45911 SERVICE DATE – AUGUST 7, 2017
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SURFACE TRANSPORTATION BOARD

DECISION

Docket No. EP 558 (Sub-No. 20)

RAILROAD COST OF CAPITAL—2016

Digest:[1] The Board finds that the cost of capital for the railroad industry, which is calculated each year, was 8.88% for 2016. 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, 2017

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 28, 2017, to update the railroad industry's cost of capital for 2016. In that decision, the Board solicited comments from interested parties on the following issues: (1) the railroads' 2016 current cost of debt capital; (2) the railroads' 2016 current cost of preferred equity capital (if any); (3) the railroads' 2016 cost of common equity capital; and (4) the 2016 capital structure mix of the railroad industry on a market value basis.

The Board received comments from the Association of American Railroads (AAR) that provide the information that is used in making the annual cost-of-capital determination, as established in Use of a Multi-Stage Discounted Cash Flow Model in Determining the R.R.

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[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.

Industry's Cost of Capital (Use of MSDCF), EP 664 (Sub-No. 1) (STB served Jan. 28, 2009). Western Coal Traffic League (WCTL) replied to AAR's submission.

WCTL acknowledges that AAR appears to have followed the Board's established methodology for estimating the cost of equity and the cost of capital, but asserts that there are several additional matters the Board should consider. (WCTL Reply 1.) Specifically, WCTL asserts that: (1) AAR omitted data on individual bond prices from its cost of debt (COD) calculations on the grounds that the data is proprietary (id. at 2); (2) the cost of capital used by the financial and investment community is 7.47%, not the 8.86% reported by AAR (id. at 2-4); (3) a proper Capital Asset Pricing Model (CAPM) confirms the 7.47% cost-of-capital figure (Id. at 4-6); and (4) railroad stock buyback programs result in even greater Multi-Stage Discounted Cash Flow (MSDCF) distortion.

AAR submitted rebuttal comments in response to WCTL's reply arguments.

DISCUSSION AND CONCLUSIONS

2016 Cost-of-Capital Determination

Consistent with previous cost-of-capital proceedings, 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).[3] According to AAR, the following four railroad holding companies meet these criteria: CSX Corporation (CSX); Kansas City Southern Corporation (KCS); Norfolk Southern Corporation (NSC); and Union Pacific Corporation (UPC).[4]

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 2016 cost of capital: (1) cost-of-debt capital; (2) cost of common equity capital; (3) cost of preferred equity

[3] The composite railroad includes those Class I carriers that: (1) are listed on either the New York Stock Exchange (NYSE) or the American Stock Exchange (AMEX); (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).

[4] In the Board's decision instituting this proceeding, the Board noted that CSX transferred its stock exchange listing from the NYSE to the Nasdaq Global Select Market (Nasdaq), effective after the market closed on December 21, 2015. For purposes of the 2016 cost-of-capital determination, however, the Board waived its requirement that a company's stock must be listed on either the NYSE or the AMEX in the year for which the cost of capital was being determined, concluding that because CSX's stock price data was reported on the NYSE and/or the Nasdaq in 2016, the Board concluded that it would have available stock price data that could be used in the Board's computation of the rail industry's cost of capital for 2016. On April 18, 2017, the Board initiated a Notice of Proposed Rulemaking that would update the screening criteria to require a company's stock to be listed on either the NYSE or the Nasdaq. See Revisions To The Cost-Of-Capital Composite R.R. Criteria, EP 664 (Sub-No. 3) (STB served Apr. 18, 2017).

capital; (4) capital structure; and (5) composite after-tax cost of capital. Based on that review, the Board estimates that the 2016 railroad cost of capital was 8.88%.

DEBT CAPITAL

AAR developed its 2016 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 2016, for all issues (a total of 103) that were publicly traded during the year. (AAR Opening, V.S. Gray 8.) To develop the current (in 2016) market value of bonds, AAR used these traded bonds and additional bonds that were outstanding but not publicly traded during 2016. 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 $34.99 billion ($34.46 billion traded, and $0.53 billion non-traded). (AAR Opening, V.S. Gray 9.) Based on the yields for the traded bonds, AAR calculated the weighted average 2016 yield for all bonds to be 3.392%. (AAR Opening, V.S. Gray 10.) OE has examined AAR's bond price and yield data and has determined that AAR's computations are correct, except for one bond for UPC. For CUSIP 907818EC8, or bond number 83, AAR used $406.79 million towards the market value of debt for UPC. (AAR Opening, V.S. Gray App. A 10.) However, this bond was not newly issued in 2016 and should not have been prorated. The full amount outstanding of $443.77 million should have been used instead of the $406.79 million to calculate the market value of debt for UPC. The calculations and data for all bonds are shown in **Tables 1** and **2** of the Appendix.

AAR's Data on Individual Bond Prices

WCTL points out that the AAR omitted data on individual bond prices from its cost of debt calculations on the ground that the data is proprietary to Bloomberg. WCTL argues that this approach is incorrect, and that the more appropriate approach would be to submit such data under a motion for a protective order, to allow review by the Board and other parties. (WCTL Reply 2.)

On rebuttal, AAR states that it followed established procedure in the annual cost-of-capital proceedings by using bond price data from Bloomberg, a subscription service used since the 2011 cost-of-capital proceeding. AAR also argues that WCTL and the Board have access to all of the data necessary to confirm AAR's calculations and that the Board stated in 2012 that the

AAR's use of Bloomberg subscription bond data was appropriate and supported. AAR notes that it has consistently followed the same procedures since then. (AAR Rebuttal 4.)

The Board finds that the AAR followed the appropriate and established procedure of using bond price data from Bloomberg. The use of Bloomberg as the source for outstanding bond data is permissible and consistent with past annual cost-of-capital proceedings. See R.R. Cost of Capital—2011, EP 558 (Sub-No. 15), slip op. at 3-4 (STB served Sept. 13, 2012) (affirming AAR's use of the Bloomberg data). AAR's bond calculations can be verified to a high level of confidence using the data provided in Appendix A of its filing. (See AAR Opening, App. A.)

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 2016 yields for these government securities, AAR added basis points[5] to these yields to compensate for the additional risks associated with the ETCs.

There were five ETCs outstanding during 2016. (AAR Opening, V.S. Gray 14-15.) Using the yield spreads, AAR calculated the weighted average cost of ETCs to be 2.494%[6] and their market value to be $1.07 billion for 2016. (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, for 2016, **Table 4** in the Appendix shows that no CSAs were outstanding in 2016. (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

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

[6] This percentage is lower than the 2015 figure of 2.535%. See R.R. Cost of Capital – 2015, EP 558 (Sub-No. 19), slip op. at 5.

value (assumed market value) for the capitalized leases and miscellaneous debt was $451.4 million for 2016.[7] (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 $451.4 million.

Total Market Value of Debt

AAR calculated the total market value for all debt during 2016 was $36.508 billion. (AAR Opening, V.S. Gray 17.) OE has examined AAR's data and has determined that the total market value for all debt during 2016 was $36.544 billion due to the previously discussed difference in the market value of UPC bonds. **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 2016, 10 new issues were reported in five filings with some filings reporting multiple new issues. (AAR Opening, V.S. Gray 20.) A simple average of the 10 flotation cost figures is 0.067%. (Id.) AAR calculated the 2016 flotation costs for bonds using publicly available data from electronic filings with the U.S. 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. at 21, citing SEC, Cost of Flotation of Corporate Securities 1951-1955 (1957).) AAR asserts that, in that study, the SEC determined ETC flotation costs to 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 0.072%.

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,[8] for which a current cost of debt has not been determined.[9] AAR calculated that flotation costs for debt equal to 0.072%. (AAR Opening, V.S. Gray 22.)

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[7] This figure consists of $1.1 billion of capitalized leases and $(668) million of miscellaneous debt. (AAR Opening, App. D.)

[8] 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 2016. (AAR Opening, V.S. Gray 15-17.)

[9] 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.)

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.[10] **Table 7** in the Appendix shows these calculations.

Overall Current Cost of Debt

AAR concluded that the railroads' cost of debt for 2016 was 3.43%.[11] (AAR Opening, V.S. Gray 23.) 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 CAPM and the Morningstar/Ibbotson 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 RF, the railroads were asked to provide the average yield to maturity in 2016 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:

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

[10] AAR calculated the 2016 flotation costs for bonds using publicly available data from electronic filings with the SEC.

[11] This percentage is lower than the 2015 cost of debt (3.55%). See R.R. Cost of Capital – 2015, EP 558 (Sub-No. 19), slip op. at 7.

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 2016 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 2016 risk-free rate to be 2.22%. (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.

RP – The Market-Risk Premium

Using the approach from Cost of Capital Methodology, EP 664, slip op. at 7-9, AAR submitted data reflecting a market-risk premium of 6.94%. 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 has replaced the former source with Duff & Phelps' 2017 Valuation Handbook—Guide to Cost of Capital, which uses the same method as Ibbotson and provides the same data reflecting the market-risk premium. (AAR Opening, V.S. Gray 30.)

While AAR has submitted data reflecting a market-risk premium of 6.94%, it did not include an appendix containing data from Duff & Phelps' 2017 Valuation Handbook on which the premium is based. However, OE was able to independently verify a market-risk premium of 6.9%. Although the figure verified by OE is one decimal point less precise than AAR's submission, the verification is sufficient here where there is no dispute on the record about the support for the 6.94% figure itself. Therefore, the Board will accept AAR's assessment that the market-risk premium is 6.94%. In the future, AAR should submit as an appendix the specific Duff & Phelps data (or other underlying source) to verify the market-risk premium figure.

Calculating Beta

Cost of Capital Methodology 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: $R - SRRF = \alpha + \beta(RM - SRRF) + \varepsilon$. Cost of Capital Methodology, EP 664, slip op. at 9. Applying the modified approach for assigning the new shares outstanding,[12] 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 1.1467.[13] (AAR Opening, V.S. Gray 35.) 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 1.1467.

[12] 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.

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

Cost of Common Equity Capital using CAPM

Using the modified approach for assigning the new shares outstanding, the Board calculates the cost of equity as RF + β × RP, or 2.22% + (1.1467 × 6.94%), which equals 10.18%. **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.)

To calculate the 2016 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, multiplied by stock prices at the close of each week in 2016. AAR calculated the combined 52-week average market value of the railroads to be $136.6 billion. But a review of the 10-Q report filed on April 13, 2016, for CSX shows that there were actually 955,867,082 shares outstanding on March 25, 2016, a figure lower than that used by AAR. Therefore, for the beginning of the week of March 21, 2016, shares outstanding should have been 955,867,082 and not the 963,150,011 used by the AAR. Using that figure, OE has determined the combined 52-week average market value of the railroads to be $139.6 billion. (AAR Opening, V.S. Gray 25.)

Morgan Stanley Report

In its reply, WCTL asserts that Morgan Stanley, an investment bank, used the same information utilized in the Board's cost-of-capital analysis for 2016 and calculated the cost of capital to be 7.47%, which is 139 basis points less than AAR's figure of 8.86%. (WCTL Reply 2-4.) Specifically, WCTL compares AAR's calculations to Morgan Stanley's Freight Transportation Report, 4Q16 Preview & 2017 Debates: The Kitchen Sink Quarter, dated January 9, 2017. (Id. at 2.) According to WCTL, this report states, among other things, that the cost of capital for the Class I industry is 7.47%, using a weighted average cost-of-capital data for each of the four carriers included in the Board's composite sample – CSX, KCS, NSC, and UPC – and weighing the data according to the market capitalization utilized by AAR. (Id. at 3; see also id., Table 1 "Calculation of Industry Average Cost of Capital Using Morgan Stanley Weighted Average Cost of Capital and AAR Market Capitalization").

WCTL explains that the Morgan Stanley figures may incorporate an income tax shield for debt. (WCTL Reply 3.) According to WCTL, the impact of such a debt shield can be estimated by multiplying AAR's percentage of debt (21.09%) times AAR's cost of debt (3.64%) times the corporate tax rate (35%), which amounts to 0.27% or 27 basis points. (Id.) Morgan Stanley's weighted cost of capital for CSX, KCS, NSC, and UPC is 7.20% (See Table 1.) WCTL increased the 7.20% figure derived from Table 1 by 27 basis points to arrive at its industry average cost of capital of 7.47%. (WCTL Reply 3.)

Noting that Morgan Stanley's figure of 7.47% is 139 basis points less than AAR's figure of 8.86%, WCTL contends that AAR's calculation, while lower than the prior year's figure, is still substantially overstated. WCTL attributes cost-of-capital volatility to the Board's "hybrid"

methodology of combining the CAPM and MSDCF, which WCTL has criticized in other proceedings. (Id.)[14]

AAR responds that WCTL's selective use of excerpts from a single analyst report from Morgan Stanley cannot be relied upon for sweeping generalizations about the cost of capital. (AAR Rebuttal 5.) AAR argues that WCTL failed to provide clear insight into the underlying assumptions used in the Morgan Stanley report, and that there was no way for the Board to know how Morgan Stanley arrived at its estimate for the submitted companies' weighted-average cost of capital. (Id. at 5-6.) Additionally, AAR contends that WCTL's proposal of a lower CAPM cost-of-equity calculation should be rejected because WCTL's figure is based on an incorrect risk-free rate related to the corresponding market risk premium. According to AAR, when WCTL's cost-of-equity calculation is corrected with regard to the risk-free rate, the figure becomes 9.81% and the cost of capital rises to 8.51 %. (Id. at 7-8.)

As the Board has previously advised, challenges to the Board's cost-of-capital methodology, such as WCTL's argument regarding the use of Morgan Stanley's cost of capital, should be addressed in Docket No. EP 664 (Sub-No. 2) and not within this annual Docket No. EP 558 proceeding.[15] Moreover, there is no single "correct" methodology for determining cost of capital; thus, different methodologies can lead to sometimes different outcomes, which is one reason the Board uses a blended approach. See R.R. Cost of Capital – 2015, EP 558 (Sub-No. 19), slip op. 2-3 (STB served Aug. 5, 2016). If two methodologies are compared over a period of years, it is not surprising that one will yield higher figures in some years, while the other will yield higher figures in others. Thus, the fact that any one analyst's or firm's cost-of-capital calculation are different from the results under our methodology is not surprising. Thus, the Board rejects the notion that the Board's hybrid approach is improper merely because CAPM and MSDCF may diverge at any given time. See Pet. of the W. Coal Traffic League to Institute a Rulemaking Proceeding to Abolish the Use of the Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital, Docket No. EP 644 (Sub-No. 2) (STB served Apr. 28, 2017).

In addition, the record does not contain evidence showing how Morgan Stanley calculated its figure, including how it calculated cashflows; what number of stages were included in the DCF model; and how the terminal cash flow perpetual growth rates were determined, etc.

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[14] WCTL points out that the Morgan Stanley 7.47% figure for the 2016 cost of capital is nearly identical to the 7.5% benchmark that WCTL derived in the comments it submitted in the 2015 cost of capital proceeding.

[15] See R.R. Cost of Capital—2012, EP 558 (Sub-No. 16), slip op. at 10 (STB served Aug. 30, 2013); Methodology to Be Employed in Determining the R.R. Indus. Cost of Capital (Cost of Capital Methodology), EP 664, slip op. at 18 (STB served Jan. 17, 2008) (recent experience has shown that the most appropriate way for the agency to review such petitions—while also completing its annual cost-of-capital determination in a timely fashion—is to maintain separate proceedings: one (Docket No. EP 558 sub-numbered proceedings) for the annual estimate and another (Docket No. EP 664 sub-numbered proceedings) for petitioners to advocate changes to the cost-of-capital model).

Any of these determinations could alter the cost of capital calculation in significant ways. We find that WCTL has provided no reason the Board should depart from its precedent.

WCTL's MRP Argument

In its reply, WCTL argues that, although AAR explained in its opening statement that, because Ibbotson/Morningstar no longer published those values, it relied on Duff & Phelps for the 1926-based historical market-risk premium of 6.94%, Duff & Phelps actually recommends the use of a lower market-risk premium—5.5% as of January 31, 2016. (WCTL Reply 4.) According to WCTL, using the 5.5% market-risk premium along with AAR's 1.1467 beta and 2.22% risk-free rate results in a cost of equity of 8.53% ((5.5% x 1.1467) + 2.22%). (Id. at 5.) WCTL states that the resulting cost of capital, using AAR's capital structure and cost of debt, is 7.47% ((8.53% x 0.7891) + (3.64% x 0.2109)). (Id.) WCTL points out that the 7.50% cost of capital figure, which is based on the CAPM analysis using the MRP recommended by Duff & Phelps, is extremely close to the 7.47% cost of capital derived from the Morgan Stanley analysis. (Id. at 6.) WCTL contends that the closeness of the 7.50% and 7.47% figures confirms the reasonableness of the Morgan Stanley figures, the soundness of both the CAPM methodology and the Duff & Phelps recommended MRP, and the unreasonableness of the results generated by using the Board's hybrid cost of equity methodology with its specified inputs. (Id.)

On rebuttal, AAR claims that WCTL failed to use the corresponding normalized risk-free rate that should be used in conjunction with the conditional MRP. (AAR Rebuttal 7.) As a result, AAR contends that WCTL incorrectly calculated a CAPM cost of equity of 8.53% when it should have been 9.81%, which would make the cost of capital calculation rise to 8.51% under WCTL's own approach. (Id. at 8.) AAR states that if WCTL's debt cost mistake is also corrected from 3.64% to 3.43%, WCTL's cost-of-capital calculation becomes 8.46%, which is only slightly different from the AAR's calculated figure of 8.86%. (Id.)

OE has examined the underlying data and has determined that AAR's assessment of the market-risk premium complies with the Board's cost-of-capital methodology. WCTL's MRP arguments, disputing the use of the 1926-based MRP, are a challenge to the Board's cost-of-capital methodology, similar to the issues recently raised in Docket No. EP 664 (Sub-No. 2). As indicated earlier, the annual determination is not the appropriate forum for such arguments

Multi-Stage Discounted Cash Flow

The cost of equity in a Discounted Cash Flow (DCF) 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 2012-2016 periods by the total sales over the same period. (AAR Opening, V.S. Gray 39.) To obtain the 2016 average cash flow, the cash-flow-to-sales ratio is multiplied by the sales revenue from 2016. (Id.) The 2016 average cash flow figure is then used as the starting point of the Morningstar/Ibbotson MSDCF model. (Id. at 38-39.) The initial value of IBEI is determined through the same averaging process for the cash flows in stages one and two. (Id. at 38.) According to AAR, the data inputs in the cash flow formula were retrieved from the railroads' 2012-2016 10-K filings with the SEC. (Id. at 40.) OE has reviewed the evidence on cash flow and verified that the AAR has used the correct data inputs for the cash flow formula.

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 and 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 5.19% was calculated by using the sum of the figures for long-run expected growth in real output (3.22%)[16] and long-run expected inflation (1.97%). (AAR Opening, V.S. Gray 44-45.) [17]

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

[17] 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 43.) AAR states that this publication has been

(continued . . .)

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 2016.

WCTL Stock Buyback Argument

WCTL points out that it has raised questions during the EP 664 (Sub-No. 2) rulemaking proceeding about whether stock buybacks are adequately addressed under the Board's MSDCF model for calculating the cost of equity. As WCTL itself recognizes, the rulemaking, and not this proceeding, is the proper forum for addressing these issues. (See WCTL Reply 2.)

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 30, 2016, and shares outstanding from the 2016 Q3 10-Q reports filed with the SEC. (AAR Opening 46.)

OE has reviewed AAR's evidence. Based on that review, the Board finds that the market values used in the 2016 estimate of the cost of equity using the Morningstar/Ibbotson MSDCF are correct.

Cost of Common Equity Capital Using MSDCF

Based on the verified inputs discussed above, AAR estimates a MSDCF cost of equity of 10.44% (AAR Opening, V.S. Gray 47), which the Board adopts. 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.

(. . . continued)
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 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, 2014, and 2015 cost-of-capital determinations. (Id.) For the 2016 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 Classic Yearbook. (Id.) To replace the SBBI long-term government yields, AAR used the 20-year U.S. Treasury Bond yields, which it contends are very close to the SBBI long-term government yields. (Id. at 44.) Appendix M in AAR's opening statement contains the calculations for the stage three growth rate for 2013 through 2016. (Id., App. M.) OE has reviewed AAR's approach and finds it to be reasonable.

Cost of Common Equity

Based on the evidence provided, we conclude that the railroad cost of equity in 2016 was 10.31%. (See AAR Opening, V.S. Gray 48.) This figure is based on an estimate of the cost of equity using a CAPM of 10.18% and a MSDCF estimate of 10.44%. **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 – 2015, EP 558 (Sub-No. 19), slip op. at 14. AAR computed the market value of preferred equity during 2016 to be $6.656 million. (AAR Opening, V.S. Gray 51.) AAR computed the cost of preferred equity to be 3.64%. (Id. at 52.)

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 $36.544 billion, $139.592 billion, and $6.7 million respectively. The percentage share of debt increased, from 18.16% in 2015 to 20.75% in 2016. The percentage share of common equity decreased, from 81.84% in 2015 to 79.25% in 2016. The percentage of preferred equity for 2016 was de minimis.[18] 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 2016 capital structure mix.

COMPOSITE COST OF CAPITAL

Based on the evidence furnished in the record, the 2016 composite after-tax cost of capital for the railroad industry, as set forth in **Table 16** in the Appendix, was 8.88%. The

[18] The weight for preferred equity is 0.0038%, which rounds to 0.00%. (See AAR Opening 2, n.1.)

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 2016 cost of capital was 0.73 percentage points lower than the 2015 cost of capital (9.61%). See R.R. Cost of Capital – 2015, EP 558 (Sub-No. 19), slip op. 14.

CONCLUSIONS

The Board finds that for 2016:

1. The cost of railroad long-term debt was 3.43%.

2. The cost of common equity was 10.31%.

3. The cost of preferred equity was 3.64%.

4. The capital structure mix of the railroads was 20.75% long-term debt, 79.25% common equity, and 0.00% preferred equity.

5. The composite railroad industry cost of capital was 8.88%.

It is ordered:

1. This decision is effective on September 6, 2017.

2. This proceeding is discontinued.

By the Board, Board Members Begeman, Elliott, and Miller.

APPENDIX

Table 1
2016 Traded & Non-traded Bonds

Railroad	Traded vs. Non-traded	Number	Market Value ($000)	% Market Value to All Bonds
CSX	Traded[1]	27	$10,241,181	97.58%
	Non-traded	3	254,338	2.42%
	Total	30	10,495,519	100.00%
KCS	Traded[2]	12	1,132,975	86.03%
	Non-traded	6	184,019	13.97%
	Total	18	1,316,994	100.00%
NSC	Traded[3]	25	10,947,983	99.23%
	Non-traded	2	84,902	0.77%
	Total	27	11,032,885	100.00%
UPC	Traded[4]	39	12,171,892	99.94%
	Non-traded	3	6,810	0.06%
	Total	42	12,178,702	100.00%
Composite	Traded	103	$34,494,031	98.49%
	Non-traded	14	530,069	1.51%
	Total	117	35,024,100	100.00%

[1] Includes 3 bonds issued during 2016, prorated based on date of issue.
[2] Includes 6 bonds issued during 2016, prorated based on date of issue.
[3] Includes 1 bonds issued during 2016, prorated based on date of issue.
[4] Includes 6 bonds issued during 2016, prorated based on date of issue.

Table 2
2016 Bonds, Notes, & Debentures

Railroad	Number of Traded Issues	Market Value Traded Issues ($000)	Current Cost	Weighted Cost
CSX	27	$10,241,181	3.700%	1.099%
KCS	12	1,132,975	3.588%	0.118%
NSC	25	10,947,983	3.499%	1.111%
UPC	39	12,171,892	3.022%	1.066%
Composite	**103**	**$34,494,031**		**3.393%**

Table 3
2016 Equipment Trust Certificates

Railroad	No. 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	1,068,200	2.494%	26,638
Composite	**5**	**$1,068,200**	**2.494%**	**$26,638**

Table 4
2016 Conditional Sales Agreements

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

Table 5
2016 Capitalized Leases & Miscellaneous Debt

Railroad	Capitalized Leases ($000)	Miscellaneous Debt[1] ($000)	Total Other Debt ($000)
CSX	$4,918	$(186,825)	$(181,907)
KCS	12,005	(30,491)	(18,486)
NSC	1,638	(383,734)	(382,096)
UPC	1,100,806	(66,942)	1,033,864
Composite	**$1,119,367**	**$(667,992)**	**$451,375**

[1] Miscellaneous debt includes unamortized debt discount.

Table 6
2016 Market Value of Debt

Type of Debt	Market Value of Debt ($000)	Percentage of Total Market Value (Excluding Other Debt)
Bonds, Notes, & Debentures	$35,024,100	97.04%
ETCs	1,068,200	2.96%
CSAs	0	0.00%
Subtotal	36,092,300	100.00%
Capitalized Leases/Miscellaneous Debt	451,375	NA
Total Market Value of Debt	**$36,543,675**	**NA**

Table 7
2016 Flotation Cost for Debt

Type of Debt	Market Weight (Excludes Other Debt)	Flotation Cost	Weighted Average Flotation Cost
Bonds, Notes, & Debentures	97.04%	0.067%	0.0650%
ETCs	2.96%	0.072%	0.0021%
CSAs	0.00%	0.000%	0.0000%
Total	**100.00%**		**0.067%**

Table 8
2016 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	97.04%	3.393%	3.2929%
ETCs	2.96%	2.494%	0.0738%
CSAs	0.00%	0.00%	0.0000%
Subtotal	100.00%		3.367%
Flotation Cost			0.067%
Weighted Cost of Debt			**3.43%**

Table 9
2016 Summary Output

Regression Statistics					
Multiple R	0.669503				
R-Square	0.448234				
Adjusted-R Square	0.446104				
Standard Error	0.020978				
Observations	261				
ANOVA					
	Df	SS	MS	F	Significance F
Regression	1	0.092593	0.092593	210.402	2.66E-35
Residual	259	0.11398	0.00044		
Total	260	0.206574			
	Coefficients	Standard Error	T Stat	P-Value	
Intercept	0.000263	0.001311	0.200236	0.841453	
X-Variable	1.146744	0.079057	14.50524	2.66E-35	

Table 10
2016 CAPM Cost of Common Equity

Risk-Free Rate (RF)	2.22%	
RF+(Beta x Market Risk Premium)	2.22% + (1.1467 x6.94%)	10.18%
Cost of Equity		**10.18%**

Table 11
2016 MSDCF Railroad Cost of Equity
($ in millions)

Railroad	CSX		KCS		NSC		UPC	
Initial CF	$960		$54		$845		$3,006	
Input for Terminal CF	$1,742		$429		$1,617		$4,133	
Stage 1 Growth Rate	5.10%		8.12%		10.17%		6.49%	
Stage 2 Growth Rate	7.47%		7.47%		7.47%		7.47%	
Stage 3 Growth Rate	5.19%		5.19%		5.19%		5.19%	
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	$1,009	$916	$58	$53	$931	$838	$3,201	$2,898
2	1,061	874	63	52	1,025	831	3,408	2,795
3	1,115	834	68	52	1,129	825	3,630	2,695
4	1,171	796	74	51	1,244	818	3,865	2,599
5	1,231	760	79	50	1,371	812	4,116	2,506
6	1,323	741	85	49	1,473	786	4,423	2,439
7	1,422	724	92	48	1,583	761	4,754	2,374
8	1,528	706	99	47	1,702	736	5,109	2,310
9	1,642	689	106	46	1,829	713	5,491	2,248
10	1,765	672	114	46	1,965	690	5,901	2,188
Terminal	$68,112	$25,941	$21,609	$8,633	$67,657	$23,740	$162,880	60,392
ΣPV	$33,654		$9,128		$31,550		$85,444	
Market Value	$33,654		$9,128		$31,550		$85,444	
COE	10.13%		9.61%		11.04%		10.43%	
Weighted COE	2.13%		0.55%		2.18%		5.58%	
COE	**10.44%**							

Table 12
2016 Cost of Common Equity Capital

Model	
Capital Asset Pricing Model	10.18%
Multi-Stage Discounted Cash Flow	10.44%
Cost of Common Equity	**10.31%**

Table 13
2016 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	$27.484	3.64%	242,170	$6,656	100.00%	3.64%
NSC	0	0	0.00%			0.00%	0.00%
UPC	0	0	0.00%			0.00%	0.00%
Composite					**$6,656**		**3.64%**

Table 14
2016 Average Market Value for Common Equity

Railroad	Average Market Value ($000)	Average Market Weight
CSX	$29,795,265	21.34%
KCS	9,527,377	6.83%
NSC	26,072,879	18.68%
UPC	74,196,795	53.15%
COMPOSITE	**$139,592,316**	**100.00%**

Table 15
2016 Capital Structure Mix

Railroad	Type of Capital	Market Value ($000)	Weight
CSX	Debt	$10,313,612	25.71%
	Equity	29,795,265	74.29%
	P. Equity	0	0.00%
KCS	Debt	1,298,508	11.99%
	Equity	9,527,377	87.95%
	P. Equity	6,655	0.06%
NSC	Debt	10,650,789	29.00%
	Equity	26,072,879	71.00%
	P. Equity	0	0.00%
UPC	Debt	14,280,766	16.14%
	Equity	74,196,795	83.86%
	P. Equity	0	0.00%
Composite Weight	Debt	36,543,675	20.75%
	Equity	139,592,316	79.25%
	P. Equity	6,656	0.00%
	Total	$176,142,647	100.00%

Table 16
2016 Cost-of-Capital Computation

Type of Capital	Cost	Weight	Weighted Average
Long-Term Debt	3.43%	20.75%	0.71%
Common Equity	10.31%	79.25%	8.17%
Preferred Equity	3.64%	0.00%	0.00%
Composite Cost of Capital		**100.00%**	**8.88%**