

SERVICE DATE – APRIL 15, 2008

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SURFACE TRANSPORTATION BOARD

DECISION

STB Ex Parte No. 558 (Sub-No. 10)

RAILROAD COST OF CAPITAL — 2006

Decided: April 14, 2008

Upon review of the evidence tendered in this proceeding, the Board finds that, in 2006, the railroad industry had an after-tax cost of capital of 9.94%, based on: (1) a current cost of debt of 5.97%; (2) a current cost of common equity of 11.13%; and (3) a capital structure mix of 23.05% debt and 76.95% common equity.

BY THE BOARD:

One of the Board's regulatory responsibilities is to determine annually the railroad industry's cost of capital.¹ This determination is one component used in evaluating the adequacy of individual railroads' revenues each year pursuant to 49 U.S.C. 10704 (a)(2) and (3). See Standards for Railroad Revenue Adequacy, 364 I.C.C. 803 (1981), modified, 3 I.C.C.2d 261 (1986), aff'd sub nom. Consolidated 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 line.

In the instant proceeding, we must calculate the cost of capital experienced by the railroad industry in 2006. In instituting this proceeding, in a decision served May 16, 2007, we noted that we were contemplating a change to the method used by the Board to estimate the cost of equity. Parties were advised that we might need to obtain supplemental evidence to implement a new methodology.

In response, the Association of American Railroads (AAR) provided the type of information that previously had been used in making the annual cost-of-capital determination, most recently in Railroad Cost of Capital - 2005, STB Ex Parte No. 558 (Sub-No. 9) (STB served Sept. 20, 2006). The Western Coal Traffic League (WCTL) submitted reply comments objecting to the continued use of the prior procedures and providing its alternate calculations.

¹ 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.

In January 2008, the Board changed its procedures, calculating the railroad industry's cost of equity, in Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No. 664 (STB served Jan. 17, 2008) (CAPM Methodology). Specifically, we decided to estimate the cost of equity using a capital asset pricing model (CAPM) approach. In a separate decision in this proceeding, also released January 17, 2008, we directed the Class I railroads to provide the information needed to apply the CAPM.

On February 1, 2008, we received a submission from AAR applying the CAPM to develop an estimate of the industry's cost of equity and resulting cost of capital. On February 15, 2008, WCTL filed a reply arguing that, contrary to the STB's express intent in its final decision adopting the CAPM Methodology, AAR had relied on *proprietary* data for a key input for its CAPM calculations. WCTL further argues that AAR improperly calculated the portfolio return of the railroad industry. Finally, WCTL contends that the Board should adopt a market risk premium of 7.1%, not the 7.13% advocated by the AAR. AAR filed a rebuttal statement on February 29, 2008, responding to these assertions, but making no changes to its calculations.

Consistent with previous cost-of-capital proceedings, AAR calculated the cost of capital for a "composite railroad" based on criteria developed in the Railroad Cost of Capital – 1984, 1 I.C.C.2d 989 (1985).² The following railroad holding companies meet these criteria: Burlington Northern Santa Fe Corporation (BNSF), CSX Corporation (CSX), Norfolk Southern Corporation (NSC), and Union Pacific Corporation (UPC).³

As discussed below, we have examined the procedures used by the AAR to calculate for 2006: (1) the railroad industry's cost-of-debt capital; (2) its cost of common equity capital; (3) its cost of preferred capital;⁴ (4) its capital structure; and (5) the composite after-tax cost of capital. We estimate that the 2006 railroad cost of capital was 9.94%.

DEBT CAPITAL

AAR developed its 2006 current cost of debt using bond price data from Standard & Poor's Corporation *Bond Guide* and a Standard & Poor's database for those bonds not traded. AAR's cost-of-debt figure is based on the market-value yields of the major forms of long-term debt instruments for the sample railroad holding companies listed above. 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.

² The composite railroad includes those Class I carriers that: (1) are listed on either the New York or American Stock Exchange; (2) paid dividends throughout the year; (3) had rail assets greater than 50% of its total assets; and (4) had a debt rating of at least BBB (Standard & Poor's) and BAA (Moody's).

³ These are the same companies used in our 2005 determination.

⁴ There was no preferred stock outstanding in the year 2006.

Cost of Bonds, Notes, and Debentures (Bonds)

AAR used data contained in Standard & Poor's *Bond Guide* for the current cost of bonds, based on monthly prices and yields during 2006, for all issues (a total of 62) that were publicly traded during the year. To develop the current (in 2006) market value of bonds, AAR used these traded bonds and 51 additional bonds that were outstanding but not traded during 2006. Continuing 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 \$21.51 billion (\$16.40 billion traded, and \$5.11 billion non-traded). Based on the yields for the traded bonds, AAR calculated the weighted average 2006 yield for all bonds to be 5.796% (rounded to 5.80%). We have examined AAR's bond price and yield data and have determined that AAR's computations are correct. Our 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 2006 yields for these government securities, AAR added basis points⁵ to these yields to compensate for the additional risks associated with the ETCs.

No new ETCs were issued during 2006. There were 30 ETCs issued prior to 2006 that were outstanding during the year. As in Ex Parte No. 486, Railroad Cost of Capital – 1989⁶ and prior proceedings, the publication *Analytical Record of Yields and Yield Spreads* prepared by the Bond Market Research Department of Salomon Brothers, Inc., was used as a proxy for ETCs of the same rating where there were no new ETC issues of a particular rating. AAR calculated that the yield spread for ETCs was 114 basis points higher than the yield for government bonds.⁷ Using the yield spreads, AAR calculated the weighted average cost of ETCs to be 6.006% (rounded to 6.01%)⁸ and their market value to be \$929.296 million for 2006.⁹

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

⁶ 6 I.C.C.2d 836 (1990).

⁷ This figure is the same as the spread used in 2005.

⁸ This is substantially higher than the 2005 figure of 5.38%.

⁹ AAR has approximated the market values of ETCs using the same procedures used in previous cost-of-capital determinations.

We have examined the cost and market value of the ETCs using AAR's data, and have determined that AAR should have included non-modeled ETCs in Miscellaneous Debt.¹⁰ A summary of our ETC computations is shown in **Table 3** in the **APPENDIX**.

Cost of Conditional Sales Agreements (CSAs)

CSAs represent a small fraction (less than 1%) of total railroad debt, and only three CSAs (issued by CSX) were outstanding in 2006. The cost of CSAs can be estimated by adding an additional factor to the yield spread between government bonds and ETCs. AAR used the yield spread between CSAs and ETCs for 1997 (the last year when a new CSA was issued) of 32 basis points to develop the year 2006 yield spread between CSAs and government bonds. These 32 basis points are added to the 114 basis point spread between government bonds and ETC. As a result, AAR estimates that 146 basis points must be added to government bond yields to develop the cost of CSAs.¹¹ Using this yield spread, AAR calculated the weighted average cost of CSAs for 2006 to be 6.32%. AAR calculated the market value for CSAs to be \$122.4 million. We have examined the cost and market value of the CSAs using AAR's data, and have determined that AAR should have included non-modeled CSAs in Miscellaneous Debt.¹² **Table 4** in the **APPENDIX** shows the market value of all modeled CSAs to be \$74.5 million.

Capitalized Leases and Miscellaneous Debt

As in previous cost-of-capital determinations, AAR excluded the costs 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 leases and commercial paper in the overall market value of debt, which is used to determine the railroads' capital structure mix. AAR noted that the cost of capitalized leases is generally higher than that of other debt, but it did not make any upward correction for the cost of those leases. AAR calculated that the market value for the capitalized leases and miscellaneous debt was \$2.783 billion for 2006.¹³ We have examined AAR's workpapers and other evidence and have determined that, as noted above, AAR did not include the market value of non-modeled ETCs (average book value) or non-modeled CSAs in Miscellaneous Debt. **Table 5** in the **APPENDIX** shows our recalculations for capitalized leases and miscellaneous debt to be \$3.079 billion.

¹⁰ ETCs can fail to be modeled for two reasons: (1) the instrument labeled by a railroad as an ETC does not have all the characteristics typical of an ETC; or (2) the ETC has a floating (instead of fixed) rate, making its rate for a particular future year uncertain.

¹¹ These are the same numbers as used in the 2005 determination.

¹² CSAs can fail to be modeled for two reasons: (1) the instrument labeled by a railroad as a CSA does not have all of the characteristics typical of a CSA; or (2) the CSA has a floating (instead of fixed) rate, making its rate for a particular future year uncertain.

¹³ This consists of \$2.09 billion of capitalized leases and \$0.693 billion of miscellaneous debt.

Total Market Value of Debt

AAR calculated that the total market value for all debt during 2006 was \$25.595 billion. Our minor restatement of non-modeled ETCs and non-modeled CSAs does not materially affect the calculation. **Table 6** in the Appendix shows a breakdown of the market value of debt.

Flotation Costs of Debt

As in past cost-of-capital decisions, AAR's calculation of the current cost-of-debt included a flotation cost factor consisting of costs associated with the issuance of new debt such as underwriters' fees, advertising costs, and legal fees. AAR calculated that flotation costs for debt equaled 0.159% (rounded to 0.16%). We have reviewed AAR's calculations concerning flotation costs and find that the cost factors developed for the various components of debt are reasonable.¹⁴ **Table 7** in the APPENDIX shows these calculations.

Overall Current Cost of Debt

AAR concluded that the railroads' cost-of-debt for 2006 was 5.97%.¹⁵ Our minor restatement of non-modeled ETCs and non-modeled CSAs does not materially affect the calculation. Our calculations are shown in **Table 8** in the Appendix.

COMMON EQUITY CAPITAL

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 , we asked the railroads to provide the average yield to maturity in 2006 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, we instructed parties to calculate beta using a portfolio of weekly, merger-adjusted railroad stock returns for the prior 5 years in the following equation:

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

$$\alpha = \text{constant term;}$$

$$R = \text{merger-adjusted stock returns for the portfolio of railroads that meet the screening criteria set forth in } \textit{Railroad Cost of Capital} - 1984, 1 \text{ I.C.C.2d 989 (1985)}$$

¹⁴ AAR's flotation cost factors are based on data developed by Salomon Brothers for ETCs and studies by the Securities and Exchange Commission concerning flotation costs for issuances of new bonds. The estimated flotation cost for CSAs is the same as that used in prior years.

¹⁵ This is slightly higher than the 2005 cost of debt (5.36%). As explained above, our measurement of the railroads' cost of debt entails the calculation of a weighted average of the current yields of the various debt instruments issued by the four railroads in our sample.

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

AAR argues that the risk-free rate in 2006 was 5.00%, a figure it obtained from the Federal Reserve Board’s website. On reply, WCTL argues that we should use a figure of 4.99% for the risk free rate, a number that WCTL had earlier submitted in this proceeding. Parties have urged us to make the calculation of the cost of capital as transparent as possible, and we believe that the Federal Reserve Board – the agency tasked with managing the nation’s money supply by buying and selling U.S. Treasury bonds – is an authoritative source for these data. Accordingly we concur with AAR that 5.00% is an appropriate measure of the risk-free rate in 2006.

RP – The Market-Risk Premium

To establish the market-risk premium, AAR relies on the Ibbotson Equity Risk Premium, a well-regarded source. As we noted in our January 17, 2008 decision asking for supplemental evidence in this proceeding, Ibbotson was one of the firms that provides estimates of the market-risk premium. For 2006, the market-risk premium reported by Ibbotson was 7.13%. WCTL argues that this figure should be rounded down to 7.10% and points to examples where Ibbotson itself often reports the figure this way. On rebuttal, AAR argues that the 7.13% figure should be used because it is more precise than the rounded-off figure and is consistent with the risk-free rate figure discussed above (that is, reported at two digits after the decimal). We agree with the AAR on this point, and will also report our final cost-of-capital figure at two digits after the decimal.

Calculating Beta

The parties disagree on how to calculate beta. First, they disagree on how to calculate the portfolio change. Second, WCTL asserts that AAR has relied on proprietary data in calculating the beta. We will address both of these issues in turn.

Beta is a measure of the sensitivity of an asset’s returns to market returns, the non-diversifiable or systematic risk associated with a particular asset. One calculates beta using a linear regression analysis. That is, we find the best-fitting line that links the changes in a portfolio of railroad stocks against changes in the S&P 500 Index. WCTL observes that the AAR has not done this, but instead has examined changes in the railroad industry’s market capitalization as a whole. AAR asserts that the sum of the market capitalizations of the relevant firms represents the portfolio value for any given week. We disagree. Our intent is to calculate merger-adjusted *stock* returns, not changes in the market capitalization as a whole. Thus, if a carrier “watered down” its stock by putting a large block of shares on the market, it could

increase its total market capitalization while delivering a loss to its existing shareholders. Beta ought to reflect changes in railroad stock prices, not changes in railroad market capitalization.

The proper way to arrive at the weekly portfolio change is to calculate the weekly stock percentage change for each firm, weighted by that firm's share of the industry as a whole.¹⁶ As a practical matter, the differences between our approach and that advocated by the AAR are very slight. Nevertheless, we agree with WCTL on this point and will calculate the Beta on this basis.

On the second issue, WCTL complains that AAR has relied on a proprietary data source, the S&P 500 Total Return. This is disconcerting. All parties in CAPM Methodology, including AAR and its expert witnesses, objected to the Board's original proposal to rely on a proprietary data source (the New York Stock Exchange Index available from the Center for Research in Security Prices) and urged us, instead, to rely on the S&P 500, which they represented was publicly available. It now appears that the relevant index from Standard and Poor's is not publicly available after all. Rather, it is the S&P 500 Price Return Index (which excludes dividend distribution), not the S&P 500 Total Return Index, which is publicly available. Over time, the two indexes diverge as dividend payments compound. Week to week, however, the percentage changes in these indexes mirror each other almost perfectly. Indeed, as we demonstrate in **Table 9, 10, and 11** in the **APPENDIX**, we found an almost perfect correlation between the two approaches.

As such, using the publicly available price index rather than the confidential total return index has no material effect on our analysis. Using the price index increases our estimate of the cost of capital by one-one hundredth of a percentage point. We conclude, therefore, that it is perfectly acceptable to rely on changes in the S&P 500 Price Return Index and reject the AAR's reliance on a proprietary data source. Should S&P make its total return index available to the public in the future, we would again consider relying on that index. Otherwise, we will rely on the publicly available data to promote transparency and predictability.

Cost of Common Equity Capital

Having made small changes to AAR's submission with respect to the portfolio and to the S&P 500 index, we calculate the beta as 0.8604. This is only marginally different from AAR's estimate of 0.864. We therefore calculate the cost of equity as $RF + \beta \times RP$, or $5.00\% + (0.8604 \times 7.13\%)$, which equals 11.13%. **Table 12** in the Appendix shows the calculations of the Cost of Common equity.

AAR calculated the 2006 market value of common equity for each railroad by calculating weekly market values for each railroad using data on shares outstanding from railroad 10-Q and 10-K reports multiplied by stock prices at the close of each week in 2006. AAR calculated the

¹⁶ Imagine two firms, one accounting for 25% of the industry's market capitalization at the start of a particular week, the other accounting for the remaining 75%. Suppose the first firm logs a 10% return over the subsequent week while the second, larger firm records a gain of 2%. In this case, the weekly portfolio change would be 4%. That is, $0.10 \times 0.25 + 0.02 \times 0.75 = 0.025 + 0.015 = 0.04$ or 4%.

52-week average market capitalization of the composite railroad to be \$85.438 billion. We have reviewed AAR's calculations and have determined that this number is correct. **Table 13** in the Appendix shows the calculations of the average market value of common equity and relative weights for each railroad.

PREFERRED EQUITY

Preferred equity has some of the characteristics of debt and some of the characteristics of equity. Essentially, preferred 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 like debt in that they usually have fixed dividend payments (akin to interest payments).

There were no preferred stock issues outstanding at the end of 2006.

CAPITAL STRUCTURE MIX

Our computations of market values and the capital structure mix for 2006 are shown in **Table 14** in the **APPENDIX**. We have determined that the market value of bonds and common equity for 2006 was \$85.438 billion. The percentage share of common equity increased significantly, from 69.59% in 2005 to 76.95% in 2006. The percentage share of debt decreased, from 30.41% in 2005 to 23.05% in 2006.

COMPOSITE COST OF CAPITAL

Based on the evidence furnished in the record, and our adjustments to that evidence discussed above, we conclude that the 2006 composite after-tax cost of capital for the railroad industry, as set forth in **Table 15** in the **APPENDIX**, was 9.94%. 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."¹⁷ The 2006 cost-of-capital was 2.26 percentage points lower than the 2005 cost-of-capital (12.2%).

CONCLUSIONS

We find that for 2006:

1. The current cost of railroad long-term debt was 5.97%.
2. The cost of common equity was 11.13%.
3. The capital structure mix of the railroads was 23.05% long-term debt and 76.95% common equity.

¹⁷ Railroad Accounting Principles Board *Final Report*, Vol. 1 (1987).

4. The composite railroad industry cost of capital was 9.94%.

Environmental and Energy Considerations

We conclude that this action will not significantly affect either the quality of the human environment or the conservation of energy resources.

Regulatory Flexibility Analysis

Pursuant to 5 U.S.C. 605(b), we conclude that our action in this proceeding will not have a significant economic impact on a substantial number of small entities. The purpose and effect of the action are merely to compute the annual railroad industry cost of capital. No new reporting or other regulatory requirements are imposed, directly or indirectly, on small entities.

It is ordered:

1. This decision is effective on April 15, 2008.
2. This proceeding is discontinued.

By the Board, Chairman Nottingham, Vice Chairman Mulvey, and Commissioner Buttrey.

Anne K. Quinlan
Acting Secretary

APPENDIX

Table 1
2006 Traded & Non-traded Bonds

Railroad	Traded vs. Untraded	Number	Market Value (\$ in 000)	% Market Value to All Bonds
BNSF	Traded ¹	24	\$4,493,989	81.73%
	Non-traded	9	1,004,553	18.27%
	Total	33	5,498,542	
CSX	Traded ²	12	2,418,571	52.16%
	Non-traded ³	19	2,218,537	47.84%
	Total	31	4,637,108	
NSC	Traded	13	5,527,883	86.24%
	Non-traded	6	881,644	13.76%
	Total	19	6,409,527	
UPC	Traded	13	3,964,162	79.82%
	Non-traded	17	1,002,151	20.18%
	Total	30	4,966,313	
Composite	Traded	62	\$16,404,605	76.26%
	Non-traded	51	5,106,885	23.74%
	Total	113	21,511,490	
¹ Includes 1 bond issued during 2006, prorated based on date of issue. ² Includes 1 bond issued during 2006, prorated based on date of issue. ³ Includes 1 bond issued during 2006, prorated based on date of issue.				

Table 2
2006 Bonds, Notes, & Debentures

Railroad	Number of Traded Issues	Market Value Traded Issues (\$000)	Current Cost	Weighted Cost
BNSF	24	\$4,493,989	5.84%	1.60%
CSX	12	2,418,571	5.60%	0.83%
NSC	13	5,527,883	5.96%	2.01%
UPC	13	3,964,162	5.64%	1.36%
Composite	62	\$16,404,605		5.80%

Table 3
2006 Equipment Trust Certificates

Railroad	No. of Issues	Market Value (\$000)	Yield %	Weighted \$ Yield (\$000)
BNSF	11	\$315,007	6.01%	\$18,922
CSX	10	287,070	6.00%	17,227
NSC	5	157,391	6.00%	9,440
UPC	4	169,828	6.02%	10,224
Composite	30	\$929,296	6.01%	\$55,813

Table 4
2006 Conditional Sales Agreements

Railroad	Number of Issues	Market Value (\$000)	Current Cost	Weighted Cost
CSX	2	\$74,489	6.32%	6.32%
Composite	2	\$74,489		6.32%

Table 5
2006 Capitalized Leases & Miscellaneous Debt

Railroad	Capitalized Leases (\$000)	Miscellaneous Debt ³ (\$000)	Total Other Debt (\$000)
BNSF	\$605,853	\$866,773	\$1,472,626
CSX	89,368	203,634	293,002
NSC ¹	159,599	(12,386)	147,213
UPC ²	1,236,301	(69,893)	1,166,408
Composite	\$2,091,121	\$988,128	\$3,079,249
¹ NSC has negative miscellaneous debt as a result of net premium discount. ² UPC has negative miscellaneous debt as a result of unamortized debt premium. ³ Miscellaneous Debt also includes non-modeled ETCs and non- modeled CSAs.			

Table 6
2006 Market Value of Debt

Type of Debt	Market Value of Debt (\$000)	Percentage of Total Market Value (Excluding Mis- cellaneous Debt)
Bonds, Notes, & Debentures	\$21,511,490	95.54%
ETCs	929,296	4.13%
CSAs	74,489	.33%
Subtotal	\$22,515,275	100.00%
Capitalized Leases/Miscellaneous Debt	3,079,249	NA
Total Market Value of Debt	\$25,594,524	NA

Table 7
2006 Flotation Cost For Debt

Type of Debt	Market Weight (Excludes Miscellaneous Debt)	Flotation Cost	Weighted Average Flotation Cost
Bonds, Notes, & Debentures	95.54%	0.16%	0.153%
ETCs	4.13%	0.13%	0.005%
CSAs	0.33%	0.13%	0.001%
Total	100.00%		0.159%

Table 8
2006 Cost of debt

Type of Debt	Percentage of Total Market Value (Excludes Miscellaneous Debt)	Debt Cost	Weighted Debt Cost (Excluding Miscellaneous Debt)
Bonds, Notes, & Debentures	95.54%	5.80%	5.54%
ETCs	4.13%	6.01%	0.25%
CSAs	0.33%	6.32%	0.02%
Subtotal			5.81%
Flotation Cost			0.16%
Weighted Average Cost of Debt			5.97%

Table 9
Results of a Linear Regression Analysis

Regression Statistics		The S&P 500 Price Index Against the S&P 500 Total Return Index			
Multiple R	0.999851901				
R-Square	0.999703824				
Adjusted-R Square	0.999702676				
Standard Error	0.000329556				
Observations	260				
ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.094580286	0.094580286	870845.3629	0
Residual	258	2.80207E-05	1.08607E-07		
Total	259	0.094608306			
	Coefficients	Standard Error	T Stat	P-Value	
Intercept	-0.000341098	2.04558E-05	-16.67485859	7.38035E-43	
X-Variable	0.998380401	0.001069856	933.1909574	0	

Note that the correlation between these two indexes is an almost perfect fit. The R square is **0.9997**, where **1.000** is a perfect fit. Also note that the slope of the coefficient is also nearly 1. This suggests that a 1 percent change in the price index implies a 1 percent change in the Total return index. Thus, the two indexes are nearly identical for our purposes and we can safely rely on the publicly available price return Index.

Table 10
Summary Output

Regression Statistics		Beta measured against S&P 500 Price return Index, 2002-2006			
Multiple R	0.573676834				
R-Square	0.32910511				
Adjusted-R Square	0.326504742				
Standard Error	0.023523511				
Observations	260				
ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.070033224	0.070033224	126.5609852	3.73361E-24
Residual	258	0.142765733	0.000553356		
Total	259	0.212798957			
	Coefficients	Standard Error	T Stat	P-Value	
Intercept	0.002515597	0.001459273	1.723869293	0.085929344	
X-Variable	0.860374293	0.076478173	11.24993268	3.73361E-24	

Table 11
Summary Output

Regression Statistics		Beta measured against S&P 500 Total Return Index, 2002-2006			
Multiple R	0.572818922				
R-Square	0.328121517				
Adjusted-R Square	0.325517337				
Standard Error	0.023540748				
Observations	260				
ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.069823917	0.069823917	125.9980096	4.5169E-24
Residual	258	0.14297504	0.000554167		
Total	259	0.212798957			
	Coefficients	Standard Error	T Stat	P-Value	
Intercept	0.002223043	0.001461193	1.521388914	0.129386898	
X-Variable	0.857823302	0.076421577	11.2248835	4.5169E-24	
Note that the difference between the two estimates of beta is 0.002550992 . This is smaller than the standard error associated with either beta estimates.					

Table 12
2006 Cost of Common Equity

Risk-Free Rate (RF)	5.00%	
RF + Beta x Market Risk Premium	5.00% + (0.8604 x 7.13%)	.1113
Cost of Equity		11.13%

Table 13
2006 Common Equity

Railroad	Average Market Value (\$000)	Average Market Weight
BNSF	\$27,583,833.9	32.28%
CSX	14,030,922.9	16.42%
NSC	20,063,704.6	23.48%
UPC	23,760,184.3	27.81%
COMPOSITE	\$85,438,645.6	100.00%

Table 14
2006 Capital Structure Mix

Railroad	Type of Capital	Market Value	Weight
BNSF	Debt	\$7,286,175	20.90%
	Equity	27,583,834	79.10%
CSX	Debt	5,291,669	27.39%
	Equity	14,030,923	72.61%
NSC	Debt	6,714,131	25.07%
	Equity	20,063,705	74.93%
UPC	Debt	6,302,549	20.96%
	Equity	23,760,184	79.04%
Composite Weight	Debt	25,594,524	23.05%
	Equity	85,438,646	76.95%
	Total	111,033,170	100.0%

Table 15
2006 Cost-of-Capital Computation

Type of Capital	Cost	Weight	Weighted Average
Long-Term Debt	5.97%	23.05%	1.38%
Common Equity	11.13%	76.95%	8.56%
Composite Cost of Capital		100.00%	9.94%