The Board uses a standard Excel regression method.

The parties' conflicting interpretations of trends in beta are not material to an assessment of whether beta was calculated correctly for 2020. Indeed, WCTL does not dispute AAR's calculation of beta for 2020, 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 1.0741.

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 + (β × RP), or 1.35% + (1.0741 × 7.25%), which equals 9.14%. **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 37-38.)

To calculate the 2020 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 2020. (Id., V.S. Gray 26.) AAR calculated the combined 52-week average market value of the railroads to be $244.6 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 2016-2020 periods by the total sales over the same periods. (AAR Opening, V.S. Gray 40.) To obtain the 2020 average cash flow, the cash-flow-to-sales ratio is multiplied by the sales revenue from 2020. (Id., V.S. Gray 41.) The 2020 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' 2016-2020 10-K filings. (Id., V.S. Gray 40.)

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 5.20% was calculated by using the sum of the figures for long-run expected growth in real output, 3.14%,[17] and long-run expected inflation, 2.06%. (Id., V.S. Gray 47-48.)[18] OE has reviewed the evidence provided by AAR and determined that the growth rates are correct and consistent with the Board's approved

[17] 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.)

[18] 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 2019 cost-of-capital determinations and has been used again for 2020. (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.

methodology. Accordingly, they will be used in the Board's determination of the cost of equity for 2020.

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, 2020, and shares outstanding from the 2020 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 2020 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 9.52%. (AAR Opening, V.S. Gray 51.) Based on the verified inputs discussed above the Board adopts 9.52% 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 2020 was 9.33%. This figure is based on an estimate of the cost of equity using a CAPM of 9.14% and an MSDCF estimate of 9.52%. (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).

To determine the cost of preferred equity here, AAR examined the preferred stock issues of KCS, using the dividend yield method (dividends divided by market price). AAR computed the market value of the preferred stock by multiplying the average quarterly price for each issue by the number of shares outstanding. This is the same procedure used in previous cost-of-capital determinations. See, e.g., R.R. Cost of Cap.—2019, EP 558 (Sub-No. 23), slip op. at 13. AAR computed the market value of preferred equity during 2020 to be $6.296 million. (AAR Opening, V.S. Gray 55, Table 18.) AAR computed the cost of preferred equity to be 3.42%. (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 $65.644 billion, $244.579 billion, and $6.3 million respectively. The percentage share of debt increased from 18.54% in 2019 to 21.16% in 2020. The percentage share of common equity decreased from 81.45% in 2019 to 78.84% in 2020. The percentage of preferred equity for 2020 was de minimis.[19] 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 2020 capital structure mix.

COMPOSITE COST OF CAPITAL

Based on the evidence furnished in the record and the MSDCF, the 2020 composite after-tax cost of capital for the railroad industry, as set forth in **Table 16** in the Appendix, was 7.89%. 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 2020 cost of capital was 1.45 percentage points lower than the 2019 cost of capital (9.34%). See R.R. Cost of Cap.—2019, EP 558 (Sub-No. 23), slip op. at 14.

CONCLUSIONS

The Board finds that for 2020:

1. The cost of railroad long-term debt was 2.54%.

2. The cost of common equity was 9.33%.

3. The cost of preferred equity was 3.42%.

4. The capital structure mix of the railroads was 21.16% long-term debt, 78.84% common equity, and 0.00% preferred equity.

5. The composite railroad industry cost of capital was 7.89%.

[19] The weight for preferred equity is small enough that it rounds to 0.00%. (See AAR Opening, V.S. Gray 2, 57.)

It is ordered:

1. This decision is effective on September 5, 2021.

2. This proceeding is discontinued.

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

APPENDIX

Table 1
2020 Traded & Non-traded Bonds

Railroad	Traded vs. Non-traded	Number	Market Value ($000)	% Market Value to All Bonds
CSX	Traded[1]	33	$18,942,310	97.72%
	Non-traded	2	441,679	2.28%
	Total	35	19,383,989	100.00%
KCS	Traded[2]	14	4,007,185	98.38%
	Non-traded	2	66,169	1.62%
	Total	16	4,073,354	100.00%
NSC	Traded[3]	31	14,998,999	100.00%
	Non-traded	0	0	0.00%
	Total	31	14,998,999	100.00%
UPC	Traded[4]	53	27,056,661	100.00%
	Non-traded	0	0	0.00%
	Total	53	27,056,661	100.00%
Composite	Traded	131	$65,005,154	99.22%
	Non-traded	4	$507,849	0.78%
	Total	135	$65,513,003	100.00%

[1] Includes 2 bonds issued during 2020, prorated based on date of issue.

[2] Includes 1 bond issued during 2020, prorated based on date of issue.

[3] Includes 2 bonds issued during 2020, prorated based on date of issue.

[4] Includes 6 bonds issued during 2020, prorated based on date of issue.

Table 2
2020 Bonds, Notes, & Debentures

Railroad	Number of Traded Issues	Market Value Traded Issues ($000)	Current Cost	Weighted Cost
CSX	33	$18,942,310	2.608%	0.760%
KCS	14	4,007,185	2.972%	0.183%
NSC	31	14,998,999	2.571%	0.593%
UPC	53	27,056,661	2.310%	0.961%
Composite	**131**	**$65,005,154**		**2.498%**

Table 3
2020 Equipment Trust Certificates

Railroad	Number of Issues	Market Value ($000)	Yield %	Weighted Yield ($000)
CSX	0	$0	0.00%	$0
KCS	0	0	0.00%	0
NSC	0	0	0.00%	0
UPC	4	962,216	1.397%	13,446
Composite	**4**	**$962,216**	**1.397%**	**$13,446**

Table 4
2020 Conditional Sales Agreements

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

Table 5
2020 Capitalized Leases & Miscellaneous Debt

Railroad	Capitalized Leases ($000)	Miscellaneous Debt[1] ($000)	Total Other Debt ($000)
CSX	$2,864	($227,658)	($224,794)
KCS	7,586	(47,582)	(39,996)
NSC	20,182	(1,012,185)	(992,003)
UPC	426,593	(557)	426,036
Composite	**$457,225**	**($1,287,982)**	**($830,757)**

[1] Miscellaneous debt includes unamortized debt discount.

Table 6
2020 Market Value of Debt

Type of Debt	Market Value of Debt ($000)	Percentage of Total Market Value (Excluding Other Debt)
Bonds, Notes, & Debentures	$65,513,003	98.55%
ETCs	962,216	1.45%
CSAs	0	0.00%
Subtotal	66,475,219	100.00%
Capitalized Leases/Miscellaneous Debt	(830,757)	NA
Total Market Value of Debt	**$65,644,461**	**NA**

Table 7
2020 Flotation Cost for Debt

Type of Debt	Market Weight (Excludes Other Debt)	Flotation Cost	Weighted Average Flotation Cost
Bonds, Notes, & Debentures	98.553%	0.057%	0.057%
ETCs	1.447%	0.067%	0.001%
CSAs	0.000%	0.000%	0.000%
Total	**100.000%**		**0.057%**

Table 8
2020 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	98.553%	2.498%	2.462%
ETCs	1.447%	1.397%	0.020%
CSAs	0.000%	0.000%	0.000%
Subtotal	100.000%		2.482%
Flotation Cost			0.057%
Weighted Cost of Debt			**2.539%**

Table 9
2020 Summary Output

Regression Statistics	
Multiple R	0.772978
R Square	0.597495
Adjusted R Square	0.595941
Standard Error	0.022089
Observations	261

ANOVA

	df	SS	MS	F	Significance F
Regression	1	0.187586	0.187586	384.469900	4.20245E-53
Residual	259	0.126368	0.000488		
Total	260	0.313954			

	Coefficients	Standard Error	t Stat	P-value
Intercept	0.002202	0.001374	1.603262	0.110096
X-Variable	1.074106	0.054779	19.607904	4.20245E-53

Table 10
2020 CAPM Cost of Common Equity

Risk-Free Rate (RF)	1.35%	
RF+(Beta x Market Risk Premium)	1.35% + (1.0741 x 7.25%)	9.14%
Cost of Equity		**9.14%**

Table 11
2020 Cost of Equity Using STB's MSDCF
($ in millions)

Company	CSX		KSU		NSC		UNP	
Initial Cash Flow	$2,129		$363		$1,617		$4,314	
Input for Terminal C.F.	$2,396		$548		$2,031		$4,845	
Stage One Growth	6.60%		11.88%		7.37%		8.09%	
Stage Two Growth	8.49%		8.49%		8.49%		8.49%	
Stage Three Growth*	5.20%		5.20%		5.20%		5.20%	
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	Value on 12/31 of Each Year	Present Value
1	$2,270	$2,075	$406	$371	$1,736	$1,588	$4,663	$4,252
2	2,420	2,021	454	380	1,864	1,560	5,041	4,190
3	2,579	1,970	508	389	2,002	1,532	5,448	4,130
4	2,750	1,919	569	398	2,149	1,504	5,889	4,070
5	2,931	1,870	636	408	2,307	1,477	6,366	4,011
6	3,180	1,854	690	405	2,503	1,466	6,906	3,968
7	3,450	1,839	749	401	2,716	1,455	7,492	3,925
8	3,743	1,823	812	398	2,946	1,443	8,129	3,882
9	4,060	1,808	881	395	3,197	1,432	8,819	3,840
10	4,405	1,793	956	392	3,468	1,421	9,567	3,799
Terminal	$123,929	$50,433	$36,952	$15,168	$110,947	$45,471	$252,465	$100,245
Sum of Present Value	$69,403		$19,107		$60,349		$140,313	
Market Value	$69,403		$19,107		$60,349		$140,313	
COE	9.41%		9.31%		9.33%		9.68%	
Weighted COE	2.26%		0.62%		1.95%		4.70%	
Industry COE	9.52%							

Table 12
2020 Cost of Common Equity Capital

Model	
Capital Asset Pricing Model	9.14%
Multi-Stage Discounted Cash Flow	9.52%
Cost of Common Equity	**9.33%**

Table 13
2020 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%
KCS	$1.00	$29.26	3.42%	215,199	$6,296	100.00%	3.42%
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					**$6,296**	**100.00%**	**3.42%**

Table 14
2020 Average Market Value for Common Equity

Railroad	**Average Market ($000)**	**Average Market Weight**
CSX	$57,135,996	23.36%
KCS	15,622,179	6.39%
NSC	50,274,622	20.56%
UPC	121,545,799	49.70%
COMPOSITE	**$244,578,596**	**100.00%**

Table 15
2020 Capital Structure Mix

Railroad	Type of Capital	Market Value ($000)	Weight
CSX	Debt	$19,159,195	25.11%
	Equity	57,135,996	74.89%
	P. Equity	0	0.00%
KCS	Debt	4,033,358	20.51%
	Equity	15,622,179	79.45%
	P. Equity	6,296	0.03%
NSC	Debt	14,006,996	21.79%
	Equity	50,274,622	78.21%
	P. Equity	0	0.00%
UPC	Debt	28,444,913	18.96%
	Equity	121,545,799	81.04%
	P. Equity	0	0.00%
Composite Weight	Debt	65,644,461	21.16%
	Equity	244,578,596	78.84%
	P. Equity	6,296	0.00%
	Total	$310,229,353	100.00%

Table 16
2020 Cost-of-Capital Computation

Type of Capital	Cost	Weight	Weighted Average
Long-Term Debt	2.54%	21.16%	0.54%
Common Equity	9.33%	78.84%	7.35%
Preferred Equity	3.42%	0.00%	0.00%
Composite Cost of Capital		**100.00%**	**7.89%**