

SURFACE TRANSPORTATION BOARD

DECISION

Docket No. EP 558 (Sub-No. 21)

RAILROAD COST OF CAPITAL—2017

Digest:¹ The Board finds that the cost of capital for the railroad industry, which is calculated each year, was 10.04% for 2017. 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: December 4, 2018

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 8, 2018, to update the railroad industry's cost of capital for 2017. In that decision, the Board solicited comments from interested parties on the following issues: (1) the railroads' 2017 current cost of debt capital; (2) the railroads' 2017 current cost of preferred equity capital (if any); (3) the railroads' 2017 cost of common equity capital; and (4) the 2017 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. 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.

³ The data submitted with AAR's filing reflected significant accounting adjustments to the rail carriers' 2017 financial reports due to a one-time revaluation of deferred tax liabilities resulting from the reduction of the federal corporate income tax rate in the Tax Cuts and Jobs

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Determining the Railroad Industry's Cost of Capital, EP 664 (Sub-No. 1) (STB served Jan. 28, 2009). Reply comments were submitted by Western Coal Traffic League (WCTL).

WCTL acknowledges in its reply that AAR generally followed the Board's prescribed methodology for estimating the cost of capital but asserts that the Board should also consider the "credibility of the results." (WCTL Reply 2.) WCTL asserts that the Morningstar/Ibbotson multi-stage discounted cash flow (MSDCF) model should not be used to determine the 2017 cost of capital. (*Id.* at 7.) According to WCTL, the MSDCF is distorted by high growth rates and produces an overstated cost of equity. (*Id.* at 4, 6.) WCTL asserts that this overstatement is "exacerbated" for 2017 because the Tax Cuts and Jobs Act created negative deferred taxes for the year that reduced the total 2013-2017 cashflow for certain Class I railroads. (*Id.* at 4-5.) WCTL asked that its reply comments also be considered as a petition to the Board to reopen various decisions in Petition of the Western Coal Traffic League to Institute a Rulemaking Proceeding to Abolish the Use of the Multistage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Equity Capital (Pet. to Abolish MSDCF), Docket No. EP 664 (Sub-No. 2), to adjust the cost of capital methodology, and to delay issuing the 2017 cost of capital until the Board has done so. (WCTL Reply 6-7.)

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 4, 10; see also WCTL Reply 2.) AAR asserts that WCTL seeks once again to "attack and overturn" the Board's cost of equity methodology, although the Board has already rejected those arguments no fewer than 10 times. (AAR Rebuttal 2-3, 10.)

WCTL filed a motion for leave to file a surreply, and its surreply, in which it rejects AAR's arguments that the Board should adopt AAR's calculation of the 2017 railroad industry cost of capital.⁴

(... continued)

Act, Pub. L. No. 115-97, 131 Stat. 2054 (2017). The Tax Cuts and Jobs Act, enacted on December 22, 2017, reduced the federal corporate income tax rate from a maximum of 35% (see 26 U.S.C. § 11(b) (2012)) to a flat 21%, effective January 1, 2018. See Tax Cuts and Jobs Act § 13001(a). Because Generally Accepted Accounting Principles require that deferred tax assets and liabilities be revalued in the year in which the change in tax rate is enacted (see Financial Accounting Standards Board (FASB) Accounting Standard Codification (ASC 740-10-25-47)), rail carriers revalued their deferred tax liability in 2017, although the reduced tax rate did not go into effect until January 2018. In revaluing their deferred tax liabilities, rail carriers made one-time, downward adjustments on their financial statements, as reported to both the U.S. Securities and Exchange Commission (SEC) and to the Board and accounted for the reduction in deferred tax liabilities as income. (See FASB ASC 740-10-45-15 ("[W]hen deferred tax accounts are adjusted . . . for the effect of a change in tax laws or rates, the effect shall be included in income from continuing operations for the period that includes the enactment date."))

⁴ Under 49 C.F.R. § 1104.13(c), a reply to a reply is not permitted. However, in the interest of a more complete record, the Board will accept the WCTL's filing into the record.

In a decision served on July 27, 2018, the Board acknowledged that the rail carriers' accounting adjustments made in response to the Tax Cuts and Jobs Act would affect, among other things, the Board's 2017 cost-of-capital determination. R.R. Revenue Adequacy—2017 Determination (July 2018 Decision), EP 552 (Sub-No. 22) et al., slip op. at 2 (STB served July 27, 2018). Accordingly, with respect to the cost-of-capital determination, the Board sought comment on whether a one-time adjustment to remove the accounting impacts of the carriers' deferred tax revaluations would be appropriate to more accurately reflect the rail carriers' financial state for 2017. Specifically, the Board proposed increasing the carriers' deferred tax figures by the amount of deferred tax liability removed by the revaluation, while also removing the same amount from the carriers' net income figures. Id. at 3-4.

By decision served on September 28, 2018, the Board denied WCTL's petition to reopen prior agency decisions that discussed the Board's use of the MSDCF in estimating the railroad industry's cost of capital. Pet. to Abolish MSDCF, EP 664 (Sub-No. 2) (STB served Sept. 28, 2018). The Board found, among other things, that WCTL had failed to identify any material error or present any claim of new evidence or changed circumstances that would alter the Board's previous decisions addressing the MSDCF's growth rate assumptions. Id. at 5. The Board acknowledged that the significant accounting impacts resulting from the Tax Cuts and Jobs Act could potentially impact the MSDCF estimates for 2017, but stated that the effects of the one-time event should not cause the Board to abandon an industry-accepted model upon which the Board had relied for years to provide stability to its estimates. Referencing the July 2018 Decision, the Board further noted that it was seeking comment on a one-time adjustment to its cost-of-capital determination. Id. at 7.

In response to the July 2018 Decision, the Board received comments and reply comments from AAR and WCTL. After considering the comments, the Board adopted, among other things, its proposal to make a one-time adjustment to the 2017 cost-of-capital determination. R.R. Revenue Adequacy—2017 Determination (December 2018 Decision), EP 552 (Sub-No. 22) et al., slip op. at 4-6 (STB served Dec. 6, 2018).⁵ Accordingly, the 2017 cost-of-capital figure discussed here incorporates the adjustments adopted in that decision.⁶

⁵ As noted above, WCTL argues that the MSDCF produces an overstated cost of equity, which is "exacerbated" for 2017 due to the Tax Cuts and Jobs Act. (WCTL Reply 4-5.) In the December 2018 Decision, EP 552 (Sub-No. 22) et al., slip op. at 5, however, the Board rejected WCTL's argument, finding it to be a mere restatement of previous claims in which WCTL criticized the Board's methodology in estimating the cost of equity. The Board further articulated that it had previously addressed WCTL's specific criticisms and found the MSDCF to be a reasonable approach, as one component of the Board's cost-of-capital methodology. Id. See, e.g., Pet. to Abolish MSDCF, EP 664 (Sub-No. 2), slip op. at 6-7.

⁶ On August 16, 2018, AAR submitted supplemental data with revised figures that exclude the accounting impacts of the rail carriers' deferred tax revaluations, as directed in the July 2018 Decision.

DISCUSSION AND CONCLUSIONS

2017 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).⁷ 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 2017 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, and the recalculated cost of common equity capital reflecting the removal of the accounting impacts of the carriers’ deferred tax revaluations, the Board estimates that the 2017 railroad cost of capital was 10.04%.

DEBT CAPITAL

AAR developed its 2017 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 2017, for all issues (a total of 113) that were publicly traded during the year. (AAR Opening, V.S. Gray 8.) To develop the current (in 2017) market value of bonds, AAR used these traded bonds and additional bonds that were outstanding but not publicly traded during 2017. 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 \$38.49 billion (\$37.98 billion traded and \$0.51 billion non-traded). (*Id.* at 9.) Based on the yields for the traded bonds, AAR calculated the weighted average 2017 yield for all bonds to be

⁷ 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).

3.510%. (*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. 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 2017 yields for these government securities, AAR added basis points⁸ to these yields to compensate for the additional risks associated with the ETCs.

There were five ETCs outstanding during 2017. (AAR Opening, V.S. Gray 15.) Using the yield spreads, AAR calculated the weighted average cost of ETCs to be 2.963%⁹ and their market value to be \$1.04 billion for 2017. (*Id.*)

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, for 2017, **Table 4** in the Appendix shows that no CSAs were outstanding in 2017. (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 \$246.7 million for 2017.¹⁰ (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 \$246.7 million.

⁸ A basis point equals 1/100th of a percentage point.

⁹ This percentage is higher than the 2016 figure of 2.494%. See R.R. Cost of Capital—2016, EP 558 (Sub-No. 20), slip op. at 4 (STB served Aug. 7, 2017).

¹⁰ This figure consists of \$0.9 billion of capitalized leases and \$(650) million of miscellaneous debt. (AAR Opening, App. D.)

Total Market Value of Debt

AAR calculated the total market value for all debt during 2017 to be \$39.778 billion. (AAR Opening, V.S. Gray 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.

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 2017, six new issues were reported in four filings with some filings reporting multiple new issues. (AAR Opening, V.S. Gray 21.) A simple average of the six flotation cost figures is 0.069%. (*Id.*) AAR calculated the 2017 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 0.074%.

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 0.069 percentage points. (AAR Opening, V.S. Gray 23.)

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

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 2017. (AAR Opening, V.S. Gray 16.)

¹² Current costs can be determined for three of the four debt categories—bonds, ETCs, and CSAs. Usually, the weighted average cost of debt is based upon these three (of the four) debt categories, but in this instance only bonds and ETCs are present. (AAR Opening, V.S. Gray 16-18.)

¹³ AAR calculated the 2017 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 2017 was 3.57%.¹⁴ (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 2017 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 2017 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 2017 risk-free rate to be 2.65%. (AAR Opening, V.S. Gray 29.) 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 higher than the 2016 figure of 3.43%. See R.R. Cost of Capital—2016, EP 558 (Sub-No. 20), 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 7.07%. 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: $R - SRRF = \alpha + \beta(RM - SRRF) + \varepsilon$. 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 1.1438.¹⁶ (AAR Opening, V.S. Gray 35-36.) 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 1.1438.

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 $2.65\% + (1.1438 \times 7.07\%)$, which equals 10.74%. **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 36-37.)

To calculate the 2017 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 2017. AAR calculated the combined 52-week average market value of the railroads to be \$181.4

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

billion. But a review of the 10-Q and 10-K reports show three discrepancies in the number of shares outstanding for a specific beginning-of-the-week time period:

Beginning of Week Date	Report Filing Date	Affected Railroad	AAR's Shares Outstanding	Actual Shares Outstanding
3/25/2013	4/16/2013	CSX	1,020,796,630	1,021,960,630
3/21/2016	4/13/2016	CSX	963,150,011	955,867,082
4/10/2017	4/21/2017	KCS	106,643,666	106,083,719

Using the correct figures, OE has determined the combined 52-week average market value of the railroads to still be \$181.4 billion.¹⁷

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. As noted above, the Board decided to make a one-time adjustment to its 2017 annual cost-of-capital determination. December 2018 Decision, EP 552 (Sub-No. 22) et al., slip op. at 3, 10. Accordingly, the Board removed the accounting impacts of the carriers' deferred tax revaluations by increasing the carriers' deferred tax figures 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 4.

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 2013-2017 periods by the total sales over the same periods. (AAR Opening, V.S. Gray 40.) To

¹⁷ Due to rounding, the three discrepancies for the number of shares outstanding did not change the \$181.4 billion for the combined 52-week average market value of the railroads and the 1.1438 for the beta.

obtain the 2017 average cash flow, the cash-flow-to-sales ratio is multiplied by the sales revenue from 2017. (*Id.*) The 2017 average cash flow figure is then used as the starting point of the Morningstar/Ibbotson MSDCF model. (*Id.* at 40.) The initial value of IBEI is determined through the same averaging process for the cash flows in stages one and two. (*Id.* at 40.) According to AAR, the data inputs in the cash flow formula were retrieved from the railroads' 2013-2017 10-K filings. (*Id.* at 41.) In accordance with the December 2018 Decision, EP 552 (Sub-No. 22) et al., slip op. at 4, 10, OE has recalculated the cash flow calculations originally submitted by AAR.

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 Thomson ONE Investment Management. The third-stage growth rate of 5.18% was calculated by using the sum of the figures for long-run expected growth in real output (3.21%)¹⁸ and long-run expected inflation (1.97%). (AAR Opening, V.S. Gray 45-46.)¹⁹

¹⁸ The real GDP growth rate is a compound growth rate calculated from the Bureau of Economic Analysis (BEA) data beginning in 1929. BEA rebased the real GDP from 2005 dollars to 2009 dollars. AAR calculated the growth rate using GDP in 2009 dollars.

¹⁹ 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 44.) 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 45.) 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 and 2016 cost-of-capital determinations and has been used again for 2017. (*Id.*) Appendix M in AAR’s opening statement contains the calculations

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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 2017.

Market Values for MSDCF

The final inputs to the Morningstar/Ibbotson MSDCF model are the stock market values for the equity of each railroad. To calculate these values, AAR used stock prices from Yahoo Finance for December 29, 2017, and shares outstanding from the 2017 Q3 10-Q reports filed with the SEC. (AAR Opening, V.S. Gray 47.)

OE has reviewed AAR's evidence. Based on that review, the Board finds that the market values used in the 2017 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 13.33%. (AAR Opening, V.S. Gray 48-49.) Based on the verified inputs discussed above and the recalculated cash flow figures, the Board adopts 12.18% 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 2017 was 11.46%. This figure is based on an estimate of the cost of equity using a CAPM of 10.74% and an MSDCF estimate of 12.18%. **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

(. . . continued)

for the stage three growth rate. (*Id.*, App. M.) OE has reviewed AAR's approach and finds it to be reasonable.

determinations. See, e.g., R.R. Cost of Capital—2016, EP 558 (Sub-No. 20), slip op. at 13. AAR computed the market value of preferred equity during 2017 to be \$6.763 million. (AAR Opening, V.S. Gray 52.) AAR computed the cost of preferred equity to be 3.58%. (Id., V.S. Gray at 53.)

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 \$39.778 billion, \$181.367 billion, and \$6.8 million respectively. The percentage share of debt decreased from 20.75% in 2016 to 17.99% in 2017. The percentage share of common equity increased from 79.25% in 2016 to 82.01% in 2017. The percentage of preferred equity for 2017 was de minimis.²⁰ 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 2017 capital structure mix.

COMPOSITE COST OF CAPITAL

Based on the evidence furnished in the record and the recalculated MSDCF, the 2017 composite after-tax cost of capital for the railroad industry, as set forth in **Table 16** in the Appendix, was 10.04%.²¹ 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 2017 cost of capital was 1.16 percentage points higher than the 2016 cost of capital (8.88%). See R.R. Cost of Capital—2016, EP 558 (Sub-No. 20), slip op. at 14.

CONCLUSIONS

The Board finds that for 2017:

1. The cost of railroad long-term debt was 3.57%.
2. The cost of common equity was 11.46%.

²⁰ The weight for preferred equity is 0.0031%, which rounds to 0.00%. (See AAR Opening 2 n.1.)

²¹ The three discrepancies in outstanding shares noted above were accounted for in the composite after-tax cost of capital.

3. The cost of preferred equity was 3.58%.
4. The capital structure mix of the railroads was 17.99% long-term debt, 82.01% common equity, and 0.00% preferred equity.
5. The composite railroad industry cost of capital was 10.04%.

It is ordered:

1. This decision is effective on December 21, 2018.
2. WCTL's motion for leave to file a surreply is granted.
3. This proceeding is discontinued.

By the Board, Board Members Begeman and Miller.

APPENDIX

Table 1
2017 Traded & Non-traded Bonds

Railroad	Traded vs. Non-traded	Number	Market Value (\$000)	% Market Value to All Bonds
CSX	Traded ¹	28	\$12,372,815	97.99%
	Non-traded	3	254,338	2.01%
	Total	31	12,627,153	100.00%
KCS	Traded	12	2,152,650	93.00%
	Non-traded	5	162,012	7.00%
	Total	17	2,314,662	100.00%
NSC	Traded ²	26	9,714,193	99.13%
	Non-traded	2	84,902	0.87%
	Total	28	9,799,095	100.00%
UPC	Traded ³	47	13,740,797	99.96%
	Non-traded	2	4,921	0.04%
	Total	49	13,745,718	100.00%
Composite	Traded	113	\$37,980,454	98.68%
	Non-traded	12	506,173	1.32%
	Total	125	38,486,628	100.00%
¹ Includes 1 bonds issued during 2017, prorated based on date of issue. ² Includes 3 bonds issued during 2017, prorated based on date of issue. ³ Includes 4 bonds issued during 2017, prorated based on date of issue.				

Table 2
2017 Bonds, Notes, & Debentures

Railroad	Number of Traded Issues	Market Value Traded Issues (\$000)	Current Cost	Weighted Cost
CSX	28	\$12,372,815	3.729%	1.215%
KCS	12	2,152,650	3.701%	0.210%
NSC	26	9,714,193	3.493%	0.893%
UPC	47	13,740,797	3.295%	1.192%
Composite	113	\$37,980,454		3.510%

Table 3
2017 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	5	1,044,632	2.963%	30,949
Composite	5	\$1,044,632	2.963%	\$30,949

Table 4
2017 Conditional Sales Agreements

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

Table 5
2017 Capitalized Leases & Miscellaneous Debt

Railroad	Capitalized Leases (\$000)	Miscellaneous Debt¹ (\$000)	Total Other Debt (\$000)
CSX	\$4,147	\$(188,896)	\$(184,749)
KCS	9,481	(27,912)	(18,431)
NSC	1,453	(846,845)	(845,392)
UPC	881,606	413,700	1,295,306
Composite	\$896,687	\$(649,953)	\$246,734

¹ Miscellaneous debt includes unamortized debt discount.

Table 6
2017 Market Value of Debt

Type of Debt	Market Value of Debt (\$000)	Percentage of Total Market Value (Excluding Other Debt)
Bonds, Notes, & Debentures	\$38,486,628	97.36%
ETCs	1,044,632	2.64%
CSAs	0	0.00%
Subtotal	39,531,260	100.00%
Capitalized Leases/Miscellaneous Debt	246,734	NA
Total Market Value of Debt	\$39,777,994	NA

Table 7
2017 Flotation Cost for Debt

Type of Debt	Market Weight (Excludes Other Debt)	Flotation Cost	Weighted Average Flotation Cost
Bonds, Notes, & Debentures	97.36%	0.069%	0.0668%
ETCs	2.64%	0.074%	0.0020%
CSAs	0.00%	0.000%	0.0000%
Total	100.00%		0.069%

Table 8
2017 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	97.36%	3.510%	3.4173%
ETCs	2.64%	2.963%	0.0783%
CSAs	0.00%	0.00%	0.0000%
Subtotal	100.00%		3.496%
Flotation Cost			0.069%
Weighted Cost of Debt			3.57%

Table 9
2017 Summary Output

Regression Statistics					
Multiple R	0.631678				
R-Square	0.399017				
Adjusted-R Square	0.396697				
Standard Error	0.021330				
Observations	261				
ANOVA					
	Df	SS	MS	F	Significance F
Regression	1	0.078234	0.078234	171.9607	1.79701E-30
Residual	259	0.117832	0.000455		
Total	260	0.196066			
	Coefficients	Standard Error	T Stat	P-Value	
Intercept	0.000960	0.001339	0.716797	0.474145	
X-Variable	1.143842	0.087227	13.11338	1.79701E-30	

Table 10
2017 CAPM Cost of Common Equity

Risk-Free Rate (RF)	2.65%	
RF+(Beta x Market Risk Premium)	2.65% + (1.1438 x 7.07%)	10.74%
Cost of Equity		10.74%

Table 11
2017 MSDCF Railroad Cost of Equity
(\$ in millions)

Railroad	CSX		KCS		NSC		UPC	
Initial CF	\$1,025		\$83		\$1,094		\$3,489	
Input for Terminal CF	\$1,801		\$481		\$1,775		\$4,525	
Stage 1 Growth Rate	15.66%		13.16%		12.00%		13.36%	
Stage 2 Growth Rate	13.55%		13.55%		13.55%		13.55%	
Stage 3 Growth Rate	5.18%		5.18%		5.18%		5.18%	
	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
Year								
1	\$1,185	\$1,061	\$94	\$85	\$1,225	\$1,095	\$3,955	\$3,512
2	1,371	1,098	107	86	1,372	1,096	4,483	3,536
3	1,585	1,136	121	88	1,536	1,097	5,082	3,560
4	1,834	1,176	137	89	1,721	1,099	5,761	3,584
5	2,121	1,217	155	91	1,927	1,100	6,531	3,609
6	2,408	1,237	176	93	2,188	1,116	7,416	3,639
7	2,735	1,256	200	94	2,485	1,133	8,420	3,670
8	3,105	1,277	227	96	2,822	1,150	9,561	3,701
9	3,526	1,297	257	98	3,204	1,167	10,857	3,733
10	4,004	1,318	292	100	3,638	1,185	12,328	3,764
Terminal	\$112,659	\$37,092	\$29,054	\$9,974	\$92,817	\$30,226	\$226,802	69,250
ΣPV	\$49,164		\$10,895		\$41,463		\$105,559	
Market Value	\$49,164		\$10,895		\$41,463		\$105,559	
COE	11.75%		11.28%		11.87%		12.60%	
Weighted COE	2.79%		0.59%		2.38%		6.42%	
COE	12.18%							

Table 12
2017 Cost of Common Equity Capital

Model	
Capital Asset Pricing Model	10.74%
Multi-Stage Discounted Cash Flow	12.18%
Cost of Common Equity	11.46%

Table 13
2017 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	\$27.926	3.58%	242,170	\$6,763	100.00%	3.58%
NSC	0	0	0.00%			0.00%	0.00%
UPC	0	0	0.00%			0.00%	0.00%
Composite					\$6,763		3.58%

Table 14
2017 Average Market Value for Common Equity

Railroad	Average Market Value (\$000)	Average Market Weight
CSX	\$46,185,094	25.47%
KCS	10,327,049	5.70%
NSC	35,467,049	19.56%
UPC	89,387,438	49.29%
COMPOSITE	\$181,366,630	100.00%

Table 15
2017 Capital Structure Mix

Railroad	Type of Capital	Market Value (\$000)	Weight
CSX	Debt	\$12,442,404	21.22%
	Equity	46,185,094	78.78%
	P. Equity	0	0.00%
KCS	Debt	2,296,231	18.18%
	Equity	10,327,049	81.77%
	P. Equity	6,763	0.05%
NSC	Debt	8,953,703	20.16%
	Equity	35,467,049	79.84%
	P. Equity	0	0.00%
UPC	Debt	16,085,656	15.25%
	Equity	89,387,438	84.75%
	P. Equity	0	0.00%
Composite Weight	Debt	39,777,994	17.99%
	Equity	181,366,630	82.01%
	P. Equity	6,763	0.00%
	Total	\$221,151,387	100.00%

Table 16
2017 Cost-of-Capital Computation

Type of Capital	Cost	Weight	Weighted Average
Long-Term Debt	3.57%	17.99%	0.64%
Common Equity	11.46%	82.01%	9.40%
Preferred Equity	3.58%	0.00%	0.00%
Composite Cost of Capital		100.00%	10.04%