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**BEFORE THE
SURFACE TRANSPORTATION BOARD**

METHODOLOGY TO BE EMPLOYED IN
DETERMINING THE RAILROAD INDUSTRY'S
COST OF CAPITAL

Ex Parte No. 664



**REPLY COMMENTS OF THE
ASSOCIATION OF AMERICAN RAILROADS**

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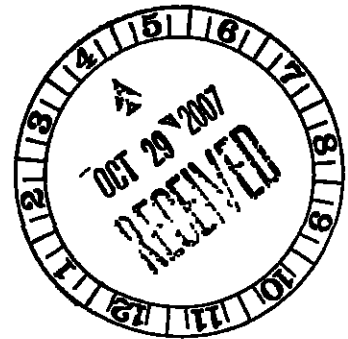
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Pursuant to the revised schedule established by the Board's decision served August 31, 2007, the Association of American Railroads ("AAR") and its members respectfully submit their Reply Comments in this proceeding. The AAR filed its initial comments ("AAR Comments") on September 27, 2007. AAR also submits in support of these Reply Comments

- (1) a Reply Verified Statement of R. Glenn Hubbard, Dean, Columbia School of Business, and Bruce E. Stangle, Chairman, Analysis Group, Inc. ("Hubbard/Stangle Reply V S"), and
- (2) a Reply Verified Statement of Stewart C. Myers, Robert C. Merton (1970) Professor of Financial Economics at MIT Sloan School of Management ("Myers Reply V S")

INTRODUCTION AND SUMMARY

The initial comments of the shippers and their allies offer no basis for the dramatic change that the Board proposes in the methodology for calculating the cost of capital – a change which would include the abandonment of the methodology that the Board has used for more than a quarter of a century. First, the Board has derived an unreasonably low cost of equity

estimate from the capital asset pricing model ("CAPM") by using unrealistically low input values

Second, underestimating the railroads' actual cost of capital, to the extent the allowed earnings were reduced as a result, almost certainly would lead to underinvestment in railroad plant capacity at a time when network capacity requirements are expected to grow rapidly. Hence, economic prudence dictates that the Board consider multiple data points; choose a value within the range of reasonable estimates thereby produced, and adopt a value above the midpoint of the range when (as here) anticipated growth in demand from ratepayers is expected to require large new capital investments in plant capacity. Implementation of an equity cost model—whether CAPM or discounted cash flow ("DCF")—by systematically adopting input values at (or below) the low end of the range of reasonableness may reduce shippers' freight costs in the short run. In the long run, however, this course would injure both shippers and railroads by leading to long-term underinvestment in plant capacity.

Third, failure to give any weight to the results of the DCF and other probative alternatives to CAPM would be arbitrary and irrational. The assumptions and inputs underlying the CAPM are as uncertain and laden with judgment as the inputs and assumptions of the DCF model.

The shippers have conceded many of these points in their initial comments, and in prior and contemporaneous statements in other forums. The chorus of shipper praise for the particular method of implementing the CAPM proposed by the Board likewise cannot obscure the fundamental flaws in that methodology. WCTL confirms that the underlying bases for the methodology cannot be found in the workpapers disclosed by the Board. Moreover, the shippers and their allies have not offered, and cannot offer, any defensible bases for the various inputs adopted by the Board. WCTL and the other shipper parties do little more than parrot the

assertion that the Board's proposed inputs are "reasonable " The shippers do not even attempt to reconcile this position with their support for much higher inputs in the electric utility and other rate cases where their own costs of service are at issue

Likewise, the shippers offer no serious challenge to the reality that railroads must be revenue adequate, and must earn an adequate return on invested capital, to make the necessary investments in their infrastructure to handle current and future capacity That railroads distribute some of their earnings to the companies' owners through dividends and buybacks does not make otherwise inadequate earnings adequate And the suggestion of the Western Coal Traffic League ("WCTL") that railroads can raise the capital they need by floating more debt is nothing more than the "funds flow" approach which the ICC correctly rejected more than 25 years ago as the benchmark for revenue adequacy – and which the Board has not proposed to resurrect here

Similarly, the shippers do not dispute that, if the CAPM is adopted with the particular input values that the Board proposes, the Board's calculation of the railroad industry's estimated cost of equity and cost of capital would decline by 40 percent or more The fundamental reality is that the cost of equity and weighted average cost of capital resulting from the Board's proposed model and inputs would be far below any reasonable estimates of the cost of equity using *either* CAPM *or* the DCF methodology They are even below the levels previously proposed by shipper groups such as the WCTL See AAR Comments at 6

Finally, the shippers fail to offer any principled defense of the Board's proposal to exclude any further use of the DCF, even as a reality check on the CAPM results Here again, the shippers simply ignore their own prior statements recognizing that maximizing the reliability of cost of capital estimates is best achieved by considering both the CAPM and the DCF And the shippers likewise make no mention of the evidence that a multi-stage DCF methodology, if implemented properly, should produce equity cost estimates that are consistent with the outputs

generated by a CAPM with reasonable inputs – and are substantially higher than the estimates produced by the Board's proposed model

ARGUMENT

I. THE BOARD HAS DERIVED AN UNREASONABLY LOW COST OF CAPITAL ESTIMATE FROM THE CAPM MODEL BY USING UNREALISTICALLY LOW INPUT VALUES.

The comments of other parties confirm that the inputs proposed by the Board to populate its CAPM model are unreliable and unreasonably low AAR Comments at 20-27 ¹

A. Risk-Free Return

The Board's decision to assume a risk-free return of 4.25 percent for 2005, based on the 10-year Treasury Bond rate, is not the only acceptable proxy for the risk-free return. At a minimum, the Board should compare its approach with two other reasonable proxies for the risk-free rate – the short-term T-Bill and long-term T-Bond – and make a reasoned determination as to which approach appears to be most appropriate. A reasonable estimate of the risk-free return, based on data for December 2005, is approximately 4.6 percent AAR Comments at 21

¹As AAR described in its initial Comments, the underlying bases for the Board's calculations of the cost of equity and the cost of capital in Tables 1 and 2 cannot be found in the workpapers made available by the Board, despite the Board's assertion to the contrary in its Notice. See AAR Comments at 16. For example, the formula and data used by the Board to calculate the market risk premium do not appear in the workpapers. The AAR's expert witnesses were able to replicate most (if not all) of the Board's calculations only through informed speculation and through the AAR's purchase of costly proprietary data that are not readily available to the public. The Board's failure to provide complete workpapers is contrary not only to its obligations under the Administrative Procedure Act, but also to its own standards governing evidentiary submissions by parties. See *id.* at 16-20. No other party disputes the inadequacy of the Board's workpapers. In fact, WCTL concedes this problem. WCTL asks the Board to use some source other than the proprietary data in question because the Board's data are subject to "unusually stringent confidentiality restrictions" which "prevent parties from including the actual data in their workpapers and force those that wish to review the STB's workpapers to procure the data on their own without then being able to resubmit it." WCTL Comments at 2 n.2

These conclusions are not seriously disputed by the comments (few of which even address the issue) *See* WCTL Comments at 5-6 (“the selection of the risk-free return does not appear to be, and should not be, an area of significant controversy”) WCTL effectively acknowledges that there is more than one reasonable proxy for the risk-free rate, noting that its own witnesses had previously used a 20-year Treasury bond *Id* at 5² Although Professor Mohanram asserts that the Board’s proposed use of a 10-year Treasury bond is inconsistent with “the usual practice espoused in the academic literature” to use a 1-month Treasury bill as the measure of the risk-free rate, he ultimately assumes a risk-free rate of 4.5 percent – which is almost identical to that estimated by the AAR Mohanram Comments at 16, 19

B. Market Risk Premium

The inputs used in the Board’s calculation of a market risk premium are also flawed First, apart from the inadequacy of the documentation provided by the workpapers produced by the Board, the 5.2 percent premium assumed by the Board is based on a time period (50 years) that is too short – an error that biases the estimated value of the risk premium downward and is contrary to the standard economic approach of using a time period that goes back as far as possible Second, the Board improperly used returns of long-term debt portfolios, with an average maturity considerably longer than 10 years, as a proxy for riskless returns; this error alone understates the risk premium by 0.5 percentage points Third, the Board did not use consistent risk-free return values for calculating both risk-free returns and the market risk premium In particular, the Board’s calculation of the historical market risk premium as the difference between the income return on 20-year Treasuries is inconsistent with its proposal to use the average yield to maturity on 10-year Treasuries AAR Comments at 21-25

² *See also* BNSF Comments, Hund V S at 6 (“all reasonable risk-free rates [should] be considered thoroughly in determining which is most appropriate and why”).

Most of the shippers do not even address the propriety of the Board's use of a 50-year period at all, and WCTL, the only shipper interest to do so, contents itself with the bromide that the 50-year period "appears reasonable." See WCTL Comments at 7. The unsoundness of limiting the time series to 50 years, however, cannot be evaded by being ignored. The consensus of economists is that fifty years is too short for measuring the market risk premium. Because the noise created by stock-market volatility makes it difficult to pin down the true average, the standard economic approach is to use even longer periods. That approach is particularly warranted in view of the abnormally low risk premiums during the past few years. AAR Comments at 22-23 & Myers V S. at 9-10, Myers Reply V S. at 6.

Many shippers themselves have recognized in their previous filings with the Board that a 50-year period is inadequate. Indeed, as recently as three months ago, WCTL witnesses Crowley and Fapp "used an 80-year average (1926-2005)" based on Ibbotson Associates data in their testimony in Ex Parte No. 558. See Hubbard/Stangle Reply V S. ¶ 12, WCTL Comments at 6, WCTL July 2007 Reply Comments, Crowley/Fapp V S. at 5-6, Reply Comments of WCTL filed April 28, 2006, in Ex Parte No. 558 (Sub-No. 9), Crowley V S. at 16 & Exhs. 2, 7 ("WCTL April 2006 Reply Comments"). Messrs. Crowley and Fapp have stated that the "Ibbotson calculation of the equity risk premium is widely considered the best estimate of the equity risk premium available." WCTL July 2007 Reply Comments, Crowley/Fapp V S. at 6, WCTL April 2006 Reply Comments, Crowley V S. at 11-12.

In state proceedings involving their own utility rates, shippers have used similarly long periods to estimate the market risk premium. In one recent Minnesota proceeding, for example, the witness for Northern States Power-Minnesota (an affiliate of Xcel Energy, which is a member of WCTL) used Ibbotson data from 1926 to 2003, explaining that "The calculation of the market risk premium should be based on the longest period possible in order to avoid giving

undue consideration to unusual market conditions”³ And in a rate case before the Missouri PSC this year, KCP&L’s witness on return on equity used the data for the period 1926-2005 from Ibbotson Associates, which he described as “the most widely followed risk premium data” Hadaway Missouri Test at 37⁴

WCTL acknowledges that the Board’s use of a 50-year period yields a lower risk premium, but rationalizes that “there is significant evidence that the equity risk premium has been decreasing over time” WCTL Comments at 6.⁵ But the supposedly “significant evidence” cited by WCTL consists merely of two sentences in Dr Hodder’s previous testimony in this proceeding, which simply recited that the average market premium during 1986-2005 based on Ibbotson data was “6.4 percent” *Id.*, December 2006 Hodder V S at 15 And the 6.4 percent

³ See Opening Testimony of Robert V Hevert on Return on Equity filed September 17, 2004, in Minnesota PUC Docket No G002/GR-04-1511, *In the Matter of the Application of Northern States Power Company d/b/a Xcel Energy For authority to Increase Rates for Gas Utility Service in Minnesota*, at 14 (“Hevert Test”) See also, e.g., Direct Testimony of Kathleen C McShane on Behalf of Illinois Power Company d/b/a Ameren IP, filed December 27, 2005 in Illinois Commerce Commission Docket Nos 06—0070, *et al.*, at 40-41 & Sch 11 (“McShane Test”) (witness for Illinois Power, an affiliate of WCTL member Ameren, calculated “achieved”/“experienced” equity risk premium by using two periods – 1926-2004 (because 1926 was “the first year for which the seminal Ibbotson Associates risk premium data are available”) and 1947-2004 (“because the end of World War II marked significant changes in the economic structure, which remain relevant today”).

⁴ See also, e.g., Direct Testimony of Zvi Benderly For Wisconsin Public Service Corporation, filed March 31, 2006, in Wisconsin PSC Docket No 6690-UR-118, at 16 (“Benderly Test”) (using Ibbotson Associates’ data for the period 1926-2004 to calculate expected market risk premium), Direct Testimony of Frank J Hanley on Behalf of Interstate Power & Light Company in Minnesota PUC Docket No E001/GR-05-748, filed May 16, 2005, at 38 (“Hanley Test”) (using Ibbotson Associates’ data for time period of 1926-2004 to derive historical market equity risk premium for “risk premium” model, “the use of holding period returns over a very long period of time is useful in the application of the beta approach”) Wisconsin Public Service Corporation is a member of WCTL, and Interstate Power & Light Company is a subsidiary of a member of WCTL (Alliant Energy) *Id.* at 2, WCTL Comments, Exhibit A

⁵ WCTL provides no support for its argument for a rolling average See WCTL Comments at 7 There is no evidence that academic studies have used such an approach to calculate the market risk premium Hubbard/Stangle Reply V S ¶ 12

value was merely an artifact of the arbitrary point at which Dr Hodder truncated the Ibbotson Associates data series. Merely including *one additional year*, 1985, in the series increases the average to 7.1 percent. See December 2006 WCTL Comments, App D, Exh 2, p 11 (reproducing Ibbotson Associates, *Risk Premia over Time Report* 2006, Table A-1, at 5). With equal logic, one could prove with data from other short-term periods that the equity risk premium has been *increasing* in recent years. For example, the market risk premium in 2006, the most recent year for which Ibbotson data are available, was *11.12 percent*. The sensitivity of the average to arbitrary differences in the choice of the time series underscores the value of using a very long time series. It is telling that Dr Hodder, in the same testimony cited by WCTL, described the use of an 80-year period as "a very standard approach and certainly a reasonable way to estimate that risk premium." December 2006 Hodder V S at 15.

C. Beta

As explained in AAR's initial comments, the Board's methodology for calculating beta was erroneous in a number of respects. First, it was illogical and inconsistent for the Board to compute monthly risk premiums by comparing the monthly returns on investment in the stocks listed on the NYSE index with ten-year interest rates, rather than short-term interest rates. Second, the Board's use of a least-square regression equation that has no constant term (*i.e.*, that assumes a zero intercept) is contrary to standard practice. Third, the Board inappropriately used a ten-year data series, rather than follow the standard approach of using weekly or monthly data for the most recent five year period. Substituting data for the five-year period ending in 2007, by eliminating the distortive effect of the two dot com bubble years, 2000 and 2001, would produce industry betas close to or above 1.0, and well above the levels computed by the Board. AAR Comments at 25-28. See also Myers Reply V S at 7-8 & Table 1.

WCTL's position regarding the appropriate time period for a data series is, in one respect, consistent with the 5-year period proposed by the AAR. While asserting that a 10-year period is reasonable, WCTL agrees that a 5-year period would also be reasonable, since the latter "is the period used by Ibbotson and some other notable providers." WCTL Comments at 7-8, *see also* Crowley/Fapp V S at 16-19⁶. But the WCTL's overall position is internally inconsistent, since a 10-year period would yield very different estimates from a 5-year period, and likely includes information that is no longer relevant. Hubbard/Stangle Reply V S ¶ 14.

Equally self-contradictory are WCTL's simultaneous proposals that "an assumed beta of 1.0" should not "be utilized, as there is no trend or data that supports the assumption" (WCTL Comments at 2), but "if the railroad betas were to exceed 1.0 for several years, further investigation would be in order to determine if the values reflected industry risk or instead reflected the exercise of market power" (*id.* at 3). Stated otherwise, WCTL's position is that the Board should rely on beta estimates whenever they fall below 1.0, but disregard the beta estimates in favor of "common sense" adjustments whenever the betas exceed 1.0 for more than a brief period. The obvious fallacy in this one-sided approach is that firms with above-average risk often have above-average betas—i.e., betas exceeding 1.0—for extended periods. Moreover, there is no necessary connection between beta and market power. To the extent that there is any connection, market power is as likely to reduce beta as increase it. Myers Reply V S at 8, Hubbard-Stangle Reply V.S. ¶ 16. To jettison betas in these circumstances is to disregard economic reality.⁷

⁶ On the issue of an intercept, WCTL agrees with the AAR that an intercept term should be included in the regression analysis. As WCTL states, "[I]gnoring the intercept forces the regression to go through an artificial point, which then alters the direction of the slope and constitutes a distortion." WCTL Comments at 9, *see also id.*, Crowley/Fapp V.S. at 22-23.

⁷ Contrary to WCTL's claim, the available evidence indicates that the railroad industry's beta is already close to or greater than 1.0—and is rising, not falling. *See* WCTL Comments at 6, Hubbard/Stangle Reply V S ¶ 15, Myers Reply V S at 7-8, Table 1 and Figure 1.

WCTL also urges the Board to use carrier-specific unlevered betas weighted according to each railroad's market capitalization and then applying (levering) that average beta to the intended industry capital structure WCTL Comments at 2, 8-9 The Board should reject that approach, because it would impose a weighting scheme with no theoretical justification and yield arbitrarily low beta estimates Hubbard/Stangle Reply V S ¶¶ 17-18 Furthermore, WCTL's proposal rests on an asserted concern that averaging levered betas would raise the "potential for distortion" WCTL Comments at 2 That concern is baseless In reality, the betas observed for the equity of each railroad already reflect the volatility created by whatever amount of debt exists in that railroad's capital structure Equalizing leverage is important when relying on CAPM estimates derived from a comparison group of companies other than those whose cost of capital one is seeking to estimate But the comparison group proposed by the Board for the "Big Four" railroads (BNSF, CSXT, NS, and UP) consists of the Big Four railroads themselves Thus, no "potential for distortion" exists

Finally, it is possible that in its reply comments WCTL will resurrect its previous argument that the Board should use a "size premium" or "size adjustment" to calculate the cost of capital, on the theory that larger companies are less risky and require lower rates of return See Reply Comments of WCTL in Ex Parte No 558 (Sub-No 10) at 8 & Crowley/Fapp V S at 7-12 The Board should decline to adopt such an adjustment The adjustment proposed by Crowley and Fapp in some of their previous testimony (but not in their September 2007 verified statement) is not generally accepted, and in any event has little impact Myers Reply V S at 5

II. THE BOARD'S COST OF CAPITAL STANDARDS SHOULD ACCOUNT FOR BOTH THE IMPRECISION OF THE AVAILABLE MODELS AND THE SIGNIFICANT COSTS OF UNDERESTIMATING THE INDUSTRY'S ACTUAL COST OF EQUITY.

A. All Methods Of Estimating the Railroads' Cost Of Equity Are Inherently Uncertain and Imprecise.

As the AAR demonstrated in its initial comments, estimating the returns demanded by equity investors is inherently judgmental and uncertain. The fundamental problem is that the minimum return needed to attract and retain adequate equity capital cannot be observed directly, and can only be observed through circumstantial evidence. Thus, both the DCF and CAPM models are necessarily simplifications of reality, and the assumptions underlying the CAPM involve at least as much judgment and uncertainty as those underlying the DCF model. AAR Comments at 7-9, BNSF Comments at 3-4, CSXT Comments at 8; Mohanram Comments at 13-20.

The shippers and their allies, ignoring this reality, content themselves with applauding the Board's proposal in conclusory terms. *See, e.g.*, Arizona Electric Cooperative Comments at 2 ("applaud[ing] the Board" for its proposal), Comments of Governor Schweitzer and Certain Agricultural Interests at 2 (proposal is "welcome, and well-supported"), USDA Comments at 2 ("commend[ing] the Board for its proposed use" of CAPM), WCTL Comments at 4 (proposal "is sound and reasonable"). The shippers' enthusiasm for what they perceive as a favorable result, however, is unaccompanied by any attempt to reconcile this outcome with the revenue adequacy provisions of Title 49 or even the most rudimentary principles of corporate finance.

Moreover, the shippers' current embrace of the CAPM is inconsistent with their previous statements acknowledging its subjectivity and imprecision. Only three months ago, for example, WCTL stated that "[a] precise cost of capital cannot be determined under any

model ” Reply Comments of WCTL filed July 25, 2007, in Ex Parte No 558 (Sub-No 10), at 10 (“WCTL July 2007 Reply Comments”) Similarly, WCTL’s witness Hodder has stated in this proceeding that “cost of equity is not totally precise All the models require assumptions in their implementation, and some differences across reasonable estimates can be expected ” WCTL Comments filed December 8, 2006, in Ex Parte No 664, Verified Statement of James E Hodder at 16 (“December 2006 Hodder V S ”)⁸ Indeed, until recent years WCTL and other shippers repeatedly objected to the use of CAPM as “conceptually and technically flawed ” See, e g , *Railroad Cost of Capital – 1982*, 367 I C C 662, 670 (1982), Ex Parte No. 558 (Sub-No 9), *Railroad Cost of Capital – 2005*, STB Decision served September 20, 2006, 2006 WL 2692729 (S T B), at *5 (WCTL’s endorsement of CAPM “is a reversal of the prior position of the shipper community that the ‘CAPM technique was conceptually and technically flawed’”) (quoting *Railroad Cost of Capital, supra*).

Similarly, in a recent proceeding before the Texas Public Utility Commission, Electric Transmission Texas, a joint venture of which one co-partner is the parent of one of WCTL’s members (MidAmerican Energy Company), sponsored testimony that, although the CAPM and other “risk premium” approaches are widely used in academic cost of capital research, “their additional data requirements and their potentially questionable underlying assumptions have detracted from their use in most regulatory jurisdictions ” See Application of Electric Transmission Texas For Regulatory Approvals and Initial Rates in Texas, filed January 22, 2007 in Public Utility Commission Docket No 33734, Direct Testimony of Samuel C. Hadaway, at 20 (“Hadaway Texas Test ”) Kansas City Power & Light, a member of WCTL,

⁸ See also, e g , Transcript of February 15, 2007 Hearing in Ex Parte No 664, at 106 (testimony of James E Hodder) (with respect to CAPM, “The problem or the issue with implementation is not whether it’s hard, it’s whether you can agree on the beta estimate and the market risk premium estimate [P]eople are going to disagree about what’s the right number to put in there”)

took the same position this year in a rate case before the Missouri Public Service Commission. *See* Direct Testimony of Samuel C. Hadaway on Behalf of Kansas City Power & Light Company, filed January 31, 2007, in Missouri PSC Case No. ER-2007-0291, at 15 (“Hadaway Missouri Test.”)

B. The Consequences Of Underestimating The Railroads’ Cost of Capital Are Especially Severe Because Railroads Face Huge Investment Needs.

As AAR and others noted in their initial comments, an unrealistically low measure of the cost of equity would increase the odds that one or more railroads will be erroneously found to be revenue adequate, and thus the likelihood (if the erroneous finding of revenue adequacy persists over an extended period) that regulation will constrain the railroads’ earnings below the level needed to cover the railroads’ cost of capital. Such a result would severely impair the railroads’ ability to attract the approximately \$148 billion in investment capital that will be needed to build the additional infrastructure required to meet expected growth in demand over the next 30 years. Without this investment, both the quality and quantity of rail service will suffer. The need for regulators to take care to avoid creating disincentives to rail investments is particularly great in view of the unlikelihood that other modes of transportation will pick up the slack if railroad capacity falls short of demand. *See* AAR Comments at 9-13, Hubbard/Stangle Reply V S ¶¶ 4, 23-24.

Other commenters recognize this fact. For example, Professor Mohanram states that he opposes the adoption of CAPM because of his “concern[] that the proposed change in cost of capital methodology will create disincentives for railroads to invest in their infrastructure and, by extension, encourage inefficient freight flows onto the already overburdened government-funded highway system.” Mohanram Comments at 3. He explains

The transportation industry is at a crossroads presently. The current state of road infrastructure appears inadequate to meet the demands of a growing

economy. As the recent Minnesota bridge tragedy suggests, significant investments need to be made in order to just maintain infrastructure at current levels. Significant maintenance investment lessens the likelihood that government funding will be available to substantially increase the capacity of highway miles in the foreseeable future. As a result, railroads will likely carry a greater percentage of the nation's freight tonnage. In order for the railroad industry to make the necessary investments to gear for this growth, the railroad industry needs to be equitably compensated.

Id. at 1. The comments by individual railroads similarly emphasize that underestimating the railroads' cost of capital will substantially impair their ability to attract and retain capital and discourage them from making the investments needed to maintain and improve their capacity. *See, e.g.*, BNSF Comments at 2-3, CSXT Comments at 3-4, NS Comments at 1, UP Comments at 5-11.

The shippers do not dispute these facts in their comments. Nor could they. In their own operations, the shippers—no less than the railroads—make investment decisions based on their expected returns. When shippers perceive that the expected return from a project is below its cost of capital, the shippers refrain from making the investment.

Only twelve days ago, for example, American Electric Power Company ("AEP") and MidAmerican Energy Holdings Company ("MidAmerican") announced that they may drop their plans to invest \$3 billion to provide service as a transmission utility in Texas through a joint venture, because they regard the return on equity which the Texas Public Utility Commission ("TPUC") established for the joint venture's power-line investments as insufficient to justify their investment in the venture. In an interview following the TPUC's decision, an AEP executive who heads the joint venture with MidAmerican (whose subsidiary is a member of WCTL)⁹ explained that the 9.96 percent return on equity set by the TPUC—rather than the return

⁹ MidAmerican is the corporate parent of MidAmerican Energy Company, a member of WCTL. *See* WCTL Comments, Exhibit A.

of 10.4 percent to 11.4 percent proposed by the joint venture (Electric Transmission Texas)—“wasn’t in the range that we had expressed as a reasonable range,” and therefore “we can’t give you certainty at this point that we’re moving forward.”¹⁰ During hearings before the TPUC, MidAmerican’s president stated that the base range of 10.4 percent to 11.4 percent proposed by the joint venture was “a significant factor in MidAmerican’s evaluation of the venture.”¹¹ Likewise, Electric Transmission Texas stated in the TPUC proceeding that the 9.5 percent return on equity proposed by the Office of PUC Counsel “would not be sufficient to attract investment as required by the Supreme Court’s *Hope* case” and “would be the lowest granted for any utility in the nation in the last several years if adopted by the [TPUC].”¹² The 9.5 percent return on equity attacked by MidAmerican in Texas as inadequate is, of course, far higher than the 8.4 percent return on equity that the Board proposes to impose on the railroads. Notice at 7.

¹⁰ See Edward Klump, “American Electric-Buffer Venture May Drop Texas Plan,” Bloomberg News, October 17, 2007 (available at <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=ac14cNJDkOQ>), “Firms May Drop Texas Line Power Project,” *Dallas Morning News*, October 17, 2007 (available at <http://www.dallasnews.com/sharedcontent/dws/news/texasouthwest/stories/101807dnbusacplines13ddaa1.html>).

¹¹ Initial Brief of Electric Transmission Texas, LLC, filed August 1, 2007 in TPUC Docket No. 33734, at 22 & n.61.

¹² *Id.* at 30, Reply Brief of Electric Transmission Texas, LLC, filed August 15, 2007, in TPUC Docket No. 33714, at 18. Last year, a witness for Central Illinois Light Company and other affiliates of Ameren (a member of WCTL) similarly testified that a review of all decisions issued by state regulators for both electric and gas utilities between the second quarter of 2003 and the first quarter of 2006 showed that “No state regulatory commission within the past two years has approved a return on equity lower than 9.7%.” Rebuttal Testimony of Kathleen C. McShane Submitted on Behalf of Central Illinois Light Company d/b/a AmerenCILCO, filed May 26, 2006, in Illinois Commerce Commission Docket Nos. 06-0070, *et al.*, at 18-19. In January 2007, KCP&L’s witness testified that between 2002 and 2006, state regulatory commissions have allowed returns on equity for electric utilities ranging from 10.36% to 11.16%. Hadaway Missouri Test at 31.

Rather than confront the reality that an understated regulatory cost of capital is likely to deter needed investment in railroad plant capacity, the shippers try to change the subject

Investor interest in railroad stock. The National Grain and Feed Association, for example, points to the continued willingness of investors to invest in the railroad industry as evidence that investors believe that current railroad earnings now provide a return sufficient to cover the cost of capital invested in the railroads' asset base NGFA Comments at 4 & Appendix A This is a *non sequitur* The particular factors or beliefs that lead a particular investor to buy stock in a particular company are matters of pure speculation A particular investor's willingness to buy the stock of a railroad proves only that the buyer of the shares values them more than does the seller It does not follow from the transaction that either party believes that the company's expected earnings will cover its cost of capital Likewise, to the extent that investors are actually aware of the Board's proposed rule changes concerning the cost of capital, there is no reason to assume that investors believe that the proposals will take effect without change

A 2005 projection by a Morgan Stanley securities analyst that several railroads would earn their cost of capital in that year. NITL asserts that an "estimate" in September 2005 by an analyst at Morgan Stanley proves that, contrary to the Board's previous conclusions using the DCF methodology, railroads "earned their cost of capital" beginning in 2005 NITL Comments at 4-5 NITL never identifies the particular cost of capital assumed by Morgan Stanley, let alone explain the derivation of the value Nor has NITL explained what powers of clairvoyance would enable an analyst to opine that four firms in an industry had "earned" (past tense) their cost of capital in a calendar year that still had three months remaining It is obvious that the analyst's purported finding of revenue adequacy was offered simply as a projection More than two years later, in November 2007, does the analyst believe that his projection has

come to pass? A projection about the earnings of certain publicly traded companies in a given year clearly becomes a testable claim once the companies issue their audited financial reports for the year

The railroads' distribution of a portion of their earnings to their owners.

Equally nonsensical is WCTL's suggestion that the railroads must be earning excessive profits because they are returning some of their earnings to their owners through dividends, stock buybacks, and the retirement of debt rather than ploughing all earnings back into the business and issuing more stock WCTL Comments at 13-14, *see also* WCTL July 2007 Reply Comments at 23-26 & Crowley/Fapp V S at 26-28 This claim fails on several levels.

First, the notion that railroads are distributing a disproportionate share of their earnings to shareholders through buybacks and dividends is flatly untrue To the contrary, net distributions by BNI, CNI, CP, CSX, KSU, NSC and UNP to shareholders in 2006, as a percentage of the stock price, were 140 basis points *below* the average for the S&P 500 ¹³

Industry Group	Gross Buyback Yield	Issuance Yield	Net Stock Yield	Dividend Yield	Total Yield
Railroads	3 0%	0 9%	2 1%	1 2%	3 3%
S&P 500	3 8%	0 9%	2 9%	1 8%	4 7%

See UP Comments at 11 (showing that WCTL's claim "is certainly false with respect to Union Pacific"), Hubbard/Stangle Reply V.S ¶¶ 25-27 & Exhibit 4 (demonstrating that buybacks and dividends by railroads are small relative to capital expenditures); Myers Reply V S at 13-14 and Figure 2 (same).

¹³ Sources Compustat, Worldscope, Morgan Stanley Research, Hubbard-Stangle Reply V S ¶¶ 26-27 & Exhibit 4

Second, the percentage of a company's earnings that is distributed to the company's owners as dividends and stock buybacks is irrelevant to the question of whether those earnings are adequate or inadequate. Hubbard/Stangle Reply V S. ¶ 9, Myers Reply V S. at 14-15. Basic principles of finance, as well as the statutory rule of ratemaking set forth at 49 U.S.C. § 10704(a)(2), define revenue adequacy in terms of the amount of net income received by the railroad, not the portion of that net income that is distributed to the railroad's owners rather than reinvested in the business. In the words of Section 10704(a)(2), revenue adequacy requires a "net income"—i.e., the income that remains after the coverage of "total operating expenses, including depreciation and obsolescence," and the "repayment of a reasonable level of debt"—that is sufficient to provide equity shareholders with a "reasonable and economic . . . return" on their investment. *Id.* If the "net income" of a railroad falls short of this benchmark, the railroad is not earning sufficient revenues—regardless of what portion of the residual income is distributed currently to the railroad's owners rather than reinvested. See Myers Reply V S. at 14-15. The optimal share of net income to distribute through dividends and share buybacks rather than reinvest in the business is a complex question. One fact is clear, however: the distribution ratio is not a measure of revenue adequacy. See also Richard A. Brealey, Stewart C. Myers and Franklin Allen, *Principles of Corporate Finance* 414-441 (8th ed. 2005).

Historical evidence refutes the notion that distributions to shareholders in excess of some arbitrary threshold are evidence of excessive earnings. To the contrary, companies with high and rapidly growing earnings often pay no dividends at all, and companies that are faring poorly often pay relatively high dividends—sometimes in excess of 100 percent of earnings. The latest reports issued by Value Line, for example, reveal that firms with very high dividend yields include (to take but a few examples) Beazer Homes USA, a troubled homebuilder that is "delinquent in filing its third-quarter 10-Q . . . due to an investigation by the SEC" (dividend

yield 4 7%), First Horizon National, a bank holding company with a portfolio full of problem loans (dividend yield 6 1%), Nautilus, Inc., a money-losing marketer of home exercise equipment (dividend yield 4 1%), and Thornburg Mortgage, an unprofitable REIT specializing in adjustable-rate mortgages (dividend yield 8 1%)¹⁴ Historically, General Motors, Ford, U S Steel and other established large cap companies have continued to pay dividends to their shareholders even during periods of unprofitability And Penn Central, despite its looming financial collapse, continued to pay cash dividends until the eve of its bankruptcy¹⁵

The railroads' ability to borrow more. WCTL also argues that the railroads must be revenue adequate (or, alternatively, that the Board need not concern itself with the railroads' revenue adequacy) because the industry has ample ability to attract additional capital by issuing more debt WCTL Comments at 13-14 However, the ability to borrow more is entirely distinct from revenue adequacy Myers Reply V S at 14-15

The shippers' argument to the contrary is essentially an argument for abandoning the fair-return-on-investment standard of *Hope Natural Gas* and 49 U S C § 10704(a)(2) in favor of a "funds flow" approach under which a railroad's revenues would be deemed adequate if sufficient to pay a fair return on *additional* capital, even if servicing this additional investment left too little revenue to pay a fair return on *existing* investment The ICC rejected this approach more than 25 years ago in Ex Parte No 393, *Standards for Railroad Revenue Adequacy*, 364 I C C 803, 808-10 (1981), and its determination was specifically upheld on judicial review in *Bessemer & Lake Erie R Co v ICC*, 691 F 2d 1104, 1111-1113 (3rd Cir 1982), *cert denied*, 462 U S 1110 (1983) The Board has not proposed to adopt a funds flow approach here, instead, it has proposed only the adoption of CAPM See Notice at 4-7 Consequently, WCTL's

¹⁴ *Value Line Investment Survey*, August 10, September 21, October 5, and October 19, 2007

¹⁵ Peter E Lynch, *Penn Central Railroad* 21 (2004)

proposal to adopt the funds flow standard cannot properly be considered by the Board in this proceeding

Moreover, even assuming *arguendo* that the funds flow standard were open to consideration in this case, a standard that defined revenue adequacy as the ability to go deeper into debt would be unlawful and economically unsound. The ICC emphasized this fact in rejecting the funds-flow standard in 1981.

As we discussed in the notice, and as the Association of American Railroads (AAR) discusses in their comments the implicit assumption of the Borts [funds flow] method is either that the railroad is already earning an adequate return on the existing investment base or that it can liquidate quickly those portions of its investment base that are not earning an adequate return. A troublesome aspect to this method is that if in applying this approach to a particular railroad neither of these assumptions is accurate, (and in many cases we think it would not be), a railroad earning less than adequate revenues would, nonetheless, be deemed revenue adequate. While it is true that the use of additional standards, such as our proposed financial indicators analyses, may lessen these problems of funds-flow analysis, we believe a method that has such biases is inconsistent with the goals of the Rail Act.

Standards For Railroad Revenue Adequacy, supra, 364 I C C at 809 n 4

These objections to the funds flow standard remain equally valid today. The rule of ratemaking codified at 49 U S C § 10704(a)(2) entitles railroads to a "reasonable and economic profit or return (or both)" on *all* "capital employed in the business"—not just incremental investment. Under the alternative standard proposed by WCTL, a railroad earning too little for a reasonable return on existing investment nonetheless would be deemed revenue-adequate until the day that it had mortgaged all of its remaining assets and could no longer meet payroll. That is the same confiscatory approach that led to the collapse of the railroad industry in the late 1970's. See AAR Comments at 12-13.¹⁶

¹⁶ A variant of WCTL's argument is that railroads could reduce their weighted average cost of capital by increasing the percentage of debt in their capital structure. The fallacy of this argument is that increasing the share of debt in the capital structure increases the risk of the equity (by increasing the share of earnings that are subject to a prior claim from bondholders).

Beyond these problems, WCTL ignores the reality that railroads can anticipate what will happen, and stop making discretionary new investments when they anticipate that they are not going to be able to earn an adequate return on them. *See, e.g.* BNSF Comments at 2 (precipitous drop in cost of capital would “discourage further investment in rail capacity”), UP Comments at 9 (“If the outlook for returns is uncertain, [UP] will not be able to make the kind of long-term commitments our customers, and our country, will need in the future”) If their expected return is less than the cost of capital, they will cut back on their investments, even if the investments could be financed by borrowing against existing assets or through cash on hand. Myers Reply V S at 14-15

C. Given The Limitations of Available Cost Of Capital Models, The Board Should Consider A Range Of Estimates Of The Cost of Equity, And Adopt A Point Estimate Each Year Within The Middle To Upper Portion Of That Range.

Given the limitations and shortcomings of both the CAPM and DCF methodologies, the Board should give weight to each model as a check on the other, while treating the results of both models with caution, and without attributing a false degree of precision to either. As a responsible regulator, the Board should (1) consider the results of all reasonable methods of estimating the cost of capital, without arbitrarily excluding any relevant data points, (2) run each model with economically sensible inputs, and (3) base the values ultimately prescribed on a point estimate selected from the middle to upper end of the range of reasonable estimates. Moreover, where (as here) the regulated firm needs to make large investments in additional infrastructure, the prudent regulatory course is to adopt a point towards the upper end of that range. *See* AAR Comments at 13-15

and therefore increases the cost of equity. The increased cost of equity offsets the savings from a higher debt/equity ratio, and the net effect of increased leverage on the weighted average cost of capital is essentially a wash. Hubbard/Stangle Reply V S. ¶ 23, Myers Reply V S at 3 & 11

As explained by Professor Myers, applying this procedure would produce a reasonable range of estimates of the cost of equity for 2007 of approximately 9.1 to 12.2 percent. Myers R V S at 8-10. “The bottom of a reasonable range is *not* a reasonable place to be, however.” *Id.* at 9 (emphasis in original). Rather, a reasonable point estimate of the cost of equity for railroads in 2007 is approximately 11 percent.

III. FAILURE TO GIVE ANY WEIGHT TO THE RESULTS OF THE DCF AND OTHER PROBATIVE COST OF EQUITY MODELS WOULD BE ARBITRARY AND IRRATIONAL.

A. The Board Has Overstated The Shortcomings of the DCF Model, and Overlooked the Shortcomings of CAPM.

The Board has exaggerated the purported shortcomings of the DCF model. Although the Board asserts that the selection of a non-arbitrary multi-stage DCF approach is difficult, neither the Board nor any participating party has challenged the conceptual predicate for adoption of multiple stages—that earnings growth rates tend to converge with the long-run rate of growth of the overall economy. Estimates of the cost of equity produced by generally accepted multi-stage DCF models are comparable to those produced by the CAPM when run with appropriate inputs. AAR Comments at 28-29.

Furthermore, the Board’s decision to accept the CAPM as the “superior financial model” overlooks the CAPM’s shortcomings while overstating its virtues. For example, the key assumptions of the CAPM are at least as subjective as those of the DCF. *Id.* at 29-31. The Board has also exaggerated the acceptance of the CAPM as the preferred method among regulators, academics, and the financial sector. Many regulatory bodies, as well as many in the financial communities, still regard the DCF to be at least as reliable as the CAPM. *Id.* at 31. See also Hubbard/Stangle Reply V S ¶ 21 (discussing inaccuracy of WCTL’s claim that CAPM is superior to DCF).

Many shippers agree Even many shipper participants, including WCTL, have advocated the use of the DCF, either alone or in combination with the CAPM, in this proceeding AAR Comments at 31-32 Likewise, in a 2005 rate case before the Minnesota PUC, the witness for Interstate Power and Light Company (a subsidiary of Alliant Energy, which is a member of WCTL), testified that he used four different models – DCF, CAPM, a risk premium model, and the comparable earnings model – because “The prudence of relying on all of the market-based models is confirmed by the financial literature” and “No single cost of common equity model is so theoretically superior to the others, or so precise, to justify sole reliance on it in the application of the traditional ratemaking paradigm ” Hanley Test at 4, *see also id* at 19-21, 56 Quoting Professor Myers, he stated

Use more than one model when you can Because estimating the opportunity cost of capital is difficult, only a fool throws away useful information That means you should not use any one model or measure mechanically and exclusively Beta is helpful as one tool in a kit, to be used in parallel with DCF models or other techniques for interpreting capital market data

Id at 21 (emphasis in original) ¹⁷

¹⁷ In another Minnesota proceeding involving rate increases proposed by Northern States Power–Minnesota, Northern States’ witness explained why he had calculated the cost of equity by using both the DCF and CAPM models and then comparing the results with the published return on equity projections of equity analysts that follow the respective proxy group companies

Each of the models available to estimate the cost of equity is subject to its own set of assumptions or methodological constraints Consequently, many finance texts recommend using a variety of approaches when estimating the cost of equity Copeland, Koller and Murrin, for example, suggest using the CAPM and Arbitrage Pricing Theory model, while Brigham and Capenski recommend the CAPM, DCF, and “bond yield plus risk premium” approaches. While there may not be complete consensus among academics as to the effectiveness of each model, analysts typically use both DCF and CAPM methodologies to estimate the cost of equity Thus, while we cannot observe the cost of equity, we can observe the methods frequently used by industry analysts to arrive at their return requirements and expectations Consequently, *I believe that the DCF model, supported by the CAPM, is a reasonable methodological approach to establish the Company’s cost of equity*

The shippers have been even more supportive of the DCF when their own regulated rates have been at stake. In testimony before the Texas PUC this year, the witness on cost of equity for Electric Transmission Texas ("ETT"), the joint venture of AEP and MidAmerican, stated that "The DCF model is the most widely used regulatory cost estimation method." *Hadaway Texas Test* at 20. *See also* *Hadaway Missouri Test* at 16 (same description, by KCP&L, in Missouri proceeding). ETT offered three DCF models, including a two-stage DCF model, as the primary support for ETT's proposed "base" return on equity. While ETT also proposed a "risk premium" model, it was offered as a parallel approach to provide a backup to the DCF analysis. *Hadaway Texas Test* at 4, 20-21, 36-44. Kansas City Power & Light Company (a member of WCTL), using the same witness as ETT, took the exact same approach this year in a rate proceeding before the Missouri Public Service Commission. *See* *Hadaway Missouri Test* at 3-4. In a recent Minnesota proceeding, Northern States Power – Minnesota's witness on cost of equity, who used both the DCF and CAPM models, testified that "DCF models are widely used in regulatory proceedings and, as discussed below, have sound theoretical bases." *Hevert Test* at 9.¹⁸ In a proceeding before the Illinois Commerce Commission, Illinois Power Company (an affiliate of Ameren, a member of WCTL) used both the DCF model (including a two-stage DCF) and CAPM to compute return on equity, Illinois

Hevert Test at 8 (emphasis added, citations omitted). *See also* *Benderly Test* at 3-4 ("There is no one approach that is now recognized, or should be recognized, as the way to determine the cost of equity. I am not alone in believing that the use of several costing methodologies will result in a better estimate of the cost of equity capital of a company")

¹⁸ Wisconsin Power and Light Company, a subsidiary of Alliant Energy (which is a member of WCTL), stated last year that both DCF and CAPM "are well-known and broadly accepted theoretical models." Pre-Filed Supplemental Direct Testimony of Enrique Bacalao for Wisconsin Power and Light Company, filed April 27, 2006, in Wisconsin PSC Docket No. 6680-UR-115 ("Bacalao Test"), at 2, WCTL Comments, Exhibit A. In that proceeding, WPL used the DCF, CAPM, and risk premium models (including two two-stage DCF models) to calculate the cost of equity. *Id.* at 2-3, 6.

Power's witness on this issue testified that "In arriving at a recommended return, no single test result should be given exclusive weight [E]ach test has its own strengths and weaknesses " McShane Test at 3, 11

Similarly, WCTL argued last December that "there is no single way to calculate the cost of capital Rather, there are several ways, including the multistage DCF and CAPM methods, and various variants and refinements thereof, for calculating the COE, each is capable of yielding accurate and meaningful results, and, ideally, the results should converge " WCTL Comments filed December 8, 2006, in Ex Parte No 664, at 6-7 ("WCTL December 2006 Comments") WCTL added that the Board should not "blindly follow[] a particular approach " *Id* at 8 Only eight months ago, WCTL reiterated that position, arguing in *this* docket that the Board should adopt *either* the multi-stage approach *or* a CAPM-based approach, because both approaches "should yield similar results, and both approaches should be considered and any differences reconciled " Summary of Hearing Testimony of WCTL, filed February 12, 2007, at 2

Likewise, a number of the same shippers (utility companies which are either members of WCTL or affiliates of such members) have argued before the Federal Energy Regulatory Commission that the cost of equity calculated under DCF is *too low* – and that FERC therefore replace DCF with a new methodology that produces a higher cost of equity *See, e g*, comments of Ameren Services Company filed January 11, 2006, in FERC Docket No RM06-4-000, *Promoting Transmission Investment Through Pricing Reform*, at 7-8 ("the prevailing DCF unduly constrains the Commission's ability to set equity returns sufficient to restore investor confidence and interest in the electric transmission sector Moreover, given the competition for investor dollars, it is unrealistic to assume that 'mid-point' returns, particularly mid-point DCF returns, will result in the kind of capital infusion necessary to significantly expand the nation's

transmission infrastructure [T]he range of reasonable returns must be expanded beyond those produced under the current DCF formulation if the Commission hopes to incent new transmission investment industry-wide"), Comments of The WPS Companies filed January 11, 2006, in FERC Docket No RM06-4-000, *supra*, at 7 ("the ROEs produced by the Commission's current implementation of the DCF method are inadequate") See also Comments of Kansas City Power and Light Company filed January 11, 2006, in FERC Docket No 06-4-000, at 4-5 (recommending that FERC "accept alternative financial methodologies in addition to DCF" in order to "allow more progressive approaches to accurately calculate a utility's cost of capital")

The shippers' prior (and contemporaneous) statements underscore the breadth of support for continuing to use the DCF Shippers prefer the CAPM (or at least the idiosyncratic version of the CAPM proposed by the Board) because they believe that it will result in a lower (rather than higher) regulatory cost of capital for railroads, and thus will be more likely to result in a finding by the Board that a railroad is revenue-adequate—thereby increasing the share of traffic that is subject to rate regulation and thus at least potentially constrained in its rates See, e.g., KCS Comments at 8-10, UP Comments at 6-11 Arguments by shippers that the Board's CAPM proposal "conforms to 'facts on the ground'" (NITL Comments at 6) are just another way of saying that the shippers hope that the proposal will lead to lower rates

WCTL attempts to explain its current support of CAPM, rather than of a multi-stage DCF, by citing prior statements by Dr Myers, the AAR's witness, that allegedly support WCTL's current position that the multi-stage DCF is arbitrary and inherently flawed Crowley/Fapp V S at 5-6 Dr Myers, however, was simply making the unobjectionable observation that the multi-stage DCF model requires the use of subjective judgments, there is no single "right" set of inputs for the model, and the model will not produce reliable results with

arbitrary inputs *Id* WCTL makes no mention of the similar observations that Dr. Myers has made about the limitations of the CAPM Myers V S at 6-8; Myers Reply V S at 1, 8-10.

B. Multi-Stage DCF Models, When Run With Appropriate Inputs, Produce A Significantly Higher Cost of Equity Than That Calculated By The Board.

When run with appropriate inputs, multi-stage DCF models produce equity cost estimates that are much higher than the estimate derived by the Board from the CAPM, and much closer to the estimates produced by more mainstream approaches For example, when the Board's two-stage DCF analysis is corrected for several obvious errors—particularly the double discounting of the stream of dividends projected after year 21 and the Board's reliance on an unreasonably low estimate of the long-run growth rate of the U S economy by the Social Security Administration—the two-stage DCF produces weighted average cost of capital values that are substantially higher than those generated by the Board's proposed version of the CAPM AAR Comments at 32-33

The shippers do not mention this issue in their comments The shippers' silence is unsurprising the DCF estimates of the cost of equity submitted by shippers in Ex Parte No 558 in recent years and this docket have been *higher* than the CAPM-based cost of equity proposed by the Board here For example, in December 2006, Dr Hodder, WCTL's witness, calculated a cost of equity "in the 8 to 10 percent range" using a multi-stage DCF, as compared to the 8.4 percent figure that the Board calculated using its proposed CAPM See December 2006 Hodder V S at 11-12, Notice at 7 In a recent Minnesota proceeding, the cost of capital witness for Northern States Power—Minnesota likewise relied on the DCF model to calculate a median cost of equity of 10.5 percent Hevert Test at 13, 31 See also, e.g., McShane Test at 5, 58 (cost of equity of 10.3% - 12.2% were calculated by Illinois Power Company using DCF model), Hadaway Missouri Test at 5 (calculating cost of equity of 10.5% - 10.8% using DCF),

Hanley Test. at 32 & Exhibit FJH-1 at 2 (calculating cost of equity of 10 25% using DCF),
Bacalao Test at 3 (calculating range of 10 45-10 70% using one- and two-stage DCF models).¹⁹

C. Professor Mohanram's Alternative Methods of Calculating the Cost of Equity Underscore The Usefulness Of Relying On Multiple Data Sources To Estimate The Cost Of Equity—And Provide Further Confirmation That The Value Proposed By The Board Is An Outlier.

Professor Mohanram, who correctly points out that the Board's proposed replacement of DCF with CAPM is not "warranted or prudent" and would severely impair the railroads' ability to make necessary investments (Mohanram Comments at 2-3), proposes two alternative methods to calculate the cost of equity. The first—and the one that he recommends be adopted by the Board—is a model based on research by Ohlson and Juettner. The OJ model relates the current price to forthcoming earnings per share, forthcoming dividends per share, two-year ahead earnings per share, and assumed perpetual growth rate. *See id.* at 21-27. Professor Mohanram's second alternative method is the residual income valuation ("RIV") model, which is based on the fundamental notion of abnormal earnings or residual income. *Id.* at 27-34.

¹⁹ In a recent proceeding before the Public Service Commission of Wisconsin involving a request by Wisconsin Public Service Corporation ("WPSC"), a member of WCTL, for authority to adjust its electric and natural gas rates, WPSC's witness used four types of models – DCF, CAPM, risk premium analyses, and a comparable earnings analysis – to calculate the cost of common equity capital. Benderly Test at 4. WCTL's DCF analysis produced a cost of equity estimate in the range of 9.16 – 10.18 percent. *Id.* at 39. WPSC's witness, however, argued that the results of the DCF were unreliable because they were too low – and that the Wisconsin commission should therefore should give more weight to the percentages that WPSC had calculated with the other models it had used, each of which calculated much higher percentages for the cost of equity. *See id.* at 31-32 ("the DCF method produces a significantly lower market-based cost of equity estimate than the other methods I employ. Thus, the large deviation of the DCF results from the results obtained using other market-based cost of equity methodologies indicates that the DCF method does not provide appropriate estimates of the cost of equity at the present time"), *id.* at 41 (Wisconsin commission should use "extreme caution" in relying on DCF because "the DCF cost of equity estimate may be understated," and therefore "it is important to consider the results of the other methods that I presented").

Professor Mohanram's alternative models, and his analysis of the Board's proposed CAPM model, confirm the usefulness of relying on a variety of sources of data to compute the cost of equity, and the unreliability of the values that the Board has computed using its proposed CAPM model. The alternative models described in his testimony yield a cost of equity ranging from 10.5 percent to 12.6 percent. *Id.* at 26, 33. Even the CAPM model, when corrected by Professor Mohanram for its erroneous market risk premium and risk-free rate, produces a cost of equity of 11.1 percent. *Id.* at 19, 35. Each of these percentages is significantly higher than the 8.4 percent computed by the Board for 2005. *See id.* at 35.

IV. WCTL'S ARGUMENTS REGARDING THE "PROPER WEIGHTING" OF THE RAILROADS' CAPITAL STRUCTURE ARE WITHOUT MERIT.

A. WCTL's Assertion That The Capital Structure Should Be Adjusted For "Excessive Equity" Is Totally Unfounded.

WCTL argues that the Board should correct the railroads' capital structure for an "excessive" equity percentage, which, according to WCTL, is due to an increase in stock prices, not to the issuance of any additional stock by the railroads. WCTL contends that the unduly high proportion of equity has caused the cost of capital to be overstated, and enables the railroads to "game" the system by failing to rebalance their capital structure when stock prices increase. To correct this alleged problem, WCTL proposes that the Board consider basing the debt-equity ratio on a multiple-year average, on the theory that averaging would tend to neutralize the supposedly inappropriate effects of momentary aberrations. *See* WCTL Comments at 10-11; WCTL July 2007 Reply Comments at 10-15, WCTL December 2006 Comments at 16-17.

The Board, however, has already rejected WCTL's proposal in this docket. In its Notice, the Board could not have been more clear:

Third, we reject WCTL's suggestion to replace the current-year debt-to-equity ratio with a multi-year average to avoid alleged "artificial" fluctuations in

the capital structure used to calculate the weighted average. Market values are not artificial. Moreover, the costs of debt and equity are related to the debt-to-equity ratios. For example, if a company is highly leveraged with debt, its cost of debt will be higher. Thus, it would be improper to first calculate the costs of debt and equity using the real debt-to-equity ratios and then attempt to weight those costs with a multi-year average.

Notice at 8

Consequently, the issue raised by WCTL has been resolved, and is beyond the scope of this docket. An agency may promulgate a final rule that differs from a proposed rule only if the final rule is a “logical outgrowth” of the proposed rule – i.e., if the interested parties should have anticipated that the change was possible, and thus reasonably should have filed their comments on the subject during the notice-and-comment period. *See, e.g., International Union, United Mine Workers of America v. Mine Safety and Health Administration*, 407 F.3d 1250, 1259 (D.C. 2005), *Appalachian Power Co. v. EPA*, 135 F.3d 791, 804 (D.C. Cir. 1998). Whether the “logical outgrowth” test is satisfied “depends on whether the affected party ‘should have anticipated’ the agency’s final course in light of the initial notice.” *Covad Communications Co. v. FCC*, 450 F.2d 528, 548 (D.C. Cir. 2006) (quoting *Small Refiner Lead Phase-Down Task Force v. EPA*, 705 F.2d 506, 548-549 (D.C. Cir. 1983)) (emphasis added). A final rule is not a “logical outgrowth” “where interested parties would have had to ‘divine [the Agency’s] unspoken thoughts.’” *Arizona Public Service Co. v. EPA*, 211 F.3d 1280, 1299 (D.C. Cir. 2000) (quoting *Shell Oil Co. v. EPA*, 950 F.2d 741, 750 (D.C. Cir. 1991)).

In any event, WCTL is wrong on the merits. Within a broad range, the debt/equity ratio has no significant effect on the weighted average cost of capital. This is because adding more debt makes equity riskier, and hence more costly. It is also consistent with the Modigliani-Miller principle—which WCTL acknowledged in its previous filings—that the value of a firm is unaffected by changes in the capital structure over a wide range. *See*

Hubbard/Stangle Reply V.S. ¶ 18, Myers Reply V S at 11 Furthermore, increasing leverage in the capital structure increases the risk of default in an economic downturn, particularly for companies which (like the railroads) have substantial fixed costs WCTL has made no showing that the debt/equity mix adopted by the railroads is overly conservative in this regard

B. WCTL's Claim That Operating Leases Should Be Capitalized And Treated As Debt Has Already Been Rejected By the Board.

WCTL contends that the debt portion of capital should be adjusted to reflect the capitalization of operating leases (reclassifying the lease expense as a debt obligation) WCTL has argued that such an adjustment is necessary because railroads have treated operating leases as "off-balance-sheet financing activities," and the failure to make such an adjustment would enable the railroads to keep two sets of books, only one of which (showing a higher cost of capital) the railroads would present to the Board See WCTL Comments at 10-12, July 2007 WCTL Reply Comments at 15-16, December 2006 WCTL Comments at 18-21

Like its argument regarding "excessive equity," WCTL's request for a reclassification of operating leases was rejected by the Board in its Notice The Board explained that "it is not proper to treat all operating leases as debt, particularly very short-term leases, and WCTL has offered no persuasive evidence to justify a departure from GAAP " Notice at 8, *see also* WCTL Comments at 10 (acknowledging that Board rejected its proposal in the Notice) Because the Board has already resolved this issue (correctly), the issue is not properly before it at this stage in this proceeding

V. ADOPTION OF A REPLACEMENT COST ASSET BASE INSTEAD OF AN ORIGINAL COST ASSET BASE.

In the Notice, the Board declined to consider in this proceeding the issue of whether it should use a replacement-cost analysis in its annual revenue adequacy determinations,

rather than the original-cost approach used to date by the Board. The Board, however, invited the railroads to petition for a separate rulemaking to consider the replacement-cost issue. Notice at 9.

Several railroads have noted in their initial comments in this proceeding that implementing a changed methodology for calculating the cost of capital for revenue adequacy determinations and ratemaking would require that the Board also address the issue of the proper valuation of the railroads' asset base. See BNSF Comments at 6, CSXT Comments at 3-4, 6-7, 9, KCS Comments at 13-14, NS Comments at 1-2, UP Comments at 19-20. The AAR believes that the two issues are inextricably related, and that the Board will need to address the asset base valuation issue in a future proceeding.

CONCLUSION

For the foregoing reasons, and the reasons stated in the AAR's initial Comments, the Board should:

- Reconsider its proposal to use the CAPM as the exclusive method of determining the cost of equity, and instead consider the results of both the CAPM and multi-stage DCF models,
- Run its models with generally accepted and economically sensible input values, and

- Adopt an annual cost of equity toward the upper end of the range of individual cost of equity estimates generated by the procedure discussed in the AAR's initial Comments

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October 29, 2007

REPLY VERIFIED STATEMENT OF STEWART C. MYERS

1. INTRODUCTION

My name is Stewart C. Myers. I am the Robert C. Merton (1970) Professor of Finance at MIT's Sloan School of Management. I submitted a verified statement in this proceeding on September 27, 2007. That statement focused on the Surface Transportation Board's proposed methodology for determining the cost of capital for the U.S. railroad industry (the Proposed Methodology).¹ The Association of American Railroads (AAR) has asked me to review and respond to the Opening Comments of the Western Coal Traffic League (WCTL), which were also submitted on September 27. These Opening Comments incorporate a verified statement by Mr. Thomas D. Crowley and Mr. Daniel L. Fapp and a brief verified statement by Professor James E. Hodder. I will concentrate on the Crowley-Fapp statement and on the WCTL's arguments.

The Surface Transportation Board (STB or the Board) has estimated railroads' cost of equity capital using a discounted cash flow (DCF) model. The Proposed Methodology would abandon DCF and switch to the capital asset pricing model (CAPM). The switch would have cut the estimated 2005 cost of equity for the railroad industry almost in half, from 15.2% (DCF) to 8.4% (CAPM).

The CAPM can be very useful if used with care and caution. The Board's proposed implementation of the CAPM is defective, however. It is inconsistent and idiosyncratic and would generate downward-biased estimates of the cost of equity. In my September statement, I recommended that the Board

- Move to standard practice in implementing the CAPM
- Recognize that the CAPM generates a range of estimates, not a precise number
- Give weight to DCF estimates, at least as a check on the CAPM

¹ "Methodology to be Employed in Determining the Railroad Industry's Cost of Capital," STB Ex Parte No. 664, August 14, 2007, plus a supplement issued on August 20, 2007.

- Recognize the adverse consequences of underestimating the cost of capital. The Board should set the cost of capital at or above the middle of the range of possible values.

In contrast, the WCTL and its experts give the Proposed Methodology good marks and recommend its adoption without significant changes. This is surprising. On July 25, 2007, shortly before the Proposed Methodology was published, the WCTL submitted Reply Comments in another STB proceeding advocating use of the CAPM.² The WCTL relied on a July verified statement by Mr. Crowley and Mr. Fapp to show how the CAPM should be implemented. Their proposed implementation in July differed significantly from the Proposed Methodology that Mr. Crowley and Mr. Fapp now endorse. For example, in July their calculation of the cost of equity for the railroad industry in 2005 was

Cost of equity = $R = \text{Risk-free interest rate} + \text{beta} \times \text{Market risk premium} + \text{Size premium}$

$$R = RF + \beta \times MRP + \text{SIZE}$$

$$= .0465 + .81 \times .071 + .0004 = .104 \text{ or } 10.4\%$$

(I discuss the size premium later.) But the September Crowley-Fapp statement in the present proceeding endorses the Proposed Methodology, which would have set the 2005 cost of equity at.³

$$R = RF + \beta \times MRP = .04251 + 0.798 \times .052 = 0.084 \text{ or } 8.4\%$$

In July, the Crowley-Fapp risk-free rate was 0.4 percentage points higher than in the Proposed

² Reply Comments of the Western Coal Traffic League, Railroad Cost of Capital – 2006, STB Ex Parte No. 558 (Sub-No. 10), July 25, 2007

³ My cost-of-equity calculations use industry-average betas. The Proposed Methodology would use individual-company betas to calculate costs of equity and then average the costs of equity. The order of averaging does not matter here.

Methodology (4.65% vs 4.25%), largely because they switched from a 20- year Treasury rate in their July statement to the ten-year rate in the Proposed Methodology. Their MRP estimate was almost two percentage points higher (7.1% vs 5.2%). Their 2005 cost of equity estimate was 10.4% in their July statement. Yet in September they say that 8.4% is fine.

My first task here is therefore to review how the CAPM should be implemented, focusing on the inconsistencies between the Crowley-Fapp statements in July and September.

Next I will respond to the WCTL's assertions about financing policy. The WCTL's Opening Comments criticize the Board's "blithe acceptance of the railroads' capital structure." The WCTL says that the railroads have "excess equity" and "ample ability to raise capital through relatively low-cost debt" (p. 3). The WCTL says that the weighted average cost of capital (WACC) for the railroad industry would be lower if only the railroads levered up with more debt financing. The WCTL relies on calculations by Mr. Crowley and Mr. Fapp, which I will review.

The WCTL misses a fundamental point about leverage and the cost of capital: there is no magic in financial leverage, and additional borrowing would not reduce the WACC. The apparently low cost of additional debt financing would be offset by the increase in financial risk borne by equity investors.

The WCTL also says that implementing the Proposed Methodology would not impair the railroad industry's ability to finance capital investment. The WCTL notes the railroads' ability to pay out cash to shareholders, for example through share repurchase programs. But railroads' cash payouts to shareholders are much smaller than capital investments and not unusually high compared to historical payouts.

U.S. railroads are in better financial health than they used to be. But the WCTL and its experts have not considered the railroads' future financial condition if the Board's Proposed Methodology is implemented and railroad profitability is restricted by a much lower WACC.

The WCTL seems to confuse available cash and debt capacity with revenue adequacy. Revenue adequacy means the ability to earn the cost of capital. Railroads will invest to modernize and expand capacity only if the expected return on investment at least equals their cost of capital. If the expected return is less than the cost of capital, then investment will be cut back, even if there is easy access to financing from cash on hand or from borrowing more against existing assets.

2. IMPLEMENTING THE CAPM

My September verified statement gives an example of standard practice for using the CAPM. I calculated the cost of equity for Burlington Northern in 2005 as about 11%. The same standard calculation for the railroad industry in 2005 gives ⁴

$$R = R_F + \beta \times MRP = .047 + .94 \times .066 = .109 \text{ or } 10.9\%$$

Here again is the Crowley-Fapp calculation from their July statement ⁵

$$\begin{aligned} R &= R_F + \beta \times MRP + \text{SIZE} \\ &= .0465 + .81 \times .071 + .0004 = .1041 \text{ or about } 10.4\% \end{aligned}$$

This calculation uses a lower beta than I used (.81 vs. .94), about the same risk-free rate and a higher MRP (7.1% vs. 6.6%). The Crowley-Fapp end result is a half percentage point less than mine.

The Crowley-Fapp calculation also includes a size adjustment. This is not common practice, although it is true that firms with relatively small market capitalizations have generated higher average returns than the CAPM predicts ⁶. But the Crowley-Fapp size adjustment for 2005 is negligible. The adjustment is a small positive number for 2003 and 2004 and a small negative

⁴ This calculation uses average betas from Value Line.

⁵ The statement does not describe the CAPM accurately. For example, at p. 4 it says that the MRP approximates "the systematic risk of default." Common stocks do not default. At p. 5 it says that beta approximates "unsystematic risk, which depends on the company's fortunes." That is exactly backwards: beta measures systematic risk, which depends on the company's exposure to market risk, not on the company's particular fortunes. The confusion between systematic and unsystematic risk cannot be a typo, because the same mistake is repeated on line 3 of p. 6 and line 3 of p. 9.

⁶ Other adjustments are possible. Some analysts increase the intercept of the CAPM, so that companies with betas less than 1.0 get higher expected returns than the standard CAPM would generate. Low-beta firms have generated higher average returns than predicted by the CAPM.

number for 2006

Now compare the Crowley-Fapp verified statement submitted with the WCTL's Opening Comments in September. The size adjustment is gone. The 7.1% MRP is gone, despite their endorsement at p. 6 of their July statement, where they say that it "is widely considered the best estimate available." Mr. Crowley and Mr. Fapp are now comfortable with a much lower 50-year average for the MRP. A ten-year period for estimating beta is now "acceptable," (p. 16) even though a five-year period is standard practice.

These are not small adjustments, because the Proposed Methodology, which they now endorse, gives a cost of equity that is two percentage points less than their calculation in July (8.4% vs. 10.4%). The change of view between July and September is dramatic.

The Market Risk Premium (MRP)

My September verified statement noted the difficulty of estimating the MRP and explained why very long-term historical averages are necessary. Standard sources average returns starting in 1926 and 1900. Table 3 in my September statement gives these averages, which include the 7.1% MRP endorsed by Mr. Crowley and Mr. Fapp. The table also includes averages from 1947 to 2005 and 50-year averages from 1956-2005. The 50-year averages are materially lower than the others.

In September, Mr. Crowley and Mr. Fapp accept the 50-year average and "would not object to a shorter time period" (p. 11). They do not attempt to demonstrate that 50-year averages are more useful than the longer-term average that they used in July. They do not explain why the Board should accept the additional statistical noise that can afflict MRPs estimated over shorter periods.

Mr. Crowley and Mr. Fapp say that the MRP is changing and that the Board should take the changes into account in calculating the railroad cost of equity. They attempt to track changes in the MRP in Table 1 in their September statement. The table shows 50-year average MRPs ending in each year from 1998 to 2006. The averages peak for 1949-1998 and then decline to a trough of 5.02% for 1956-2005.⁷ But the differences between the averages in their Table 1 have not a shred

⁷ This 5.02% MRP is slightly less than the 5.2% MRP given in the Proposed Methodology for 1956-2005. The Crowley-Fapp statement appears to define the risk-free rate as a ten-year

of statistical or practical significance. The table shows only that 50-year averages are higher for periods ending in the stock market boom of the late 1990s than for periods including the bear market that followed. The numbers in the table fluctuate, just as one would expect when years with randomly high or low returns are added or subtracted from the averages.

Estimating beta

The September Crowley-Fapp statement says that a ten-year (120 month) beta estimation period is "acceptable," although they note that a five-year period is standard. (They properly reject a 25-year period.) I believe that a ten-year period is unacceptable. Five years should be used instead.

A ten-year period is particularly dangerous now, because it reaches back to data from the dot com and telecom boom and bust. Railroad betas were unusually low during that period because the stock market was largely driven by fluctuations in the prices of dot coms and other hot stocks.

Table 1 reports industry betas⁸ for three successive periods, 1993-1997, 1998-2002 and the most recent five-year period ending in September 2007. Notice the low betas in the middle period, which includes much of the boom and bust, and the higher beta for 2003-2007.⁹

Table 1 includes betas from weekly as well as monthly returns. Weekly betas for railroads appear to be more stable and accurate than monthly betas. (I recommend that the Board track weekly as well as monthly estimates.) Figure 1 presents rolling five-year monthly and weekly railroad industry betas starting in 1993. The figure confirms that railroad betas were high in the

Treasury yield to maturity. The Proposed Methodology uses the income return on 20-year Treasuries.

⁸ The betas are calculated from returns on a portfolio of the stocks of the four largest U.S. railroads. I calculate industry betas this way, instead of averaging individual-company betas, in order to obtain an estimate of the standard error of the industry beta.

⁹ The last two periods overlap by three months in 2002. Estimated betas increase when these three months are excluded. The weekly beta from January 2003 through September 2007 is 1.00 with a standard error of .09. The monthly beta for the same period is 1.26, although the standard error is relatively high at .25.

mid-1990s, lower in the late 1990s and early 2000s and higher again recently

The September Crowley-Fapp statement claims that railroad industry betas have been declining (pp 21-22). Their Table 1 presents beta estimates from STB work papers that appear to show a declining trend. This is another odd result from using ten-year betas. Table 2 of their July statement, which is based on five-year betas from a standard source, reports betas that increase in each year from 2003 to 2006. My Table 1 and Figure 1 also show an increasing trend. Table 1 in my September statement, which reports beta estimates from several sources, shows higher betas in 2007 than in 2005. Railroad betas have clearly increased over the last few years.

If recent estimates hold, railroad equity betas will be close to 1.0 and may move higher.¹⁰ There is nothing illogical about betas greater than 1.0. A beta of 1.0 is the market average, and many companies have above-average betas for years or decades. Estimated railroad betas were greater than 1.0 for several years in the 1990s. The WCTL's suggestion that betas greater than 1.0 deserve "further investigation" because they might reflect "exercise of market power"¹¹ is illogical. All beta estimates deserve careful investigation, and market power, if or when it exists in the railroad industry, is as likely to reduce beta as increase it.

A Range for CAPM Estimates

My September report stressed that the CAPM does not give a precise number for the cost of equity, but a range of numbers. No one can observe true betas. We have only estimates based on past returns. No one knows for sure what the expected MRP is. We can only start with long-term historical averages.

Quantifying a reasonable range for the cost of equity is partly judgment and partly statistics. Here is an example for September 2007. The two inputs that generate the range are beta and the MRP.

Table 1 gives the most recent estimates for the railroad industry beta, .89 for monthly returns

¹⁰ The most recent three-year (156-week) beta for the railroad industry relative to the S&P 500 index is 1.32, with a standard error of .145.

¹¹ WCTL Opening Comments, p. 3.

and .96 for weekly returns. (These are the most recent betas plotted in Figure 1.) The weekly beta is a more precise estimate, so I set the midpoint of the beta range at .96. I set the width of the range by adding and subtracting .10, giving a range of .86 to 1.06. This range is narrower than a statistician's normal confidence limit, but the longer-term view of beta in Figure 1 gives somewhat more precision and confidence than the single estimates for 2003-2007.

Historical average MRPs are reported in Table 3 of my September statement. Average MRPs from 1900 or 1926 lie in a range of about 6% to 7% over long-term Treasury rates. Some practitioners use lower MRPs, however, reflecting their view that average MRPs over the next decades are likely to be somewhat lower than long-term historical averages.¹² The Board could give weight to these views and set an adjusted range for the MRP from 5% to 7% rather than 6% to 7%. The Board's proposed 5.2% 50-year MRP average from 1956 to 2005 happens to lie at the bottom of this adjusted range, although it is below the range based on historical averages.

The long-term Treasury rate in September 2007 was 4.8%.¹³ Here is a table of the costs of equity using the tops and bottoms of the beta and MRP ranges:

$\beta = 1.06$, MRP = 7%	R = 12.2%
$\beta = .86$, MRP = 7%	R = 10.8%
$\beta = 1.06$, MRP = 5%	R = 10.1%
$\beta = .86$, MRP = 5%	R = 9.1%

¹² There is a large research literature attempting to forecast the MRP, but no consensus, again illustrating that using the CAPM is not as easy as a first look would suggest. One source suggests an expected MRP of 4.5% to 5% for the entire world market. See E. Dimson, P. R. Marsh and M. Staunton, *Global Investment Returns Yearbook 2007*, London Business School and ABN AMRO, February 2007, p. 48. Ibbotson Associates forecasted an MRP of 6.28% in *S&P Valuation Edition, 2006 Yearbook*, p. 97. My textbook quotes a MRP range of 5% to 8% (A. Brealey, S. C. Myers and F. Allen, *Principles of Corporate Finance*, 8th ed., McGraw-Hill Irwin, p. 154). These MRPs are all forward-looking. The Dimson-Marsh-Staunton and Brealey-Myers-Allen MRPs are defined relative to short-term interest rates, however. The translation to MRPs vs. long-term interest rates is a further difficulty.

¹³ This is the 20-year constant-maturity Treasury rate reported in the Federal Reserve System Release H15 (Selected Interest Rates).

The two middle rows of this table are more relevant than the top and bottom rows, since it is not likely that the beta and the MRP are both at the top or bottom of their ranges

The table shows a range for the CAPM cost of equity from about 9% to about 12%. One could call it a "reasonable range" based on available data and judgment. The bottom of a reasonable range is *not* a reasonable place to be, however. Not all estimates in the range are equally valid and sensible. The point of quantifying a range is to show the extent of imprecision in CAPM estimates and to find out what estimates are in the heart of the range instead of the bottom or top of it. The width of the range also shows why the Board should not ignore other approaches to estimating the cost of equity. My September statement explained why the Board should also use DCF estimates, at least as a check on the CAPM estimates.

The Proposed Methodology would give CAPM cost of equity estimates at or below the bottom of the range given in the table above. The methodology would use ten-year betas, which are lower than betas estimated properly from more recent data, and a low MRP.

My September statement explained why the costs of underestimating the cost of capital are greater than the costs of overestimating it. Setting a cost of capital that is too low would restrict profitability and deter capital investment. I also understand that the Board is supposed to support the long-term financial health of the railroad industry and promote an adequate and efficient transportation network. Therefore the Board is better off setting a higher cost of capital than a lower one.

Here is an example of how standard practice would calculate a CAPM cost of equity for the railroad industry in 2007. I use a risk-free interest rate of 4.8%, an industry beta of .9 and an MRP of 6.6%, which is the historical average from 1900-2006.

$$R = RF + \beta \times MRP = .048 + .9 \times .066 = .111 \text{ or about } 11\%$$

3. DEBT AND THE WEIGHTED AVERAGE COST OF CAPITAL

I have noted the WCTL's argument that the four large U.S. railroads have too much equity

and too little debt in their capital structure. The WCTL says that “excessive equity” is inefficient and has increased the railroad-industry WACC.¹⁴

The WACC used by the Board is a simple weighted average of the costs of debt and equity, with no tax or other adjustments. There are standard formulas for calculating the cost of equity and WACC at different debt ratios. These formulas, properly applied, will give the *same* numerical value for WACC at *any* debt ratio. The overall cost of capital does not depend on financing, because the apparent advantage of using more “low-cost” debt is exactly offset by an increase in financial risk, in the equity beta and in the cost of equity.¹⁵

The July Crowley-Fapp statement used the standard formulas to compare WACC at the railroads’ actual debt and equity ratios to WACC at other ratios, including equity ratios of 50%, 60% and 100%. Their calculations gave WACCs that were almost identical. See their Exhibits 6, 8, 9 and 10 and Table 4 in the WCTL’s Reply Comments.¹⁶ According to these exhibits, WACC would not decline if railroads levered up with more debt and less equity. The WCTL must understand this point, because its Reply Comments say at p. 17 that “[O]ne of the virtues of the CAPM approach is that it is relatively insensitive to changes in the debt-equity ratio.”

The WCTL nevertheless argues elsewhere that railroads’ “excessive equity” is inefficient and that railroad WACCs could be reduced at higher debt ratios. Table 3 at p. 11 of the WCTL’s Reply Comments introduces WACCs that seem to decline as the debt ratio is increased. This table relies on calculations in Exhibits 11 and 12 of the July Crowley-Fapp statement, where WACC is calculated at different debt ratios with no adjustments for the effects of financial leverage on financial risk, beta and the cost of equity. The standard formulas for calculating cost of equity and WACC at different debt ratios are ignored in these exhibits. This is a blatant and elementary

¹⁴ “[T]he reduction in the railroads’ leverage has contributed substantially to both the absolute size of the cost of capital and to the relative increase over the 2003-2006 period. [O]ne cause of the increased cost of capital under the Board’s existing methodology is the proportion of equity in the railroads’ capital structure.” WCTL Reply Comments, p. 12.

¹⁵ The after-tax WACC used in other industries can decline with financial leverage because interest is tax deductible. Taxes do not enter the Board’s WACC calculation for railroads, however.

¹⁶ The minor differences in WACC at different equity ratios came from failure to adjust the SIZE factor in the Crowley-Fapp CAPM equation.

mistake, as is clear by comparison to the preceding Exhibits 6, 8, 9 and 10 in the July Crowley-Fapp statement

The WCTL takes these mistaken numbers seriously, however ¹⁷ This mistake disqualifies the WCTL's arguments about railroads' "excessive equity" and the supposed reduction in WACC from using more debt financing

4. CASH DISTRIBUTIONS AND REVENUE ADEQUACY

The WCTL's Opening Comments say at p 13 that "Proper measurement of the cost of capital will not impair the railroads' ability to raise capital or attract investment " Since the WCTL endorses the Proposed Methodology, it must believe that the much lower cost of capital from that methodology would be an adequate return But they offer no evidence on railroads' future financial health at lower rates of return and no evidence that railroads' capital investment programs could be maintained in the future if the Proposed Methodology were implemented Instead they point to the railroads' recent cash flow and to recent increases in dividends and stock repurchases "[T]he railroads have not raised capital by issuing stock to the public in many, many years Instead, they have been using a substantial portion of their recent inflow of cash to buyback stock, increase dividends and to reduce long-term debt, rather than to expand capacity or increase capital expenditures " (pp 13-14)

In effect the WCTL is arguing as follows If railroads' recent profitability has allowed them to pay down some debt and pay out more cash to investors, why worry about regulatory changes that could reduce profitability in the future?

The WCTL's characterization of railroads' recent cash flows and cash payouts rests on Tables 6 and 7 in its July Reply Comments, which are in turn based on Tables 13 and 14 in the July Crowley-Fapp statement Table 13 reports a cumulative increase in dividends and repurchases of \$2,369 million from 2003 to 2006 The cumulative increase in capital investment was \$1,792 million Table 14 shows net reductions of long-term debt during this period

¹⁷ See the discussion of Table 3 at pp 10-12 in the WCTL's Reply Comments in July The WCTL's Opening Comments in September refer back to the Reply Comments, for example at p 3

These amounts may leave the impression that increased payouts to railroad investors have taken priority over railroad capital investment. That impression could follow from the short time period examined by Mr. Crowley and Mr. Fapp. Why did they start Tables 13 and 14 in 2003? My Figure 2 may suggest an answer. It plots capital investment vs. distributions over a longer period starting in 1990.¹⁸ Note first that capital investment is always far above dividends and repurchases. Capital investment increased to about \$7 billion in 2006. Gross dividends and repurchases for 2006 (the lower solid line in Figure 2) were about \$3.2 billion.

Second, gross dividends and repurchases increased in the late 1990s and 2000 but were cut back sharply in 2001 to 2003. The increase in payout from 2003 was largely a recovery from previous cutbacks. Starting from 2003 was misleading.

In addition, Mr. Crowley and Mr. Fapp overstate net cash distributions to investors. The lower solid line in Figure 2 defines distributions in the same way as the Crowley-Fapp July statement. This definition is questionable, because it calls for gross, not net distributions. The dashed line in Figure 2 shows net distributions, which offset shares issued against shares repurchased. The railroads issued about \$2.5 billion of new shares from 2003 to 2006.¹⁹ As the dashed line indicates, net distributions increased more slowly than gross distributions, to about \$2.3 billion in 2006. The increase in net distributions from 2003 to 2006 was less than the increase in capital investment.

There is nothing unusual or abnormal about the time patterns of railroad capital investment and cash payout shown in Figure 2. Distributions are often cut back when times are tough and increased when profits and cash flow recover. Capital investment usually increases when demand, profitability and investment opportunities improve. Corporations often pay down debt in good times in order to build up a reserve of unused debt capacity that can be tapped if necessary to fund future investment.

¹⁸ Figure 2 required 15 years of data, which was downloaded from Compustat. The Crowley-Fapp statement uses a different source for 2003-2006 only. The Compustat data do not match the Crowley-Fapp data for 2003-2006 exactly, but the numbers are very close.

¹⁹ Corporations issue shares through various channels, for example to finance acquisitions, from exercise of stock options or from conversion of convertible debt. Absence of formal public offerings does not mean that stock issues are zero.

But the railroads' recent uses of cash are not the point of this proceeding. The point is to estimate the railroads' cost of capital. Getting the cost of capital right is important in determining whether railroads are or will be revenue adequate. From an economic point of view, revenue adequacy means the ability to earn the cost of capital on new investment and on the economic value of existing assets.

Railroads should have sufficient incentives to invest in order to modernize, cut costs and expand capacity. Railroads will make these investments only to the extent that they can expect to earn at least their cost of capital. Railroads will not invest just because they have cash on hand or the ability to borrow more. If the expected rate of return on investment is less than the cost of capital, responsible managers will not invest, regardless of how much cash is in the bank. Thus the WCTL's arguments about railroads' debt capacity and payout policy are irrelevant. The real issue is the cost of capital, which sets the hurdle rate for investment.

In a competitive economy, revenue adequacy also means the ability to earn the cost of capital, on average and in the long run, on the economic value of existing assets. I stress "economic." The ability to earn the cost of capital on the *book* value of existing assets does not prove a company is revenue adequate or that returns on new investment meet the cost of capital.

VERIFICATION

I, Stewart C. Myers, declare under penalty of perjury, that the foregoing statement is true and correct and that I am qualified and authorized to file this statement.

Executed on October 29, 2007

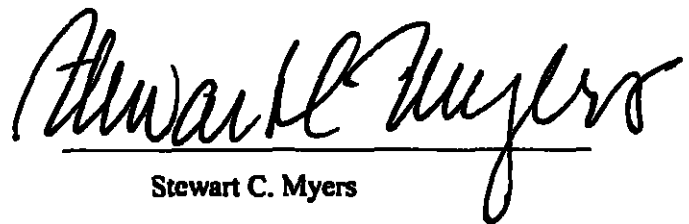

Stewart C. Myers

Table 1
Five-Year Beta Estimates

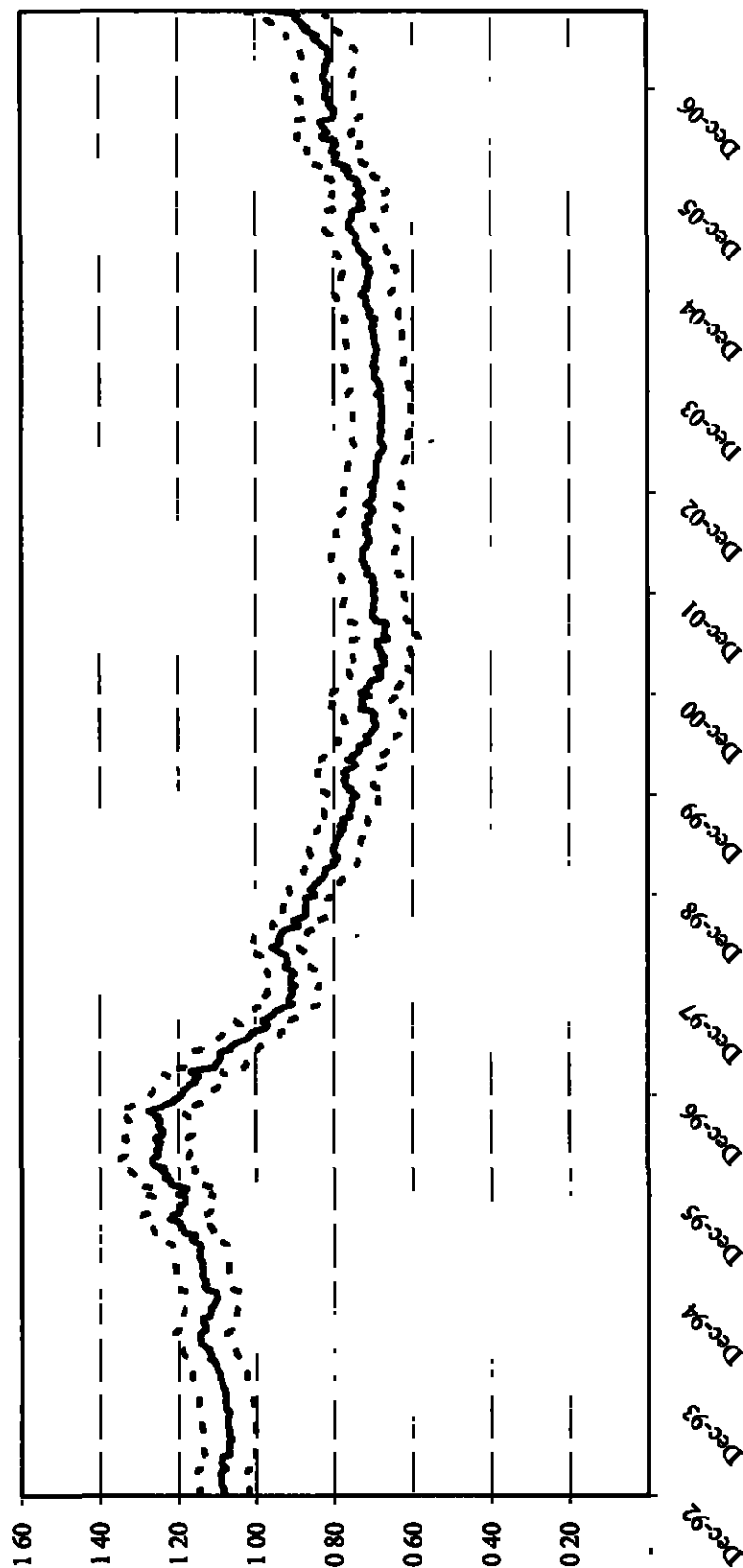
	Period	Beta	Standard Error
60 Month	1993-1997	0.94	0.11
	1998-2002	0.43	0.16
	2003-2007 *	0.89	0.22
260 Week	1993-1997	0.91	0.06
	1998-2002	0.70	0.08
	2003-2007 *	0.96	0.08

Sources and Notes

Returns for railroad stocks and the S&P 500 Index from Bloomberg as of 10/10/2007. Betas are calculated from monthly or weekly rates of return on a market-value weighted portfolio of the four major U.S. railroads. Treasury bill rates are subtracted from the portfolio and market returns. The regression equation includes an intercept.

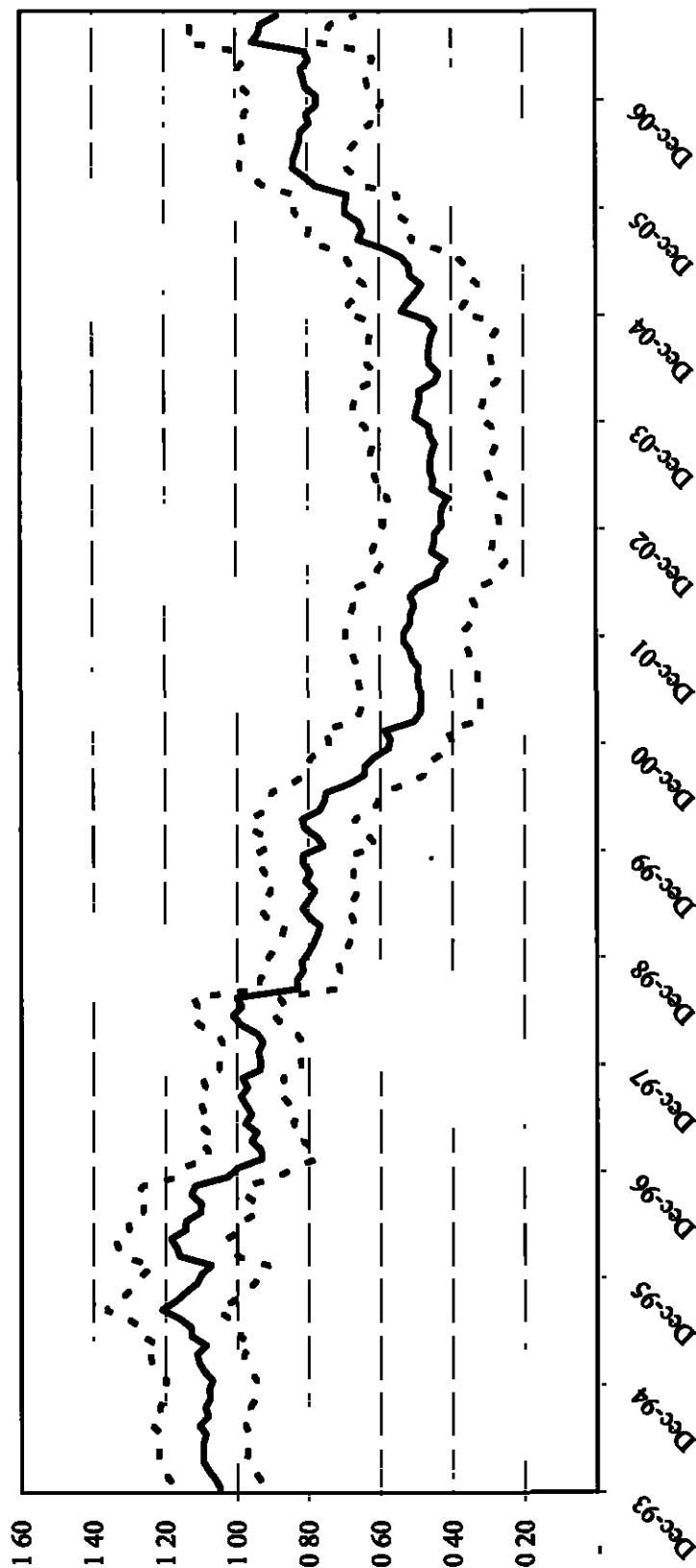
*Beta calculation includes returns for October - December 2002

Figure 1
Rolling Five-Year Betas for the Railroad Industry
Panel B: Weekly Returns



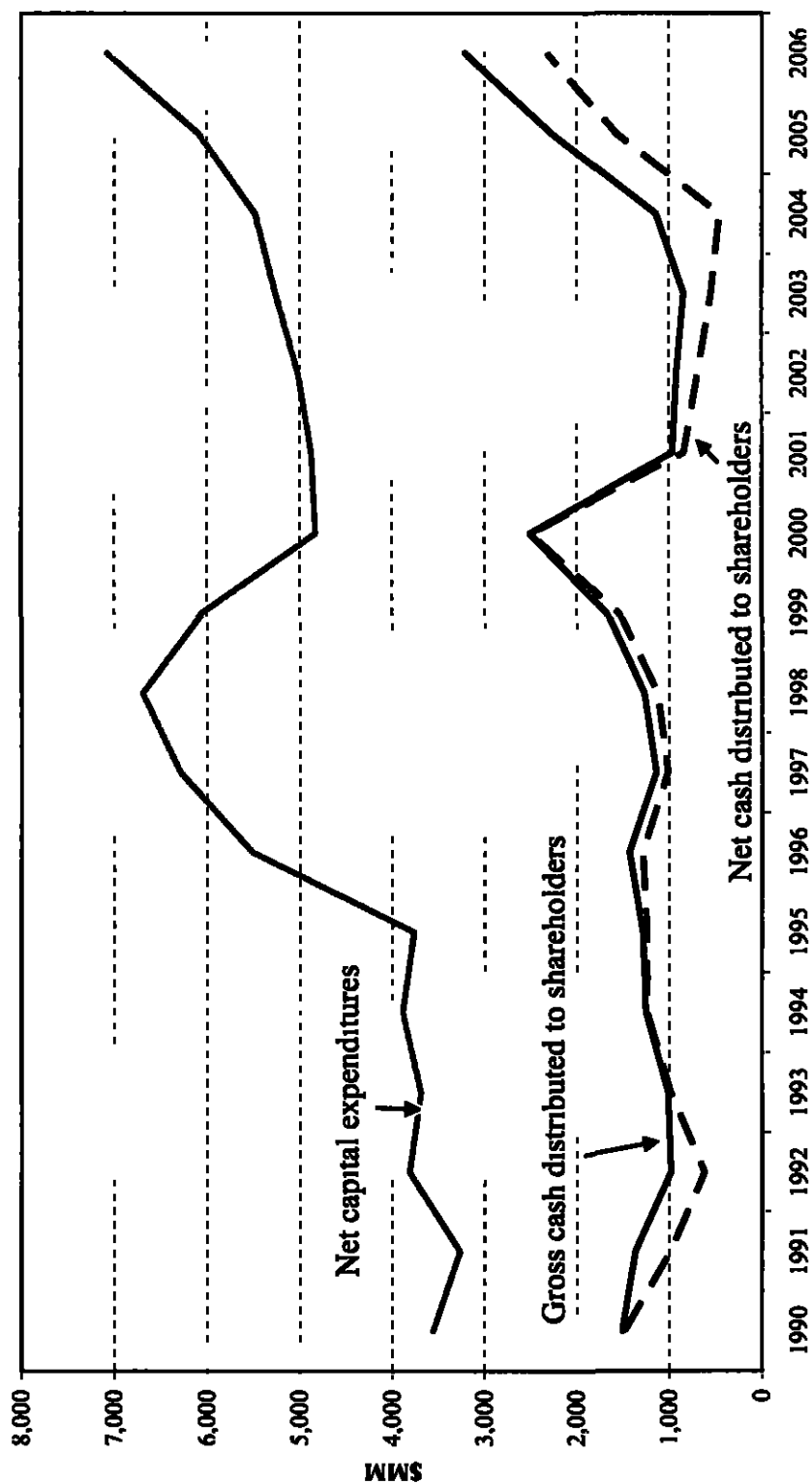
Sources and Notes Returns for railroad stocks and the S&P 500 Index from Bloomberg as of 10/10/2007 Betas are calculated from weekly rates of return on a market-value weighted portfolio of the four major U S railroads Treasury bill rates are subtracted from the portfolio and market returns The regression equation includes an intercept Data include returns from 1988 Dashed lines show the beta estimates plus and minus one standard error

Figure 1
Rolling Five-Year Betas for the Railroad Industry
Panel A: Monthly Returns



Sources and Notes Returns for railroad stocks and the S&P 500 Index from Bloomberg as of 10/10/2007 Betas are calculated from monthly rates of return on a market-value weighted portfolio of the four major U S railroads Treasury bill rates are subtracted from the portfolio and market returns The regression equation includes an intercept Data include returns from 1988 Dashed lines show the beta estimates plus and minus one standard error

Figure 2
Railroad Industry Capital Investment vs. Cash Distributed to Shareholders
1990-2006



Sources and Notes Computat as of October, 2007 Net capital expenditure is calculated as the capital expenditure net of sale of assets
 Gross cash distributed to common and preferred shareholders includes dividends and share repurchases

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

METHODOLOGY TO BE EMPLOYED IN)
DETERMINING THE RAILROAD INDUSTRY'S)
COST OF CAPITAL)

Ex Parte No 664

**REPLY VERIFIED STATEMENT
OF
R. GLENN HUBBARD
DEAN, COLUMBIA BUSINESS SCHOOL
AND
BRUCE E. STANGLE
CHAIRMAN, ANALYSIS GROUP, INC.
ON BEHALF OF
ASSOCIATION OF AMERICAN RAILROADS**

October 29, 2007

I. INTRODUCTION

A. Qualifications

- 1 Our names are R. Glenn Hubbard and Bruce E. Stangle. We are the same individuals who submitted a joint Verified Statement on behalf of the Association of American Railroads ("AAR") in this proceeding on September 27, 2007. Our backgrounds and qualifications are described in our earlier statement.

B. Purpose of Reply

- 2 We have been asked by counsel for the AAR to reply to comments filed by various parties on or before September 27, 2007 addressing the August 14, 2007 proposal (corrected on August 20, 2007) of the Surface Transportation Board ("STB") "to revise its method for calculating the railroad industry's cost of capital by computing the cost of equity using a capital asset pricing model."¹
- 3 We have previously filed statements on December 8, 2006, February 12, 2007, and September 27, 2007 regarding the methodology we believe is appropriate for estimating the cost of capital in this industry, including our rationale for the continued use of the DCF model. In this reply we focus primarily on the submission of the Western Coal Traffic League ("WCTL"), which filed the most extensive set of comments in support of the STB's proposed methodology.²
- 4 In evaluating the comments filed by the various parties, our objective is to help ensure that the methodology adopted by the STB does not create inefficient investment incentives. This objective is particularly important because the

¹ Surface Transportation Board Decision STB Ex Parte 664, In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, August 14, 2007, p. 1.

² "Opening Comments of the Western Coal Traffic League," In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No. 664, September 27, 2007 ("WCTL Comments").

railroad industry plans to make significant infrastructure investments in future years. If the regulated cost of capital is set too low, investment will be deterred, and both the quantity and quality of rail service provided will suffer. Similarly, it is possible that the regulated cost of capital could be set too high, which would also have adverse and inefficient consequences for the allocation of resources across industries. We are also concerned that sunk investments in long-lived railroad assets may be "stranded" if the STB's new approach reduces revenues from existing investments that were made based on the prior regulatory environment. Finally, we show that the actual level of capital expenditures in recent years by the major railroads has remained quite high despite increases in dividends and share repurchases.

C. Summary of Reply

- 5 Overall, the comments submitted on or before September 27, 2007 have only strengthened our concern that the STB's proposal is not well considered and will cause significant harm to the railroad industry.
- 6 Section II of our reply addresses comments that specifically relate to the STB's proposed methodology for estimating the cost of equity. The WCTL, for example, issues essentially a blanket endorsement of the STB's proposed implementation of the CAPM, but fails to acknowledge that the results are highly sensitive to the inputs chosen by the STB. Moreover, the WCTL ignores that when more reasonable inputs are chosen, the cost of equity increases substantially, putting the STB estimate at the low end of the range of possible estimates.
- 7 Similarly, the WCTL wholly endorses the STB decision to focus on the CAPM and ignore information provided by the DCF model. In our view, this position is completely unfounded, given the availability of more general versions of the DCF model, such as the three-stage DCF model and the Ohlson-Juettner model.

advocated in Professor Mohanram's submission³ In general, we believe Professor Mohanram makes a strong case for the continued use of a variant of the DCF model, and we find the cost of equity estimates he presents to be in a much more reasonable range than the STB estimate

- 8 Section III of our reply addresses several comments that pertain generally to the railroad industry's capital structure and its past capital expenditures The WCTL asserts that the railroads "have been using a substantial portion of their recent inflow of cash to buyback stock, increase dividends, and to reduce long-term debt, rather than to expand capacity or increase capital expenditures"⁴ The WCTL concludes from this that "the railroads have ample ability to increase their debt on attractive terms" and that "there is no good reason to think that lowering the COE [cost of equity] to an appropriate level will have an adverse impact on the railroads' ability to attract capital"⁵ The WCTL's position makes no economic sense
- 9 Increases in dividends and/or share repurchases are widely used in many industries to increase shareholder value. In addition, share repurchases may help to achieve the desired mix of debt and equity Increases in dividends and share repurchases have no bearing on the proper cost of capital or the appropriate level of capital expenditures Moreover, the optimal capital structure of a firm is affected by many economic variables (*e g*, tax rates, net income, cost of debt, cost of equity) and is not something that the STB needs to be concerned with in order to compute the appropriate cost of capital

³ Partha S Mohanram, "Determining an Appropriate Cost of Capital for Railroads," In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No 664, September 13, 2007 ("Mohanram Comments")

⁴ WCTL Comments, pp 13-14

⁵ WCTL Comments, p 14

II. REPLY TO COMMENTS ON THE PROPOSED METHODOLOGY FOR ESTIMATING THE COST OF EQUITY

A. Implementation of the CAPM

10 The WCTL's characterization of the STB's proposed CAPM as "plain vanilla"⁶ is highly misleading because all CAPM inputs require careful consideration and the exercise of judgment. The WCTL endorses the implementation of the CAPM as proposed by the STB, but it fails to acknowledge the full extent of the sensitivity of the CAPM results to the choice of inputs or the time period considered.

11 For example, the WCTL did not present any cost of equity estimates using data that extend into 2007. As we demonstrated in Exhibits 3a and 3b of our September 27, 2007 submission, the cost of equity increases substantially between 2005 and 2007, even when a consistent methodology is maintained.⁷ Using the Ibbotson 5-year monthly betas, the cost of equity estimates for Burlington Northern, CSX, and Union Pacific increase by 3.5, 2.0, and 1.8 percentage points, respectively, when the December 2005 CAPM estimates are updated using data through September 2007.

12 Regarding the calculation of the market risk premium, two of the WCTL's experts (Mr. Crowley and Mr. Fapp) have used an 80-year average of the market premium, yet the WCTL without explanation abandons their position in favor of the STB's use of a 50-year average.⁸ As we showed in Exhibit 2 of our September 27, 2007 submission, the estimate of the risk premium chosen by the STB is at the low end of the range of plausible estimates. The WCTL does not comment on the large difference this choice makes in the cost of equity results.

⁶ WCTL Comments, p. 2.

⁷ "Verified Statement of R. Glenn Hubbard and Bruce E. Stangle," In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No. 664, September 27, 2007 ("Hubbard-Stangle Comments"). For ease of reference, Exhibits 1a-1d, 2, and 3a-3b from our September 27, 2007 submission are included again with this reply.

⁸ WCTL Comments, pp. 6-7. The WCTL also indicates that "the average, whatever its length, should be a rolling one, so that more recent data is considered, and older data is discarded."

Moreover, the WCTL provides no convincing support for the use of a 50-year *rolling average*. We are unaware of any academic studies that have used this rolling average methodology to estimate the market risk premium.

- 13 As we have previously pointed out, the STB should use as many observations of the risk premium as possible when calculating the average.⁹ The reasoning behind this practice is nicely summed up in Ibbotson Associates' *Stocks, Bonds, Bills and Inflation 2007 Yearbook, Valuation Edition* ("SBBIV")

A proper estimate of the equity risk premium requires a data series long enough to give a reliable average without being unduly influenced by very good and very poor short-term returns. When calculated using a long data series, the historical equity risk premium is relatively stable. Furthermore, because an average of the realized equity risk premium is quite volatile when calculated using a short history, using a long series makes it less likely that the analyst can justify any number he or she wants.

Without an appreciation of the 1920s and 1930s, no one would believe that such events could happen. The 81-year period starting with 1926 is representative of what can happen. It includes high and low returns, volatile and quiet markets, war and peace, inflation and deflation, and prosperity and depression. Restricting attention to a shorter historical period underestimates the amount of change that could occur in a long future period. Finally, because historical event-types (not specific events) tend to repeat themselves, long-run capital market return studies can reveal a great deal about the future. Investors probably expect "unusual" events to occur from time to time, and their return expectations reflect this.¹⁰

In contrast, the WCTL's proposed methodology discards over time increasingly large amounts of data that are clearly useful in obtaining a more precise estimate of the market risk premium.

- 14 Regarding the estimation of beta, the WCTL essentially agrees with our view regarding the appropriate sample period. The WCTL states that "a measurement period of as short as 5 years, which is the period used by Ibbotson

⁹ Hubbard-Stangle Comments, pp. 12-13.

¹⁰ *Stocks, Bonds, Bills and Inflation, Market Results for 1926-2006, 2007 Yearbook, Valuation Edition*, Morningstar, Inc., pp. 82-83.

and some other notable providers (Value Line, Standard & Poor's, and Merrill Lynch), would also be reasonable."¹¹ However, the WCTL also states that the STB's choice of a 10-year window is reasonable. The WCTL cannot have it both ways. The 5-year and 10-year windows yield very different estimates, and the longer period likely includes information that is not relevant to the economic environment currently facing the railroad industry.¹²

15 The WCTL claims that "there is substantial evidence that [the railroad industry] beta is below 1.0 and that it is falling and not rising."¹³ The U.S. Department of Agriculture appears to agree.¹⁴ Both parties fail to acknowledge that this claim depends critically on the estimation methodology and time period chosen. As Exhibits 1a-1d of our September 27, 2007 submission show, this claim is inconsistent with the available evidence when the CAPM analysis is extended through 2007. For example, the 5-year monthly betas for all four of the major railroads show an upward trend as the sample is extended into 2007, and three of the four betas (Burlington Northern, CSX, Norfolk Southern) exceed 1.0 at some point in 2007.¹⁵ Neither the WCTL nor the Department of Agriculture address this trend. One of the contributing factors to the increase in the beta estimates is that when the 5-year sample period is extended into 2007, it no longer includes a period of high market volatility associated with the boom and bust cycle in technology stocks that occurred over the period 1998-2002 (*i.e.*,

¹¹ WCTL Comments, p. 7.

¹² While using a relatively short time period to estimate beta may appear to conflict with the practice of using as much data as possible when estimating the market risk premium, in fact there is a fundamental difference in the objectives of each estimation process. The market risk premium should reflect long-term investor expectations about returns available for holding risky securities in general, while beta should reflect investor perceptions of how changes in a firm's value currently relate to changes in the overall market.

¹³ WCTL Comments, p. 8.

¹⁴ "Comments of the U.S. Department of Agriculture," In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No. 664, September 13, 2007, p. 4.

¹⁵ In previous submissions, the WCTL asserted that a beta less than 1.0 was justified by comparing the railroad industry to regulated electric utilities – an analogy that is clearly inappropriate in the current economic environment. See "Summary of the Presentation of the American Association of Railroads," STB Ex Parte 664, In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, February 12, 2007, pp. 20-21.

the dot-com bubble) During the 1998-2002 period railroad stocks did not have a strong positive relationship with the overall stock market Including the 1998-2002 period when estimating beta would erroneously include information that is not relevant to the current economic environment faced by the railroads We believe that there is substantial evidence that railroad industry betas are greater than 1.0 and rising ¹⁶ If this is the case, then the calls for lowering the industry cost of capital are moving in exactly the wrong direction

- 16 The WCTL makes the remarkable assertion that if the railroad industry beta did exceed 1.0 for several years, then "further investigation would be in order to determine if the values reflected industry risk or instead reflected the exercise of market power that the STB is supposed to regulate" ¹⁷ From an economic perspective, there is no necessary connection between beta and market power In a review of studies on this topic, Professor Paul Peyser concluded

A number of empirical studies have sought to determine the relationship between a firm's market power and the concept of systematic risk associated with the Sharpe-Lintner Capital Asset Pricing Model The upshot of these studies is that the empirical relationship between systematic risk and market power is unclear at this juncture ¹⁸

- 17 WCTL's recommendation that the industry beta should be computed "by using carrier-specific unlevered betas weighted according to each railroad's market capitalization and then applying (levering) the average beta to the intended industry capital structure" ¹⁹ is also unfounded This weighting scheme has no theoretical justification and would yield an arbitrary estimate of the industry beta that would depend on whatever the WCTL specified as the "optimal" debt-to-equity ratio

¹⁶ See also Exhibit 3b from our September 27, 2007 submission

¹⁷ WCTL Comments, p. 3

¹⁸ Paul S. Peyser, "Beta, Market Power and Wage Uncertainty," *Journal of Industrial Economics*, vol. 42, no. 2 (June 1994), p. 217

¹⁹ WCTL Comments, p. 2

18 The WCTL claims that the railroads could “game” the beta by reducing leverage after the STB sets the cost of capital using a more highly levered capital structure²⁰ This claim ignores the reality that an increase in the debt-to-equity ratio would cause shareholders to demand a higher return on equity, thus leaving the weighted average cost of capital essentially unchanged In fact, Modigliani and Miller established that under certain conditions the increase in the cost of equity will exactly offset the reduction in the cost of capital resulting from an increase in the debt-to-equity ratio, thus leaving the weighted average cost of capital unchanged²¹ The WCTL’s current claim that the railroads could readily change their overall cost of capital by changing their capital structure is contradicted by the WCTL’s prior recognition that its cost of capital estimates were invariant to assumptions about the debt-to-equity ratio “The general lack of variability is also consistent with the Modigliani-Miller theorem that the value of a firm is unaffected by how the firm is financed (putting aside issues of taxes, bankruptcy costs, asymmetric information, and other inefficiencies)”²²

B. Role of the DCF Model

19 The WCTL claims that the AAR failed to identify any superior alternative to the CAPM (other than the one-stage DCF model) in previous submissions²³ This claim is plainly wrong The AAR’s prior submissions discussed multi-factor DCF models as well as the Fama-French asset pricing model²⁴ As we explained in detail in our September 27, 2007 submission, cost of equity estimates using the three-stage DCF model are published annually by Ibbotson

²⁰ WCTL Comments, p 9

²¹ Richard A Brealey, Stewart C Myers, and Franklin Allen, *Principles of Corporate Finance*, 8th ed., McGraw-Hill Irwin, 2006, Chapter 17

²² “Reply Comments of the Western Coal Traffic League,” STB Ex Parte 558 (Sub-No 10), In the Matter of Railroad Cost of Capital – 2006, p 18

²³ WCTL Comments, p 4

²⁴ “Verified Statement of R Glenn Hubbard,” in “Comments of the Association of American Railroads on Advanced Notice of Proposed Rulemaking,” STB Ex Parte 664, In the Matter of Methodology to be Employed in Determining the Railroad Industry’s Cost of Capital, pp 7-8, Hubbard-Stangle Comments, pp 15-17

Associates, and these estimates rely on straightforward and transparent inputs that are well-grounded from an economic perspective²⁵ Furthermore, research in financial economics has demonstrated that the additional variables in the Fama-French asset pricing model explain stock returns better than beta alone²⁶ This point was implicitly acknowledged by the WCTL's expert, Mr Crowley, who previously included firm size in his cost of equity estimates²⁷ Research in financial economics also indicates that a firm's market-to-book ratio contributes significant explanatory power to risk-return asset pricing models²⁸

20 We also note that the variant of the DCF approach advocated by Professor Mohanram in his September 13, 2007 submission (*i.e.*, the Ohlson-Juettner model) yields cost of equity estimates in basically the same range (10.5 percent to 12 percent) as in our September 27, 2007 submission²⁹ In addition, Professor Mohanram's recommendation that the STB adopt a variant of the DCF model is consistent with our view that the DCF model should continue to play a role in the STB's cost of equity determination As we have indicated previously, the DCF model adds valuable information to the process because it is estimated using forward-looking growth rate estimates, whereas the CAPM relies exclusively on inputs constructed from historical data

21. Finally, the WCTL claims that "CAPM is far superior to DCF because CAPM explicitly considers the impact of risk and inflation"³⁰ This claim is false because the DCF model also incorporates risk and inflation through the parameter(s) controlling the forecasted growth in nominal earnings As we

²⁵ Hubbard-Stangle Comments, pp 16-17

²⁶ Richard A Brealey, Stewart C Myers, and Franklin Allen, *Principles of Corporate Finance*, 8th ed., McGraw-Hill Irwin, 2006, pp 194-197 and 203-204

²⁷ See, for example, "Exhibit B Verified Statement of Thomas D Crowley," in "Comments of the Western Coal Traffic League," In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No 664, December 8, 2006, pp 12-13

²⁸ Richard A Brealey, Stewart C Myers, and Franklin Allen, *Principles of Corporate Finance*, 8th ed., McGraw-Hill Irwin, 2006, pp 194-197

²⁹ See cover letter accompanying Mohanram Comments, p 2

³⁰ WCTL Comments, p 3

noted in our previous submission, neither the CAPM or DCF models are inherently superior. Both models have their limitations but should produce similar results over time and each can provide a meaningful check on the reasonableness of any results obtained.³¹

III. REPLY TO GENERAL COMMENTS ON THE RAILROAD INDUSTRY'S INVESTMENTS AND CAPITAL STRUCTURE

A. Sources of Railroad Industry Capital

22 Several parties claim that the railroad industry's ability to raise capital will not be impaired if the STB were to specify a lower cost of equity using its proposed methodology, and that the financial markets perceive the railroad industry to be "financially healthy."³² These parties fail to recognize that the railroad industry's previous large capital expenditures were made with the expectation of earning returns based on appropriate cost of capital rates determined by the STB using its established methodology, and any changes in the STB's methodology will affect investor expectations.³³ Comments filed by railroad industry investors confirm this point.³⁴ Furthermore, the industry is facing

³¹ Hubbard-Stangle Comments, pp. 15-17.

³² "Comments of the National Industrial Transportation League," In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No. 664, September 27, 2007, p. 3; "Opening Comments of The Honorable Brian Schweitzer et al.," In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No. 664, September 27, 2007, p. 7; "Opening Comments of the National Grain and Feed Association," In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No. 664, September 27, 2007, p. 4; WCTL Comments, p. 14.

³³ The impact of the STB's August decision on railroad stock prices is illustrated in "Comments of Union Pacific Railroad Company," In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No. 664, September 27, 2007 ("Union Pacific Comments"), p. 4. The comments indicate that "By the end of the week, after investors had time to study the Board's proposal, rail stocks had dropped by an average of nearly 7 percent, while the S&P 500 dropped less than 0.5 percent."

³⁴ "Atticus Capital, Letter to STB," In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No. 664, September 27, 2007; "Greenhaven Associates, Inc., Letter to the STB," In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No. 664, August 29, 2007.

economic conditions that require it to continue to make significant infrastructure investments³⁵

23 The WCTL claims that the railroads could raise all necessary additional capital by issuing more debt, and that the industry's capital structure is inappropriately weighted toward equity³⁶ The WCTL's assertion ignores the costs of increased leverage (*e.g.*, higher borrowing costs due to reduced credit ratings) Furthermore, some of the railroads are already carrying significant debt³⁷

24 In addition, the WCTL fails to consider the railroads' internally generated retained earnings as a source of financing for capital expenditures If the railroads are not allowed to earn sufficient returns from new capital investments, they will reallocate the funds to other investments or distribute the capital to shareholders, regardless of the source of financing

B. Capital Expenditures, Dividends, and Stock Repurchases

25 The WCTL claims that "the railroads' recent influx of incremental dollars has gone more to stockholders than to capital expenditures"³⁸ This claim is factually untrue and irrelevant to the issue in this proceeding For example, since 1999, Union Pacific has spent nearly 20 percent of its annual revenue on capital expenditures, for a total of almost \$19 billion Union Pacific has noted that it "must make large capital expenditures every year just to maintain our

³⁵ "Verified Statement of Thomas Hund," In the Matter of Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, STB Ex Parte No. 664, September 27, 2007 ("Hund Comments"), pp. 7-8 See also Mohanram Comments, p. 1

³⁶ WCTL Comments, pp. 3, 13-14

³⁷ "CSX Corporation - Downgrading on Rising Execution Risk, Valuation," *Morgan Stanley*, October 3, 2007, p. 3

³⁸ WCTL Comments, p. 3

existing network and service levels”³⁹ Similar evidence is presented by other rail carriers⁴⁰

- 26 An analysis of railroad industry capital expenditures versus share buybacks and dividend payouts shows that, while buybacks and dividends have been significant, they are small relative to capital expenditures Exhibit 4 shows industry net capital expenditures relative to the sum of share repurchases and dividend payouts, net of amounts received from the exercise of employee stock options Exhibit 4 illustrates that while the growth rate of dividends and share repurchases may at times exceed the growth rate of net capital expenditures, the levels of these two data series are so different that any comparison of growth rates is misleading Furthermore, between 2005 and 2006, the level of industry net capital expenditures increased by \$2.0 billion (\$6.8 billion – \$4.8 billion), while the level of dividends and share repurchases increased by only \$1.3 billion (\$2.2 billion – \$0.9 billion) While both increases are significant, it is disingenuous for the WCTL to suggest that the railroad industry has favored paying dividends and buying back shares over making new capital expenditures
- 27 Furthermore, stock market data indicate that railroads are actually below average among U.S. firms in terms of the value distributed to shareholders through dividends and stock repurchases In 2006, buybacks and dividends among the S&P 500 companies generated a return for shareholders of 5.8 percent, while buybacks and dividends for the four major railroads generated a return of only 4.2 percent⁴¹ These data contradict the WCTL’s assertion that the industry has shortchanged capital spending through the excessive use of dividends and share repurchases

³⁹ Union Pacific Comments, p. 6

⁴⁰ “Opening Comments of BNSF Railway Company,” In the Matter of Methodology to be Employed in Determining the Railroad Industry’s Cost of Capital, STB Ex Parte No. 664, September 27, 2007, p. 3; Hund Comments, p. 4

⁴¹ These figures are computed using data from Bloomberg and the 10-K filings of the four major railroads The yield from dividends and buybacks was computed by dividing total cash spent on dividends and share repurchases during 2006 by total market capitalization at the beginning of 2006

28 The WCTL asserts that because the railroads "have been using a substantial portion of their recent inflow of cash to buyback stock, increase dividends, and to reduce long-term debt, rather than to expand capacity or increase capital expenditures there is no good reason to think that lowering the COE [cost of equity] to an appropriate level will have an adverse impact on the railroads' ability to attract capital."⁴² The WCTL's position makes no economic sense because dividend increases and share repurchases are devices commonly used by most major public companies for maintaining investor confidence. If the railroads were to follow the WCTL's advice and largely reallocate cash flows from dividends and share repurchases to capital expenditures, then railroad stocks would be less attractive relative to other public equities and the railroad industry would find it more difficult to raise capital for future infrastructure investments.

⁴² WCTL Comments, pp 13-14

VERIFICATION

I, R Glenn Hubbard, declare under penalty of perjury that the foregoing is true and correct.

Executed on October 29, 2007

R. Glenn Hubbard

R Glenn Hubbard

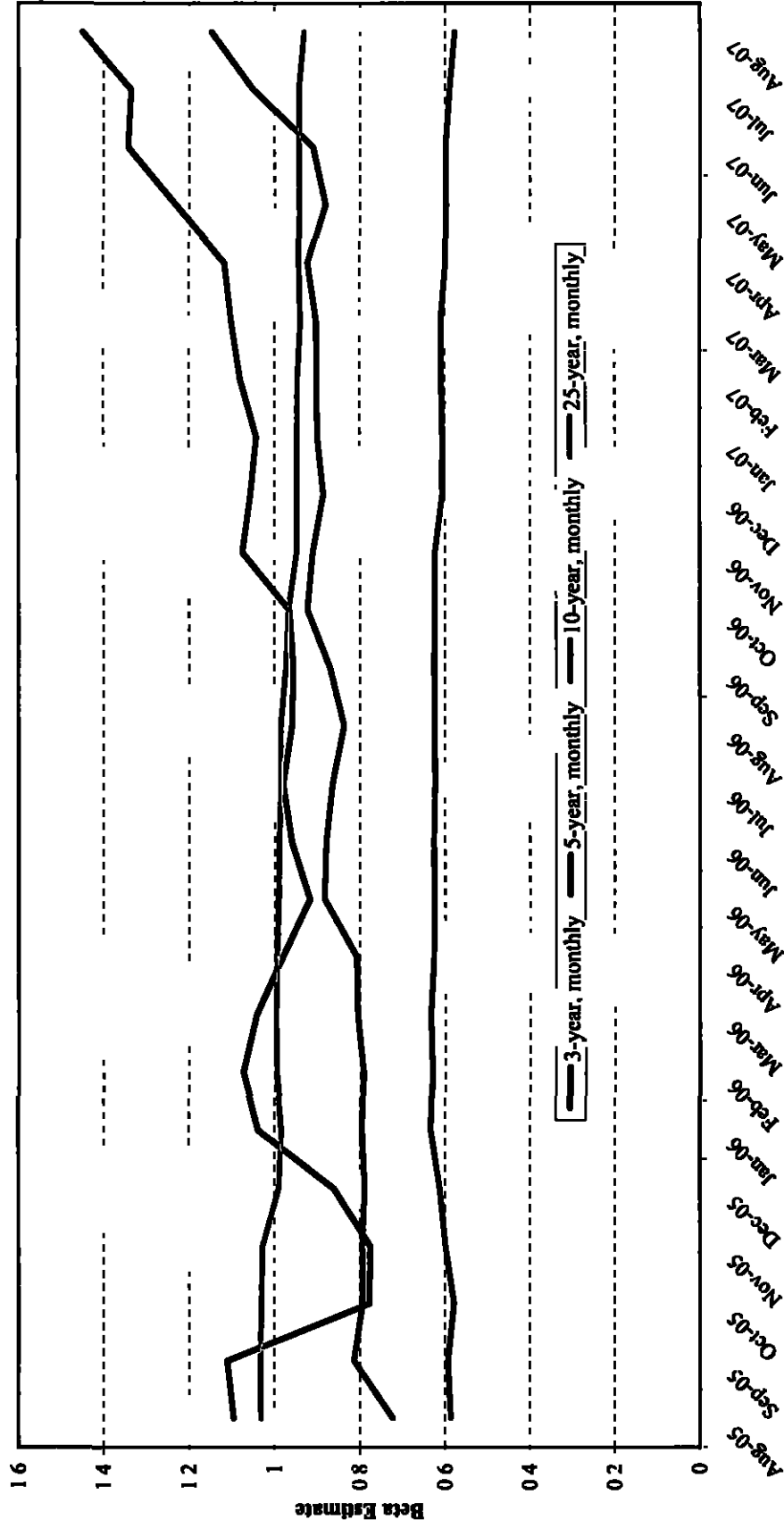
I, Bruce E. Stangle, declare under penalty of perjury that the foregoing is true and correct.

Executed on October 29, 2007

Bruce E. Stangle

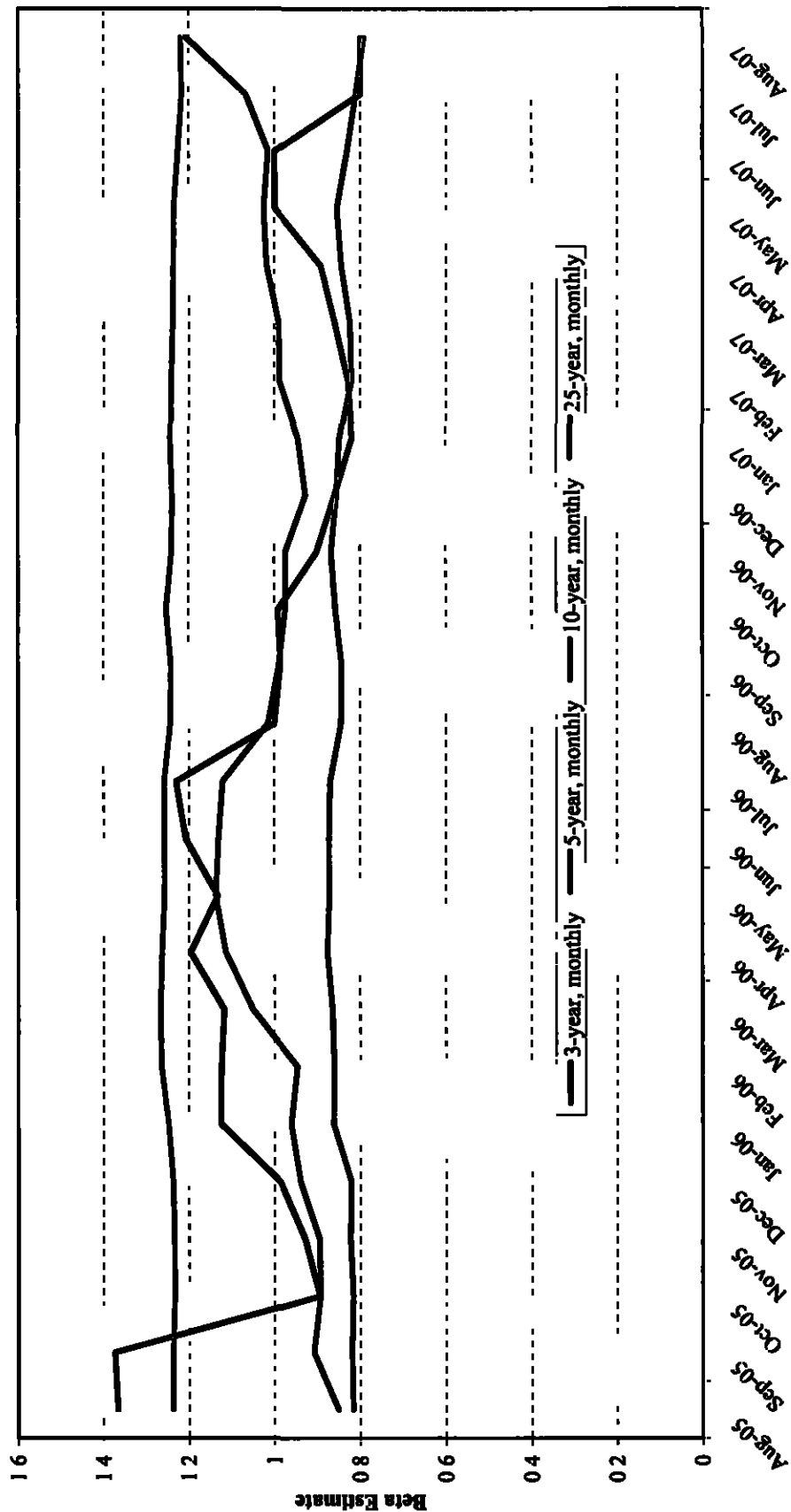
Bruce E. Stangle

Exhibit 1a
Burlington Northern Santa Fe Beta Estimates by Estimation Period
August 2005 - August 2007



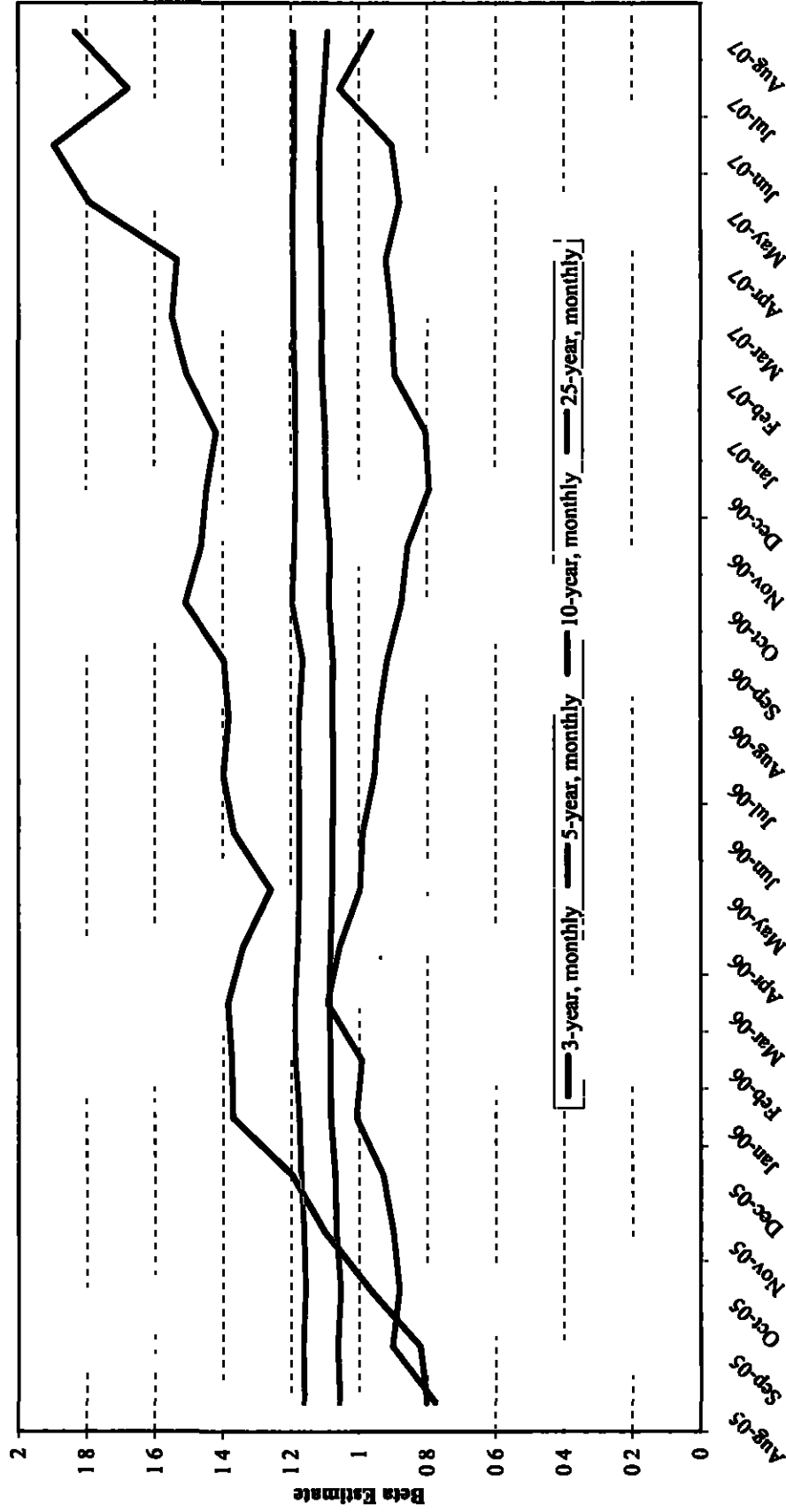
Notes and Sources Beta estimates were obtained by regressing monthly returns of the railroad's stock on monthly returns of the NYSE Composite Index, using the specified estimation window Railroad and NYSE price data are from Bloomberg The time period is restricted to August 2005 - August 2007 due to data availability, as 25 years of data are required to compute the first 25-year beta estimate

Exhibit 1b
CSX Beta Estimates by Estimation Period
August 2005 - August 2007



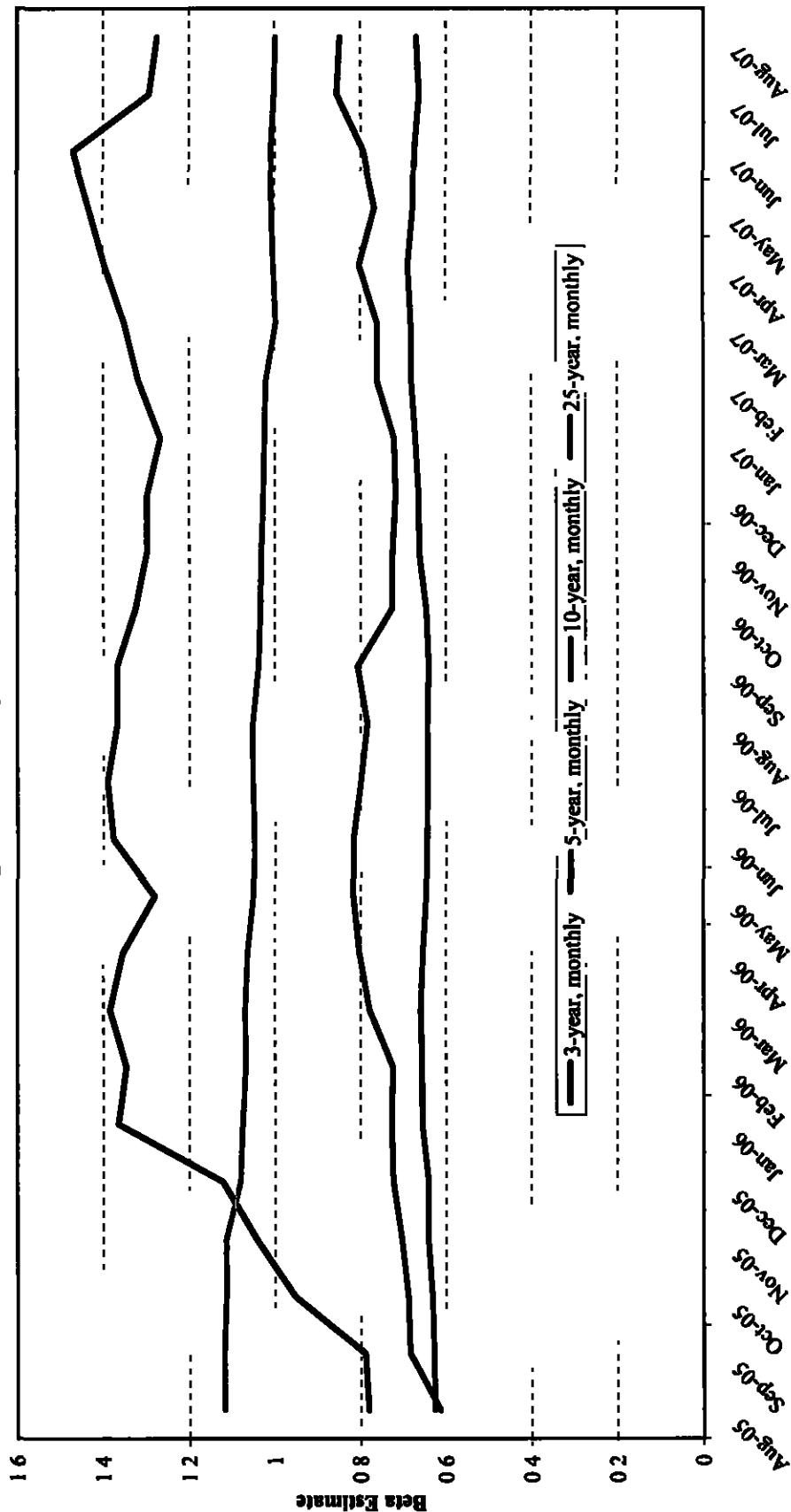
Notes and Sources Beta estimates were obtained by regressing monthly returns of the railroad's stock on monthly returns of the NYSE Composite Index, using the specified estimation window Railroad and NYSE price data are from Bloomberg The time period is restricted to August 2005 - August 2007 due to data availability, as 25 years of data are required to compute the first 25-year beta estimate

Exhibit 1c
Norfolk Southern Beta Estimates by Estimation Period
August 2005 - August 2007



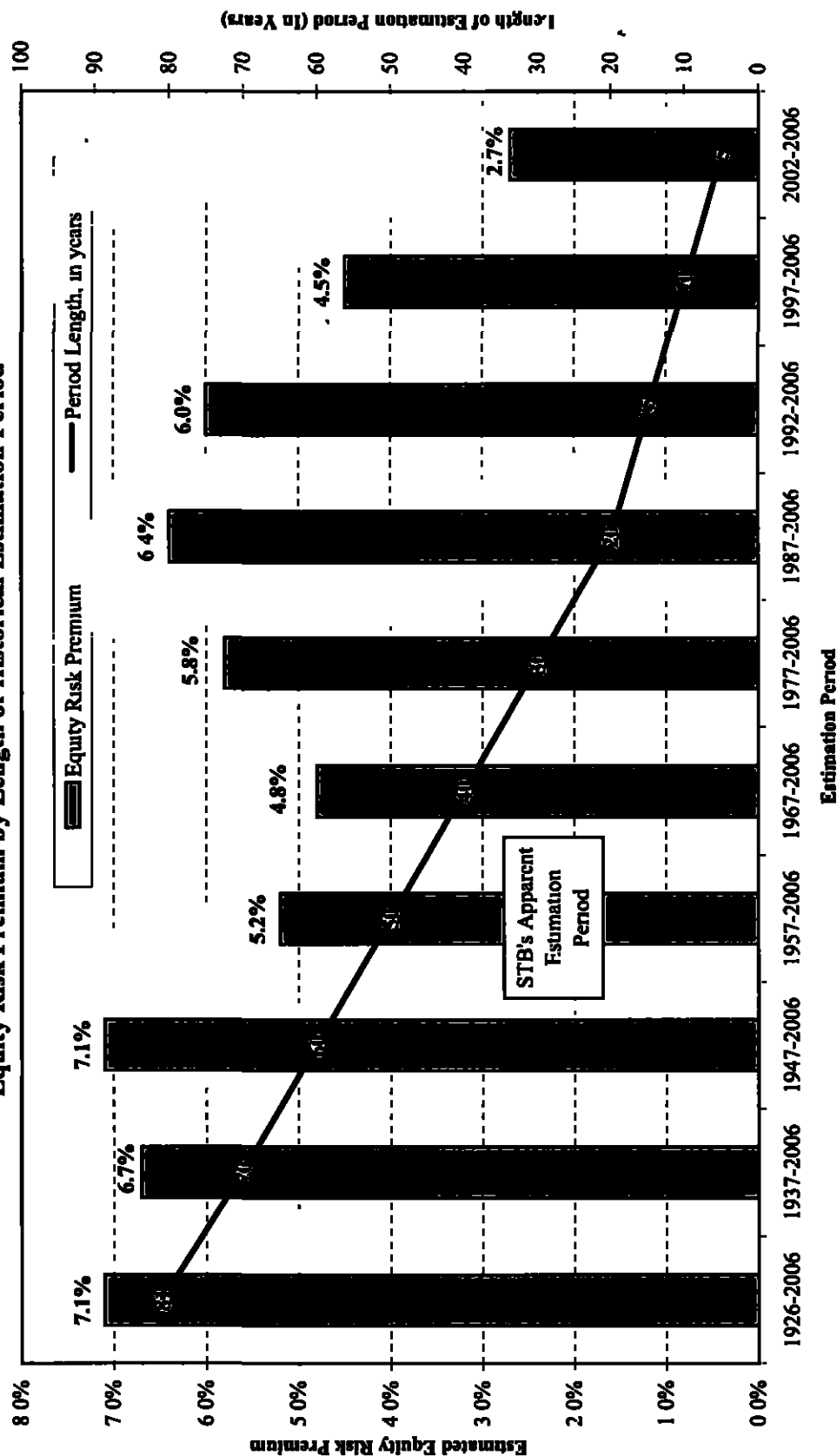
Notes and Sources Beta estimates were obtained by regressing monthly returns of the railroad's stock on monthly returns of the NYSE Composite Index, using the specified estimation window Railroad and NYSE price data are from Bloomberg The time period is restricted to August 2005 - August 2007 due to data availability, as 25 years of data are required to compute the first 25-year beta estimate

Exhibit 1d
Union Pacific Beta Estimates by Estimation Period
August 2005 - August 2007



Notes and Sources Beta estimates were obtained by regressing monthly returns of the railroad's stock on monthly returns of the NYSE Composite Index, using the specified estimation window Railroad and NYSE price data are from Bloomberg The time period is restricted to August 2005 - August 2007 due to data availability, as 25 years of data are required to compute the first 25-year beta estimate

Exhibit 2
Equity Risk Premium by Length of Historical Estimation Period



Notes and Sources Data are from *Stocks, Bonds, Bills and Inflation, Market Results for 1926-2006, 2007 Yearbook, Valuation Edition*, Morningstar, Inc., Table 5-5, p. 83. The stock market proxy used here is the S&P 500 and the government bond used here is the 20-year Treasury Bond (pp. 72-75). Ibbotson notes "[T]he equity risk premium is calculated by subtracting the arithmetic mean of the government bond income return from the arithmetic mean of the stock market total return" (p. 72).

Exhibit 3a
CAPM Inputs and Implied Cost of Equity According to the STB and Professional Providers
2005

STB Estimates, as of December 2005

Railroad	Risk-Free Rate	Beta	Risk Premium	Cost of Equity
Burlington Northern Santa Fe Corp	4.25%	0.85	5.20%	8.69%
CSX Corp	4.25%	0.83	5.20%	8.57%
Norfolk Southern Corp	4.25%	0.85	5.20%	8.69%
Union Pacific Corp	4.25%	0.68	5.20%	7.78%

Ibbotson 5-Year Monthly Estimates, as of December 2005

Railroad	Risk-Free Rate	Beta	Risk Premium	Cost of Equity
Burlington Northern Santa Fe Corp	4.60%	0.64	7.08%	9.13%
CSX Corp	4.60%	0.83	7.08%	10.48%
Norfolk Southern Corp	4.60%	0.89	7.08%	10.90%
Union Pacific Corp	4.60%	0.59	7.08%	8.78%

Value Line 5-Year Weekly Estimates, as of December 2005

Railroad	Risk-Free Rate	Beta	Risk Premium	Cost of Equity
Burlington Northern Santa Fe Corp	4.60%	0.95	7.08%	11.33%
CSX Corp	4.60%	1.00	7.08%	11.68%
Norfolk Southern Corp	4.60%	1.00	7.08%	11.68%
Union Pacific Corp	4.60%	0.85	7.08%	10.62%

Bloomberg 2-Year Weekly Estimates, as of December 2005

Railroad	Risk-Free Rate	Beta	Risk Premium	Cost of Equity
Burlington Northern Santa Fe Corp	4.60%	0.94	7.08%	11.23%
CSX Corp	4.60%	1.20	7.08%	13.07%
Norfolk Southern Corp	4.60%	1.19	7.08%	13.01%
Union Pacific Corp	4.60%	0.81	7.08%	10.32%

Median (Non-STB Estimates) 11.06%

Notes and Sources

- [1] Cost of Equity = [Risk-Free Rate] + [Beta]*[Risk Premium]
- [2] STB risk-free rate, beta, and risk premium estimates are from STB workpapers
- [3] The risk-free rate and risk premium used with the Ibbotson, Value Line, and Bloomberg estimates are from *Stocks, Bonds, Bills and Inflation, Market Results for 1926-2006, 2006 Yearbook, Valuation Edition*, Ibbotson, pp. 59 and 72. The risk-free rate represents the yield on the 20-year U.S. Treasury Bond as of December 31, 2005. The risk premium is measured over the period 1926-2005.
- [4] Ibbotson betas are unadjusted OLS betas from the Ibbotson Beta Book, First Edition 2006 (Data through December 2005). Ibbotson also provides adjusted betas.
- [5] Value Line betas are from Value Line, risk-free rate and equity risk premium are from SBBI, see note [3]. Value Line provides only adjusted betas, which are shown here.
- [6] Bloomberg betas are unadjusted OLS betas from Bloomberg, risk-free rate and equity risk premium are from SBBI, see note [3]. Bloomberg also provides adjusted betas.

Exhibit 3b
CAPM Inputs and Implied Cost of Equity According to Professional Providers
2007

Ibbotson 5-Year Monthly Estimates, as of September 2007

Railroad	Risk-Free Rate	Beta	Risk Premium	Cost of Equity
Burlington Northern Santa Fe Corp	4.90%	1.09	7.13%	12.65%
CSX Corp	4.90%	1.06	7.13%	12.46%
Norfolk Southern Corp	4.90%	0.85	7.13%	10.95%
Union Pacific Corp	4.90%	0.79	7.13%	10.53%

Value Line 5-Year Weekly Estimates, as of September 2007

Railroad	Risk-Free Rate	Beta	Risk Premium	Cost of Equity
Burlington Northern Santa Fe Corp	4.90%	1.00	7.13%	12.03%
CSX Corp	4.90%	1.05	7.13%	12.39%
Norfolk Southern Corp	4.90%	1.05	7.13%	12.39%
Union Pacific Corp	4.90%	0.95	7.13%	11.67%

Bloomberg 2-Year Weekly Estimates, as of September 2007

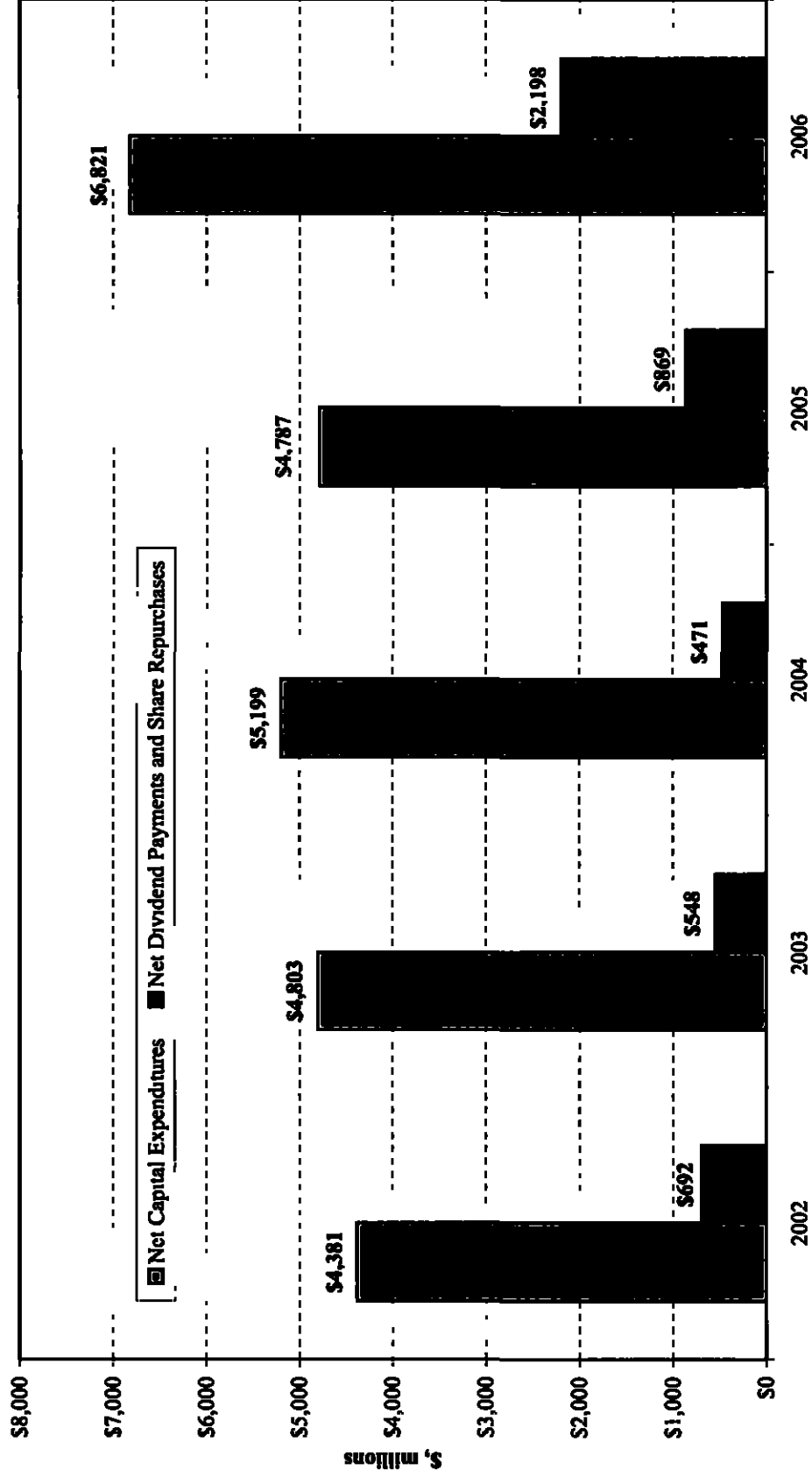
Railroad	Risk-Free Rate	Beta	Risk Premium	Cost of Equity
Burlington Northern Santa Fe Corp	4.90%	1.50	7.13%	15.61%
CSX Corp	4.90%	1.02	7.13%	12.14%
Norfolk Southern Corp	4.90%	1.64	7.13%	16.62%
Union Pacific Corp	4.90%	1.40	7.13%	14.91%

Median **12.39%**

Notes and Sources

- [1] Cost of Equity = [Risk-Free Rate] + [Beta]*[Risk Premium]
- [2] The risk premium used with the above estimates is from *Stocks, Bonds, Bills and Inflation, Market Results for 1926-2006, 2007 Yearbook, Valuation Edition*, Morningstar, Inc., p. 72. The risk premium is measured over the period 1926-2006.
- [3] The risk-free rate represents the yield on the 20-year U.S. Treasury Bond as of August 31, 2007, and is from http://www.federalreserve.gov/release/h15/data/Weekly_Friday_1115_TCMNOM_Y20.txt, accessed on September 20, 2007.
- [4] Due to the absence of recently published estimates, Ibbotson betas are obtained by regressing 5 years of monthly returns of each railroad stock on 5 years of monthly returns of the S&P 500, which is the method used by Ibbotson.
- [5] Value Line betas are from Value Line; risk-free rate and equity risk premium are from Ibbotson, see notes [2] and [3]. Value Line provides only adjusted betas, which are shown here.
- [6] Bloomberg betas are from Bloomberg; risk-free rate and equity risk premium are from Ibbotson, see notes [2] and [3]. Bloomberg also provides adjusted betas.

Exhibit 4
Capital Expenditures, Dividend Payments, and Share Repurchases by Major Railroads*
2002-2006



* Data are from the year end financial statements of CSX, Burlington Northern Santa Fe, Norfolk Southern Corp., and Union Pacific

CERTIFICATE OF SERVICE

I hereby certify this 29th day of October, 2007, that I have served copies
of the foregoing on all parties of record in this proceeding

Matt Wolf