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RAILROAD REVENUE ADEQUACY

**OPENING COMMENTS OF
NORFOLK SOUTHERN RAILWAY COMPANY**

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INTRODUCTION AND SUMMARY OF COMMENTS

Norfolk Southern Railway Company (“Norfolk Southern”) appreciates the Board’s institution of this proceeding to examine its statutory mandate to ensure that railroads earn adequate revenues and how revenue adequacy relates to the Board’s rate reasonableness procedures, because it gives the Board an opportunity to reaffirm its commitment to economically sound rate regulation and the statutory goal of ensuring financially stable railroads. The Board’s current rate reasonableness procedures – the Stand Alone Cost test (“SAC”), the Simplified SAC test, and the Three Benchmark test – provide ample protection for the relatively small number of rail movements that lack effective competition. Indeed, the SAC test is already a rigorous measure of revenue adequacy, for SAC’s “very purpose” is to determine what a railroad “needs to charge to earn ‘adequate’ revenues on the portion of its system that is included in the system of the SARR.”¹ There is no need for the Board to develop another independent, top-down revenue adequacy constraint and developing such a constraint would create far more problems than it would solve.

The Board’s mandate from Congress on revenue adequacy is clear – it should promote revenue adequacy, not treat improving railroad finances as a problem that needs to be solved. The recent improving financial health of Norfolk Southern and other major railroads is not a cause for regulatory concern, but rather affirmation of Congress’s and the agency’s wise regulatory policies. The basic policy of the Staggers Act – to remove most government oversight over rail rates, while allowing individualized rate reasonableness assessments for individual rail shipments that lack competitive options – has been one of the

¹ *Public Serv. Co. of Col. d/b/a Xcel Energy v. BNSF Ry. Co.*, S.T.B. Docket No. 42057, at 6 (served Jan. 19, 2005) (“*Xcel Reconsideration*”).

most successful regulatory policies in American history. It has transformed an industry on the verge of financial collapse into a network of freight railroads that have been able to increase capacity, improve efficiency, and reduce rates without government funding. The Board should not do anything to disturb this framework.

Norfolk Southern therefore respectfully urges the Board to abandon the independent, top-down revenue adequacy constraint for six reasons.

First, calls from some interest groups for increased regulation of railroads that are able to achieve returns on investment that exceed their cost of capital misunderstand that earning a return on investment equal to a firm's cost of capital is "widely agreed to be the minimum necessary to attract and maintain capital in the railroad, or any other, industry."² See, e.g., *Adequacy of Railroad Revenue - 1978 Determination*, 362 I.C.C. 199, 201 (1979) ("Moreover, this study was designed to compute a minimum adequate revenue level for the Nation's class I railroads; the methodology of the study is not necessarily appropriate for the determination of the maximum fair revenue issues involved in individual rate proceedings.") (emphasis in original); *Standards for Railroad Revenue Adequacy*, 364 I.C.C. 803, 810 (1981) ("The minimum rate of return that will allow railroads to obtain investment funds is the cost of capital.") (emphasis added) ("*Standards I'*"). The Board should not do anything to transform the minimum floor into a maximum ceiling on earnings.

Second, the SAC and Simplified SAC constraints are targeted "revenue adequacy" constraints that are vastly superior to any independent rate constraint based on the system-wide health of a carrier. In the STB's words, "CMP, with its

² *Bessemer & L. E. R. Co. v. Interstate Commerce Comm'n*, 691 F.2d 1104, 1110 (3d Cir. 1982) (internal citations omitted) (emphasis added) ("*Bessemer*").

SAC constraint, is the most accurate procedure available for determining the reasonableness of rail rates where there is an absence of effective competition.”³ “As railroads enjoy increasing market power with rising demand for their services,” the STB has opined that “the SAC test (in either its full or simplified form) would provide a critical restraint on their pricing of captive traffic, without deterring railroads from making the investments in their rail networks that are needed to meet rising demand.”⁴ Conversely, a test of “system-wide revenue need” provides “no guidance” on the rates that a particular shipper should be charged for the particular facilities and services it uses.⁵ The Board should therefore not do anything to force carriers to lower rates based on a measurement of system-wide revenue needs where the targeted and preferred SAC or Simplified SAC tests show the challenged rate to be reasonable.

Third, state and federal regulators have been discarding rate-of-return regulation because of the known incentive problems that plague this kind of regulation. Professor David Sappington of the University of Florida – a leading expert on “performance-based regulations” who served as Chief Economist for the Federal Communications Commission – describes his research into the modern movement away from rate-of-return regulation toward performance-based regulation frameworks. He explains that regulators throughout the U.S. and worldwide have grown to appreciate the many well-known pitfalls of strict earnings regulations. He concludes that regulating rates based on an antiquated revenue adequacy constraint would be markedly inferior to the Board’s current

³ *Simplified Standards for Rail Rate Cases*, STB Ex Parte No. 646 (Sub-No. 1) at 13 (served Sept. 5, 2007) (“*Simplified Standards*”).

⁴ *Rate Regulation Reforms*, STB Ex Parte No. 715, at 10 (served July 25, 2012) (“*Rate Regulation Reforms*”).

⁵ *BNSF Ry. Co. v. Surface Transp. Bd.*, 453 F.3d 473, 481 (D.C. Cir. 2006).

regulatory framework. According to Professor Sappington, SAC is already a highly effective form of modern performance-based regulation.

Fourth, the well-known problems that plague rate-of-return regulation will be pronounced in the railroad industry. Professor Bradford Cornell of the California Institute of Technology and Professor Sappington describe in detail how an independent, top-down revenue adequacy constraint would stifle innovation, productivity, capital investments, and competition. The logic is simple. Once a railroad is earning more than what the Board (rather than the marketplace) would permit, why should the railroad bother to become more efficient, improve productivity, or compete for new business if any improved earnings will be confiscated by an independent, top-down revenue adequacy constraint? The ICC was concerned about these incentive problems at the time it proposed this constraint, but it could identify no good way to resolve them.⁶ The situation is no different today.

Fifth, there would be tremendous technical obstacles to surmount in designing an economically sound rate constraint based on the system-wide financial health of a carrier. Professor Cornell describes the measurement errors that render the annual revenue adequacy findings unsuitable for use in regulating rates.⁷ The paramount problem is the failure of the Board to properly

⁶ Notice of Proposed Rulemaking, *Coal Rate Guidelines – Nationwide*, Ex Parte No. 347 (Sub-No. 1), at 16 (Feb. 8, 1983) (“Moreover, we would be reluctant to reduce existing rates on captive coal traffic if the source of an increased rate of return is increased efficiency in operations or a more profitable rate on competitive traffic.”) (“*Coal Rate Guidelines NPRM*”).

⁷ Indeed, the ICC long ago cautioned that these annual findings did not preclude parties from submitting any probative evidence about the true system-wide revenue needs of a carrier in an individual rate dispute. *Railroad Revenue Adequacy – 1985 Determination*, 3 I.C.C.2d 541, 544 (1987) (“We will continue to accept all competent and probative evidence relative to the carrier’s revenue adequacy.”); see also, e.g., *Bituminous Coal – Hiawatha, Utah, to Moapa, Nevada*, 6 I.C.C.2d 1, 7 n.24 (1989); *Railroad Revenue Adequacy –*

measure revenue adequacy on the basis of current replacement costs, which the Board has declared can only be done in individual SAC or Simplified SAC cases, not on a network basis.⁸ Moreover, any rate constraint based on an historical analysis of financial returns would be hopelessly backwards-looking. Finally, Professor Cornell cautions that there is no correlation between the system-wide financial health of a railroad and the reasonableness of a particular rate. Indeed, the D.C. Circuit agreed with the Board that a test of “system-wide revenue need” provides “no guidance” on the rates that a particular shipper should be charged for the particular facilities and services it uses.⁹ If the Board nonetheless constrained rates based on a measurement of system-wide revenue needs, it inevitably would create the kinds of prohibited internal cross-subsidies that the SAC test was designed to root out.

Sixth, there is no reason to develop and impose yet another rate constraint on the railroad industry. The Board has worked hard to improve and refine the SAC and Simplified SAC tests, and they are more than sufficient to ensure that rates remain reasonable. The purpose of these tests is not to provide a remedy for every shipper that subjectively believes its rates are “too high.” Rather, these tests exist as a means to determine through the application of sound economic principles whether a rate imposed by a railroad on a shipper that lacks effective competition in a particular lane is unreasonable. And these tests not only provide a means for such shippers to challenge their rail rate; the very existence

1987 Determination, 4 I.C.C.2d 731, 734 (1988); *Railroad Revenue Adequacy – 1986 Determination*, 3 I.C.C.2d 966, 970 (1987).

⁸ *Association of American Railroads – Petition Regarding Methodology for Determining Railroad Revenue Adequacy*, S.T.B. Ex Parte No. 679, at 7 (STB served Oct. 24, 2008).

⁹ *BNSF Ry. Co. v. Surface Transp. Bd.*, 453 F.3d 473, 481 (D.C. Cir. 2006).

of these tests serves to constrain the rates offered by railroads in the first instance.¹⁰

It should come as no surprise that relatively few rate challenges are brought by shippers. Immediately after the adoption of *Coal Rate Guidelines*, the agency expected that there would be few rate cases because of its limited jurisdiction.¹¹ And even fewer cases should be expected with greater clarity about the rate reasonableness tests, because that clarity helps promote private-sector negotiations and contracts.¹² The direct effect of the Board's efforts to improve the consistency of application of rules in SAC cases and to develop two alternatives to SAC is to make the regulatory system clearer to the regulated entities, which means it is easier for railroads to comply with that regime.¹³ Vice Chairman Miller recently and correctly observed "that when shippers have more

¹⁰ NS prices to the market using the tools encouraged and preferred by the statute – private, market-based negotiation and contracts. See, e.g., 49 U.S.C. § 10101(1), (2); *id.* § 10709. NS collaborates and negotiates with its customers while drawing upon its knowledge of specific markets and modal, product, and geographic competition to craft rail pricing which will allow its customers to compete, and for NS to handle their shipments. At the same time, a regulatory system is in place as a backdrop of which NS and its customers are fully aware.

¹¹ *Standards for Railroad Revenue Adequacy*, Ex Parte No. 393 (Sub-No 1), 3 I.C.C. 2d 261, 273 (1986) ("Furthermore, we have been involved in only a few rate reasonableness proceedings, a reflection of the fact that our jurisdiction regarding rate review is circumscribed by 49 U.S.C. 10701a(b)(A).") ("*Standards II*").

¹² *Coal Rate Guidelines - Nationwide*, 1 I.C.C.2d 520, 524 (1985) ("[A] benefit of these guidelines is to enable both the shipper and the railroad to estimate the maximum rate we would prescribe if the matter were brought to us for adjudication. We believe this will encourage contract solutions which . . . may often be more efficient and more beneficial to both parties than a prescribed rate.") ("*Coal Rate Guidelines*").

¹³ See, e.g., Organization for Economic Cooperation and Development, *Reducing the Risk of Policy Failure: Challenges for Regulatory Compliance* at 11 (2000), available at <http://www.oecd.org/gov/regulatory-policy/46466287.pdf>.

information they can make better decisions and, as a consequence, fewer disputes will arise.”¹⁴

Norfolk Southern’s comments are organized into two sections. Section I summarizes the legal and historical background that should inform the Board’s analysis of revenue adequacy issues. The Board’s analysis should be informed in part by the strong indications in the statute that the Board is to promote revenue adequacy – not treat it as a rate cap – as well as the history that led Congress to make the promotion of revenue adequacy a key policy instruction for the Board. Section I also discusses the Board’s existing rate reasonableness standards and explains why those robust standards effectively protect shippers from abuses of market power. This Section also reviews the regulatory history of the revenue adequacy constraint proposed in *Coal Rate Guidelines* and some of the contemporaneous concerns expressed by the ICC and commenters about that constraint – many of which remain valid today. Finally, Section I discusses the pressing national need for railroad infrastructure investment, which could be adversely affected if an independent, top-down revenue adequacy constraint were imposed.

Section II explains the many reasons why the Board should abandon the revenue adequacy constraint. The revenue adequacy constraint is a Pandora’s box. While it may appear to offer a superficially “easy” alternative to SAC or Simplified SAC, once opened it will lead the agency down a difficult and dangerous path. An independent, top-down revenue adequacy constraint would stifle innovation and discourage investment. It would penalize railroads for

¹⁴ *Petition of Norfolk Southern Ry. Co. and CSX Transp. Inc., to Institute a Rulemaking Proceeding to Exempt Railroads from Filing Agricultural Transp. Contract Summaries*, S.T.B. Ex Parte No. 725, at 6 (served August 11, 2014) (V.C. Miller, concurring).

improving performance based on better productivity or improved returns from competitive traffic. It would be a hopelessly backward-looking methodology used for ratemaking that needs to be forward-looking. It would produce results that would have no relationship to the reasonableness of particular individual rates. It would create impermissible cross-subsidies in any case in which it was used to prescribe a rate for a shipper who could not have prevailed under SAC. And it would create a cloud of uncertainty over the industry. Section II also discusses the fact that the Board should not be fooled into thinking that railroads are “revenue adequate” based on the Board’s annual “revenue adequacy” determinations. These annual determinations are only a shorthand method of determining whether railroads are trending in the right direction in light of the Board’s statutory directive to help railroads achieve revenue adequacy. Annual revenue adequacy determinations are far too imprecise to be used in connection with an individual rate constraint.

In the end, it is difficult to see who would benefit from developing another rate reasonableness methodology – other than perhaps shippers who cannot prevail under the SAC or Simplified SAC tests because their rates are reasonable under those tests. But it is clear who would be harmed: virtually all other stakeholders who would otherwise benefit from the innovation, competition, productivity, and infrastructure improvements that an independent, top-down revenue adequacy constraint would discourage. The STB should not prefer a small sub-set of shippers to the detriment of the many rail customers who would be harmed by this sort of discredited and disfavored rate-of-return regulation. The STB should instead be taking actions to promote more capital investment, not imposing another rate constraint that will discourage innovation and investment. Piling on additional federal limitations

for rates is not justified. If SAC, Simplified SAC, or Three Benchmark shows that the challenged rate is not unreasonable, the STB should not let a shipper shop around for another constraint that it thinks might offer a different answer. The Board should use this proceeding to discard this vestige of the past once and for all.

I. THE LEGAL, REGULATORY, AND ECONOMIC BACKGROUND THAT SHOULD INFORM THIS PROCEEDING.

The Board is not writing on a blank slate in this proceeding. On the contrary, it is acting against a background that includes clear Congressional guidance, important historic lessons on the impact of excessive top-down regulations on railroad economics, and a host of well-developed, well-calibrated rate reasonableness procedures. Five background facts are particularly important for the Board to keep in mind as it considers its role to promote revenue adequacy. First, the statutory framework properly emphasizes the need for the Board to promote revenue adequacy and to be mindful of revenue adequacy needs when determining the reasonableness of rates, both of which are inconsistent with efforts to penalize railroads for supposedly earning too much. The Board is not free to ignore Congress's directions simply because some interests believe railroads are sufficiently profitable. Second, Congress's command that the Board promote the financial health of railroads was born out of an economic catastrophe created by excessive agency regulation, and the Board should not be tempted to adopt the failed policies of the past. Third, the Board has strong, well-understood rate reasonableness procedures that incorporate revenue adequacy principles and adequately protect shippers against unreasonably high rates. Fourth, the concept of a independent, top-down revenue adequacy constraint proposed three decades ago in *Coal Rate*

Guidelines has no economic validity, was inconsistent with the comments expressed to the ICC at the time, and should not be allowed to undermine the successful regulatory policies of today. Fifth, there is a pressing need for railroad-funded infrastructure investment that will not occur if the Board were to adopt a misguided proposal to prevent railroads from earning revenues over a certain level. Indeed, at a recent Board hearing on service, shipper after shipper reinforced the fact that railroad infrastructure growth and improvement is essential.

A. The Controlling Legal Standards.

Congress has ordered the Board to monitor the financial health of the railroad industry and to help railroads achieve and sustain adequate revenues to foster the industry's development. Section 101(a) of the Rail Revitalization and Regulatory Reform Act of 1976 ("4R Act") provides that in regulating the railroad industry, it shall be the policy of the United States to promote a safe and efficient rail transportation system by allowing rail carriers to earn adequate revenues.¹⁵ In particular, the Act provided that the Interstate Commerce Commission [now the Board] shall "develop and promulgate . . . reasonable standards and procedures for the establishment of revenue levels adequate under honest, economical, and efficient management to cover total operating expenses . . ." ¹⁶ Furthermore, the Commission was instructed to "make an adequate and continuing effort to assist those carriers in attaining revenue levels prescribed under this paragraph."¹⁷

¹⁵ *Standards I*, 364 I.C.C. at 804.

¹⁶ Rail Revitalization and Regulatory Reform Act, Pub. L. 94-201, 90 Stat. 31 (1976), Sec. 205 ("4R Act").

¹⁷ *Id.*

Congress strengthened the revenue adequacy requirement in the Staggers Act by amending section 205 to provide that “the commission shall maintain and revise as necessary standards and procedures for establishing revenue levels” and to require the first proceeding be completed within 180 days after the effective date of the Staggers Act. 4R Act, Sec. 205. The ICC complied and established a methodology for determining whether a rail carrier was revenue adequate. The ICC determined that the appropriate measure for determining on an annual basis whether a railroad was earning adequate revenues “should be a rate of return equal to the cost of capital.” In doing so, the ICC acknowledged that “[s]uch a standard is widely agreed to be the minimum necessary to attract and maintain capital in the railroad, or any other, industry. The cost of capital is the rate of return required of a firm by current and prospective holders of its securities.”¹⁸ The agency further noted that:

Railroads can obtain funds for investment only by offering rates of return comparable to other investment opportunities. Otherwise, investors will elect to invest their funds elsewhere. If railroads earn less than adequate rates of return because of inappropriate regulatory action, rather than because they are not providing a desired service, then the standards of the Rail Act and the clear thrust of congressional policy will be thwarted.

The minimum rate of return that will allow railroads to obtain investment funds is the cost of capital.¹⁹

The ICC further made clear that it was seeking to avoid a situation in which the agency would “in the next few years find ourselves denying a railroad the pricing flexibility necessary to obtain long-term revenue adequacy simply because that railroad was making some progress toward achieving that goal. In

¹⁸ *Standards I*, 364 I.C.C. at 809 (footnote omitted) (emphasis added).

¹⁹ *Id.* at 810 (emphasis added).

short, we would be assigning the railroads the Sisyphean task of working toward revenue adequacy, and every time it came close robbing it of the very means it had used to get there.”²⁰

The Third Circuit upheld the metric adopted by the agency, noting that the cost of capital is a standard that is “widely agreed to be the minimum necessary to attract and maintain capital in the railroad, or any other, industry.”²¹ The court agreed with the ICC that Section 205 “was addressed to the opportunity to attain revenue levels which would reverse the long decline in the railroad industry. The specific objectives listed in section 205 should not in its view be read as limitations on revenue . . .” *Id.*, 691 F.2d at 1112 (emphasis added). A determination of revenue inadequacy was intended by the statute to give those carriers even more pricing freedom without regulatory review and was separate from rate regulation.²² But the ICC’s longstanding position has been that the revenue adequacy of a carrier is not a relevant consideration in determining whether a particular rate is reasonable.²³ The Interstate Commerce Commission Termination Act of 1995 (“ICCTA”) ratified the requirements in

²⁰ *Id.* at 808.

²¹ *Bessemer*, 691 F.2d at 1110 (internal citations omitted) (emphasis added). Unfortunately, over time and without explanation, the notion that the cost of capital is the “minimum” needed has been lost.

²² *Id.* at 1108 (“That Act amended the 4R Act in several respects. In an effort to increase railroad revenues, it created zones of rail carrier rate flexibility in which even market dominant carriers, if found to be revenue inadequate, could increase rates without ICC approval.”) (emphasis added); see also *Consolidated Rail Corp. v. United States*, 855 F.2d 78 (3d Cir. 1988) (citing Staggers Rail Act of 1980, Pub. L. 96-448, 94 Stat. 1895 (1980) (“Staggers Act”).

²³ *Standards I*, 346 I.C.C. 809 (“It should not be expected, in other words, that a carrier with inadequate revenue under the proposed standards will have unlimited freedom to raise its rates on market dominant traffic.”); *Omaha Pub. Power Dist. v. Burlington N. R.R. Co.*, 3 I.C.C. 2d 123, 157 (1986) (“ . . . a finding of revenue inadequacy does not give a railroad license to set rates at unreasonable levels”).

Staggers that the Board “make an adequate and continuing effort” to assist railroads in attaining revenue levels that are “adequate, under honest, economical, and efficient management to cover total operating expenses, including depreciation and obsolescence, plus a reasonable and economic profit or return (or both) on capital employed in the business.” 49 U.S.C. § 10704(a)(2). The statute further requires that these revenue levels should (1) “provide a flow of net income plus depreciation adequate to support prudent capital outlays, assure the repayment of a reasonable level of debt, permit the raising of needed equity capital, and cover the effects of inflation”; and (2) “attract and retain capital in amounts adequate to provide a sound transportation system in the United States.” *Id.* Section 10704(a)(3) requires that the Board “annually determine which carriers are earning adequate revenues” under the standards and procedures that the Board develops for establishing adequate revenue levels. *Id.* § 10704(a)(3). Furthermore, Section 10701 requires that in determining whether a rate established by a rail carrier is reasonable, the Board must “recogniz[e] the policy of this part that rail carriers shall earn adequate revenues.” *Id.* § 10701(d)(2).²⁴

In short, the thrust of the Interstate Commerce Act is not that the agency must act to limit railroads to earning only “adequate” revenues, but rather that

²⁴ Both the Board and the ICC have determined that “adequate” revenues are those that provide a rate of return on net investment equal to the current cost of capital:

This is the revenue level necessary for a railroad to compete equally with other firms for available financing in order to maintain, replace, modernize, and, where appropriate, expand its facilities and services. If railroads cannot earn the fair market rate of return, their ability both to retain existing investments and obtain new capital will be impaired, because both the existing and prospective funds could be invested elsewhere at a more attractive rate of return.

Coal Rate Guidelines, 1 I.C.C.2d at 535; *see also Standards I*, 364 I.C.C. at 809-11.

the agency must do everything in its power to allow railroads to earn adequate revenues. The reason for Congress's policy choice becomes clear when considering the history of rail regulatory policies and the dire consequences of a regulatory system that did not prioritize revenue adequacy.

B. The Board's Congressional Mandate to Promote Revenue Adequacy Arose From the Near-Collapse of the Railroad Industry Due to Excessive Regulation.

The Interstate Commerce Act's command that the Board "allow[] carriers to earn adequate revenues" requires the Board to regulate in a way that will preserve the financial health of the industry. History teaches that the best way for the Board to do so is to regulate narrowly and carefully and to avoid unintended consequences. Indeed, the requirement that the Board promote revenue adequacy was part of a direct congressional response to a crisis in which excessive regulation nearly destroyed private railroading in the United States.

1. The Financial Crisis Caused By Excessive Regulation.

In the 1970s, the railroad industry was collapsing in many parts of the United States. Many weak railroads failed, including all the major railroads in the Northeast: the Reading, Erie-Lackawanna, the Lehigh Valley, the Boston and Maine, the Lehigh and Hudson River, the Ann Arbor, and Central New Jersey.²⁵ The bankruptcy of the Penn Central Transportation Company only two years after its formation was particularly shocking, and at that time was the largest

²⁵ RICHARD D. STONE, *THE INTERSTATE COMMERCE COMMISSION AND THE RAILROAD INDUSTRY: A HISTORY OF REGULATORY POLICY*, 113 (1991) (noting that 27 railroads went bankrupt between 1937 and 1980).

bankruptcy in United States history.²⁶ The Midwest also saw major roads like the Milwaukee Railroad and the Rock Island collapse.²⁷

Many railroads that did not declare bankruptcy were close to collapse by almost any measure. In 1978, the rate of return on net investment was 0.08 percent for Class I railroads, far below the 11.2 percent cost of capital for the rail industry.²⁸ Since the goal of any company is to have a rate of return on net investment that exceeds by as much as possible its cost of capital, this was stunningly moribund performance. Other measures of financial strength paint an equally grim picture of railroads in the late 1970s. The 1.55 percent rate of return on equity for railroads lagged far behind other modes of transportation, such as barges (8.6 percent) and trucks (17.2 percent).²⁹ Similarly, railroads trailed other industries by significant margins when measured by the rate of return on net worth. In 1978, the rate of return on net worth was 1.3 percent, compared to 15.9 percent in the manufacturing sector, 12 percent for public utilities, and 8.2 percent for the entire transportation sector.³⁰

Both Congress and federal agencies concluded that this financial crisis was largely attributable to excessive and outdated regulations. The U.S.

²⁶ See STONE, at 70-71 & 113-116.

²⁷ G. Kent Woodman & J. Sutter Starke, *The Competitive Access Debate: A 'Backdoor' Approach to Rate Regulation*, 16 TRANS. L.J. 263, 268 (1988).

²⁸ DEP'T OF TRANSP., A PROSPECTUS FOR CHANGE IN THE FREIGHT RAILROAD INDUSTRY, 23 (1978) ("PROSPECTUS"); ASSOCIATION OF AMERICAN RAILROADS, RAILROADS FACTS—2001, at 19 (2001 ed.) ("RAILROAD FACTS—2001") (summarizing the annual ICC/STB determinations of cost of capital for the industry). Between 1966 and 1979, the rate of return on net investment in the railroad industry never exceeded three percent. H.R. Rep. No. 96-1035, at 101 (1980). Class I Railroads are railroads with revenues greater than \$261.9 million. RAILROAD FACTS—2001, at 3.

²⁹ H.R. Rep. No. 96-1035, at 36 (1980).

³⁰ *Id.* at 98.

Department of Transportation (“USDOT”) concluded that “the adverse effects of economic regulation have contributed to the decline of the railroad industry.”³¹ Congress concurred that regulatory constraints impinged upon management’s ability to adjust rates, merge corporate entities, abandon facilities and services, and improve productivity.³² The federal government regulated a railroad’s entry or exit from the industry as well as many aspects of rail operations including labor relations, safety, environmental, and many other areas that affected railroads.³³ USDOT was understating matters when it observed that “[r]ailroading has fallen on difficult times.”³⁴

Perhaps most onerous was the authority of the federal government over rail rates. Prior to 1976, the ICC had jurisdiction over nearly all rail rates and terms of rail service, regardless of whether there was competition for the traffic involved.³⁵ All rates over all routes between an origin and destination had to be the same. Rate increases and decreases were subject to review and possible

³¹ PROSPECTUS at 49; *id.* at 114 (“The current system of railroad regulation reflects a series of uncoordinated actions intended to remedy specific problems encountered during almost 100 years since the regulatory system was first imposed. The result is a hodgepodge of inconsistent and often anachronistic regulations that no longer correspond to the economic condition of the railroads, the nature of intermodal competition, or the often conflicting needs of shippers, consumers, and taxpayers.”).

³² See H.R. Rep. No. 96-1035, at 85-95 (1980); PROSPECTUS, at 39.

³³ H.R. Rep. No. 96-1035, at 91-92 (1980); PROSPECTUS, at 51. For fourteen merger, acquisition, or control cases before the Interstate Commerce Commission (“ICC”) between 1955 and 1970, the average time for a decision was two and one-half years, excluding litigation over the decision. PROSPECTUS, at 51. The process for approving mergers took so long, that the Union Pacific’s merger with Rock Island Railroad languished before the ICC from 1964 to 1974. *Id.* Ultimately, the Rock Island filed for bankruptcy less than six months before the ICC finally approved the merger. *Id.*

³⁴ PROSPECTUS, at 2.

³⁵ Fred R. Birkholz, *The Staggers Act of 1980, Deregulations and Reregulation: A Railroad Perspective*, 17 THE FORUM 850 (Sec. of Tort and Insurance Practice, ABA, Winter 1982); see also *Western Coal Traffic League v. United States*, 694 F.2d 378, 384 (5th Cir. 1982) (stating that ICC had authority to regulate all rates that were not “just and reasonable”).

suspension by the ICC, and the ICC refused to let railroads lower rates if it might detrimentally affect the barge or truck industries.³⁶

One crippling effect of these rate regulations was to prevent railroads from differentially pricing traffic to compete with other modes of transportation.³⁷ Some comparisons outlined in a congressional report demonstrate the staggering slope of this decline. In 1947, railroads carried three times more traffic than trucks, but by 1979 trucks carried 50 percent more freight than railroads.³⁸ The use of waterway and pipeline shipping also cut into the railroads' market share.

Something had to be done to solve this crisis, and Congress responded with one of the most successful regulatory reforms in our Nation's history.

2. Congress Acts To Modernize Federal Regulation And Resurrect The Railroad Industry.

Congress took a series of actions to reform the ICC's outdated regulatory scheme and respond to the alarming rate of bankruptcies throughout the industry. First was the Rail Revitalization and Regulatory Reform Act of 1976 ("4R Act"). The 4R Act was a modest attempt to reduce the regulatory burden on the railroads. The Act reduced the ICC's jurisdiction over the maximum level

³⁶ H.R. Rep. No. 96-1035, at 126 (1980); PROSPECTUS, at 49 & 114.

³⁷ The railroads lost market share to other modes, at least in part, because the government subsidized the construction and maintenance of infrastructure for other modes of transportation. The publicly provided highways and waterways "require[d] no direct capital investment from truckers or water carriers, thus lowering the fixed expenses and corporate investment base of these modes." PROSPECTUS, at 45. Truckers are subsidized because all drivers contribute to the highway trust fund, which is used for road maintenance and construction, through a tax on gasoline passed on to them. Fed. Highway Admin, *Financing Federal-aid Highways*, Pub. No. FHWA-PL-07-017, 32-33 (Mar. 2007). They also use the highways mostly free of charge.

³⁸ H.R. Rep. No. 96-1035, at 35, 110 (1980).

of a rail rate to those rates where the railroad had “market dominance” over the traffic to which the rate applied.³⁹ In other words, where effective competition existed in the industry, the agency was stripped of power to regulate rates. The 4R Act also allowed railroads to enter into confidential contracts and “encourage[d] mergers, consolidations, and joint use of facilities that tend to rationalize and improve the Nation’s rail system.”⁴⁰

While the 4R Act took significant steps towards revitalizing the industry, it was soon apparent that it did not go far enough to improve the financial viability of the railroads. As a result, Congress passed the Staggers Rail Act of 1980 (“Staggers Act”), which, among other things, established a national rail transportation policy that “emphasizes the importance of the relationship between ensuring adequacy of transportation and retention of competition.”⁴¹ In the Staggers Act, Congress made a clear policy choice to permit railroads to price their services differentially. Congress recognized that differential pricing is ultimately in the best interest of all shippers, because such a policy is necessary to enable railroads to earn revenues sufficient to support adequate service and capital investment:

Because of the existence of competition, all rates cannot pay an equal percentage of “fixed costs.” As in other industries, some rates will contribute more to fixed costs than others. The Committee understands the necessity of such differential pricing, and has designed a regulatory system which allows for such pricing decisions. In the absence of the regulatory flexibility which permits differential pricing, all shippers would be harmed. If traffic which moved at low rates were forced to pay higher rates, the traffic

³⁹ See Birkholz at 850, 852; see also *Entergy Services, Inc. v. Union Pac. R.R. Co.*, 99 F.Supp.2d 1080, 1083 (D. Neb. 2000) (citing *Burlington N. R.R. Co. v. Interstate Commerce Comm’n*, 679 F.2d 934, 935 (D.C. Cir. 1982)).

⁴⁰ S. Rep. No. 94-499, at 20 (1975).

⁴¹ *Union Pac. R.R. Co. – Control – Missouri Pac. R.R. Co.*, 366 I.C.C. 462, 484 (1982).

would disappear to other modes. When the traffic moved to another mode, the contribution to fixed cost made by that traffic would also disappear. The result is that the remaining commodities would have to make up for the fixed cost formerly paid by the traffic which moved to another mode, resulting in higher rates for the remaining traffic.⁴²

That legislation has been widely recognized as a “stroke of genius” that “allowed the revitalization of a previously deeply troubled U.S. railroad industry by removing many of the shackles of over-regulation.”⁴³ The Board,⁴⁴ Congress,⁴⁵ the Government Accountability Office (“GAO”),⁴⁶ and USDOT⁴⁷ all have recognized the wisdom of the policies embodied in the Staggers Act and the success of those policies in revitalizing the nation’s railroads. As the Board observed,

The Staggers Act granted railroads freedom from an overly restrictive and burdensome regulatory regime, enabling them to compete more effectively with each other and with other transportation modes, most notably motor carriers and barge

⁴² H.R. REP. NO. 96-1035, at 39-40 (1980), *reprinted in* 1980 U.S.C.C.A.N. 3978, 3984-85 (emphasis added).

⁴³ *Rail Transp. of Grain*, STB Ex Parte No. 665, at 6 (served Jan. 14, 2008) (comments of Comm’r Buttrey).

⁴⁴ *See, e.g., Review of Rail Access and Competition Issues*, 3 S.T.B. 92, 92 (1998) (“There is no dispute that the Staggers Rail Act of 1980 . . . as implemented and administered first by the Interstate Commerce Commission . . . and now by the Board, has revitalized American railroads.”).

⁴⁵ *See, e.g.,* H. REP. NO. 104-311, at 91 (1995), *reprinted in* 1995 U.S.C.C.A.N. 793, 803 (“The Staggers era has produced a renaissance in the railroad industry.”).

⁴⁶ U.S. GOV’T ACCOUNTABILITY OFFICE, GAO/RCED-90-80, *RAILROAD REGULATION: ECONOMIC AND FINANCIAL IMPACTS OF THE STAGGERS RAIL ACT OF 1980* 3-4 (May 1990) (finding that the Staggers Act made railroads “more competitive” and that “[s]hippers have benefited from reduced railroad regulation”).

⁴⁷ *See The 25th Anniversary of the Staggers Rail Act of 1980: A Review and Look Ahead*, STB Ex Parte No. 658, Hr’g Tr. at 14-15 (Oct. 19, 2005) (testimony of USDOT) (“The Department of Transportation considers the Act a resounding success. We do so because in sum the statute did what it was designed to do. It revitalized the railroad industry and by so doing benefitted shippers and consumers throughout the economy.”).

lines. . . . The competitive process unleashed by the Staggers Act has been one of the most significant public policy successes of this century.⁴⁸

3. The Resurrection of the Freight Rail Industry

The deregulatory freedom afforded by the Staggers Act and ICCTA (and the ICC/STB's implementation of those statutes) was the critical ingredient in the revitalization of America's rail industry. That recovery has enabled railroads to deliver more efficient and reliable service and to invest hundreds of billions of dollars in private capital to create the capacity and facilities necessary to meet the growing demand for rail transportation in North America. The primary purpose of the Staggers Act was "to allow for the restoration of the rail industry to vigorous and profitable growth." S. REP. NO. 96-470, at 6 (1979).

The result of these legislative changes was a remarkable rebirth of the rail industry. As a Department of Transportation witness testified at the Board's 2005 hearing on the effects of the Staggers Act:

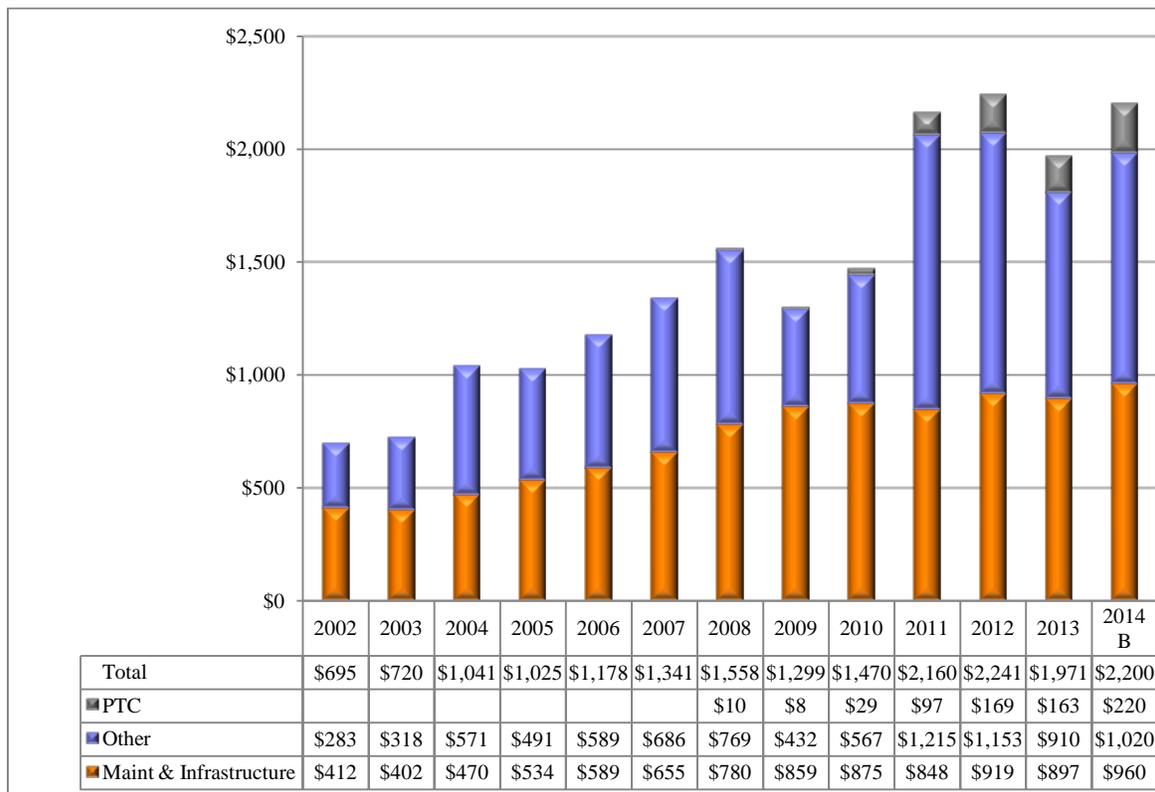
[The Staggers Act] revitalized the railroad industry and by so doing benefitted shippers and consumers throughout the economy. 25 years ago this was an industry . . . marked by decline in all major respects. High rates, low returns on investment, eroding demand, low modal traffic share and excess capacity. Of course, in 2005, all of these factors have been reversed. Average rates are down, return on investment is up, demand is robust, modal traffic share has increased and capacity is increasingly scarce. . . . [T]he dramatic overhaul of economic regulation brought about by the Staggers Act has been absolutely essential [to this turnaround]. . . . [C]ontinuation of the prior restrictive regulatory regime would

⁴⁸ *Union Pac. Corp. – Control and Merger – S. Pac. Corp.*, 1 S.T.B. 233, 384 (1996) (emphasis added).

likely have doomed the rail industry to a much reduced role in today's transportation sector.⁴⁹

In short, the improved financial condition of the rail industry today is precisely the result that Congress sought to achieve in passing the Staggers Act. Since 1980, railroads have invested \$550 billion into the national rail network.⁵⁰ As shown below, NS has been steadily increasing its capacity investment to record levels in recent years, growing the investment from \$700 million to \$2.2 billion (a 315% increase over a single decade). *See Butler V.S. at 9.*

Norfolk Southern Total Capital Expenditures (2002 to Present)



⁴⁹ *The 25th Anniversary of the Staggers Rail Act of 1980: A Review and Look Ahead*, STB Ex Parte No. 658, Hr'g Tr. at 15-16 (Oct. 19, 2005) (testimony of U.S. DOT representative P. Smith) (emphasis added).

⁵⁰ *See Association of American Railroads, Private Rail Investments Power America's Economy*, available at freightrailworks.org/future/chart-1/

As the Association of American Railroads has recognized, the railroad renaissance has made it possible for railroads to “develop cutting edge technologies to improve safety and efficiency while helping keep rates low for customers.”⁵¹ Calls for the Board to roll back the policies of Staggers simply because railroads are financially better off than they were 30 years ago are ill-founded.

Despite claims to the contrary, the rail revitalization has not come at the cost of competition or abuse of market power in the industry. Multiple studies of the state of competition in freight rail transportation—including the extensive *Christensen Report* commissioned by the STB—debunk the notion that tighter regulation of railroad prices and service is necessary to offset the exercise of “market power” by rail carriers.⁵² To the contrary, the rebirth of the rail industry under policies set forth in the Staggers Act was accompanied by a twenty-year decline in the inflation-adjusted rates that shippers pay for rail service. The upward movement in rail rates in the years immediately following the recent recession is not indicative of a “competition problem” requiring a regulatory solution. Rather, as the *Christensen Report* shows,⁵³ those price increases were the logical response to market conditions, including significant growth in demand, higher operating expenses, a slowing in the pace of productivity gains in the rail

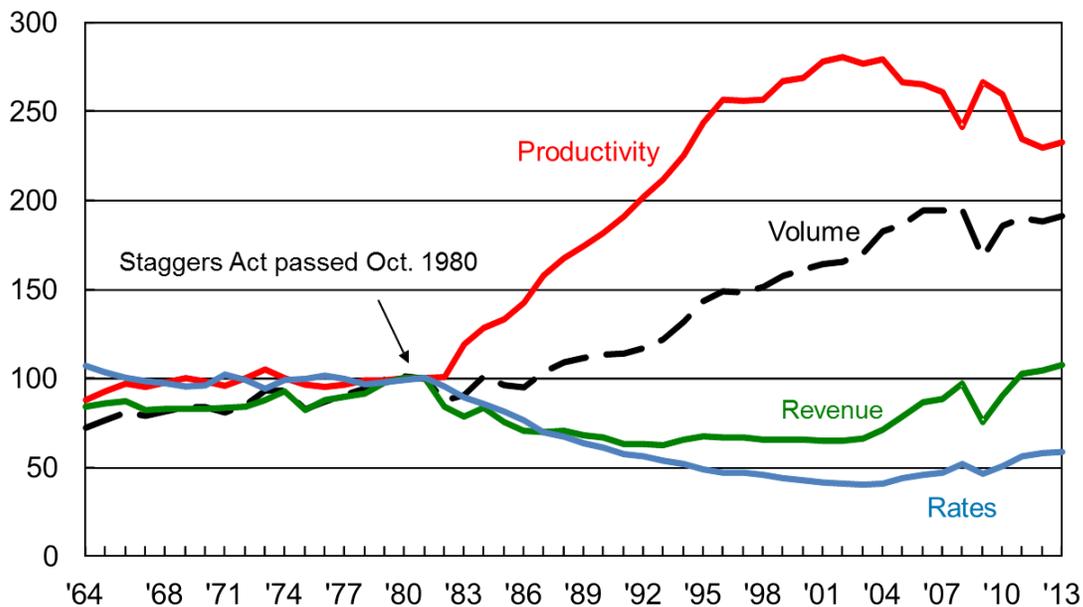
⁵¹ Association of American Railroads, Key Issues: Balanced Regulation, *available at* <https://www.aar.org/keyissues/Pages/Balanced-Regulation.aspx>

⁵² See Laurits R. Christensen Associates, Inc., *A Study of Competition in the U.S. Freight Railroad Industry and Analysis of Proposals that Might Enhance Competition, Executive Summary of Revised Final Report* (2009) (“2009 Christensen Report”); Laurits R. Christensen Associates, Inc., *A Study of Competition in the U.S. Freight Railroad Industry and Analysis of Proposals that Might Enhance Competition, Final Report* (2010) (“2010 Christensen Report”). The 2009 Christensen Report and the 2010 Christensen Report are referred to collectively herein as the “Christensen Report.”

⁵³ See 2010 Christensen Report at 3-25-26.

industry, and changes in the trucking market (driver shortages, higher fuel prices, highway congestion). In other words, recent changes in rail rates reflect the proper working of a competitive transportation market. As shown in Figure 1, notwithstanding those increases, shippers continue to enjoy the benefits of rail service at prices that are significantly lower (in real terms) than the prices that prevailed prior to enactment of the Staggers Act.

**FIGURE 1
U.S. FREIGHT RAILROAD PERFORMANCE
SINCE STAGGERS (1981 = 100)**



"Rates" is inflation -adjusted revenue per ton -mile. "Volume" is ton -miles. "Productivity" is revenue ton -miles per constant dollar operating expense. The decline in productivity in recent years is mainly due to the effect of higher fuel prices in the productivity calculation. Source: AAR

Christensen Associates concluded that both railroads and their customers benefitted from deregulation: “[F]ollowing the passage of The Staggers Act, the railroad industry experienced dramatic reductions in costs and increased productivity, which yielded higher returns for carriers and lower inflation-adjusted rates for shippers.”⁵⁴ More importantly, the *Christensen Report* found

⁵⁴ 2009 *Christensen Report* at ES-1.

that “[t]he recent increases in revenue per ton-mile appear to be largely the result of increases in fixed and marginal costs—related to increases in the railroad industry’s input prices and diminishing productivity growth—and not due to an increased exercise of market power.”⁵⁵ The fact that average rail rates declined once again in 2009 further demonstrates that rate increases during the 2004-2008 period were not the product of railroad market power.⁵⁶

Thus, the railroad renaissance has benefitted railroads and shippers alike. Railroads are stronger financially and have been able to reinvest hundreds of billions of dollars back into the network over the past 30 years. This reinvestment has improved infrastructure and technology used to serve shippers, all while keeping rates low—indeed, as of 2012 average inflation-adjusted rail rates were down 44% from 1980.⁵⁷ All the while, the Board has protected shipper interests by providing shippers with simplified mechanisms by which to challenge railroad rates. Studies show that the renaissance has not resulted in an abuse of market power, but that railroads have increased productivity in a way that benefits all parties.

C. The Board Has Robust, Well-Established Rate Regulatory Procedures That Incorporate Revenue Adequacy Principles.

The foundation of post-Staggers rate regulation is the differential pricing principle that demand-inelastic shippers reasonably can and should be expected to pay more for rail service than shippers who have competitive options. That said, shippers without effective competitive options have ample ability to seek a

⁵⁵ See 2010 Christensen Report at 4-13, 5-20, 6-3, 6-17; see also 2009 Christensen Report at ES-38.

⁵⁶ See 2010 Christensen Report at i, 2-5.

⁵⁷ Association of American Railroads, Key Issues: Balanced Regulation, available at <https://www.aar.org/keyissues/Pages/Balanced-Regulation.aspx>.

rate reasonableness determination. The Board has made significant efforts to provide access to its rate reasonableness policies, including developing simplified standards for smaller rate cases and substantially lowering filing fees. If a shipper believes that its rate is unreasonable, it is free to use the Board's processes to challenge the reasonableness of that rate.

Shippers have several choices of procedures to challenge a railroad's rates. The Stand-Alone-Cost test – which is rooted in sound economics – is available to all shippers and protects a captive shipper from bearing costs of inefficiencies or from cross-subsidizing other traffic by paying more than the revenue needed to replicate rail service to a select subset of the carrier's traffic base.⁵⁸ SAC is indisputably the "most accurate procedure available for determining the reasonableness of rail rates where there is an absence of effective competition."⁵⁹ Because SAC is accurate and economically sound, it is also a rigorous and complex methodology that is best suited to large-value cases. But today SAC is well-understood by experienced counsel and consultants who specialize in representing shippers.⁶⁰

One of the many advantages of the SAC test is that it considers the defendant carrier's revenue adequacy needs and is designed to give complainants relief if they can show that a SARR replicating part of the defendant's network would earn more than a reasonable return on its

⁵⁸ See *Coal Rate Guidelines*, 1 I.C.C. 2d at 542-46.

⁵⁹ *Simplified Standards* at 13; see also *Burlington Northern R.R. Co. v. Interstate Commerce Comm'n*, 985 F.2d 589, 596 (D.C. Cir. 1993) ("CMP, with its SAC constraint is the 'preferred and most accurate procedure available for determining the reasonableness' of rates in markets where the rail carrier enjoys market dominance.") (quoting ICC in *McCarty Farms v. Burlington Northern, Inc.*, 3 I.C.C. 2d 822 (1987)).

⁶⁰ See, e.g., *Western Fuels Ass'n v. BNSF Ry. Co.*, STB Docket 42088 (Feb. 18, 2009); *AEPCO v. BNSF Ry. Co. & Union Pac. R.R. Co.*, S.T.B. Docket No. 42113 (Nov. 22, 2011).

investment.⁶¹ SAC complainants are required to posit a SARR that could serve the selected traffic group “while fully covering all of its costs and earning a reasonable return on investment.”⁶² A SARR earns “a reasonable return on its investment” if its earnings exceed its cost of capital (which is typically derived from the Board’s Ex Parte 558 cost of capital calculations for the railroad industry). Thus, to say that a SARR is earning a reasonable return on its investment is effectively to say that the SARR would be revenue adequate. As the Board recognized in *Xcel Reconsideration*, “[t]he very purpose of the SAC test is to determine what [the defendant] needs to charge to earn ‘adequate’ revenues on the portion of its system that is included in the system of the SARR.”⁶³ SAC thus fulfills Congress’s mandate for the Board to consider revenue adequacy in the rate reasonableness process, and it does so in a rigorous, targeted way that focuses on the specific shipment at issue and on the portions of the defendant’s network used to serve that shipment.⁶⁴

Congress also determined that in some limited instances a less economically-sound test may be appropriate. Accordingly, Congress directed the Board to “establish a simplified and expedited method for determining the reasonableness of challenged rail rates in those cases in which a full stand-alone cost presentation is too costly, given the value of the case.” 49 U.S.C.

⁶¹*Xcel Reconsideration*, S.T.B. Docket No. 42057, at 6.

⁶² *E.I. du Pont de Nemours & Co. v. Norfolk So. Ry. Co.*, S.T.B. Docket No. 42125, at 32 (served Mar. 24, 2014) (“*DuPont*”).

⁶³ *Xcel Reconsideration*, S.T.B. Docket No. 42057 at 6; see also *BNSF Ry. Co. v. Surface Transp. Bd.*, 453 F.3d 473, 480 (D.C. Cir. 2006) (“the SAC test is designed to take into account the railroad’s need for revenue adequacy ‘on the portion of its system that is included in the system of the SARR’”).

⁶⁴ As demonstrated below, a generalized top-down revenue adequacy constraint would create impermissible cross-subsidies if used to provide relief for rates that are reasonable under SAC.

§ 10701(d)(3). Simplified SAC and the Three Benchmark approach were developed to allow shippers to seek rate relief without engaging in a full-SAC analysis. The Board has repeatedly acknowledged that these procedures are less robust in nature than full SAC, and in particular has commented on the “crude,”⁶⁵ “rough,”⁶⁶ and “imperfect”⁶⁷ nature of the Three Benchmark approach. Ultimately, the Board has determined that these approaches are necessary to ensure that “shippers with small disputes [have] some practical means of challenging the reasonableness of their rail rates.”⁶⁸ At the same time, the Board has appropriately limited the availability of the Three Benchmark approach because of its weak foundation compared with SAC and Simplified SAC.

The Board’s established rate relief programs offer a varied level of relief⁶⁹ at a varied cost to all shippers based on the shipper’s needs and preferences. As a result, shippers already have ample options to challenge rates they believe are unreasonable with methodologies that are designed to account for shippers’ individualized circumstances. However, as NS has noted in other proceedings, the number of cases filed and who wins those cases is not a measure of whether the Board’s rate regulation is successful. Indeed, with more clarity, there will be

⁶⁵ *Simplified Standards* at 73.

⁶⁶ *Id.*

⁶⁷ Notice of Proposed Rulemaking, *Simplified Standards for Rail Rate Cases*, STB Ex Parte No. 646 (Sub-No. 1), at 28 (served July 28, 2006) (“*Simplified Standards NPRM*”).

⁶⁸ *Simplified Standards NPRM* at 28.

⁶⁹ Over the strong objection of NS and other railroads, the Board recently removed the relief limit from Simplified SAC cases in Ex Parte 715.

fewer cases, and the regulated entity, which is trying to comply with the law, should win more cases.⁷⁰

Although *Coal Rate Guidelines* also proposed top-down constraints based on management efficiency and revenue adequacy, those constraints have almost never been invoked, and development of those constraints would create serious theoretical and practical problems.

D. ICC Announces An Independent, Top-Down Revenue Adequacy Constraint Laden with Ambiguity and Unresolved Issues.

To understand the problems that would result from attempting to develop an independent, top-down revenue adequacy constraint to supplement the Board's existing rate reasonableness procedures, it is useful to review the regulatory genesis of *Coal Rate Guidelines'* proposed revenue adequacy constraint. To be clear, the revenue adequacy constraint is different from references to the Board's mission of promoting revenue adequacy generally, and from the annual revenue adequacy determination which is a measure of whether the Board is making progress in its mission.⁷¹

1. The Initial Rulemaking Proposes A Flexible Revenue Adequacy Constraint.

The ICC's first proposal of a revenue adequacy constraint emphasized that the constraint would be flexible and recognized the considerable problems that are created from a rigidly-applied constraint. The 1983 Notice of Proposed

⁷⁰ See Comments of Norfolk Southern Ry. Co., STB Ex Parte No. 665 (Sub-No. 1) (filed Aug. 25, 2014) at 3-4, 28.

⁷¹ *Railroad Revenue Adequacy – 1988 Determination*, Ex Parte No. 483, 6 I.C.C. 2d 933, 952 (1990) (“A revenue adequacy finding may have little practical effect on a carrier's continued ratemaking flexibility and prosperity. The annual revenue adequacy determination was introduced by the [4R Act], and clarified by the Staggers Rail Act of 1980, primarily to monitor the industry's progress towards financial health.”).

Rulemaking for the rules that became *Coal Rate Guidelines* proposed a revenue adequacy constraint that would accompany SAC and a constraint on management efficiency, but it made clear that this constraint would be flexibly applied in service of the overall statutory goal of promoting revenue adequacy.⁷²

First, the ICC said that although rates should be permitted to increase as needed for railroads to become revenue adequate, “this does not mean that further rate increases on captive coal traffic would be unreasonable *per se* once a carrier achieves revenue adequacy.”⁷³ This statement is inconsistent with court statements that warn against confusing concepts of revenue adequacy and rate reasonableness.⁷⁴ The ICC explained that revenue adequacy should not prohibit rate adjustments because “such an approach would be economically unsound, as it would create disincentives to optimal market pricing.”⁷⁵

Second, the ICC dismissed concerns that it was not removing assets that are no longer used and useful, explaining that it was not practical to determine which assets should not be entitled to a full return. Even if it could identify those assets, subsequent judgments about prior investments might discourage current investments, or at least significantly affect investors’ evaluation of the risk associated with the rail industry. That, in turn, would raise the cost of capital for new investment. “By excluding those investments from the investment base,” the ICC concluded, “it is not clear that the rates to captive shippers would

⁷² *Coal Rate Guidelines NPRM*, at 14.

⁷³ *Id.* at 15.

⁷⁴ *Bessemer*, 691 F.2d at 1113 (noting that there is a “distinction in the statute between revenue adequacy proceedings and rate reasonableness proceedings”).

⁷⁵ *Coal Rate Guidelines NPRM* at 19.

necessarily decline; the increase in risk cost might more than offset any saving from the theoretically reduced asset base.”⁷⁶

Third, the ICC again recognized the illogical Sisyphean task that arises from regulation based on revenue adequacy. It recognized that Return on Investment (“ROI”) may drop below the standard or temporarily rise above the standard. Consequently, “we do not intend to require the railroads to continuously adjust rates on captive traffic so as to maintain perfect year-to-year conformance with the prescribed revenue adequacy level.”⁷⁷

Fourth, the ICC expressed concern that it not discourage the industry from improving efficiency and raising rates on competitive traffic. In the notice, the ICC acknowledged that a “rigidly applied revenue adequacy constraint” would have many practical problems, such as causing carriers to try to avoid a finding of revenue adequacy by lowering rates on competitive traffic. Not only would this encourage non-market based pricing, “it would contribute to higher rates on captive traffic.”⁷⁸ The ICC also observed that increased profitability demonstrated by a revenue adequacy finding may be related to factors other than raising rates on captive traffic, such as “increased productivity.” As a result, “[i]n scrutinizing rates on captive traffic once revenue adequacy is achieved our goal is to exercise our jurisdiction in a manner which does not destroy the railroads’ incentive and ability to increase efficiency, while protecting captive shippers from exploitation.” *Coal Rate Guidelines NPRM* at 20; *see also id.* at 16 (“Moreover, we would be reluctant to reduce existing rates on captive coal traffic

⁷⁶ *Id.* at 15 n. 43.

⁷⁷ *Id.* at 16.

⁷⁸ *Id.* at 19.

if the source of an increased rate of return is increased efficiency in operations or a more profitable rate on competitive traffic.”).

Finally, the ICC noted that its concern was primarily about a “consistent” pattern of returns “substantially” in excess of a carrier’s revenue needs. *Id.* at 17 (“[W]here a consistent pattern of returns substantially in excess of a carrier’s revenue needs has been established, we would, upon complaint, consider the reasonableness of rates on captive coal traffic and prescribe lower rates in appropriate circumstances.”). In explaining how it might apply the revenue adequacy constraint, the ICC said that the reasonableness of rates for revenue adequate carriers would depend on many factors, including: (1) the relationship among rates for similar movements; (2) the degree to which a carrier has exceeded the revenue adequacy standard; and (3) the reasons for a carrier attaining revenue adequacy (*e.g.*, efficiency improvements, raised rates on captive traffic). *See id.* at 20.

2. Public Comments on the Ex Parte 347 (Sub-No. 1) NPRM Either Opposed a Revenue Adequacy Constraint or Emphasized That It Should Be Flexibly Applied.

Significantly, USDOT and even some shippers opposed the imposition of an inflexible revenue adequacy constraint. While USDOT approved of the idea of applying closer scrutiny to rates once the agency determines that a railroad is earning adequate revenues, the Department specifically noted that it did “not advocate limiting railroads to the revenue adequacy level, by requiring rate reductions or new rates that hold total earnings at the level established as the minimum required to sustain operations.”⁷⁹ The Department also opposed a

⁷⁹ Comments of US Dep’t of Transp., *Coal Rate Guidelines – Nationwide*, Ex Parte No. 347 (Sub. No.1) (July 29,1983) at 32 (emphasis added).

regime under which a rate previously found to be reasonable when a railroad was not revenue adequate should be reduced when the railroad reaches or exceeds the revenue adequacy standard.”⁸⁰ USDOT explained that such an approach “would require regulatory intervention beyond that envisioned or even authorized by the Staggers Act.”⁸¹

In addition to receiving comments, the ICC held hearings. At those hearings, parties addressed the concept of a revenue adequacy constraint based on knowledge of regulatory systems at that time.⁸² Although both railroad and shipper parties at the time supported the theoretical concept of a revenue adequacy constraint, both also advocated against a firm cap. The representative for the Eastern Railroads was clear that if there were a revenue adequacy constraint, it should not be a firm cap and that the industry should be permitted to keep additional revenue from competitive traffic and increased efficiencies.⁸³ The representative for the Western Railroads advocated for a constraint set above the minimum level needed to achieve revenue adequacy, otherwise revenue adequacy would be no more than a pipe dream.⁸⁴ Even if a railroad were determined to be revenue adequate, he noted that the agency had to be sure that the revenue adequacy was not momentary and not due to efficiency or

⁸⁰ *Id.* at 34.

⁸¹ *Id.* (emphasis added).

⁸² It is important to keep in mind that at that rulemaking stage, the agency was considering various forms of regulation and had no experience with implementing any of them. Indeed, other industries similarly did not have experience with regulating industries that were deregulated only in part.

⁸³ *Coal Rate Guidelines – Nationwide*, Ex Parte 347 (Sub-No. 1), Hr. Tr. at 22 (Oct. 4, 1984) (“It should not serve as a firm cap, Mr. Chairman.”)

⁸⁴ *Id.* at 56.

productivity gains and that revenue adequacy should not be imposed as a firm cap in light of the “need for investment capital.”⁸⁵

The shipper parties were similarly concerned about implementation of a revenue adequacy constraint that would act as a firm cap which would prohibit further rate increases, acknowledging that “for 100 years the law in this country was that the level of an individual rate was not determined by the success or failure of the enterprise as a whole.”⁸⁶ Another representative of coal parties similarly rejected the idea of revenue adequacy as a firm cap, noting that should not be “an inflexible ceiling.”⁸⁷ Further, he said: “I certainly think that in terms of a particular rate, if this Commission can come up with a measure of individual rate reasonableness, we have to let the chips fall where they will. If a rate on coal happens to be out of line and depressed, . . . I would not expect the fact of overall revenue adequacy of that carrier to deter them from . . . applying a reasonable rate.”⁸⁸ Of course, the agency in fact came up with a “measure of individual rate reasonableness” – the SAC test – and then two more – the Simplified SAC test and the Three Benchmark test.

⁸⁵ *Id.* at 66-67.

⁸⁶ *Id.* at 79.

⁸⁷ *Id.* at 114.

⁸⁸ *Id.* at 115. Of course, this statement is just the inverse of the agency’s long held view that the revenue inadequacy of a carrier is irrelevant in a rate case. *Omaha Public Power Dist. v. Burlington Northern R.R. Co.*, 3 I.C.C. 2d 123, 157 (1986) (citing *Standards I*, 346 I.C.C. at 808-9) (“a finding of revenue inadequacy does not give a railroad license to set rates at unreasonable levels”); *BNSF Ry. v. Surface Transp. Bd.*, 453 F.3d 473, 480 (D.C. Cir. 2006) (“[S]ystem-wide revenue inadequacy is not a basis upon which a carrier may defend an unreasonable rate over a segment of its system” based on the SAC test.).

3. The Final Coal Rate Guidelines Deviated from the Initial Proposal

In *Coal Rate Guidelines*, the ICC reviewed the public comments and announced that it was making substantial changes to the SAC, managerial efficiency, and phasing constraint, but left the inference that it was not making any substantial changes to the independent, top-down revenue adequacy constraint:

While we have retained many aspects of the basic approach, we also have substantially revised and clarified our earlier proposal. In particular, some revisions and clarifications have been undertaken to address concerns expressed by the shipper community about our interim guidelines. We have responded by making what we consider to be significant changes with respect to interpretation and implementation of the phasing, management efficiency, and stand-alone cost constraints.⁸⁹

The ICC elaborated in the introduction that, in light of the comments received, “We have made significant changes in response to certain elimination [sic] of the 15 percent annual limit in favor of case-by-case scrutiny of the need for phasing, the use of a longrun marginal cost standard to estimate any avoidable revenue need shortfall, and a declaration of the importance of grouping to stand-alone cost presentations.”⁹⁰ Again, the ICC provided no suggestion that it was making any significant changes to the proposed revenue adequacy constraint.

Nonetheless, much was lost in translation between the NPRM and *Guidelines*. Lost were the judicially-approved concepts that meeting the cost of capital was the minimum rate of return for a rail carrier,⁹¹ that being revenue

⁸⁹ *Coal Rate Guidelines*, 1 I.C.C.2d at 525.

⁹⁰ *Id.* at 521.

⁹¹ *Standards I*, 364 I.C.C. at 809.

adequate should not result in limitation on revenue,⁹² or the distinction between revenue adequacy and rate reasonableness determinations.⁹³

In the Constrained Market Pricing methodology that it approved in *Coal Rate Guidelines*, the ICC established a revenue adequacy constraint, under which “rate increases would generally only be permitted to the extent needed to reach and maintain revenue adequacy.”⁹⁴ In particular, *Coal Rate Guidelines* misguidedly implied – in contradiction of longstanding agency and court findings⁹⁵ – that the “minimum” level of revenue needed was the maximum a carrier could earn.

Carriers do not need greater revenues than this standard permits, and we believe that, in a regulated setting, they are not entitled to any higher revenues. Therefore, the logical first constraint on a carrier’s pricing is that its rates not be designed to earn greater revenues than needed to achieve and maintain this “revenue adequacy” level. In other words, captive shippers should not be required to continue to pay differentially higher rates than other shippers when some or all of that differential is no longer necessary to ensure a financially sound carrier capable of meeting its current and future service needs.⁹⁶

⁹² *Bessemer*, 691 F.2d at 1113.

⁹³ *Id.*

⁹⁴ *Coal Rate Guidelines*, 1 I.C.C.2d at 521.

⁹⁵ See, e.g., *Adequacy of Railroad Revenue - 1978 Determination*, 362 I.C.C. at 201 (“Moreover, this study was designed to compute a minimum adequate revenue level for the Nation’s class I railroads; the methodology of the study is not necessarily appropriate for the determination of the maximum fair revenue issues involved in individual rate proceedings.”) (emphasis in original); *Standards I*, 364 I.C.C. at 810 (“The minimum rate of return that will allow railroads to obtain investment funds is the cost of capital.”) (emphasis added); *Bessemer*, 691 F.2d at 1112 (“the section was addressed to the *opportunity* to attain revenue levels which would reverse the long decline in the railroad industry. The specific objectives listed in section 205 should not in its view be read as limitations on revenue.”) (emphasis added).

⁹⁶ *Coal Rate Guidelines*, 1 I.C.C.2d at 535-36 (footnote omitted)

However, the ICC made clear that the revenue adequacy constraint is not rigid and inflexible. For example, the ICC stated that a railroad would be allowed to earn revenues in the long run which would provide an ROI in excess of the cost of capital if the railroad could sufficiently show “(1) a need for the higher revenues, (2) the harm it would suffer if it could not collect them, and (3) why captive shippers should provide them.”⁹⁷

Although other parts of the *Coal Rate Guidelines* were challenged in court at the United States Court of Appeals for the Third Circuit, the revenue adequacy constraint was not challenged and its economic validity has never been reviewed by a court.⁹⁸

4. The ICC Announces that the Annual Revenue Adequacy Findings (Based on Book Values) Will Not Be Binding in Individual Rate Disputes.

The ICC made clear that the agency’s annual revenue determinations are *not* conclusive evidence regarding a railroad’s financial condition in a rate reasonableness proceeding. In its very first revenue adequacy determination, the ICC stated that it “wish[ed] to stress that our findings here will not be the determinative factor in other proceedings affecting railroad revenue. . . . [T]he methodology of the [revenue adequacy] study is not necessarily appropriate for the determination of the maximum fair revenue issues involved in individual rate proceedings.”⁹⁹

⁹⁷ *Id.* at 536 n.36.

⁹⁸ See *Consolidated Rail Corp. v. U.S.*, 812 F.2d 1444 (3d Cir. 1987). The revenue adequacy constraint was applied in one pipeline case, but in that case the appellant made clear that it was challenging the Board’s application of the constraint and not the constraint itself. *CF Indus., Inc. v. Surface Transp. Bd.*, 255 F.3d 816 (D.C. Cir. 2001); see *CF Industries, Inc. v. Koch Pipeline Co., L.P.*, 4 S.T.B. 637 (2000).

⁹⁹ *Adequacy of Railroad Revenue – 1978 Determination*, 362 I.C.C. 199, 201 (1979); see also *Increased Rates on Coal, Midwestern Railroads, August 1979*, 364 I.C.C. 29, 34-35 (1979)

Despite the 4R Act and the Staggers Act providing more flexibility to revenue inadequate carriers and Congress's command that the agency make an adequate and continuing effort to assist carriers in attaining adequate revenues, the ICC from the outset determined that revenue inadequacy was irrelevant when determining the reasonableness of a rate. *Standards I*, 346 I.C.C. at 809. ("It should not be expected, in other words, that a carrier with inadequate revenue under the proposed standards will have unlimited freedom to raise its rates on market dominant traffic.") However, the agency also determined that the annual revenue adequacy determination was irrelevant to rate regulation. *Adequacy of Railroad Revenue - 1978 Determination*, 362 I.C.C. at 201. ("This study was designed to compute a minimum adequate revenue level for the Nation's class I railroads; the methodology of the study is not necessarily appropriate for the determination of the maximum fair revenue issues involved in individual rate proceedings.")

In its revenue adequacy determination for 1984, the ICC reemphasized the limited evidentiary value of its annual revenue adequacy determinations in rate proceedings:

[I]n rate reasonableness proceedings under Section 10701a, we do not treat the findings made under our current methodology as determinative or conclusive of the revenue adequacy of the carrier involved unless the parties present no other evidence relevant to that issue. Indeed, where the record is open in a particular case, we

(decision on adequacy of railroad revenues for 1978 "is not conclusive in this proceeding. Its revenue adequacy determinations were made from a historical perspective based on limited data that is no longer current. They provide no assurance that the carrier will be able to meet its future revenue needs. We specifically said in [that decision] that our findings would not necessarily be the determinative factor in other proceedings concerning railroad revenue.").

accept all competent, probative evidence relevant to a carrier's revenue adequacy which the parties may submit.¹⁰⁰

The ICC maintained this position even after it reevaluated its revenue adequacy standards in its 1986 decision in *Standards for Railroad Revenue Adequacy. Railroad Revenue Adequacy – 1985 Determination*, 3 I.C.C.2d 541, 544 (1987) (“We will continue to accept all competent and probative evidence relative to the carrier’s revenue adequacy.”).¹⁰¹ Thus, the ICC’s policy was that, at most, it would “consider” its previous annual revenue adequacy determinations in an individual rate reasonableness proceeding, but that those findings were not binding on the agency or on the parties.¹⁰²

As a result, while the agency has been tasked with monitoring railroad revenue adequacy, it has declined to make those findings binding in rate disputes. This position makes sense, as the ICC had been unsuccessful in moving

¹⁰⁰ *Railroad Revenue Adequacy – 1984 Determination*, 1 I.C.C.2d 615, 620 (1986).

¹⁰¹ See also, e.g., *Bituminous Coal – Hiawatha, Utah, to Moapa, Nevada*, 6 I.C.C.2d 1, 7 n.24 (1989) (“We have stated that any other competent and probative evidence relative to the carrier’s revenue adequacy may be submitted in individual rate reasonableness proceedings”) (citing *Railroad Revenue Adequacy – 1987 Determination*); *Railroad Revenue Adequacy – 1987 Determination*, 4 I.C.C.2d 731, 731 (1988) (“We will also consider [the] findings [regarding revenue adequacy] in individual rate reasonableness proceedings conducted under 49 U.S.C. § 10701a, but will not necessarily treat these findings as determinative of revenue adequacy issues raised in those cases. Rather, we will continue to consider all probative evidence submitted in such cases pertaining to the revenue adequacy of the particular carrier(s) involved”); *Railroad Revenue Adequacy – 1986 Determination*, 3 I.C.C.2d 966, 970 (1987) (“In rate reasonableness proceedings under § 10701a, we will continue to accept all competent and probative evidence relative to the carrier’s revenue adequacy that may be submitted by the various parties. Such evidence may include any financial data which these parties see fit to present. On the basis of the record developed we will determine the sufficiency of revenues on a case-by-case basis for the particular railroad or railroads involved. In the absence of such evidence, the revenue adequacy findings contained herein will be utilized.”).

¹⁰² See also *Railroad Revenue Adequacy – 1990 Determination*, 8 I.C.C.2d 1 n.1 (1991); *Railroad Revenue Adequacy – 1989 Determination*, 7 I.C.C.2d 158 n.1 (1990); *Railroad Revenue Adequacy – 1988 Determination*, 6 I.C.C.2d 163 n.1 (1989).

its annual revenue adequacy measurement onto the preferred replacement cost footing. But the ICC never explained what kinds of “probative evidence” relevant to a carrier's revenue adequacy the parties may submit.

E. The Private Freight Rail Network Needs to Expand and Grow to Serve the National Interest

In contemplating what to do with this ambiguous free-standing revenue adequacy constraint, the STB should be mindful of the pressing need for the private freight rail network to expand and grow to serve the growing National demand for safe, efficient, and environmentally friendly freight rail transportation.

While the industry has experienced significant growth and improved financial prospects since the ICC published *Coal Rate Guidelines*, railroads face continued and developing challenges that will require a regulatory regime that allows them to successfully undertake enormous capital expense. Tightening rail capacity is a growing concern that will require billions of dollars in railroad investment to address. Moreover, national policies regarding transportation infrastructure and even climate policies are challenging railroads to do more every day to assist the country to become more technologically advanced, more efficient, and more environmentally friendly. Responding to all of these needs requires that the rail network continue to grow and to invest heavily in its infrastructure and technological advancement. This will require enormous capital investment—investment that will not be possible absent regulatory certainty.

1. Tightening Rail Capacity Requires Substantial Investments.

The railroads' need for an adequate return on investment is particularly critical in view of the massive increases in rail freight traffic that can be expected over the next 25 years. To fulfill the additional demand for freight service, railroads will be required to invest record amounts of capital to improve and expand their networks.

Following the rationalization of the rail network that began after the passage of the Staggers Act in 1980, railroads have carried increased volumes of freight across a smaller but more efficient rail system. By 2005, the volume of traffic had increased to a level that began to trigger concerns about capacity constraints. Several studies in that time frame projected that the rail system would require significant infrastructure and capacity expansions to accommodate long-term freight growth in coming decades.¹⁰³ The recession forestalled the immediate urgency of capacity issues, but as the U.S. economy continues to improve, capacity is once again emerging as an important and growing concern. Macroeconomic projections and widespread shipper comments confirm that the railroads will need to significantly increase their capacity over the next twenty-five years to handle increased volume from even modest national economic growth.¹⁰⁴ Although estimates vary, even the current

¹⁰³ See USDA & DOT, *Study of Rural Transportation Issues*, at 335 (Apr. 2010) (citing FHWA, *FAF2, the Second Generation of the Freight Analysis Framework* (July 2007)) (projecting a 65% increase in domestic freight demand from 1998 to 2020); see also American Association of State Highway and Transportation Officials ("AASHTO"), *Freight Rail Bottom Line Report*, at 50 (2003) (projecting freight increase from 15.2 billion tons in 2000 to 24.5 billion tons in 2020). DOT put together a second FAF study in 2007, *FAF2.2*, that projected that total freight transportation would blow by those projections and rise 93% from 2007 to 2035. Federal Highway Administration ("FHWA"), *FAF2, The Second Generation of the Freight Analysis Framework* (July 2007).

¹⁰⁴ The AASHTO study projected that railroad ton-miles would grow to 1.82 trillion by 2020, an increase of 47% from 2000. AASHTO, *Freight Rail Bottom Line Report*, at 51.

record-breaking private reinvestment by the railroads into their networks may not be enough to maintain rail's current modal share of the freight market.¹⁰⁵

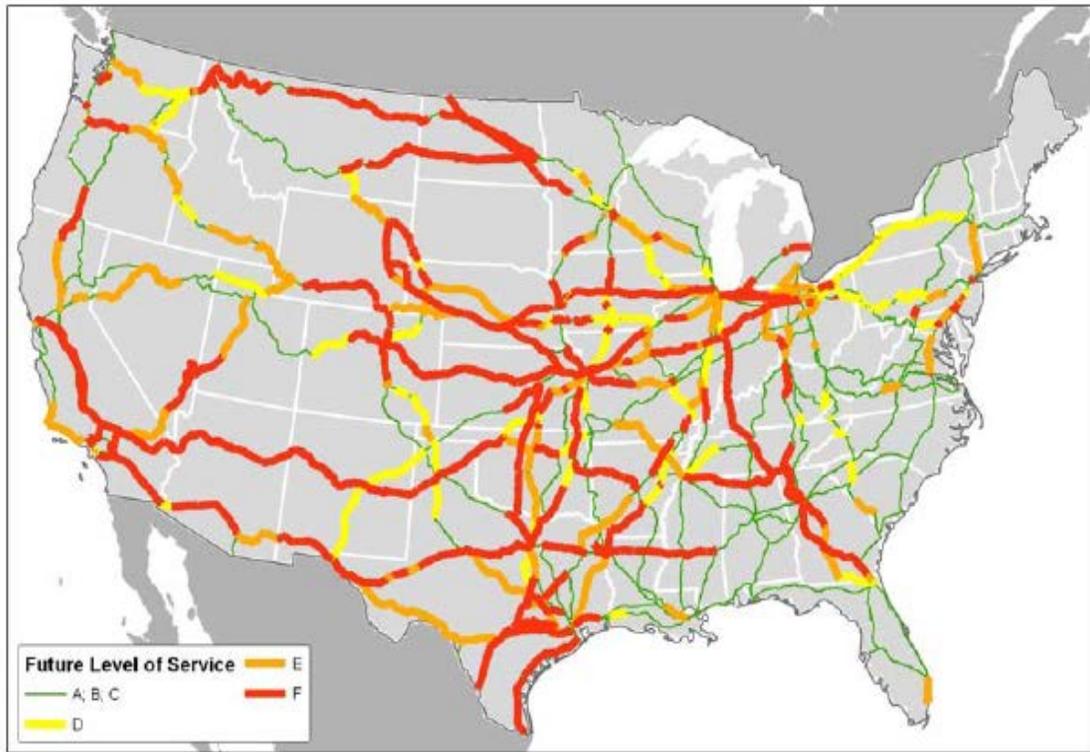
Without significant improvements to the national rail network, capacity will be stretched to a breaking point within a few years. A Cambridge Systematics Study used DOT's FAF^{2.2} projections to project rail congestion in 2035 based on capacity in 2005. As the figure below demonstrates, the study predicted that 25% of the corridors studied will be operating near or at capacity by 2035 (depicted in yellow and orange), and 30% will be operating above capacity (depicted in red).¹⁰⁶

Comparing this prediction to realized numbers, the AAR reported that Class I ton-miles had already reached 1.71 trillion by 2012, outpacing AASHTO's projection to that point. See AAR, *Class I Railroad Statistics*, at 2. The DOT FAF^{2.2} study estimated rail volumes would increase 88 percent from 2007 to 2035. FHWA, *FAF2, The Second Generation of the Freight Analysis Framework*. Even using the newest and most restrained FAF^{3.4} study, rail transportation still projects to increase 46%, measured by tonnage, between 2011 and 2040. See FHWA, *Freight Facts and Figures 2012*.

¹⁰⁵ AASHTO's rail study in 2003 found that "[w]ith minimal Class I investments accomplished by the railroads from revenue alone and from investments in short-line improvements and safety enhancements, the freight-rail system could carry the same volume of freight in 2020 as it carries today, but little more." AASHTO, *Freight Rail Bottom Line Report*, at 3. To maintain modal share from 2000, AASHTO estimated that \$175 to \$195 billion in investment would be required, with approximately \$3.5 billion a year devoted to infrastructure improvements above and beyond repair and maintenance. *Id.* at 4. The study estimated that this left a gap of \$2.65 billion a year above private railroad reinvestment. *Id.*

¹⁰⁶ See Cambridge Systematics, *National Rail Freight Infrastructure Capacity and Investment Study*, at 5-6 (Sept. 2007) ("*Cambridge Study*").

2035 Volumes Compared to Current Corridor Capacity without Improvements
(Cambridge National Capacity Study)¹⁰⁷



Source: Cambridge Systematics, Inc.

Note: Volumes are for the 85th percentile day.

This represents a dramatic degradation compared to 2005, when less than one percent of lines operated above capacity.¹⁰⁸ As the study observed, “[t]he resulting level of congestion would affect nearly every region of the country and would likely shut down the national rail network.”¹⁰⁹

Public interest in diverting even more traffic from the overburdened national highway system to rail will only compound any shortfall, and the

¹⁰⁷ *Id.* at 5-5, fig. 5.4.

¹⁰⁸ *Id.* at 4-10.

¹⁰⁹ *Id.* at 5-6.

positive externalities of rail transportation may not be fully realized without outside incentive. The importance of adequate capacity and the railroads' ability to meet expanded volumes in the future is not lost on shippers and has recently resurfaced in the Board's hearings regarding rail service issues, addressing the service disruptions triggered in large part by severe winter weather at the beginning of 2014 and prolonged by heavy freight volumes through the summer. During the Board's April hearing and in submitted comments, participants repeatedly raised three points.

- First, many industries, including agricultural commodities and chemicals, are seeing and will continue to see significant growth in freight volumes transportable by rail, putting increasing strain on rail capacity.¹¹⁰
- Second, rail transportation must be capable of accommodating its share of the projected growth as part of an all-inclusive transportation policy.¹¹¹
- And third, railroads need to invest heavily, and quickly, to expand capacity to meet these growing demands.¹¹²

¹¹⁰ See *United States Rail Service Issues*, STB Ex Parte 724: Testimony of Lance Peterson, American Soybean Association (Apr. 10, 2014) ("The demand for rail shipments of soybeans is expected to continue to grow in the coming years. . . . [T]he takeaway from most forecasts is that soybean shipments will be increasing, and the rail network needs to accommodate this growth along with the growth in crude oil shipments."); Comments of Alliance for Rail Competition at 14 (filed Apr. 15, 2014) ("This growth in traffic and the associated necessary rail expansion will lead to continuing capacity issues for the next 5 to 10 years.").

¹¹¹ See *United States Rail Service Issues*, STB Ex Parte 724: Comments of United Sugars Corporation, at 3 (filed Apr. 7, 2014) ("There simply is not enough truck capacity to make much of a dent . . ."); Testimony of Lance Peterson, American Soybean Association (Apr. 10, 2014) (supporting policies that "encourage or provide direct investment in expanding transportation capacity including rail, trucks, and waterways" including a tax credit on new rail infrastructure).

This testimony and these comments confirm that the railroads will need to be capable of bringing increased capacity online to meet shipper demand.

To allow the industry to commit to the large infrastructure investments necessary to meet these demands, financial certainty throughout the industry will be of the utmost importance. The freight railroads have been reinvesting in their systems to a record-breaking extent over the past decade.¹¹³ Still, the capital-intensive nature of the industry means that substantial portions of these sums are required just to maintain current capacity and are not available to expand existing infrastructure. Despite the Class I railroads' estimate that they will generate and privately invest approximately \$70 billion of the amount needed for new capacity through volume and revenue growth, the Cambridge Study found that "[t]his would leave a balance for the Class I freight railroads of \$39 billion or about \$1.4 billion per year to be funded from railroad investment tax incentives, public-private partnerships, or other sources."¹¹⁴

A 2010 examination of the Cambridge Study by USDA and DOT determined that the recession "has delayed the effect of such constraints as much

¹¹² See *United States Rail Service Issues*, STB Ex Parte 724: Testimony of Hal Clemensen, South Dakota Wheat Growers Cooperative (Apr. 10, 2014) ("We feel that there needs to be a lot more reinvestment in the rail system than what is being planned at this point"); Testimony of Lucas Lentsch, Secretary of Agriculture, State of South Dakota (Apr. 10, 2014) ("Farmers spent the capital to increase production, grain companies have spent the capital to handle this new production, and now it is up to railroads to spend the capital to get this production to export. . . . And now is the time to build up the railroad infrastructure to handle this increased production."); Comments of Minnesota Grain and Feed Association, at 2-3 (filed Apr. 10, 2014) ("Velocity and Cycle time of cars needs to obviously improve, which means that the railroads will need to put a lot of money into infrastructure improvements over the next few years.").

¹¹³ See, e.g., AAR, *Freight Railroad Capacity and Reinvestment*, at 1-2 (Oct. 2013), available at <https://www.aar.org/keyissues/Documents/Background-Papers/Freight%20Railroad%20Capacity%20and%20Investment.pdf>.

¹¹⁴ *Cambridge Study*, at 7-6.

as 5 years.”¹¹⁵ Still, USDA and DOT concluded that “there seems to be consensus that substantial investment, even if an unknown amount, is required to provide shippers the capacity and service they desire.”¹¹⁶ A 2012 study funded by the U.S. soybean industry revisited the Cambridge Study calculations and confirmed that, even with a rail volume growth of just 2.05 percent a year, the industry is faced with a \$35.6 billion investment gap between 2012 and 2035.¹¹⁷

In short, the economic downturn may have provided temporary relief from the capacity strains exhibited in 2005 and 2006. However, as the economy continues to recover, even at a moderate annual pace, volumes will begin to exceed the capacity of increasing portions of the greater rail network. And although long-term projections are subject to intervening events, such as the decline in coal volumes or the rapid development of significant demand surrounding domestic oil and natural gas drilling, the many studies on this topic point to the same conclusion: substantial and sustained investment in new infrastructure by the Class I railroads will be required, and indeed may prove insufficient on its own, to maintain the same modal share and fluidity that freight rail transportation has experienced in recent years.

Capacity improvements require financial certainty. The ability and willingness of railroads or other entities to invest in new infrastructure and capacity may be constrained by the characteristics of the rail network separate and apart from the availability of financial capital. Christensen Associates explained that railroad investments have particular features that complicate

¹¹⁵ USDA & DOT, *Study of Rural Transportation Issues*, at 305.

¹¹⁶ *Id.* at 339.

¹¹⁷ Kendell W. Keith, “Maintaining a Track Record of Success, Expanding Rail Infrastructure to Accommodate Growth in Agriculture and Other Sectors,” TRC Consulting Ltd., at 50 (Dec. 2012) (“*TRC Consulting Study*”).

capacity additions. Rail infrastructure projects are often large and expensive, meaning the benefits take a long time to pay off.¹¹⁸ Investments are also largely sunk – they are not easily moved, sold, or used for other purposes.¹¹⁹ As a result, investments are more risky and may “be undertaken only if they are clearly expected to be profitable.”¹²⁰ Firms in such markets would not be expected to make significant investments to account for rare or unlikely circumstances.¹²¹ Any additional sources of financial uncertainty decrease the likelihood that an investment will produce a positive return over the long-term to justify investment. Such factors lead to lumpy investments, occurring only after periods of demonstrated demand that may temporarily constrain capacity but make the potential payoff more certain.¹²² Companies will more quickly embrace smaller, cost-effective options to mitigate immediate issues.¹²³ Therefore, financial

¹¹⁸ Laurits R. Christensen Associates, Inc., *Supplemental Report to the U.S. Surface Transportation Board on Capacity and Infrastructure Investment*, at 2-18 (Mar. 2009) (“*Christensen Supplemental Report*”).

¹¹⁹ *See id.*

¹²⁰ *See id.* at 2-19.

¹²¹ In contrast, some shippers seem to expect railroads to make exactly such investments. *See, e.g.,* Comments of United Sugars Corporation at 7, *United States Rail Service Issues*, STB Ex Parte No. 724 (filed Apr. 7, 2014) (“While United Sugars hopes that BNSF will not need the extra cars because its service levels will have returned to normal, United Sugars needs to know that those cars will be there just in case.”).

¹²² *See Christensen Supplemental Report*, at 2-18; *cf.* James McClellan, “Railroad Capacity Issues,” *Research to Enhance Rail Network Performance*, Transportation Research Board, at 34 (2007) (“So, management is in a constant struggle to create just-in-time capacity – that is, having the resources in place when needed, not 6 months sooner or later.”).

¹²³ *See Christensen Supplemental Report*, at 2-19; *cf.* James McClellan, *Railroad Capacity Issues*, at 32 (“Building more tracks seems a natural solution but may not be the best alternative. A fixed plant is so called for a reason; once in place, it is costly to move the resources elsewhere. Thus, a different operating strategy (e.g., changing schedules or powering up some or all trains) is often a less costly and less risky solution; locomotives can be moved around, but track cannot.”).

certainty for the railroads, both in terms of volumes and revenue, will play a major role in the scale and timing of infrastructure investments.

Although precise estimation of the growth in rail freight demand over the coming decades is necessarily difficult and subject to reasonable debate, the trends clearly show that, as the American economy grows, railroads will be called on to handle significant increases in volume just to maintain their current share of freight transportation. Such traffic will constrain capacity on increasing portions of the national rail network. Shippers agree with the conclusions of these market studies and are similarly sounding the alarm that railroads will need to make significant investments in new capacity to handle forthcoming traffic growth. Public calls for diverting even more freight from the nation's highways to rail will only increase this need.¹²⁴ Despite record-breaking current rail investment, projected private reinvestment is unlikely to be enough to sustain current network fluidity. The railroad industry's capital-intensive nature and long time-horizons also make infrastructure investments more risky and especially susceptible to variability or uncertainty in projectable financial return. All of these influences suggest that capacity will remain an important and ongoing issue for the railroad industry going forward.

2. Executive Branch Policies Call for Increased Investment in the Rail Sector.

The STB is not the only agency to have an interest in the continued development of the national rail network. The White House recently published its Economic Analysis of Transportation Infrastructure Investment, which, while primarily focused on highway infrastructure, also calls for "smart infrastructure

¹²⁴ See discussion *infra* Section I.V.2.

investment” across the national transportation network.¹²⁵ For example, the GROW AMERICA Act provides \$10 billion over four years to “targeted investments to improve the nation’s freight network” to improve “multistate freight corridors” and support “multimodal” projects.¹²⁶ Such projects come at a cost, and railroads are likely to be called upon to contribute to investment in these projects above and beyond the public funds earmarked for them.

Similarly, DOT’s budget for 2015 focuses on infrastructure investment to improve” America’s roads, bridges, transit systems, and railways” and in particular calls for reforms to “support American exports by improving movement within the Nation’s freight networks.”¹²⁷ DOT’s budget reflects the Executive Branch’s goals of ensuring critical infrastructure investment for long-term growth. To meet those goals in the rail sector, railroads will themselves have to invest heavily in their own infrastructure.¹²⁸

A focus on rail investment by other branches of the federal government is not novel. In 2009, FRA issued its Preliminary National Rail Plan. That plan found that freight rail performance is integral to the overall national transportation system performance. In particular, FRA noted that “if freight rail is to play a larger role in the national transportation system, its performance must improve. This will require expanding capacity, improving connections,

¹²⁵ The White House, *An Economic Analysis of Transportation Infrastructure Investment* (July 2014) at 2.

¹²⁶ *Id.* at 22. The White House touts the Alameda Corridor project in California, a project in which 90 miles of rail and 200 roadway crossings were consolidated “into a 20-mile high capacity transport corridor between the ports of Long Beach and Los Angeles” as an example of “regional and multi-stakeholder collaboration and investment” that improved intermodal freight mobility across modes. *Id.*

¹²⁷ Department of Transportation, Budget for Fiscal Year 2015 at 118.

¹²⁸ See *supra* Section IV.A.

reducing chokepoints, and providing new and expanded services.”¹²⁹ The FRA specifically noted that “regulatory and institutional factors that increase costs and impose unequal burdens on performance may have to be revised to better serve the transportation industry and the Department’s goals.”¹³⁰ Like other observers, FRA found that the Staggers Act has produced improved rail infrastructure, increased carrier competitiveness, and lower rates for shippers.¹³¹ FRA’s analysis concluded that the increase in rail rates in the mid-2000s was not the product of increased market power, but rather “can be attributed to a booming economy that placed capacity constraints on the transportation network [and to] rising fuel prices.”¹³² FRA emphasized the importance of “Federal legislation and policies that allow rail carriers to earn revenues sufficient to encourage further investment in the rail system” to provide for necessary “infrastructure maintenance and capacity enhancements.”¹³³

Somewhat further removed from the rail industry, but still having an effect on railroad development, is the National Climate Action Plan announced by the Executive Office of the President in June 2013. That plan calls for nationwide action to deploy clean energy and cut carbon pollution, among other things.¹³⁴ President Obama specifically calls upon the transportation sector to

¹²⁹ FED. R.R. ADM’R, PRELIMINARY NATIONAL RAIL PLAN: THE GROUNDWORK FOR DEVELOPING POLICIES TO IMPROVE THE UNITED STATES TRANSPORTATION SYSTEM 7 (Oct. 2009).

¹³⁰ *Id.*

¹³¹ *Id.* at 21 (finding that since the Staggers Act, railroads have improved their infrastructure and that “[r]ail rates are lower today than in 1980, when compared in constant dollars”).

¹³² *Id.* at 17.

¹³³ *Id.* at 4.

¹³⁴ See Executive Office of the President, The President’s Climate Action Plan (June 2013).

develop advanced transportation technologies and increase fuel economy.¹³⁵

Railroads more than ever are acknowledging the national interest in protecting the environment and are investing in clean technologies and are aiming to increase fuel economy.¹³⁶ While over time some of these investments are likely to lead to cost savings for the industry, the initial investment requires significant private capital.

3. Congress Also Calls for Increased Investment in the Rail Sector.

In recent Board proceedings, numerous U.S. Senators and Representatives have filed statements supporting the rail industry's need to invest in infrastructure to improve efficiency and grow their networks. In Ex Parte 711, the U.S. House of Representatives Committee on Transportation and Infrastructure filed a letter with the Board noting that the U.S. rail industry is "the most efficient, affordable, and environmentally-friendly freight rail network in the world." Letter from U.S. House of Rep. Committee on Transportation & Infrastructure, STB Docket No. EP 711 (filed Mar. 20, 2014) at 1. The Committee went on to note that any Board policy change that "decreases the railroads' efficiency, and limits their ability to reinvest, grow their networks and meet the nation's freight transportation demands both today and in the future would be

¹³⁵ *Id.* at 8.

¹³⁶ See, e.g., Jeff Stagl, *Class Is employ fuel-saving practices that promise stingier diesel usage*, PROGRESSIVE RAILROADING (Mar. 2010), available at <http://www.progressiverailroading.com/mechanical/article/Class-Is-employ-fuelsaving-practices-that-promise-stingier-diesel-usage--22736> ("During the past few years, Class Is have continued to acquire more fuel-efficient road locomotives and GenSet switchers, and retire older diesel-guzzling units; install Auto Engine Start Stop (AESS) devices on motive power to control idling; employ manual engine shut-down procedures; lubricate rail to reduce friction; and coach locomotive engineers to improve train-handling skills.")

opposed by this Committee.” *Id.* at 2. Congressman William L. Enyart filed similar comments supporting the rail industry’s need “to make necessary investment in their systems to match the rising demand for capacity.” Letter from Congressman W. Enyart, STB Docket No. EP 711 (filed May 14, 2014). More than fifty Senators and Congressmen filed similar statements in the Ex Parte 705 proceeding. Senators Blunt, Chambliss, DeMint, Graham, Isakson, Johans, Kyl, Moran, Nelson, and Warner all filed letters with the Board supporting the railroad’s ability to invest in their networks, as did Members of the House Committee on Transportation and Infrastructure and the following Representatives: Altmire, Brown, Costello, Culberson, Diaz-Balart, Granger, Graves, Hanna, Holden, LaTourette, Mica, Miller, Miller, Neal, Rahall, Rigell, Ruppertsberger, Shuster, Smith, and Terry. In particular, members of the House Committee noted that “Transportation experts are united in predicting massive increases in freight movements over the next 20 years. It is imperative that our rail network be positioned to handle a large share of the burden.”

In sum, the national interest in a rail network that is efficient, safe, and environmentally friendly is widespread. Those interests are shared by the industry, but require significant financial investment to achieve. Without sound economic policies within the rate regulatory sphere, it is unlikely that railroads would take the financial risk to invest as much as will be needed to meet these national goals.

II. THE BOARD SHOULD ABANDON THE INDEPENDENT, TOP-DOWN REVENUE ADEQUACY CONSTRAINT.

The time has come for the Board to abandon the independent, top-down revenue adequacy constraint. The revenue adequacy constraint should be abandoned because that constraint would undermine the overall regulatory

policies of the Interstate Commerce Act. The independent, top-down revenue adequacy constraint is a vestige of outdated, top-down regulation that is plagued by multiple theoretical and methodological flaws. Indeed, one of the reasons that the revenue adequacy constraint was so poorly defined in *Coal Rate Guidelines* is that the ICC could not sufficiently resolve some of the fundamental problems that implementing such a constraint would create. But while in 1983 the ICC proposed revenue adequacy as an alternative to the unknown and untested SAC constraint, now the Board knows that it has multiple, well-grounded and effective rate reasonableness methodologies. There is no need to develop a revenue adequacy constraint as yet another alternative methodology for shippers who lack effective competition and who believe that their rates are unreasonably high.

A. The Flaws in a Revenue Adequacy Constraint Recognized in *Coal Rate Guidelines* Prevent Development of a Non-Arbitrary Constraint Today.

Coal Rate Guidelines was a groundbreaking decision made in response to the competing policy goals of the Staggers Act. For the first time, Congress made clear that railroads must be permitted to engage in demand-based differential pricing to have any hope of righting the ship and restoring the financial health of the industry.¹³⁷ But Congress also left the requirement that rates must be “reasonable.” Taken together, this meant that most traditional forms of rate regulation were invalid. The old approach by the ICC for almost a century of

¹³⁷ H.R. Rep. No. 96-1035, at 39 (1980), *reprinted in* 1980 U.S.C.C.A.N. 3978, 3984-85 (“The Committee understands the necessity of such differential pricing, and has designed a regulatory system which allows for such pricing decisions. In the absence of the regulatory flexibility which permits differential pricing, all shippers would be harmed.”)

rate equalization or rate parity was obsolete.¹³⁸ Traditional models used to regulate other utilities like water, oil and gas, and electricity were also of little help.¹³⁹ Nor could the ICC simply allocate joint and common costs in a fixed and arbitrary fashion. Rather, the ICC had to create a defensible way to place a constraint on the degree of differential pricing for a small subset of rail movements, while following the Congressional mandate to assist the railroads achieve and sustain adequate revenues.

The ICC settled on Constrained Market Pricing and the SAC test to meet this new challenge. The economic theory behind the SAC test was cutting edge. And no other regulatory body had tested this approach. So the ICC was exploring uncharted territory. In its proposed and final guidelines, however, the ICC retained a vestige of a traditional utility-style rate constraint that it called the “revenue adequacy constraint.” The thought was that as a railroad moved towards revenue adequacy, the degree of differential pricing needed would diminish.¹⁴⁰ It was certainly never contemplated that a carrier that achieved the desired financial strength would lose the right to engage in any differential

¹³⁸ *Arizona Pub. Svc. Co. v. Burlington N. & Santa Fe Rwy. Co.*, S.T.B. Docket No. 42077, at 6-7 (STB served Oct. 14, 2003) (“But Congress, in the Railroad Revitalization and Regulatory Reform Act of 1976, Pub.L. No. 94-210, 90 Stat. 35, and in subsequent legislation, effectively steered the ICC (and now the Board) away from the pre-1976 practice of regulating so as to equalize rates. See *American Short Line Railroad Ass’n v. United States*, 751 F.2d 107, 109-110 (2d. Cir. 1984). Indeed, the antidiscrimination provisions of what is now 49 U.S.C 10741 were expressly amended to sharply limit rate equalization practices. See, e.g., the Conference Report accompanying the Staggers Rail Act of 1980, H.R. Rep. no. 1430, 96th Cong., 2d. Sess. at 104 (1980).”). The Board has expressly disavowed any intent “to return to an era of rate equalization among different traffic” in 1996. *Rate Guidelines – Non-Coal Proceedings*, 1 S.T.B. 1004, 1022 (1996) (“*Simplified Guidelines*”).

¹³⁹ *Railroad Revenue Adequacy – 1988 Determination*, 6 I.C.C. 2d at 938 (distinguishing the utility industry from rail); *Western Coal Traffic League – Petition for Declaratory Order*, Docket No 35506, at 15-18 (July 25, 2013) (distinguishing the utility industry from rail).

¹⁴⁰ *Guidelines*, 1 I.C.C.2d at 535-36.

pricing. Such an outcome would be ludicrous; akin to kicking the ladder from beneath the legs of a struggling climber just when they reached the summit. It would doom the climber (here the railroad industry) back into the abyss from which she just climbed. The ICC never contemplated such an ill-advised result.

Given the untested nature of the SAC test, it is understandable that the ICC left a vestige of older-style regulations in the guidelines. But what the ICC actually contemplated is a bit of a mystery and its continued validity is certainly questionable.

The ICC was plainly worried that any constraint based on the system-wide financial health of the railroad industry carried grave public policy risks.¹⁴¹ All companies need incentives to innovate, grow, improve service, and become more productive. The ICC needed to unleash the entrepreneurial spirit that decades of heavy-handed regulations had throttled. Bluntly put, the opportunity to earn earnings in excess of the cost of capital is the carrot. It is the opportunity to earn these earnings that pushes companies to take risks, to make expensive capital infrastructure investments, and to otherwise seek to improve service. The problem with rate-of-return style regulation is the danger of deterring the

¹⁴¹ As noted above, when it proposed the concept of a revenue adequacy constraint, the ICC said a “rigidly applied revenue adequacy constraint” would have many practical problems, such as causing carriers to try to avoid a finding of revenue adequacy by lowering rates on competitive traffic. Not only would this encourage non-market based pricing, the ICC observed “it would contribute to higher rates on captive traffic.” *Guidelines NPRM* at 19. The ICC also observed that increased profitability demonstrated by a revenue adequacy finding may be related to factors other than raising rates on captive traffic, such as “increased productivity.” It then said that “[i]n scrutinizing rates on captive traffic once revenue adequacy is achieved our goal is to exercise our jurisdiction in a manner which does not destroy the railroads’ incentive and ability to increase efficiency, while protecting captive shippers from exploitation.” *Id.* at 20; *see also id.* at 16 (“Moreover, we would be reluctant to reduce existing rates on captive coal traffic if the source of an increased rate of return is increased efficiency in operations or a more profitable rate on competitive traffic.”).

regulated entity from innovating, growing, becoming more productive, and improving service.

As Professor Sappington observes, it is apparent from the observed movement away from this kind of antiquated rate of return regulation that “regulators are well aware of the many drawbacks to stringent earnings regulation.” Sappington V.S. at 11. To illustrate, the U.S. Federal Communications Commission has observed:

Traditional “cost-plus” rate of return regulation focuses on establishing a reasonable limit on the carriers’ profits. . . . The limitations and drawbacks of such “cost plus” regulation include distorted incentives in capital investment, encouragement of cost shifting when the carrier also participates in more competitive markets, and little incentive to introduce new and innovative services.¹⁴²

Similarly, the Massachusetts Department of Public Utilities has explained:

[T]he defects of traditional [cost of service/rate of return regulation (COS/ROR)] are well known. The “cost-plus” approach under COS/ROR regulation contributes to (1) lack of incentive for cost control, through its inherent bias favoring expenditures which can be passed through to customers; (2) inflexible and less than efficient pricing; (3) persistent cross-subsidies among service classifications; (4) inefficient allocation of resources; (5) poor asset performance; (6) risk-averse management; and (7) disincentives for innovation.¹⁴³

The ICC also understood that it had to avoid these well-known pitfalls that would plague an independent, top-down revenue adequacy constraint.

First, it understood that the cost of capital was a floor on earnings, not a

¹⁴² Notice of Inquiry, *Price Cap Performance Review for AT&T*, FCC Docket No. 92-134, 7 FCC Rcd 5322, 5322 (1992).

¹⁴³ Massachusetts Department of Public Utilities, “Investigation by the Department on its Own Motion into the Theory and Implementation of Incentive Regulation for Electric and Gas Companies under its Jurisdiction.” D.P.U. 94-158, at 8 (Feb. 24, 1995). “COS/ROR regulation” denotes “cost of service/rate of return regulation.” *Coal Rate Guidelines NPRM* at 16.

ceiling.¹⁴⁴ So it proposed that “where a consistent pattern of returns substantially in excess of carrier’s revenue needs has been established, we would, upon complaint, consider the reasonableness of rates on captive coal traffic and prescribe lower rates in appropriate circumstances.”¹⁴⁵ Yet no clues were offered to discern, among other things, how far revenues would be permitted to exceed the carrier’s revenue needs before the ICC began to scrutinize rates more carefully.

Second, the ICC sought to encourage optimal pricing by carriers. In espousing that “further rate increases on captive coal traffic would [not] be unreasonable per se once a carrier achieves revenue adequacy,”¹⁴⁶ the ICC explained that revenue adequacy should not prohibit rate adjustments because “[s]uch an approach would be economically unsound, as it would create disincentives to optimal marketing pricing.”¹⁴⁷ Again, however, no clues were offered about how – once it observed a pattern of returns substantially above revenue needs – the ICC would apply the incentive and simultaneously encourage optimal pricing.

¹⁴⁴ See, e.g. *Adequacy of Railroad Revenue – 1978 Determination*, 362 I.C.C. at 201 (“Moreover, this study was designed to compute a minimum adequate revenue level for the Nation’s class I railroads; the methodology of the study is not necessarily appropriate for the determination of the maximum fair revenue issues involved in individual rate proceedings.”) (emphasis in original); *Standards I*, 364 I.C.C. at 810 (“The minimum rate of return that will allow railroads to obtain investment funds is the cost of capital.”) (emphasis added); *Bessemer*, 691 F.2d at 1112 (“the section was addressed to the opportunity to attain revenue levels which would reverse the long decline in the railroad industry. The specific objectives listed in section 205 should not in its view be read as limitations on revenue.”) (emphasis added).

¹⁴⁵ *Coal Rate Guidelines NPRM*, at 16.

¹⁴⁶ *Id.* at 15.

¹⁴⁷ *Id.* at 19.

Third, the ICC was properly concerned about how a revenue adequacy constraint could inadvertently discourage the industry from improving efficiency and raising rates on competitive traffic. The logic is straightforward. Once a railroad is earning greater returns than the ICC would permit, why would it bother to become more efficient? Every dollar of improved efficiency would translate into a dollar of more relief for shippers that lack effective competition. Similarly, why make risky capital improvements and other efforts needed to innovate and improve service if the increased earning from that traffic simply translated into more relief to other shippers? In other words, the ICC understood that a rigidly applied revenue adequacy constraint would encourage those railroads who achieve the “permitted” earning level to rest on their laurels.

The ICC therefore cautioned that it would not apply the constraint to discourage innovation, further productivity gains, or continued growth of competitive segments. In the notice, the ICC said a “rigidly applied revenue adequacy constraint” would have many practical problems, such as causing carriers to try to avoid a finding of revenue adequacy by lowering rates on competitive traffic. Not only would this encourage non-market based pricing, the ICC observed “it would contribute to higher rates on captive traffic.” *Guidelines NPRM* at 19. The ICC also observed that increased profitability demonstrated by a revenue adequacy finding may be related to factors other than raising rates on captive traffic, such as “increased productivity.” It then said that “[i]n scrutinizing rates on captive traffic once revenue adequacy is achieved our goal is to exercise our jurisdiction in a manner which does not destroy the railroads’ incentive and ability to increase efficiency, while protecting captive shippers from exploitation.” *Id.* at 20; *see also id.* at 16 (“Moreover, we would be reluctant to reduce existing rates on captive coal traffic if the source of an

increased rate of return is increased efficiency in operations or a more profitable rate on competitive traffic.”). How it would avoid discouraging innovation and improved efficiency was left unresolved, however.

Developing the revenue adequacy constraint would force the Board to directly confront the policy problems that *Coal Rate Guidelines* dodged. How is the Board to determine how far above the cost of capital returns must go to trigger a revenue adequacy constraint, and how can it set that level in a way that would not discourage optimal pricing and remove incentives for investments and efficiency improvements? And many more policy problems exist that *Coal Rate Guidelines* did not acknowledge. For example, once the agency had detected a pattern of returns substantially above the cost of capital, who gets relief? Will the agency adopt a first-come, first served approach (and thus encourage complainants to rush to the courtroom to reap a windfall before the railroad is pushed below revenue adequacy)? And how would the agency address conflicts between the results of a revenue adequacy analysis and a SAC analysis? A top-down revenue adequacy constraint could wind up granting relief to shippers on lighter-density lines who could not prevail under a proper SAC analysis, and thus could create impermissible cross-subsidies.

And on top of these theoretical concerns are insurmountable methodological problems with how the Board could measure revenue adequacy. For example, how can the Board assess the forward-looking revenue needs of the railroad based on backward-looking measures of financial performance? And how is the Board to distinguish between the exercise of market power and superior earnings from innovation, productivity, or superior service? In the same vein, how will the agency distinguish between earnings from traffic that has effective competition and earnings from traffic that does not?

These are just a few of the significant problems created by a revenue adequacy constraint (more of which are elaborated below). Rather than open the Pandora's Box of the revenue adequacy constraint, the Board should discard this antiquated approach and adhere to its existing, economically-sound, and judicially-approved methodologies.

B. An Independent, Top-Down Revenue Adequacy Constraint Has Multiple Significant Flaws.

1. A Revenue Adequacy Constraint Would Stifle Innovation, Productivity, and Competition.

Professor Sappington describes for the Board how a revenue adequacy constraint is a form of asymmetric earnings regulation. He explains, however, that most regulators are moving away from this kind of stringent profit regulation because of the poor incentives it creates for the regulated industry. "As regulators in many industries around the world have recognized in abandoning [rate-of-return regulation], stringent earnings regulation has the potential to seriously impede industry performance." Sappington V.S. at 8. One problem is the deterrence to lowering operating costs. When total earnings are restricted, the supplier "has limited incentive to enhance its earnings, and so has limited incentive to reduce its operating costs." *Id.*

Many innovative actions are underway at Norfolk Southern. These projects or future ones like them would be placed in peril by a revenue adequacy constraint. Deborah H. Butler, Executive Vice President of Planning and Chief Information Officer for Norfolk Southern Corporation, describes numerous projects underway at the railroad. *See* Butler V.S. at 2-8. These cutting-edge innovations include,

- **UNIFIED TRAIN CONTROL SYSTEM "UTCS"/MOVEMENT PLANNER.** UTCS is Norfolk Southern's next-generation

dispatching system, and together with its Movement Planner component, it is the equivalent of an air traffic control system for our railroad. Constantly looking up to 8 hours into the future, UTCS and Movement Planner use advanced algorithms to formulate a comprehensive movement plan that minimizes network congestion and delay and maximizes schedule adherence from a system perspective.

- **LOCOMOTIVE ENGINEER ASSIST DISPLAY AND EVENT RECORDER (“LEADER”):** LEADER is a locomotive-based energy management system that helps engineers make better train handling decisions by providing real-time coaching on performance against an optimal “golden run” for a route. LEADER monitors the train’s location, track topology, speed, acceleration, and in-train forces and recommends optimal operations for throttling, braking, and minimum and maximum speeds with the goal of optimizing fuel efficiency and adherence to schedule.

Sappington explains that companies like Norfolk Southern must have proper incentive to undertake these kinds of risky, expensive efforts: “Suppliers that are not shackled by stringent earnings regulation have strong financial incentive to enhance the quality of existing service and develop new products and services that consumers value highly.” Sappington V.S. at 9. Consumers are willing to pay higher prices for services they value more highly, and higher prices can enhance a railroad’s earnings. “When its authorized earnings are restricted,” Sappington cautions, “a supplier has limited incentive to identify, develop, and introduce new products and services, regardless of how highly consumers might value the product innovations.” *Id.* If the Board imposed a rate constraint based on the overall financial health of the railroad, the railroad would have reduced incentive to invest in projects like LEADER that will lower operating costs, because the railroads would be required to cede all those economic benefits to shippers who lack effective competition.

These concerns were echoed by Professor Cornell. He notes that “[e]arning returns in excess of the cost of capital is not a sign of a market failure.” Cornell V.S. at 34. Rather, it is the potential to enjoy these superior earnings that gives railroads the incentive to invest and to become more efficient in response to rising demand for transportation. Having reviewed the innovations describe by Ms. Butler, Professor Cornell cautioned that “a rate constraint based on the overall financial health of the railroads would dampen the incentive for railroads to take these kinds of innovative risks to improve service if they are not permitted to reap the benefits from investments that pay off.” *Id.* at 35.

Another pervasive problem with a constraint based on system-wide financial health is that the agency would be penalizing a railroad that improves productivity or enjoys increased earnings from competitive traffic by offering superior service. Once a railroad has hit whatever target was set by the STB, why would it bother to seek improved earnings? Every dollar in improved earnings from increased productivity would simply translate into another dollar that would be returned to the limited subset of shippers who lack effective competition (even if the improvement in productivity benefits other shippers).

Fostering this kind of incentive would be a terrible disservice to the public interest and the vast majority of our shippers. The resurrection of the rail industry following Staggers occurred because Congress and the ICC unleashed the railroad industry. It fostered an environment where the railroads had every incentive, like their unregulated competitors, to scrap for new business, turn over every stone in the search for increased productivity, and otherwise transform themselves in the modern rail industry. The continuation of such behavior is in the interest of all shippers as well as the public. Dropping a revenue adequacy

constraint on the industry, however, will have a chilling effect on innovation and growth of competitive lines of business like intermodal.

2. A Revenue Adequacy Constraint at the Industry-Average Cost of Capital – The *Minimum* Level of Adequate Returns – Would Sharply Discourage Investment.

The uncertainty that surrounds an independent, top-down revenue adequacy constraint makes it difficult to judge how its application would affect the incentive to invest. The ICC originally said that it would scrutinize rates more closely if it observed a pattern of returns substantially in excess of the cost of capital. This framework made some sense, because the ICC had previously recognized that the cost of capital was the minimum level needed to achieve revenue adequacy.¹⁴⁸

Norfolk Southern expects, however, that interested parties will advocate that the Board discard the idea that overall returns should be permitted to exceed substantially the cost of capital, and instead will urge the STB to impose an independent, top-down revenue adequacy constraint if the returns on investment exceeded the cost of capital over a short period of time.

This would be a terrible public policy mistake. It is undeniable that “[t]he minimum rate of return that will allow railroads to obtain investment funds is

¹⁴⁸ See, e.g., *Adequacy of Railroad Revenue – 1978 Determination*, 362 I.C.C. at 201 (“Moreover, this study was designed to compute a minimum adequate revenue level for the Nation’s class I railroads; the methodology of the study is not necessarily appropriate for the determination of the maximum fair revenue issues involved in individual rate proceedings.”) (emphasis in original); *Standards I*, 364 I.C.C. at 810 (“The minimum rate of return that will allow railroads to obtain investment funds is the cost of capital.”) (emphasis added); *Bessemer*, 691 F.2d at 1112 (“the section was addressed to the opportunity to attain revenue levels which would reverse the long decline in the railroad industry. The specific objectives listed in section 205 should not in its view be read as limitations on revenue.”) (emphasis added).

the cost of capital.”¹⁴⁹ A minimum floor should not be transformed into a ceiling. Indeed, capping returns at the floor – even if properly calculated based on replacement costs – would doom the railroad to return to revenue inadequacy. A railroad must be permitted to earn more than its cost of capital to offset inevitable years where it will earn less. If the railroad industry were a struggling swimmer, trying to get its head above water (earn returns in excess of its cost of capital), a lifeguard (the STB) performs her job poorly if, upon seeing the swimmer finally swimming above water, she drops a glass ceiling right at the water’s edge. If the STB places a glass ceiling right at the cost of capital, it will guarantee that the railroad industry never earns its cost of capital over the lifetime of any investment. “Elementary mathematics tells us that if a railroad is required to adjust rates whenever it is deemed to be revenue adequate for one year, the railroad will never be able to produce long run returns that meet its cost of capital.” Cornell V.S. at 25. The consequence is predictable: railroads will retrench and reduce investment.¹⁵⁰

3. A Revenue Adequacy Constraint Would Be Backward-Looking When the STB Needs to be Looking Ahead.

Each year, the STB publishes annual findings on the “revenue adequacy” of the railroads. The ICC cautioned, however, that those findings “will not be the determinative factor in other proceedings affecting railroad revenue. . . . [T]he methodology of the [revenue adequacy] study is not necessarily appropriate for the determination of the maximum fair revenue issues involved in individual

¹⁴⁹ *Standards I*, 364 I.C.C. at 809.

¹⁵⁰ See Jerry Hausman & Stewart Myers, *Regulation of United States Railroads: The Effects of Sunk Costs and Asymmetric Risk*, 22:3 J. REG. ECON. 287, 308 (2002) (“[R]egulation by truncating the return of investment by the railroads will force investment below economically efficient levels, so that too little investment will be made in situations where regulation of railroad prices can occur.”).

rate proceedings.”¹⁵¹ Rather, the ICC advised parties that it would continue to accept all competent and probative evidence relative to the carrier’s revenue adequacy.”¹⁵²

Nonetheless, NS expects that interested parties will ask the Board to rely on these annual determinations – over some period of time – to trigger in some ill-defined way a revenue adequacy constraint. But a fundamental problem with a revenue adequacy constraint that relied in any way on historical annual

¹⁵¹ *Adequacy of Railroad Revenue – 1978 Determination*, 362 I.C.C. at 201; see also *Increased Rates on Coal, Midwestern Railroads, August 1979*, 364 I.C.C. 29, 34-35 (1979) (decision on adequacy of railroad revenues for 1978 “is not conclusive in this proceeding. Its revenue adequacy determinations were made from an historical perspective based on limited data that is no longer current. They provide no assurance that the carrier will be able to meet its future revenue needs. We specifically said in [that decision] that our findings would not necessarily be the determinative factor in other proceedings concerning railroad revenue.”).

¹⁵² *Railroad Revenue Adequacy – 1985 Determination*, 3 I.C.C.2d 541, 544 (1987); see also, e.g., *Bituminous Coal – Hiawatha, Utah, to Moapa, Nevada*, 6 I.C.C.2d 1, 7 n.24 (1989) (“We have stated that any other competent and probative evidence relative to the carrier’s revenue adequacy may be submitted in individual rate reasonableness proceedings”) (citing *Railroad Revenue Adequacy – 1987 Determination; Railroad Revenue Adequacy – 1987 Determination*, 4 I.C.C.2d 731 (1988) (“We will also consider [the] findings [regarding revenue adequacy] in individual rate reasonableness proceedings conducted under 49 U.S.C. § 10701a, but will not necessarily treat these findings as determinative of revenue adequacy issues raised in those cases. Rather, we will continue to consider all probative evidence submitted in such cases pertaining to the revenue adequacy of the particular carrier(s) involved”); *Railroad Revenue Adequacy – 1986 Determination*, 3 I.C.C.2d 966, 970 (1987) (“In rate reasonableness proceedings under § 10701a, we will continue to accept all competent and probative evidence relative to the carrier’s revenue adequacy that may be submitted by the various parties. Such evidence may include any financial data which these parties see fit to present. On the basis of the record developed we will determine the sufficiency of revenues on a case-by-case basis for the particular railroad or railroads involved. In the absence of such evidence, the revenue adequacy findings contained herein will be utilized.”); *Railroad Revenue Adequacy – 1984 Determination*, 1 I.C.C.2d 615, 620 (1986) (“[I]n rate reasonableness proceedings under Section 10701a, we do not treat the findings made under our current methodology as determinative or conclusive of the revenue adequacy of the carrier involved unless the parties present no other evidence relevant to that issue. Indeed, where the record is open in a particular case, we accept all competent, probative evidence relevant to a carrier's revenue adequacy which the parties may submit.”).

revenue adequacy findings is that the approach would be hopelessly backward looking. The annual determination by definition looks at the railroad's past performance because it compares the cost of capital in a bygone year to the railroad's returns in a bygone year.

But ratemaking needs to be forward looking. As Professor Cornell explains, when either general economic or industry specific conditions change, backward looking measures can become highly misleading. For instance, "if the railroad industry suffers another sharp downturn as it did during the Great Recession, the backward-looking ROI could be suggesting regulation that is consistent with healthy railroads because it considers only the economically favorable past; meanwhile, a forward looking measure would be sounding an alarm that railroads need assistance." Cornell V.S. at 31. Only after significant time passes will backward-looking measures reflect the economic downturn. Professor Cornell cautions that "Regulatory decisions made prior to this realization will constrain the railroads at precisely the time when the economic environment should have the Board assisting railroad recovery." *Id.*

SAC, of course, is properly forward looking. It relies on replacement costs, a current measure of the value of railroad assets that is far superior to a backward looking measurement based on historic book value. And it looks forward at future demand for railroad service. An "eyes-forward" approach to ratemaking is important. As Professor Cornell explains, to attract equity capital, an investment must offer at least as much future return as alternative investments of comparable risk. This required level of return changes over time as investor optimism adjusts to changing views of the future and changing perceptions of investment risk. "Consequently, the relevant question for determining revenue adequacy from a financial perspective is not whether

Norfolk Southern has earned its cost of capital during a snapshot of any given year in the past, but whether it is reasonable to expect it to earn its cost of capital over the next 20 years." *Id.*

4. A Revenue Adequacy Constraint Would Create Impermissible Internal Cross-Subsidies.

A centerpiece of the STB's rate regulations is the prohibition against cross-subsidies. The ICC long ago declared that "a captive shipper should not bear the cost of any facilities or services from which it derives no benefit."¹⁵³ A corollary "core economic underpinning of CMP is the principle that a shipper must cover its own attributable costs and only unattributable costs are to be allocated among the traffic group. Indeed, this theme permeates *Guidelines*."¹⁵⁴

However, a complainant cannot "shift responsibility for paying for facilities it uses to other shippers who do not benefit from those facilities."¹⁵⁵ As the Board has explained, it would "turn the CMP principle against cross-subsidization on its head to protect a captive shipper from subsidizing other traffic, while at the same time allowing that shipper's rates to be subsidized by other traffic."¹⁵⁶ The D.C. Circuit, in affirming the Board's interpretation of *Coal Rate Guidelines*, observed that "it is difficult to steal from a penniless Peter to pay Paul."¹⁵⁷ And the STB recognized that it could improperly exacerbate an internal

¹⁵³ *Coal Rate Guidelines*, 1 I.C.C.2d at 523.

¹⁵⁴ *Otter Tail Power Co. v. BNSF Ry. Co.*, Docket No. 42071, at 24 (STB served Jan. 27, 2006), *aff'd sub nom. Otter Tail Power Co. v. Surface Transp. Bd.*, 484 F.3d 959 (8th Cir. 2007) ("*Otter Tail*").

¹⁵⁵ *PPL Montana, LLC v. Burlington N. & S.F. Ry.*, S.T.B. Docket No. 42054, 6 S.T.B. 752, 757-58 & n.21 (2003) ("*PPL 2003*"); *see also PPL Montana, LLC v. Burlington N. & S.F. Ry.*, 6 S.T.B. 286 (2002) ("*PPL 2002*"), *aff'd sub nom. PPL Montana, LLC v. Surface Transp. Bd.*, 437 F.3d 1240 (D.C. Cir. 2006).

¹⁵⁶ *PPL 2003*, 6 S.T.B. at 757.

¹⁵⁷ *PPL*, 437 F.3d at 1246.

cross-subsidy by ordering the defendant to lower the challenged rate where the complainant was not covering its own attributable costs.¹⁵⁸ Accordingly, the Board has cautioned that its *PPL* cross-subsidy analysis “serves as both a threshold inquiry and a limit on potential rate relief.”¹⁵⁹

An independent, top-down revenue adequacy constraint would spawn precisely the kind of impermissible cross-subsidies the SAC test is designed to root out. Indeed, the rule against cross-subsidies is the reason that a carrier’s overall revenue inadequacy does not preclude a SAC finding that its rates are nonetheless unreasonably high. For if a SARR could earn more than a reasonable return on investment from its selected traffic, disallowing a SAC prescription because of the defendant’s overall failure to earn a reasonable return on investment effectively would be using the SARR’s selected traffic to cross-subsidize the defendant’s other traffic.¹⁶⁰

The converse is equally true. If the SAC test shows that a SARR could not earn a reasonable return on its investment from its selected traffic (and thus that the challenged rates are reasonable under SAC), then using a railroad’s overall revenue adequacy as grounds to reduce the rates that SAC found reasonable would be an impermissible cross-subsidy. The Board effectively would be using profits from traffic not replicated by the SARR to cross-subsidize the challenged rates. Such a result would violate the fundamental “CMP principle against cross-subsidization” – a principle that applies to all rate relief and “is not limited to the SAC test.”¹⁶¹ Any independent, top-down revenue adequacy constraint that

¹⁵⁸ See *PPL 2002*, 6 S.T.B. at 295, n.17.

¹⁵⁹ *Otter Tail*, S.T.B. Docket No. 42071, at 11.

¹⁶⁰ See *Xcel Reconsideration*, S.T.B. Docket No. 42057, at 6; *BNSF Ry. Co. v. Surface Transp. Bd.*, 453 F.3d 473, 481 (D.C. Cir. 2006).

¹⁶¹ *PPL 2003*, 6 S.T.B. at 757 (emphasis added).

would provide relief on rates that are reasonable under SAC would do precisely what the Board disavowed in *Otter Tail* and *PPL*—exacerbate an internal cross-subsidy by ordering the defendant to lower the challenged rate where the shipper was not covering its own attributable costs.

5. A Revenue Adequacy Constraint Based On The System-Wide Financial Health Of A Railroad Would Have No Correlation To The Reasonableness Of An Individual Rate.

Yet another serious problem with a revenue adequacy constraint is the lack of any coherent connection between the financial health of a railroad and the reasonableness of an individual rate. The Board and the ICC have repeatedly acknowledged that the carrier's revenues have no relevance to the reasonableness of an individual rate.¹⁶² If a carrier is showing a pattern of returns substantially in excess of the cost of capital, how can the STB determine who is entitled to rate relief? Would a shipper located on a light density line be entitled to relief if there was insufficient traffic on the line to provide a reasonable return on those facilities? If the improvement in earnings is from increased revenues from intermodal traffic, should chemical companies get rate relief? If a movement is coming off a legacy contract, can the railroad return the rate to a current market level, or would it be prohibited from raising the rate (thereby providing a perpetual benefit to shippers under contract)? These kinds of questions are difficult enough to answer within a SAC test; they become exponentially more difficult to answer if the agency tried to use system-wide financial health as a basis to regulate individual rates.

¹⁶² *Omaha Pub. Power Dist. v. Burlington N. R.R. Co.*, 3 I.C.C. 2d at 157 (1986) (citing *Standards I*, 346 I.C.C. 808) (“a finding of revenue inadequacy does not give a railroad license to set rates at unreasonable levels”); *BNSF Ry. Co. v. Surface Transp. Bd.*, 453 F.3d at 480 (“[S]ystem-wide revenue inadequacy is not a basis upon which a carrier may defend an unreasonable rate over a segment of its system’ based on the SAC test.”).

Indeed, the Board itself has argued that system-wide revenue adequacy metrics are irrelevant to the reasonableness of a particular rate. Specifically, in the appeal of the *Xcel* decision the Board argued that the fact that it prescribed a rate well below RSAM for a railroad that was revenue inadequate was irrelevant, because RSAM measured system-wide revenue needs and not the revenue needs of the facilities and services used for the shipments at issue. The D.C. Circuit agreed:

As the Board points out, the RSAM figure merely provides a test of “system-wide revenue need” and therefore “provides no guidance on the rates Xcel should be charged for the particular facilities and services Xcel uses.” In contrast, the Board has “consistently affirmed that CMP, with its SAC constraint, is the preferred and most accurate procedure available for determining the reasonableness of rates in markets where the rail carrier enjoys market dominance.¹⁶³

As clearly stated in *Xcel*, a system-wide measure of revenue adequacy similarly has no relevance to whether a particular rate for a movement utilizing a particular portion of a railroad’s network is reasonable.

6. A Revenue Adequacy Constraint Would Create A Cloud Of Uncertainty Over The Industry.

It is fairly universally accepted that regulatory uncertainty deters investment. Firms facing massive risky sunk investments need to understand the regulatory environment that will govern the potential returns from that investment. In that respect, risk is not a friend of railroad investment and infrastructure renewal. As an illustration, Dr. Fabrizio of Boston University published a recent article exploring the impact of regulatory uncertainty on

¹⁶³ *BNSF Ry. Co. v. Surface Transp. Bd.*, 453 F.3d at 481.

investment in the renewable energy industry.¹⁶⁴ Her findings were consistent with common sense – firms invested less in new assets in states with regulatory instability, thereby undermining important policy goals.

As the railroads slowly improved their financial health following the passage of the Staggers Act, the host of ambiguities and questions raised by a revenue adequacy constraint were of little moment. How the STB might apply a revenue adequacy constraint was largely irrelevant.

The agency's examination of railroad revenue adequacy is laudable and understandable given the Board's statutory mandate to ensure that railroads are revenue adequate. Indeed, Norfolk Southern believes that there are several ways the Board could improve its annual measurement of revenue adequacy. But the Board needs to understand that the intense regulatory uncertainty that swirls around any revenue adequacy rate constraint will have a counterproductive effect of discouraging railroads from making the optimal investments in the railroad industry. This runs contrary to every indication from the Board, Congress, DOT, and others that they want the railroads to continue to invest, to grow to meet the rising demand for transportation services, and to make investments needed to improve network fluidity and improve rail service. And the Board would make the uncertainty worse if it fails to address the critical failings that Norfolk Southern believes render the constraint useless as a tool to gauge the reasonableness of an individual rate.

¹⁶⁴ Kira R. Fabrizio, *The Effect of Regulatory Uncertainty on Investment: Evidence from Renewable Energy Generation*, J. of Law Economics Organization, 4(29), 765 (2013).

C. **The Board's Annual Revenue Adequacy Findings are Plagued with Measurement Errors that Prevent Their Use to Regulate Rates.**

Professor Cornell describes in great depth the pervasive measurement errors in the Board's annual revenue adequacy findings. He explains that these annual findings are well suited for the task they were designed to achieve—monitoring the financial health of the industry. But like an inaccurate scale, these annual findings can only tell if the patient is losing or gaining weight; they are too inaccurate for any other purpose.

1. The STB Is Not Measuring Revenue Adequacy Based On Replacement Costs.

The central quandary is that these findings are not premised on replacement costs or capturing the true economic depreciation of railroad assets. It is impossible to overstate the importance of this problem. Professor Cornell explains, "Price regulation based on such misguided conclusions would likely make it more difficult for railroads to attract and retain capital investment on account of not being able to realize economically required rates of return." Cornell V.S. at 18. Nor is there any serious debate that this is the right way to measure revenue adequacy. In 1985, economists Professor Cornell referred to as "the leading economists of the day"¹⁶⁵ submitted a joint statement of basic principles to guide the ICC in its rate setting duties. They urged the ICC that:

The appropriate standard for determining the adequacy of railroad revenues is a rate of return equal to the current cost of capital on the replacement value of all rail assets that are required to meet the demands for railroad service, regardless of the source of funds used in investing in those assets.¹⁶⁶

¹⁶⁵ Cornell V.S. at 18, n. 38.

¹⁶⁶ Economists' Statement in Support of Staggers Act (Feb. 25, 1985) (attachment A).

The Board and ICC have recognized the value of using replacement costs rather than historical book value to measure revenue adequacy and in ratesetting. As the ICC observed in the early 1980s, “replacement cost valuation can be preferable to original cost valuation,” because “regular and continuing calculation of depreciation charges and inflation adjustments under the replacement cost method may better reflect the true economic costs associated with an investment. Further, the replacement cost method is preferable because it comes closer to the competitive result.”¹⁶⁷ The Railroad Accounting Principles Board (RAPB) reached a similar conclusion, stating that “current market valuation is preferable to historical valuation from a theoretical economic viewpoint.”¹⁶⁸

But the STB and ICC concluded that switching to a replacement costs approach was infeasible. The major obstacle has been estimating the current

¹⁶⁷ *Standards I*, 364 I.C.C. at 818. The ICC has opined that, “current cost accounting is theoretically preferable to original cost valuation.” *Standards II*, 3 I.C.C.2d at 277. A year later, the ICC reaffirmed that “one of the major reasons for developing CMP was to provide railroads the opportunity to earn adequate revenues and replace assets expended in the provision of rail service at a current cost level. In describing the SAC test of maximum reasonableness in our *Guidelines* decision, we therefore emphasized that current replacement costs were to be used in the calculation of any proposed SAC test.” *Rate Guidelines – Non-Coal Proceedings*, ICC Ex Parte No. 347 (Sub-No. 2) (decided Mar. 23, 1987), 1987 WL 98067 at *3. More recently, in describing the benefits of the Simplified SAC methodology, the Board has noted that the methodology has “numerous positive features” including the fact that “unlike the Three-Benchmark analysis, the Simplified SAC approach uses replacement cost to determine the maximum lawful rates a carrier may charge.” *Rate Regulation Reforms*, at 13.

¹⁶⁸ Final Report of the RAPB, Vol II at 60 (1987) (RAPB Final Report). The RAPB was established by Congress to evaluate issues associated with rail costing and to propose principles to govern the estimation of such costs. See former 49 U.S.C. 11161-63 (1995). The RAPB set forth its costing principles in its report, Railroad Accounting Principles (Sept. 1987). Pursuant to the statute, the ICC gave great weight to the recommendations of the RAPB. See former 49 U.S.C. 11163 (1995). While former sections 11161-63 are no longer in the governing statute, and the RAPB no longer exists, the STB continues to accord great weight to the recommendations of the RAPB.

value of individual investments, because this valuation cannot be based on actual transactions. Since 1986, the ICC and STB have taken the position that “[w]hile current cost accounting is theoretically preferable to original cost valuation, it cannot be practically implemented in a manner that we can be confident would produce accurate and reliable results.”¹⁶⁹ The Board recently declared that while preferable, a replacement cost approach has only proven to be practical in the context of an individualized rate proceeding.¹⁷⁰

Norfolk Southern does not believe that the STB gave the AAR proposal fair treatment. But in any event, the refusal to use the proper measurement of revenue adequacy creates a sharp tension between the annual revenue adequacy findings and the SAC test (and the Simplified SAC test), which the agency has properly characterized “central to our rate regulation rules.”¹⁷¹ SAC rests on replacement costs. The annual revenue adequacy findings do not. This means that results of the two will not approximate one another. Shippers who cannot prevail under the SAC test – because the railroad is not earning an unreasonable return on the replacement cost of facilities used to serve that shipper – should not have the option of another constraint that might grant relief where the SAC test, the central test relied on by the ICC and Board for decades, says no relief is warranted.

Indeed, the Board has explained that “The very purpose of the SAC test is to determine what [a railroad] needs to charge to earn “adequate” revenues on the portion of its system that is included in the system of the SARR.” *Xcel*

¹⁶⁹ *Standards II*, 3 I.C.C.2d at 277.

¹⁷⁰ See *Association of American Railroads – Petition Regarding Methodology For Determining Railroad Revenue Adequacy*, Ex Parte No. 679 (served Oct. 24, 2008).

¹⁷¹ *Rate Regulation Reforms*, S.T.B. Ex Parte No. 715, at 2 (served July 18, 2013).

Reconsideration, STB Docket No. 42057, at 6. If that more precise test shows that the railroad is not earning what it needs to charge to earn “adequate” revenues on that portion of its system replicated by the SARR, there is no plausible reason to grant relief based on a system-wide revenue adequacy constraint that does not properly look to the replacement cost of rail facilities.

In sum, not using replacement costs means the annual revenue adequacy findings should not be used to regulate rates. As cautioned by Professors Brealey, Myers, and Allen: “If book depreciation and economic depreciation are different (they are rarely the same), then the book profitability measures will be wrong; that is, they will not measure true profitability.”¹⁷² And “[p]rice regulation based on such misguided conclusions would likely make it more difficult for railroads to attract and retain capital investment on account of not being able to realize economically required rates of return.” Cornell V.S. at 18.

2. The STB is Unwisely Excluding Billions of Dollars of Deferred Taxes from the Investment Base.

Another significant measurement error in the annual revenue adequacy findings surrounds the Board’s treatment of deferred taxes. The ICC swayed back and forth on this issue.¹⁷³ The treatment was of little importance, however, because no railroad was close to revenue adequacy. But the issue becomes important if the STB considers any form of revenue adequacy constraint based on these historical findings. Professor Cornell explains that for all businesses, accelerated depreciation is a source of capital that may be reinvested:

¹⁷² BREALEY, MYERS, ALLEN, PRINCIPLES OF CORPORATE FINANCE 317 (8th ed. 2005).

¹⁷³ *Standards & Procedures for the Establishment of Adequate Railroad Revenue Levels*, 358 I.C.C. 844, 890 (1978) (excluding deferred taxes); *Standards I*, 364 I.C.C. at 813-14 (not excluding deferred taxes); *Standards II*, 3 I.C.C.2d at 269 (excluding deferred taxes).

Accelerated depreciation and the associated deferred taxes create a source of funds that may be (i) reinvested if the railroads are permitted to realize sufficiently high returns or (ii) distributed to shareholders if they are not so permitted. Restricting the level of returns leads to the latter scenario where funds are returned for investment in other industries. Less capital investment would restrict the scope of projects railroads can undertake.

Cornell V.S. at 23.

Reversing the agency's treatment of deferred taxes is also supported by the 1985 joint statement of leading economists. To repeat, they urged the ICC that:

The appropriate standard for determining the adequacy of railroad revenues is a rate of return equal to the current cost of capital on the replacement value of all rail assets that are required to meet the demands for railroad service, regardless of the source of funds used in investing in those assets.¹⁷⁴

The appropriate standard does not therefore depend on the source of the funds used to make investments. Whether the source is debt financing, equity financing, returns from existing traffic, or tax benefits bestowed by Congress, the standard (according to some of the world's elite economists) should be the same: a rate of return equal to the current cost of capital on the replacement value of all rail assets required to meet the demand for railroad service.¹⁷⁵

¹⁷⁴ Economists' Statement in Support of Staggers Act (Feb. 25, 1985) (emphasis added)

¹⁷⁵ Therefore, even if the Board abandons the revenue adequacy constraint, it should no longer deduct deferred taxes from the investment base as part of its annual revenue adequacy determinations. The annual revenue adequacy findings are slowly creeping into rate setting, first in the Three-Benchmark test and more recently in the Board's novel, uneconomic, and widely-criticized limit-price test for market dominance. For example, in the recent Grain proceeding (S.T.B. Docket No. Ex Parte 665 (Sub-No. 1)), the limit-price test was universally rejected by railroads and grain shippers alike. *See, e.g.*, Reply Comments of Norfolk Southern Railway Co. (filed Aug. 25, 2014) at 7-9; Reply Comments of the Association of American Railroads (filed Aug. 25, 2014) at 20-21; Reply Comments of CSX Transportation, Inc. (filed August 25, 2014) at 11; Reply Comments of Alliance for Rail Competition et al. (filed Aug. 25, 2014) at 18; Opening Comments of

3. The STB is Failing to Measure Revenue Adequacy over the Average Life of Railroad Investment.

Finally, the Board is failing to measure revenue adequacy over the average life of railroad investments. Professor Cornell explains that “[a]ny period short of the full life of railroad assets is too short to make a fully informed assessment.” Cornell V.S. at 28. He also explains that there are several problems with trying to measure revenue adequacy just over the average business cycle. “Despite the name,” Professor Cornell explains, “business cycles are not cyclical; rather, they are largely random as to how long they last and in the magnitudes of their peaks and valleys.” *Id.* at 27. For investors to be willing to finance railroad operations, “they must expect that they will be able to earn their cost of capital, on average, over the life of the investment.” *Id.* at 31. Professor Cornell cautions that “[s]ingle year snapshots are at best unhelpful when trying to assess the performance of such long lived assets.” *Id.* at 24. “Certainly single year snapshots of railroad performance (*i.e.*, annual revenue adequacy measures) will not provide rate regulators with consistently accurate guidance.” *Id.*

D. An Independent, Top-Down Revenue Adequacy Constraint is Not Necessary To Ensure That Rates Are Reasonable.

The final reason the Board should abandon the revenue adequacy constraint is that there is simply no need to add yet another rate reasonableness methodology to the suite of alternatives available to shippers. The Board has invested substantial time and effort in crafting and refining its existing

The National Grain and Feed Association (filed June 26, 2014) at 35. If the Board is going to use the RSAM figure – and Norfolk Southern is not supporting its use anywhere other than as designed in the Three-Benchmark cases – then the agency should try to reduce the measurement error in that metric. While moving to replacement costs would be more difficult, the STB can easily reverse its treatment of deferred taxes.

procedures, and they are more than adequate to prevent shippers from being charged rates that are unreasonably high.

An independent revenue adequacy constraint would be in serious tension with the SAC constraint, which is widely and consistently recognized by the Board, courts, and economists as the gold standard. In the STB's words, "CMP is the most economically precise procedure available for evaluating the reasonableness of rates and should be used wherever possible."¹⁷⁶ The D.C. Circuit has recognized the Commission's "affirm[ation] that CMP, with its SAC constraint, is the 'preferred and most accurate procedure available for determining the reasonableness' of rates in markets where the rail carrier enjoys market dominance."¹⁷⁷ The court repeated the same point in the *Xcel* appeal. *BNSF Ry. Co. v. Surface Transp. Bd.*, 453 F.3d at 481 ("[T]he Board has 'consistently affirmed that CMP, with its SAC constraint, is the preferred and most accurate procedure available in determining the reasonableness of rates in markets where the rail carrier enjoys market dominance.'").

SAC itself considers the defendant carrier's revenue adequacy needs and is designed to give complainants relief if they can show that a SARR replicating part of the defendant's network would earn more than a reasonable return on its investment.¹⁷⁸ A SARR must serve the selected traffic group "while fully covering all of its costs and earning a reasonable return on investment."¹⁷⁹ And

¹⁷⁶ *Simplified Guidelines*, 1 S.T.B. at 1013; see also *Simplified Standards* at 13 ("CMP, with its SAC constraint, is the most accurate procedure available for determining the reasonableness of rail rates where there is an absence of effective competition.").

¹⁷⁷ *Burlington N. R.R. Co. v. Interstate Commerce Comm'n*, 985 F.2d 589, 596 (DC Cir. 1993) (citing *McCarty Farms, Inc. v. Burlington Northern, Inc.*, 3 I.C.C.2d 822, 839-40 (1987)).

¹⁷⁸ *Xcel Reconsideration*, S.T.B. Docket No. 42057, at 6.

¹⁷⁹ *DuPont*, S.T.B. Docket No. 42125, at 32.

because a SARR earns “a reasonable return on its investment” if its earnings exceed its cost of capital, to say that a SARR is earning a reasonable return on its investment is effectively to say that the SARR would be revenue adequate. The Board said as much in *Xcel Reconsideration* when it held that “[t]he very purpose of the SAC test is to determine what [the defendant] needs to charge to earn ‘adequate’ revenues on the portion of its system that is included in the system of the SARR.”¹⁸⁰ Because SAC itself measures revenue adequacy on the SARR network, there is no need for the Board to develop an independent, top-down revenue adequacy constraint.

The solution for any shipper who believes that a railroad is earning excessive revenues by charging it unreasonable rates is quite simple: file a case under SAC or the *Simplified Standards*. If the amount is significant, the shipper can pursue unlimited relief under SAC or Simplified SAC. If the amount is smaller, the more crude Three Benchmark methodology can be used. The overall profitability of the railroad would be a factor in the Board’s analysis in all of these methodologies. In SAC and Simplified SAC cases the SARR is assumed to earn the same revenues as the incumbent on selected traffic, and thus the analysis directly reflects the degree to which the defendant can be said to be earning adequate revenues on the line segments at issue.¹⁸¹ And the Three Benchmark approach—as rough and imprecise as it is—also imports some measure of revenue adequacy in the form of the RSAM benchmark. Shippers also have access to a residual constraint, the phasing constraint, which provides

¹⁸⁰ *Xcel Reconsideration*, S.T.B. Docket No. 42057, at 6; see also *BNSF Ry. Co. v. Surface Transp. Bd.*, 453 F.3d at 480 (“the SAC test is designed to take into account the railroad’s need for revenue adequacy ‘on the portion of its system that is included in the system of the SARR.’”).

¹⁸¹ Appropriate adjustments must be made in the case of cross-over traffic, but in all cases the railroad’s existing rates are the starting point of the analysis.

temporary protections where an otherwise reasonable rate would cause severe economic dislocation.

That makes four existing constraints on railroad pricing.¹⁸² There is no need for five – particularly when the fifth constraint is fraught with the kind of problems that the revenue adequacy constraint presents. While a subset of shippers perennially complains about the adequacy of existing rate procedures, those complaints overlook the substantial reforms the Board has made to its rate procedures and the theoretical difficulty of crafting a nonarbitrary rate process.

Some shippers have complained that existing rate procedures are too complex or expensive. To some extent, cost and time are inherent in any significant litigation. But they are also in part byproducts of applying sound economics in the regulation of rail rates. Although examination of railroad economic principles may at times be difficult, sound economics must be the foundation of any rate regulatory system that is not arbitrary.¹⁸³ These complaints also ignore both substantial simplifications the Board has made to SAC cases and the work the Board has done to develop low-cost alternatives to SAC. For example, in 2006 the Board significantly simplified the full-SAC test by prohibiting movement-specific adjustments to its Uniform Rail Costing System and settling longstanding disputes about issues like revenue allocation

¹⁸² The managerial efficiency constraint is closely related to the revenue adequacy constraint, raising all the same issues and problems, but adding the difficulty of measuring managerial inefficiency. It should share the same fate as the revenue adequacy constraint.

¹⁸³ See, e.g., *Simplified Standards* at 13 (“The SAC test, which judges the reasonableness of a challenged rate by comparison to the rate that would prevail in a competitive market, rests on a sound economic foundation and has been affirmed by the courts Any simplified methodology for assessing the reasonableness of rail rates should be designed to achieve the same objective . . .”).

methodologies and productivity adjustments.¹⁸⁴ In 2007, the Board overhauled its simplified procedures to provide two alternatives for disputes where the value of the case could not justify the expense of a full-SAC presentation.¹⁸⁵ In 2013, the Board vastly expanded access to these new alternatives by removing the limitation on relief for Simplified SAC cases and proposing to quadruple the limit on relief for Three Benchmark cases.¹⁸⁶

And this is just the beginning of the Board's efforts. Filing fees that once were nearly \$180,000 for SAC have been reduced to \$350.¹⁸⁷ In 2013, the Board transformed its arbitration and mediation rules to provide for greater use of alternative dispute resolution.¹⁸⁸ And the Board overall has successfully promoted negotiated resolutions to rate disputes, both through its Office of Public Assistance and through its mandatory mediation program for SAC cases. These efforts have enabled parties to efficiently settle many rate disputes that otherwise might have required significant time and effort.

The Board should have some faith in its own reforms to simplify the SAC process and encourage the use of alternatives to Full-SAC. Indeed, Norfolk Southern respectfully submits that in some respects the Board has gone too far down the path of simplifying its rate methodologies (for example, Norfolk

¹⁸⁴ *Major Issues in Rail Rate Cases*, EP 657 (Sub-No. 1) (STB served Oct. 30, 2006), *aff'd sub nom. BNSF Ry. Co. v. Surface Transp. Bd.*, 526 F.3d 770 (D.C. Cir. 2008) ("*Major Issues*").

¹⁸⁵ *See generally Simplified Standards*.

¹⁸⁶ *See generally Rate Regulation Reforms*. The D.C. Circuit has remanded this portion of the Board's decision to address the fact that the calculations through which the Board arrived at the \$4 million relief cap included double-counts of expenses. *See CSX Transp. v. Surface Transp. Bd.*, No. 13-1230 (D.C. Cir. June 20, 2014).

¹⁸⁷ *Regulations Governing Fees for Services*, S.T.B. Ex Parte No. 542 (Sub-No. 18) (STB served July 7, 2011).

¹⁸⁸ *Assessment of Mediation & Arbitration Procedures*, S.T.B. Ex Parte No. 660 (STB served May 13, 2013).

Southern continues to have concerns with the unfettered use of the Simplified SAC test and with increased limits on the Three Benchmark test). But it cannot be disputed that the Board has taken dramatic steps to make it easier for shippers to pursue rate cases. There is little need for another constraint with so many measurement errors and fundamental pitfalls.

It is certainly true that Full-SAC cases continue to be complex. And they should be. SAC cases are often disputes over tens or even hundreds of millions of dollars, and the results of a SAC case can have widespread implications for a railroad's pricing for other customers. Precision and economic rigor is essential. And the litigation expense and efforts required for a SAC case are not appreciably different from that for any other commercial litigation where comparable amounts of money are at stake. Moreover, while some Board members have expressed concern that shippers' relative lack of familiarity with railroad operations might disadvantage them in a SAC case,¹⁸⁹ shippers have access to experienced counsel and consultants who specialize in STB rate litigation. Shippers are thus well-equipped to litigate SAC cases on equal footing, particularly because of their extensive procedural rights under the Board's rules. Not only are shippers entitled to substantial discovery of every aspect of the defendant's operations, they have the enormous advantage of having a second evidentiary filing in which they can both correct minor errors in their opening evidence and respond to the defendant's evidence.

Some shippers have also claimed that a supposed lack of rate cases at the Board is evidence that the Board's procedures are inadequate. In the first place, multiple SAC and *Simplified Standards* cases have been litigated in recent years.

¹⁸⁹ See *SunBelt Chlor Alkali P'Ship v. Norfolk S. Ry. Co.*, S.T.B Docket No. 42130, at 31-32 (served Jun 20, 2014) (V.C. Miller, concurring).

While it is true that most shippers resolve their rate disputes with railroads in private negotiations rather than rate litigation, this is entirely appropriate. A well-functioning regulatory environment should create relatively few rate cases. When railroads are working to price traffic consistent with a well-understood regulatory regime, rate cases will only arise when railroads and shippers have a significantly different assessment of what the rate regime requires (or where shippers take a calculated risk to push the envelope with SAC presentations that do not account for the full costs of serving their selected traffic).¹⁹⁰

With more certainty railroads are able to conform pricing to the regulatory regime. Shippers, too, well understand their regulatory options with the advice of outside counsel and consultants, and they negotiate accordingly. All these factors prove the truth of the ICC's 1986 prophecy that relatively few rate cases would be brought.¹⁹¹ But the fact that most shippers never feel the need to bring rate cases is not a sign of regulatory failure—it is a sign of regulatory success. Vice Chairman Miller recently and correctly observed “that when shippers have more information they can make better decisions and, as a consequence, fewer disputes will arise.”¹⁹²

Some shippers assume that a rate reasonableness methodology “works” only when shippers win. SAC indeed does work if a shipper prevails by showing that a railroad is recovering more than it needs to earn adequate

¹⁹⁰ Cf. *DuPont*, S.T.B. Docket No. 42125, at 38.

¹⁹¹ *Coal Rate Guidelines*, 1 I.C.C.2d at 524 (“[A] benefit of these guidelines is to enable both the shipper and the railroad to estimate the maximum rate we would prescribe if the matter were brought to us for adjudication. We believe this will encourage contract solutions which (as shown below) may often be more efficient and more beneficial to both parties than a prescribed rate.”).

¹⁹² *Petition of Norfolk Southern Ry. Co. and CSX Transp. Inc., to Institute a Rulemaking Proceeding to Exempt Railroads from Filing Agricultural Transp. Contract Summaries*, S.T.B. Ex Parte No. 725, at 6 (served August 11, 2014) (V.C. Miller, concurring).

revenues on the portion of its system used for the shipper's traffic. But SAC also works if a SAC analysis shows that the railroad is not recovering more than it needs to earn adequate revenues and thus that the rates are reasonable. And the Board's rate procedures are also working if shippers and railroads reach negotiated resolutions against a background of rate reasonableness rules that are economically valid. However, predictability of the results – while a virtue of a well-functioning regulatory system – cannot be elevated above the need for an economically sound approach. Any number of regimes could be predictable. But validity of the regime comes from the generation of outcomes consistent with sound economics.

Furthermore, the vocal subset of shippers who demand development of a “revenue adequacy” methodology to accompany the Board's existing rate reasonableness methodologies gloss over the fact that any methodology used to evaluate the reasonableness of rail rates must rest on sound economic principles.¹⁹³ History teaches that it is very difficult to develop a nonarbitrary methodology for judging rate reasonableness. The agency has made numerous attempts to develop and apply novel rate reasonableness tests which have failed or been overturned by courts because they lacked economic foundation. For example, an early rule promulgated by the ICC established that a rail rate could include a seven percent additive above a carrier's fully allocated costs to support

¹⁹³ See, e.g., *Simplified Standards* at 13 (“The SAC test, which judges the reasonableness of a challenged rate by comparison to the rate that would prevail in a competitive market, rests on a sound economic foundation and has been affirmed by the courts. . . . Any simplified methodology for assessing the reasonableness of rail rates should be designed to achieve the same objective, albeit in a less precise manner.”); *Simplified Guidelines*, 1 S.T.B. at 1010 (“Even though the impact of simplified procedures would be limited, the ICC acknowledged that it did not have free rein in devising simplified reasonableness procedures. Rather, the simplified procedures must be equitable, must comport with the underlying statutory directives and guiding economic principles, and must produce realistic measurements.”).

a carrier's effort to attain revenue adequacy. The D.C. Circuit rejected this methodology, finding that the ICC "provide[d] no defensible rationale for the inclusion of the seven percent increment."¹⁹⁴ The ICC then developed the "ton-mile method," which assigned a carrier's constant costs "to particular traffic based upon the tonnage and ton-miles involved."¹⁹⁵ A carrier would then be able to attribute the "fully allocated costs" to that traffic and charge it to the shipper.¹⁹⁶ Before the Third Circuit could rule on a pending challenge, the ICC determined that this methodology would produce maximum rates that would not adequately reflect demand or contribute adequate revenues and withdrew the methodology.¹⁹⁷ In a final, failed attempt to develop rules, the ICC established a Revenue Over Variable Cost methodology which deemed a rate reasonable if "its mark-up over variable cost is no greater than the mark-up on 'benchmark' traffic selected as suitable for comparison."¹⁹⁸ On appeal, the D.C. Circuit found this approach lacked "supporting principle or intellectual coherence" and that the agency "had not intelligibly explained why the trade-off chosen was reasonable."¹⁹⁹ The court remanded the case, concluding that "the jettisoning of CMP/SAC cannot pass for reasoned decisionmaking."²⁰⁰

For the reasons discussed above in sections I and II, an independent, top-down revenue adequacy constraint faces significant methodological and

¹⁹⁴ *City Pub. Serv. Bd. Ex rel. San Antonio v. United States*, 631 F.2d 831, 851-52 (D.C. Cir. 1980) (requiring the agency to "provide adequate justification for its choice of a particular increment above fully allocated costs").

¹⁹⁵ *Coal Rate Guidelines*, 1 I.C.C.2d at 523.

¹⁹⁶ *Id.* at 522.

¹⁹⁷ *Id.* at 523 n.7.

¹⁹⁸ *Burlington N. R.R. Co. v. Interstate Commerce Comm'n*, 985 F.2d 589, 596 (D.C. Cir 1993).

¹⁹⁹ *Id.* at 597.

²⁰⁰ *Id.* at 599.

theoretical obstacles, and it is not possible for the Board to design a revenue adequacy constraint that is not hopelessly arbitrary. There is no need for the Board to undertake a project with so little hope of success when it has already created a suite of effective, judicially approved rate reasonableness methodologies.

CONCLUSION

In short, the revenue adequacy constraint is a black box filled with difficult questions that will resist simple solutions. While it may appear to offer a superficially “easy” alternative to SAC or Simplified SAC, once opened it will lead the agency down a difficult and dangerous path. The constraint would stifle innovation and discourage investment, as earning one’s cost of capital is widely agreed to be the *minimum* necessary to attract and maintain capital. It would also penalize railroads for improving performance based on better productivity or improved returns from competitive traffic. It would be a hopelessly backward-looking methodology used for ratemaking that needs to be forward-looking. It would produce results that would have no relationship to the reasonableness of particular individual rates. It would create impermissible cross-subsidies in any case in which it was used to prescribe a rate for a shipper that could not have prevailed under SAC. And it would create a cloud of uncertainty over the industry. Regulators worldwide have been discarding rate-of-return regulation because of the known incentive problems that plague this kind of regulation.

Norfolk Southern therefore urges the Board to abandon this constraint and instead rely on the elaborate and significant rate reforms it just completed. The agency has undertaken dozens of rulemakings to make its rate review processes accessible. It streamlined its procedures. It reduced filing fees. It

adopted alternative dispute resolution procedures. It removed the requirement that a shipper design a hypothetical railroad. It prohibited movement-specific adjustments to its costing model for purposes of calculating the jurisdictional threshold. It added structure and clarity to its full-SAC process. All these regulatory changes were adopted notwithstanding the directive that, in regulating the railroad industry, the agency is "to minimize the need for Federal regulatory control over the rail transportation system." 49 U.S.C. 10101(3).

The STB has already cast open its doors to genuine disputes over rates. Superimposing another rate constraint fraught with measurement error and policy pitfalls would conflict with the Congressional directive to regulate with a light hand.

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September 5, 2014

VERIFIED STATEMENT OF
BRADFORD CORNELL

**BEFORE THE
SURFACE TRANSPORTATION BOARD
Docket No. EP 722**

RAILROAD REVENUE ADEQUACY

&

EP 664 (Sub-No. 2)

**PETITION OF THE WESTERN COAL
TRAFFIC LEAGUE TO INSTITUTE A
RULEMAKING PROCEEDING TO ABOLISH
THE USE OF THE MULTI-STAGE
DISCOUNTED CASH FLOW MODEL IN
DETERMINING THE RAILROAD
INDUSTRY'S COST OF EQUITY CAPITAL**

VERIFIED STATEMENT

OF

BRADFORD CORNELL

September 5, 2014

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**BEFORE THE
SURFACE TRANSPORTATION BOARD
Docket No. EP 722 & EP 664 (Sub-No. 2)**

VERIFIED STATEMENT

OF

BRADFORD CORNELL

I. QUALIFICATIONS

My name is Bradford Cornell. I am a Visiting Professor of Financial Economics at the California Institute of Technology and a Professor Emeritus at the Anderson Graduate School of Management at the University of California, Los Angeles.

I earned a master's degree in Statistics from Stanford University in 1974 and a doctorate in Financial Economics from Stanford University in 1975. I have served as an editor of numerous journals relating to business and finance and have authored more than 100 published articles and two books on finance and securities, including *Corporate Valuation: Tools for Effective Appraisal and Decision-Making*, published by McGraw-Hill. I have served as an associate editor of numerous academic journals including the *Journal of Finance*, the *Journal of Financial Economics*, the *Financial Analysts Journal*, and the *Journal of Portfolio Management*. I am also a Senior Consultant and Advisory Committee member at Compass Lexecon. My background is described more fully in my attached *curriculum vitae*.

II. BACKGROUND

In regulating the railroad industry, Congress charged the Surface Transportation Board (the “Board”) with multifaceted objectives. See 49 U.S.C. § 10101. In general, the Board must allow competition and the demand for services to establish reasonable rates for transportation by rail. It must also minimize the need for federal regulatory control. Where there is an absence of effective competition, the Board must then balance two potentially competing objectives. On one hand, it has a duty to maintain reasonable rates. And on the other hand, it is required to assist, or at least allow, rail carriers to “attract and retain capital in amounts adequate to provide a sound transportation system in the United States.”¹

The Western Coal Traffic League (the “WCTL”) recently petitioned the Board “to institute a rulemaking proceeding to abolish the use of its Multi-Stage Discounted Cash Flow...model in its determination of the railroad cost of equity...and cost of capital...and to instead rely exclusively on the Capital Asset Pricing Model.”² The Board indicated it will receive comments on how it calculates the railroad industry’s cost of capital.³ The Board also sought comments “to explore the Board’s methodology for determining railroad revenue adequacy, as well as the revenue adequacy component used in judging the reasonableness of rail freight rates.”⁴

¹ 49 U.S.C. § 10704.

² Western Coal Traffic League, Petition, *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry’s Cost of Capital*, S.T.B. Ex Parte No. 664 (Sub-No. 2) at 1 (Aug. 27, 2013) (“*Cost of Capital Proceeding*”).

³ *Cost of Capital Proceeding* at 4 (served April 2, 2014).

⁴ *Railroad Revenue Adequacy*, S.T.B Ex Parte No. 722, at 1 (served April 2, 2014) (“*Revenue Adequacy*”).

III. ASSIGNMENT AND SUMMARY OF OPINIONS

Norfolk Southern requested that I address issues raised by the Board's notices in EP 664 (Sub-No. 2) and EP 722, including an economic and financial assessment of the effectiveness of certain regulatory tools available to the Board. Specifically, I address (i) whether the stand-alone cost constraint ("SAC" or "the SAC constraint") and the simplified stand-alone cost constraint ("Simplified-SAC" or "the Simplified-SAC constraint") are economically sound and effective methods for meeting the Board's objectives, and (ii) whether a revenue adequacy rate constraint based on the overall financial health of a railroad would also be an economically sound and effective method for meeting the Board's objectives.

As detailed below, it is my opinion that:

- 1) The SAC and Simplified-SAC are economically sound and well suited to meet the Board's regulatory purposes.
- 2) The annual revenue adequacy calculation is useful only as a gauge of a railroad's overall financial health; it informs the agency whether the industry's health is improving or deteriorating.
- 3) Basing rate regulation on the Board's flawed measurement of revenue adequacy could mistakenly restrain railroad investment and innovation.
- 4) Even if errors in measuring revenue adequacy could be corrected, a rate constraint based on system-wide financial health would have fundamental problems, including:
 - i. A system-wide measure of a railroad's financial health would fail to inform whether any *particular* rate is reasonable;
 - ii. A rate constraint based on historical performance would be backward looking and would fail to suggest optimal responses to current and future scenarios; and
 - iii. The cost of capital is the *minimum* return needed to attract capital investment; treating it as a ceiling on

returns would discourage investment, productivity, and innovation.

IV. THE STAND-ALONE COST CONSTRAINT IS ECONOMICALLY SOUND AND WELL-SUITED TO MEET THE BOARD'S REGULATORY PURPOSES.

A. Regulation should simulate a competitive result and is only needed in the minority of cases where traffic lacks effective competition.

The Board has described its jurisdiction concerning freight rail pricing as covering instances “[w]here there is no competitive freight rail transportation market.”⁵ In such instances, Congress has charged the Board with protecting the public from the possibility of unreasonable pricing by freight railroads. The Board has undertaken to meet this charge by simulating what competitive price would prevail if shippers had effective transportation alternatives.⁶ When shippers do have these alternatives, rate regulation is unnecessary because prices are already constrained by natural market forces. Congress has determined that rate regulation is also unnecessary for traffic where a carrier’s revenues are less than 180 percent of its variable costs.⁷

I understand that Michael R. Baranowski is submitting to the Board comments that identify the amount of Norfolk Southern’s traffic that (i) is

⁵ *Rate Regulation Reforms*, S.T.B Ex Parte No. 715, at 1 (served July 18, 2013) (“*Rate Regulation Reforms*”).

⁶ “[R]ailroads functioning in a noncompetitive market will be required to price as if alternatives to their services were available. That is, their rates will be judged against simulated competitive prices. As a result, the efficiencies of a contestable market will serve as the guide for establishing maximum rates on captive coal traffic.” *Coal Rate Guidelines – Nationwide*, 1 I.C.C.2d 520, 542 (1985) (“*Coal Rate Guidelines*”).

⁷ *BNSF Ry. Co. v. Surface Transp. Bd.*, No. 12-1042, at 7 (D.C. Cir. May 23, 2014).

exempt from rate review because the Board determined this traffic had sufficient competitive alternatives to make rate regulation unnecessary or (ii) for which Norfolk Southern's revenues are less than 180% of its variable costs, in which case Congress says that traffic has effective competition.⁸ I understand that Mr. Baranowski determined that 78% of Norfolk Southern's traffic meets these criteria. In other words, the Board's regulation of rates is not necessary for the vast majority of Norfolk Southern's traffic.

B. The stand-alone cost methodology is economically sound and properly targeted.

The SAC constraint is intended to simulate a competitive rate, which the Board specifies as “the rate a hypothetical efficient railroad would need to charge to serve the complaining shipper, while fully covering all of its costs, including a reasonable return on investment.”⁹ This competitive rate is precisely the sort of protection that the Board has been charged with making available to shippers for movements where effective competition is absent. The Coal Rate Guidelines, which set forth guiding principles and concepts that remain relevant to the Board's objectives, explain:

The purpose of a SAC analysis is to determine the least cost at which an efficient competitor could provide the service, because by so doing we are simulating the competitive price for the market.¹⁰

In 2014, the U.S. Court of Appeals for the District of Columbia reaffirmed the intent of the SAC constraint, commenting:

The ultimate aim of the Stand-Alone-Cost test is to require that ‘railroads functioning in a noncompetitive market . . . price as if

⁸ See NS Opening Comments, V.S. of Baranowski.

⁹ *Rate Regulation Reforms*, at 2.

¹⁰ *Coal Rate Guidelines*, 1 I.C.C.2d at 542.

alternatives to their services were available' to the captive shipper.¹¹

The SAC constraint allows a complaining shipper to propose pricing based on a hypothetical, efficient stand-alone competing carrier. The constraint is economically sound because it simulates—not some arbitrarily determined price—but the competitive market price, equal to “the least cost at which an efficient competitor could provide the service.”¹² A firm that faces no competition maximizes profits by setting a price that is above the competitive market price. In contrast, when a firm faces a competitor or multiple competitors that offer substitutable goods, they compete for market share, undercutting each other's prices so that each firm earns only a reasonable rate of return. The Coal Rate Guidelines state that this constraint allows “a captive shipper [to] have its rates based on the lower costs of an alternate, ‘stand-alone’ system in which the plant size and traffic base are designed to maximize the efficiencies and production economies.”¹³ The Coal Rate Guidelines explain the SAC constraint further:

We recognize that a stand-alone facility would, in reality, seldom, if ever, be constructed. However, by identifying the costs that would be incurred if it were, an appropriate rate cap can be determined. In this way, railroads functioning in a noncompetitive market will be required to price as if alternatives to their services were available. That is, their rates will be judged against simulated competitive prices. As a result, the efficiencies of a contestable market will serve as the guide for establishing maximum rates on captive coal traffic.¹⁴

While the primary objective of the SAC constraint “is to restrain a railroad from exploiting market power over a captive shipper,” the Board

¹¹ *BNSF Ry. Co. v. Surface Transp. Bd.*, No. 12-1042 at 4 (D.C. Cir. May 23, 2014) (citing *Coal Rate Guidelines*).

¹² *Coal Rate Guidelines*, 1 I.C.C.2d at 542.

¹³ *Id.*

¹⁴ *Id.*

explains that a “second objective of the SAC constraint is to detect and eliminate the costs of inefficiencies in a carrier’s investments or operations.”¹⁵ The SAC constraint gives the railroad a powerful incentive to operate efficiently. Since the railroad must essentially compete with a hypothetical and efficient carrier, the railroad seeks to eliminate inefficiencies that reduce its profitability.

Additionally, the SAC constraint is economically sound because it considers the full life of the necessary investments as part of the process used to simulate competitive rates.

In this proceeding, the railroads have proposed (and the shippers agree with) a more sophisticated, multiple-period analysis. Under their approach, one would project the stream of earnings which can be expected (based on the economic life of the assets in the investment base and the demand for service), then discount it at the current cost of capital to derive the present value of the stand-alone system. The SAC for each year would equal the difference between (1) the earnings already collected, together with those expected in future years, and (2) the total earnings stream required to cover the SAC.¹⁶

Finally, the SAC constraint is targeted. The SAC constraint applies to complaints from shippers that lack effective transportation alternatives—a minority of Norfolk Southern’s traffic base—on a case-by-case basis. By addressing such shipper complaints individually, the Board is able to provide those shippers with price protection without discouraging railroads from making further investments. This targeted regulation allows the majority of rail traffic to operate consistent with the competitive market forces it faces, enabling railroads to reap rewards for innovation and efficiency. Such rewards are essential for a railroad to attract investors. The Board has made similar observations regarding the targeted nature of SAC, commenting:

¹⁵ *Rate Regulation Reforms*, at 9.

¹⁶ *Coal Rate Guidelines*, 1 I.C.C.2d. at 545.

As railroads enjoy increasing market power with rising demand for their services, the SAC test (in either its full or simplified form) would provide a critical restraint on their pricing of captive traffic, without deterring railroads from making the investments in their rail networks that are needed to meet rising demand.¹⁷

Based on the foregoing, I conclude that the SAC constraint is an economically sound and effective tool that allows the Board to meet its potentially competing objectives: to maintain reasonable rates where there is an absence of effective competition, and to allow or even assist railroads in “fostering a sound, safe, and efficient rail transportation system.”¹⁸

C. Where the SAC constraint is too complicated and expensive, Simplified-SAC provides an effective tool to protect shippers that may lack effective transportation alternatives.

The Board has declared that “the stand-alone cost (SAC) test is central to our rate regulation rules.”¹⁹ Yet a full SAC presentation can be expensive and infeasible where the amount of money at issue is not large enough to justify the expense. To address this concern, the Board has adopted simplified guidelines for smaller cases.²⁰

The Board created the Simplified-SAC constraint for litigants who cannot justify the expense of the more detailed full SAC analysis. The Board summarized the Simplified-SAC approach as follows:

The Simplified-SAC presentation will differ from a Full-SAC presentation by eliminating or restricting the evidence parties can submit on certain issues. The core analysis in a Simplified-SAC proceeding will address the replacement cost of the existing facilities

¹⁷ *Rate Regulation Reforms*, at 9.

¹⁸ *Id.* at 1.

¹⁹ *Id.* at 2.

²⁰ *Simplified Standards For Rail Rate Cases*, S.T.B. Ex Parte No. 646 (Sub-No. 1) (STB served Sept. 5, 2007) (“*Simplified Standards*”).

used to serve the captive shipper and the return on investment a hypothetical SARR would require to replicate those facilities. We will then seek to determine whether the traffic using those facilities is paying more than needed to cover operating expenses and a reasonable return on the replacement value of those facilities.²¹

The Board remarked that “this simplified approach has numerous positive features,” including:

- Unlike SAC, Simplified-SAC does not require shippers to design hypothetical railroads. Rather, Simplified-SAC focuses on the operations of the defendant railroad to determine if the railroad is exploiting its market power to charge monopoly prices;
- Because Simplified-SAC does not require the complainant to design a hypothetical railroad, the Board expects it to be a far simpler and less costly approach; and
- Simplified-SAC uses replacement cost to determine the maximum lawful rates a carrier may charge.

The Board reasoned that “[t]he Simplified-SAC test can provide a critical restraint on the railroad’s pricing of captive traffic by allowing the Board to determine whether a captive shipper is being forced to cross-subsidize parts of the defendant’s existing rail network the shipper does not use.”²²

Like full SAC, this simplified approach is an attempt to simulate a competitive market rate using a targeted approach that gauges the replacement costs of the facilities used to serve the complaining shipper. Also like full SAC, Simplified-SAC incepts railroads to operate efficiently since they must compete with the rate Simplified-SAC indicates. Importantly, the Simplified-SAC constraint, like the full SAC constraint, is targeted: it addresses *particular* complaints from individual shippers without involving the competitive majority of rail traffic that does not use the lines and facilities needed to serve the complaining shippers. When offered together

²¹ *Id.* at 15.

²² Notice of Proposed Rule Making, *Rate Regulation Reforms*, STB Ex Parte No 715 at 13 (Released July 25, 2012).

with the more robust SAC intended for large disputes, this simplified version allows the agency to meet its dual objectives of protecting shippers that may lack effective transportation alternatives while permitting or even assisting railroads to earn adequate revenues needed to foster a sound, safe, and efficient rail transportation system. Other tools the Board wishes to consider are appropriately measured against the merits of the SAC and Simplified-SAC constraints.²³

V. RATE REGULATION BASED ON A RAILROAD'S OVERALL FINANCIAL HEALTH WOULD NOT SERVE THE BOARD'S OBJECTIVES.

By statute, the Board determines annually whether a railroad is “revenue adequate.”²⁴ The Board judges a railroad to be revenue adequate in a particular year if it has generated a return on the book value of its investment (less deferred taxes) that exceeds the industry average cost of capital. I refer to these calculations as the annual revenue adequacy findings.

Measuring revenue adequacy each year is useful for meeting the Congressional mandate to assist in ensuring the industry’s financial health.²⁵ Nevertheless, the Board's method for measuring revenue adequacy has flaws, discussed below, that make it more likely that the Board will mistakenly

²³ I understand that the STB also has an alternative rate constraint called the Three Benchmark approach. Under this approach, the reasonableness of a particular rate is gauged by comparing the challenged rates to other rates for similarly-situated movements. Apparently this test provides limited relief; the STB concluded that the approach is far cruder than either SAC or Simplified-SAC, acknowledging that the Three Benchmark approach requires “a crude adjustment” and noting that “precision must be sacrificed for simplicity, and any simplified procedures will necessarily be very rough and imprecise.” *See Simplified Standards* at 73.

²⁴ “[T]he Board shall annually determine which rail carriers are earning adequate revenues.” 49 U.S.C. §10704.

²⁵ “...to promote a safe and efficient rail transportation system by allowing rail carriers to earn adequate revenues, as determined by the Board.” 49 U.S.C. §10101.

conclude revenue adequacy. Because of such measurement flaws, the annual revenue adequacy findings are less informative as an absolute measure (*i.e.*, determining whether a particular railroad was revenue adequate in a given year) and more informative in terms of monitoring gains or declines in industry health from one year to the next.

The Constrained Market Pricing guidelines discuss a “revenue adequacy constraint” that appears to be based on, but remains distinct from, the Board's annual measurement of revenue adequacy.²⁶ The scope and boundaries of this constraint are vague because it has never been applied to railroads. And the Board recently indicated only that it seeks comments “to explore...the revenue adequacy component used in judging the reasonableness of rail freight rates” without offering any details to define this component or explain how it would be implemented.²⁷

The Board's predecessor, the ICC, suggested that revenue adequacy might serve as a trigger that signals a need for greater scrutiny of the railroads. For instance, the ICC proposed in 1983 that “where a consistent pattern of returns substantially in excess of carrier’s revenue needs has been established, we would, upon complaint, consider the reasonableness of rates on captive coal traffic and prescribe lower rates in appropriate circumstances.”²⁸ The ICC also appeared to suggest in the Coal Rate Guidelines that revenue adequacy should constrain railroad revenues, stating:

Our “revenue adequacy” standard represents a reasonable level of profitability for a healthy carrier. It fairly rewards the rail company's investors and assures shippers that the carrier will be able to meet

²⁶ The ICC adopted these guidelines and summarized their principles in Coal Rate Guidelines. *Coal Rate Guidelines*, 1 I.C.C.2d at 520.

²⁷ *Revenue Adequacy*, at 1; *Cost of Capital Proceeding*, at 1.

²⁸ Notice of Proposed Rulemaking, *Coal Rate Guidelines – Nationwide*, Ex Parte 347 (Sub-No. 1), at 16 (ICC served Feb. 8, 1983) (“*Coal Rate Guidelines NPRM*”)

their service needs for the long term. Carriers do not need greater revenues than this standard permits, and we believe that, in a regulated setting, they are not entitled to any higher revenues. Therefore, the logical first constraint on a carrier's pricing is that its rates not be designed to earn greater revenues than needed to achieve and maintain this revenue adequacy level.²⁹

Yet in the same paragraph the ICC then goes on to suggest that a revenue adequacy constraint would only be concerned with reducing “differentially higher rates” charged where there is an absence of effective competition and doing so only when railroads are revenue adequate, stating:

In other words, captive shippers should not be required to continue to pay differentially higher rates than other shippers when some or all of that differential is no longer necessary to ensure a financially sound carrier capable of meeting its current and future service needs.³⁰

Other statements complicate the picture of what form a revenue adequacy constraint might take. For instance, the ICC determined in 1981 that the appropriate measure for determining on an annual basis whether a railroad was earning adequate revenues “should be a rate of return equal to the cost of capital.”³¹ In doing so, the ICC acknowledged that “[s]uch a standard is widely agreed to be the minimum necessary to attract and maintain capital in the railroad, or any other, industry.”³²

The “revenue adequacy constraint” is a difficult concept to address given this lack of clarity. For purposes of this statement, I assume that the Board is seeking public input on whether it should use the annual revenue adequacy findings to gauge the reasonableness of a *particular* rate. I also assume that the constraint might be “triggered” if the railroad earns a

²⁹ *Coal Rate Guidelines*, 1 I.C.C.2d. at 535.

³⁰ *Id.* at 535-36.

³¹ *Standards for Railroad Revenue Adequacy*, 364 I.C.C. 803, 809 (1981) (*Standards D*).

³² *Id.*

system-wide return substantially in excess of the industry average cost of capital over some undefined period of time.

As detailed below, any revenue adequacy constraint that relies on annual revenue adequacy findings is not economically sound both because of substantial measurement error in the annual revenue adequacy findings and because, even when measured accurately, revenue adequacy reflects a railroad's *overall* financial health without informing how particular rates for specific traffic should be regulated.

A. Basing rate regulation on the Board's flawed measurement of revenue adequacy could mistakenly restrain rail rates and, therefore, railroad investment and innovation.

In this section, I detail three existing measurement errors in the annual revenue adequacy findings. These errors would affect the reliability of any kind of rate reasonableness standard that is based on measures of revenue adequacy. They include: 1) the failure to measure economic depreciation and replacement cost, 2) the exclusion of deferred taxes from the investment base, and 3) the failure to measure returns over the lifetime of rail assets. In addition to these three existing errors, if the Board changes its current approach to estimating the cost of equity by dropping the multi-stage discounted cash flows model, it would introduce even more measurement error into its annual revenue adequacy findings, rendering any associated rate reasonableness standard even less sound.

1. *By not using economic depreciation and asset replacement values, the Board misstates ROI.*

The annual revenue adequacy findings compare a railroad's ROI against the industry average cost of capital. ROI is calculated as return (*i.e.*, net income) divided by the value of investments in place. The Board's

particular calculation of ROI uses book values to estimate the value of investments in place, and it uses straight line depreciation to calculate those book values.

Using straight line depreciation and asset book values to calculate ROI as a measure to be compared with cost of capital is conceptually wrong: investors are concerned with how economic returns—not accounting returns—compare to the cost of capital when making investment decisions. Regulation based on a comparison that is inconsistent with how investment opportunities are assessed may dissuade railroad investment. Accurate assessments of a railroad’s profitability use economic depreciation.³³

A pair of examples developed in Exhibits 1a and 1b demonstrates that misleading results can ensue when calculating ROI on the basis of book values that are calculated using straight line depreciation. The examples assume that the cost of capital is 10% and that new investments all earn exactly the cost of capital.³⁴ They also assume the investment costs \$1,000,

³³ “If book depreciation and economic depreciation are different (they are rarely the same), then the book profitability measures will be wrong; that is, they will not measure true profitability.” BREALEY, MYERS, ALLEN, *PRINCIPLES OF CORPORATE FINANCE*, 317 (8th ed. 2005). “Of course, any accounting measure of profitability, such as EVA or the book return on investment (ROI), depends on accurate accounting measures of earnings and capital employed. Unless adjustments are made to accounting data, these measures may underestimate the true profitability of new assets and overestimate that of old assets. In principle the solution is easy. EVA and ROI should be calculated using true or economic income. Economic income is equal to the cash flow less economic depreciation (that is, the decline in the present value of the asset). Unfortunately, we can’t ask accountants to recalculate each asset’s present value each time income is calculated. But it does seem fair to ask why they don’t at least try to match book depreciation schedules to typical patterns of economic depreciation.” *Id.* at 322.

³⁴ I realize that the 10 percent figure that I use in this example is lower than the cost of capital that the ICC and the Board have determined in most prior years, as set forth in Exhibit 4. I am using a 10 percent figure to simplify the example. However, the point that the example illustrates – the bias produced by the Board’s current methodology – would be the same even if I used a higher figure, such as 12 percent or 15 percent.

the purchased asset has a life of 20 years, and the investment produces a constant cash flow stream of \$117.46 annually so that the internal rate of return on the investment over its full life equals the 10% cost of capital.

Exhibit 1a shows that applying straight-line depreciation to this \$1,000 asset over twenty years results in yearly depreciation of \$50 and annual net income of \$67.46 (cash flow of \$117.46 minus \$50 of depreciation). Under this construction, return on investment is not constant and never equal to the overall internal rate of return or the cost of capital of 10%. Instead ROI starts at 6.75% in the first year and increases to over 100% in the investment's final year. In any given year, the Board would conclude that this hypothetical railroad either falls short of revenue adequacy or surpasses revenue adequacy, often by large margins, but would never come to the right conclusion: the railroad is just revenue adequate. Such a mismatched comparison of cost of capital and ROI based on straight line depreciation would have the Board believe that railroads are struggling in some years and in need of greater regulation in other years; yet in the example the railroad's return just meets its cost of capital in all years.

In contrast, calculating ROI using *economic* depreciation yields the right conclusion: the railroad is just revenue adequate over the full life of the asset and during each year of its life. Exhibit 1b demonstrates this. It shows that ROI is always 10%, an expected result because, by construction, the example assumes the asset would just earn its cost of capital. The result is also a sensible comparison of ROI and cost of capital: it conveys correct information to the Board, in contrast to the mismatched comparison of cost of capital and ROI calculated using straight line depreciation.

Economic depreciation is the decline in the market value of an asset attributable to its usage in the current year.³⁵ For a single year, it equals the difference between the discounted cash flows at the beginning of the year and the discounted cash flow value at the end of the year. The value of the asset declines during this period because the future cash flow stream becomes one year shorter. Economic depreciation is not constant but tends to increase as the asset ages, a result of the discounting process. Additionally, asset value calculated using economic depreciation equals replacement (*i.e.*, market) value; if the assets trade in a competitive marketplace where buyers and sellers value assets based on the cash flows they are expected to generate, price will equal the present value of expected cash flows. By contrast, asset values calculated using straight-line depreciation would equal the asset's replacement value only by rare coincidence.

One might contend that the above example is not applicable to an actual railroad because it involves only one asset. In response to this potential criticism, Exhibits 2a and 2b extend the example by assuming that the modeled railroad has many assets, one of each vintage (*i.e.*, one asset is brand new, a second asset is one year old, and so on up to the twentieth asset which is nineteen years old at the beginning of the period). The income and cash flow data are all for a single year. At the end of the year, the oldest asset is scrapped and replaced by a new one, so that at the start of the next year the mix of assets is identical to the mix at the beginning of the year. By this construction, the railroad is in equilibrium and does not change over time, so results from one year would be the same as results from any other year. This extended example still assumes that each investment costs \$1,000 and earns precisely its cost of capital.

³⁵ "Any reduction in present value represents economic depreciation; any increase in present value represents negative economic depreciation. Therefore economic depreciation = reduction in present value." BREALEY at 316.

Exhibits 2a (using straight line depreciation) and 2b (using economic depreciation) show that total depreciation each year is \$1,000, equal to the cost of buying a new asset.³⁶ Net income is also the same under both approaches at \$1,349.20 per year. However, as with the one asset example, the time paths of the depreciation are quite different for the two methods and result in different estimates of asset value. The method based on straight-line depreciation indicates beginning of period book value of \$10,500 (an ROI of 12.85%), while the measure using economic depreciation is \$13,492 (an ROI of 10.0%).³⁷ This estimate of ROI based on straight-line depreciation is 2.85 percentage points in excess of the cost of capital, mistakenly suggesting that the railroad is earning returns well beyond its 10% cost of capital. Using economic depreciation instead indicates ROI of 10%, equal to the true economic return and equal to the cost of capital.

The ROI bias that results from failing to use economic depreciation increases with the average life of a company's assets; this is clear from Exhibit 1a which shows ROI greater than 100% by its final year. If an asset has a life of only one year, then economic and straight-line depreciation both equal the cost of the asset because it is fully depreciated in a single measurement period. Of course, railroad assets have much longer lives. Because railroads have such long-lived assets, it is particularly important to properly measure depreciation to get an accurate estimate of a railroad's return on investment.

These examples identify a straightforward test to determine whether an upward bias exists in the measurement of ROI. The key question is

³⁶ If there were inflation or technological improvements then it would no longer necessarily be true that total depreciation equals replacement cost. This example does not incorporate those complications.

³⁷ ROI is calculated as net income divided by beginning of period book value. In the straight-line depreciation example, this is $\$1,349/\$10,500=12.85\%$. In this economic depreciation example, this is $\$1,349/\$13,492=10.0\%$.

whether the reported book value of railroad assets based on straight-line depreciation is less than the replacement cost of those assets. If it is, then the Board's approach will overestimate a railroad's true ROI. As a result, a railroad that appears revenue adequate according to the Board's measurement may not in fact be earning its cost of capital. Price regulation based on such misguided conclusions would likely make it more difficult for railroads to attract and retain capital investment on account of not being able to realize economically required rates of return.³⁸

The example calculations in Exhibits 1a, 1b, 2a, and 2b do not include the impact of inflation. Because the United States has experienced consistent and sometimes substantial inflation (as in the early 1980s), it is important to ask whether the results of the example calculations are affected by inflation. For straight line depreciation, the answer is yes, although the effect is not dramatic for low to moderate inflation rates. The greater the rate of inflation, the greater the upward bias in ROI because inflation increases the gap between replacement cost and book value.³⁹ This effect would reinforce the tendency to mistakenly conclude that railroads are revenue adequate.

³⁸ I do not stand alone in reaching this conclusion. In 1985, dozens of the leading economists of the day—including several Nobel laureates—submitted a joint statement of basic principles to guide the ICC in its rate setting duties. In particular, they urged the ICC that: “The appropriate standard for determining the adequacy of railroad revenues is a rate of return equal to the current cost of capital on the replacement value of all rail assets that are required to meet the demands for railroad service, regardless of the source of funds used in investing in those assets.” See *Economist's Statement in Support of Staggers Act*, Feb 25, 1985.

³⁹ This assumes that replacement cost exceeds accounting book value in the first place. If it does, a rising rate of inflation tends to increase the gap.

2. *The Board is more likely to find revenue adequacy when deferred taxes are deducted from the investment base, potentially restricting railroad investment.*

The Board calculates ROI by dividing Net Railway Operating Income (NROI) by railroad assets net of deferred taxes. Removing deferred taxes from the base substantially increases ROI, making it more likely that the Board will conclude a railroad is revenue adequate. Because deferred taxes currently constitute a substantial fraction of total railroad assets, the effect of removing them is significant.⁴⁰

It appears that the ICC struggled with how to handle deferred taxes as part of its annual revenue adequacy findings. Initially, the ICC concluded that it would be appropriate to deduct the deferred tax account from the net investment rate base prior to any calculation of rate or return. It reasoned that the capital funds arising from deferred taxes have been contributed by the ratepayers rather than by investors in the company.⁴¹

After more careful consideration of the consequences of that policy, the ICC changed course and decided not to exclude the deferred taxes from the investment base. It reasoned as follows:

The deferred tax account can be considered a source of funds freed up for reinvestment. These funds constitute a substantial part—up to 20 percent in some cases—of the total capital available to individual railroads for this purpose. To the extent that the railroads are not allowed to earn a return on investments made with these funds, the incentive to undertake

⁴⁰ For instance, the Board's Railroad Revenue Adequacy—2012 Determination showed that Norfolk Southern had a Tax Adjusted Net Investment Base of \$16,578,622 after removing \$8,033,436 in Average Accumulated Deferred Income Tax Credits, resulting in a Tax Adjusted Return on Investment of 11.48%. The same calculation without removing the \$8,033,436 in Average Accumulated Deferred Income Tax Credits would equal 7.74%. See STB Updated Decision, Docket No. EP 552 (Sub-No. 17) (served January 2, 2014).

⁴¹ *Standards & Procedures for the Establishment of Adequate Railroad Revenue Levels*, 358 I.C.C. 844 (1978).

railroad investments with such funds is substantially reduced. *Instead, an environment is created in which there is an incentive to take funds generated within the railroad industry and invest them elsewhere, where market-determined rates of return are available.* We are concerned that this may thwart the intent of Congress . . . to provide business enterprise with tax benefits as a means of spurring capital spending.

While we are not considering ratemaking *per se* here, the economic principle is the same. If we exclude internally generated funds, whether stemming from accelerated depreciation or any other railroad activity, from the investment base, the effect will be to establish a rate of return below the cost of capital. This, in turn, will result in incentives to railroads to invest these funds in nonrail operations.⁴²

On appeal, the U.S. Court of Appeals for the Third Circuit affirmed this economic analysis as reasonable. The federal court explained:

The simple fact remains, however, that for all businesses accelerated depreciation is a source of funds which may be reinvested. If the railroad industry were to be put in the position that unlike unregulated industries it could not earn a rate of return on investment of such funds, it would be at a competitive disadvantage in seeking equity capital, and it would be encouraged to invest the funds generated from accelerated depreciation elsewhere than in the railroad business. . . . It would, moreover, produce a rate of return below the cost of capital, since capital markets act with knowledge of the availability of accelerated depreciation as a source of funds.⁴³

Then—somewhat puzzling given the detailed and proper analysis undertaken by the ICC on this issue—the ICC reversed course again. In 1981, Congress bestowed certain tax benefits on the railroads with the Economic Recovery Tax Act of 1981 (ERTA). As railroads were investing and reaping the benefits of this Act, the ICC concluded that its failure to exclude deferred taxes from the investment base was rendering its findings

⁴² *Standards I*, 364 I.C.C. at 813-14 (emphasis added).

⁴³ *Bessemer & Lake Erie R.R. Co. v. Interstate Commerce Comm'n*, 691 F.2d 1104, 1116 (1983) (“*Bessemer*”).

imprecise. So it excluded deferred taxes from the investment base when calculating the return on investment.⁴⁴ It reasoned as follows:

Deferred tax reserves are clearly a no-cost source of capital. To assume that the railroads need a return on that capital in order to achieve revenue adequacy is especially inappropriate, given the huge increases in deferred tax reserves resulting from the passage of ERTA. ERTA allowed the railroads accelerated write-offs of additions and betterments to road property made through 1984. These provisions increased the deferred tax accounts of the railroads by several billion dollars. Given this situation, we can no longer justify not adjusting for deferred taxes in the revenue adequacy process.⁴⁵

The ICC rejected argument by the railroad industry that this decision would conflict with the purpose of the ERTA because it would create powerful disincentives for railroad investments. “Even with a deferred tax adjustment,” the ICC asserted, “the railroads will still be able to take full advantage of the tax law which allows them to defer the payment of some income taxes. The adjustment in no way requires the railroads to forfeit any cash flow benefits which they are entitled to under the tax law and allows them to invest the proceeds as they see fit.”⁴⁶ The ICC stated that:

In our view, when we allowed railroads to treat deferred taxes as an expense without a corresponding reduction in the net investment base we allowed the railroads a double benefit: they were allowed to demand rates sufficient to cover tax liabilities not yet paid and also to collect additional profits on the funds held on reserve to pay such deferred taxes. We now view this as the unfair distortion of the railroads’ revenue adequacy that shippers have long argued.⁴⁷

On appeal, the Court of Appeals cautioned the ICC that it was generating a powerful disincentive for future investment in the railroad

⁴⁴ *Standards I*, 3 I.C.C.2d at 261.

⁴⁵ *Id.* at 272.

⁴⁶ *Id.* at 273.

⁴⁷ *Id.* at 272.

industry.⁴⁸ The Court explained that the ICC was taking away half of the benefits bestowed on the railroads with the Economic Recovery Tax Act of 1981: the ability to earn a return on investments from the tax savings. The ICC argued that depriving railroads of the ability to earn a return on these investment would not completely abolish the desired incentive to invest in railroads. The Court observed, however, that “this argument ignores the fact, emphasized by the railroads, that they have to *compete* for capital with unregulated firms which do retain the second benefit of an opportunity to earn a return on those funds.”⁴⁹ The Court reasoned that “Given the competition between the railroads and unregulated firms for capital, the railroads are substantially disadvantaged by being deprived of the opportunity to earn a return on the funds in comparison to the unregulated firms, and therefore the incentive to all investors, including the railroads, is to invest in the unregulated firms where the advantage of the ‘double benefit’ is retained.”⁵⁰

But the Court stopped short of rejecting the ICC’s change in position. The federal court instead chose to “reject the railroads’ challenge to the change in the standard for revenue adequacy which excludes deferred taxes from their rate base.”⁵¹

To my knowledge, the Board has never reexamined the ICC’s conflicting positions on the treatment of deferred taxes. And as the industry has only recently approached revenue adequacy (as measured by the Board), the ICC’s seesawing positions on this issue likely had no practical effect because there were no policy implications related to the exclusion of deferred

⁴⁸ *Consolidated Rail Corp. v. United States*, 855 F.2d 78 (3d Cir. 1988).

⁴⁹ *Id.* at 90 (emphasis in original)

⁵⁰ *Id.*

⁵¹ *Id.* at 93.

taxes from the investment base. This will change if the Board uses this potentially biased measurement of revenue adequacy to constrain rates and if the railroads are judged to be revenue adequate.

The Board is more likely to determine that a railroad is revenue adequate when using an ROI calculation that backs deferred taxes out of invested capital. If the Board uses such a determination to restrict shipping rates, railroads will not be able to either attract or retain as much equity capital as they otherwise would, leading to the environment of which the ICC spoke wherein “there is an incentive to take funds generated within the railroad industry and invest them elsewhere, where market-determined rates of return are available.”⁵² In my opinion, the federal court’s rationale was correct on the economics, despite the court’s choice to affirm the ICC’s flawed thinking. Accelerated depreciation and the associated deferred taxes create a source of funds that may be (i) reinvested if the railroads are permitted to realize sufficiently high returns or (ii) distributed to shareholders if they are not so permitted. Restricting the level of returns leads to the latter scenario where funds are returned for investment in other industries. Less capital investment would restrict the scope of projects railroads can undertake.

3. *Not measuring revenue adequacy over the life of the investment may misguide rate regulation.*

An investment has positive value when the return on investment exceeds the cost of capital *over the life of the investment* (i.e., when the present value of all cash flows from an investment exceeds the present value of all its costs). Leaving out some portion of cash flows can result in the wrong conclusion regarding the existence of “excess” returns. As such, rate regulation—whether based on SAC, Simplified-SAC, or revenue adequacy measures—may be misguided if the underlying measures consider anything

⁵² *Standards I*, 364 I.C.C. at 813-14.

less than the full life of the investment. Certainly single year snapshots of railroad performance (*i.e.*, annual revenue adequacy measures) will not provide rate regulators with consistently accurate guidance.⁵³

The average life of railroad assets is among the longest in all of American industry. For example, Mr. Baranowski explains that, based on economic depreciation, Norfolk Southern's assets have an average life of 27.6 years when new and an average remaining life of almost 20 years. Single year snapshots are at best unhelpful when trying to assess the performance of such long lived assets.⁵⁴

Railroad performance is also volatile, characterized by stretches of performance that fall short followed by periods when return on investment exceeds cost of capital. In order to have ROI just equal the cost of capital, periods of deficient performance must be offset by periods when railroad ROI exceeds the cost of capital. Exhibit 3 shows that, on average, over the last 32 years Norfolk Southern's return on investment was less than its cost of capital as estimated by the ICC and the Board. For that time period, the mean difference between the ROI for Norfolk Southern and the cost of capital, called the margin, is negative 1.89%. Even if the sample is limited to

⁵³ “Anyone using accounting measures of performance had better hope that the accounting numbers are accurate. Unfortunately, they are often not accurate, but biased. Applying EVA [Economic Value Added] or any other accounting measure of performance therefore requires major adjustments to the income statements and balance sheets. For example, think of the difficulties in measuring the profitability of a pharmaceutical research program, where it typically takes 10 to 12 years to bring a new drug from discovery to final regulatory approval and the drug's first revenues. That means 10 to 12 years of guaranteed losses, even if the managers in charge do everything right. Similar problems occur in startup ventures, where there may be heavy capital outlays but low or negative earnings the first years of operation. This does not imply negative NPV, so long as operating earnings and cash flows are sufficiently high later on. But EVA and ROI would be negative in the startup years, even if the project were on track to a strong positive NPV.” BREALEY at 314.

⁵⁴ NS Opening Comments, V.S. Baranowski.

the most recent 20 years—which excludes the early 1980’s when Norfolk Southern was highly revenue inadequate—the mean difference is still negative 0.20%.

In the longer 32-year sample period, the standard deviation of the margin is 4.02%.⁵⁵ This standard deviation implies that a railroad that is just revenue adequate will earn more than 4.02 percentage points in excess of its cost of capital in about 16% of its years of operation.⁵⁶ 2006 was the only year when the Board's revenue adequacy calculation indicated that Norfolk Southern's ROI exceeded the cost of capital by more than 4.02%. Statistically, the railroad would require several more years of this “excess” performance simply to balance the years of deficient performance and to meet its cost of capital in the long run. Yet this single year of “excess” performance, taken in isolation and without understanding the volatility of railroad returns, would mistakenly suggest a need for rate regulation. Elementary mathematics tells us that if a railroad is required to adjust rates whenever it is deemed to be revenue adequate for a single year, the railroad will never be able to produce long run returns that meet its cost of capital.

Norfolk Southern's lack of long-term revenue adequacy is not unique. Exhibit 4 reports revenue adequacy findings for all available major railroads during the period from 1981 to 2012. For many railroads, only a limited sample of years is available because those companies either went bankrupt or were merged, often due to financial distress.⁵⁷ Nonetheless, the data reveal

⁵⁵ For the twenty year period, the standard deviation is 2.46%.

⁵⁶ It is a property of the normal distribution that 16% of the observations are more than one standard deviation above the mean, and 16% of the observations are more than one standard deviation below the mean. *See, e.g.,* ACZEL, AMIR AND JAYAVEL SOUNDERPANDIAN, COMPLETE BUSINESS STATISTICS 776 (6th ed. 2005).

⁵⁷ “By 1997, only ten Class I carriers remained. As a result of bankruptcy, merger, or a changing classification threshold, some sixty-three systems had disappeared from the Class I category. Because of the economic malaise surrounding the industry in the 1970s, several carriers, including the Chicago, Rock Island & Pacific (Rock

that not one railroad has been revenue adequate, on average, over a significant period of time, let alone over a term approximately equal to the life of a railroads' assets. In fact, most railroads were significantly revenue inadequate. As with Norfolk Southern, stretches of "excess" returns are needed to offset these long stretches of deficient returns. Suddenly instituting new rate regulations in response to brief or even lengthy periods of "excess" returns, should they occur, would prevent railroads from achieving long run revenue adequacy. The ICC made similar observations about the need to assess financial performance over long stretches of time, commenting:

[T]hat revenue adequacy is *a long-term concept* that calls for a company, *over time*, to average return on investment equal to its cost of capital. In any industry there are business cycles producing years during which earnings exceed projections, and years when they fall short of the target.⁵⁸

The question of the period over which to assess financial performance also arises with the Board's use of SAC and Simplified-SAC. Under these methods as well, not considering financial performance over the full life of the investment can yield misleading results. The Board proposed that SAC analysis be performed over a ten year period, reasoning as follows:

And a 20-year analysis period is twice what is needed to incorporate the effects of a business cycle. There have been 32 business cycles between 1854 and 2001, with an average cycle of 55 months (4.5 years). Since 1960, the average length of a business cycle was 82 months (about 7 years). Although business cycles have become longer (July 1981 – July 1991, July 1991 – March 2001), a 10-year analysis should still capture a full business cycle.⁵⁹

Yet the average length of business cycles is not the right standard for assessing revenue adequacy. Foremost, the average length of a business cycle

Island) were either divided, sold, or left to rust." JAMES B. BURNS, RAILROAD MERGERS AND THE LANGUAGE OF UNIFICATION 6 (1998).

⁵⁸ *Coal Rate Guidelines*, 1 I.C.C.2d. at 536.

⁵⁹ *Major Issues in Rail Rate Cases*, S.T.B. Ex Parte No. 657 (Sub-No. 1), at 62 (served October 30, 2006).

has no economically meaningful relationship to the life of railroad assets. The value of an investment (*i.e.*, the determination whether return on investment exceeds or falls short of the cost of capital) is assessed over the life of the investment, not over the length of a business cycle.⁶⁰ In addition to this lack of economic justification, using business cycles has other problems. Despite the name, business cycles are not cyclical; rather, they are largely random as to how long they last and in the magnitudes of their peaks and valleys.⁶¹ Exhibit 5a illustrates these random time spans by charting the number of years in each of the seven business cycles from 1961 through 2009, which range in length from 28 months to 128 months. Exhibit 5b shows that the cumulative change in GDP during a business cycle is also not consistent. The smallest amount of net growth during a business cycle since 1960 was 1.15% (1980 to 1982) and the greatest was 50.63% (1961-1970).

As a result, the decision to use the length of a business cycle is arbitrary and results in cutting short the period of analysis. Leaving out

⁶⁰ Financial managers use net present value (“NPV”) analysis to assess the value of an investment. This is performed by projecting all future cash flows from an investment and discounting them to present value. The life of an investment and its cash flows are not tied to either the length of a particular business cycle or the average length of historical business cycles. For instance, assume you had two investments, a short-term IT investment with an expected life of three years and a long-term rail tunnel investment with an expected life of one-hundred years. The value of the short-term investment will be calculated based on cash flows that occur over three years and the value of the long-term investment will be calculated based on cash flows that occur over one-hundred years. The value of neither investment, however, would be calculated over the length of a business cycle. Such a period would be too long a horizon for the IT investment and therefore include years during which no cash flows occur. And it would be too short a horizon for the tunnel, and it would therefore lop off the majority of years during which cash flows are expected to occur. NPV calculations that do not consider all cash flows from an investment will indicate the wrong value and may even provide the wrong general conclusion (*e.g.*, indicate negative NPV when the investment is actually positive NPV or *vice versa*).

⁶¹ For instance, one macroeconomist describes business cycles as “the irregular and largely unpredictable fluctuations in economic activity, as measured by the production of goods and services or the number of people employed.” N. GREGORY MANKIW, *PRINCIPLES OF MACROECONOMICS* 13 (4th ed., 2007).

information that would otherwise inform the revenue adequacy determination can cause one to improperly conclude that a financially unhealthy railroad is healthy or *vice versa*. Financial assessments based on a ten-year period are more informed measures of performance than those based on a single year, but any period short of the full life of railroad assets is too short to make a fully informed assessment.

4. *Relying on CAPM alone, rather than averaging the CAPM and MSDCF approaches, would introduce unnecessary measurement error.*

The cost of capital is a central component of the Board’s annual revenue adequacy findings. The cost of capital is an average of a company’s cost of debt and its cost of equity, each weighted by its relative portion of the company’s capital structure. The cost of investment grade debt is readily identifiable by the interest rate that a company pays on recently issued debt; its measurement is straightforward and relatively uncontroversial. Cost of equity, by contrast, is not readily identifiable and subject to substantial measurement error. Numerous methods exist for estimating the cost of equity, and experts disagree on which methods are most effective. Experts also disagree regarding the proper inputs into each of the competing models.⁶² And the results from the competing finance models will vary based on the assumptions used by the modeler.

⁶² For instance, one valuation textbook provides an overview of various methods for estimating the market risk premium, including the historical approach (which itself varies in the historical period considered), estimates from Chief Financial Officers, and estimates from implied cost of capital measures. See ROBERT W. HOLTHAUSEN AND MARK E. ZMIJEWSKI, *CORPORATE VALUATION: THEORY, EVIDENCE, & PRACTICE*, 313-14 (1st ed., 2014). The Board has itself noted the difficulty in measuring the cost of equity. It remarked: “While the cost of debt is observable and readily available, the cost of equity (the expected return that equity investors require) can only be estimated. How best to calculate the cost of equity is the subject of a vast amount of literature covering the fields of finance, economics, and regulation. In each case, however, because the cost of equity cannot be directly observed, estimating the cost of equity requires adopting a financial model and making a variety of simplifying

Given the degree of uncertainty that surrounds estimating the cost of capital, using two largely independent approaches is better than relying upon only one approach. As the U.S. Department of Transportation properly observed: “no single methodology has a monopoly on producing reasonable, real-world estimates.”⁶³ In my opinion, using one approach would throw away valuable information. Furthermore, using the capital asset pricing model, which is based on stock returns, and the multi-stage discounted cash flows model, which is based on projected cash flows, provides perspective that neither approach can provide by itself. Both the CAPM and MSDCF models that the Board uses to estimate the cost of equity capital are widely employed in the finance industry. The Board’s approach of averaging the two is also reasonable because it reduces the possible measurement error associated with using only one method. I see no reason to alter this approach by ignoring the information provided by the MSDCF.

B. Even if the Board corrected its method for measuring revenue adequacy, a rate constraint based on system-wide financial returns suffers numerous fundamental problems that render it either un-useful or detrimental to the Board's objectives.

A constraint that is based on the annual revenue adequacy findings would suffer from the measurement errors just discussed. Even if these measurement errors are corrected, there remain five fundamental problems with any kind of rate constraint that is premised on the system-wide financial health of a railroad.

assumptions. The Board currently uses a Discounted Cash Flow (DCF) methodology to calculate the cost of equity, which in turn is used to calculate the cost of capital.” *Methodology to be Employed in Determining the Railroad Industry's Cost of Capital*, STB Ex Parte No. 664, at 2 (served October 24, 2007).

⁶³ Hearing Statement of the U.S. Department of Transportation, *Methodology to be Employed in Determining the Railroad Industry's Cost of Capital*, Ex Parte No. 664, at 2-3 (filed Nov. 26, 2007).

1. *A system-wide measure of a railroad's financial health fails to inform whether any particular rate is reasonable.*

One of the Board's objectives is to protect an individual shipper that may lack effective transportation alternatives, a minority of Norfolk Southern's traffic. At its best, properly measured revenue adequacy indicates only how a railroad's historical overall return on investment compares to its cost of capital. Such a system-wide measure would not serve the regulator's need to identify the appropriate rate that should be charged for *particular* traffic. More basic, a constraint based on this measure would not even convey whether a railroad is overcharging or undercharging any *particular* shipper.

Simple solutions tend to serve simple scenarios. The revenue adequacy constraint's problem is that it is a facially simple concept but one that is intended to address a highly complex scenario. A properly implemented revenue adequacy constraint might prove informative in the simplistic scenario that has a railroad offering only one service to only one shipper. In this unrealistic case, a constraint based on the railroad's revenue adequacy status might indicate whether a rate should be adjusted up or down. But complicating this scenario at all (*e.g.*, introducing a second customer or varying the customer's competitive landscape along its shipping route) quickly reduces such a constraint's usefulness. With their highly complex operations and numerous customers that face widely varied competitive circumstances, railroads represent the extreme opposite of a railroad with only one shipper. Knowing how a railroad's returns compare with its cost of capital says nothing about the reasonableness of any individual rate it charges. In contrast to rate regulation based on a system-wide measure of financial health, SAC and Simplified-SAC are targeted. They meet the Board's objectives by indicating *specific* rates for *particular* routes.

2. *Return on investment, a central component of the revenue adequacy measure, is short term and backward looking.*

ROI is short term and backward looking, an unhelpful vantage point for regulation intended to be long-term and forward looking. When either general economic or industry specific conditions change, backward looking measures can become highly misleading. For instance, if the railroad industry suffers another sharp downturn as it did during the Great Recession, the backward-looking ROI could be suggesting regulation that is consistent with healthy railroads because it considers only the economically favorable past; meanwhile, a forward looking measure would be sounding an alarm that railroads need assistance. Only after significant time passes will backward-looking measures reflect the economic downturn. Regulatory decisions made prior to this realization will constrain the railroads at precisely the time when the depressed economic environment should have the Board assisting railroad recovery.

For investors to be willing to finance railroad operations, they must expect that they will be able to earn their cost of capital, on average, over the life of the investment. This means that, in the case of Norfolk Southern, investors must expect to earn their cost of capital, on average, over the next 20 years.⁶⁴ Consequently, the relevant question for determining revenue adequacy from a financial perspective is not whether Norfolk Southern has earned its cost of capital during a snapshot of any given year in the past or by how much its ROI exceeded its cost of capital in a given year, but whether it is reasonable to expect it to earn its cost of capital over the next 20 years. In contrast to the annual revenue adequacy measure, the SAC constraint avoids this backward looking vantage point.⁶⁵

⁶⁴ See V.S. Baranowski.

⁶⁵ I understand the Board has not yet applied the Simplified SAC methodology. But this methodology is not as forward looking as SAC because it rests on a single test

3. *Capping returns at the cost of capital would prevent railroads from earning the cost of capital in the long run, discouraging investment.*

Railroads must be able to attract capital that can be invested to expand infrastructure and realize greater levels of efficiency. The Board has observed that a railroad’s ability to earn “adequate revenues” should include being able to “attract and retain capital in amounts adequate to provide a sound transportation system in the United States.”⁶⁶

Capping a railroad’s returns at the cost of capital undermines a railroad’s ability to attract capital because the cost of capital is the *minimum* return investors require to forego competing investment opportunities.⁶⁷

year of historical data. Errors may result from applying this new test based on a single snapshot year that might not be representative of current circumstances. There is a possibility that an upwards adjustment may be needed to assure the railroad the ability to earn the cost of capital. Constraining rates at the cost of capital based on a single year of data will create the same kind of asymmetric risk discussed above. Nonetheless, the Simplified SAC approach is more current and responsive than a revenue adequacy constraint that might consider data from the distant past and does not use true economic depreciation and forward-looking replacement costs.

⁶⁶ See 49 U.S.C. § 10704.

⁶⁷ “*Cost of capital is the expected rate of return that the market requires in order to attract funds to a particular investment.* In economic terms, the cost of capital for a particular investment is an *opportunity cost*—the cost of forgoing the next best alternative investment. In this sense, it relates to the economic *principle of substitution*—that is, an investor will not invest in a particular asset if there is a more attractive substitute.” SHANNON P. PRATT, *COST OF CAPITAL: ESTIMATION AND APPLICATION* 3 (2d ed., 2002) (emphasis in original). “When a company uses the cost of capital to evaluate a commitment of capital to an investment or project, it often refers to that cost of capital as the ‘hurdle rate.’ The ‘hurdle rate’ means the minimum expected rate of return that the company would be willing to accept to justify making the investment...The most popular theme of contemporary corporate finance is that companies should be making investments, either capital investments or acquisitions, from which the returns will exceed the cost of capital for that investment. Doing so creates *economic value added, economic profit, or shareholder value added.*” *Id.* at 5 (emphasis in original). “Here, then, we have two equivalent decision rules for capital investment: *Net present value rule.* Accept investments that have positive net present values. *Rate of return rule.* Accept investments that offer rates of return in excess of their opportunity costs of capital.” BREALEY at 18.

Exhibit 6a is a hypothetical illustration of how return on investment fluctuates around the cost of capital over time and may equal its cost of capital only if this fluctuation is allowed. The exhibit plots, for a hypothetical railroad, the 20-year average return on investment against the cost of capital.⁶⁸ If, as soon as that average ROI reaches the cost of capital, refunds and reparations are required, then the cost of capital becomes an upper bound that the railroad's return on investment can never exceed, as shown in Exhibit 6b. If that upper bound is binding, investors will opt for competing investments that offer greater returns for the same level of investment risk.⁶⁹ Deprived of the proper scale of investment, railroads will fail to be optimally sound, safe, and efficient.

The ICC expressed similar reasoning, noting that a railroad will be disadvantaged when competing for equity capital if it cannot achieve its cost of capital. It remarked:

We have previously determined...that “adequate” revenues are those which provide a rate of return on net investment equal to the current cost of capital (i.e., the level of return available on alternative investments). This is the revenue level necessary for a railroad to compete equally with other firms for available financing in order to maintain, replace, modernize, and, where appropriate, expand its facilities and services. If railroads cannot earn the fair market rate of return, their ability both to retain existing investments and obtain new capital will be impaired, because both the existing and prospective funds could be invested elsewhere at a more attractive rate of return.⁷⁰

Thus, the ICC was historically correct when it repeatedly and accurately observed that the cost of capital was the minimum needed. However, the ICC

⁶⁸ The exhibit assumes that the cost of capital is constant to allow for a simpler illustration. The twenty-year analysis period is also hypothetical. The conclusions in no way depend upon these assumptions.

⁶⁹ “‘Adequate’ means returns at least equal to the returns that stockholders could earn by investing in financial markets. If your firm’s projects consistently generate inadequate returns, your shareholders will want their money back.” BREALEY at 7.

⁷⁰ *Coal Rate Guidelines*, 1 I.C.C.2d at 535

erred in *Coal Rate Guidelines* when it suggested that the cost of capital could be a cap on railroad returns.⁷¹

To the contrary, the cost of capital is the *minimum* level of return needed to attract investment. An investor faced with two equally risky investments—one with a maximum possible return equal to the cost of capital and one with no cap on returns—will opt for the investment that has potential upside.⁷² An investment that is capped has an asymmetric payout: the investor earns returns less than the cost of capital in bad times but has no chance at earning returns in excess of the cost of capital in good times. The capped investment exposes the investor to downside risk without providing potential upside.

4. *Capping returns at the cost of capital would suppress important market signals and discourage innovation.*

Earning returns in excess of the cost of capital is not a sign of market failure. Indeed it is the potential for these temporary excess returns that gives carriers the incentive to invest and to become more efficient in response to rising demand for rail services.⁷³ Depriving carriers of potentially earning

⁷¹ As quoted above, the ICC stated, “Our revenue adequacy standard represents a reasonable level of profitability for a healthy carrier. It fairly rewards the rail company’s investors and assures shippers that the carrier will be able to meet their service needs for the long term. Carriers do not need greater revenues than this standard permits, and we believe that, in a regulated setting, they are not entitled to any higher revenues. Therefore, the logical first constraint on a carrier’s pricing is that its rates not be designed to earn greater revenues than needed to achieve and maintain this ‘revenue adequacy’ level.” *Id.*, at 535.

⁷² “In economic terms, the cost of capital for a particular investment is an *opportunity cost*—the cost of forgoing the next best alternative investment. In this sense, it relates to the economic *principle of substitution*—that is, an investor will not invest in a particular asset if there is a more attractive substitute.” PRATT at 3 (emphasis in original).

⁷³ “When an investment opportunity or ‘project’ is identified, the financial manager first asks whether the project is worth *more* than the capital required to undertake it.” BREALEY, at 7 (emphasis added). “An investment should be made if it has a

excess returns would dissuade investment and lead to suboptimal development of railway infrastructure, retarding economic growth and energy efficiency.

Markets reward railroads with higher revenues when railroads innovate in ways the market favors or when the market demands that railroads grow. Railroads are not utilities with stable demand; they depend on a properly functioning market to signal when participants must grow beyond existing infrastructure or innovate to improve their services. I have reviewed the verified statement submitted in support of Norfolk Southern's Opening Comments by Deborah H. Butler, Executive Vice President of Planning and Chief Information Officer for Norfolk Southern. The innovations described by Ms. Butler to improve services require effort and capital investment that only the promise of sufficient returns can attract. In my opinion, a rate constraint based on the overall financial health of the railroads would dampen the incentive for railroads to take these kinds of innovative risks to improve service if they are not permitted to reap the benefits from investments that pay off.

Higher revenues and increased profitability function as an important market signal, indicating to both the railroad and its competitors and potential competitors (which includes other railroads, trucks, pipelines, barges, etc.) that demand has increased and the market justifies further investment in carrier infrastructure.⁷⁴ Limiting returns to the cost of capital

positive NPV. If an investment's NPV is negative, it should be rejected." ROSS, WESTERFIELD, JAFFE, CORPORATE FINANCE 60 (6th ed., 2003).

⁷⁴ "If consumers show an increasing preference for some particular commodity by buying more of it, the increase in demand will cause the price of the goods to rise. Entrepreneurs managing firms producing this commodity will be encouraged to expand supply, with the prospect of a higher selling price, increased sales revenue and higher profits. In turn the increased profits being made by firms in this industry will attract new firms into the industry, which will further increase the supply of goods on to the market. More resources will be attracted into the industry because

would stymie this signal, resulting in less than optimal investment and disrupting the mission to foster a “sound, safe, and efficient rail transportation system.”⁷⁵

5. *As only a minority of shippers lack effective transportation alternatives, improvements in system-wide financial health are driven largely by greater efficiency and productivity in a railroad's competitive traffic.*

Another failing of any revenue adequacy constraint is that it is a system-wide measure for an industry where rate regulation applies to only a minority of traffic. Improvement in the overall financial health of a railroad, even if driven entirely by the majority competitive portion of its business, can trigger this constraint. Triggering by competitive traffic does nothing to promote the Board’s stated objective to protect shippers that may lack effective transportation alternatives; it instead confuses matters by sending a false signal that railroads need new price regulation. Such a false signal could be damaging to railroads and those they serve.

The ICC observed that a railroad’s overall financial performance does not indicate whether shippers without effective transportation alternatives are being fairly treated in each case, stating:

[I]t should be noted that a rate may be unreasonable even if the carrier is far short of revenue adequacy. Besides the constraints discussed in these guidelines, there may be factors brought to light in an individual case which under the circumstances peculiar to that case may render the challenged rate unreasonable.⁷⁶

The opposite is also true. Just as being “revenue inadequate” does not mean all shippers are receiving reasonable rates, being “revenue adequate”

higher rewards are offered.” SAMPAT MUKHERJEE, *MODERN ECONOMIC THEORY* 560 (4th ed., 2005).

⁷⁵ *Rate Regulation Reforms*, at 1.

⁷⁶ *Coal Rate Guidelines*, 1 I.C.C.2d at 536-37.

does not mean that shippers that lack effective transportation alternatives are suffering unreasonable rates. This is because Norfolk Southern's overall returns are likely driven far more by its competitive traffic (the vast majority of its traffic) than by traffic that lacks effective competition. Moreover, even if a carrier's improving financial returns were attributable to improper exercise of market power (and I am aware of no facts that would support that conclusion at this time), a revenue adequacy constraint would neither identify market power as the cause nor identify the affected customers.

In sum, the revenue adequacy constraint would not serve the Board's stated objectives. It could be triggered by increased earnings from competitive traffic, new innovative service, or greater productivity. And once triggered, it would provide no guidance on how to properly adjust rates for particular shippers that may lack effective transportation alternatives.

VI. CONCLUSION

The Board is required by Congress to monitor the financial health of the railroad industry. The Board is well aware, for example, that its annual revenue adequacy findings are not premised on replacement costs and fail to capture the true economic depreciation of railroad assets. Although the measurement is flawed, the simple metric can serve as a useful indicator of the overall direction of the financial health of the railroad industry. However, the Board should not permit these annual findings—which were designed to comply with a statutory requirement—to spread unnecessarily into rate setting where the nature of the inquiry demands a more targeted and precise measurement.

Even if the measurement errors could be corrected, there are major fundamental problems with *any* rate constraint that is based on the overall financial health of the railroads. *First*, the cost of capital is the *minimum*

return needed to attract investment. The Board should not transform that minimum into a maximum. *Second*, the approach would create counterproductive incentives that will deter innovation and investment and distort important market signals. *Finally*, and perhaps most fundamentally, the overall returns fail to inform about the reasonableness of a particular rate charged to an individual shipper.

In my opinion, the SAC and Simplified-SAC constraints are sound and well suited to meet the Board's objectives with regard to rate setting. These approaches properly gauge the reasonableness of a challenged rate against the replacement costs of the facilities used to serve the complaining shipper. Moreover, because SAC and Simplified-SAC are targeted, they do not interfere with market incentives to grow earnings from the competitive traffic that generates the bulk of Norfolk Southern's overall revenues. As such, these approaches neither deprive investors of returns to which they are appropriately entitled nor prevent important signals that the market should invest more in railroad infrastructure. The Board observed, "As railroads enjoy increasing market power with rising demand for their services, the SAC test (in either its full or simplified form) would provide a critical restraint on their pricing of captive traffic, without deterring railroads from making the investments in their rail networks that are needed to meet rising demand."⁷⁷ This targeted constraint achieves the desired goal while avoiding the pitfalls that would surround any kind of revenue adequacy constraint.

My analysis implies that railroads and those they serve could suffer under a rate standard that calls for regulation when railroad system-wide financial health improves. This unintended consequence would likely undermine efforts to establish "a sound transportation system in the United

⁷⁷ *Rate Regulation Reforms*, at 9.

States”⁷⁸—a system that will invest, innovate, and grow to improve rail service and meet the Nation’s growing appetite for environmentally friendly rail transportation.

⁷⁸ 49 U.S.C. § 10704.

VERIFICATION

I, BRADFORD CORNELL, 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: 9/5/2014

A handwritten signature in black ink, appearing to read "Bradford Cornell", written over a horizontal line.

BRADFORD CORNELL

BRADFORD CORNELL

Senior Consultant

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EDUCATION

Ph.D., Financial Economics, Stanford University

M.S., Statistics, Stanford University

A.B., (Interdepartmental) Physics, Philosophy, and Psychology, Stanford University

ACADEMIC AND PROFESSIONAL POSITIONS

December 2011–Present	<i>Senior Consultant</i> , Compass Lexecon
December 2010–Present	<i>Managing Director</i> , San Marino Business Partners
1999–December 2011	<i>Senior Consultant</i> , CRA
2005–Present	<i>Visiting Professor of Financial Economics</i> , California Institute of Technology
1987–2005	<i>Professor of Finance and Director of the Bank of America Research Center</i> , Anderson Graduate School of Management, UCLA
1990–1999	<i>President</i> , FinEcon: Financial Economic Consulting
1988–1990	<i>Vice-President and Director of the Securities Litigation Group</i> , Economic Analysis Corporation
1979–1986	<i>Assistant and Associate Professor of Finance</i> , UCLA
1983–1984	<i>Visiting Professor of Finance</i> , California Institute of Technology
1977–1979	<i>Assistant Professor of Finance</i> , University of Southern California
1975–1977	<i>Assistant Professor of Finance</i> , University of Arizona

PUBLICATIONS

Books and book chapters

“Stock Repurchases: Tradeoffs and Trends.” *Dividends and Dividend Policy*, H. Kent Baker, ed., Blackwell Publishing, New York, 2009.

“Securities Fraud Damages.” With J. Hirshleifer and J. Haut. *Developments in Litigation Economics*, Vol. 87, P. Gaughan and R. Thornton, eds., Elsevier, Ltd., Oxford, UK, 2005.

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Academic articles

“The ‘Machinery’ of Asset Pricing and Its Implications,” With Jason Hsu, under review.

“Tesla: The Anatomy of a Run-up,” With Aswath Damodaran, *Journal of Portfolio Management*, forthcoming.

“Looking for the Size Effect in Valuation Multiples,” With Rajiv Gokhale, under review.

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“Asset Pricing Under Uncertain Inflation: A Note on the Work of Long and Roll,” *Intermountain Economic Review*, Vol. 7, Spring 1976, pp. 85–91.

“The Arizona Retirement System 1956–1975: An Investment Analysis,” *Arizona Review*, Vol. 25, March 1976, pp. 1–9.

Book reviews and discussion comments

“Statistical Analysis of Price and Basis Behavior: October 12–6, 1987,” *The Stock Market: Bubbles, Volatility, and Chaos*, E. Dwyer and R. Hafer, eds., Kluwer Academic Publishers, 1990.

Review of *Futures Markets*, *Journal of Monetary Economics*, M. Streit, ed., Vol. 16, July 1985, pp. 133–135.

Review of *Exchange Rates and International Macroeconomics*, *Journal of International Money and Finance*, J. Frenkel, ed., Vol. 4, 1985, pp. 212–214.

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Working papers

“Assessing the Risk of Securities Lending Transactions.” 1999.

Social Decoding and Ethnic Discrimination. 1996, book-length manuscript.

“Using the DCF Method to Estimate the Cross-Sectional Variation of Expected Returns.” With S. Cheng. 1995

“Testing the Tax Timing Option Theory: A New Approach.” 1984.

“Determinants of Corporate Capital Structure: An Empirical Analysis.” With J. Dietrich. 1979.

AWARDS AND HONORS

Graham and Dodd G&D Scroll Award for research on securities analysis and valuation, 2011

Bernstein Fabozzi/Jacobs Levy Award for outstanding research from *The Journal of Portfolio Management*, 2010

Graham and Dodd G&D Scroll Award for research on securities analysis and valuation (with Richard Roll), 2006

I/B/E/S award for research in empirical finance (with W. Landsman and J. Conrad), 1999

Cited as one of the 10 most prolific research authors in the field of finance in “Most Frequent Contributors to the Finance Literature” by Jean Louis Heck and Phillip L. Cooley, *Financial Management*, Autumn 1988

Financial Management Association Prize for Applied Research, 1987

Institute for Quantitative Research in Finance, Research Grant, 1984

Center for the Study of Futures Markets, Research Grant, 1983

Center for the Study of Futures Markets, Research Grant, 1981

Chicago Mercantile Exchange, Research Grant, 1979

Phi Beta Kappa, Stanford University, 1970

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

American Finance Association	1973-Present
Western Finance Association	1973-Present
Member of Board of Directors	1982-1985
Vice-President	1987
American Economic Association	1973-Present
American Statistical Association	1992-Present

SELECTED BOARD AND COMMITTEE MEMBERSHIPS

Board of Advisors: Research Affiliates LLC	2013-
Chairman, Mayor Riordan’s Blue Ribbon Commission on Los Angeles Municipal Investments	
Pension Policy Board, The Aerospace Corporation	1985-2002
Board of Directors, Forms Engineering Corporation	1976-1989
Trustee, Kellow Trust	1982-1991

SPECIAL EDUCATION PROGRAMS

The U.S. Business School in Prague – Special Finance Program	Summer 1991
The Nissan Program for Historically Black Colleges, Director	Summer 1989
The Lead Program for Business Education of Minority High School Students	1987-2004

EXHIBIT 1

Exhibit 1a

**Illustration of ROI from a Single Asset in each Year of its Life
Calculated using Straight-Line Depreciation**

<u>Year</u>	<i>A</i> <u>Cash Flows</u> (1000.00)	<i>B</i> <u>Straight-Line Depreciation</u>	<i>C = A - B</i> <u>Net Income</u>	<i>D = PrevD - PrevB</i> <u>Book Value (Beg. of Period)</u>	<i>E = C / D</i> <u>ROI</u>
1	\$117.46	\$50.00	\$67.46	\$1,000.00	6.75%
2	117.46	50.00	67.46	950.00	7.10%
3	117.46	50.00	67.46	900.00	7.50%
4	117.46	50.00	67.46	850.00	7.94%
5	117.46	50.00	67.46	800.00	8.43%
6	117.46	50.00	67.46	750.00	8.99%
7	117.46	50.00	67.46	700.00	9.64%
8	117.46	50.00	67.46	650.00	10.38%
9	117.46	50.00	67.46	600.00	11.24%
10	117.46	50.00	67.46	550.00	12.27%
11	117.46	50.00	67.46	500.00	13.49%
12	117.46	50.00	67.46	450.00	14.99%
13	117.46	50.00	67.46	400.00	16.87%
14	117.46	50.00	67.46	350.00	19.27%
15	117.46	50.00	67.46	300.00	22.49%
16	117.46	50.00	67.46	250.00	26.98%
17	117.46	50.00	67.46	200.00	33.73%
18	117.46	50.00	67.46	150.00	44.97%
19	117.46	50.00	67.46	100.00	67.46%
20	117.46	50.00	67.46	50.00	134.92%

Exhibit 1b

Illustration of ROI from a Single Asset in each Year of its Life Calculated using Economic Depreciation

Year	<i>A</i> Cash Flows (1000.00)	<i>B</i> Economic Depreciation [1]	<i>C = A - B</i> Net Income	<i>D = PrevD - PrevB</i> Book Value (Beg. of Period)	<i>E = C / D</i> ROI
1	\$117.46	\$17.46	\$100.00	\$1,000.00	10.00%
2	117.46	19.21	98.25	982.54	10.00%
3	117.46	21.13	96.33	963.33	10.00%
4	117.46	23.24	94.22	942.21	10.00%
5	117.46	25.56	91.90	918.97	10.00%
6	117.46	28.12	89.34	893.41	10.00%
7	117.46	30.93	86.53	865.29	10.00%
8	117.46	34.02	83.44	834.36	10.00%
9	117.46	37.43	80.03	800.33	10.00%
10	117.46	41.17	76.29	762.91	10.00%
11	117.46	45.29	72.17	721.74	10.00%
12	117.46	49.81	67.65	676.45	10.00%
13	117.46	54.80	62.66	626.64	10.00%
14	117.46	60.28	57.18	571.84	10.00%
15	117.46	66.30	51.16	511.57	10.00%
16	117.46	72.93	44.53	445.26	10.00%
17	117.46	80.23	37.23	372.33	10.00%
18	117.46	88.25	29.21	292.10	10.00%
19	117.46	97.07	20.39	203.85	10.00%
20	117.46	106.78	10.68	106.78	10.00%

Calculation of Economic Depreciation [1]			
Discount Rate	Discount Periods	Present Value of Cash Flows	
10%	1	106.78	106.78
10%	2	97.07	97.07
10%	3	88.25	88.25
10%	4	80.23	80.23
10%	5	72.93	72.93
10%	6	66.30	66.30
10%	7	60.28	60.28
10%	8	54.80	54.80
10%	9	49.81	49.81
10%	10	45.29	45.29
10%	11	41.17	41.17
10%	12	37.43	37.43
10%	13	34.02	34.02
10%	14	30.93	30.93
10%	15	28.12	28.12
10%	16	25.56	25.56
10%	17	23.24	23.24
10%	18	21.13	21.13
10%	19	19.21	19.21
10%	20	17.46	17.46
Present Value			1000.0

[1] Economic depreciation equals the change in the present value of remaining cash flows from one year to the next. Since this example has equal cash flows in each year, economic depreciation in the first year is equal to the present value of the last year's cash flows, economic depreciation in the second year is equal to the present value of the second to last year's cash flows, and so on.

EXHIBIT 2

Exhibit 2a

**Illustration of ROI for a Single Year from a Set of Twenty Assets of Different Vintages
Calculated using Straight-Line Depreciation**

<u>Asset Age (Beg. Of Period)</u>	<i>A</i> <u>Cash Flows</u> (1000.00)	<i>B</i> <u>Straight-Line Depreciation</u>	<i>C = A - B</i> <u>Net Income</u>	<i>D = PrevD - PrevB</i> <u>Book Value (Beg. of Period)</u>	<i>E = C/D</i> <u>ROI</u>
1	\$117.46	\$50.00	\$67.46	\$1,000.00	6.75%
2	117.46	50.00	67.46	950.00	7.10%
3	117.46	50.00	67.46	900.00	7.50%
4	117.46	50.00	67.46	850.00	7.94%
5	117.46	50.00	67.46	800.00	8.43%
6	117.46	50.00	67.46	750.00	8.99%
7	117.46	50.00	67.46	700.00	9.64%
8	117.46	50.00	67.46	650.00	10.38%
9	117.46	50.00	67.46	600.00	11.24%
10	117.46	50.00	67.46	550.00	12.27%
11	117.46	50.00	67.46	500.00	13.49%
12	117.46	50.00	67.46	450.00	14.99%
13	117.46	50.00	67.46	400.00	16.87%
14	117.46	50.00	67.46	350.00	19.27%
15	117.46	50.00	67.46	300.00	22.49%
16	117.46	50.00	67.46	250.00	26.98%
17	117.46	50.00	67.46	200.00	33.73%
18	117.46	50.00	67.46	150.00	44.97%
19	117.46	50.00	67.46	100.00	67.46%
20	117.46	50.00	67.46	50.00	134.92%
Current Year Total for All Assets			\$1,349.20	\$10,500.00	12.85%

Exhibit 2b

Illustration of ROI for a Single Year from a Set of Twenty Assets of Different Vintages Calculated using Economic Depreciation

Asset Vintage (Beg. Of Period)	<i>A</i> Cash Flows (1000.00)	<i>B</i> Economic Depreciation [1]	<i>C = A - B</i> Net Income	<i>D = PrevD - PrevB</i> Book Value (Beg. of Period)	<i>E = C / D</i> ROI
1	\$117.46	\$17.46	\$100.00	\$1,000.00	10.0%
2	117.46	19.21	98.25	982.54	10.0%
3	117.46	21.13	96.33	963.33	10.0%
4	117.46	23.24	94.22	942.21	10.0%
5	117.46	25.56	91.90	918.97	10.0%
6	117.46	28.12	89.34	893.41	10.0%
7	117.46	30.93	86.53	865.29	10.0%
8	117.46	34.02	83.44	834.36	10.0%
9	117.46	37.43	80.03	800.33	10.0%
10	117.46	41.17	76.29	762.91	10.0%
11	117.46	45.29	72.17	721.74	10.0%
12	117.46	49.81	67.65	676.45	10.0%
13	117.46	54.80	62.66	626.64	10.0%
14	117.46	60.28	57.18	571.84	10.0%
15	117.46	66.30	51.16	511.57	10.0%
16	117.46	72.93	44.53	445.26	10.0%
17	117.46	80.23	37.23	372.33	10.0%
18	117.46	88.25	29.21	292.10	10.0%
19	117.46	97.07	20.39	203.85	10.0%
20	117.46	106.78	10.68	106.78	10.0%
Current Year Total for All Assets			\$1,349.20	\$13,491.90	10.0%

Calculation of Economic Depreciation [1]		
Discount Rate	Discount Periods	Present Value of Cash Flows
10%	1	106.78
10%	2	97.07
10%	3	88.25
10%	4	80.23
10%	5	72.93
10%	6	66.30
10%	7	60.28
10%	8	54.80
10%	9	49.81
10%	10	45.29
10%	11	41.17
10%	12	37.43
10%	13	34.02
10%	14	30.93
10%	15	28.12
10%	16	25.56
10%	17	23.24
10%	18	21.13
10%	19	19.21
10%	20	17.46
Present Value		1000.0

[1] Economic depreciation equals the change in the present value of remaining cash flows from one year to the next. Since this example has equal cash flows in each year, economic depreciation in the first year is equal to the present value of the last year's cash flows, economic depreciation in the second year is equal to the present value of the second to last year's cash flows, and so on.

EXHIBIT 3

Exhibit 3
ICC'S and The Board's Revenue Adequacy Calculation
for Norfolk Southern

Year	Cost of Capital	NS ROI	Margin
1981	16.46%	9.24%	-7.22%
1982	17.70%	6.20%	-11.50%
1983	15.30%	4.67%	-10.63%
1984	15.78%	5.40%	-10.38%
1985	13.60%	8.56%	-5.04%
1986	11.70%	7.44%	-4.26%
1987	11.60%	7.39%	-4.21%
1988	11.70%	13.06%	1.36%
1989	11.50%	11.90%	0.40%
1990	11.80%	11.70%	-0.10%
1991	11.60%	6.00%	-5.60%
1992	11.40%	12.10%	0.70%
1993	11.40%	9.30%	-2.10%
1994	12.20%	11.50%	-0.70%
1995	11.70%	12.10%	0.40%
1996	11.90%	13.00%	1.10%
1997	11.80%	13.10%	1.30%
1998	10.70%	10.50%	-0.20%
1999	10.80%	5.20%	-5.60%
2000	11.00%	5.50%	-5.50%
2001	10.20%	8.30%	-1.90%
2002	9.80%	9.10%	-0.70%
2003	9.40%	9.10%	-0.30%
2004	10.10%	11.60%	1.50%
2005	12.20%	13.20%	1.00%
2006	9.90%	14.40%	4.50%
2007	11.30%	13.60%	2.30%
2008	11.75%	13.75%	2.00%
2009	10.43%	7.69%	-2.74%
2010	11.03%	10.96%	-0.07%
2011	11.57%	12.87%	1.30%
2012	11.12%	11.48%	0.36%

1981 through 2012 (Full Period, 32 years)

Mean	11.89%	10.00%	-1.89%
St dev	1.91%	2.93%	4.02%

1993 through 2012 (Most Recent 20 years)

Mean	11.02%	10.81%	-0.20%
St dev	0.83%	2.68%	2.46%

Note: Calculated as the average of N&W and NS for 1981 through 1985.

EXHIBIT 4

Exhibit 4
Railroad Industry Revenue Adequacy, 1981-2012

Year	<i>A</i> Cost of Capital	<i>B</i>		<i>C = B - A</i>									
		NS		CSXT		BNSF		UPRR		KCS		C&O	
		ROI	Margin	ROI	Margin	ROI	Margin	ROI	Margin	ROI	Margin	ROI	Margin
1981	16.46%	9.24%	-7.22%					7.41%	-9.05%	7.61%	-8.85%	5.38%	-11.08%
1982	17.70%	6.20%	-11.50%					4.43%	-13.27%	7.25%	-10.45%	5.33%	-12.37%
1983	15.30%	4.67%	-10.63%					4.66%	-10.64%	7.40%	-7.90%	4.08%	-11.22%
1984	15.80%	5.40%	-10.40%					4.30%	-11.50%	9.00%	-6.80%	4.30%	-11.50%
1985	13.60%	8.56%	-5.04%					7.34%	-6.26%	9.23%	-4.37%	11.10%	-2.50%
1986	11.70%	7.44%	-4.26%	5.46%	-6.24%			8.61%	-3.09%	8.95%	-2.75%		
1987	11.60%	7.39%	-4.21%	5.89%	-5.71%			9.99%	-1.61%	11.03%	-0.57%		
1988	11.70%	13.06%	1.36%	0.92%	-10.78%			11.19%	-0.51%	11.54%	-0.16%		
1989	11.50%	11.90%	0.40%	6.10%	-5.40%			10.30%	-1.20%	10.70%	-0.80%		
1990	11.80%	11.70%	-0.10%	6.80%	-5.00%			10.40%	-1.40%	10.80%	-1.00%		
1991	11.60%	6.00%	-5.60%	NM				1.70%	-9.90%	9.30%	-2.30%		
1992	11.40%	12.10%	0.70%	0.10%	-11.30%			11.10%	-0.30%	9.00%	-2.40%		
1993	11.40%	9.30%	-2.10%	5.20%	-6.20%			9.70%	-1.70%	13.10%	1.70%		
1994	12.20%	11.50%	-0.70%	8.10%	-4.10%			12.00%	-0.20%	8.90%	-3.30%		
1995	11.70%	12.10%	0.40%	6.50%	-5.20%			11.70%	0.00%	7.90%	-3.80%		
1996	11.90%	13.00%	1.10%	8.90%	-3.00%	8.60%	-3.30%	8.30%	-3.60%	7.20%	-4.70%		
1997	11.80%	13.10%	1.30%	9.80%	-2.00%	8.40%	-3.40%	5.20%	-6.60%	3.60%	-8.20%		
1998	10.70%	10.50%	-0.20%	8.10%	-2.60%	9.70%	-1.00%	2.90%	-7.80%	9.10%	-1.60%		
1999	10.80%	5.20%	-5.60%	3.80%	-7.00%	9.50%	-1.30%	6.80%	-4.00%	6.40%	-4.40%		
2000	11.00%	5.50%	-5.50%	3.60%	-7.40%	8.80%	-2.20%	6.90%	-4.10%	6.30%	-4.70%		
2001	10.20%	8.30%	-1.90%	4.60%	-5.60%	7.10%	-3.10%	7.60%	-2.60%	7.00%	-3.20%		
2002	9.80%	9.10%	-0.70%	5.20%	-4.60%	6.40%	-3.40%	8.60%	-1.20%	6.50%	-3.30%		
2003	9.40%	9.10%	-0.30%	4.00%	-5.40%	6.20%	-3.20%	7.30%	-2.10%	3.70%	-5.70%		
2004	10.10%	11.64%	1.54%	4.51%	-5.59%	7.43%	-2.67%	5.27%	-4.83%	8.30%	-1.80%		
2005	12.20%	13.21%	1.01%	6.23%	-5.97%	10.32%	-1.88%	6.34%	-5.86%	5.89%	-6.31%		
2006	9.94%	14.36%	4.42%	8.15%	-1.79%	11.43%	1.49%	8.21%	-1.73%	9.31%	-0.63%		
2007	11.33%	13.55%	2.22%	7.61%	-3.72%	9.97%	-1.36%	8.90%	-2.43%	9.37%	-1.96%		
2008	11.75%	13.75%	2.00%	9.34%	-2.41%	10.51%	-1.24%	10.46%	-1.29%	7.72%	-4.03%		
2009	10.43%	7.69%	-2.74%	7.30%	-3.13%	8.67%	-1.76%	8.62%	-1.81%	6.51%	-3.92%		
2010	11.03%	10.96%	-0.07%	10.85%	-0.18%	10.28%	-0.75%	11.54%	0.51%	9.77%	-1.26%		
2011	11.57%	12.87%	1.30%	11.54%	-0.03%	12.39%	0.82%	13.11%	1.54%	10.76%	-0.81%		
2012	11.12%	11.48%	0.36%	10.81%	-0.31%	13.47%	2.35%	14.69%	3.57%	9.54%	-1.58%		
Mean			-1.90%		-4.64%		-1.52%		-3.59%		-3.50%		-9.73%

Notes

"NM" means "not meaningful" and indicates that the railroad incurred operating losses.
NS is calculated as the average of N&W and NS for 1981 through 1985.

Exhibit 4 (Cont.)

Year	<i>A</i>	<i>B</i> <i>C = B - A</i>											
	Cost of Capital	Conrail		N&W		WEST MD.		AGS		Cent. of GA		CNOTP	
		ROI	Margin	ROI	Margin	ROI	Margin	ROI	Margin	ROI	Margin	ROI	Margin
1981	16.46%	0.00%	-16.46%	10.77%	-5.69%	5.72%	-10.74%	8.65%	-7.81%	9.74%	-6.72%	10.26%	-6.20%
1982	17.70%	0.00%	-17.70%	8.03%	-9.67%	5.84%	-11.86%	4.34%	-13.36%	6.24%	-11.46%	7.56%	-10.14%
1983	15.30%	3.71%	-11.59%	5.32%	-9.98%			4.79%	-10.51%	8.14%	-7.16%	9.71%	-5.59%
1984	15.80%	6.60%	-9.20%	5.20%	-10.60%			8.90%	-6.90%	10.70%	-5.10%	12.20%	-3.60%
1985	13.60%	4.88%	-8.72%	9.05%	-4.55%								
1986	11.70%	4.29%	-7.41%										
1987	11.60%	4.26%	-7.34%										
1988	11.70%	5.93%	-5.77%										
1989	11.50%	2.60%	-8.90%										
1990	11.80%	5.60%	-6.20%										
1991	11.60%	NM											
1992	11.40%	6.50%	-4.90%										
1993	11.40%	7.00%	-4.40%										
1994	12.20%	8.00%	-4.20%										
1995	11.70%	6.80%	-4.90%										
1996	11.90%	8.40%	-3.50%										
1997	11.80%	1.90%	-9.90%										
1998	10.70%	6.90%	-3.80%										
1999	10.80%												
2000	11.00%												
2001	10.20%												
2002	9.80%												
2003	9.40%												
2004	10.10%												
2005	12.20%												
2006	9.94%												
2007	11.33%												
2008	11.75%												
2009	10.43%												
2010	11.03%												
2011	11.57%												
2012	11.12%												
Mean			-7.93%		-8.10%		-11.30%		-9.65%		-7.61%		-6.38%

Exhibit 4 (Cont.)

Year	<i>A</i>	<i>B</i>		<i>C = B - A</i>									
	Cost of Capital	Clinchfield		L&N		Seaboard		SR		ATSF		BN	
		ROI	Margin	ROI	Margin	ROI	Margin	ROI	Margin	ROI	Margin	ROI	Margin
1981	16.46%	18.06%	1.60%	7.04%	-9.42%	2.10%	-14.36%	7.71%	-8.75%	4.99%	-11.47%	4.29%	-12.17%
1982	17.70%	8.02%	-9.68%	4.87%	-12.83%	1.38%	-16.32%	4.36%	-13.34%	2.66%	-15.04%	4.49%	-13.21%
1983	15.30%					4.24%	-11.06%	4.01%	-11.29%	3.29%	-12.01%	8.21%	-7.09%
1984	15.80%					5.60%	-10.20%	5.00%	-10.80%	2.80%	-13.00%	11.00%	-4.80%
1985	13.60%					7.95%	-5.65%	8.06%	-5.54%	4.29%	-9.31%	10.29%	-3.31%
1986	11.70%									4.21%	-7.49%	5.67%	-6.03%
1987	11.60%									3.58%	-8.02%	9.48%	-2.12%
1988	11.70%									5.65%	-6.05%	11.62%	-0.08%
1989	11.50%									NM		12.40%	0.90%
1990	11.80%									5.00%	-6.80%	10.90%	-0.90%
1991	11.60%									6.50%	-5.10%	NM	
1992	11.40%									1.90%	-9.50%	9.40%	-2.00%
1993	11.40%									4.70%	-6.70%	9.20%	-2.20%
1994	12.20%									7.40%	-4.80%	11.80%	-0.40%
1995	11.70%									5.30%	-6.40%	6.30%	-5.40%
1996	11.90%												
1997	11.80%												
1998	10.70%												
1999	10.80%												
2000	11.00%												
2001	10.20%												
2002	9.80%												
2003	9.40%												
2004	10.10%												
2005	12.20%												
2006	9.94%												
2007	11.33%												
2008	11.75%												
2009	10.43%												
2010	11.03%												
2011	11.57%												
2012	11.12%												
Mean			-4.04%		-11.13%		-11.52%		-9.94%		-8.69%		-4.20%

Exhibit 4 (Cont.)

Year	<i>A</i>	<i>B</i>	<i>C = B - A</i>										
	Cost of Capital	CNW		MILW		D&RG		B&O		MKT		MP	
		ROI	Margin	ROI	Margin	ROI	Margin	ROI	Margin	ROI	Margin	ROI	Margin
1981	16.46%	2.16%	-14.30%	0.00%	-16.46%	8.09%	-8.37%	2.37%	-14.09%	11.81%	-4.65%	7.98%	-8.48%
1982	17.70%	0.00%	-17.70%	0.00%	-17.70%	4.53%	-13.17%	0.35%	-17.35%	6.96%	-10.74%	6.03%	-11.67%
1983	15.30%	4.74%	-10.56%	-1.05%	-16.35%	2.91%	-12.39%	0.02%	-15.28%	6.53%	-8.77%	4.88%	-10.42%
1984	15.80%	3.10%	-12.70%	5.20%	-10.60%	0.80%	-15.00%	2.90%	-12.90%	5.40%	-10.40%	3.60%	-12.20%
1985	13.60%	1.96%	-11.64%			5.62%	-7.98%	4.28%	-9.32%	2.17%	-11.43%	6.21%	-7.39%
1986	11.70%	2.10%	-9.60%			4.45%	-7.25%			1.85%	-9.85%		
1987	11.60%	3.22%	-8.38%			2.34%	-9.26%			6.83%	-4.77%		
1988	11.70%	10.45%	-1.25%			6.87%	-4.83%						
1989	11.50%	8.20%	-3.30%										
1990	11.80%	7.20%	-4.60%										
1991	11.60%	7.10%	-4.50%										
1992	11.40%	10.30%	-1.10%										
1993	11.40%	10.50%	-0.90%										
1994	12.20%	10.70%	-1.50%										
1995	11.70%												
1996	11.90%												
1997	11.80%												
1998	10.70%												
1999	10.80%												
2000	11.00%												
2001	10.20%												
2002	9.80%												
2003	9.40%												
2004	10.10%												
2005	12.20%												
2006	9.94%												
2007	11.33%												
2008	11.75%												
2009	10.43%												
2010	11.03%												
2011	11.57%												
2012	11.12%												
Mean			-7.29%		-15.28%		-9.78%		-13.79%		-8.66%		-10.03%

Exhibit 4 (Cont.)

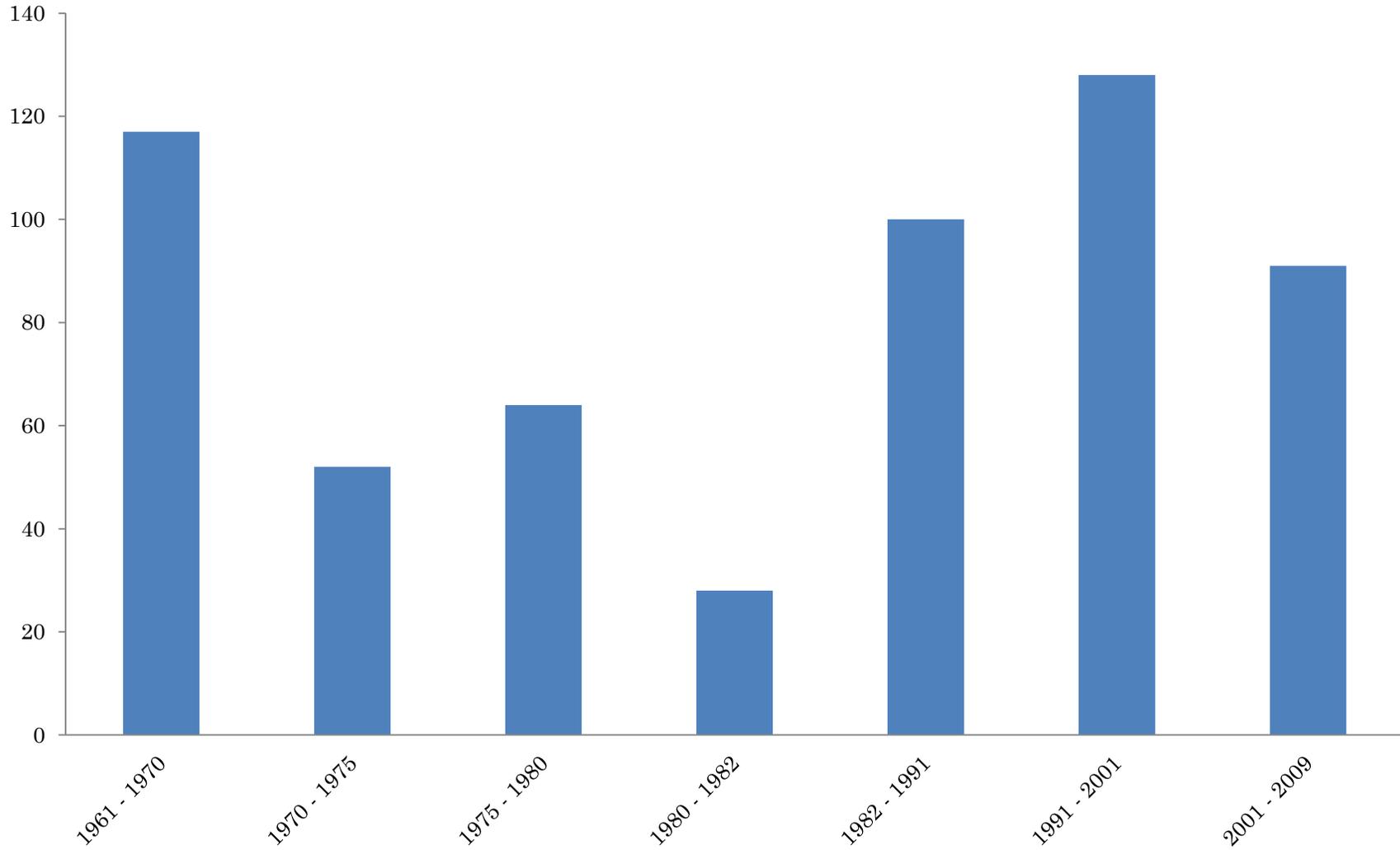
Year	<i>A</i> Cost of Capital	<i>B</i> <i>C = B - A</i>		SP		WP	
		ST.L.-SW ROI	Margin	ROI	Margin	ROI	Margin
1981	16.46%	3.93%	-12.53%	0.50%	-15.96%	0.00%	-16.46%
1982	17.70%	4.20%	-13.50%	0.00%	-17.70%	0.00%	-17.70%
1983	15.30%	3.33%	-11.97%	-1.68%	-16.98%	-10.16%	-25.46%
1984	15.80%	1.60%	-14.20%	-0.70%	-16.50%	0.20%	-15.60%
1985	13.60%	3.19%	-10.41%	0.67%	-12.93%	NM	
1986	11.70%	4.31%	-7.39%	NM			
1987	11.60%	6.34%		0.97%	-10.63%		
1988	11.70%			NM			
1989	11.50%			0.90%	-10.60%		
1990	11.80%			5.70%	-6.10%		
1991	11.60%			NM			
1992	11.40%			3.50%	-7.90%		
1993	11.40%			0.70%	-10.70%		
1994	12.20%			7.20%	-5.00%		
1995	11.70%			1.30%	-10.40%		
1996	11.90%						
1997	11.80%						
1998	10.70%						
1999	10.80%						
2000	11.00%						
2001	10.20%						
2002	9.80%						
2003	9.40%						
2004	10.10%						
2005	12.20%						
2006	9.94%						
2007	11.33%						
2008	11.75%						
2009	10.43%						
2010	11.03%						
2011	11.57%						
2012	11.12%						
Mean			-11.67%		-11.78%		-18.81%

EXHIBIT 5

Exhibit 5a

The duration of a business cycle is random

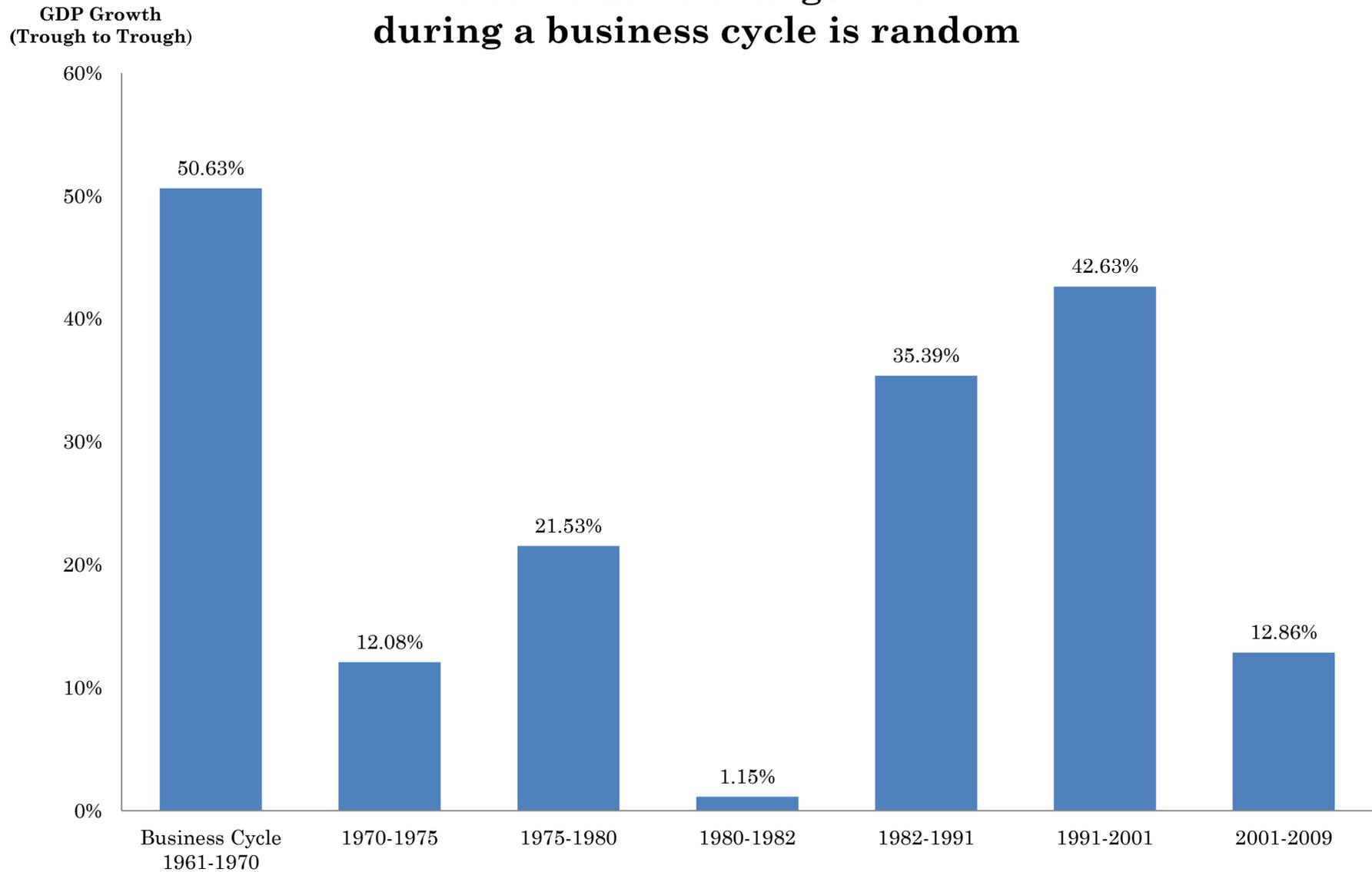
Length of Business Cycle
(Months - Trough to Trough)



Source: NBER

Exhibit 5b

The cumulative change in GDP during a business cycle is random



Source: NBER

EXHIBIT 6

Exhibit 6a

Average long-run ROI may equal the cost of capital only when ROI is allowed to fluctuate above the cost of capital

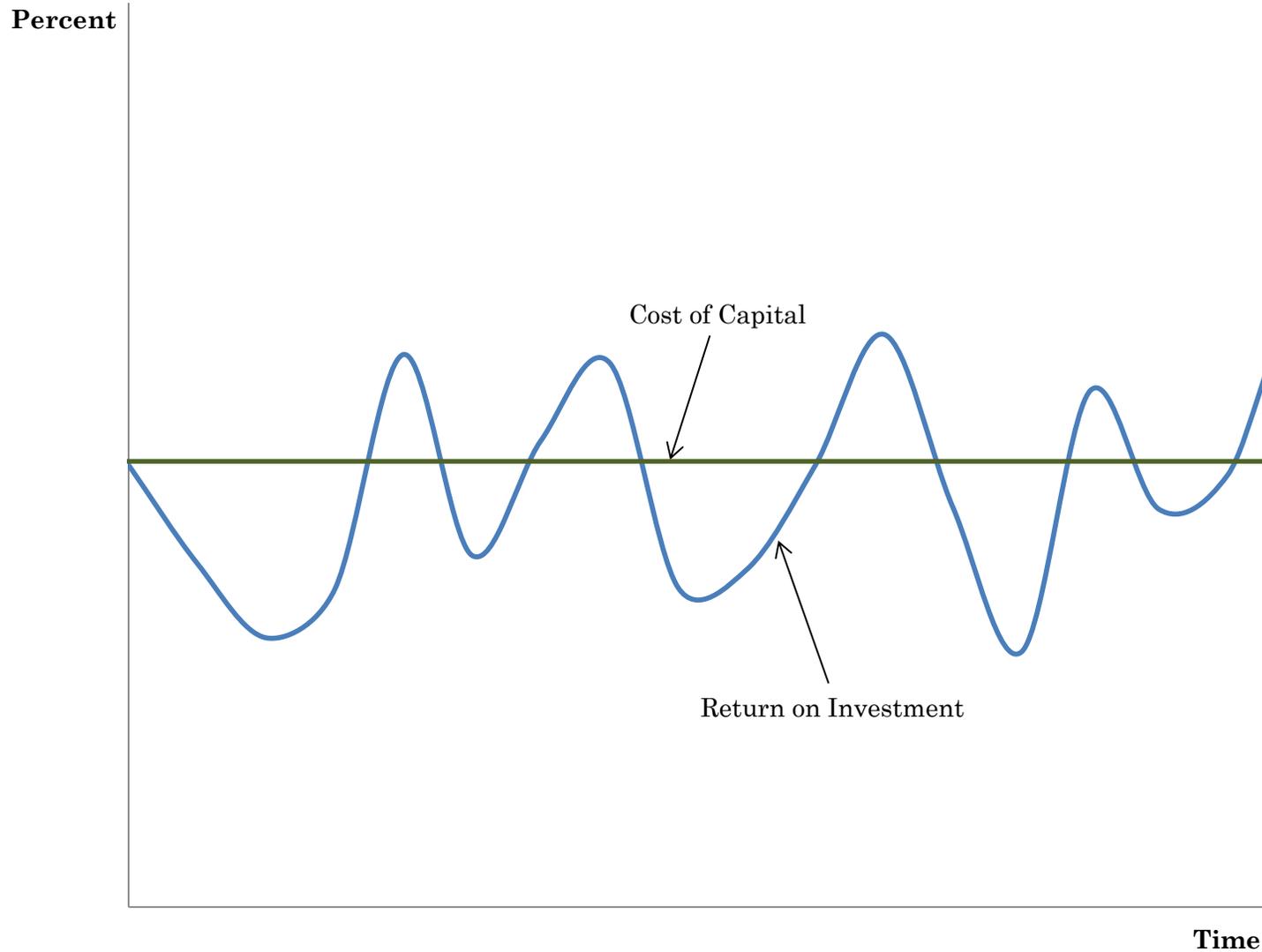
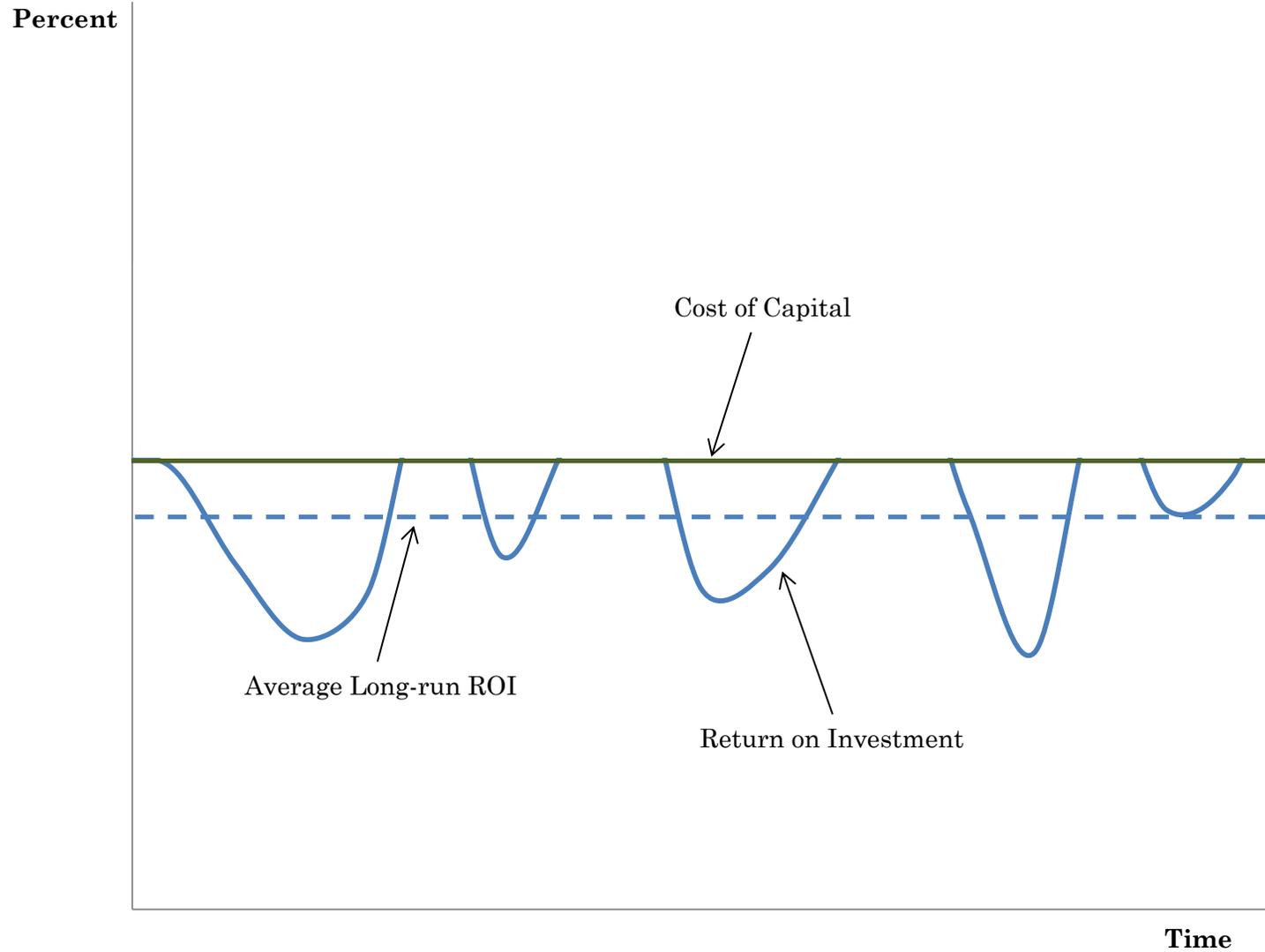


Exhibit 6b

Average long-run ROI will fall below cost of capital when it is capped at the cost of capital



VERIFIED STATEMENT OF
PROFESSOR DAVID SAPPINGTON

**BEFORE THE
SURFACE TRANSPORTATION BOARD
Docket No. EP 722**

RAILROAD REVENUE ADEQUACY

**VERIFIED STATEMENT
OF
PROFESSOR DAVID SAPPINGTON**

September 5, 2014

Regulatory Policy Design in the U.S. Railroad Industry

by Professor David Sappington

I. Background Information

My name is David Sappington. I am an eminent scholar in the Department of Economics at the University of Florida, and the Director of the University's Public Policy Research Center.

Since earning my Ph.D. in economics from Princeton University in 1980, I have served on the faculties of the University of Michigan and the University of Pennsylvania and on the technical staff of Bell Communications Research. I have also served as the Chief Economist for the Federal Communications Commission and as the President of the Industrial Organization Society. I presently hold positions on the editorial boards of six major journals, including the *Journal of Regulatory Economics*, the *Rand Journal of Economics*, the *Review of Industrial Organization*, and the *Journal of Economics and Management Strategy*.

My research focuses on the optimal design of incentive structures, with particular emphasis on the design and implementation of regulatory policy. I have analyzed the strengths and weaknesses of a variety of regulatory policies in different industries and in different countries. I have published more than one hundred and fifty articles in leading journals in the profession and have coauthored a book on *Designing Incentive Regulation for the Telecommunications Industry*. My curriculum vitae appears as an attachment to this report.

II. Purpose and Outline of this Report

The Surface Transportation Board ("the Board") has instituted a proceeding "to discuss the Board's methodology in fulfilling its statutory mandate to determine railroad revenue adequacy, as well as the revenue adequacy component of the Board's standards for judging the reasonableness of rail freight rates, with a view to what, if any, changes the Board can and should consider" (Surface Transportation Board, 2014, p. 4). I have been asked by Norfolk Southern Railway Company ("Norfolk Southern") to assess the appropriate design of regulatory policy in the U.S. railroad industry, with particular emphasis on the revenue adequacy component of the Board's rate reasonableness standards. This report summarizes my assessment.

Section III of this report offers some perspective for my assessment by reviewing recent trends in regulatory policy in other industries. Section IV explains the rationale for these trends. Section V explores the appropriate design of regulatory policy in the U.S. railroad industry. Section VI provides concluding observations.

For clarity, I summarize my primary conclusions as follows:

1. Regulation to protect shippers that lack effective competition in the U.S. railroad industry should be designed to replicate the disciplining forces of competition.
2. The Board's regulation presently provides strong protection to shippers that lack effective competition, and can reasonably be viewed as replicating the disciplining forces of competition.
3. Additional stringent earnings regulation motivated by revenue adequacy considerations would fail to replicate the disciplining forces of competition.
4. Such regulation would increase operating costs, raise regulatory costs, and stifle innovation in the U.S. railroad industry, to the detriment of shippers and those who purchase commodities shipped by rail.
5. Any additional regulation that considers the earnings railroads achieve in serving shippers that enjoy the protection of effective competition would harm all shippers and seriously undermine recent progress in the U.S. railroad industry.

III. Regulators Have Been Moving Away from Stringent Profit Regulation

Every industry has its own idiosyncrasies, and no single regulatory policy is ideal in all industries. Nevertheless, to assess the design of appropriate policy in the U.S. railroad industry, it is instructive to briefly review trends in regulatory policy in other regulated industries.

The primary trend in many regulated sectors – including the telecommunications and energy sectors – is away from rate of return regulation toward alternative forms of regulation that are commonly referred to as “performance based regulation.”¹ Rate of return regulation (RORR) can be viewed as closely matching the regulated supplier's revenues to its realized production costs, thereby limiting the supplier's earnings to what are deemed to be “normal” earnings. In contrast, performance based regulation (PBR) can be viewed as allowing revenues to diverge from realized costs, thereby allowing the regulated supplier to secure extra-normal earnings if it can, for example, achieve exceptional reductions in operating costs.

Prior to 1985, U.S. regulators in all fifty states employed RORR to regulate the intra-state activities of telecommunications suppliers.² State regulators began experimenting with PBR in

¹ Alternatives to rate of return regulation are also commonly referred to as “incentive regulation.”

² The Federal Communications Commission (FCC) also employed rate of return regulation to regulate the interstate earnings of AT&T.

1986.³ By 1995, only 18 states were still employing RORR for this purpose. This number shrank to 7 by the turn of the century (Sappington, 2002, p. 237). As of 2007, only 3 states still employed RORR in their telecommunications sectors (Sappington and Weisman, 2010).

The U.S. electricity sector has experienced a corresponding, though somewhat less dramatic, trend. Prior to 1980, U.S. state regulators employed RORR almost exclusively to regulate the intra-state operations of electricity suppliers. By 2001, at least 16 states were employing PBR to regulate these operations (Sappington et al., 2001). The use of PBR in the U.S. electricity sector has continued to expand throughout this century.⁴

PBR has also been displacing RORR in other countries and in other sectors.⁵ To illustrate, as early as 1994, PBR was being employed in the UK to regulate airports and suppliers of water and natural gas (Armstrong et al., 1994, p. 165).⁶ Joskow (2008, p. 552) reports the widespread use of PBR to regulate “electric, gas, telephone and water utilities in the UK, New Zealand, Australia, and portions of Latin America.” Makhholm et al. (2012) document the widespread use of PBR in the Canadian electricity and natural gas sectors.⁷

IV. The Rationale for Moving Away from Stringent Profit Regulation

The trend away from stringent earnings regulation in many industries reflects an important principle that is relevant in all industries, including the U.S. freight railroad industry. The principle is that all parties – suppliers and customers alike – can gain when the prospect of extra-normal earnings is employed to motivate regulated suppliers to deliver exceptional performance in the marketplace.

³ The FCC implemented PBR to regulate AT&T’s interstate operations in 1989 (Sappington and Weisman, 1996, pp. 82-83). (All references in this report are further identified and compiled in Attachment A hereto.)

⁴ Lowry (2007), Joskow (2008), and Makhholm et al. (2012) provide numerous examples of settings where PBR has been implemented to regulate the operations of electricity suppliers.

⁵ Sappington (1994, p. 245) observes that “[i]ncentive regulation has replaced rate of return regulation as the norm in many industries.” Similarly, Carson (2010, p. iv) notes that “PBR has replaced traditional rate of return (ROR) regulation for utility rate regulation in many jurisdictions across the world.”

⁶ As Cunha Marques (2010, p. 209) reports, PBR is also employed in the water sector in many countries other than the UK.

⁷ Kirkpatrick et al. (2005) note the extensive use of PBR in the telecommunications and energy sectors of the transition economies of Albania, Algeria, Barbados, Botswana, Brazil, Cameroon, Colombia, Estonia, Gabon, Georgia, Ghana, Guinea Bissau, India, Jamaica, Jordan, Kenya, Lithuania, Malawi, Mexico, Morocco, Nicaragua, Nigeria, Oman, Pakistan, the Philippines, Romania, South Africa, South Korea, Sri Lanka, Tanzania, Thailand, Uganda, Uruguay, Venezuela, Zambia, and Zimbabwe.

Strict earnings regulation in general, and RORR in particular, reflects the misguided premise that regulators serve consumers well by systematically precluding regulated suppliers from securing anything more than normal earnings. This premise ignores the fact that a policy that limits a supplier to normal earnings – regardless of its performance – provides the supplier with little or no incentive to excel in the marketplace. In particular, stringent earnings regulation provides no incentive for the regulated firm to engage in the challenging, costly processes of discovering more efficient means of operation and identifying and fulfilling the needs and desires of consumers.

The more enlightened philosophy underlying PBR is that all parties can gain when regulated suppliers are motivated by the prospect of financial reward to discover innovative ways to operate more efficiently and to serve the best interests of consumers.⁸ Indeed, the prospect of extra-normal earnings is precisely what drives producers in competitive markets to innovate and serve the best interests of consumers.⁹

V. The Design of Regulatory Policy in the U.S. Railroad Industry

The recent experience in other regulated industries and the rationale for this experience have important implications for the appropriate design of regulatory policy in the U.S. railroad industry.

A. Regulatory policy should replicate the disciplining forces of competition

In an industry where many actual or potential rivals compete to serve customers, no regulation is needed to induce suppliers to serve the best interests of consumers.¹⁰ The financial rewards that accompany success in the marketplace motivate suppliers to continually strive to reduce their operating costs, to develop new and improved services, and generally to serve the

⁸ As Weisman and Pfeifenberger (2003, pp. 58-59) observe, “the broad appeal of incentive regulation is precisely that the realized efficiency gains can benefit regulated firms and consumers alike. In other words, because incentive regulation is not a zero-sum game, higher profits and lower prices need not be mutually exclusive.” Similarly, Sappington (1994, p. 269) notes “it is essential to recognize that incentive regulation can provide gains for both consumers and producers in the regulated industry. It is important that gains for regulated producers not be viewed as losses for customers: such a perspective can lead to lost opportunities for all parties.”

⁹ As Weisman and Pfeifenberger (2003, pp. 56-57) observe, the “performance incentives fostered by competitive markets derive from the profit motive. The quest for such profits ultimately benefits society as producers strive to supply the goods and services that consumers want at the lowest possible cost.”

¹⁰ Viscusi et al. (1992, p. 2) note that “If we existed in a world that functioned in accordance with the perfect competition paradigm, there would be little need for antitrust policies and other regulatory efforts.” Sappington and Weisman (1996, p. 3) observe that regulation “is appropriate only if competition in the industry is insufficient to drive all industry participants to pursue social goals.”

best interests of consumers (Schumpeter, 1942). In this sense, competition is the ideal regulator of industry activities, and additional regulation should be avoided when industry competition is sufficiently intense.¹¹ In industries like the railroad industry, though, the massive infrastructure required to supply high-quality service precludes the profitable operation of a large number of suppliers. Even when only a single railroad supplies relevant rail services, though, the railroad may still have to compete against other modes of transportation, including trucks, barges, and pipelines. Nevertheless, where effective competition is absent, regulation can sometimes play a useful role in substituting for the discipline that competition would otherwise impose on industry suppliers.

In settings where regulation is needed as a substitute for competition, regulatory policy typically should be designed to replicate the disciplining forces of competition. Indeed, “the single most widely accepted rule for the governance of regulated industries is regulate them in such a way as to produce the same results as would be produced by effective competition, if it were feasible” (Kahn, 1970, p. 17). Stated slightly differently, it is an “almost universally accepted... principle ... that the proper role of regulation is [to] substitute for competitive market forces where those forces are weak or absent” (Baumol and Sidak, 1994, p. 5).¹²

B. The Board’s prevailing policy approximates market discipline

The Surface Transportation Board presently implements a policy that can be viewed as approximating the discipline competition would impose on railroads. As per its mandate from Congress, the Board relies on market forces to govern the prices charged to shippers that have meaningful transportation choices from rail or other transportation modes, and thus enjoy the protection of effective competition.¹³ Therefore, the Board’s policy appropriately restricts its regulation to the prices railroads charge to shippers that are deemed to lack effective competition.

The Board’s regulation of these prices entails a form of PBR that reflects the “constrained market pricing” principles adopted by the Interstate Commerce Commission (ICC, 1985). This regulation is designed to afford shippers that lack effective competition the protection they

¹¹ Kahn (2002, p. 53) concludes that the “experience of the airlines, telecommunications and electricity industries over the last 30 years amply documents the superiority of competition over comprehensive regulation.”

¹² Similarly, Weisman’s (2006, p. 7) second principle of regulatory policy design states that “Economic regulation should serve as a surrogate for competition.”

¹³ Congress has declared that “In regulating the railroad industry, it is the policy of the United States Government ... to allow, to the maximum extent possible, competition and the demand for services to establish reasonable rates for transportation by rail” (49 U.S.C. § 10101). Furthermore, a rail carrier that is not found to have market dominance “may establish any rate for transportation or other service provided by the rail carrier” (49 U.S.C. § 10701(c)).

would enjoy in a contestable market.¹⁴ This protection exceeds the protection the shippers would secure in a competitive market in an important respect. Entry barriers (e.g., the costs of securing essential right-of-way permits) are not present in contestable markets. Consequently, potential suppliers typically face lower costs in a contestable market than in a competitive market, and so will charge lower prices to consumers. By prohibiting a railroad from charging a shipper more than the shipper would face in a contestable market,¹⁵ the Board's policy provides pronounced protection to shippers that lack effective competition.^{16,17}

C. The Board is apparently considering asymmetric earnings regulation

The Board presently is considering whether to augment this pronounced protection with additional restrictions on the prices railroads can charge to shippers that lack effective competition. In particular, with regard to “the revenue adequacy component of the Board’s standard for judging the reasonableness of rail freight rates,” the Board is apparently contemplating whether these shippers should be permitted to demand prices below the prices that would prevail in a contestable market whenever a railroad is earning more than a specified level of earnings.¹⁸

¹⁴ In a contestable market, new suppliers will enter the industry and attract all consumers if the incumbent supplier is charging prices that allow it to earn more than the minimum return required to attract industry investment. Consequently, an incumbent supplier can only earn the minimum return required for ongoing industry operation in a contestable market. See (Baumol et al., 1982) for a detailed development of the theory of contestable markets.

¹⁵ Under the Board’s policy, a railroad cannot charge a shipper that lacks effective competition more than the cost a hypothetical efficient railroad would incur in serving the shipper. Because the authorized price does not reflect the railroad’s own cost of serving the shipper, the Board’s policy is a form of PBR that provides strong incentives for the railroad to operate efficiently.

¹⁶ Potential suppliers in contestable markets also have ready access to the most advanced, most efficient production technologies. The intense competition that prevails among potential suppliers in contestable markets ensures that all of the cost savings admitted by the advanced technologies accrue to customers in the form of lower prices.

¹⁷ The classic model of perfect competition does not provide the best caricature of the railroad industry. In this model, many suppliers actively serve customers and each supplier operates at a small scale with relatively limited fixed costs of production (i.e., costs that do not vary with the level of the supplier’s output). In practice, the typical railroad operates with very large fixed costs. Consequently, a more appropriate model of competition in the railroad industry is one in which few suppliers operate, but the threat of entry limits the active suppliers to recovering their costs, which include relevant fixed costs and sunk costs (i.e., costs a supplier cannot recover if it terminates its operations). Hausman and Myers (2002) demonstrate how failure to account adequately for the sunk costs that prevail in the railroad industry can result in regulated prices that are substantially below relevant operating costs.

¹⁸ The Board notes the ICC’s unsupported and unexplained suggestion that “carriers do not need greater revenues than this [revenue adequacy] standard permits” (Surface Transportation Board, 2014, p. 3).

This additional regulation can be referred to as *asymmetric earnings* (AE) regulation. AE regulation is asymmetric in the sense that it would place an upper bound on the earnings a railroad can achieve in serving shippers that lack effective competition without implementing a corresponding lower bound on the railroad's earnings. The regulation would thereby limit a railroad's financial gains without stemming its financial losses. In doing so, AE regulation would function much like RORR, except that it would fail to provide the protection against unusually meager earnings that RORR often provides.

D. Asymmetric earnings regulation does not replicate the discipline of competition and would increase operating costs in the railroad industry

As regulators in many industries around the world have recognized in abandoning RORR, stringent earnings regulation has the potential to seriously impede industry performance. AE regulation in the U.S. railroad industry would diminish industry performance, to the detriment of all shippers.

AE regulation would harm shippers in part by encouraging higher operating costs in the railroad industry. When a supplier's potential earnings are restricted, the supplier has limited incentive to enhance its earnings, and so has limited incentive to reduce its operating costs.¹⁹ Consequently, AE regulation would promote higher industry costs and corresponding higher industry prices.²⁰

Depending on the details of its implementation, AE regulation also can motivate railroads to employ factors of production (e.g., capital and labor) in combinations that fail to minimize production costs. Regulation that constrains a supplier's earnings by specifying an authorized return on capital investments can induce the supplier to employ excessive capital in the production process. When the authorized return on capital exceeds the supplier's true cost of capital, the supplier can increase its earnings by employing more than the cost-minimizing level of capital.²¹ The resulting higher production costs can lead to higher prices for customers.

¹⁹ Cost reductions generate higher earnings, *ceteris paribus*. Under the "constrained market pricing" principles adopted by the Interstate Commerce Commission (ICC, 1985), the rates a railroad charges to captive shippers are not linked to the railroad's own realized costs. Instead, the rates reflect the costs of an efficient stand-alone railroad. Consequently, in contrast to AE regulation, the Board's current regulatory policy presents railroads with strong incentives to operate efficiently.

²⁰ Posner (1969), Baumol and Klevorick (1970), Beesley and Littlechild (1989), Braeutigam and Panzar (1989), Brennan (1989), Kaserman and Mayo (1995, p. 478), and Newbery (1999, p. 38) are among the many scholars who observe that earnings regulation can limit incentives for cost containment.

²¹ This conclusion is demonstrated formally by Averch and Johnson (1962), Wellisz (1963), and Baumol and Klevorick (1970), among others.

An even more severe problem arises when the regulator under-estimates the supplier's true cost of capital. In this event, AE regulation will limit a supplier's ability to attract the capital it requires to maintain its infrastructure and deliver high-quality service to its customers. AE regulation can thereby jeopardize both the financial integrity of the regulated supplier and its ongoing ability to provide high-quality service to its customers.²²

These drawbacks to regulation that constrains a supplier's earnings prevail even when the regulation is symmetric, i.e., even when the regulation limits the downside financial risk a supplier faces in addition to limiting its upside earnings potential. Asymmetric regulation compounds these undesirable incentives. Innovation generally entails risk because the ultimate success of a project (e.g., the design and implementation of a new, potentially lower-cost production process) typically cannot be predicted perfectly. In settings where a supplier stands to gain little if a project succeeds but faces the full financial consequences of a failed project, the supplier will be highly reluctant to undertake the project at all. Consequently, AE regulation would lead to particularly limited incentives for innovation in the railroad industry.

E. Asymmetric earnings regulation stifles both product and process innovation

AE regulation would stifle incentives for product innovation, just as it would limit incentives for cost reduction. Suppliers that are not shackled by stringent earnings regulation have strong financial incentive to enhance the quality of existing service and develop new products and services that consumers value highly. A consumer will pay a higher price for a service he values more highly, and higher prices can enhance a supplier's earnings. When its authorized earnings are restricted, though, a supplier has limited incentive to identify, develop, and introduce new products and services, regardless of how highly consumers might value the product innovations.²³

The propensity for stringent earnings regulation to stifle innovation and limit valued infrastructure investment is widely recognized. The United States Congress, for example, explicitly instructs the Federal Communications Commission and state telecommunications regulators to consider alternatives to stringent earnings regulation in order to "encourage the deployment on a reasonable and timely basis" of the infrastructure required to deliver high-speed

²² RORR also can limit a supplier's ability to attract capital if regulators inappropriately exclude prudent capital investments from the supplier's rate base, and thereby deny the supplier a return on these investments. The prospect of such inappropriate exclusion can undermine RORR's potential strength in attracting capital (Armstrong and Sappington, 2007, p. 1608) and thereby further the case against RORR (Lowry, 2007).

²³ Brennan (1989) and Sappington and Weisman (1996, p. 5), among others, observe that earnings regulation can limit incentives for product innovation.

Internet service.²⁴ There is also considerable empirical evidence that stringent earnings regulation inhibits investment and innovation. To illustrate, in reviewing the relevant economic literature, Guthrie (2006, p. 928) reports that in the telecommunications industry, “Investment in network “modernization” ... is greater under incentive regulation than rate of return regulation.”²⁵ Similarly, Cambini and Rondi (2010, p. 1) report that the “investment rate is higher under incentive regulation than under rate of return regulation” in the European Union’s energy sector.²⁶

F. Asymmetric earnings regulation would require frequent, comprehensive, and inherently arbitrary allocation of each railroad’s overhead costs

AE regulation that limits a railroad’s earnings in serving shippers that lack effective competition also would require ongoing, comprehensive allocation of a railroad’s joint and common costs. The costs that a railroad incurs in serving shippers that lack effective competition must be calculated in order to determine the railroad’s earnings in serving these shippers. Consequently, in order to implement AE regulation, the Board would need to allocate the entirety of each railroad’s overhead costs on an ongoing basis. It would no longer suffice to allocate selective overhead costs only when a shipper that lacks effective competition challenges a proposed rate.

Such comprehensive, ongoing cost allocation would be a monumental undertaking that is far more challenging and burdensome than the occasional allocation of the common costs associated with a small subset of the facilities employed to serve an individual shipper that lacks effective competition. To illustrate, Norfolk Southern’s railroad network spans 20,000 route miles in 22 states and exhibits wide variation in traffic density due in part to the heterogeneity of the many thousands of distinct shippers that Norfolk Southern serves. Any sensible procedure that might be employed to allocate all of the common costs in such a massive network between shippers that lack effective competition and those that do not would be cumbersome, complex, controversial, and costly.

²⁴ Section 706 of the Telecommunications Act of 1996 (Pub. L. No. 104-104, 110 Stat. 56 (codified at 47 U.S.C. §§ 151 *et seq.*)) states in part “The Commission and each State commission with regulatory jurisdiction over telecommunications services shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans ... by utilizing ... price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment.”

²⁵ See Greenstein et al. (1995) and Ai and Sappington (2002), for example, for estimates of the extent to which stringent earnings regulation limits investment in modern telecommunications infrastructure.

²⁶ Cambini and Rondi (2006, p. 20) also report that investment tends to be more pronounced under forms of PBR that place less stringent controls on authorized retail prices.

Such a cost allocation procedure also would be inherently arbitrary. As Braeutigam (1980, p. 182) observes, “shared costs cannot be unambiguously identified with individual products, so that any rule selected to associate shared costs with individual services will be arbitrary.”²⁷ The largely arbitrary nature of allocating the joint and common costs of an entire railroad infrastructure would render highly questionable both the corresponding estimate of a railroad’s earnings in serving shippers that lack effective competition and the associated prices these shippers would face.

Any cost allocation rules that were ultimately adopted also could encourage railroads to implement technologies that do not minimize industry operating costs. To illustrate, if a relatively small proportion of common costs are counted as costs of serving shippers that lack effective competition, then railroads might gain financially by adopting production technologies that entail inefficiently low common costs and inefficiently high service-specific costs of serving shippers that lack effective competition. The resulting relatively high costs of serving these shippers can increase the prices they pay for rail transport.²⁸

G. Regulators recognize the many drawbacks to AE regulation

As is apparent from their observed behavior in moving away from RORR and toward PBR, regulators are well aware of the many drawbacks to stringent earnings regulation. To illustrate, the U.S. Federal Communications Commission (FCC) has observed:

Traditional “cost-plus” rate of return regulation focuses on establishing a reasonable limit on the carriers’ profits. The limitations and drawbacks of such “cost plus” regulation include distorted incentives in capital investment, encouragement of cost shifting when the carrier also participates in more competitive markets, and little incentive to introduce new and innovative services.²⁹

Similarly, the Massachusetts Department of Public Utilities (MDPU) has explained:

[T]he defects of traditional COS/ROR regulation are well known. The “cost-plus” approach under COS/ROR regulation contributes to (1) lack of incentive for cost control, through its inherent bias favoring expenditures which can be passed through to customers; (2) inflexible and less than efficient pricing; (3) persistent cross-subsidies among service classifications; (4) inefficient allocation of resources; (5) poor asset

²⁷ McKie (1970, p. 12) notes that “Cost allocations are arbitrary, as everyone knows.” Rates based on allocated costs unavoidably inherit the arbitrary nature of cost allocation.

²⁸ See Brennan (1990). The rules employed to allocate common costs also can provide inappropriate incentives for railroads to unduly expand or contract the services they deliver to non-captive shippers. See Braeutigam and Panzar (1989, 1993), for example.

²⁹ Federal Communications Commission, *Price Cap Performance Review for AT&T*. Notice of Inquiry. CC Docket 92-134, 7 FCC Rcd 5322, 1992, p. 5322.

performance; (6) risk-averse management; and (7) disincentives for innovation. COS/ROR regulation is also a costly method of regulation, and is characterized by long lags both in reflecting and controlling actual utility operations and their costs.³⁰

The Alberta Utilities Commission (AUC) has noted:

[R]ate-base rate of return regulation offers few incentives to improve efficiency, and produces incentives for regulated companies to maximize costs and inefficiently allocate resources. In addition, rate-base rate of return regulation is increasingly cumbersome in an environment where some companies offer both regulated and unregulated services ... These conditions complicate the task for regulators who must critically analyze in detail management judgments and decisions that, in competitive markets and under other forms of regulation, are made in response to market signals and economic incentives. The role of the regulator in this environment is limited to second guessing. Traditional rate-base rate of return regulation provides few opportunities to create meaningful positive economic incentives which would benefit both the companies and the customers.³¹

H. Asymmetric earnings regulation must not harm shippers that already benefit from effective competition

As the AUC observes, earnings regulation is fraught with particular difficulty when, as is the case in the U.S. railroad industry, suppliers offer both regulated and unregulated services. As noted above, the Board only regulates prices charged to shippers that lack effective competition. Much of the transport services railroads supply are delivered to shippers that enjoy the protection of effective competition. To illustrate, I am informed that less than 22% of the traffic that the Norfolk Southern Railway carries presently is subject to potential rate regulation.³²

Any assessment of a railroad's revenue adequacy for the purpose of assessing the reasonableness of rail freight rates charged to shippers that lack effective competition must be restricted to an assessment of the railroads' earnings in serving those shippers. An assessment that considers the railroad's overall earnings, i.e., its earnings that include those from movements over which the STB has no jurisdiction, would be entirely inappropriate and profoundly unwise.

³⁰ Massachusetts Department of Public Utilities, "Investigation by the Department on its Own Motion into the Theory and Implementation of Incentive Regulation for Electric and Gas Companies under its Jurisdiction." D.P.U. 94-158, February 24, 1995, p. 8. "COS/ROR regulation" denotes "cost of service/rate of return regulation."

³¹ Alberta Utilities Commission, "Rate Regulation Initiative: Distribution Performance-Based Regulation," *Decision 2012-237*, Application No. 1606029, Proceeding ID No. 566, September 12, 2012, section 1.2, paragraph 14.

³² Verified Statement of Michael R. Baranowski on behalf of Norfolk Southern filed in this proceeding.

A policy that bases rates for shippers that lack effective competition on a railroad's overall earnings would effectively confiscate the railroad's earnings in serving shippers with effective competition in order to finance rate reductions for certain shippers below the levels that would prevail in a contestable market. Such an over-reaching regulatory policy would export the deleterious consequences of earnings regulation from a sizable, yet limited, sector of the railroad industry (shippers that lack effective competition) to the entire industry. In doing so, the over-reaching policy would limit the incentives of railroads to compete vigorously against one another and against all other suppliers of shipping services. Such diminished competition would deprive shippers of the many benefits of effective competition and thereby impose substantial harm on these shippers.³³

If, despite the serious harms it will cause, AE regulation is imposed in the railroad industry, it will be imperative to limit the associated damage to the segment of the railroad industry that lacks effective competition, to the maximum extent possible. If the rate relief granted to shippers that lack effective competition under AE regulation were to reflect a railroad's earnings in serving all shippers, then the regulation would effectively tax, and thereby stifle, the innovation, productivity gains, and cost reductions the railroad achieves in serving all shippers. Such expansion of the unavoidable damages from AE regulation to the effectively competitive segments of the railroad industry would cause significant widespread harm and threaten to reverse the substantial progress the industry has achieved in recent years.³⁴ Therefore, if AE regulation is imposed, any associated rate relief granted to shippers that lack effective competition should reflect only a railroad's earnings in serving those shippers.

VI. Conclusion

In summary, stringent earnings regulation entails significant drawbacks that are well known to academicians and regulators alike. Any attempt to add such regulation to the strong protection shippers that lack effective competition already enjoy is likely to seriously impede performance in the railroad industry, to the long-term detriment of all shippers and those who purchase shipped commodities.

The U.S. railroad industry has made substantial progress in recent years. The railroads' earnings have improved even as inflation-adjusted rail rates have declined significantly since the passage of the Staggers Act of 1980. The improved earnings have enabled railroads to reinvest

³³ McKie (1970) and Kahn (2002) decry the tendency of regulation to expand beyond the boundaries of the settings in which it serves a useful purpose.

³⁴ The Association of American Railroads (2014, p. 1) reports that since the passage of the Staggers Rail Act of 1980 “[inflation-adjusted] average rail rates have fallen 42 percent, train accident rates are down 79 percent, [and] rail traffic volume has nearly doubled.”

more than half a trillion dollars in their operations.³⁵ This investment has produced important innovations of substantial benefit to shippers and the public generally. For example, I understand that Norfolk Southern has implemented a new remote control locomotive technology (which enables remote control of a locomotive's operation), next-generation dispatching systems (which help to limit network congestion and delay), and state-of-the-art process control systems (which help to ensure that cars are routed to appropriate tracks in a safe and efficient manner).³⁶

Innovations like these, increased industry investment, declining real prices, and improved safety performance all reflect in part a successful regulatory policy in the U.S railroad industry.³⁷ The demonstrated success of the policy cautions against major changes, particularly changes that would introduce the well-known, deleterious consequences of stringent earnings regulation.

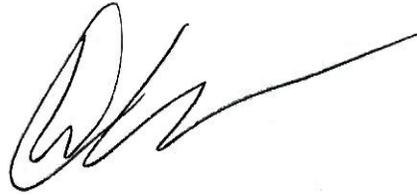
³⁵ *Id.*

³⁶ Verified Statement of Deborah H. Butler on behalf of Norfolk Southern filed in this proceeding.

³⁷ The Association of American Railroads (2014, p. 1)

VERIFICATION

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

A handwritten signature in black ink, appearing to read 'D. Sappington', with a long horizontal stroke extending to the right.

Executed: September 5, 2014

DAVID SAPPINGTON

EXHIBIT 1

Attachment A: References

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2001 – 2002	Chief Economist, Federal Communications Commission.
1989 – 1990	Matherly Professor of Economics, Department of Economics, University of Florida.
1989 – 1990	District Manager, Economics Research Group, Bell Communications Research.
1988 – 1989	Visiting Lecturer with Title of Full Professor, Department of Economics, Princeton University.
1984 – 1989	Member of Technical Staff, Economics Research Group, Bell Communications Research.
1982 – 1986	Assistant Professor, Department of Economics, University of Pennsylvania.
1980 – 1982	Assistant Professor, Department of Economics and Institute of Public Policy Studies, University of Michigan.

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1993 – Present	<i>Journal of Economics and Management Strategy</i>	(Co-Editor).
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1983 – 2012	<i>Economics Letters</i>	(Advisory Editor).
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1996 – 1999	<i>The American Economic Review</i>	(Board of Editors).
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1988 – 1992	<i>The American Economic Review</i>	(Board of Editors).

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- “Designing Input Prices to Motivate Process Innovation,” *The International Journal of Industrial Organization*, Vol. 27(3), May 2009, pp. 390-402 (with Y. Chen).
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- “Innovation in Vertically Related Markets,” *The Journal of Industrial Economics*, Vol. 58(2), June 2010, pp. 373-401 (with Y. Chen).
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- “On the Performance of Endogenous Access Pricing,” *The Journal of Regulatory Economics*, Vol. 44(3), December 2013, pp. 237-250 (with K. Fjell and D. Pal).
- “The Impact of Public Ownership in the Lending Sector,” *The Canadian Journal of Economics*, forthcoming (with A. Bose and D. Pal).
- “Contracting with Private Knowledge of Production Capacity,” *The Journal of Economics and Management Strategy*, forthcoming (with L. Chu).
- “Welfare-Enhancing Fraudulent Behavior,” *The Review of Accounting Studies*, forthcoming (with H. Lin).
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“Introduction,” to *Information Economics: Critical Concepts in Economics. Volumes I – IV*. New York, NY: Routledge, 2014 (with M. Baye).

HONORS AND AWARDS:

- | | |
|-------------|---|
| 2011 – 2013 | Research Foundation Professorship, University of Florida. |
| 2003 | Distinguished Service Award, Public Utility Research Center, University of Florida. |
| 2000 | Faculty Honoree, Anderson Scholars Program, University of Florida. |
| 1998 | Professorial Excellence Program Award, University of Florida. |
| 1997 – 1999 | Research Foundation Professorship, University of Florida. |
| 1992 | Research Achievement Award, University of Florida. |
| 1976 | Inducted into the Phi Beta Kappa Society. |

REFEREE/REVIEWER FOR:

Accounting Review	Economic Design
Addison Wesley, Publishers	Economic Inquiry
American Economic Journal:	Economics Letters
Economic Policy	Economic Theory
American Economic Review	Energy Economics
American Law and Economics Review	Energy Journal
American Enterprise Institute	Encyclopedia of Law and Economics
Bell Journal of Economics	European Economic Review
Berkeley Electronic Press Journal of	European Journal of Operational Research
Economic Analysis and Policy	Games and Economic Behavior
Bulletin of Economic Research	Harcourt Brace, Publishers
Cambridge University Press	International Economic Review
China Economic Review	Information Economics and Policy
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Economic Journal	Industrial Organization
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Law and Economics
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Journal of Accounting Research
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Journal of Economic Behavior and
Organization
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Strategy
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Management
Journal of Health Economics
Journal of Industrial Economics
Journal of International Economics
Journal of Law and Economics
Journal of Law, Economics and
Organization
Journal of Marketing Research
Journal of Policy Analysis and Management
Journal of Political Economy
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Research in Labor Economics
Review of Economic Studies
Review of Economics and Statistics
Review of Industrial Organization
Review of Network Economics
Sloan Foundation
Southern Economic Journal
Telecommunications Policy
Utilities Policy
World Bank Economic Review

SELECTED ADDITIONAL EXPERIENCE:

- 1997 – Present Instructor in *The International Training Program on Utility Regulation and Strategy*, sponsored by
The World Bank and Florida's Public Utility Research Center.
- 2014 Advisor to EPCOR Utilities Incorporated on
The Design of Performance Based Regulation in the Energy Sector.
- 2014 Advisor to Norfolk Southern Corporation on
The Design of Regulatory Policy in the Railroad Industry.
- 2014 Advisor to DISH Network on
The Design of Competition Policy in Broadband and Media Markets.
- 2013 – Present Advisor and Expert Witness for the Alliance of Automobile
Manufacturers On the Design of Legislation Affecting the Automobile
Industry.
- 2013 Advisor to AT&T on
The Design of Spectrum Auctions.
- 2013 Advisor to Telefonica on
The Design of Price Cap Regulation in Peru.
- 2013 Advisor to the National Grid Service Company on
The Design of Service Quality Standards in the Electricity Sector.
- 2011 Advisor to Leap Wireless International on
Competition Policy in the Wireless Communications Industry.
- 2011 Advisor to Telstra Corporation, Ltd. on the Design of
Access Pricing Policy in Australia's Telecommunications
Industry.
- 2010 Advisor to COFETEL, Mexico's Telecommunications Regulator,
on
Competition Policy in Mexico's Communications Industry.
- 2010 Advisor to the U.S. Federal Communications Commission on
Incentive Regulation and Broadband Deployment.
- 2009 Advisor to the OECD on
Competition Policy in Mexico's Communications Industry.

2009 Advisor to Afilias on the Design of Policy to Assign Internet Names and Addresses.

SELECTED ADDITIONAL EXPERIENCE (CONTINUED):

2008 – 2009 Advisor and Expert Witness for AT&T on the Design of Competition Policy in the U.S. Telecommunications Industry.

2008 Member of Advisory Committee to the “Electronic Health Information Exchange Project,” sponsored by the National Governors Association.

2008 Advisor to United States Cellular Corporation on the Design of Telecommunications Universal Service Policy.

2007 – 2008 Advisor to United Parcel Service on the Design of Regulatory Policy in the Postal Industry.

2006 – 2007 Advisor to Earthlink, Inc. on the Design of Telecommunications and Internet Competition Policy.

2006 – 2007 Advisor to Telstra Corporation, Ltd. on the Design of Competition Policy in Australia’s Telecommunications Industry.

2005 – 2006 Advisor to General Communication, Inc. on the Design of Telecommunications Competition Policy.

2005 Advisor to United Parcel Service on Competition Policy in the U.S. Postal Industry.

2004 – 2005 Advisor to the Antitrust Division of the U.S. Department of Justice on Competition Policy in the Telecommunications Industry.

2004 Advisor to OSIPTEL, Peru’s Telecommunications Regulatory Agency, on the Design of Price Cap Regulation

2003 – 2004 Advisor to SBC, Inc. on the Design of Performance Measurement Systems in the U.S. Telecommunications Industry.

2003 Presented Invited Testimony to the President’s Commission on the United States Postal Service.

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- 2003 Advisor to General Communication, Inc. on the Design of Universal Service and Competition Policy.
- 2001 Advisor to CONATEL, Ecuador's Central Regulatory Body on the Design of Telecommunications Policy.
- 2000 – 2001 Advisor to Ameren UE on the Design of Incentive Regulation for Electric Utilities.
- 1999 – 2000 Advisor to the Antitrust Division of the U. S. Department of Justice on a Proposed Merger in the Communications Industry.
- 1998 – 2000 Consultant and Expert Witness for United Parcel Service on Postal Industry Pricing.
- 1998 – 2000 Advisor to the World Bank on Telecommunications Privatization in Africa.
- 1996 Consultant and Expert Witness for TELUS Communications, Inc. on the Design of Price Cap Regulation.
- 1995 Advisor and Expert Witness for GTE-California on Incentive Regulation and Telecommunications Competition Policy.
- 1992 – 1994 Advisor to the Southern Bell Telephone Company on the Design of Incentive Regulation.
- 1992 Advisor to the New York State Public Service Commission on Incentive Regulation in the Electric Power Industry.

August 2014

VERIFIED STATEMENT OF

DEBORAH H. BUTLER

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

STB Ex Parte No. 722

RAILROAD REVENUE ADEQUACY

VERIFIED STATEMENT OF DEBORAH H. BUTLER

My name is Deborah H. Butler. I am the Executive Vice President of Planning and Chief Information Officer for Norfolk Southern Corporation (“NS”). I joined NS in 1978 and worked for one year in the accounting department and twenty-eight years in various positions in the operating department in Atlanta, Georgia, before assuming my current duties and relocating to Norfolk, Virginia, in 2007. I graduated from Agnes Scott College with a degree in English literature, hold executive education certifications from Northwestern University and Duke University and completed the advanced management program at Harvard University. I also recently completed a term as chair of the executive committee of the Transportation Research Board. The responsibilities of my present position include leading NS’s real estate, sustainability, strategic planning and information technology initiatives.

As part of those duties, I chair NS’s Future Track Steering Committee, comprised of Vice Presidents from across the company. NS’s Future Track plan outlines long-term business strategies and gives NS the flexibility to update goals annually to respond to unexpected changes in U.S. and global economic conditions. The Committee’s mission is to help the railroad improve performance in six broad areas: safety, service, asset utilization, fuel efficiency, revenue growth, and workforce productivity. The processes we’re using in Future Track are making the

railroad safer, more efficient, more productive, and more profitable. At some level, one or more of these processes is going to touch every single employee on the railroad. NS's commitment to this area reflects the importance we place on maintaining a competitive edge in an era of rapidly changing business markets.

Innovation, adaptability, and technology are key components in many of the processes NS is advancing to improve network efficiency and productivity. The following summarizes several of the initiatives currently underway at NS:

- **UNIFIED TRAIN CONTROL SYSTEM (“UTCS”) / MOVEMENT PLANNER**

UTCS is our next-generation dispatching system, and together with its Movement Planner component, it is the equivalent of an air traffic control system for our railroad. Constantly looking up to 8 hours into the future, UTCS and Movement Planner use advanced algorithms to formulate a comprehensive movement plan that minimizes network congestion and delay and maximizes schedule adherence from a system perspective. While a single NS dispatcher is responsible for train movements over a 100- to 200-mile territory, the computer-based UTCS and Movement Planner are designed to plot train routes across the entire network. The software evaluates thousands of pieces of data — such as topography, train length, tonnage, track characteristics and potential conflicts that could cause delays — to determine the best way to get a train to its destination. This lets NS run more trains over a given line segment and at faster average speeds, while at the same time providing more consistent windows of opportunity for our track maintenance forces to keep our right of way in top condition. Improved customer service is another benefit of UTCS, because as the velocity and reliability of the train network improves, on-time performance improves as well.

Increased velocity also improves freight capacity without laying new track or buying more locomotives and rail cars. UTCS has the potential to improve network velocity by 2-4 mph, or between 10% and 20%. Past studies have shown that each 1 mph improvement in velocity produces around \$200 million in avoided capital expense, plus millions more in operating savings. UTCS provides robust disaster recovery capability as well, giving NS the ability to dispatch any train from any division on the system if one or more divisions are offline.

NS has worked to develop and refine UTCS and Movement Planner with industry partner GE Transportation, the manufacturer of both technologies. In 2013, NS completed rollout of the base UTCS dispatching system on all eleven operating divisions. By mid-year 2014, Movement Planner was operational on all or parts of eight of the operating divisions, and rollout will continue through early 2015.

- **LOCOMOTIVE ENGINEER ASSIST DISPLAY AND EVENT RECORDER (“LEADER”)**

LEADER is a locomotive-based energy management system that helps our engineers make better train handling decisions by providing real-time coaching on performance against an optimal “golden run” for a route. Developed by New York Air Brake Corp., LEADER monitors the train’s location, track topology, speed, acceleration, and in-train forces and recommends optimal operations for throttling, braking, and minimum and maximum speeds with the goal of optimizing fuel efficiency and adherence to schedule. For example, following LEADER’s cues, the engineer learns to back off the throttle before reaching the top of a hill, allowing the train’s momentum to carry it over the crest and descend at a slower pace. In contrast, an engineer’s instinct is to power up the hill and apply the brake after it crests, which burns more fuel and puts additional stress on the tracks – exactly what LEADER is designed to correct. NS first began testing LEADER in 2003. By end of 2013, LEADER was installed on 63 percent of the

railroad's road locomotives, and NS has seen, on average, an approximate 7 percent fuel-efficiency advantage when a LEADER-equipped locomotive is used as the lead unit in a consist of locomotives. During 2014 and 2015, we expect to continue installing LEADER units on our road locomotive fleet, and to train substantially all of the company's approximately 7,000 locomotive engineers on the use of LEADER. We are also starting work on future iterations of the technology that will permit automatic throttle control, automatic consist management, and eventual integration with UTCS to optimize both velocity and energy usage.

- **ALGORITHMIC BLOCKING AND CLASSIFICATION (“ABC”) NEXT GENERATION**

The ABC system is the classification model that determines the blocks in which each freight car will travel and is responsible for the safe and efficient routing of nearly 170,000 cars through our network on a daily basis. ABC Next Generation is a more advanced car routing algorithm that will consider train and yard capacity. This provides the ability to route traffic to minimize extra trains, low-volume trains, and annulments, while avoiding yards experiencing heavy volumes. Additionally, the new algorithm not only takes into account the number of miles that a car would travel but also the time it will take as it looks for alternate routes and dynamically changes traffic flows to avoid potential bottlenecks in the network. The end result is improved asset utilization and reduced operational variability, providing more consistent performance for our customers.

- **GEOSPACIAL INFORMATION SYSTEM**

This project entailed the creation of a comprehensive database that includes information about the location of every siding, switch, signal, bridge, tunnel, crossing, and other infrastructure on our system. NS mapped our entire system by using a low-flying helicopter

outfitted with remote laser technology, high-resolution digital cameras, video, and a GPS device to collect GPS information and digital images of the entire network, allowing us to pinpoint the location of every piece of infrastructure on the network. The mapping required three years to finish, wrapping up in 2011. We are now integrating this information with our various enterprise operating systems – UTCS/Movement Planner, LEADER, PTC – allowing every system that relies on geo-spatial data to pull from this single source. Our industrial development and real estate departments are also benefitting from new applications built on the GIS platform.

- **TOP-OF-RAIL (“TOR”) FRICTION MODIFICATION**

TOR systems apply friction modifier material directly to the top of both rails in order to lower the friction between the cars’ wheels and the rail. A solar panel powers the computer-based system, saving on energy costs and allowing the system to be used in remote locations. As a train approaches, the wheel sensor activates the system. A water-soluble material similar in consistency to toothpaste is dispensed on the rail running surface as a train passes, easing friction between wheels and rail. This process reduces the energy needed to move the train and the lateral curving forces that cars generate in curves. Rail corridors equipped with TOR Friction Modification generate an estimated 2 percent in fuel savings, in addition to reducing maintenance costs on both tracks and wheels. By the end of 2013, the company had installed 965 of these systems, including 51 during 2013. In addition, NS installed 65 solar-powered gage-face rail lubricators in 2013, which dispense grease onto passing wheel flanges to reduce friction between the flanges and the inside face of the rail – the gauge – on curves.

- **REMOTE INTELLIGENT TERMINAL (“RIT”)**

RIT allows conductors and operations employees to use a wireless, handheld device to send and receive work assignments in near real time. In the past, a conductor would fill out paper forms to update the status of rail cars, then fax the information to NS’s Operations Service and Support Center in Atlanta for processing. RIT allows the conductor to update the status of cars electronically while in the field, eliminating transcription errors and other problems inherent in paper transmission and reporting. As a result, the car location and status information provided by RIT is available to our customers much more quickly to assist in their supply chain management decisions. More accurate car inventories improve asset utilization and customer satisfaction by eliminating time-consuming reconciliation of information on paper forms and giving our train and engine employees more time to switch cars and serve customer needs. NS began developing RIT in 2009 for a test group of 30 conductors and completed the rollout across NS’s 22-state network during third-quarter 2013.

- **THOROUGHBRED EQUIPMENT ASSET MANAGEMENT SYSTEM (“TEAMS”)**

Among the major computer systems just beginning development is a new empty railcar distribution system that promises to significantly improve the availability of cars to our customers for loading and to improve utilization of the billions of dollars worth of railcar assets that operate on our network. TEAMS will simplify and improve our customers’ freight car ordering experience and permit the generation of on-demand reports of the location and expected arrival times of empty railcars that have been selected to fill the orders. The information in these reports will help our customers more effectively plan their work and schedule their loading crews. A complex optimization model will work in the background to select the right empty cars

to fill each order and to insure the cars are routed most efficiently and economically to the customer's siding.

- **OPTIMIZED TERMINAL CONTROL SYSTEM (“OPTCS”)**

Another significant new system in development is OPTCS, which is designed to enable best-practice processes in our intermodal terminals that will increase asset utilization, reduce the cost of operations, increase terminal capacity, and improve customer service. The system includes processes that will permit the real-time exchange of information with truck drivers entering and leaving the terminal area and increase trailer/container inventory accuracy and visibility. Better gate and yard management will improve utilization of the railcars used in intermodal service. And the improved operating systems will provide the foundation for the development of optimization models to further improve yard throughput and “load planning,” the process of selecting the right containers to ride on the right platforms.

- **CONSOLIDATED LOCAL PLANNING SYSTEM (“CLPS”)**

NS already has a state-of-the-art block and train planning and scheduling system for its road trains. When complete late in 2015, CLPS will extend the same scheduling discipline and reliability to the six hundred local trains that operate on our railroad each day. Our customers will have a true “dock to dock” schedule against which we and they can measure the performance of every railcar shipped on our network. And enterprise operating systems like UTCS/Movement Planner, LEADER and our Thoroughbred Yard Enterprise System (TYES) will function more effectively with more accurate predictive information about the yard and local train network.

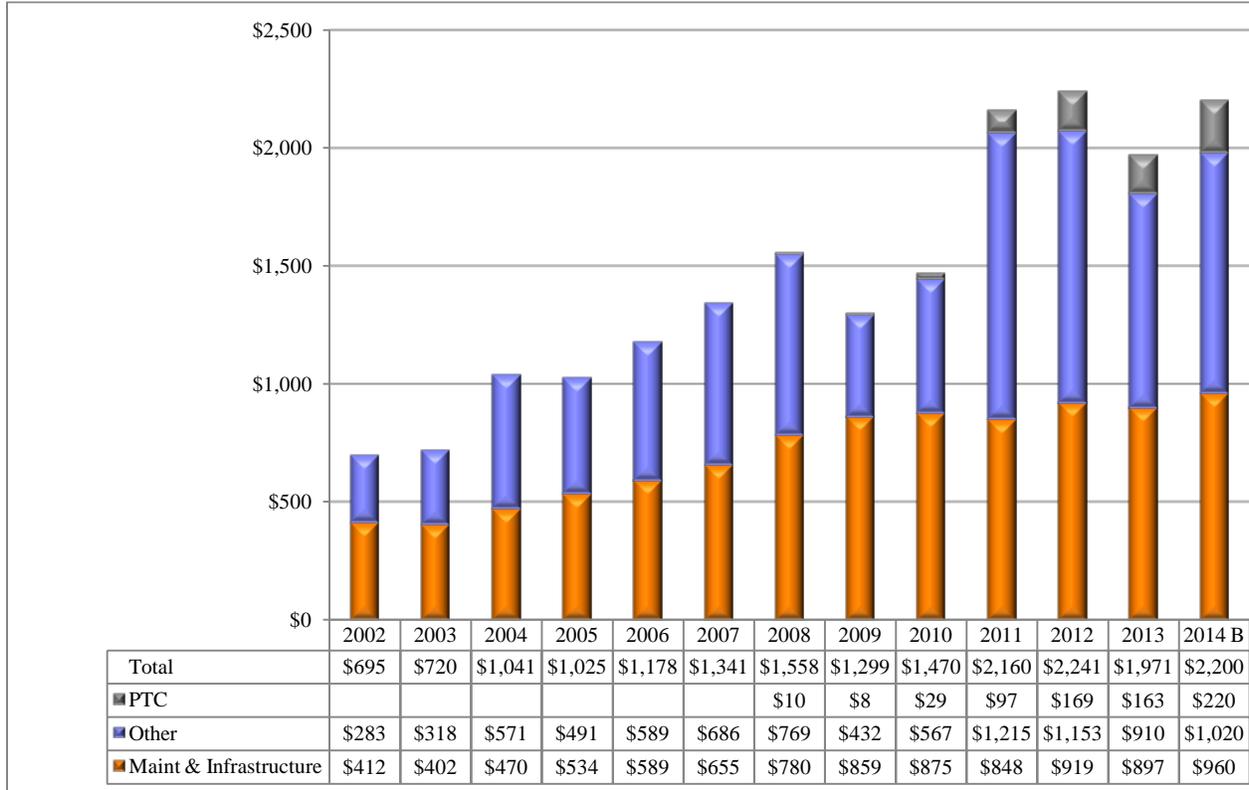
- **BATTERY POWERED LOCOMOTIVES**

NS's No. 999 was the first all-electric, battery-powered locomotive in the United States. NS began work on NS 999 in 2007, and the prototype came online in 2009. NS continues to use it to study and test ways to prolong battery life to improve performance and reliability. NS 999 also features "regenerative" braking technology that helps recharge the batteries while it operates. The system works by converting the kinetic energy created when the locomotive's dynamic brake is applied into a power source that is stored in the batteries – similar to the way hybrid automobiles work. By contrast, conventional diesel locomotives blow off the energy as heat. In addition to the NS 999, the company continues to research development of a hybrid electric six-axle long-haul locomotive. Research and innovation with battery-powered locomotives provide an avenue towards clean, alternative-powered locomotives that could one day help improve air quality and save on fuel costs.

* * *

These innovations work hand-in-hand with the massive capital investments undertaken by NS to improve network efficiency and productivity. As shown below, NS has been steadily increasing its capacity investment to record levels in recent years, growing the annual investment from \$700 million to \$2.2 billion (a 315% increase over a single decade).

Figure 1: Norfolk Southern Total Capital Expenditures (2002 to Present)



The Board witnessed this winter how capacity constraints in one region of the country can have broad ripple effects on network fluidity. One area of longstanding concern is the Chicago gateway. This December, NS will complete its massive \$162 million yard expansion in Bellevue, Ohio. As shown below, the Bellevue Yard stands at a crossroads of NS’s key northern route structure. Merchandise traffic moving between Chicago, St. Louis, Kansas City, and points east of Bellevue move through this critical yard.

Figure 2: Bellevue Yard Expansion

This massive yard expansion will require 38.5 miles of new track, 149 new turnouts, 10 miles of new service roads, the installation of 162 new power switches, and the installation of a new hump control system. The benefits to network fluidity are expected to be pronounced. One of the key benefits of this project will be diverting over-heading freight away from Elkhart, IN (located outside of Chicago), thereby freeing up capacity in and through that congested gateway.

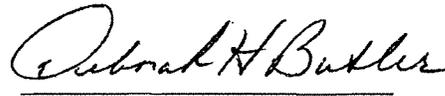
Technological innovations like those described above, or the more traditional yet equally important on-the-ground investments like those in the Bellevue Yard, are critical undertakings so that NS will remain able to serve the public's growing appetite for efficient, safe, and environmentally friendly freight rail service. But like all investment, technological innovations entail risk. Some will exceed expectations, others will prove to either be more expensive to implement or take longer to realize the desired benefits. I urge the Board to take care not to

impose more regulations on NS that would discourage the company from undertaking these kinds of investment where supported by the commercial marketplace.

Verification

I, Deborah H. Butler, verify under penalty of perjury that I am Executive Vice President Planning and Chief Information Officer of Norfolk Southern Corporation, that I have read the foregoing document and know its contents, and that the same is true and correct to the best of my knowledge and belief.

Executed on September 2, 2014

A handwritten signature in cursive script that reads "Deborah H. Butler". The signature is written in black ink and is positioned above a horizontal line.

Deborah H. Butler

VERIFIED STATEMENT OF
MICHAEL R. BARANOWSKI

**BEFORE THE
SURFACE TRANSPORTATION BOARD
Docket No. EP 722**

RAILROAD REVENUE ADEQUACY

**VERIFIED STATEMENT
OF
MICHAEL R. BARANOWSKI**

September 5, 2014

I. Introduction

I am Michael R. Baranowski. I am a Senior Managing Director of FTI Consulting, leading its Network Industries Strategies practice with offices at 1101 K Street, NW, Washington, DC 20005. A statement of my qualifications is set forth in Exhibit MRB-1 to this statement. I have been asked by counsel for Norfolk Southern Railway Company (NS) to conduct two analyses on behalf of NS for use in this proceeding. For the first analysis, I was asked to quantify (1) the amount of NS railroad traffic that is exempt from rate review because the Surface Transportation Board (STB or Board) had determined that this traffic had sufficient competitive alternatives to make regulation unnecessary, and (2) the amount of NS railroad traffic with revenues that are less than 180 percent of variable costs. For the second analysis, I was asked to calculate the average economic life of NS's railroad assets and their estimated remaining life.

II. NS Traffic Exempt From STB Regulation and Traffic With Revenues Below 180 Percent of Variable Costs

The vast majority of NS traffic falls outside the rate jurisdiction of the Board, either because it is exempt from rate regulation or because the traffic has a revenue-to-variable cost (R/VC) ratio that falls below 180%. Over time, the STB has exempted from regulation the transportation of specific commodities,¹ as well as certain types of transportation.² Using the Board's 2012 confidential Carload Waybill Sample, I have determined that 34 percent of NS's carload shipments, as well as all of NS's intermodal shipments, are exempt from STB regulation because of findings that they are subject to effective competition.

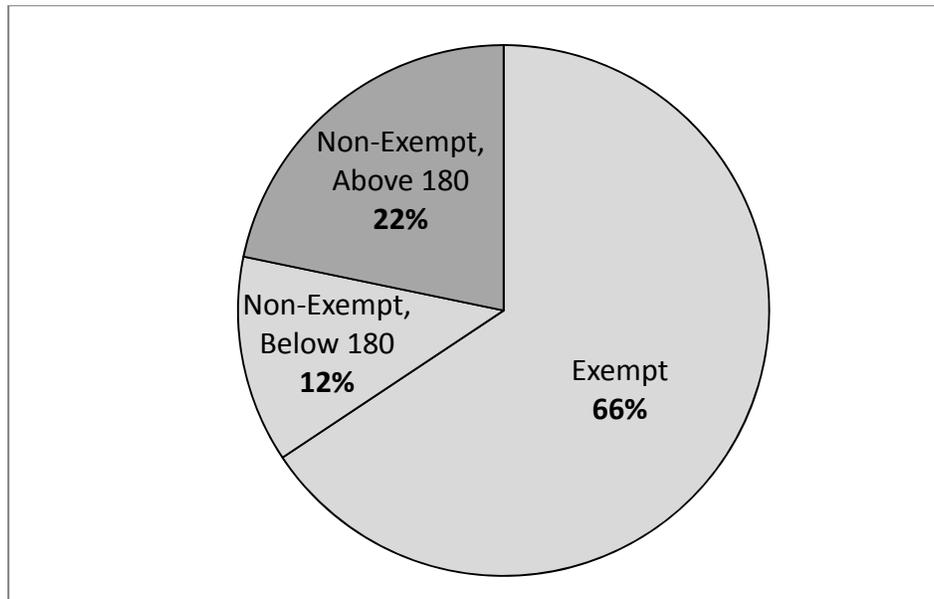
¹ For example, motor vehicles parts and accessories under 49 CFR 1039.11 and a variety of agricultural commodities under 49 CFR 1039.10

² For example, containerized intermodal traffic, 49 CFR 1090, and boxcar shipments, 49 CFR 1039.14

Similarly, Congress has declared that traffic with revenues that are less than 180 percent of URCS variable costs are subject to “effective competition” and are therefore not subject to rate regulation. Using the same 2012 Confidential Waybill Sample, I have determined that 50 percent of NS’s terminated carload shipments and 94 percent of NS’s terminated intermodal shipments have revenues that are less than 180 percent of their associated URCS variable costs.³

Figure 1 below summarizes my results. The figure shows that 66 percent of all shipments are exempt from rate regulation and an additional 12 percent of shipments are not exempt but have R/VC ratios below 180, meaning that 78 percent of NS’s shipments are not subject to rate regulation.

Figure 1: 2012 NS Shipments



³ Only NS terminated shipments (or Rule 11 moves) have unmasked revenue in the CWS provided by the Board. These comprise 91% of NS’s carload traffic and 94% of NS’s intermodal traffic.

Additional details of my calculations of the relative proportions of NS exempt shipments and shipments with revenues below 180 percent of the associated URCS variable costs are set forth in Exhibit MRB-2.

III. Average Age and Remaining Life of NS Assets

Based on data reported in NS’s 2013 Annual R-1 Report on gross investment, depreciation rates, and accumulated depreciation for NS’s road property and equipment accounts, I have calculated the following average age, remaining life, and total life for NS’s railroad assets based on economic depreciation as:

Table 1: Average Age and Remaining Life of NS Assets

2013 NS Average Asset Age and Remaining Life Based on Economic Depreciation			
	Road	Equipment	Total
Average Life	30.2	23.2	27.6
Average Age	7.6	8.5	8.0
Average Remaining Life	22.6	14.7	19.6

To derive the results in the above table, I first determined the average asset life for each road and equipment account based on the inverse of the annual composite depreciation rate stated in column (d) of Schedule 332. Next, I calculated an annual annuity payment required to recover the gross investment for each account over its average asset life. The annuity calculation is based on my calculation of the average asset life for each asset category and the STB’s 2013 railroad industry cost of capital of 11.32%.⁴ I then summed the annual annuity payments across all asset categories and solved for the average economic life, which is defined as the number of annual payments required to fully recover the total gross asset investment.

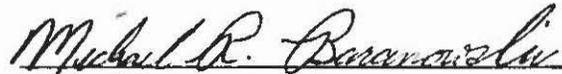
⁴ See STB Decision Ex Parte 558 Sub-No. 17 decided on 7/31/2014, “RAILROAD COST OF CAPITAL – 2013”

I calculated the average remaining economic life of the NS assets by first calculating the unamortized portion of the original gross investment for each asset category based on the average estimated life, average age,⁵ and STB 2013 railroad industry cost of capital. I then summed the remaining economic values across all asset categories and calculated the average remaining economic life by calculating the number of annual annuity payments required to amortize fully the remaining economic values. I then subtracted the average remaining life from the average life to arrive at the estimated age. Additional details of my calculations of the average life and average remaining life of NS's assets are set forth in Exhibit MRB-3.

⁵ Average age for each asset category was determined by dividing accumulated depreciation reported in column (g) of Schedule 335 by gross investment in column (h) of Schedule 330, then multiplying by the annual composite depreciation rate reported in column (d) of Schedule 332.

I declare under penalty of perjury that the foregoing is true and correct. I further certify that I am qualified and authorized to sponsor and file this statement.

Executed on September 4, 2014



Michael R. Baranowski

EXHIBIT 1

Michael R. Baranowski

Senior Managing Director – Economic Consulting

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FTI Consulting
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EDUCATION

B.S. in Accounting, Fairfield University

Supplemental Finance Studies, Kean College

Mike Baranowski heads FTI's Network Industries Strategies practice and provides strategic, financial and economic consulting services to the telecommunications and railroad and pipeline transportation industries. He has special expertise in analyzing and developing complex costing and cash flow models, conducting detailed operations analysis, and transportation engineering. Much of his work involves providing oral and written expert testimony before courts, arbitration panels and regulatory bodies.

He is a recognized expert in railroad regulatory economics and has assisted FTI's railroad clients in a broad range of litigation and regulatory engagements involving pricing of services, contract disputes, damage calculations and analyses of the specific effects of pending or proposed changes in policy or regulation.

Some of Mr. Baranowski's representative experience includes:

- Development of strategic litigation approach for large railroad rate proceedings based on the theory of Constrained Market Pricing and the Stand-Alone cost test. Theory assumes the existence of a hypothetical, efficient competitor and involves detailed analysis of railroad operations, expenses, capital expenditures and revenues.
- Development of a suite of modeling tools to assess the regulatory risk of railroad rates for a mix of commodities based on key cost drivers and forecasts.
- Design and development of modeling tools designed to simulate the cost of competitive entry into local telecommunications markets and directing the efforts of a nationwide team of testifying experts presenting the cost model results in multiple proceedings across the country.
- Detailed analysis, critique and restatement of complex cost models developed for the railroad, telecommunications, pipeline and trucking industries.
- Designing modeling tools for use in calculating the costs of competitive entry into railroad, telecommunications and pipeline markets.
- Conducting detailed analyses of railroad operations and developing the associated capital requirements and operating expenses attributable to specific movements and the incremental capital and operating expense requirements attributable to major changes in anticipated traffic levels.

Mr. Baranowski holds a B.S. in Accounting from Fairfield University in Fairfield, Connecticut and has pursued supplemental finance studies at Kean College in Union, New Jersey.

SELECT RAILROAD TESTIMONY

Surface Transportation Board

August 24, 2009	Docket No. 42114 US Magnesium, L.L.C. v. Union Pacific Railroad Company, Opening Evidence of Union Pacific Railroad Company
October 22, 2009	Docket No. 42114 US Magnesium, L.L.C. v. Union Pacific Railroad Company, Rebuttal Evidence of Union Pacific Railroad Company
January 19, 2010	Docket No. 42110 Seminole Electric Cooperative, Inc. v. CSX Transportation, Inc., Reply Evidence of CSX Transportation, Inc.
May 7, 2010	Docket No. 42113 Arizona Electric Power Cooperative, Inc. v. BNSF Railway Company and Union Pacific Railroad Company, Joint Reply Evidence of BNSF Railway Company and Union Pacific Railroad Company
November 22, 2010	Docket No. 42088 Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v. BNSF Railway Company, BNSF Comments on Remand, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher
January 6, 2011	Docket No. 42056 Texas Municipal Power Agency v. BNSF Railway Company, BNSF Reply to TMPA Petition for Enforcement of Decision, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher
October 28, 2011	Docket No. FD 35506 Western Coal Traffic League - Petition for Declaratory Order, Opening Evidence of BNSF Railway Company, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher
November 10, 2011	Docket No. 42127 Intermountain Power Agency v. Union Pacific Railroad Company, Reply Evidence of Union Pacific Railroad Company
November 28, 2011	Docket No. FD 35506 Western Coal Traffic League - Petition for Declaratory Order, Reply Evidence of BNSF Railway Company, Joint Reply Verified Statement of Michael R. Baranowski and Benton V. Fisher
May 10, 2012	Docket No. 42056 Texas Municipal Power Agency v. BNSF Railway Company, BNSF Reply to TMPA Petition to Reopen and Modify Rate Prescription, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher
November 30, 2012	Docket No. 42125 E.I. DuPont De Nemours & Company v. Norfolk Southern Railway Company, Reply Evidence of Norfolk Southern Railway Company
December 7, 2012	Docket No. Ex Parte 715, Rate Regulation Reforms, Reply Comments of the Association of American Railroads, Verified Statement of Michael R. Baranowski
January 7, 2013	Docket No. 42130 SunBelt Chlor Alkali Partnership v. Norfolk Southern Railway Company, Reply Evidence of Norfolk Southern Railway Company
March 1, 2013	Ex Parte No. 711 Petition for Rulemaking to Adopt Revised Competitive Switching Rules, Opening Comments of the Association of American Railroads, Verified Statement of Michael R. Baranowski and Richard W. Brown
April 12, 2013	Docket No. 42136 Intermountain Power Agency v. Union Pacific Railroad Company, Reply Evidence of Union Pacific Railroad Company

April 30, 2013	Ex Parte No. 711 Petition for Rulemaking to Adopt Revised Competitive Switching Rules, Reply Comments of the Association of American Railroads, Verified Statement of Michael R. Baranowski and Richard W. Brown
June 20, 2013	Ex Part No. 431 (Sub-No. 4) Review of the General Purpose Costing System, Comments of the Association of American Railroads, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher
September 5, 2013	Ex Part No. 431 (Sub-No. 4) Review of the General Purpose Costing System, Reply Comments of the Association of American Railroads, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher
July 21, 2014	Docket No. 42121 Total Petrochemicals & Refining USA, Inc. v. CSX Transportation, Inc., Reply Evidence of CSX Transportation, Inc.

Arbitrations and Mediations

February 12, 2009	In the Matter of the Arbitration between Wisconsin Public Service Corporation and Union Pacific Railroad Company, Rebuttal Expert Report of Michael R. Baranowski on behalf of Union Pacific Railroad Company
October 16, 2009	In the Matter of Arbitration Between Norfolk Southern Railway Company and Drummond Coal Sales, Inc., Expert Report of Michael R. Baranowski on behalf of Norfolk Southern Railway Company
July 25, 2011	American Arbitration Association Case No. 58 147 Y 0031809, BNSF Railway Company and Kansas City Southern Railway Company, Expert Report of Michael R. Baranowski on behalf of BNSF Railway Company
April 25, 2013	JAMS REF #1340009009, Union Pacific Railroad vs. Canadian Pacific and Dakota, Minnesota & Eastern Railroad Arbitration, Expert Report of Michael R. Baranowski on behalf of Union Pacific Railroad Company
September 6, 2013	IN JAMS ARBITRATION, Case No. 1220044715, Union Pacific Railroad Company v. BNSF Railway Company, Expert Report of Michael R. Baranowski
October 25, 2013	IN JAMS ARBITRATION, Case No. 1220044715, Union Pacific Railroad Company v. BNSF Railway Company, Expert Reply Report of Michael R. Baranowski
January 1, 2014	IN JAMS ARBITRATION, Case No. 1220044715, Union Pacific Railroad Company v. BNSF Railway Company, BNSF Post-Argument Submission, Affidavit of Michael R. Baranowski

EXHIBIT 2

Calculation of Norfolk Southern Traffic Exempt From STB Regulation and Traffic With Revenues Below 180 Percent of Variable Costs

			(a)	(b)	(c)
Line	Item	Source	Total	Exempt	Percent
(1)	Expanded Carloads	2012 CWS	3,695,447	1,266,112	34%
(2)	Expanded Intermodal Units	2012 CWS	3,377,040	3,377,040	100%
			Total	Rev. < 180 VC	Percent
(3)	Expanded Terminated Carloads	2012 CWS	3,359,143	1,669,802	50%
(4)	Expanded Terminated Intermodal Units	2012 CWS	3,168,040	2,964,960	94%
(5)	Non-Exempt Expanded Carloads Terminated by NS:	2012 CWS	2,268,603	832,689	37%
(6)	Non-Exempt Expanded Carloads Not Terminated by NS: - 1/	2012 CWS	160,732	58,997	37%
			Total	Percent	
(7)	Exempt Shipments	Lines (1)(b) + (2)(b)		4,643,152	66%
(8)	Non-Exempt Shipments, Below 180	Lines (5)(b) + (6)(b)		891,686	12%
(9)	Shipments Not Subject to STB Regulation	Lines (7)(c) + (8)(c)		5,534,838	78%
(10)	Non-Exempt Shipments, Above 180	Lines (5)(a) + (6)(a) - (8)(a)		1,537,649	22%

NOTES:

1/ - CWS provided by Board included unmasked revenue only for shipments terminated by NS. Analysis assumes R/VC distribution for non-exempt shipments not terminated by NS is the same as for non-exempt shipments terminated.

EXHIBIT 3

Calculation of Average Age and Remaining Life of Norfolk Southern Assets Using NS's 2013 R-1 Annual Report

ACCT #	Asset Description	R-1 Data			Calculations							
		Gross Investment (a)	Annual Depreciation % (b)	Accumulated Depreciation (c)	Average Life (d)	Average Age (e)	Remaining Life (f)	Annual Annuity (g)	Remaining Economic Value (h)	Average Life (i)	Average Age (j)	Average Remaining Life (k)
LAND												
2	Land for transportation purposes	\$2,122,577		\$0	N/A	N/A	N/A	\$240,276	\$2,122,577			
OTHER ROAD												
3	Grading	\$3,042,058	2.38%	\$729,578	42.0	10.1	31.9	\$348,207	\$2,975,928			
4	Other right-of-way expenditures	\$18,816	1.11%	\$1,985	90.1	9.5	80.6	\$2,130	\$18,814			
5	Tunnels and subways	\$370,982	1.14%	\$52,534	87.7	12.4	75.3	\$41,999	\$370,897			
6	Bridges, trestles and culverts	\$2,503,996	1.60%	\$400,002	62.5	10.0	52.5	\$283,801	\$2,498,093			
7	Elevated structures	\$42,582	6.65%	\$39,586	15.0	14.0	1.1	\$6,021	\$5,705			
8	Ties	\$4,418,114	4.63%	\$1,361,009	21.6	6.7	14.9	\$554,869	\$3,914,676			
9	Rail and other track material	\$5,934,171	2.57%	\$1,686,610	38.9	11.1	27.9	\$682,262	\$5,722,977			
11	Ballast	\$2,244,494	2.72%	\$415,759	36.8	6.8	30.0	\$259,103	\$2,196,733			
13	Fences, snowsheds and signs	\$11,993	1.09%	\$3,967	91.7	30.3	61.4	\$1,358	\$11,977			
16	Station and office buildings	\$728,644	2.49%	\$286,915	40.2	15.8	24.3	\$83,609	\$684,335			
17	Roadway buildings	\$53,394	2.30%	\$31,546	43.5	25.7	17.8	\$6,102	\$45,904			
18	Water stations	\$0	0.00%	\$0	N/A	N/A	N/A	N/A	N/A			
19	Fuel stations	\$93,329	3.31%	\$21,964	30.2	7.1	23.1	\$10,996	\$88,978			
20	Shops and enginehouses	\$435,852	2.04%	\$109,371	49.0	12.3	36.7	\$49,597	\$429,595			
22	Storage warehouses - 1/	\$871	2.50%	\$983	40.0	40.0	-	\$100	\$0			
23	Wharves and docks	\$5,050	3.33%	\$2,274	30.0	13.5	16.5	\$595	\$4,364			
24	Coal and ore wharves	\$251,755	3.09%	\$102,361	32.4	13.2	19.2	\$29,413	\$226,700			
25	TOFC/COFC terminals	\$730,810	3.09%	\$190,115	32.4	8.4	23.9	\$85,383	\$696,406			
26	Communications systems	\$584,368	3.90%	\$305,272	25.6	13.4	12.2	\$70,670	\$456,393			
27	Signals and interlockers	\$1,609,225	1.83%	\$260,559	54.6	8.8	45.8	\$182,685	\$1,601,943			
29	Power plants	\$2,775	3.08%	\$2,533	32.5	29.6	2.8	\$324	\$750			
31	Power transmission systems	\$40,617	2.27%	\$16,351	44.1	17.7	26.3	\$4,639	\$38,544			
35	Miscellaneous structures	\$13,487	2.58%	\$9,693	38.8	27.9	10.9	\$1,551	\$9,446			
37	Roadway machines	\$630,960	5.35%	\$213,716	18.7	6.3	12.4	\$82,546	\$535,483			
39	Public improvements - construction - 2/	\$375,751	7.75%	(\$90,929)	12.9	-	12.9	\$56,762	\$375,751			
44	Shop machinery	\$141,143	3.62%	\$57,228	27.6	11.2	16.4	\$16,848	\$123,263			
45	Power plant machinery	\$15,287	2.27%	\$10,570	44.1	30.5	13.6	\$1,746	\$11,834			
	ROAD SUBTOTAL	\$24,300,524						\$2,863,315	\$23,045,489	30.2	7.6	22.6
EQUIPMENT												
52	Locomotives	\$4,814,059	3.44%	\$1,917,968	29.1	11.6	17.5	\$570,195	\$4,264,911			
53	Freight Train Cars	\$3,224,675	2.83%	\$1,427,857	35.3	15.6	19.7	\$373,478	\$2,899,860			
55	Highway Revenue Equipment	\$459,901	7.41%	\$154,278	13.5	4.5	9.0	\$68,073	\$371,499			
57	Work Equipment	\$162,746	2.47%	\$65,962	40.5	16.4	24.1	\$18,666	\$152,422			
58	Miscellaneous Equipment	\$238,967	7.76%	\$96,144	12.9	5.2	7.7	\$36,121	\$179,383			
59	Computer Systems and WP Equipment	\$512,892	11.51%	\$292,391	8.7	5.0	3.7	\$95,789	\$279,287			
	EQUIP SUBTOTAL	\$9,413,240						\$1,162,321	\$8,147,362	23.2	8.5	14.7
	ROAD and EQUIPMENT TOTAL (Excl. Land)	\$33,713,764						\$4,025,637	\$31,192,851	27.6	8.0	19.6

NOTES:

- 1/ - Accumulated depreciation exceeds gross investment--average age is assumed to equal average life
- 2/ - Negative accumulated depreciation results in negative average age, which is adjusted to zero years, reflecting a new asset

2013 Cost of Capital (STB)

11.32% (r)

R-1 Source/Formula

Sch 330 col H Sch 332 col D

Sch 335 col G

= 1 / (b)

= (c) / [(a) * (b)]

= (d) - (e)

= PMT [(r), (d), -(a)]

= [(a) * (1 + (r))^(f) - (g) * (1 + (r))^(e)] / (r)

= NPER [(r), (g), -(a)]

= (i) - (k)

= NPER [(r), (g), -(h)]