

SURFACE TRANSPORTATION BOARD

CORRECTED DECISION*

Docket No. EP 558 (Sub-No. 22)

RAILROAD COST OF CAPITAL—2018

Digest:¹ The Board finds that the cost of capital for the railroad industry, which is calculated each year, was 12.22% for 2018. 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: September 30, 2019

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 15, 2019, to update the railroad industry's cost of capital for 2018. In that decision, the Board solicited comments from interested parties on the following issues: (1) the railroads' 2018 current cost of debt capital; (2) the railroads' 2018 current cost of preferred equity capital (if any); (3) the railroads' 2018 cost of common equity capital; and (4) the 2018 capital structure mix of the railroad industry on a market value basis. The Board received comments from the Association of

* This decision corrects the decision served on August 6, 2019. In that decision, Table 11 on page 17 incorrectly noted Norfolk Southern Corporation's stage two growth rate as 9.88%. It has been corrected to 19.88%. The decision remains unchanged in all other respects. The 9.88% notation was a typographical error that had no impact on the cost of equity and cost of capital determined by the Board.

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. Policy Statement on Plain Language Digests 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.

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 Determining the Railroad Industry's Cost of Capital, EP 664 (Sub-No. 1) (STB served Jan. 28, 2009). Western Coal Traffic League (WCTL) submitted reply comments, and AAR submitted a rebuttal to WCTL's reply.

In its reply, WCTL states that AAR's 2018 cost-of-capital figure is "an outlier and plainly wrong" under the Board's present methodology. (WCTL Reply 3.) In support, WCTL provides a table of alternative cost-of-capital valuations, ranging from 6.1% to 7.83%, advanced separately by various sources, including BNSF's then-Executive Chairman and Chief Executive Officer in a March 5, 2019 speech, Morgan Stanley, and Institutional Shareholder Services, Inc. (ISS-EVA). (*Id.* at 2, Table 1.) WCTL also advances its own proposed valuation. (*Id.*) WCTL declares that changes are necessary but it does not explain in its reply the specific changes it believes that the Board should make to its cost-of-capital calculation. (*Id.* at 3.)

AAR submitted rebuttal comments in response to WCTL's reply arguments. According to AAR, it followed the established Board procedures in this proceeding, as WCTL concedes in its reply comments. (AAR Rebuttal 1; see also WCTL Reply 1.) AAR asserts that WCTL "misstates the role of the Board's cost-of-capital calculation and presents self-serving, misleading, and unsupported cost-of-capital valuations. . . ." (AAR Rebuttal 1.)

DISCUSSION AND CONCLUSIONS

WCTL's Opposition

WCTL argues that the 2018 cost-of-capital figure is "an outlier and plainly wrong," (WCTL Reply 3), but as the Board has stated previously, there is "no single simple or correct way to estimate the cost of equity for the railroad industry, and countless reasonable options are available," Use of a Multi-Stage Discounted Cash Flow Model, EP 664 (Sub-No. 1), slip op. at 15. See also 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. Cost of

³ By decision served on July 27, 2018, the Board sought comment on whether it would be appropriate to, among other things, make 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. No. 115-97, 131 Stat. 2054 (2017), on rail carriers' deferred tax liability. R.R. Revenue Adequacy—2017 Determination, EP 552 (Sub-No. 22) et al., slip op. at 2-4 (STB served July 27, 2018). Specifically, with respect to the annual cost-of-capital determination, the Board proposed to increase the deferred tax figures for each of the four carriers comprising the "composite railroad" by the amount of deferred tax liability removed due to the revaluation, while also removing the same amount from the carriers' net income figures. *Id.* at 3-4. The Board adopted this proposal in Railroad Revenue Adequacy—2017 Determination, EP 552 (Sub-No. 22) et al., slip op. at 4-6 (STB served Dec. 6, 2018). Consistent with the decisions in that docket, 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, 41.)

Equity Capital, EP 664 (Sub-No. 2), slip op. at 2 (STB served Oct. 31, 2016). Although WCTL lists a few alternative cost-of-capital valuations, the mere existence of alternative methodologies does not mean that the Board’s methodology is flawed.

Furthermore, WCTL does not detail how each cost of capital valuation was calculated under the alternative methodologies listed in its reply. WCTL does mention that its own proposed valuation utilizes the Capital Asset Pricing Model (CAPM) only without the Multi-Stage Discounted Cash Flow Model (MSDCF).⁴ The CAPM, which suggests that the cost of equity has been stable in recent years, is a largely backward-looking model that does not observe all current marketplace behavior. The MSDCF, by contrast, is a more forward-looking model than the CAPM. As a result, the MSDCF captures information that the CAPM may miss, and vice versa, which is precisely why the Board has previously determined that a methodology that uses multiple models is more robust than a methodology that utilizes only one model. Pet. of the W. Coal Traffic League, EP 664 (Sub-No. 2), slip op. at 11 (STB served Oct. 31, 2016). Indeed, the Board has stated that, “[b]ecause the models are based on different perspectives, and thus rely on different inputs, an anomaly that might affect one model is less likely to affect the other, thus leading to a more stable overall result.” Id. at 12; see also Pet. of the W. Coal Traffic League, EP 664 (Sub-No. 2), slip op. at 4 (STB served Sept. 28, 2018) (stating that a methodology using multiple models with differing assumptions and inputs results in “stable and robust results”). Simply because the MSDCF model, under current economic conditions, produces a result higher than the CAPM model is not evidence that one model is more accurate than the other. While WCTL vaguely states the “capital cost calculation is also wrong for the many reasons WCTL has provided over the years,” (WCTL Reply 1), WCTL has not provided the Board with a sufficient basis to reject AAR’s calculation in this year’s cost-of-capital proceeding, which complies with the Board’s established methodology.

While the existence of a high cost-of-capital figure, without more, is not sufficient to undermine the Board’s existing cost-of-capital methodology, the Board acknowledges that the application of the existing methodology does result in a substantial increase in the 2018 cost of capital compared to the 2017 cost of capital and, in fact, results in a cost of capital that is higher than it has been in recent years. While there is no single simple or correct way to estimate the cost of equity, major ongoing changes within the rail industry—financial and operational—underscore the importance of exploring whether the methodology can still yet better capture information. When appropriate, the Board has undertaken an examination of whether changes to its cost-of-capital methodology may be warranted. Therefore, the Board expects to open a proceeding under Docket No. EP 664 to further explore its cost-of-capital methodology and whether modifications may be appropriate.

2018 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

⁴ WCTL also states that its valuation substitutes a market risk premium of 5%. (WCTL Reply 2.)

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 2018 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 2018 railroad cost of capital was 12.22%.

DEBT CAPITAL

AAR developed its 2018 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 2018, for all issues (a total of 125) that were publicly traded during the year. (AAR Opening, V.S. Gray 7-8.) To develop the current (in 2018) market value of bonds, AAR used these traded bonds and additional bonds that were outstanding but not publicly traded during 2018. 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 \$43.62 billion (\$43.27 billion traded and \$0.34 billion non-traded). (*Id.* at 9.) Based on the yields for the traded bonds, AAR calculated the weighted average 2018 yield for all bonds to be 4.095%. (*Id.* at 10-11.) 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.

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.

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).

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 2018 yields for these government securities, AAR added basis points⁶ to these yields to compensate for the additional risks associated with the ETCs.

There were four ETCs outstanding during 2018. (AAR Opening, V.S. Gray 14.) Using the yield spreads, AAR calculated the weighted average cost of ETCs to be 3.593%⁷ and their market value to be \$0.96 billion for 2018. (*Id.* at 15.)

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 2018 cost of debt because no CSAs are outstanding. (AAR Opening, V.S. Gray 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. 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 \$73.2 million for 2018.⁸ (AAR Opening, V.S. Gray 17.) 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 \$73.2 million.

Total Market Value of Debt

AAR calculated the total market value for all debt during 2018 to be \$44.652 billion. (AAR Opening, V.S. Gray 17-18.) 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.

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

⁷ This percentage is higher than the 2017 figure of 2.963%. See R.R. Cost of Capital—2017, EP 558 (Sub-No. 21), slip op. at 5 (STB served Dec. 6, 2018).

⁸ This figure consists of \$765.8 million of capitalized leases and (\$692.6) million of miscellaneous debt. (AAR Opening, App. D.)

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 2018, 18 new issues were reported in six filings with some filings reporting multiple new issues. (AAR Opening, V.S. Gray 20.) A simple average of the 18 flotation cost figures is 0.078%. (*Id.*) AAR calculated the 2018 flotation costs for bonds using publicly available data from electronic filings with the 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.* at 21 (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 21.) 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 0.077%. (*Id.* at 22.)

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,⁹ for which a current cost of debt has not been determined.¹⁰ AAR calculated that the flotation costs of debt increase the cost of debt by 0.078 percentage points. (*Id.* at 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.¹¹ **Table 7** in the Appendix shows these calculations.

⁹ 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 2018. (AAR Opening, V.S. Gray 16-17.)

¹⁰ 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. Gray 18.)

¹¹ AAR calculated the 2018 flotation costs for bonds using publicly available data from electronic filings with the SEC.

Overall Current Cost of Debt

AAR concluded that the railroads' cost of debt for 2018 was 4.16%.¹² (AAR Opening, V.S. Gray 24.) OE has verified that the percentage put forth by AAR is correct. **Table 8** in the Appendix shows the overall current cost of debt.

COMMON EQUITY CAPITAL

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

CAPM

Under CAPM, the cost of equity is equal to $RF + \beta \times RP$, where RF is the risk-free rate, RP is the market-risk premium, and β (or beta) is the measure of systematic, non-diversifiable risk. In order to calculate RF, the railroads were asked to provide the average yield to maturity in 2018 for a 20-year U.S. Treasury Bond. Similarly, the railroads were asked to provide an estimate for 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:

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

| | | |
|---------------|---|--|
| α | = | 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 |
| 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 2018 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 2018 risk-free rate to be 3.02%. (AAR Opening, V.S. Gray 29.) OE has examined AAR's data and

¹² This percentage is higher than the 2017 figure of 3.57%. See R.R. Cost of Capital—2017, EP 558 (Sub-No. 21), slip op. at 7.

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 6.91%. 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 Ibbotson and provides the same data reflecting the market-risk premium. (AAR Opening, V.S. Gray 30-31.) OE has verified that 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,¹³ 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 1.1120.¹⁴ (AAR Opening, V.S. Gray 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 1.1120.

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 $3.02\% + (1.1120 \times 6.91\%)$, which equals 10.70%. **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 2018 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

¹³ 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.

¹⁴ AAR uses the SAS General Linear Model procedure to compute regression data. The Board uses a standard Excel regression method.

10-K reports filed with the SEC, multiplied by stock prices at the close of each week in 2018. AAR calculated the combined 52-week average market value of the railroads to be \$219.3 billion. (*Id.* at 25-26.) OE has determined the combined 52-week average market value of the railroads to be \$219.3 billion.

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 2014-2018 periods by the total sales over the same periods. (AAR Opening, V.S. Gray 40-41.) To obtain the 2018 average cash flow, the cash-flow-to-sales ratio is multiplied by the sales revenue from 2018. (*Id.* at 41-42.) The 2018 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.* at 42.) According to AAR, the data inputs in the cash flow formula were retrieved from the railroads' 2014-2018 10-K filings. (*Id.*)

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 43-45). The third-stage growth rate of 5.00% was calculated by using the sum of the figures for long-run expected growth in real output (3.22%)¹⁵ and long-run expected inflation (1.78%). (*Id.* at 47-48.)¹⁶ 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 2018.

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 28, 2018, and shares outstanding from the 2018 Q3 10-Q reports filed with the SEC. (AAR Opening, V.S. Gray 49.)

OE has reviewed AAR's evidence. Based on that review, the Board finds that the market values used in the 2018 estimate of the cost of equity using the Morningstar/Ibbotson MSDCF are correct.

¹⁵ 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. (AAR Opening, V.S. Gray 47.)

¹⁶ 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 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. (*Id.* at 48.) 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. This methodology was accepted in the 2015, 2016, and 2017 cost-of-capital determinations and has been used again for 2018. (*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.

Cost of Common Equity Capital Using MSDCF

AAR estimates an MSDCF cost of equity of 17.01%. (AAR Opening, V.S. Gray 51.) However, a review of the 10-K reports shows one discrepancy. For 2018, NSC designated its deferred taxes as \$227 million, but the correct figure is \$173 million. **Table 11** reflects the corrected value. Using the corrected figure, OE has determined that the MSDCF cost of equity remains 17.01%. Based on the verified inputs discussed above, and the corrected deferred taxes figure, the Board adopts 17.01% 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 2018 was 13.86%. This figure is based on an estimate of the cost of equity using a CAPM of 10.70% and an MSDCF estimate of 17.01%. (AAR Opening, V.S. Gray 53 & *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 Capital—2017*, EP 558 (Sub-No. 21), slip op. at 11-12. AAR computed the market value of preferred equity during 2018 to be \$6.173 million. (AAR Opening, V.S. Gray 55, Table 18.) AAR computed the cost of preferred equity to be 3.70%. (*Id.* at 56.)

OE has determined that the 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 \$44.652 billion, \$219.319 billion, and \$6.2 million respectively. The percentage share

of debt decreased from 17.99% in 2017 to 16.92% in 2018. The percentage share of common equity increased from 82.01% in 2017 to 83.08% in 2018. The percentage of preferred equity for 2018 was de minimis.¹⁷ 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 2018 capital structure mix.

COMPOSITE COST OF CAPITAL

Based on the evidence furnished in the record and the MSDCF, the 2018 composite after-tax cost of capital for the railroad industry, as set forth in **Table 16** in the Appendix, was 12.22%. 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 2018 cost of capital was 2.18 percentage points higher than the 2017 cost of capital (10.04%). See R.R. Cost of Capital—2017, EP 558 (Sub-No. 21), slip op. at 12.

CONCLUSIONS

The Board finds that for 2018:

1. The cost of railroad long-term debt was 4.16%.
2. The cost of common equity was 13.86%.
3. The cost of preferred equity was 3.70%.
4. The capital structure mix of the railroads was 16.92% long-term debt, 83.08% common equity, and 0.00% preferred equity.
5. The composite railroad industry cost of capital was 12.22%.

It is ordered:

1. This decision is effective on September 5, 2019.
2. This proceeding is discontinued.

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

¹⁷ The weight for preferred equity is 0.0023%, which rounds to 0.00%. (See AAR Opening, V.S. Gray 58.)

APPENDIX

Table 1
2018 Traded & Non-traded Bonds

| Railroad | Traded vs. Non-traded | Number | Market Value (\$000) | % Market Value to All Bonds |
|--|------------------------------|---------------|-----------------------------|------------------------------------|
| CSX | Traded ¹ | 33 | \$13,848,244 | 98.20% |
| | Non-traded | 3 | 254,338 | 1.80% |
| | Total | 36 | 14,102,582 | 100.00% |
| KCS | Traded ² | 13 | 2,411,988 | 96.42% |
| | Non-traded | 3 | 89,613 | 3.58% |
| | Total | 16 | 2,501,601 | 100.00% |
| NSC | Traded ³ | 30 | 10,257,206 | 100.00% |
| | Non-traded | 0 | 0 | 0.00% |
| | Total | 30 | 10,257,206 | 100.00% |
| UPC | Traded ⁴ | 49 | 16,757,492 | 100.00% |
| | Non-traded | 0 | 0 | 0.00% |
| | Total | 49 | 16,757,492 | 100.00% |
| Composite | Traded | 125 | \$43,274,930 | 99.21% |
| | Non-traded | 6 | \$343,951 | 0.79% |
| | Total | 131 | 43,618,880 | 100.00% |
| ¹ Includes 5 bonds issued during 2018, prorated based on date of issue. ² Includes 1 bonds issued during 2018, prorated based on date of issue. ³ Includes 7 bonds issued during 2018, prorated based on date of issue. ⁴ Includes 7 bonds issued during 2018, prorated based on date of issue. | | | | |

Table 2
2018 Bonds, Notes, & Debentures

| Railroad | Number of Traded Issues | Market Value Traded Issues (\$000) | Current Cost | Weighted Cost |
|------------------|--------------------------------|---|---------------------|----------------------|
| CSX | 33 | \$13,848,244 | 4.220% | 1.350% |
| KCS | 13 | 2,411,988 | 4.260% | 0.237% |
| NSC | 30 | 10,257,206 | 4.105% | 0.973% |
| UPC | 49 | 16,757,492 | 3.960% | 1.533% |
| Composite | 125 | \$43,274,930 | | 4.095% |

Table 3
2018 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 | 959,903 | 3.593% | 34,486 |
| Composite | 4 | \$959,903 | 3.593% | \$34,486 |

Table 4
2018 Conditional Sales Agreements

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

Table 5
2018 Capitalized Leases & Miscellaneous Debt

| Railroad | Capitalized Leases (\$000) | Miscellaneous Debt¹ (\$000) | Total Other Debt (\$000) |
|------------------|-----------------------------------|---|---------------------------------|
| CSX | \$3,568 | \$(222,072) | \$(218,504) |
| KCS | 10,398 | (31,232) | (20,834) |
| NSC | 1,258 | (839,027) | (837,769) |
| UPC | 750,541 | 399,781 | 1,150,322 |
| Composite | \$765,765 | \$(692,550) | \$73,216 |

¹ Miscellaneous debt includes unamortized debt discount.

Table 6
2018 Market Value of Debt

| Type of Debt | Market Value of Debt (\$000) | Percentage of Total Market Value (Excluding Other Debt) |
|---------------------------------------|-------------------------------------|--|
| Bonds, Notes, & Debentures | \$43,618,880 | 97.85% |
| ETCs | 959,903 | 2.15% |
| CSAs | 0 | 0.00% |
| Subtotal | 44,578,784 | 100.00% |
| Capitalized Leases/Miscellaneous Debt | 73,216 | NA |
| Total Market Value of Debt | \$44,651,999 | NA |

Table 7
2018 Flotation Cost for Debt

| Type of Debt | Market Weight (Excludes Other Debt) | Flotation Cost | Weighted Average Flotation Cost |
|----------------------------|--|-----------------------|--|
| Bonds, Notes, & Debentures | 97.85% | 0.078% | 0.076% |
| ETCs | 2.15% | 0.077% | 0.002% |
| CSAs | 0.00% | 0.000% | 0.000% |
| Total | 100.00% | | 0.078% |

Table 8
2018 Current Cost of Debt

| Type of Debt | Percentage of Total Market Value (Excludes Other Debt) | Debt Cost | Weighted Debt Cost (Excluding Other Debt) |
|------------------------------|---|------------------|--|
| Bonds, Notes, & Debentures | 97.85% | 4.095% | 4.007% |
| ETCs | 2.15% | 3.593% | 0.077% |
| CSAs | 0.00% | 0.00% | 0.000% |
| Subtotal | 100.00% | | 4.084% |
| Flotation Cost | | | 0.078% |
| Weighted Cost of Debt | | | 4.16% |

Table 9
2018 Summary Output

| Regression Statistics | | | | | |
|------------------------------|--------------|----------------|-----------|------------|----------------|
| Multiple R | 0.675964 | | | | |
| R-Square | 0.456928 | | | | |
| Adjusted-R Square | 0.454823 | | | | |
| Standard Error | 0.021674 | | | | |
| Observations | 260 | | | | |
| ANOVA | | | | | |
| | Df | SS | MS | F | Significance F |
| Regression | 1 | 0.101973 | 0.101973 | 217.0748 | 4.5758E-36 |
| Residual | 258 | 0.121198 | 0.000470 | | |
| Total | 259 | 0.223172 | | | |
| | | | | | |
| | Coefficients | Standard Error | T Stat | P-Value | |
| Intercept | 0.001327 | 0.001347 | 0.985268 | 0.325416 | |
| X-Variable | 1.111993 | 0.075474 | 14.733459 | 4.5758E-36 | |

Table 10
2018 CAPM Cost of Common Equity

| | | |
|---------------------------------|--------------------------|---------------|
| Risk-Free Rate (RF) | 3.02% | |
| RF+(Beta x Market Risk Premium) | 3.02% + (1.1120 x 6.91%) | 10.70% |
| Cost of Equity | | 10.70% |

Table 11
2018 MSDCF Railroad Cost of Equity
(\$ in millions)

| Railroad | CSX | | KCS | | NSC | | UPC | |
|-----------------------|-----------------------------|---------------|-----------------------------|---------------|-----------------------------|---------------|-----------------------------|---------------|
| Initial CF | \$1,555 | | \$208 | | \$1,367 | | \$4,067 | |
| Input for Terminal CF | \$2,226 | | \$551 | | \$2,081 | | \$5,154 | |
| Stage 1 Growth Rate | 27.43% | | 14.70% | | 17.40% | | 19.99% | |
| Stage 2 Growth Rate | 19.88% | | 19.88% | | 19.88% | | 19.88% | |
| Stage 3 Growth Rate | 5.00% | | 5.00% | | 5.00% | | 5.00% | |
| 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 | \$1,982 | \$1,684 | \$239 | \$208 | \$1,605 | \$1,384 | \$4,880 | \$4,159 |
| 2 | 2,526 | 1,824 | 274 | 209 | 1,884 | 1,402 | 5,855 | 4,254 |
| 3 | 3,218 | 1,976 | 315 | 209 | 2,212 | 1,420 | 7,026 | 4,350 |
| 4 | 4,101 | 2,140 | 361 | 209 | 2,597 | 1,438 | 8,430 | 4,449 |
| 5 | 5,226 | 2,318 | 414 | 209 | 3,049 | 1,456 | 10,115 | 4,551 |
| 6 | 6,265 | 2,362 | 496 | 218 | 3,655 | 1,505 | 12,126 | 4,650 |
| 7 | 7,510 | 2,406 | 595 | 228 | 4,382 | 1,557 | 14,537 | 4,751 |
| 8 | 9,003 | 2,452 | 713 | 238 | 5,253 | 1,610 | 17,427 | 4,855 |
| 9 | 10,793 | 2,498 | 855 | 249 | 6,297 | 1,664 | 20,891 | 4,960 |
| 10 | 12,939 | 2,545 | 1,025 | 261 | 7,549 | 1,721 | 25,045 | 5,068 |
| Terminal | \$153,615 | \$30,217 | \$29,421 | \$7,484 | \$110,333 | \$25,154 | \$270,439 | \$54,731 |
| | | | | | | | | |
| | | | | | | | | |
| ΣPV | \$52,422 | | \$9,721 | | \$40,310 | | \$100,778 | |
| Market Value | \$52,422 | | \$9,721 | | \$40,310 | | \$100,778 | |
| COE | 17.66% | | 14.67% | | 15.93% | | 17.32% | |
| Weighted COE | 4.55% | | 0.70% | | 3.16% | | 8.59% | |
| COE | 17.01% | | | | | | | |

Table 12
2018 Cost of Common Equity Capital

| Model | |
|----------------------------------|---------------|
| Capital Asset Pricing Model | 10.70% |
| Multi-Stage Discounted Cash Flow | 17.01% |
| Cost of Common Equity | 13.86% |

Table 13
2018 Cost & Market Value of Preferred Stock

| Railroad | Dividend | Value Per Share | Div. Yield % | Shares (000) | Market Value (\$000) | Market Weight | Weighted Yield |
|------------------|-----------------|------------------------|---------------------|---------------------|-----------------------------|----------------------|-----------------------|
| CSX | 0 | 0 | 0.00% | | | 0.00% | 0.00% |
| KCS | \$1.00 | \$27.029 | 3.70% | 228,395 | \$6,173 | 100.00% | 3.70% |
| NSC | 0 | 0 | 0.00% | | | 0.00% | 0.00% |
| UPC | 0 | 0 | 0.00% | | | 0.00% | 0.00% |
| Composite | | | | | \$6,173 | | 3.70% |

Table 14
2018 Average Market Value for Common Equity

| Railroad | Average Market Value (\$000) | Average Market Weight |
|------------------|-------------------------------------|------------------------------|
| CSX | \$55,943,717 | 25.51% |
| KCS | 11,093,625 | 5.06% |
| NSC | 43,768,995 | 19.96% |
| UPC | 108,513,040 | 49.48% |
| COMPOSITE | \$219,319,377 | 100.00% |

Table 15
2018 Capital Structure Mix

| Railroad | Type of Capital | Market Value (\$000) | Weight |
|------------------|------------------------|-----------------------------|----------------|
| CSX | Debt | \$13,884,078 | 19.88% |
| | Equity | 55,943,717 | 80.12% |
| | P. Equity | 0 | 0.00% |
| KCS | Debt | 2,480,767 | 18.27% |
| | Equity | 11,093,625 | 81.69% |
| | P. Equity | 6,173 | 0.05% |
| NSC | Debt | 9,419,437 | 17.71% |
| | Equity | 43,768,995 | 82.29% |
| | P. Equity | 0 | 0.00% |
| UPC | Debt | 18,867,717 | 14.81% |
| | Equity | 108,513,040 | 85.19% |
| | P. Equity | 0 | 0.00% |
| Composite Weight | Debt | 44,651,999 | 16.92% |
| | Equity | 219,319,377 | 83.08% |
| | P. Equity | 6,173 | 0.00% |
| | Total | \$263,977,549 | 100.00% |

Table 16
2018 Cost-of-Capital Computation

| Type of Capital | Cost | Weight | Weighted Average |
|----------------------------------|-------------|----------------|-------------------------|
| Long-Term Debt | 4.16% | 16.92% | 0.70% |
| Common Equity | 13.86% | 83.08% | 11.51% |
| Preferred Equity | 3.70% | 0.00% | 0.00% |
| Composite Cost of Capital | | 100.00% | 12.22% |