

BEFORE THE SURFACE TRANSPORTATION BOARD

STB Ex Parte No. 722

RAILROAD REVENUE ADEQUACY

**OPENING COMMENTS OF
THE ASSOCIATION OF AMERICAN RAILROADS**

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INTRODUCTION

In response to the Board's orders dated April 3 and June 16, 2014, the Association of American Railroads ("AAR") respectfully submits its opening comments in this proceeding.

The Board has issued a broad call for comments on the subject of railroad revenue adequacy. Revenue adequacy is an important, multi-dimensional concept and the Board's treatment of the concept has great significance for the future of the rail transportation sector and for the nation's economy as a whole. A misdirected regulatory response to improved railroad financial health would reverse decades of progress for U.S. freight railroads, effectively imposing stiff economic penalties on railroads, their customers, and the national economy.

AAR and its member railroads believe that the Board's consideration of revenue adequacy should be governed by two overriding principles.

First, railroads are a vital engine of growth for the nation's expanding economy and must continue to have the opportunity, ability, and incentives to invest in their networks.

Second, railroad financial health must not become a penalty that restrains future investment. Railroad revenue adequacy is a congressional goal that must be viewed by the Board as a floor, not as a ceiling.

In its opening comments, AAR expands upon these core propositions, addressing the multi-dimensional revenue adequacy concept with reference to the governing competitive market framework of regulation established by the statute and agency decisions. Our discussion is informed by the recognition that the term "revenue adequacy" applies in three contexts but is often used without explicit recognition of those contexts.

First, the term revenue adequacy is used in the governing statute to denote the status or condition of being "revenue adequate." This is the status or condition of railroad financial health that Congress instructed the ICC (and subsequently the Board) to promote and the status or condition that Congress hoped the industry would achieve and sustain.

Second, the term revenue adequacy is used, also in the statute, to refer to an annual financial measurement – the revenue adequacy determination for individual railroads that the agency is required to conduct.

Third, the term revenue adequacy is used with reference to the “revenue adequacy constraint” of Constrained Market Pricing (“CMP”). This constraint is not found in the statute but rather is a creation of the ICC in *Coal Rate Guidelines*.¹ As a standard for rail rate regulation, this constraint lacks substantive content and a firm basis in either law or economics. Such a constraint should not be applied on a firm-wide basis to a railroad’s mix of competitive and regulated traffic and should not be used in individual rate cases if it produces a result different from the stand-alone cost test.

AAR believes that the Board’s existing rate regulation tools are adequate to address the potential for railroad abuse of market power. While there is no need to adopt new rate regulation methodologies, the Board, where appropriate, should continue to refine and improve its existing standards and procedures for determining maximum reasonable rate levels. The competitive market framework that informs the Board’s approach to regulating rates must be preserved. AAR and its members are committed to work constructively to improve the Board’s rate regulation process.

AAR’s opening comments are supported by the testimony of four witnesses with expertise bearing on various aspects of the subject of railroad revenue adequacy:

- **Professor Joseph P. Kalt** of Harvard’s Kennedy School of Government describes the improved financial health and performance of the nation’s freight railroads fostered by the sound economic principles of railroad regulation introduced in the Staggers Act. He addresses the importance of allowing competitive market principles to guide regulation and fitting the

¹ *Coal Rate Guidelines – Nationwide*, 1 I.C.C. 2d 520 (1985) (“*Coal Rate Guidelines*”), *aff’d sub nom. Consolidated Rail Corp. v. U.S.*, 812 F.2d 1444 (3rd Cir. 1987).

definition and use of any revenue adequacy concept to those principles. Professor Kalt explains that capping railroad revenues would be contrary to sound economic regulatory policy.²

- **Dr. Roger Brinner**, Chief Economist of SandPointe, LLC, with experience analyzing investment returns, capital formation, market growth, and public policy needed to optimize growth, compares railroad rates of return to the returns in other industries and shows that notwithstanding recent gains in railroad profitability, railroad rates of return are markedly low. Dr. Brinner further explains that two aspects of the Board’s rate of return calculations – the use of historic book value of assets and the treatment of deferred taxes – substantially overstate railroad rates of returns. Dr. Brinner also explains that even if railroads were able to achieve returns in excess of their cost of capital, that would not justify more aggressive regulation since firms in competitive markets must have the incentive and opportunity to earn returns in excess of their cost of capital and they regularly pursue and achieve such returns.³
- **Emil H. Frankel**, a transportation consultant and scholar who served as Assistant Secretary for Transportation Policy of the United States Department of Transportation from 2002 to 2005, addresses the role and importance of freight railroads to achievement of the nation’s transportation policy goals. Mr. Frankel describes the national interest in promoting the capacity, efficiency, and productivity of the primarily privately-funded freight railroads; permitting and encouraging railroads to innovate and adapt to new markets; maintaining and increasing railroads’ share of freight traffic; enhancing railroad safety; and reducing the environmental impacts resulting from the movement of freight. He concludes that the Board should not take any action as an outgrowth of this proceeding that adversely affects railroads’ ability and incentives to make the investments necessary to achieve these policy goals.⁴
- **B. Kelly Eakin, Mark E. Meitzen, and Philip E. Schoech of Christensen Associates** have previously studied railroad productivity and were three of the principal authors of the Christensen Associates’ railroad competition studies. They address the evolution of railroad productivity during the last several decades and describe the shift in the source of productivity gains from network rationalization and cost-cutting to technological improvements dependent on capital investment. They explain the importance of ensuring

² See Verified Statement of Joseph P. Kalt (“Kalt V.S.”).

³ See Verified Statement of Roger Brinner (“Brinner V.S.”).

⁴ See Verified Statement of Emil H. Frankel (“Frankel V.S.”).

that railroads have the financial flexibility to make the investments that will lead to future productivity gains.⁵

ARGUMENT

I. The Competitive Market Framework of Regulation Mandated by Staggers Establishes the Proper Conceptual Structure for this Proceeding.

A. The STB Must Allow Competition and the Demand for Services to Establish Reasonable Rates to the Maximum Extent Possible.

The key concept underlying the reforms of the 4R⁶ and Staggers Acts⁷ and ICCTA⁸ was to replace regulation with market forces, thereby freeing the freight railroads to adapt and respond to market conditions using competitive market practices. Congress correctly anticipated that embracing sound regulation that relied on normal market forces would give freight railroads a reasonable opportunity to become financially sound.

Evidence of congressional commitment to this market based framework is pervasive in the statutory provisions. The National Rail Transportation Policy set forth in 49 U.S.C. § 10101 repeatedly emphasizes the importance of allowing market forces to function without pervasive regulatory intervention. “[C]ompetition and the demand for services” are to govern rates “to the maximum extent possible.” 49 U.S.C. § 10101(1). The new regulatory regime would “minimize the need for Federal regulatory control over the rail transportation system.” *Id.* § 10101(2). To “promote a safe and efficient rail transportation system,” rail carriers should be allowed to earn adequate revenues. *Id.* § 10101(3).

⁵ Joint Verified Statement of B. Kelly Eakin, Mark E. Meitzen & Philip E. Schoech (“Christensen V.S.”).

⁶ Railroad Revitalization and Regulatory Reform Act of 1976, Pub. L. No. 94-210, 90 Stat. 31 (1976).

⁷ Staggers Rail Act of 1980, Pub. L. No. 96-448, 94 Stat. 1895 (1980).

⁸ ICC Termination Act of 1995, Pub. L. No. 104-88, 109 Stat. 803 (1995).

In implementing its stated policy, Congress expressly limited the role of the regulator. For example, Congress removed the ICC's authority to regulate rates for traffic where the railroad lacks market dominance. 49 U.S.C. § 10701. Indeed, the statute conclusively presumes that traffic with a revenue-to-variable-cost ratio of less than 180% is subject to "effective competition" and therefore is excluded from the Board's rate regulation jurisdiction. *Id.* § 10707. Congress directed the agency to exempt categories of rail traffic and transactions to the maximum extent possible where regulation is not needed to protect shippers from market power abuses. *Id.* § 10502(a). Similarly, traffic moving under privately negotiated contracts is not subject to regulation by the Board. *Id.* § 10709. Congress clearly envisioned that the role of regulation would be confined to addressing the limited circumstances where market forces are inadequate to constrain railroad exercise of market power.

The regulatory choices made by the ICC and the Board have generally reflected the congressional expectation that markets functioning with a minimum of regulatory intervention should be allowed to guide railroad rates and conduct. The ICC embraced that concept and determined that it would strive to reproduce competitive market outcomes through regulation in those limited circumstances where its intervention is needed to address the abuse of railroad market power. Nothing illustrates this commitment more emphatically than the ICC's adoption of an economically sound test – the SAC test – as the best and most reliable standard for determining the reasonableness of rail rates on market dominant traffic in *Coal Rate Guidelines*. The SAC test embraces the competitive market framework for rate regulation by identifying a competitive price in a contestable market that assumes away barriers to entry.

B. The Principles Limiting Regulatory Intervention to Instances of Market Power Abuse Continue to Apply When a Railroad Earns a Rate of Return Equal to or Greater than the Rail Industry Cost of Capital.

The fact that a railroad may be earning revenues sufficient to cover the industry's cost of capital does not change the fundamental principles that should apply to Board rate regulation.

As Professor Kalt explains in detail, where there is no market failure, *i.e.*, where market forces are functioning to constrain railroad abuse of market power, the Board should not intervene. Its intervention in those limited circumstances where it is necessary to rectify market power abuse should seek to mimic competitive market outcomes.⁹

The rationale for a competitive market framework for the economic regulation of railroads established by the Staggers Act and ICCTA has not changed. The increased financial health of the rail industry is emphatic proof that that framework was the right one for the industry, its customers, and the U.S. economy as a whole. Accordingly, the implications and consequences of rail revenue adequacy must be assessed with reference to competitive market principles and the incentives of other firms operating in competitive markets. The visible hand of federal regulation should not take precedence over the invisible hand of competitive market forces where those forces are functioning properly.

II. There Is No Public Policy Rationale for Limiting Rail Revenue under a Revenue Adequacy Constraint.

A. The Improved Financial Health of the Railroad Industry Does Not Indicate an Inappropriate Exercise of Market Power.

The objective of STB rate regulation is to remedy specific abuses of rail market power. There is no reason to believe that the freight rail industry's improved financial health has resulted from the inappropriate exercise of market power and therefore no reason for the Board

⁹ See Kalt V.S., at 23-24, 31-34.

to believe that a regime of enhanced rate regulation would be called for if and when freight railroads achieve long run revenue adequate status.

Professor Kalt explains that the improved financial performance of railroads in recent years is attributable in large measure to efforts by the railroads to improve the profitability of competitive traffic, not to exploitation of potentially market dominant traffic.¹⁰ Most rail traffic is subject to effective competition. More than 70% of the carloads reported in the Board's 2012 Expanded Commodity Revenue Stratification Report had a revenue-to-variable cost ratio below 180% and were therefore excluded from Board rate regulation because the statute conclusively presumes that such traffic is competitive.¹¹ Significant additional traffic has been exempted from regulation by the ICC or the Board on grounds that it is competitive.

Professor Kalt uses data from the Board's Commodity Revenue Stratification Reports to show that improvements in railroad financial performance have resulted from increased profitability of competitive traffic.¹² The Stratification Reports report revenue and variable cost information for railroad traffic with revenue to variable cost ratios between 100 and 180% and above 180%. Dr. Kalt's analysis shows that over the period 2008-2012 an increasing share of railroad contribution in excess of variable cost was earned on traffic that is conclusively presumed to be competitive – traffic with an R/VC ratio less than 180%. An increased contribution share from competitive traffic is inconsistent with the notion that railroads have achieved improved financial results by pricing potentially market dominant traffic at excessive levels.

¹⁰ See Kalt V.S., at 36-37.

¹¹ STB data indicates that 71% of carloads in 2012 had revenue-to-variable-cost ratio below the 180% jurisdictional threshold. STB, 2012 Expanded Commodity Revenue Stratification Report, available at http://www.stb.dot.gov/stb/industry/econ_reports.html .

¹² See Kalt V.S., at 36-37.

Moreover, to date, railroads have not consistently earned revenues that exceed their cost of capital as calculated by the Board. The fact that they might do so at some point in the future would not in itself signify an abuse of market power. The Board must exercise considerable caution regarding any inferences it might be tempted to draw on the possible abuse of market power from its revenue adequacy calculations. There is good reason to believe that the Board's annual measurements of revenue adequacy substantially overstate the *true economic returns* earned by railroads.

As Dr. Brinner explains, this overstatement is based on two key methodological assumptions in the Board's calculation of railroad return on investment ("ROI"), the valuation of assets using book value and the treatment of deferred taxes.¹³ With regard to the use of book value of assets, both Professor Kalt and Dr. Brinner reiterate the widely acknowledged economic wisdom that the current replacement cost of assets is the economically appropriate value to be used for determining return on investment. Professor Kalt explains that *accounting* rates of return are not probative of whether a railroad is earning an *economic* rate of return that exceeds its cost of capital.¹⁴ As Professor Kalt notes, difficulty in using current replacement cost as a measure "cannot justify the use of economically incoherent rates of return on depreciated historical book value to determine whether a railroad is realizing 'excess revenues.'"¹⁵

Dr. Brinner's analysis of railroad ROI leads him to conclude that the use of book value versus current replacement costs results in particularly overstated ROI calculations in the case of

¹³ See Brinner V.S., at 14-26. As Dr. Brinner explains, book value is based on the historic cost of assets carried on a firm's books as opposed to the current cost of assets.

¹⁴ See F. Fisher & J. McGowan, "On the Misuses of Accounting Rates of Return to Infer Monopoly Profits," 73 *The American Economic Review* 82, 90 (1983) ("there is no way in which one can look at accounting rates of return and infer anything about relative economic profitability or, a fortiori, about the presence or absence of monopoly profits").

¹⁵ Kalt V.S., at 31.

railroads because of the extremely long lives of railroad assets. Dr. Brinner shows that the use of current-cost asset values reduces the rate of return for railroads and all comparison industries, but the disparity in the rate of return based on the book value and the current-cost value of assets is particularly great for railroads whose assets are among the longest lived of any industry.¹⁶

The second aspect of the Board's ROI methodology that leads to overstated railroad returns is the Board's treatment of deferred taxes in its annual revenue adequacy determinations. The Board has never itself explicitly considered the proper treatment of deferred taxes for revenue adequacy purposes. The current approach – deducting deferred tax reserves from the net investment base – was established by the ICC in 1986,¹⁷ and marked a reversal of the prior approach of including deferred taxes that the ICC had adopted in 1981.¹⁸ Both approaches were affirmed, in turn, by the U.S. Court of Appeals for the Third Circuit. The *Bessemer* court relied on the ICC's 1981 reasoning that excluding deferred taxes from the investment base would create a disincentive for railroads to invest in rail assets. 691 F.2d at 1116. The subsequent ruling by the *Conrail* court largely confirmed the ICC's 1981 reasoning, but ultimately concluded that the ICC could nonetheless, consistent with the statute, modify its revenue adequacy formula. *Conrail*, 855 F.2d at 93.

Regardless of the latitude the Board may have in addressing deferred taxes, the effects of the current approach are not subject to dispute. Excluding deferred taxes from the net investment

¹⁶ See Brinner V.S., at 23-26.

¹⁷ *Standards for Railroad Revenue Adequacy*, 3 I.C.C. 2d 261 (1986), *aff'd sub nom. Consolidated Rail Corp. v. United States*, 855 F.2d 78 (3rd Cir. 1988) (“*Conrail*”).

¹⁸ *Standards for Railroad Revenue Adequacy*, 364 I.C.C. 803 (1981), *aff'd sub nom. Bessemer & Lake Erie Railroad Co. v. I.C.C.*, 691 F.2d 1104 (3rd Cir. 1982). The ICC's 1981 decision was, in turn, a departure from its pre-Staggers decision to exclude deferred taxes from the net investment base. *Standards and Procedures for the Establishment of Adequate Railroad Revenue Levels*, 359 I.C.C. 270 (1978).

base, which signals that railroads are not expected to earn a return on that portion of their capital, creates a disincentive for further investment in railroad assets. The *Bessemer* court cogently explained that:

[F]or 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.

Bessemer, 691 F.2d at 1116. The *Conrail* court agreed:

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 [deferred tax] funds in comparison to the unregulated firms, and therefore the incentive to all investors, including the railroads, is to invest in the unregulated firms

Conrail, 855 F.2d at 90.

The impact of excluding deferred taxes from the net investment base is to inflate railroad ROI by creating the impression that a railroad's earnings are based on a smaller investment base. Dr. Brinner shows that the magnitude of this inflated return is substantial. He explains that the difference between the STB average railroad ROI for the period 2004-2013 calculated on a historic basis and the Bloomberg calculation on a historic cost basis for the same period is 2.7 percentage points – *i.e.*, 9.9 percent according to the STB's calculation versus 7.2 for Bloomberg – two-thirds of which is attributable to the Board's treatment of deferred taxes.¹⁹

¹⁹ *Brinner V.S.*, at 15-18. While shipper interests will likely contend that Dr. Brinner's findings regarding railroad ROI are not credible given railroad equity stock performance over the past several years, that argument misses the point. Stock prices respond primarily to earnings. Railroad earnings have improved significantly over the past several years, as railroad ROI has also improved over time. But railroads' true economic ROI is almost certainly lower than that calculated by the Board and lower than it should be to meet congressional goals. *Brinner V.S.* at 30-32.

AAR is not advocating in this proceeding that the Board adopt an alternative method for determining railroad ROI in its annual determination, nor is AAR arguing that another set of ROI numbers different from those calculated by the Board are the “right” numbers. What AAR is saying is that the Board does not in fact calculate a *true economic return* for freight railroads, and that the numbers it has calculated almost certainly overstate that true economic return due to the Board’s treatment of asset values and deferred taxes. Moreover, AAR maintains that the Board could not rationally base a scheme of enhanced rate regulation on supposedly revenue adequate railroads for two related reasons. First, it will not know with confidence if and when railroads are indeed revenue adequate in the true economic sense of the term. Second, a regulatory scheme based on improperly derived ROI determinations would be inconsistent with the Board’s reliance on the true economic value of assets in market based rate regulation under the SAC standard.

In any event, regardless of the specific ROI calculated under various approaches, Dr. Brinner shows that railroad returns are far lower than the average returns of other industries, including industries with characteristics similar to railroads. Therefore, there is nothing about the level of railroads’ rates of return that suggests an abuse of market power. Dr. Brinner explains that firms with long-lived assets must be able to earn higher returns due to the higher risk that they and their investors face by having their capital tied up in long-lived assets. Dr. Brinner shows that railroad assets have a longer working life than the assets of virtually all other industries.²⁰ While railroads should have higher rates of return than other industries as a consequence of longer lived assets, in reality, railroads earn significantly lower rates of return

²⁰ Brinner V.S., Exhibit 5.

than other industries with long-lived assets. *See* Brinner V.S., Exhibit 2. No valid inference of widespread market power abuse can be drawn from such a circumstance.

B. The Public Interest Is Best Served by a Regulatory Regime that Incentivizes Railroads to Invest to Meet Demand for Transportation Services.

The public interest calls for continuing expansion of rail network capacity to meet increasing demand for transportation services and changing patterns of commodity movements.²¹

The improved financial performance of railroads has translated into record investment in their facilities.²² Any notion that earning returns in excess of the rail industry's cost of capital should be the occasion for limiting railroad revenues and thus limiting that investment would be inimical to the public interest.

Professor Kalt explains that the goal of earning returns in excess of the cost of capital is a fundamental driver of innovation and productivity gains. As in other industries, the ability to earn returns that exceed a firm's cost of capital is necessary to provide incentives for railroads to invest in efficient capacity expansion and system replenishment, to pursue cost saving innovations, and to respond to the opportunities presented by emerging market developments. It is sound economic policy to maintain incentives for railroads to try to earn returns in excess of their cost of capital.²³

Moreover, Dr. Brinner explains that investors want and expect a firm's rate of return to exceed its cost of capital. Without this excess return, the incentive to invest is significantly

²¹ Frankel V.S., at 7, *citing* Federal Railroad Administration, *National Rail Plan – Moving Forward: A Progress Report*, 8-9 (Sept. 2010) (“*National Rail Plan*”).

²² *See* Christensen V.S., at 14-15, Figure 6.

²³ *See* Kalt V.S., at 33-34.

diminished. Firms in competitive markets do – and must have – the incentive and opportunity to earn returns in excess of their cost of capital.²⁴

If railroads at some point in the future are able to earn returns in excess of their true economic cost of capital, that would not be evidence of any abuse of market power. As Professor Kalt explains, competitive markets are dynamic, and successful competitive firms often earn above the long-run equilibrium return. Professor Kalt explains that firms seek to achieve economic returns that not just equal but exceed their cost of capital. As technology changes and markets shift, firms that are particularly adept at taking advantage of these changes reap economic returns in excess of their capital costs. Firms that are particularly adept at staying ahead of the curve when it comes to anticipating changes in technology or shifts in traffic mix, among other things, can sustain rates of return in excess of their costs of capital and ahead of the returns and revenue required by a static system-wide stand-alone railroad.²⁵

Dr. Brinner explains why firms in competitive markets can be expected to earn returns that are higher, and often far higher than their cost of capital. CEOs and CFOs typically invest in a portfolio of projects at any given time. They decide whether to invest in particular projects based on “hurdle rates” that are somewhat above the firm’s cost of capital. Senior management does not approve investments unless they are expected to generate a return at least as high as the hurdle rate. The approved investments, therefore, will have expected returns above the firm’s cost of capital and often significantly above the cost of capital. As a result, if the risk and return assessments underlying the investment decisions are accurate – and successful firms strive to make rational decisions based on the most accurate assessments possible – the portfolio of approved projects will produce overall firm returns that substantially exceed the firm’s cost of

²⁴ See Brinner V.S., 26-30.

²⁵ See Kalt V.S., at 33-34.

capital. And such returns above the cost of capital are exactly what Dr. Brinner observes in the real world.²⁶

Dr. Brinner also shows that it is not at all uncommon for companies to earn more than their cost of capital. He explains that many industries with risk characteristics similar to railroads (*e.g.*, long-lived assets, subject to regulation, and facing market uncertainties) earn substantially more than their cost of capital. Significantly, almost all other industries examined by Dr. Brinner have earned returns substantially in excess of returns earned by railroads over the past decade.²⁷

Limiting railroads to a return equal to the cost of capital would likely preclude attainment of sustained revenue adequacy by creating an asymmetric regulatory regime in which upside returns would never be sufficient to offset the downside shortfalls that have already occurred. In most years since Stagers, railroads have earned substantially less than their cost of capital, even at the upwardly biased levels of return calculated by the Board. They will achieve long-term revenue adequacy only if years in which they have earned below adequate returns can be balanced by years in which they earn rates of return in excess of the true, economic cost of capital.

Therefore, evaluating the consequences of railroad revenue adequacy would require assessment of *long-run equilibrium* competitive returns and revenues, as Professor Kalt explains. Even with relatively stable competitive market conditions, one would expect to see returns both above and below the long-run equilibrium over the course of many years in response to fluctuations in demand and cost conditions around the long-run equilibrium. Professor Kalt explains that returns for a railroad in excess of the long-run equilibrium competitive level for

²⁶ See Brinner V.S., Exhibit 2.

²⁷ See, *e.g.*, Brinner V.S., Exhibits 1a, 1b, and 2.

some limited period, even if properly measured, would not indicate that the railroad is in fact earning supra-competitive returns on its investments.²⁸

Apart from the issue of asymmetric returns over the long run, the Board can neither assure nor be confident that railroads will earn returns equal to their cost of capital year in and year out going forward. Unlike regulated utilities with monopoly franchises, railroads operate predominantly in competitive markets and cannot be guaranteed a level of revenues that will ensure coverage of their full costs. As noted previously, the vast majority of rail traffic is either excluded from rate regulation because the statute presumptively concludes that traffic moving below the 180% R/VC threshold is competitive or because the traffic has been exempted from regulation by the ICC or the Board on grounds that it is competitive. The Board cannot, and does not try to, assure a level of return on this traffic. Nor can the Board protect railroads from downturns in traffic due to changes in the industries they serve. Moreover, the Board has recognized that much competitive traffic cannot be expected to cover a proportional share of unattributable costs. Railroads are essentially on their own when it comes to sustaining themselves, and the prospect of earning higher than normal returns in some periods to offset inevitable downturns must be preserved.

Sustained returns in excess of the cost of capital can be a catalyst for railroad productivity gains. Testimony in this proceeding by Christensen Associates economists suggests that future railroad productivity gains will flow predominantly from technological improvements, *e.g.* heavier, stronger, more powerful trains, rather than from the system rationalization of prior years.²⁹ These technologically driven productivity gains will require substantial capital investment. The Christensen economists point out that any new constraint on railroad revenues

²⁸ See *Kalt V.S.*, at 33.

²⁹ See *Christensen V.S.*, at 13-16.

would discourage investment at precisely the time when continued railroad productivity gains are particularly dependent on new capital investment.

III. The Post-Staggers Transformation of the Rail Industry Is a Dynamic Process that Should Continue into the Future.

Railroads are a key driver of prosperity and growth in the U.S. economy.³⁰ They are vital links in the efficient transportation of freight throughout the country and to the nation's ports for export. In contrast to other forms of transportation, they perform this function relying almost exclusively on private funding. At a time when partisan political gridlock imperils public sector funding for highways, the railroads are expanding their capital investment.³¹

Moreover, the nation has a growing need for rail transportation that is more environmentally friendly and eases the congestion burden on interstate highways.³² If railroads are to continue to meet national freight transportation needs into the future, they must have the resources not only to maintain their position in their current markets but to grow with those markets and to evolve as new markets emerge. Unless freight railroads have sufficient earnings to fund the replacement and expansion of their networks, the national goal of an efficient and reliable freight transportation system cannot be met.

The Board's inquiry into revenue adequacy is obviously important for STB stakeholders, but it has a potentially significant impact on national transportation policy as well. Successful implementation of that policy requires a strong rail sector able to replenish and expand the

³⁰ Frankel V.S., at 3, *citing National Rail Plan*, at 3.

³¹ Frankel V.S., at 2.

³² *See, e.g.*, American Association of State Highway and Transportation Officials, *Freight-Rail Bottom Line Report*, 27-32 (2003); American Society of Civil Engineers, *2013 Report Card for America's Infrastructure*, Rail ("Railroads are experiencing a competitive resurgence as . . . an energy-efficient freight transportation option"), available at <http://www.infrastructurereportcard.org/>.

freight rail network. As Emil Frankel, former Assistant Secretary for Policy at the United States Department of Transportation explains, the Board should be careful that it does not take any action as an outgrowth of this proceeding that would undermine the ability of railroads to make the investments needed to sustain and expand the rail network into the future.

The goals of National Transportation Policy addressed by Mr. Frankel comport with the Rail Transportation Policy in the Board's governing statute³³ and include the following:

- Improved efficiency and reliability, including the elimination of freight bottlenecks, particularly, at points of intermodal connection and transfer.

Improved efficiency and reliability is needed to reduce supply chain costs and assure timely delivery of goods to promote the efficient operations of freight shippers. Recent issues related to congestion highlight the challenges the rail industry faces in establishing consistently high quality service and providing sufficient capacity. Notwithstanding these service challenges, there is no dispute that the industry has become much more efficient by reducing interchanges, improving service design for carload traffic, promoting more efficient and less costly unit train service, and increasing velocity on high density trunk lines.³⁴ These trends must continue into the future.

- Expanded capacity.

Expanded freight transportation capacity is needed to meet the expected increase in demand for freight transportation due to an increasing population and an expanding economy.

³³ See, e.g., 49 U.S.C. §§ 10101(3), (4), (5), (8) and (14).

³⁴ See, e.g., Laurits R. Christensen Assoc., Inc., *A Study of Competition in the U.S. Freight Railroad Industry and Analysis of Proposals that Might Enhance Competition: Revised Final Report*, Vol. I, Chap. 2 (2009); C. Winston, *The Success of the Staggers Rail Act of 1980* (October 2005), available at <http://www.brookings.edu/research/papers/2005/10/railact-winston>.

Growth in modal share of freight railroads would yield public benefits.³⁵ After years of network rationalization (downsizing/rightsizing), freight railroads are now focused on expanding network capacity by eliminating bottlenecks, adding new line haul capacity (double and triple tracking), adding locomotives and other rolling stock and increasing train crews and maintenance workers. As demonstrated by comments and testimony in the recent Ex Parte No. 724 proceeding, *United States Rail Service Issues*, shippers are actively calling for increased investment to improve rail service and increase capacity.³⁶ As Mr. Frankel notes, the vast majority of the capital needed to fund this capacity expansion will have to come from the freight railroads themselves. The Board should consider the issues relating to revenue adequacy with this imperative in mind.

- Responsiveness to new market opportunities.

Mr. Frankel explains that one of the less anticipated consequences of the Staggers Act deregulatory reforms is the freight railroads' responsiveness to new market opportunities. Given the flexibility by Staggers to act in response to market forces, like other firms in the economy, railroads were quick to adapt to market developments. Coal, grain, shale oil and intermodal traffic have all increased substantially in the post-Staggers era due in large measure to the

³⁵ See, e.g., U.S. Government Accountability Office, *Surface Freight Transportation: A Comparison of the Costs of Road, Rail, and Waterways Freight Shipments That Are Not Passed on to Consumers*, GAO 11-134 (2011) (concluding that “additional freight service provided by trucks generated significantly more costs that are not passed on to consumers of that service than the same amount of freight service provided by either rail or water. . . . Most of these costs were external costs imposed on society.”); B. Weatherford, H. Willis & D. Ortiz, *The State of U.S. Railroads: A Review of Capacity and Performance Data*, 42 (2008) (“shipping freight does not include all of the external costs to other users (e.g., congestion, pollution, traffic accidents). In these areas, rail has certain advantages over trucking that benefit the public”), available at http://www.rand.org/pubs/technical_reports/TR603.html .

³⁶ See, e.g., Testimony of Lance Peterson, American Soybean Association, *United States Rail Service Issues*, Docket No. EP 724, hearing transcript at 126 (April 10, 2014) (indicating “support of policies that encourage or provide direct investment in expanding transportation capacity including rail, trucks, and waterways”); *id.*, Testimony of Hal Clemensen, South Dakota Wheat Growers Cooperative, hearing transcript at 369 (“there needs to be a lot more reinvestment into the rail system”).

railroads' commercial flexibility and willingness to commit capital to new facilities needed to accommodate growing and changing traffic flows. Undoubtedly there are further market changes to come, and railroads need to have the incentive and resources to adapt to them.

- Improved safety.

The goal of improved safety to protect the lives and well-being of transport workers, users and the general public is self-evident. Railroads have significantly improved their safety performance in recent years.³⁷ Improving rail safety into the future will require an ongoing funding commitment that cannot be compromised.

- The reduction of environmental impacts resulting from the movement of freight and goods.

The need to reduce carbon emissions is widely understood. Railroads are far more fuel efficient than trucks and are continuing to invest in more fuel efficient and lower emitting locomotives.³⁸

As Mr. Frankel explains, policymakers need to be focused on whether sufficient capital funds are available to meet these goals. Railroads will need to retain the ability to respond to the demands of emerging markets. Changes in freight patterns and transportation demand are certain even if their nature is unknown today. At the time of the Staggers Act, the explosive growth of western coal markets, transpacific container traffic and crude oil shipments could not be foreseen. The flexibility and resources available to railroads post-Staggers allowed them to respond to these developments to the benefit of the entire economy. The future will also bring challenges and opportunities. Railroads will need to respond to the growing dependence of

³⁷ See, e.g., L. Terry, "Railroad Operations: Where Safety and Innovation Converge," *Inbound Logistics* (Oct. 2013), available at <http://www.inboundlogistics.com/cms/article/railroad-operations-where-safety-and-innovation-converge/> .

³⁸ Frankel V.S., at 18.

America's manufacturers and retailers on logistics and just-in-time supply chains, changes in intermodal shipping patterns with the expansion of the Panama Canal, and infrastructure needs resulting from climate change, to identify only a few of the future challenges that can be anticipated today. Any action by the Board that limits the availability of capital funds and the ability of railroads to respond to future market developments based on a finding of sustained revenue adequacy would be counter-productive, as it would undermine the transportation policy goals that the Board is entrusted to support.³⁹

IV. The Statutory Directives to Promote Revenue Adequacy and to Make Annual Determinations of Rail Revenue Adequacy Do Not Warrant the Adoption of a Separate Revenue Adequacy Constraint.

Congress viewed the status of railroad revenue adequacy as a goal to be achieved through fundamental changes in the regulation of rail rates, not as a ceiling that the regulator might impose on the revenues that a railroad can earn. And Congress specifically wanted the agency to monitor, through its annual revenue adequacy determinations, the progress it was making in assisting railroads to achieve financial health. The idea of revenue adequacy as some sort of ceiling or cap on railroad rates was introduced by the ICC in 1985 in the *Coal Rate Guidelines* without any statutory underpinning or clear evidence of congressional intent. Indeed, the revenue adequacy constraint remains only a concept today and appears to be disconnected from the scheme of rail rate regulation that Congress created to address the potential for the abuse of market power in railroad rate setting. Application of a firm-wide revenue adequacy constraint on rates (or revenue) would violate the basic competitive market principles underlying STB rate regulation.

³⁹ Frankel V.S., at 11-15.

A. Revenue Adequacy Is a Statutory Goal that the Board Is Directed to Promote, Not a Ceiling on Revenues.

The statutory goal of achieving revenue adequacy appeared for the first time in the 4R Act. The 4R Act was a response to the deterioration of the railroad industry and widespread concern that the railroad industry would not survive without a fundamental change in the regulation of railroad rates. The thrust of the 4R Act was to lighten the burden of overbearing regulation of railroads and to allow railroads to return to financial health by giving them greater commercial freedom to act in response to market forces. As Congress explained,

It is the purpose of the Congress in this Act to provide the means to rehabilitate and maintain the physical facilities, improve the operations and structure, and restore the financial stability of the railways system of the United States, and to promote the revitalization of such railway system, so that this mode of transportation will remain viable in the private sector of the economy and will be able to provide energy-efficient, ecologically compatible transportation services with greater efficiency, effectiveness, and economy...⁴⁰

The revenue adequacy provisions in the 4R Act were central to Congress's objective to promote the financial health of the railroad industry. The 4R Act specified that a revenue adequate railroad would be one with revenues sufficient to

“(a) 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 (b) insure retention and attraction of capital in amounts adequate to provide a sound transportation system in the United States.”⁴¹

The 4R Act also instructed that “[t]he Commission shall make an adequate and continuing effort to assist such carriers in attaining such revenue levels.”⁴²

Four years after enacting the 4R Act, Congress was concerned that the ICC was not doing enough to promote the objective of revenue adequacy and it enacted the Staggers Act to

⁴⁰ 45 U.S.C. § 801(a) (1976).

⁴¹ 49 U.S.C. § 15(a)(4) (1976).

⁴² *Id.*

reinforce its instruction to the ICC to assist railroads in achieving financial viability. The House report on the Staggers Act noted that “[p]revious admonitions by the Congress that the Commission assist carriers in earning adequate revenue levels . . . have not achieved their goals.”⁴³ The Staggers Act forcefully reiterated Congress’s intent that the ICC promote long-term financial stability of the railroad industry. As the conference committee report explained, the “overall purpose of the [Staggers Act] is to provide, through financial assistance and freedom from unnecessary regulation, the opportunity for railroads to obtain adequate earnings to restore, maintain and improve their physical facilities while achieving the financial stability of the national rail system.”⁴⁴

The Rail Transportation Policy adopted in the Staggers Act emphasized that Congress wanted the regulator to promote railroad revenue adequacy in the interest of a strong and viable railroad industry. The Staggers Act added section 10101a(3) to the statute, specifying that it was the policy of the United States Government “to promote a safe and efficient rail transportation system by allowing rail carriers to earn adequate revenues, as determined by the Interstate Commerce Commission.”⁴⁵ Congress instructed that the “Commission shall make an adequate and continuing effort to assist those carriers in attaining [adequate] revenue levels.”⁴⁶

Most references to revenue adequacy in the Staggers Act focus on the need to promote railroad revenue adequacy and to take appropriate measures to ensure that railroads have the opportunity to earn adequate revenues. There is only one provision of Staggers that addresses the consequences of railroads achieving revenue adequacy. That provision, however, does not

⁴³ H.R. Rep. No. 96-1035, at 54 (1980), *as reprinted in* 1980 U.S.C.C.A.N. 3978, 3999.

⁴⁴ H.R. Rep. No. 96-1430, at 80 (1980), *as reprinted in* 1980 U.S.C.C.A.N. 4110, 4111.

⁴⁵ 49 U.S.C. § 10101a(3) (1982).

⁴⁶ 49 U.S.C. § 10704(a)(2) (1982).

relate to the subject of a revenue adequacy constraint on rates and does not support the notion that railroad revenue adequacy would be the occasion for intensified regulation of railroad rates.

The provision in question deals with “zones” of rate flexibility. The Staggers Act allowed carriers to increase their rates without ICC approval within certain zones of rate flexibility. Some of the flexibility to increase rates without ICC approval extended to both revenue adequate and revenue inadequate carriers, while other provisions were available only to revenue inadequate carriers. However, the statute made it clear that rate increases exceeding the amounts authorized by the zones of rate flexibility could not be presumed to be unreasonable.⁴⁷ Thus, the statute facilitated rate increases within certain zones for revenue inadequate railroads, consistent with Congress’s instruction to the ICC to assist railroads to achieve revenue adequacy, but it did not prohibit rate increases outside the zones of rate flexibility or rate increases by revenue adequate railroads – those rate increases would be subject to rate reasonableness challenges brought by shippers under the agency’s prevailing rate reasonableness standards.⁴⁸

In short, the scheme established in the Staggers Act was that the regulator was supposed to promote railroad revenue adequacy through affirmative measures that would provide railroads the opportunity to increase their revenues. Nothing in the statute authorized the agency to use the attainment of revenue adequacy status as the occasion for a new limitation on rates. Revenue adequacy was never contemplated as a separate basis for capping rates or as a regulatory ceiling on revenues that a railroad could earn.

⁴⁷ 49 U.S.C. § 10707a(g) (1982).

⁴⁸ The zones of rate flexibility were removed by Congress in ICCTA.

B. The Annual Revenue Adequacy Determination Is a Useful Benchmark for Monitoring the Financial Health of the Railroads but it Was Not Intended as a Tool to Regulate Rates nor Is it Sufficiently Accurate to Do So.

When the concept of revenue adequacy first appeared in the 4R Act, Congress instructed the ICC to “develop and promulgate (and thereafter revise and maintain) reasonable standards and procedures for the establishment of revenue levels adequate under honest, economical, and efficient management to cover total operating expenses, including depreciation and obsolescence, plus a fair, reasonable, and economic profit or return (or both) on capital employed in the business.”⁴⁹ In the Staggers Act, Congress reiterated the basic requirement to develop revenue adequacy standards and instructed the ICC to make annual revenue adequacy determinations.⁵⁰ Among other things, these determinations would allow the agency to monitor its progress in assisting railroads to achieve financial stability.

The ICC’s initial revenue adequacy standard, adopted before the Staggers Act, considered a range of financial ratios as indicative of a railroad’s ability to raise capital, including fixed charge coverage, proportion of debt in the capital structure, return on shareholders’ equity and ratio of market value of common stock to book value.⁵¹ The ICC also considered a flow of funds analysis that looked at whether funds available from operations and capital sources were sufficient to cover projected funding requirements.⁵²

In 1981, after notice and comment, the ICC rejected the multi-factor approach and adopted the current standard for its annual revenue adequacy measurement that examines whether a railroad earns a rate of return on net investment equal to the rail industry’s current cost

⁴⁹ 49 U.S.C. § 15a(4) (1976).

⁵⁰ 49 U.S.C. § 10704(a)(2), (4) (1982).

⁵¹ *Standards and Procedures for the Establishment of Adequate Railroad Revenue Levels*, 358 I.C.C. 844, 859 (1978).

⁵² *Id.*

of capital. *Standards for Railroad Revenue Adequacy*, 364 I.C.C. 803 (1981). The Third Circuit, in *Bessemer and Lake Erie v. ICC*, 691 F.2d 1104 (3rd Cir. 1982), approved the new standard over the objections of certain shipper groups. The court's discussion of the new standard made it clear that the revenue adequacy provisions in the statute were not intended as a tool for rate regulation.

1. A Railroad's Revenue Adequacy Status Does Not Affect the Reasonableness of Individual Rates.

Shippers challenging the new standard for measuring revenue adequacy argued that the ICC was obligated to continue using the multi-factor approach. The Third Circuit noted that the shippers' apparent objective in urging the use of a multi-factor analysis was that "utilization of these additional standards will produce a level of revenue adequacy lower than that resulting from application of the current cost of capital standard. This, they hope, will prevent more carriers from taking advantage of the zones of rate flexibility." *Bessemer*, 691 F.2d at 1112. The court noted with approval the ICC's conclusions that the shippers' desire to use the annual measurement of revenue adequacy as a means to limit rail rates misunderstood the objective of achieving revenue adequacy status. The court accepted the ICC's view that the revenue adequacy provisions in the statute are "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 [the revenue adequacy definition] should not in [the ICC's] view be read as limitations on revenue. . . ." *Bessemer*, 691 F.2d at 1112 (emphasis in original). The ICC's view was that revenue adequacy was intended by Congress as a goal to be achieved and not a limit on revenues that railroads could earn, and the court accepted this interpretation of the statute.

The court further noted that the shippers "ignore[] the distinction in the statute between revenue adequacy proceedings and rate reasonableness proceedings." *Id.* at 1113. The court

acknowledged that the achievement of revenue adequacy would, under the statute, have an impact on a railroad's ability to take advantage of the zones of rate flexibility established by the Staggers Act. But the ultimate reasonableness of a particular rate was a separate question. Whether or not a rate fell within the zone of flexibility, "[i]ndividual shippers who object to specific rates may file complaints against market dominant carriers challenging the reasonableness of such rates. . . . In such proceedings, the ICC retains the authority to prevent imposition of unreasonable rates on market dominant traffic." *Id.*

A railroad's revenue adequacy status should not have an impact on determination of the reasonableness of an individual rate. The fact that a railroad is not earning its cost of capital does not make a challenged rate reasonable.⁵³ A railroad might be revenue inadequate because it is unable to charge rates to many shippers that cover the full cost of serving those shippers. But that does not mean that all shippers' rates are below a reasonable maximum level. Some shippers might be paying supra-competitive rates (and therefore entitled to a rate reduction) even though many other rates of the defendant carrier are below maximum reasonable levels.

Similarly, a railroad's achievement of overall financial health does not mean that any particular shipper has been charged an unreasonable rate. The same rationale that allows the Board to reduce rates charged by railroads that are revenue inadequate in appropriate cases would prohibit an automatic finding that a particular rate charged by a railroad that has achieved revenue adequacy is unreasonable (thus justifying regulation of the rate). A railroad's revenue inadequacy may well be driven by factors unrelated to the particular service to which an individual rate applies, which is why the Board is entitled to reduce rates found to be unreasonable when charged by a revenue inadequate railroad. But the flip side of this

⁵³ *Standards for Railroad Revenue Adequacy*, 364 I.C.C. at 808.

proposition is also true, namely that the achievement of financial health may be attributable to factors unrelated to the level of an individual rate. In neither case – revenue adequacy or revenue inadequacy – is the railroad’s overall financial condition determinative as to the reasonableness of a particular rate.

2. Assumptions Used in the Annual Revenue Adequacy Determinations Make those Determinations Inappropriate for Use in Regulating Rates.

The ICC properly concluded when it adopted the current revenue adequacy standard for its annual determinations that the ability of a railroad to earn a rate of return equal to its cost of capital was “the minimum necessary to attract and maintain capital in the railroad, or any other, industry. . . . If a firm is unable to earn the cost of capital, investors will be unwilling to supply capital to it.”⁵⁴ While the standard currently used by the Board is useful in measuring a railroad’s financial health from year-to-year and the Board’s progress in promoting the railroads’ long-term financial viability, the actual calculation of ROI is imprecise and cannot confidently be used to make reliable rate reasonableness determinations.⁵⁵

As previously noted, a key methodological problem with the Board’s calculation of railroad ROI is use of the book value of the railroad’s assets. The ICC and the Board have repeatedly acknowledged that the proper way to value the assets of a firm for purposes of assessing the adequacy of the firm’s revenues is the replacement cost of the assets, but they have declined to use replacement costs in the annual revenue adequacy determinations based on practical considerations.

⁵⁴ *Standards for Railroad Revenue Adequacy*, 364 I.C.C. at 809.

⁵⁵ See, e.g., *Adequacy of Railroad Revenue (1978 Determination)*, 362 I.C.C. at 201 (“the methodology of the [revenue adequacy] study is not necessarily appropriate for the determination of the maximum fair revenue issues involved in individual rate proceedings”); *Bessemer*, 691 F.2d at 1112 (noting ICC view that “the specific [revenue adequacy] objectives listed in section 205 should not . . . be read as limitations on revenue”).

When the ICC adopted its annual revenue adequacy measurement standard in 1981, it recognized that the use of replacement costs in calculating a railroad's rate of return would be superior to using net book value of the railroad's assets: "While we perceive some difficulty in implementing a replacement cost valuation method, we believe that it is conceptually the best method available."⁵⁶ The ICC nevertheless decided to calculate a railroad's rate of return using the railroad's net book value of assets because the ICC concluded that it would be impractical to apply a replacement cost standard in the context of its annual revenue adequacy determinations for Class I railroads. "While current cost accounting [*i.e.*, current replacement cost of assets] 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."⁵⁷

In 2008, AAR proposed an approach to determining the replacement costs of a railroad's assets that it believed could address the Board's concerns over practicality and accuracy. AAR proposed that the cost of a railroad's assets be based on the Board's Simplified SAC ("SSAC") approach to valuing the assets of a stand-alone railroad. While AAR acknowledged that a replacement cost approach based on the SSAC methodology was somewhat more complicated than the existing rate of return approach that uses net book value, AAR argued that an SSAC-based approach was nevertheless feasible and should be adopted because it would produce a much more accurate assessment of asset values.

The Board denied AAR's request to institute a rulemaking to adopt a replacement cost standard. But the Board did not question AAR's basic argument that replacement costs are superior to net book value in assessing railroad revenue adequacy. Instead, the Board's concern

⁵⁶ *Standards for Railroad Revenue Adequacy*, 364 I.C.C. at 820.

⁵⁷ *Standards for Railroad Revenue Adequacy*, 3 I.C.C. 2d 261, 277 (1986).

focused on the difficulty in “identifying and valuing those rail assets that the railroad will not replace in its current configuration.”⁵⁸

In his verified statement, Professor Kalt explains why revenue adequacy cannot properly be determined based on an analysis of the rate of return earned on the book value of assets. Professor Kalt illustrates the problem by reference to a simple example of an older apartment building whose assets are highly depreciated. The rents that can be charged by the apartment building owner are determined by competition, and those competitive rates will be in part driven by the cost of new apartment construction. The competitive rents can result in very large returns on investment if the rate of return is calculated based on the depreciated value of the building. While the rate of return appears to be very large, the rents are still competitive. No meaningful information about the reasonableness of the rates charged by a firm can be determined by reference to the firm’s rate of return using historical depreciated book value of assets.⁵⁹

Dr. Brinner reiterates Professor Kalt’s view that the historic cost methodology is an inaccurate and inappropriate approach to determining a railroad’s rate of return. Dr. Brinner uses data from the Department of Commerce’s Bureau of Economic Affairs to calculate returns on investment on a current replacement cost versus a historic cost or book value basis. He demonstrates that the use of book value of assets substantially overstates the actual rate of return across all firms. The discrepancy is particularly pronounced in the case of railroads due to the unusually long lives of railroad assets. Given the very large discrepancy in rates of return using

⁵⁸ *Association of American Railroads – Petition Regarding Methodology for Determining Railroad Revenue Adequacy*, STB Ex Parte No. 679, slip op. at 5-6 (served Oct. 24, 2008).

⁵⁹ Kalt V.S. at 29-30. Academic literature relating to rent controls confirms that price caps suppress supply below optimal levels that would be found in an unregulated market and may also cause inefficient allocation of scarce resources. *See, e.g.*, E. Glaeser & E. Luttmer, “The Misallocation of Housing Under Rent Control,” 93 *The American Economic Review* 1027 (2003).

the historic and current costs, it would be arbitrary to make any decisions about the reasonableness of rail rates based on rate of return calculations that use the depreciated book value of assets.⁶⁰

The Board's decision to use book values of assets rather than replacement costs in its annual revenue adequacy determinations on practical grounds does not preclude the use of those determinations as a benchmark for monitoring railroads' progress toward financial viability. To date, the determinations have been informative in the post-Staggers era. In particular, the inability of a railroad to earn its cost of capital based on the book value of assets is a clear sign of potential long term financial trouble. And a narrowing or elimination of the revenue shortfall under the current standard could be a sign of financial progress. But the Board's refusal on practical grounds to use replacement costs in the annual revenue adequacy determinations makes those annual findings inappropriate for rate regulation purposes. Any assessment of revenue adequacy based on the book value of a railroad's assets does not present an accurate picture of a railroad's true long-term financial viability. Even if a revenue adequacy constraint were authorized under the statute – which it is not – to constrain rates based on an inaccurate assessment of a railroad's financial condition would be arbitrary and improper.

As previously discussed in section II.A, the upward bias in the Board's ROI calculations is compounded by its treatment of deferred taxes. Excluding deferred taxes from the asset base results in a substantial, unwarranted increase in railroad ROI, further discrediting that measure as a useful tool for rate regulation purposes.

The overstatement of railroad rates of return brought about by the use of historical book value of assets and the treatment of deferred taxes also affects the RSAM. The RSAM is

⁶⁰ Brinner V.S., at 18-26.

intended to measure “how far [a] railroad is over or under the revenue adequate target.”⁶¹ The RSAM is a ratio that identifies the amount by which rates on traffic with R/VC ratios above 180% would need to be adjusted – up or down – to produce overall revenues just equal to the amount determined in the Board’s annual revenue adequacy determinations to be necessary for a railroad to earn its cost of capital. But since the revenue adequacy determinations understate the long-term revenue needs of a railroad by using historical costs and ignoring deferred taxes, the RSAM does not accurately reflect the extent of a carrier’s revenue adequacy or inadequacy.

In addition to the inaccuracy in the revenue adequacy standard due to the approach used to calculate ROI, the other element of the revenue adequacy formula – the railroad industry cost of capital – is only an imprecise estimate of something that cannot be objectively measured. The cost of equity capital cannot be directly observed and the cost of capital determined by the Board will necessarily remain an estimate. In a separate proceeding, the Board has asked for comments on its current methodology for assessing the railroad industry’s cost of capital. AAR is filing separate comments in that proceeding. As explained by AAR’s expert witness in that proceeding:

To precisely measure the cost of capital thus requires precise knowledge of market expectations for risk and return across the universe of tradable risky assets. But clearly, it is impossible to ever ‘know’ these expectations. Even after the fact, realized returns and risk measurements are only point observations from the distribution of outcomes that were possible at the time of investment. The best one can do is to *estimate* the parameters relating to the cost of capital using the techniques of modern finance.⁶²

⁶¹ *Simplified Standards for Rail Rate Cases*, STB Ex Parte No. 646 (Sub-No. 1), slip op. at 20 (served Sept. 5, 2007) (“*Simplified Standards*”).

⁶² Opening Comments of the Association of American Railroads, Verified Statement of Bente Villadsen, *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*, Docket No. EP 664 (Sub-No. 2), at 4 (filed Sept. 5, 2014) (emphasis in original).

The Board's annual revenue adequacy determinations also are inappropriate for use in rate regulation because they are single-year snapshots of a railroad's financial condition. As the ICC and the Board have repeatedly acknowledged, revenue adequacy is a long-term concept. Congress enacted the revenue adequacy provisions set out in the Rail Transportation Policy and the statute to promote the long-term financial viability of the railroad industry. The ICC and the Board have been instructed to make annual determinations to monitor progress, but an annual determination of revenue adequacy does not say anything about the long-term viability of a railroad. As the ICC explained when it adopted the current cost of capital standard, the viability of the railroad industry must be assessed over the long run: "Any firm that is allowed to earn a long-run competitive return will, as a matter of course, be able, to the extent there is demand for its services, to cover all of its costs. . . . Conversely, it is impossible for a firm that is not earning a long run return equal to the cost of capital to meet these criteria."⁶³

In short, the Board's annual revenue adequacy determinations provide a benchmark for measuring the railroad industry's progress toward attaining and sustaining long-run financial viability. But the annual revenue adequacy determinations are not designed for determining the reasonableness of a railroad's rates and should not be used for that purpose.

C. The Language Describing the Revenue Adequacy Constraint in the 1985 Coal Rate Guidelines Decision Deviated from the ICC's 1983 Proposal Without Explanation or Support.

While the ICC was implementing Congress's instruction in the 4R and Staggers Acts to develop standards for assessing railroad revenue adequacy, the agency was separately developing new rate reasonableness standards. As noted above, the statutory treatment in the Staggers Act of revenue adequate railroads in connection with the zones of rate flexibility made it clear that a

⁶³ *Standards for Railroad Revenue Adequacy*, 364 I.C.C. at 810.

railroad's revenue adequacy status could have an impact on the *procedures* that would be applied to assess the reasonableness of a particular rate. It was equally clear, however, that the statutory provisions relating to revenue adequacy did not establish any independent standard for regulating rail rates.

In 1983, the ICC proposed in a Notice of Proposed Rulemaking (NPRM) new maximum rate standards for coal rates that reflected an understanding that attainment of revenue adequacy could be the occasion for heightened scrutiny of rail rates but that revenue adequacy was not a rate reasonableness standard.⁶⁴ The ICC explained that “[o]ur regulatory task is to determine the reasonableness of only those rates which are set in an essentially non-competitive market environment. We must develop a means to assure that the rate assessed on this traffic properly reflects the high demand for the service, but is not set at an unreasonably high or ‘monopoly’ level.”⁶⁵ To implement this approach, the ICC proposed four constraints on railroad pricing: the cost of serving market dominant traffic (“SAC”); certain checks on obviously inefficient management (“managerial inefficiency”); achievement of revenue adequacy; and phasing of any substantial rate increases.

As to the revenue adequacy constraint, the ICC first observed that Congress mandated that the ICC assist the nation's railroads in attaining adequate revenues. To achieve revenue adequacy, “maximum rates on market dominant traffic, in general, should be permitted to increase to the extent necessary for a carrier to achieve revenue adequacy. . . . [H]owever, this does not mean that further rate increases on captive coal traffic would be unreasonable *per se*

⁶⁴ *Coal Rate Guidelines, Nationwide*, I.C.C. Ex Parte No. 347 (Sub-No. 1) (Feb. 8, 1983).

⁶⁵ *Id.*, slip op. at 9 (note omitted).

once a carrier attains revenue adequacy.”⁶⁶ Instead, “once revenue adequacy is achieved, we must scrutinize rates more closely.”⁶⁷

The ICC went on to explain that the achievement of revenue adequacy should not result in a freeze on rates charged to market dominant traffic. Rate adjustments should not be prohibited. “Such an approach,” the ICC explained, “would be economically unsound, as it would create disincentives to optimal marketing pricing.”⁶⁸ “A rigidly applied revenue adequacy constraint would have many practical problems.”⁶⁹ The ICC also observed that increased profitability demonstrated by a revenue adequacy finding could be related to factors other than raising rates on captive traffic, such as “increased efficiency,” or “a more profitable rate on competitive traffic.”⁷⁰ 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 railroad’s incentive and ability to increase efficiency, while protecting captive shippers from exploitation.”⁷¹

The ICC explained that its concern over rates charged by revenue adequate railroads would be triggered by a consistent pattern of returns “substantially” in excess of a carrier’s revenue needs.⁷² Where such a consistent pattern of returns “substantially” in excess of a

⁶⁶ *Id.*, slip op. at 15.

⁶⁷ *Id.*

⁶⁸ *Id.*, slip op. at 19.

⁶⁹ *Id.*

⁷⁰ *Id.*, slip op. 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.”).

⁷¹ *Id.*, slip op. at 20.

⁷² *Id.*, slip op. 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.”).

carrier's revenue needs exists, the reasonableness of the rates would, according to the ICC, depend on many factors, including: "the relationship among rates for similar movements; the degree to which a carrier has exceeded the revenue adequacy constraint; and the reasons for a carrier attaining revenue adequacy (e.g., efficiency improvements . . . , raising rates on competitive traffic)."⁷³

There were relatively few comments on the ICC's proposed revenue adequacy constraint, most likely because railroads were so far from earning sufficient revenues that the revenue adequacy constraint was more a theoretical exercise than a practical consideration for rate regulation purposes. However, the parties that did comment generally supported the ICC's view that revenue adequacy was not intended to be a firm-wide constraint on the revenues that a railroad could earn but rather the basis for taking a harder look at the reasonableness of particular rates.

The Department of Transportation ("DOT") submitted extensive comments on the ICC's proposed rule. On the issue of a revenue adequacy constraint, DOT agreed with the idea of applying closer scrutiny to rates after the ICC determines a railroad is earning adequate revenues but it expressly stated 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."⁷⁴ DOT explained that such an inflexible approach "would require regulatory intervention beyond that envisioned *or even authorized by the Staggers Act*."⁷⁵

⁷³ *Id.*, slip op. at 20.

⁷⁴ Comments of the United States Department of Transportation, *Coal Rate Guidelines, Nationwide*, I.C.C. Ex Parte No. 347 (Sub-No. 1), at 32 (filed July 29, 1983).

⁷⁵ *Id.* at 34 (emphasis added).

Notwithstanding that the NPRM had not proposed that revenue adequacy be used as a constraint on total revenues that could be earned by revenue adequate railroads and that the parties commenting on the NPRM all opposed an inflexible revenue ceiling, the ICC's final rules included a revenue adequacy constraint that might be read to contemplate something akin to a firm-wide cap on revenues for revenue adequate railroads. The final *Coal Rate Guidelines* decision described the new revenue adequacy constraint:

[The] 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.

Coal Rate Guidelines, 1 I.C.C. 2d at 535 (emphasis added).

This passage, which the Board quoted in its decision initiating this proceeding, is certainly not free from ambiguity. While suggesting the possibility of an overall revenue cap as a rate constraint, the ICC gave no indication how the constraint might be applied. As already discussed, there is a disconnect between overall revenues and the reasonableness of individual rates. And what is the significance of the phrase "in a regulated setting?" The majority of rail rates are determined by market forces and not subject to STB rate regulation. Neither those competitive rates nor their contribution to overall firm revenues can be subject to STB regulation. Finally, the quoted passage refers to a rate structure "designed to earn greater revenues than needed," possibly suggesting that consideration of a revenue adequate carrier's intent in the design of its overall rate structure would trigger application of the revenue adequacy constraint.

Although the ICC said in 1985 that a revenue adequacy constraint exists, there is no substance to that constraint. Indeed, the ICC did not even hint at, much less set out, a methodology for implementing a revenue adequacy constraint. As discussed below, a separate revenue adequacy constraint predicated on the concept of rate of return would be both inappropriate and likely impossible to implement in the predominantly competitive rail sector. There is nothing in the 1985 *Coal Rate Guidelines* decision that compels the Board to preserve the ICC's concept of a revenue adequacy constraint on rail rates.

D. There Is No Basis in the Statute or the Economic Principles Underlying the Board's Regulation of Rates for the Use of a Firm-Wide Revenue Adequacy Constraint on the Revenues that a Railroad Can Earn.

Various aspects of the ICC's *Coal Rate Guidelines* were appealed by shippers and railroads to the Third Circuit, which rejected all of the challenges. No party challenged the revenue adequacy constraint, which was widely viewed as little more than a theoretical possibility given that the industry remained deeply mired in long-standing financial difficulty. The absence of a challenge in 1985 to a purely theoretical revenue adequacy constraint that lacked definition or substance in no way obligates the Board to infuse it with substance in the current environment. A firm-wide constraint on revenues is not consistent with the statute, case law or sound regulatory policy and could not be implemented coherently.

A firm-wide cap on revenue for revenue adequate railroads would be inconsistent with the scheme of rate regulation under the statute, which focuses on the reasonableness of specific rates on market dominant rail traffic. Unless a railroad has market dominance over a particular movement, the statute says that a railroad is free to establish a rate of its choice without any interference from the regulator. 49 U.S.C. §10701(c). Most rail traffic is subject to robust competition and is therefore off limits as far as Board rate regulation is concerned.

The rate reasonableness provisions of the statute do not state that the Board may declare a rate to be unreasonable based solely on the amount of revenue that a railroad earns on a firm-wide basis. To the contrary, the statute expressly requires a finding that the challenged rate is unreasonable before the Board may prescribe an alternative rate. 49 U.S.C. § 10704. The statute further contemplates a “full hearing” to determine the reasonableness of the challenged rate, and only after conducting such a hearing is the Board authorized to take regulatory action. The notion that a rate could be deemed to be unreasonable based on the carrier’s overall financial condition without any consideration of the specifics of the challenged rate itself is contrary to the entire scheme of rate regulation set up under the statute.

Gauging the reasonableness of rates on the basis of system-wide revenues, without reference to the individual circumstances of the rate at issue, also would virtually guarantee the creation of a cross-subsidy by some shippers of other traffic on a railroad’s network, contrary to the Board’s rules against cross-subsidy. Even if a railroad is able to earn revenues that cover its full long-term costs on a system-wide basis, that does not necessarily mean that all movements generate revenues sufficient to cover their own long-run costs. A firm-wide cap on the revenues that a revenue adequate railroad is permitted to earn could result in holding rates to certain shippers down to levels that are insufficient to cover the full long-run costs of service to those shippers. Other shippers on the railroad would be forced to subsidize the movements that are not covering their full costs.

Such a result would violate the Board’s precedent, developed in *PPL*⁷⁶ and *Otter Tail*,⁷⁷ that the Board should not exercise its rate regulation authority in such a way as to maintain or

⁷⁶ *PPL Montana, LLC v. Burlington Northern & Santa Fe Railway*, 6 S.T.B. 286 (2003), *aff’d*, 437 F.3d 1240 (D.C. Cir. 2006).

create cross-subsidies. In *PPL*, the Board adopted an internal-cross subsidy test (applied in stand-alone cost rate proceedings) to ensure that issue traffic which uses only a subset of the facilities of a stand-alone railroad can cover the cost of those facilities. Revenues from the issue traffic and any other traffic that shares the subset of facilities must cover the attributable cost of that subset of facilities. Otherwise, traffic included in the SARR shipper group that does not use the subset of facilities would be subsidizing the traffic that does (*i.e.*, bearing the costs of facilities it does not use). In *Otter Tail*, the Board clarified that a rate prescription could not reduce revenues to such an extent that rate relief would cause a complainant to fail the *PPL* cross-subsidy test.

E. A Firm-Wide Revenue Adequacy Constraint Would also Be Inconsistent with the Results of SAC Applied on a Firm-Wide Basis As Long As the Board Defines Revenue Adequacy by Reference to the Book Value of Assets.

The goal of the Staggers Act was to “treat[] the American railroad industry as any other business.”⁷⁸ Where a railroad is not market dominant, which is the case with the substantial majority of traffic handled by railroads, rates are determined by market forces. Where a railroad has market dominance, the Board regulates rates by simulating competitive market outcomes through application of the SAC test for rate reasonableness.

As the Board has recognized, “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. The SAC test, which judges the reasonableness of a challenged rate by

⁷⁷ *Otter Tail Power Co. v. BNSF Railway Co.*, STB Docket No. 42071 (served Jan. 27, 2006), *aff'd*, 484 F.3d 959 (8th Cir. 2007).

⁷⁸ *Burlington Northern R.R. Co. v. Public Utility Comm’n of Texas*, 812 F.2d 231, 235 (5th Cir. 1987) (citing 126 Cong. Rec. 28,431 (1980) (statement of Rep. Staggers)).

comparison to the rate that would prevail in a competitive market, rests on a sound economic foundation and has been affirmed by the courts.”⁷⁹

The statutory scheme of rate regulation administered by the Board does not allow a traditional utility-style rate of return regulation superimposed over SAC. It has long been recognized that railroads cannot survive under traditional rate of return regulation, where the overall revenues earned by a firm are regulated to ensure a reasonable level of profits on the regulated business. Even before the Staggers Act, the ICC did not apply public-utility style rate of return regulation to assess the reasonableness of rates. As the Third Circuit noted in addressing shippers’ challenges to the ICC’s adoption of CMP in *Coal Rates Guidelines*, prior to the 4R and Staggers Acts “[r]ailroad rate regulation was not like traditional public utility rate regulation because of the ICC’s inability to guarantee that the carrier obtained business.” 812 F.2d at 1453. As the *Bessemer* court explained:

Railroad regulation by the ICC, is not, however, classic public utility regulation. For the most part railroads operate in a competitive environment. It is true that under the 4R and Staggers Acts they are subject to regulation of rates for market dominant traffic. They are not, however, assured of a compensable rate of return even on the investment required to serve that traffic.

Bessemer, 691 F.2d at 1113-14. As the ICC noted shortly after the Staggers Act, “[t]he Commission does not regulate the overall rate of return for railroads.”⁸⁰

Rate of return regulation makes no sense in an industry like the railroad industry where competition is widespread. Such an approach could not work, either as a practical or legal matter, since the Board cannot control the revenues that a railroad earns on its competitive traffic and could not assure an adequate return. If the Board were to try to regulate a railroad’s overall

⁷⁹ *Simplified Standards*, slip op. at 13.

⁸⁰ *Arkansas Power and Light et al. Petition to Institute Rulemaking Proceeding – Implementation of Long-Cannon Amendment to the Staggers Act*, 365 I.C.C. 983, 989 (1982).

earnings indirectly by manipulating the rates charged to the relatively small set of shippers whose rates are subject to regulation, the results would irreconcilably conflict with the competitive market principles underlying the SAC test. The SAC test is based on the principle that in competitive markets, prices must be sufficient to cover the long-run costs of service. A firm will not remain in business over the long term if it is unable to cover its full costs over the life of its assets. If a rate charged to a shipper does not exceed an amount necessary to cover the full costs of providing service, the rate is consistent with competitive market principles and it should not be reduced in an effort to regulate a railroad's overall rate of return.

If the Board were to cap regulated rates based on the current revenue adequacy standard, which is based on the book values of assets, rates subject to regulation would inevitably be driven down below levels necessary to cover the full long-run cost of service. Unlike the replacement cost asset values used in SAC, the book value of assets used to calculate annual revenue adequacy does not reflect the true economic value of assets. If regulation were based on book value, the firm providing the service could not remain in business over the long term. Setting maximum rate levels based on the current revenue adequacy standard would inevitably drive rates on some regulated traffic down below SAC levels – *i.e.*, below the level necessary to cover full long-run costs – contrary to the competitive market principles underlying the Board's approach to rate regulation.

The Board has never attempted to apply a revenue adequacy constraint in a rail rate case. The only time that the Board or the ICC has applied rate of return regulation under the revenue adequacy constraint of the *Coal Rate Guidelines* was in the Koch pipeline case. *CF Industries, Inc. v. Koch Pipeline Co., L.P.*, 4 S.T.B. 637 (2000), *aff'd sub nom. CF Industries, Inc. v. STB*,

255 F.3d 816 (D.C. Cir. 2001). The system-wide rate of return approach applied in the *Koch* case to the rates of a structurally different industry would not work in the rail rate context.

The complaining shipper in *Koch* challenged the reasonableness of an across-the-board rate increase for the pipeline system in its entirety. Indeed, the *Koch* anhydrous ammonia pipeline resembled a traditional public utility monopoly in that the pipeline was market dominant as to virtually all of its movements. Thus, the rate case resembled a traditional public utility rate case, instead of a rail rate case where the complaint focuses on a sub-system of the carrier's network that handles the allegedly market dominant issue traffic. Because it was challenging rates across the pipeline system as a whole, the shipper's election to proceed under the top-down revenue adequacy constraint fit the facts of its rate case. There could be no such fit in the rail rate context because there could be no challenge to a railroad's rate structure in its entirety – most rail traffic falls outside of the Board's rate jurisdiction.

Moreover, a top-down approach under a revenue adequacy constraint predicated on depreciated book values of assets, as in *Koch*, produces outcomes inconsistent with SAC, as the parties' evidence in *Koch* under the differing approaches showed. These divergent outcomes resulted from the different methods of asset valuation underlying the two constraints – the use of replacement costs in SAC, and the use of depreciated book values under the revenue adequacy test. In the rail context, the SAC test is established as the most accurate and reliable rate reasonableness standard available to the Board. Adoption of an alternative standard that produces results markedly different from SAC would not comport with the Board's repeated acknowledgement of the superiority of the SAC test in evaluating the reasonableness of rail rates.

V. AAR Supports Efforts to Improve the Application of the SAC Test and to Provide for More Expeditious Resolution of Rate Cases.

A. Despite the Complexity of Full SAC Cases, SAC Is the Best and Most Accurate Maximum Rate Standard Available to the Board.

As discussed above, there can be no serious doubt that the SAC test is the best method currently available for determining the reasonableness of rates on market dominant rail traffic. SAC comports with competitive market principles and simulates competitive market outcomes. The courts have ruled that SAC and the Board's implementation of SAC are consistent with ICCTA.⁸¹ The simplified procedures adopted by the Board have been upheld in part because, as currently formulated, they remain tethered to the guiding principle of demand-based differential pricing that underlies SAC. For all these reasons, SAC should remain the primary methodology for determining the reasonableness of rates set by revenue adequate rail carriers as well as those set by revenue inadequate rail carriers. Just as it does not make economic sense to allow revenue inadequate carriers to charge rates that exceed the SAC maximum, it would not make economic sense to require revenue adequate carriers to charge rates lower than the SAC maximum.

AAR recognizes that the Board members have recently expressed concern that full SAC cases are complex, costly and time consuming. In their recent separate expressions in the *Sunbelt* decision, the members focused particularly on the complexity of SARR design and the large number of discrete, contested issues that need to be decided by the Board to resolve a full SAC case. Chairman Elliott expressed the hope that the upcoming Revenue Adequacy

⁸¹ See, e.g., *CSX Transportation, Inc. v. Surface Transportation Board*, 584 F.3d 1076 (D.C. Cir.2009); *Consolidated Rail Corp. v. United States*, 812 F.2d 1444 (3d Cir. 1987).

proceeding could initiate a process of “making better, and hopefully more manageable, rate decisions.”⁸²

Importantly, while expressing concerns regarding the complexity of full SAC cases, the Chairman’s separate expression in *Sunbelt* also acknowledged that SAC is “economically sound” and “advance[s] the goals” of ICCTA.⁸³ SAC “is the Board’s primary mechanism for judging rate reasonableness in large disputes.”⁸⁴ Although the application of full SAC can be difficult, the Board should not contemplate abandoning the economically valid centerpiece of its rate regulation approach because of dissatisfaction with how SAC is applied in practice. If the issue is the complexity of rate proceedings, then the Board should work with stakeholders to streamline and refine the application of full SAC. AAR and its members stand ready to support such a process.

B. Streamlining Full SAC Cases

The desire to provide clarity and streamline full SAC cases is not a new phenomenon. In 1985, when the ICC adopted the basic framework underlying CMP and the SAC test, it believed that the guidelines would provide a workable approach to case-by-case resolution of rate complaints. But it realized that “the workability of guidelines is most appropriately evaluated in light of experience.” *Coal Rate Guidelines*, 1 I.C.C.2d at 525. “The test of experience is appropriate,” the ICC explained, “because CMP is based on rather sophisticated economic theories which require careful interpretation and application. We may well find, after some

⁸² *Sunbelt Chlor Alkali Partnership v. Norfolk Southern Railway Co.*, STB Docket No. NOR 42130, slip op. at 30 (served June 20, 2014).

⁸³ *Id.*

⁸⁴ *Id.*

experience with applying the guidelines, that modifications are needed to make the approach to maximum rate regulation ... workable.”⁸⁵

Over time, the SAC test evolved organically as new issues were presented, litigated, and ultimately ruled upon by the ICC or STB. Indeed, full SAC cases have evolved from little more than a concept nearly thirty years ago in *Coal Rate Guidelines* to a sophisticated package of interactive algorithms and computer models today. In this evolution, some element of complexity has been inevitable and is not unwarranted. The network enterprise of railroading is complex and modeling a railroad is complex. But many vexing issues have been overcome.

The pattern that has emerged over time is that new issues are presented by the parties in individual rate cases. This inevitably introduces new complexity and temporary uncertainty into the SAC process. The issues are then debated vigorously, often in a series of cases, sometimes even on appeal. Eventually, the ICC or STB settles the issue. Resolution has occurred most frequently on a case-by-case basis, but occasionally the STB has resolved major controversies through notice and comment procedures. Examples of complex issues raised by parties, and resolved by the ICC or STB, include the following:

- How to define barriers to entry;
- How to allocate revenue from cross-over traffic;
- How to model the capacity of the railroad network using the RTC model;
- How to perform a discounted cash flow analysis of the hypothetical SARR to estimate the capital carrying charges in each year;
- How to deal with internal and external rerouted traffic;
- How to forecast operating expenses to reflect productivity improvements;
- How to forecast revenues using a mix of internal forecasts and long-term government forecasts;
- How to allocate the overall revenue requirements of the SARR to determine whether and how much relief should be available to a complaining shipper; and
- How to erect protections against internal cross-subsidies within the SAC analysis.

⁸⁵ *Id.*

These (and other) issues were the vexing issues of their day. Over time, however, the Board managed to resolve the disputes and provide guidance to the parties on what it expected going forward. Indeed, some of the most vexing early questions—such as how to perform the discounted cash flow analysis—are now so routine that there is often no dispute over them in the SAC analysis.

Resolving these complex issues was not easy. And in some cases, it took longer to achieve than the parties or the Board would have wished. But the solutions are now bedrock components of the SAC methodology and their adoption illustrates that the full SAC methodology can be streamlined and improved. Such improvements result in greater clarity in the application of SAC, which facilitates negotiated resolution of rate disputes instead of litigation before the Board.

The STB is entering a new phase in the evolution of SAC cases because recent hypothetical railroads are raising new complex issues that will again require guidance from the STB. Historically, the vast majority of traffic included in a traffic group consisted of trainload movements. Now, however, traffic groups often include significant amounts of manifest (or carload) traffic. This *inevitably* raises complex operating questions. (It has also raised complex questions about how to allocate revenue for manifest cross-over traffic that will be the subject of a promised rulemaking by the STB.) Modeling trainload operations is a far cry from modeling manifest operations. The inability of complainants in recent cases to successfully model those complex railroad operations is not a flaw of the SAC test. The Board insists that the hypothetical railroad be realistic and feasible. But recent complainants have sought to model the hypothetical railroad's operations by treating the hypothetical railroad as if it were just handling trainload traffic, rather than using commercially available programs that can model complex manifest and

intermodal service, including adoption of blocking plans and plans for the pickup and delivery of traffic. The Board properly rejected those operating plans, and simultaneously provided some initial guidance on how to properly model manifest traffic.

Over time, the complexities involved in modeling manifest traffic for a SARR will be streamlined and simplified, just as similarly vexing issues have been streamlined and simplified in the past. In the process, complainants may well lose cases that perhaps never should have been brought in the first place. But this does not mean that the SAC test is flawed in some way. It simply illustrates the fact that the SAC test is dynamic and constantly evolving.

So while the concerns expressed by Board members in the *Sunbelt* case regarding the difficulties involved in modeling traffic for a SARR involving mostly manifest traffic are understandable, AAR respectfully submits that the solution is not to find an alternative to the SAC test. Rather, to resolve issues presented by manifest traffic, the Board should either let the SAC test continue to evolve on a case-by-case basis or engage in one or more rulemakings focused on accelerating the evolutionary process as it has done for similar issues in the past.⁸⁶

C. Regulatory Contestability

Finally, it is important to understand that the absence of large numbers of full SAC or SSAC cases brought before the Board does not indicate that there is something wrong with a rate regulation regime centered on SAC. After nearly twenty years of development and implementation, the SAC standard does not need to be applied in large numbers of cases to be effective. Railroads and shippers regularly resolve disagreements over rates by reference to the likely outcome of SAC cases. A practice of “regulatory contestability” has taken hold in the rail

⁸⁶ The Board’s discontinuance of movement-specific adjustments to URCS, which has been highly successful in reducing the complexity of rate litigation, was accomplished as a result of a Board initiated rulemaking.

sector. That is to say, potential litigants avoid the costs and other burdens of complex rate litigation by simulating the likely outcomes of litigation through negotiated resolution of disputes. This practice limits the number of rate cases needed to resolve potential abuses of market power.

The absence of a large number of rate cases is therefore not a sign that the existing procedures are not “working.” The premise that an effective rate reasonableness regime would result in increasing numbers of rate cases inverts the proper relationship – a successful regime should result in *fewer*, not more, cases. Indeed, the ICC predicted as much in *Coal Rate Guidelines* when it noted: “[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 that this will encourage contract solutions which . . . may often be more efficient and more beneficial to both parties than a prescribed rate.”⁸⁷ This logical prediction was echoed recently by Vice Chairman Miller: “My view is that when shippers have more information they can make better decisions and, as a consequence, fewer disputes will arise.”⁸⁸

Railroads and their customers are very much aware of the regulatory backdrop provided by existing rate standards and procedures. The Board has worked hard to improve the

⁸⁷ See *Coal Rate Guidelines*, 1 I.C.C.2d at 524. In the early 1980s, the ICC was besieged by rate cases prompted by the passage of the Staggers Act, which contained a provision that required parties with grievance that predated Staggers to file suit now, or forever hold their peace. Without any guidance from the ICC about how it would implement the Staggers Act, hundreds of rate disputes poured into the agency. As the ICC provided guidance to the parties on how it would implement the new regime, these disputes were dropped or settled, leaving only a few cases where the parties could not agree on whether the challenged rates violated the principles announced in *Coal Rate Guidelines*.

⁸⁸ *Petition of Norfolk Southern Ry. Co. and CSX Transp. Inc., to Institute a Rulemaking Proceeding to Exempt Railroads from Filing Agricultural Transportation Contract Summaries*, Docket No. EP 725, slip op. at 6 (served August 11, 2014) (V.C. Miller, concurring).

consistency of application of rules in SAC cases and to develop two alternatives to a full SAC presentation. The direct effect of those efforts is that the regulatory system is clearer to the regulated entities, which means it is easier for them to comply with that regime.⁸⁹

Greater consistency in rulings in rate cases makes it more likely that railroads (the regulated entity) will attempt to comply with the rate regulation regime when private market-based negotiations break down by publishing rates that will survive a rate reasonableness challenge.

Even when the parties are not able to foreclose the initiation of litigation because their assessments of probable regulatory outcomes diverge too much, they are often able to reach a settlement after litigation begins. This is illustrated by the history of all rate disputes filed with the agency since 1996. As reported on the STB website,⁹⁰ there have been 46 rate disputes brought before the STB since 1996; 56% of those cases settled or were withdrawn. These figures are illustrative of a well-functioning regulatory compliance program. The majority of disputes are resolved without litigation; the majority of cases that go to litigation ultimately settle. As the greater clarity provided by the STB's recent rate reforms is digested and understood by industry stakeholders, the Board should expect even fewer cases to require regulatory resolution, not more.

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

⁸⁹ In the report *Reducing the Risk of Policy Failure: Challenges for Regulatory Compliance*, the Organization for Economic Cooperation and Development noted that “[r]egulatory compliance in this report refers to *obedience by a target population with regulations*. Why do people obey any rule? Several conditions are needed. The first condition is that the target group has to be *aware of the rule and understand it*. For example, lack of clarity in a rule may bring about unintentional non-compliance.” 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>. (emphasis in original).

⁹⁰ See http://www.stb.dot.gov/stb/industry/Rate_Cases.htm

of regimes could be predictable. But validity of the regime comes from the generation of outcomes consistent with sound economics.

* * *

AAR supports the goal of improving the workability and accuracy of full SAC and SSAC maximum rate standards because it understands that effective restraints on the exercise of market power are a key element of the trade-off implemented by the Staggers Act. Railroads were given the freedom to act in response to market forces where market forces are sufficient to constrain their pricing and commercial behavior. The role of the regulator is to constrain the undue exercise of market power. That trade-off has worked well, in large measure because the Board's rate constraints emulate competitive market principles. Any refinements to full SAC or SSAC should further the objective of simulating competitive market outcomes.

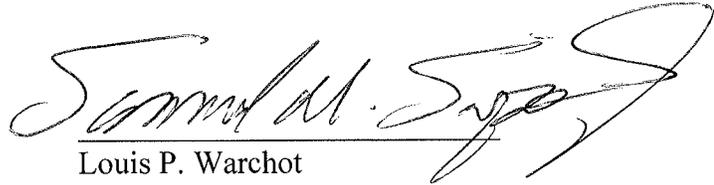
CONCLUSION

There is no policy rationale or legal basis for any sort of firm-wide cap on revenues or rates of revenue adequate railroads. Revenue adequacy should be treated by the Board as a floor, not a ceiling. Railroads must have the incentive and opportunity to earn returns in excess of their cost of capital so that they will be able and willing to make the capital investments necessary to maintain and expand their networks. Finally, there is no need for a separate revenue adequacy constraint for individual rate cases, as the SAC test constitutes an accurate and economically sound method for simulating competitive market outcomes in those rare instances where Board intervention is needed to rectify market power abuse.

Respectfully submitted,

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September 5, 2014

**Verified Statement of
Joseph P. Kalt**

BEFORE THE
SURFACE TRANSPORTATION BOARD

RAILROAD REVENUE ADEQUACY

Docket No. EP 722

VERIFIED STATEMENT OF

JOSEPH P. KALT, PH.D.

SEPTEMBER 5, 2014

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I. INTRODUCTION AND STATEMENT OVERVIEW

A. Witness Introduction

My name is Joseph P. Kalt. I am the Ford Foundation Professor (Emeritus) of International Political Economy at the John F. Kennedy School of Government at Harvard University. The Kennedy School of Government is Harvard's graduate school for public policy and public administration. I joined the faculty at Harvard in 1978, serving first as an Instructor, then as an Assistant Professor and Associate Professor of Economics in the Department of Economics. I joined the faculty of the Kennedy School of Government as a Professor of Public Policy with tenure in 1986. At the Kennedy School, my teaching responsibilities have included economics for public policy, the economics of regulation and antitrust, natural resource and environmental policy, and economic development.

During 2005-2009, I served as a visiting professor at the University of Arizona's Eller College of Management. Since 2008, I have been a visiting professor at the University of Arizona's Rogers College of Law. My teaching at the University of Arizona has included the economics of regulation and antitrust, as well as economic development policy.

I am also a senior economist with Compass Lexecon, an economics consulting firm with offices in Boston, MA; Washington, DC; Los Angeles, CA; Chicago, IL; Oakland, CA; Pasadena, CA; Princeton, NJ; Tucson, AZ; Houston, TX; New York, NY; Europe; and Latin America. I hold B.A., M.A., and Ph.D. degrees in economics.

Throughout my career, I have engaged in extensive research, teaching, and consulting on the economics of regulated markets, as well as on competition economics and policy more generally. In addition to my university teaching, I have taught on such topics in programs for

working journalists, state legislators, federal administrative law judges, and business and non-profit sector leaders. Over the last 30 years, I have testified on numerous occasions before state, federal, and international courts, tribunals and commissions, as well as before the U.S. Senate and the U.S. House of Representatives, regarding the economics and policy of competition and regulated industries.

With regard to the railroad sector, I have provided expert testimony before the Surface Transportation Board (“STB” or “the Board”) and various other federal and international tribunals on a wide range of matters, including major rail mergers, rate making and rate regulation exemptions, competitive access policy, and a number of antitrust matters. I have also been invited on multiple occasions to provide education on the basic economics of the railroad sector and its regulation to STB members, congressional staff, and federal administrative law judges.

My curriculum vitae is attached as Appendix A and lists my prior testimony as an expert, my publications, and my other professional activities.

B. Purpose and Summary of Findings

Here, I have been asked by the Association of American Railroads (“AAR”) to provide analysis related to the economic regulation of railroads, with specific focus on the concept of revenue adequacy. In particular, I have been asked to provide an assessment of the evolution of the regulation of railroads in the U.S. in light of the bedrock economic principles which underlie regulation that is in the public interest. From this perspective, I address below the proper definition and measurement of revenue adequacy; and I discuss how a properly defined and measured concept of revenue adequacy can fit into an economically sound regulatory framework. My conclusions span a range of matters pertinent to the issues raised by the Board’s inquiries in this proceeding.

Regulatory Performance. A review of the state of the rail industry over the last half century reveals the power of regulation to make or break the sector:

- The well-known physical and financial decline of the U.S. railroad industry in the 1960s and through the mid-1970s was the direct result of a distortionary and ultimately destructive regulatory structure that ignored fundamental aspects of the economics of the industry and the role railroads can play in promoting a healthy national economy. In particular, the ill-conceived regulatory policies of the era treated the challenge of regulation as one of balancing competing interests through non-economic criteria of interest group politics.
- Reforms ushered in under the 4-R Act of 1976 and, especially, the Staggers Rail Act of 1980 (“Staggers”) embraced the important principles that the overall public’s interest in a healthy national economy is best served by a regulatory framework: (1) which works to ensure that railroads have the opportunity to realize revenues which are adequate to sustain them as viable contributors to the nation’s economy, and (2) which relies on the forces of the marketplace to regulate rail rates and service where competition is potent, but can intervene with direct regulation of rates and service so as to mimic competitive market outcomes where competition does not provide adequate discipline.
- The Staggers Act is a story of successful economic regulation. The focus on ending revenue-draining and inefficient operations and structures, coupled with regulation driven by competitive market principles, brought abrupt and sustained improvement in railroad productivity, at least two decades of declining real (i.e., inflation-adjusted) rates, and gradual improvement in the overall financial well-being of the industry.

Defining and Measuring “Revenue Adequacy.” Improvements in the financial performance of the rail industry have given rise to the question of whether a number of railroads are, or may soon be, “revenue adequate.” This, in turn, raises the question of the meaning of the term. Presuming that policy seeks a definition that is consistent with the public’s interest in sound regulation of the rail industry and the associated health of the nation’s economy (as opposed to an earlier era’s focus on parsing out value to interested parties), the basic economics of regulation tell us that:

- The concept of “revenue adequacy” must be understood with reference to the overriding public interest in competitive market outcomes. That is, with sound regulation guided by the standard of enabling competitive market outcomes through regulatory freedom where competition is potent and mimicking competitive outcomes where it is not, it follows that the revenues which would be generated by competitive

market outcomes across a railroad's network are the competitive market's determination of adequate revenues for a firm whose performance satisfies the public's interest in a healthy national economy. Competitively determined revenues provide the firm with the incentive to chase business it can efficiently serve, and the cash flow that justifies investments in that pursuit.

- Sustained revenues in excess of the competitive standard would be subject to limitation via the entry and pricing of rivals in a competitive setting. Conversely, inadequate revenues would be elevated by competitive markets as rising demand in a generally growing economy pulled them upward to the point at which new entrants would begin to appear and constrain them. In short, adequate revenues from the perspective of the public interest are the revenues a railroad would earn *in equilibrium over the long term* if it were compelled by competition to charge no more and no less than competitive rates on all of its movements. In terms familiar to the Board, adequate revenues are the revenues that would, at a minimum,¹ cover the costs (including the cost of capital) of a System-Wide Stand-Alone Railroad – a SW-SARR – which could efficiently reproduce the service of an actual railroad were the industry subject to free entry by competitors.
- Attempts to define and measure revenue adequacy based on quantification of accounting measures of the depreciated, historic book value of assets are conceptually misguided and, ultimately, contrary to the public's interest in competitive market outcomes and regulation which yields or mimics those outcomes. Especially with the kind of durable and long-lived capital we find in the rail industry, non-economic accounting measures of depreciated original book costs readily yield economically nonsensical conclusions as to the adequacy of revenues and returns. If used as justification for constraining rates below competitive market levels, such measures would distort investment and consumer choices in the nation's transportation networks.

The Role of “Revenue Adequacy” in Ratemaking. Generally improving financial performance among the nation's railroads raises the question of the proper role of a standard of revenue adequacy in the Board's oversight and regulation of rail rates.

- Basic economics teaches that earnings by an actual railroad at a given point in time which are in excess of those required to achieve system-wide revenue adequacy do not necessarily indicate that the railroad is charging supra-competitive rates somewhere in its network. Nor is “financial health” more generally somehow indicative of market power. A particularly efficient firm in competitive markets can readily sustain revenues higher than those of a statically specified SW-SARR when the firm is adept at staying ahead of dynamic market conditions by anticipating where and what kind of

¹ As I point out below, an incumbent firm which is particularly efficient in its operations, abilities to anticipate customer needs, and/or implementation of technologic innovations will have its overall revenues constrained and set by such competition, but nevertheless realize what economics refers to as “efficiency rents,” which leave it with rates of return on its capital investment which exceed its cost of capital.

service customers value most. Ferretting out the exercise of market dominance which generates above-competitive returns is inherently a market-by-market task. Overall revenue supra-adequacy is no guide.

- It would be economically unsound and contrary to the public's interest to use a system-wide revenue adequacy standard – even one based on the costs of a SW-SARR – as justification for applying firm-wide revenue caps. Such a policy would be contrary to the competitive market standards that underlie the Staggers Act, would distort and artificially depress rail rates *below* competitive levels in markets in which competition can otherwise protect the public interest, and would threaten the unravelling of the hugely important post-Staggers Act improvements.
- Were a railroad to be found to be sustaining revenues over the long term that exceed the competitive market standard of the SW-SARR, it *might* be the case that some rate or rates are above competitive levels in markets in which a railroad is market dominant. But proper investigation of such concerns inherently requires market-specific examinations. Just as the Board does not simply *assume* that all of a railroad's rates are reasonable if it is revenue inadequate overall, so it is not proper to assume that any, much less all, of a railroad's rates are unreasonably high if it is overall revenue adequate.
- In the same vein, overall revenue supra-adequacy, itself, would not justify the constraining of rates on specific traffic even if that traffic is found to be subject to rail market dominance. As the Board has long recognized, rates for specific traffic subject to market dominance are properly subjected to the competitive market standard of the stand alone cost ("SAC") of an efficient would-be entrant seeking to serve such traffic. The Board's SAC standards for specific traffic recognize that it is proper to prevent shippers from claiming cross-subsidies via revenues generated elsewhere in the system. The use of a criterion of overall system revenue supra-adequacy to justify rates lower than generated by the Board's SAC test for specific traffic would effectively promote just such cross-subsidies.
- It is appropriate for regulatory policy to be concerned with the complexity and expense associated with implementing the Board's constrained market pricing framework for assessing the reasonableness of individual rates. But the fact that rate cases before the Board can be complex and costly does not mean that the competitive market framework that underlies constrained market pricing and SAC is flawed, or that the SAC standard is ineffective in disciplining rates to shippers that lack effective competitive alternatives. It means that progress is needed in simplifying market dominance and SAC tests *in accord with sound economic principles*.

The remainder of this statement is organized as follows: Section II outlines the regulatory evolution and principles that have transformed the U.S. rail freight industry over the last several decades. Section III then addresses the proper definition and measurement of revenue adequacy in

the context of an overall sound economic regulatory policy. Section IV discusses the proper role for revenue adequacy in the Board's ratemaking, and Section V summarizes my conclusions.

II. BACKGROUND ON REGULATORY EVOLUTION AND PRINCIPLES

A. The Pre-Staggers State of the Rail Freight Industry

The fundamental economic rationale for regulating rates and services in the railroad industry (really, in any industry) is the prospect of a rail carrier exercising market power and elevating rates above competitive levels.² Such concerns arise because railroading is generally subject to both barriers to entry as well as substantial economies of scope and scale. The latter can make it inefficient for multiple systems to serve certain locations, and the former limit the ability of new entrant railroads to contest for certain traffic carried by an incumbent. At the same time, however, Board policy has consistently recognized that rail service is subject to very potent competition in numerous markets, as railroads do confront other railroads and other modes of freight transportation across wide swaths of their systems. These rivals, as well as the flexibility of many customers in their geographic sourcing and location decisions, bring the disciplining force of competition to bear on railroads.

At the time Congress passed the Staggers Act in 1980, the railroad industry was in a state of severe disrepair. This was the direct result of a regulatory framework that ignored the fundamental economics of the industry. Prior to the Staggers Act, rail regulation was effectively completely divorced from the economic principles governing competitive markets. All rail rates were subject to regulation, with price and service offerings determined by rate bureaus and widely disseminated through public tariffs. This structure made it impossible for railroads to meet

² See U.S. Code, Title 49, §10101, Rail Transportation Policy.

individual shipper demands, negotiate rates through private contract with their shippers, or compete on price and service quality with other modes of transportation. In addition, regulation drained railroads financially by limiting their abilities to divest unprofitable lines, consolidate systems, and/or introduce more economically rational operating practices.³

Not only did the pre-Staggers regulatory approach ignore the role competition could and did play in regulating rail rates. It also was grossly inconsistent with the fact that railroading is a *network* industry which relies on extremely long-lived capital assets and large fixed and common sunk costs. Because all parts of a network are ultimately interconnected with all other parts of the network – and because different users of the network find themselves in highly diverse competitive and other market circumstances – it is challenging to structure economically coherent and sustainable regulation.

First, it must be recognized that, in a network setting, the adverse effects of poor policy and irrationally set rates on one part of the system are ultimately felt across other parts of the system. It is tempting for self-interested parties to advocate for operational policies and rate regulations that serve their own myopic interests. But if every shipper is awarded rates based on their myopic interests (e.g., at a rate equal to only the variable cost of providing the transportation an individual shipper requires), a railroad will not have the ability to generate enough revenue to support the fixed and common costs of the network and will have no ability to fund the on-going investment that is required to maintain and/or expand the network over time. Individual shippers can myopically pursue below-competitive rates consistent with their own self-interest because the

³ See, for example, Meyer, John R. and Alexander L. Morton, “A Better Way to Run the Railroads,” *Harvard Business Review*, LII (July-August, 1974); Moore, Thomas G., *Freight Transportation Regulation: Surface Freight and the Interstate Commerce Commission* (American Enterprise Institute, Washington, D.C., 1972); Meyer, John R., Merton J. Peck, John Stenason, and Charles Zwick, *The Economics of Competition in the Transportation Industries* (Harvard University Press, Cambridge, Mass., 1959); Friedlander, Ann F. and Richard H. Spady, *Freight Transport Regulation* (MIT Press, Cambridge, MA, 1980).

adverse effects of that decision are not borne entirely by the shipper alone but are, instead, spread across the network. Meanwhile, investment overall by the railroad will be discouraged, with investments which are made targeted to those specific parts and activities of the system where rates are least depressed and can payoff for investors.

Further, because of the very long-lives of many of a railroad's assets, the negative effects of reduced maintenance and lower rates of re-investment typically take years to materialize. Economically sound regulatory policy, therefore, must be grounded in economic principles that promote the long-term health of the overall network rather than respond to repeated incarnations of narrowly-focused, short-run interests of individual shippers or groups of shippers. The pre-Staggers experience illustrates the dangers of policy that is divorced from the fundamental economics of the industry.

Without the guide of the overall public's interest in regulation which yields or mimics competitive market outcomes, the pre-Staggers regime was overrun with attempts to hear and respond to the interests of innumerable parties. The resulting pre-Staggers bureau-imposed rates were established without regard for the wide range of competitive dynamics that were at play then for individual shippers. Setting broad, across-the-board rates for all shippers using a specific route or shipping a specific commodity failed to account for the fact that shippers valued those services in very different ways and, therefore, were willing to pay very different rates. The result was that bureau-established rates – reflecting “average markups” over the railroads' variable costs of service – were very attractive to some shippers and very unattractive to others.

The results were predictable. With railroads unable to tailor rates or service offerings to meet individual demands, shippers whose regulated rates were attractive relative to the cost of the next-best alternative chose rail service. Shippers whose regulated rates were much less attractive

than rates offered by competing transportation alternatives abandoned the railroads. Rail volumes began to shift toward the high-cost traffic that obtained a relatively good deal under the pre-Staggers rates (i.e., rates below the true cost of providing service). Left with a shrinking traffic base of largely high-cost shipments generating revenues significantly below total costs, railroads could not generate revenue adequate to cover operating costs and finance necessary long-term capital investments. For many years, the resulting physical deterioration of the nation's rail network was masked by the long lives of railroad capital, but the slow slide into physical and financial ruin eventually took its toll on the nation's economy. By the 1970s, the industry was experiencing multiple bankruptcies and the public was experiencing decrepit service.

By 1980, the railroad industry was among the worst performers in the economy, registering returns on even book-valued investment that hovered around 2%.⁴ The physical assets of the industry were in dire straits, with more than \$4 billion dollars of accumulated deferred maintenance leading to the deterioration of existing physical assets and a lack of investment in infrastructure and equipment.⁵ As numerous railroads fell into bankruptcy in the decade preceding the Staggers Act, service across the network suffered.⁶ Rather than making a positive contribution to the health of the U.S. economy, railroads were a drain on GDP growth and global competitiveness.

Particularly in an increasingly globalized economy, rail networks can make extremely valuable contributions to the nation's overall economic health by reducing trade and transaction

⁴ *Railroad Regulation: Economic and Financial Impacts of the Staggers Rail Act of 1980*, United States General Accounting Office (May 1990) at 3.

⁵ *Railroad Regulation: Economic and Financial Impacts of the Staggers Rail Act of 1980*, United States General Accounting Office (May 1990) at 2.

⁶ *Railroad Regulation: Economic and Financial Impacts of the Staggers Rail Act of 1980*, United States General Accounting Office (May 1990) at 10.

costs that otherwise limit productivity. The policies of the pre-Staggers regime drove home the lesson that rate regulation which protects the interests of individual shippers to the detriment of the rail network as a whole, and which ignores the relative value of rail service to the wide range of customers served, ultimately hurts all shippers and is fatal to the long-term viability of the nation's rail transportation network. Such policies were undoubtedly contrary to the overall public's interest in a healthy national economy.

B. The Staggers Response

Faced with a deteriorating and increasingly inoperable national rail network, Congress initiated a series of regulatory reforms, culminating in the passage of the Staggers Rail Act of 1980. The overriding objective of these reforms was to establish an economically rational regulatory framework that would help restore the industry to sustainable health, encourage system rationalization, and spur increased and sustainable investment – while providing regulatory oversight for shippers who *truly* were subject to abuses of market power.

To achieve these objectives, Staggers embraced two foundational regulatory principles: (1) where competition is adequate, give railroads the flexibility to set their own rates, terms, conditions and service offerings so that they can better tailor their service to customers and the economy's needs, and (2) maintain regulatory oversight of rates paid by shippers, but *only* where it could be shown that a railroad is market dominant (i.e., not constrained by effective competition) through a qualitative finding as to the lack of effective competitive alternatives and a quantitative finding that the rate exceeds 180% of the railroad's variable costs of service to a shipper.

While the Staggers Act recognized that constraints on pricing freedom were warranted to protect truly “captive” shippers, it also recognized that the economics of a network industry operating with high and shared fixed costs across markets of diverse competitive conditions require

that railroads engage in *differential* pricing. That is, with competition faced by railroads for certain traffic unavoidably limiting the contributions which such traffic can make to recovery of the very high fixed costs of the shared network, other traffic necessarily has to provide greater contribution – in accord with the higher value that shippers place on rail service.

Differential pricing under the Staggers Act embodies wise recognition of the differential ability and willingness of disparate traffic to contribute to paying for the overall network. At the same time, however, differential pricing has not been unconstrained. Under the Staggers regime, the Board (and its predecessor, the Interstate Commerce Commission) implemented protections against abuses of market power. Through policies of Constrained Market Pricing (“CMP”), rates have been capped according to a very explicit criterion of “mimic competition.” Specifically, on non-exempt traffic where rates exceed 180% of variable costs and a complaining shipper demonstrates that the serving railroad is market dominant (i.e., not subject to workable competition), maximum rates are set under the principles of a competitive, “contestable” market.

The principles of CMP recognize that, *if* entry and exit were unimpeded in the rail sector, prospective entrants would continually discipline an incumbent carrier by offering shippers rates down to the level of the entrants’ costs (including coverage of the cost of capital in the form of returns to investors commensurate with what investors could realize in alternative endeavors of comparable risk). That is, *if* the subject traffic were contestable, the incumbent would not be able to realize rates and concomitant revenues in excess of the costs of an efficient stand-alone railroad competing for the subject traffic. This stand-alone – “SAC” – test ensures that when rates are regulated by the Board, those rates mimic competitive market prices and that shippers neither pay for (cross-subsidize) portions of the network they do not use nor receive cross-subsidies from

revenues in excess of variable costs contributed by unrelated shippers elsewhere on the incumbent's overall network.

Chastened by the history of destructive rate regulation in the railroad industry, the Staggers Act recognized that constraints on pricing freedom that could be justified for truly “captive” shippers paying unreasonably high rates, must be tempered by the requirement that the regulator also promote a railroad's legitimate need to earn revenues which would be sufficient, overall, to cover the costs of operation, including investments required to sustain an efficient and modern system over the long run and earn a market-based rate of return on investment. This concept has come to be known as “revenue adequacy.”

C. Rail Performance in the Post-Staggers Era

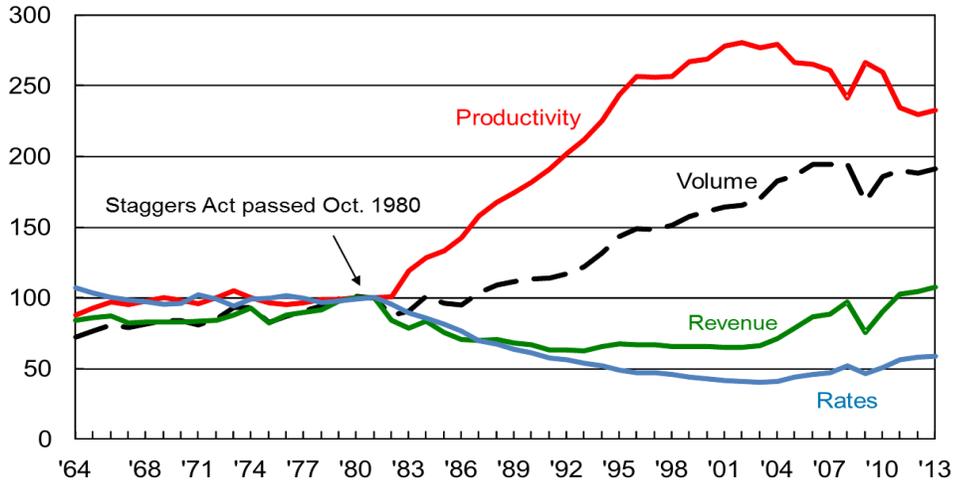
It is difficult to find other examples of regulatory success that rival that of the Staggers Act and its implementation by the ICC and the Board. Since passage of the Act in 1980, the rail industry as a whole has seen dramatically improved service and productivity, more flexible and responsive service offerings, 25 years of rising traffic and declining real transportation rates, and a rail industry capable of supporting an increasingly globalized U.S. economy. In fact, after steadily losing traffic in the period leading up to the Staggers Act, by 2000 rail carriage in the U.S. accounted for the highest share of freight transportation (43%) of any developed country.⁷

Railroads have generated striking improvement across a range of performance metrics, including dramatically lower costs, improved productivity, and increases in private capital spending and investment. Much of the improvement has been passed through to shippers in the form of lower rates for transportation and a high-quality, more efficient, and cost-effective

⁷ “American railways: High-speed railroading,” *The Economist*, July 22, 2010.

network.⁸ This can be seen in Figure 1, which shows the changes in a number of measures of industry performance following passage 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 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

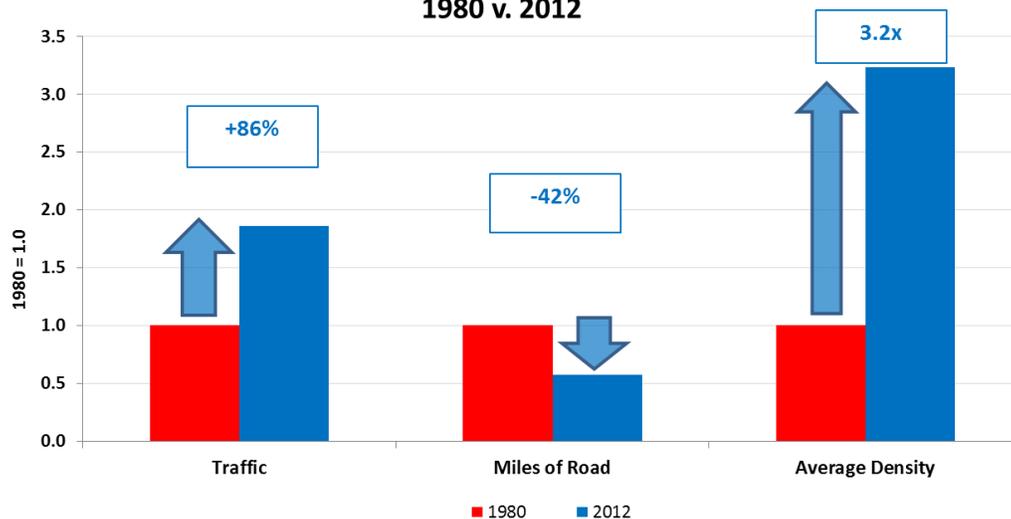
Volumes: In the pre-Staggers era, politically-driven cost-based pricing restraints made it nearly impossible for railroads to compete for traffic with other modes such as barges and trucks. The freedom to tailor price and service offerings to specific shipper needs – and to adjust those prices quickly as needs change – has allowed railroads to better serve their customers, thereby attracting additional customers and creating economies of density nationwide.

Productivity: The rationalization of the nation’s rail network that resulted from the easing of restrictions on spin-offs, abandonments, and mergers allowed railroads to eliminate duplicative

⁸ Bitzan, John D., and Theodore E. Keeler, “The Evolution of U.S. Rail Freight Pricing in the Post-Deregulation Era: Revenues Versus Marginal Costs for Five Commodity Types,” *Transportation* 41.2 (2014)

and unproductive lines and employ their existing assets more effectively. The process of “getting the fat out” naturally plateaus, but has left the rail industry a major and positive contributor now to an overall efficient economy. The nature of the improved productivity of the rail freight industry are summarized in Figure 2. The figure shows that from 1980 (when the Staggers Act was passed) through 2012, rail volumes served have increased more than 60%. This surge in traffic is a striking case of doing “more with less.” It has been achieved while eliminating more than 40% of the system’s road miles, resulting in almost tripled traffic density. Getting more output out of fewer inputs is the essence of economic efficiency and, in the case of railroading since 1980, a major source of cost savings.

Figure 2
IMPROVED U.S. RAILROAD PERFORMANCE:
VOLUMES, ROAD MILES, AND DENSITY
1980 v. 2012

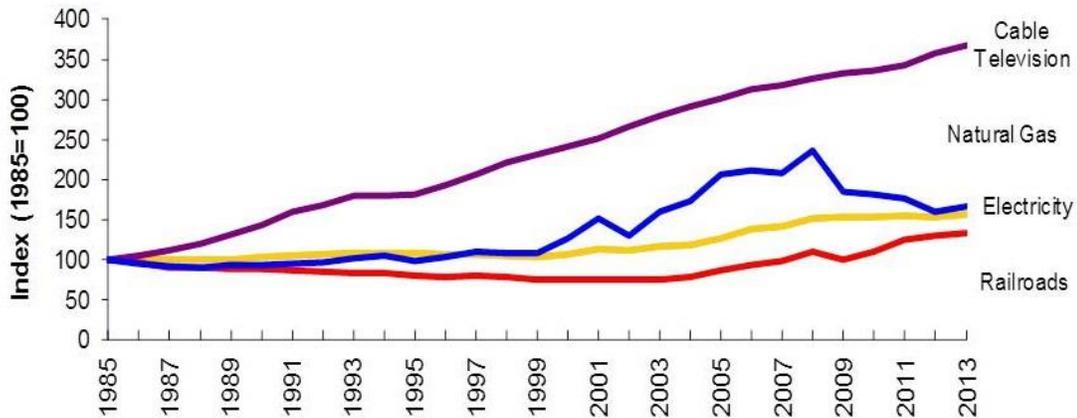


Source: [Statistics of Railroads of Class I in the US, 1970-1980](#) (AAR, Sept. 1982); [Analysis of Class I Railroads, 2012](#), (AAR, July 2014)

Rates: Improved productivity and efficiency have manifested themselves in a long history of declining rates (Figure 1). In fact, when compared to other industries that have undergone major regulatory reform over the last several decades, rail stands out for its ability to deliver increased amounts of service with little or no upward pressure on prices. This is seen in Figure 3, which

compares rail rates since 1985 with those in the electric power, natural gas and cable television sectors.

Figure 3
AVERAGE PRICES, RAILROADS v. SELECTED OTHER INDUSTRIES:
1985-2013



Source: AAR

Investment: The freedoms to set prices that reflect the relative value of rail service to shippers and to rationalize the physical plant created by the Staggers Act reforms has translated into improved financial performance, allowing the railroads to focus investment dollars more effectively. As shown in Figure 4, railroads have exceedingly high rates of investment per dollar of output when compared to other U.S. manufacturing and mining sectors. The railroads’ capital expenditures relative to output over the last decade are roughly triple (21% v. 7%) that of manufacturing as a whole. Moreover, this share has been increasing.⁹ In the six years before Staggers, the capital expenditures of Class I Railroads represented approximately 11% of revenues,

⁹ Bureau of Economic Analysis, Gross Output Released April 25, 2014; Investment in Private Nonresidential Fixed Assets, Updated September 30, 2013.

compared to the recent six-year period (2007-2012). The latter spans the Great Recession, during which Class I Railroads capital investments were approximately 17% of revenues.¹⁰

Figure 4

**CAPITAL EXPENDITURES AS PERCENT OF GROSS OUTPUT:
VARIOUS U.S. INDUSTRIES
AVERAGE 2003-2012**

Average of all Manufacturing	7%
Food, Beverage, and Tobacco Products	3%
Petroleum and Coal Products	3%
Machinery	6%
Motor Vehicles, Bodies and Trailers, and Parts	7%
Wood Products	3%
Fabricated Metal Products	4%
Chemical Products	13%
Plastics and Rubber Products	5%
Paper Products	6%
Nonmetallic Mineral Products	6%
Mining	13%
Railroad Transportation	21%

Source: Bureau of Economic Analysis Gross Output Released April 25, 2014; Bureau of Economic Analysis Investment in Private Nonresidential Fixed Assets, Updated September 30, 2013

D. Competition in the Rail Industry

As mergers, abandonments, and consolidations have been undertaken in an effort to improve the efficiency and performance (operationally and financially) of the nation's rail network, some observers have expressed concern that the structure of the rail industry has grown

¹⁰ *Statistics of Class I Railroads, 1970–1980*, AAR (September 1982); *Analysis of Class I Railroads, 2012* (AAR, July 2014).

less competitive, thereby increasing the risk that shippers could be forced to pay unreasonably high rates.¹¹ The evidence from extensive, rigorous research is that this concern is unfounded.¹²

First, given the investment necessary to lay track all the way to a shipper's doorstep (which can include the cost of acquiring land, investing in track, switches, sidings, and the like), it has always been the case that specific locales have rarely been *directly* connected to multiple railroads. Nonetheless, rail rates for many shippers are constrained to various – often determinative – degrees by one or more of the following features of the markets in which rail service is provided:

- potential competition offered by a competing rail build-in (or build-out) option;
- access to a competing rail carrier via a transload option;
- a shipper's ability to shift its purchases or production from/to a range of geographic regions that provide different rail transportation options (referred to as geographic competition);
- a shipper's ability to use substitute products with different rail transportation alternatives (often referred to as product competition); and
- intermodal competition from other modes of transportation (i.e., trucks, barges or pipelines).

Indeed, intermodal competition has been effective and growing, with rail and trucks competing vigorously for traffic. Railroad intermodal traffic volumes have quadrupled since the Staggers Act, and now represent the Class I railroads' single largest traffic group.¹³ Intermodal

¹¹ See, for example, Committee on Commerce, Science, and Transportation, Office of Oversight and Investigations Majority Staff, *The Current Financial State of the Class I Freight Rail Industry*, Staff Report for Chairman Rockefeller (September 15, 2010) at 10.

¹² See, for example, Laurits R. Christensen Associates, Inc., *A Study of Competition in the U.S. Freight Railroad Industry and Analysis of Proposals that Might Enhance Competition, Revised Final Report*, (Madison, WI, November 2009) (hereafter, "Christensen Rail Study - 2009"). Christensen Associates issued an update to their initial study in January 2010: Laurits R. Christensen Associates, Inc., *An Update to the Study of Competition in the U.S. Freight Railroad Industry, Final Report* (Madison, WI, January 2010) (hereafter "Christensen Rail Study – Updated 2010").

¹³ The AAR reports 3.1 million intermodal containers and trailers in 1980, compared to 12.8 million containers and trailers in 2013. See, [https://www.aar.org/keyissues/Documents/Background-Papers/Rail %20 Intermodal.pdf](https://www.aar.org/keyissues/Documents/Background-Papers/Rail%20Intermodal.pdf), accessed August 20, 2014.

shipments also present an example of how the carriers' investments and innovation have produced efficiencies and benefits for shippers and the public. In response to extensive competition from trucks, railroads must invest in terminals, equipment, and right-of-way to provide more time-sensitive service. Moreover, they must price to attract customers away from trucks. The strong rise of intermodal service indicates they have done so.

The increasing dynamism of U.S. industry – with greater capital mobility, easier logistics of sourcing, greater integration into the global economy, etc. – has increased the forces of geographic and product competition for many types of traffic. To illustrate, consider the example of indirect competition that can be seen in electricity markets, as falling natural gas prices and increased supplies have made natural gas an increasingly attractive alternative to coal-fired electric generation.¹⁴ Being able to source natural gas delivered by pipeline provides competitive discipline on the delivered prices and, hence, freight rates for rail-delivered coal. Such examples are pervasive, from the ability of importers and exporters to select which ports – and which associated serving railroads – to utilities, to automakers with multiple choices as to where to locate plants and production across the national and even North American rail network.

As seen in Figure 1 above, it took more than 20 years for the benefits of the Staggers Act to work their way fully into today's modern systems (reflecting, again, the long-lives of railroad capital). By the early to mid-2000s, productivity gains peaked and plateaued (as they had to at some point) and average rail rates showed upward movement for the first time in two decades. It is common in the media and political arenas (albeit, not among scholars) to hear claims that the latter, at least, has been the result of reduced rail-to-rail competition putatively attributable to mergers,

¹⁴ See Ex Parte 717 “Petition of the Association of American Railroads to Institute a Rulemaking Proceeding to Reintroduce Indirect Competition as a Factor Considered in Market Dominance Determinations for Coal Transported to Utility Generation Facilities,” Decision, March 19, 2013 at 7 and footnote 27.

consolidations, abandonments and other system reconfigurations and rationalizations that have taken place under the Staggers Act. Thus, for example, various shipper groups have recently opined that “unchecked consolidation has led to dramatic increases in rates”, asserting that while there were 26 Class I railroads prior to the Staggers Act, four Class I railroads now “control 90 percent of the market” and “more than three-quarters of U.S. rail stations [being] now served by just one major rail company.”¹⁵

Such assertions do not stand up to careful scrutiny. First, the noted “four Class I railroads” were effectively in place by 1996 (with the consolidation of the Union Pacific and the Southern Pacific),¹⁶ well before we saw the upturn in average rail rates. Moreover, that upturn coincided with the extremely strong and sustained growth in the U.S. economy and in the associated demand for rail freight service (see Figure 1). These conditions pushed the nation’s rail capacity to the point of unprecedented and well-documented congestion. Dealing with that congestion put upward pressure on costs – and rates. In fact, conditions of growing demand, rising costs, and tight supply are precisely the conditions that would be expected to result in rising prices in a well-functioning market.

Some who argue that there has been a diminution in rail-to-rail competition point to statistics on the number of rail stations served by only one rail carrier. Yet, as noted above, the economies of scale and scope associated with railroad operations have always made multi-carrier service to individual stations the exception rather than the rule. Moreover, the various major consolidations, mergers and (in the case of Conrail) “de-consolidations” in the Staggers era have

¹⁵ Agricultural Retailers Association, *et al.*, letter to Senator Harry Reid and Senator Mitch McConnell, July 10, 2014, http://www.publicpower.org/files/PDFs/STB%20Reform%2020140710%20_%20Senate%20Leadership.pdf, accessed August 20, 2014.

¹⁶ The break-up of Conrail in 1998 represented net *de-consolidation* with the Board’s authorization of a large shared service area for NS and CSX.

consistently been accompanied by regulator-mandated (or induced) net *increases* in multiple-rail-served locales. The Shared Asset Areas created by the Conrail transaction offer the most recent and obvious examples of increases in competitive physical service alternatives. In that case, areas in North Jersey, South Jersey/Philadelphia, and Detroit – all solely-served by Conrail pre-transaction – now have service from both CSX and NS as a result of the Conrail deconsolidation.¹⁷

Another significant example has its genesis in the UP-SP merger. At the time of the UP-SP merger, the then-recently merged BN-ATSF moved traffic between the Pacific Northwest and California on a very circuitous route via Denver. Under the terms of the I-5 (i.e., Interstate Highway 5) agreement, UP-SP allowed BNSF to operate much more directly over UP's I-5 route across Oregon to/from northern California, in exchange for BNSF's granting UP the ability to access customers at previously solely-served BNSF points in the Pacific Northwest. Today, UP can quote rates to customers in Washington, Idaho, western Montana, and northern Oregon, and BNSF provides haulage to Portland, from which UP transports the shipments to/from their further destination/origin.¹⁸

Consistent with these observations, numerous academic studies of the rail industry have concluded that competition in the rail industry has not been eroded by consolidation in the post-Staggers Act era. By implication, this means that improved railroad financial performance has not been achieved by exercising a greater level of railroad market power.¹⁹ A recent, comprehensive

¹⁷ See, <http://www.conrail.com/freight.htm>, accessed August 1, 2014.

¹⁸ See https://www.uprr.com/customers/ind-prod/i_5.shtml, accessed August 27, 2014.

¹⁹ See, for example, Christensen Rail Study – 2009; Christensen Rail Study – Updated 2010. See also, Pittman, Russell, “Railway Mergers and Railway Alliances: Competition Issues and Lessons from Other Network Industries”, U.S. Department of Justice, Antitrust Division, Economic Analysis Group Discussion Paper EAG 09-2 (May 2009). See also, Bitzan, John D., and Theodore E. Keeler, *op. cit.* at 305-324; Coublucq, Daniel, “Demand Estimation with Selection Bias: A Dynamic Game Approach with an Application to the U.S. Railroad Industry”, Düsseldorf Institute for Competition Economics Discussion Paper, No. 94 (2013); Ivaldi, Marc and Gerard McCullough, “Railroad Pricing and Revenue-to-Cost

study concluded that, relative to a benchmark of pre-Staggers era ownership structures and policies:

“[The] takeover waves have led to efficiency gains by decreasing the marginal costs, and this was translated into lower prices and an increase in the consumer surplus. Finally, the takeovers have led to a reallocation of assets from the less efficient firms to the most efficient firms, which improved the quality of the freight services provided.”²⁰

In other words, the Staggers’ era changes have contributed to the improved industry performance that we see in Figure 1 above.

E. Modifications to Current Regulatory Standards

While the overarching success of the Staggers Act is incontrovertible and widely acknowledged, the Board has increasingly expressed concern about the cost to shippers of access to regulatory protections at a time of improved service and solid financial performance by the nation’s railroads. In particular, the Board’s current interest in how the revenue adequacy standard should be interpreted and what role revenue adequacy should play – if any – in individual rate cases, raises issues that are complex from both an economic and policy perspective and that the Board must consider carefully. I turn to these issues now.

III. THE PROPER DEFINITION AND MEASUREMENT OF REVENUE ADEQUACY

A. Competitive Markets Are the Touchstone for Regulatory Policy

Competitive markets provide the guiding principles by which rail rate regulation (and economic regulation in general) serves the public interest. Competitive markets, where they can

Margins in the Post-Staggers Era,” *Railroad Economics* Vol. 20 (2007), pp. 153–78; Ivaldi, Marc and Gerard McCullough, “Welfare Tradeoffs in U.S. Rail Mergers”, Toulouse School of Economics Working Paper 10-196 (September 2010).

²⁰ Coublucq, Daniel (2013), *op. cit.* at 1. Note that this does not mean that it would be reasonable to expect perpetually declining costs and rates in the Staggers era. As noted in Sections II.B and II.C above, productivity improvements naturally must (and did) plateau, and costs and rates could not (and did not) decline forever.

operate well, optimally meet the demands of consumers and businesses in the most efficient way possible.²¹ Well-functioning competitive markets direct resources toward those activities most highly-valued by businesses and consumers in the marketplace. These resources include the deployment of labor, equipment, technology, and capital investments for future improvements and expansions.

Where there are functioning markets and competition is workable, direct regulation is unnecessary to protect the overall public's economic interests. In workably competitive markets, this means letting market forces set prices, establish product and service offerings, and determine the nature and level of capital investment and ownership structures. Workably competitive markets will generally result in economic outcomes more efficient than those that could be obtained through regulation. Where markets do not work well or are not realistically viable, then regulation may be necessary. Under those circumstances, the economically appropriate goal of regulatory policy is to mimic the outcome that competitive markets would generate if competition were workable.

At its core, a “mimic competition” standard means that: (i) regulation should not permit prices to be set by markets or regulation at artificially high (monopolistic) levels, (ii) regulation should not permit prices to be set at artificially low (subsidized or monopsonized) levels, (iii) regulation should not preclude the earning of revenues consistent with competitive markets sufficient to sustain the economic viability of the regulated industry over the long run; and (iv)

²¹ The effectiveness of competitive markets in efficiently deploying and utilizing labor, technology and other inputs has been emphasized since Adam Smith, and represents the foundation of modern economics. (See, e.g., Arrow, Kenneth J., “General Economic Equilibrium: Purpose, Analytic Techniques, Collective Choice,” Nobel Memorial Lecture, December 12, 1972, http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/1972/arrow-lecture.pdf.)

regulation should allow firms to respond to incentives for efficiency-enhancing operational improvements and capital investments.

The mimic competition approach is now the guiding principle of most U.S. regulatory policy across numerous industries and regulatory agencies. From the natural gas and electricity industries regulated by the Federal Energy Regulatory Commission to the telecommunications industry regulated by the Federal Communications Commission, regulatory policy is grounded in allowing competition to operate where feasible and, only if necessary, implementing regulation that *mimics* competitive outcomes in otherwise uncompetitive contexts.²²

B. The Staggers Act Embraces the “Mimic Competition” Standard

The Staggers Act and its implementation epitomize the “mimic competition” standard. As noted above, the goal of the Staggers Act was to free railroads from unnecessary and overbearing regulation by allowing them to respond to competitive market forces to the maximum extent possible. A major cause of the financial distress of the railroad industry in the 1960s and 1970s was the overbearing regulatory policies that made it impossible for railroads to adapt to changing competitive market conditions, particularly the emergence of extensive truck competition in the post-World War II era.

Consistent with the economics of modern regulatory policy, the Staggers Act effectively eliminated rate regulation for competitive traffic, freeing railroads to compete for shippers through lower rates and enhanced service offerings.²³ The role of rate regulation is reserved for the

²² See, for example, Federal Energy Regulatory Commission, Docket No. OR12-4-000, Enterprise Products Partners, L.P. and Enbridge Inc., “Order on Rehearing,” February 20, 2014, beginning at paragraph 31 for a discussion of the FERC’s approach to market-based rate regulation. See also, Hundt, Reed E. and Gregory L. Rosston, “Articulating a Modern Approach to FCC Competition Policy,” *Federal Communications Law Journal*, Vol. 60, No. 1, pp. 72-102.

²³ Staggers also permitted railroads to raise rates to competitive levels that had been held below economically remunerative levels, and, subject to regulatory oversight, to abandon rail lines that were uneconomic.

minority of circumstances where regulatory oversight is necessary to protect shippers from the abuse of market power. Where such rate regulation is required, standards have been adopted that attempt to emulate the results that would arise from competitive markets if competition were viable. This approach provides an economically rational guide to properly defining and applying a firm-wide revenue adequacy standard.

C. Differential Pricing Is Essential for Rail Regulation

As highlighted in Section II above, differential pricing is necessary for efficient economic outcomes and sustainable carriers in the railroad industry. First, railroads provide a diverse set of transportation services subject to a heterogenous array of competitive conditions across a multitude of specific markets. Depending on location, commodity, and other characteristics, the transportation services offered by railroads are subject to varying competitive forces emanating from other transportation modes, other railroads, and/or the substitution of geographic or product alternatives. Efficient competitive outcomes require that railroads be able to adjust prices and service conditions quickly in response to changing competitive forces for specific traffic in specific markets.

Second, rail freight carriage is a network industry in which large common and joint costs and assets are shared by a range of traffic. Trains carrying all sorts of commodities to and from different locations travel over the same rail lines, use the same switching yards, and benefit from the accompanying system support and overhead. Different traffic, however, will share different segments of the rail network based on, for example, ultimate originations and destinations and shippers' service quality needs. Freight with widely varying competitive circumstances (e.g., chlorine and lumber, foodstuffs and furniture) may be carried on the same train.

Third, these joint and common costs represent large portions of the total cost of providing rail service. As discussed above, railroading is among the most capital intensive industries in the economy, and its capital is among the most long-lived. Moreover, much of the capital used in the rail industry is fixed and “sunk,” some of it literally bolted to the ground; it cannot be redeployed for another purpose once an investment is made.²⁴ Because of such sunk costs, railroads have the incentive, where necessary, to compete prices down toward the marginal cost of providing the service: Any dollar above marginal cost yields contribution of the system’s heavy fixed costs. Effective intermodal, intramodal, geographic or product competition tends to drive rail rates down toward out-of-pocket variable costs. Thus, rail traffic subject to such competition often makes only modest contributions to the recovery of the very significant shared and sunk costs of the network. Accordingly, railroads must collect revenues in excess of marginal cost on other traffic because, if they never receive contributions above marginal cost for any traffic, they will not earn revenue sufficient to finance the large common and sunk capital necessary for the efficient operation of the railroad.²⁵

In short, differential pricing is an essential component of competition in the markets in which railroads operate. By recovering varying amounts of un-attributable shared costs in response to varying levels of shipper demand for rail service across the full portfolio of a railroad’s traffic, differential pricing maximizes utilization of railroad infrastructure and allows railroads the best possible opportunity to generate revenues that are sufficient to support the fixed and common costs of the network on an overall, system-wide basis.

²⁴ It is this large fixed and sunk capital that precludes competitive entry and exit of new railroads and very few new rail lines by existing railroads.

²⁵ Note the need to collect revenues in excess of marginal costs does not necessarily lead to distortive pricing: It is common in the railroad sector for pricing to be volume related, with prices for service *at the margin* of customers’ use to equate to marginal costs. Such pricing benefits both the railroad and the shipper by permitting traffic able to cover marginal cost to move on the system.

The *opportunity* to collect adequate revenue under the Staggers Act through differential pricing does not mean that the nation's railroads are guaranteed adequate revenues, and any presumption that the railroad industry is a "natural monopoly" capable of always generating above-competitive returns is inapplicable to today's rail markets. To the contrary, in a wide range of rail markets, railroads must earn revenues by competing with other providers of transportation services (or in competition with other alternatives to rail transportation). And, in those markets in which competition is not sufficiently vigorous, regulation under the provisions of the Staggers Act provides principled standards for regulatory oversight and, under specified condition, regulation of maximum rates.

D. The SAC Test Ensures Prices Consistent with Competitive Markets

As discussed above, the use of Constrained Market Pricing and the Stand-Alone Cost test in the rail industry prevents the abuse of market power and implements the "mimic competition" principle of rate regulation in the public interest.²⁶ CMP and the SAC test rest on the economics of "contestable markets."²⁷ These economics describe how competition would work in industries, like railroads, with substantial economies of scale and scope *if* entrants could readily and freely "contest" for some or all of an incumbent firm's business. In a contestable market, an incumbent firm could not sustain prices and earn revenues in excess of competitors' required costs (including the costs of capital), because one or more competitors would always be entering and taking away business if prices were set at such elevated levels.

²⁶ Constrained Market Pricing and the principle of the Stand-Alone Cost test were adopted by the ICC in 1985. Coal Rate Guidelines, Nationwide, 1 I.C.C.2d 520 (1985).

²⁷ See the seminal work of Baumol, William J., John C. Panzar, and Robert D. Willig, *Contestable Markets and the Theory of Industry Structure* (New York: Harcourt Brace Jovanovich 1982).

Contestable markets, in practice, require that entry into and exit from the market be unimpeded, a condition that often does not apply to the rail industry with its enormous sunk costs. Nevertheless, the core insights of contestable market theory have been successfully applied to the rail industry by considering how the benefits of competitive entry (or its threat) would constrain railroad pricing *assuming* entry *were* feasible (i.e., hypothesizing the existence of a “contestable market”).²⁸ The SAC test is the mechanism adopted by the ICC and applied by the Board to evaluate the benefits that competitive entry would provide to affected shippers. The SAC test mimics competition by permitting differential pricing, capping rates and revenues that might otherwise result from an abuse of market power, and preventing shippers from paying for portions of the network from which they derive no benefit (thereby effectively subsidizing other traffic elsewhere on the network).

E. The Concept and Measurement of Revenue Adequacy Should Be Guided by the “Mimic Competition” Principle

Under regulatory policy designed to serve the public’s interest in a healthy economy, “revenue adequacy” must be understood with reference to a competitive standard – i.e., based on what a railroad would earn in *equilibrium over the long term* if it was compelled by competition to charge rates consistent with competition. As applied to revenue adequacy, the “mimic competition” standard reflects the outcomes of hypothesizing contestable market provision of the overall set of services performed by an actual incumbent railroad. That is, the determination of revenue adequacy for any railroad should be rooted in the question: In a competitive contest among possible entrants and an incumbent, what revenues would be required by an entrant who

²⁸ Baumol, William J. and Robert D. Willig, “Contestability: Developments since the Book,” *Oxford Economic Papers*, New Series, Vol. 38, Supplement: Strategic Behaviour and Industrial Competition. (Nov. 1986), pp. 9-36.

successfully contested today for all of the business that the incumbent (BNSF, or UP, or NS, or CSX, etc.) provides (and is forecasted to provide going forward)? The answer is that those revenues would have to cover all of the costs – operating and risk-inclusive capital costs – of serving the business. This would include the reasonable rate of return that investors in the activities of the railroad, inclusive of all of the real world risks, would require in order to attract and hold the necessary capital of the successful entrant, i.e. the costs of a SW-SARR.²⁹

Although SAC has typically been employed to assess the reasonableness of individual rates, or groups of rates, the principle of competitive pricing discipline imposed by the potential for competitive entry also applies to the railroad as a whole. That is, adequate revenues under a proper “mimic competition” standard of rail rate regulation are the revenues that would be realized under a SAC test for a SW-SARR – i.e., a hypothetical entrant capable of providing all of the service for all of the incumbents’ traffic (but not necessarily replicating the configuration and operations of the incumbent, with its history-dependent structures and operations, since a new entrant in a contestable market would seek to design and operate itself as efficiently as possible).

F. Historic Book Value Is Not an Appropriate Metric for Determining Revenue Adequacy

Revenue adequacy that is determined consistent with the mimic competition standard cannot be based on an analysis of the rate of return earned on the depreciated book value of assets. Setting aside the well-known problems of the nominal measurement of capital and depreciation with long-lived assets in the presence of even modest inflation, a benchmark based on earnings relative to the return on historical (original cost) book value bears no relationship to competitive

²⁹ In this framework, revenue still must cover the necessary cost and returns to capital employed. Capital however is treated as though it is not sunk and can be deployed and re-deployed in other alternative uses at no additional cost.

market outcomes.³⁰ Alternatively stated, the successful entrant in a contestable market would have to cover all of its operating and capital costs, and those costs would be the *current* costs of providing all of the system's services. The older, original costs that the incumbent bore at some point in the past are simply irrelevant to pricing by participants in competitive markets.

The disconnect between revenues consistent with competition and the returns on historical book capital is easily illustrated. Suppose I own an older apartment building in Washington DC. Given the age of the building, the historical cost of the land and the building would be expected to be low relative to the costs of new buildings; in addition, the accumulated depreciation assumed by accounting rules may have reduced the net book value of the building to a small percentage of its original, historical cost. What then is the competitive rental rate (and resulting return on historical book value) I should receive for apartments in the building? Rents are determined by competition with the thousands of other apartments in the city. With the rental market healthy and growing (and/or reinvesting in itself), rents in the city will be at a level sufficient to cover the cost of new apartment construction and operation in the city. Holding quality constant, my older apartments will earn rents at this competitive level. As a result, I will appear to be earning very high returns *if* my rate of return is calculated as my net income divided by my historic, depreciated book costs – yet, I am charging competitive market rents and not gouging any tenant!

In fact, in this illustration I am earning only my cost of capital once we recognize that the capital I have invested in the subject apartment building is its current market value (equal to the cost of new entrants in the marketplace), not its depreciated original cost. The reason for this is that, by holding my asset in the form of an apartment building (and not, for example, selling the

³⁰ Before the Surface Transportation Board, Docket No. EP 722 – Railroad Revenue Adequacy, “Verified Statement of Roger Brinner, Ph.D.,” September 5, 2014.

building and getting my value out of the business in the form of the sale price of my building when it charges competitive rents), I am holding capital in the industry.³¹ Calculating my rate of return on the basis of my depreciated historic cost violates basic economics and the economics of competitive markets by failing to recognize that my capital investment in the industry is its *current market value*. That value is set by the rents commanded by new entrants who need to cover the costs of bringing their new capacity to the market.³²

What, then, is the attraction of using rates of return on book value as indicators of “adequate revenue”? The relative simplicity of the calculation renders it appealing on its face. Any economic justification, however, harkens back to public-utility style regulation of “natural monopolies” that is wholly inconsistent with the realities faced by today’s rail industry. Because it fails to recognize that much of the traffic handled by the railroad industry is subject to effective competition, public-utility style regulation represents “old-style” regulation that has consistently been rejected in modern federal policy (see above). Consider a regulated public utility with sufficient market power to allow the regulator to invariably set prices at levels required to earn whatever overall revenue requirement is deemed “adequate” over the life of its capital investments. Regulators are then in a position to effectively guarantee that the public utility monopolist will always earn a given “required” rate of return on its invested capital over the whole life of the investment. Such a regulatory approach, however, requires that the regulated utility have sufficient certainty and market power that is sufficiently widespread to allow the utility to actually earn the

³¹ Indeed, a competitive capital market would induce me or compel me to get out of the apartment business – abruptly or gradually (by failing to invest in the long-term sustainability of my long-lived building) – if a regulator forced my rents to levels below those set by in the contestable, competitive, new entry market.

³² The classic demonstration and discussion of these economics are found in Fisher, Franklin M. and John J. McGowan, “On the Misuse of Accounting Rates of Return to Infer Monopoly Profits,” *The American Economic Review* (March 1983) at 82-97.

“required” rate of return over the life of its assets. Such conditions do not exist in today’s railroad industry in the United States.

The railroads regulated by the Board are not public utilities and they do not function like public utilities, able to operate under exclusive franchises that protect them from potential competitors. To the contrary, the large proportion of railroad traffic that is subject to effective competition means rail carriers lack the ubiquitous market power that would otherwise guarantee their ability to consistently earn a given required return over the long lives of their capital investments. Indeed, the history of the rail industry – with a record of bankruptcies, abandonments and network rationalization, and decades of returns that were “inadequate” even under historical book accounting measures – demonstrates the futility of thinking we could apply a public utility regulatory paradigm to the rail industry.

As an alternative to historical book accounting, replacement cost accounting can provide, under certain conditions, a measure of the asset base on which rates of return roughly consistent with long-run equilibrium rates of return from competition may result.³³ The Board, however, has previously said that it is not practicable to assess replacement costs for purposes of its revenue adequacy determinations.³⁴ But asserted impracticality cannot justify the use of economically incoherent rates of return on depreciated historical book value to determine whether a railroad is realizing “excess revenues.” The annual determinations made by the Board on the basis of historical book value are useful only as a rough yardstick in assessing railroads’ progress toward long term competitive viability.

³³ These conditions would, among other things, indicate that the current asset configuration is consistent with a competitive entrant railroad’s (i.e., a SW-SARR), and that the prices for replacement capital are in long-run equilibrium relative to the value of the capital employed in the industry.

³⁴ Surface Transportation Board, Ex Parte 679, Association of American Railroads – Petition Regarding Methodology For Determining Railroad Revenue Adequacy, “Decision,” October 23, 2008 at 2.

G. “Excess” Rates of Return Cannot Be Assumed to Reflect the Abuse of Market Power

A finding that a railroad is earning an “excessive” rate of return (relative to its current cost of capital) is not a demonstration that the firm is thereby earning supra-competitive profits through the exercise of market power. This principle is clear from the example above of the older apartment building in an otherwise competitive apartment rental market. The nearly fully depreciated apartment building would show “excess returns” on its depreciated original book cost of capital regardless of whether the rents charged (over some range) were at, above, or below the competitive market’s rental rates. Similarly, any attempt to read “excess returns” into similarly-calculated railroad earnings is unsupported – especially in light of the very long lives of railroad capital: Such capital gets depreciated formulaically for accounting purposes long before it has ceased being productive. Moreover, revenues were likely *insufficient* to fully cover formulaic depreciation that would have been calculated early in the assets’ lives, when book values were high. Measures based on historical book accounting cannot reliably indicate the level or direction of rail rates and revenue relative to competitive levels.

The infirmities of using accounting profitability and rates of return to infer market power or above-competitive returns, particularly for capital industries like railroading with long-lived equipment, are well known. As starkly summarized by the classic treatment of the issue, “there is no way in which one can look at accounting rates of return and infer anything about relative economic profitability or, a fortiori, about the presence or absence of monopoly profits.”³⁵

Even if revenue adequacy were properly measured, a finding that rates of return were in “excess” of an incumbent firm’s cost of capital on a system-wide basis would not necessarily

³⁵ Fisher and McGowan, *op. cit.*, at 90.

indicate an abuse of market power. The appropriate revenue adequacy benchmark mimics what are *long-run equilibrium* competitive returns and revenues. Even with relatively stable competitive market conditions, one would expect to see returns at certain points in time that would be above or below the long-run equilibrium, because of fluctuations in demand and cost conditions around the long-run equilibrium. Thus, observed returns for a railroad in excess of the long-run equilibrium competitive level for some limited period, even if properly measured, would not be a demonstration that the railroad is in fact earning supra-competitive returns on its investments. The ICC recognized that attempting to limit returns so as not to exceed the competitive benchmark return would in fact deprive railroads of the ability to realize a competitive return on its investments.³⁶ This type of rate “cap” would preclude railroads from obtaining overall adequate long-term revenues as the railroads would bear the burden of shortfalls around long-run returns without the compensatory upside benefits.

Competitive markets are dynamic, and successful competitive firms often earn above long-run equilibrium rates of return. Firms seek to achieve economic returns that not just equal but exceed their cost of capital. As technology changes and markets shift, firms that are particularly adept at taking advantage of these changes reap economic returns in excess of their capital costs. Firms that are particularly adept at staying ahead of the curve when it comes to anticipating technology, shifts in traffic mix, changing shipper needs, etc., can sustain rates of return in excess of their costs of capital and ahead of the returns and revenue required by a static SW-SARR.

In competitive markets, the prospect of successfully out-earning one’s cost of capital drives innovation and investment. As in other industries, competitive revenue adequacy is necessary to provide incentives for railroads to invest in efficient capacity expansion and system replenishment,

³⁶ Standards for Railroad Revenue Adequacy, Ex Parte No. 393, 364 I.C.C. 803, March 26, 1981.

to pursue cost saving innovations, and to respond to the opportunities presented by emerging market developments. It is sound economic policy to maintain incentives for railroads to try to earn returns in excess of their cost of capital.

The “mimic competition” standard tells us that the relevant question for regulatory purposes is not whether railroads are financially healthy overall, but whether there is any evidence that railroads’ financial health stems from the abuse of market power in the specific markets in which they operate. As discussed above, the evidence does not support a finding that the improving financial performance of the rail industry is the result of an exercise in market power.³⁷ As explained above, as long as the rail industry (and its shippers) benefit from the economies of scale, scope and density of a well-functioning rail network, some rail rates and revenue must exceed marginal and variable costs. This margin above variable cost provides the revenues necessary to support the shared costs and investments in the rail network.

The relationship between price and marginal cost is often used as an indicator of the extent of market power exercised in an industry.³⁸ Studies of pricing and costs in the U.S. rail freight industry, however, provide no evidence that the improved financial health of the industry is the result of an increase in the exercise of market power. The Board itself commissioned Christensen Associates to conduct extensive studies of the rail industry that in part addressed this issue.³⁹ In 2009 and again in 2010, Christensen Associates looked at the relationship of rail rates to costs and found that the mark-up of price to marginal cost peaked in the mid-1990s and has been generally declining since. The research concluded: “In recent years, we have observed the simultaneous

³⁷ Bitzan & Keeler, op. cit. at 322-323; Christensen Rail Study – 2009; Christensen Rail Study – Updated 2010.

³⁸ Carlton, Dennis W. and Jeffrey M. Perloff, *Modern Industrial Organization* (New York: Pearson, 2005) at 93.

³⁹ See, Christensen Rail Study – 2009 and Christensen Rail Study – Updated 2010.

lessening of the exercise of market power and the improvement in the railroad industry's revenue sufficiency position";⁴⁰ yet, "[t]he increase in rail rates in recent years appears to be the result of increasing cost and does not appear to reflect an increase in the exercise of market power."⁴¹

This general result is confirmed by other studies that find improved financial outcomes are not the result of an increase in the exercise of market power by railroads against captive shippers.⁴² Rather the improved financial performance arises from the growing demand for rail traffic and the improving competitive position of rail relative to other competing modes of traffic.⁴³ It is the improved competitiveness against other modes of traffic and the potential for future revenues from increased traffic demand that has called forth a doubling in railroad investment expenditures on new productive capital.⁴⁴

IV. THE SYSTEM-WIDE REVENUE ADEQUACY STANDARD HAS LIMITED VALUE IN RESOLVING DISPUTES OVER THE REASONABLENESS OF INDIVIDUAL RATES OR GROUPS OF RATES

A. Proper Application of a Revenue Adequacy Standard

Having outlined the principles for sound definition and measurement of a revenue adequacy standard that is consistent with the public interest, it is appropriate to ask whether the Board can usefully extrapolate the results of its system-wide revenue adequacy findings for a given railroad to assist in resolving disputes in individual rate reasonableness proceedings, while simultaneously remaining true to well-established and widely acknowledged "mimic competition"

⁴⁰ Christensen – Updated 2010 at 4-12 - 4-13.

⁴¹ Christensen - Updated 2010 at 4-7.

⁴² Bitzan and Keeler, *op. cit.*, at 305-324.

⁴³ Bitzan and Keeler, *op. cit.*, at 322-23.

⁴⁴ See, e.g., Morris, Betsy, "Boom Times on the Tracks: Rail Capacity, Spending Soar," *Wall Street Journal*, March 26, 2013.

principles of economic regulation. In this section, I turn to the implications of a determination of system-wide revenue adequacy for rail rate regulation.

B. Improving Financial Performance Does Not Imply the Board Has Failed to Protect Shippers

As discussed above, some have argued that shippers have suffered under “unchecked” increase in railroad market power that have led to “dramatic increases in rates.”⁴⁵ By implication, this might suggest that the improving financial conditions of railroads in the Staggers era are attributable to “dramatically” increasing profitability on market dominant traffic. This is not borne out by the data. Rather, the data indicate that the generally improved financial performance of the Class I railroads is attributable in largest part to the profitability of their *competitive* traffic.⁴⁶ In fact, the Board’s Expanded Commodity Revenue Stratification Reports indicate exactly this. While the contribution margins are obviously smaller for competitive traffic, they have increased to a greater extent than the margins for regulated traffic. Figure 5 below shows that Contribution as a percentage of Revenue has been flat for that regulated traffic which has revenue to variable cost (“R/VC”) ratios that exceed 180% from 2008 to 2012, but has increased for both of the other traffic groupings (i.e., regulated traffic with R/VC ratios <180% and all exempt traffic).

⁴⁵ Agricultural Retailers Association, *et al.*, letter to Senator Harry Reid and Senator Mitch McConnell, July 10, 2014, http://www.publicpower.org/files/PDFs/STB%20Reform%2020140710%20_%20Senate%20Leadership.pdf, accessed August 20, 2014.

⁴⁶ See Christensen Rail Study - 2009.

Figure 5
CONTRIBUTION AS PERCENTAGE OF REVENUE
FOR COMMODITY CATEGORIES
2008-2012

	2008	2012	Percentage Point Difference
Non-Exempt, RVC >180%	59.7%	60.2%	0.5%
Non-Exempt, RVC <180%	16.8%	23.0%	6.2%
Exempt	18.7%	21.4%	2.7%

Source: STB Expanded Commodity Revenue Stratification Reports. Note that the percentages for each category are independent and need not add to 100%.

During this time, the revenues from competitive traffic have generated an additional \$2.5 billion in contribution above variable costs – half of the overall increase from 2008 to 2012. In order to capture this traffic and realize any revenues, the railroads must compete, and provide better service, requiring investments and innovation. And without contribution from this traffic, the railroads would have to make up the shortfall through rate increases on their regulated traffic. Review of the Board’s Revenue Stratification Reports indicates that this has not been the case for the recent period. Figure 6 below shows that the R/VC ratios for regulated traffic with R/VC ratios greater than 180% were only 1% higher in 2012 than in 2008, while the ratios for other traffic rose by considerably more.

Figure 6
REVENUE-TO-VARIABLE COST RATIOS
2008-2012

	2008	2012	Percentage Change
Non-Exempt, RVC>180%	248%	251%	1%
Non-Exempt, RVC<180%	120%	130%	8%
Exempt	123%	127%	3%

Source: STB Expanded Commodity Revenue Stratification Reports.

C. A System of Revenue Adequacy Decrements Would Be Economically Arbitrary and Unworkable

We can ask whether a finding of revenue supra-adequacy (again, against a SW-SARR measure) should be sufficient basis, alone, to trigger some form of constraint in individual rate cases that could be more stringent than rates that would be authorized by SAC, “mimic competition” analysis. A finding that the SW-SARR for a particular railroad generated revenues in excess of its costs over the long run *might* suggest that a higher proportion of movements on the railroad would be found unreasonably high in individual rate cases, as compared to a railroad for which SW-SARR generated revenues well below its economic costs. But that still would not tell us anything about the reasonableness of rates for an individual movement or group of movements at issue in a particular rate dispute (the “issue traffic”). Why? Because the issue traffic could well be comprised entirely of movements that have effective competitive alternatives; or the issue traffic might well traverse parts of the network that are not heavily utilized, and therefore are not covering their full economic costs. Under this latter scenario, the issue traffic would necessarily be benefitting from an internal cross-subsidy (since overall revenue adequacy could be achieved only if some *other* part of the system was generating revenues *in excess of* its full economic costs). Reducing the issue traffic’s rates merely on the basis of an overall determination of revenue supra-adequacy would perpetuate (and, in fact, exacerbate) the cross-subsidy.

In short, a finding of revenue adequacy provides no basis for concluding that every movement or group of movements is paying rates that are unreasonably high; just as a finding of revenue *inadequacy* provides no basis for concluding that every movement or group of movements is paying rates that are reasonable. Therefore, imposing a rate prescription for an individual movement (or group of movements) simply because a railroad is found to be overall revenue supra-adequate is economically incoherent. The Board must first determine whether the carrier’s

service is subject to market dominance; and, if this is the case, the SAC test must be applied to determine whether the movement or group of movements is subsidizing others – by paying more than the full economic cost (i.e., stand-alone cost) of the facilities and services it requires – or whether it is indeed being subsidized by others. Rates would properly be reduced *only* if the movement or group of movements is paying rates in excess of SAC for the SARR needed to serve the issue traffic specifically.

D. The Principles behind Current Regulatory Standards Are Appropriate for Controlling Market Power Abuses

The above discussion makes clear that the Board already has an appropriate set of regulatory standards for assessing and controlling market power abuses. Market dominance testing with SAC rate making (CMP) *is* “mimic competition” regulation. CMP permits rate and contract freedom/deregulation where competition is effective, and it provides maximum rate regulation in individual cases where abuse of market dominance can be demonstrated, i.e., where the shipper is paying rates that over-compensate the carrier vis-à-vis “mimic competition” rate levels.

To the extent there are concerns with the high cost of using SAC to determine “mimic competition” rate levels, the proper approach is to seek to *simplify* the procedures for implementing SAC as the Board has successfully done in the past, not to throw the baby out with the bath water by fashioning alternative, economically unsound standards. The fact that SAC cases are complex and costly does not mean that the competitive market framework that underlies SAC is flawed, or that the SAC standard is ineffective in disciplining rates to shippers that lack effective competitive alternatives.

There have been enough SAC decisions to provide information to both railroads and shippers on the likely outcome of regulatory challenges for use in contract negotiations. Both sides have ample incentives to avoid rate litigation, and the Board itself has helped to reduce uncertainty

about likely outcomes by forcing convergence in the way SAC is implemented (for example, by requiring both parties to use the RTC model in creating their operating plans). Indeed, the prospect of SAC litigation could well be more unattractive to railroads than to individual shippers given the potential for recurrence.

To be sure, the Board should be concerned that its regulatory mechanisms be not so complicated and expensive for parties to implement that rate cases which really should be brought go unheard. Efforts at simplification of SAC tests, however, need not and should not abandon the principles of “mimic competition” and the public interest protected by those principles. Certainly, arbitrary imposition of rate decrements for a railroad determined to be revenue supra-adequate would violate the “mimic competition” standard that lies at the heart of the Staggers Act and its accomplishments.

V. CONCLUSION

Regulation must be designed with an understanding of the basic economics of the industry being regulated. The rail industry’s pre-Staggers experience is a graphic illustration of how economically unsound policy can be fatal to an industry. The pre-Stagger’s regulatory framework ignored the fact that railroading is a *network* industry that relies on extremely long-lived capital assets and large fixed and common sunk costs, and it focused on meeting individual shipper demands without an eye toward promoting the long-term health of the overall industry.

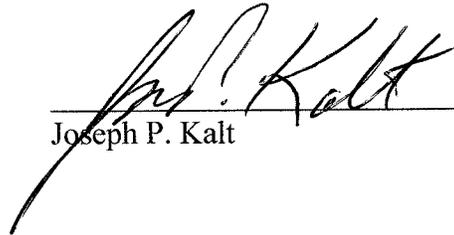
The Staggers Act embraced two principles – that, where feasible, competition should be allowed to discipline rates; and that where competition was not effective, shippers should be afforded some protection from the potential exercise of market power. An important element of Staggers was the recognition, however, that railroads must have a realistic opportunity to earn revenue sufficient to cover overall operating costs and fund investment over the long-term. In this

regard, the concept of “revenue adequacy” must be understood with reference to the economic principles embraced in Staggers. Revenue adequacy should be assessed based on what a railroad would earn *in equilibrium over the long term* if it was compelled by competition to meet the rates (and associated revenue collection) of competitor entrants seeking to take away its business and replace it. The Board already has an appropriate set of regulatory standards for assessing and controlling market power abuses in the individual markets in which railroads actually compete. Market dominance testing with SAC rate making (CMP) is “mimic competition” regulation. Under the same principles, overall revenue adequacy for a railroad is given by the revenues that a System-Wide Stand-Alone Railroad would be able to realize in a contestable, fully competitive railroad industry.

VERIFICATION

I, Joseph P. Kalt, verify under penalty of perjury under the laws of the United States that the foregoing is true and correct and that I am qualified and authorized to file this statement.

Executed: September 2 2014



Joseph P. Kalt

Appendix A to the Verified Statement of Joseph P. Kalt

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Areas of specialization include Industrial Organization, Economics of Antitrust and Regulation, Natural Resource Economics, Public Choice and Political Economy, Economic Development, Microeconomic Theory.

Co-Director, The Harvard Project on American Indian Economic Development, 1987-present

Faculty Chair, Harvard University Native American Program, 2000-2006

Chair, Economics and Quantitative Methods Cluster, 1995-2000

Professor of Political Economy, 1986-1992

Faculty Chair and Academic Dean for Research, 1992-1994

Chairman, Environment and Natural Resources Program, Center for Science and International Affairs, 1990-1994

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Assistant Director for Natural Resources, Energy and Environmental Policy Center, 1985-1990

Co-Director, Harvard Study on the Future of Natural Gas Policy (with Frank C. Schuller), Energy and Environmental Policy Center, 1984-1986

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Associate Professor of Economics, 1983-1986

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Visiting Professor, Rogers College of Law, 2008-2013; *Faculty Affiliate*, 2013-present

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Senior Economist, 2003-present (and since 1983 with predecessor enterprises)

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EDUCATION

University of California, Los Angeles, Ph.D. in Economics, 1980; M.A. in Economics, 1977
Doctoral Dissertation: *Federal Control of Petroleum Prices: A Case Study of the Theory of Regulation*

Stanford University, Stanford, CA, B.A. in Economics (Honors), 1973

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Statement to the National Gambling Impact Study Commission, *Economic Impact of Gaming by American Indian Tribes*, Hearing of March 16, 1998.

“Measures Against Tribes Are Counterproductive,” editorial (with Jonathan B. Taylor), *Indian Country Today*, September 22-29, 1997.

“American Indian Economic Development,” *Tribal Pathways Technical Assistant Program Newsletter*, February 1997, p. 3.

“Tourists’ Role Downplayed”, Plaintiffs say Crow have no authority to compel them to collect a tax from tourists, *by David Crisp Of The Gazette Staff*, copy dated January 30, 1997.

Statement to U.S. Senate Committee on Indian Affairs, *Economic Development in Indian Country*, Hearing of September 17, 1996.

“A Harvard Professor Looks at the Effects of Allowing U.S. Hunters to Import Polar Bear Trophies,” *Safari Times*, April 1994.

Statement to U.S. Congress, Joint Economic Committee, Subcommittee on Trade, Productivity and Economic Growth, *The Economic Impact of Lower Oil Price*, Hearing of March 12, 1986.

“Administration Backsliding on Energy Policy” (with Peter Navarro), *Wall Street Journal*, editorial page, February 9, 1982.

Statement to the Energy and Natural Resources Committee, U.S. Senate, *Government Responses to Oil Supply Disruptions*, Hearing of July 28-29, 1981, U.S. Government Printing Office, 1981, pp. 623-630 and 787-801.

“Staff Report on Effects of Restrictions on Advertising and Commercial Practice in the Professions: The Case of Optometry,” Ronald S. Bond, *et al.*, Executive Summary, Bureau of Economics, Federal Trade Commission, September 1980.

“Redistribution of Wealth in Federal Oil Policy,” *San Diego Business Journal*, August 18, 1980, pp. 22-23.

“The Energy Crisis—Moral Equivalent of Civil War” (with Peter Navarro), *Regulation*, January/February 1980, pp. 41-43.

“Windfall Profits Tax Will Reap Bonanza—But For Whom?” (with Peter Navarro), *The Miami Herald*, December 23, 1979, editorial page.

SELECTED PRESENTATIONS

“Indigenous Self-Government: The Political Economy of the Only Policy That Has Ever Worked,” Ministry of Business, Innovation and Employment, Government of New Zealand, Wellington, NZ, April 18, 2013.

“American Indian Self-Government: The Political Economy of a Policy That’s Worked,” Dean’s Distinguished Speakers Series, University of Auckland (NZ) Business School, April 16, 2013.

Keynote Address: “Harvesting Creosote to Build Houses: Is Arizona’s Economic Model Sustainable?” 96th Arizona Town Hall, Tucson, AZ, April 26, 2010.

Keynote Address: “Resurgence and Renaissance in Indian America,” Native American Business Association Annual Convention, Mississippi Choctaw Nation, April 29, 2008.

“Standard Oil to Today: Antitrust Enforcement in the Oil Industry,” American Bar Association, 56th Antitrust Law Spring Meeting, Washington, D.C., March 27, 2008.

Keynote Address: “Nation Building: Lessons from Indian Country,” National Native American Economic Policy Statement, Phoenix, AZ, May 15, 2007.

Keynote Address: “A Conversation on the State of the Native Nations: A Gathering of Leaders,” Res 2007, Las Vegas, NV, March 14, 2007.

“Foundations of Nation Building: The Roles of Culture, Institutions, & Leadership Among Contemporary American Indian Nations,” a lecture to faculty, staff and students, Marine Corps University, Quantico, VA, March 12, 2007.

Keynote Address: “The Universal Challenge of Nation Building,” First Annual Great Lakes Tribal Economic Development Symposium, Traverse City, MI, October 25-26, 2006.

Transcript of Keynote Address, “Setting the Agenda: What Will Drive Energy’s Future?” *Congressional Quarterly Forum*, “The Politics of Oil: U.S. Imperatives, Foreign Consequences,” Washington, D.C., September 13, 2005.

“The Role of the Tribal Courts and Economic Development,” Bureau of Indian Affairs, *Tribal Courts in the 21st Century*, Billings, MT, August 16, 2005.

“Linking Tribal Sovereignty to Economic Self-Determination in Indian Country,” *The Tribal Leaders Forum*, “Sovereignty in Crisis,” Las Vegas, NV, May 27, 2005.

“Competition and Regulation in the North American Electricity Industry: Can These Two Seemingly Opposed Forces Coexist?” (with Charles Augustine and Joseph Cavicchi), 24th Annual North American Conference, USAEE/IAEE, Energy, Environment, and Economics in a New Era, Washington, DC, July 8-10, 2004.

“The State of U.S. Railroads and the Challenges Ahead,” briefing of Capitol Hill staff, Association of American Railroads, April 17, 2003.

“The State of the Railroad Industry and the Challenges Ahead,” briefing of Roger Nober, Chairman, US Surface Transportation Board, Association of American Railroads, January 28, 2003.

“The Wealth of American Indian Nations: Culture and Institutions,” Federal Reserve Bank of Boston, December 11, 2002.

“The Roots of California’s Energy Crisis: Law, Policy, Politics, and Economics,” Regulation Seminar, Center for Business and Government, Kennedy School, Harvard University, November 7, 2002.

“Public Policy Foundations of Nation Building in Indian Country,” National Symposium on Legal Foundations of American Indian Self-Governance,” Mashantucket Pequot Nation, February 9, 2001.

“Twenty-Five Years of Self-Determination: Lessons from the Harvard Project on American Indian Economic Development,” Udall Center for Studies in Public Policy, University of Arizona, November 13-14, 1999.

Proceedings of the Fourth Annual DOE-NARUC Natural Gas Conference, Orlando, FL, February 1995.

Keynote Address, “Sovereignty and American Indian Economic Development,” Arizona Town Hall, Grand Canyon, AZ, October 1994.

“Is the Movement Toward a Less-Regulated, More Competitive LDC Sector Inexorable?, (Re)Inventing State/Federal Partnerships: Policies for Optimal Gas Use,” U.S. Department of Energy and The National Association of Regulatory Utility Commissioners Annual Conference, Nashville, TN, February 1994.

“Cultural Evolution and Constitutional Public Choice: Institutional Diversity and Economic Performance on American Indian Reservations,” Festschrift in Honor of Armen A. Alchian, Western Economic Association, Vancouver, BC, July 1994.

“Precedent and Legal Argument in U.S. Trade Policy: Do they Matter to the Political Economy of the Lumber Dispute?” National Bureau of Economic Research, Conference on Political Economy of Trade Protection, February, September 1994.

“The Redesign of Rate Structures and Capacity Auctioning in the Natural Gas Pipeline Industry,” Natural Gas Supply Association, Houston, TX, March 1988.

“Property Rights and American Indian Economic Development,” Pacific Research Institute Conference, Alexandria, VA, May 1987.

“The Development of Private Property Markets in Wilderness Recreation: An Assessment of the Policy of Self-Determination by American Indians,” Political Economy Research Center Conference, Big Sky, MT, December 4-7, 1985.

“Lessons from the U.S, Experience with Energy Price Regulation,” International Association of Energy Economists Delegation to the People’s Republic of China, Beijing and Shanghai, PRC, June 1985.

“The Impact of Domestic Regulation on the International Competitiveness of American Industry,” Harvard/NEC Conference on International Competition, Ft. Lauderdale, FL, March 7-9, 1985.

“The Welfare and Competitive Effects of Natural Gas Pricing,” American Economic Association Annual Meetings, December 1984.

“The Ideological Behavior of Legislators,” Stanford University Conference on the Political Economy of Public Policy, March 1984.

“Principal-Agent Slack in the Theory of Bureaucratic Behavior,” Columbia University Center for Law and Economic Studies, 1984.

“The Political Power of the Underground Coal Industry,” FTC Conference on the Strategic Use of Regulation, March 1984.

“Decontrolling Natural Gas Prices: The Intertemporal Implications of Theory,” International Association of Energy Economists Annual Meetings, Houston, TX, November 1981.

“The Role of Government and the Marketplace in the Production and Distribution of Energy,” Brown University Symposium on Energy and Economics, March 1981.

“A Political Pressure Theory of Oil Pricing,” Conference on New Strategies for Managing U.S. Oil Shortages, Yale University, November 1980.

“The Politics of Energy,” Eastern Economic Association Annual Meetings, 1977.

WORKSHOPS PRESENTED

University of Auckland; Ministry of Business, Innovation and Employment, Government of New Zealand; Federal Reserve Bank of Boston; University of Indiana; University of Montana; Oglala Lakota College; University of New Mexico; Columbia University Law School; Department of Economics and John F. Kennedy School of Government, Harvard University; MIT; University of Chicago; Duke University; University of Rochester; Yale University; Virginia Polytechnic Institute; U.S. Federal Trade Commission; University of Texas; University of Arizona; Federal Reserve Bank of Dallas; U.S. Department of Justice; Rice University; Washington University; University of Michigan; University of Saskatchewan; Montana State University; UCLA; University of Maryland; National Bureau of Economic Research; University of Southern California.

TEACHING

Markets and Market Failure with Cases (Harvard Kennedy School of Government, graduate); Native Americans in the 21st Century: Nation Building I & II (Harvard, University-wide, graduate and undergraduate); Competition, Strategy, and Regulation (Harvard Kennedy School of Government, graduate); Introduction to Nation Building/The Law, Policy, and Economics of Contemporary Tribal Economic Development (University of Arizona, Rogers College of Law and Eller College of Management, graduate); Intergovernmental Relations (University of Arizona, Rogers College of Law); Introduction to Environment and Natural Resource Policy (Harvard Kennedy School of Government, graduate); Seminar in Positive Political Economy (Harvard Kennedy School of Government, graduate); Intermediate Microeconomics for Public Policy (Harvard Kennedy School of Government, graduate); Natural Resources and Public Lands Policy (Harvard Kennedy School of Government, graduate); Economics of Regulation and Antitrust (Harvard Department of Economics, graduate); Economics of Regulation (Harvard Department of Economics, undergraduate); Introduction to Energy and Environmental Policy (Harvard Kennedy School of Government, graduate); Graduate Seminar in Industrial Organization and Regulation (Harvard Department of Economics, graduate); Intermediate Microeconomics (Harvard Department of Economics, undergraduate); Principles of Economics (Harvard Department of Economics, undergraduate); Seminar in Energy and Environmental Policy (Harvard Kennedy School of Government, graduate)

OTHER PROFESSIONAL ACTIVITIES

Board of Directors, Fort Apache Heritage Foundation, 2000-present (Chair, 2010-present)

Working Board, National Institute for Civil Discourse, 2011-present

Advisory Board, Community Development Enterprise, Chickasaw Nation, 2014-present

Board of Directors, Sonoran Institute, 2008-present (Vice-Chair, 2014-present)

Honorary Advisory Board, Centro Artistico y Cultural de Huachinera, Sonora, Mexico, 2009-present

National Advisory Board, Big Sky Institute, Montana State University, 2007-present

Board of Trustees, The Communications Institute, 2003-present

Mediator (with Keith G. Allred), Nez Perce Tribe and the North Central Idaho Jurisdictional Alliance, MOU signed December 2002

Mediator, *In the Matter of the White Mountain Apache Tribe v. United States Fish and Wildlife Service*, re: endangered species management authority, May-December, 1994

Steering Committee, National Park Service, 75th Anniversary Symposium, 1991-1993

Board of Trustees, Foundation for American Communications, 1989-2003

Editorial Board, *Economic Inquiry*, 1988-2002

Advisory Committee, Oak Ridge National Laboratory, Energy Division, 1987-1989

Commissioner, President's Aviation Safety Commission, 1987-1988

Principal Lecturer in the Program of Economics for Journalists, Foundation for American Communications, teaching economic principles to working journalists in the broadcast and print media, 1979-2000

Lecturer in the Economics Institute for Federal Administrative Law Judges, University of Miami School of Law, 1983-1991

Research Fellow, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, 1981-1987

Editorial Board, MIT Press Series on *Regulation of Economic Activity*, 1984-1992

Research Advisory Committee, American Enterprise Institute, 1979-1985

Editor, *Quarterly Journal of Economics*, 1979-1984

Referee for *American Economic Review*, *Bell Journal of Economics*, *Economic Inquiry*, *Journal of Political Economy*, *Review of Economics and Statistics*, *Science Magazine*, *Journal of Policy Analysis and Management*, *Social Choice and Welfare*, *Quarterly Journal of Economics*, MIT Press, North-Holland Press, Harvard University Press, *American Indian Culture and Research Journal*

SELECTED HONORS AND AWARDS

Distinguished Visiting Professor, University of Auckland Business School, April 2013.

Public Sector Leadership Award, National Congress of American Indians, Washington, DC, March 1, 2010.

First American Public Policy Award, First American Leadership Awards 2005, "Realizing the Vision: Healthy Communities, Businesses, and Economies," National Center for American Indian Enterprise Development, Phoenix, AZ, June 9, 2005.

Allyn Young Prize for Excellence in the Teaching of the Principles of Economics, Harvard University, 1978-1979 and 1979-1980.

Chancellor's Intern Fellowship in Economics, September 1973 to July 1978, one of two awarded in 1973, University of California, Los Angeles.

Smith-Richardson Dissertation Fellowship in Political Economy, Foundation for Research in Economics and Education, June 1977 to September 1977, UCLA.

Summer Research Fellowship, UCLA Foundation, June 1976 to September 1976.

Dissertation Fellowship, Hoover Institution, Stanford University, September 1977 to June 1978.

Research funding sources have included: Archibald Bush Foundation; Annie E. Casey Foundation; Nathan Cummings Foundation; Department of Indian Affairs and Northern Development (Canada); National Indian Gaming Association; The National Science Foundation; USAID (IRIS Foundation); Pew Charitable Trust; Christian A. Johnson Family Endeavor Foundation; The Ford Foundation; The Kellogg Foundation; Harvard Program on the Environment; The Northwest Area Foundation; the U.S. Department of Energy; the Research Center for Managerial Economics and Public Policy, UCLA Graduate School of Management; the MIT Energy Laboratory; Harvard's Energy and Environmental Policy Center; the Political Economy Research Center; the Center for Economic Policy Research, Stanford University; the Federal Trade Commission; Resources for the Future; and The Rockefeller Foundation.

Four years of undergraduate academic scholarships, 1969-1973; graduated with University Distinction and Departmental Honors, Stanford University.

SELECTED EXPERT TESTIMONY – REGULATORY PROCEEDINGS

TTX Company

Before the Surface Transportation Board, In re Finance Docket No. 27590 (Sub-No. 4), Application for Approval of Pooling Of Car Service with Respect to Flatcars, Verified Statement of Joseph P. Kalt, January 16, 2014.

Tri-State Generation and Transmission Association, Inc.

Before the Public Utility Commission of the State of Colorado, Docket No. 13F-0145E, La Plata Electric Association, Inc., et al. v. Tri-State Generation and Transmission Association, Inc., Witness Statement, July 5, 2013; Oral Testimony, August 1, 2013.

MPS Merchant Services, Inc. (F/K/A Aquila Power Corporation) and Illinova Energy Partners, Inc.

Before the Federal Energy Regulatory Commission. Exh. No. MI-1, San Diego Gas & Electric Company, Complainant v. Sellers of Energy and Ancillary Services Into Markets Operated by the California Independent System Operator Corporation and the California Power Exchange, Respondents, Docket No. EL00-95-248, Prepared Direct Testimony, October 25, 2011; Oral Testimony, July 10, 2012.

Progress Energy and Duke Energy

Before the Public Service Commission of South Carolina, Docket No. 2011-158-E, In the Matter of Application of Duke Energy Corporation and Progress Energy, Inc. to Engage in a Business Combination Transaction, Direct Testimony, September 14, 2011; Rebuttal Testimony, November 30, 2011; Oral Testimony, December 12, 2011.

North Carolina Utilities Commission, Docket Nos. E-2, Sub 998 and E-7 Sub 986, In the Matter of Application of Duke Energy Corporation and Progress Energy, Inc. to Engage in a Business Combination Transaction and Address Regulatory Conditions and Codes of Conduct, Testimony, May 20, 2011; Rebuttal Testimony, September 15, 2011; Oral Testimony, September 21, 2011.

Before the Public Service Commission of South Carolina, In the Matter of Application of Duke Energy Carolinas to Engage in a Business Combination Transaction, Docket No. 2011-158-E., Rebuttal Testimony, December 8, 2011.

New England Power Generators Association

Before the Federal Energy Regulatory Commission. RE: ISO New England Inc. and New England Power Pool, Docket No. ER10-787-000, EL10-50-000, EL10-57-000, Second Brief of the New England Power Generators Association Inc., Written Testimony, September 1, 2010.

PPL Corporation and E.ON U.S. LLC

Before the Federal Energy Regulatory Commission, In re Docket No. EC10-__-000, Application for Approval Pursuant to Section 203 of the Federal Power Act, Volume 1 of 3; Affidavit filed with Joseph Cavicchi, June 28, 2010.

BNSF Railway Company

Before the Surface Transportation Board, In re STB Finance Docket No. 35305, Petition of Arkansas Electric Cooperative Corporation for a Declaratory Order, Rebuttal Verified Statement of Joseph P. Kalt and Glenn Mitchell, June 4, 2010.

Rio Tinto

In the Australian Competition Tribunal, Application for the Review of the Deemed Decision by the Commonwealth Treasurer of 23 May 2006 Under Section 44H(9) of the Trade Practices Act in Relation to the Application for Declaration of Services Provided by The Mount Newman Railway Line; Application for Review of the Decision by the Commonwealth Treasurer of October 27, 2008 Under Section 44h(1) of Trade Practices Act in Relation to the Application for Declaration of a Service Provided by the Robe Railway; Application for Review of the Decision by the Commonwealth Treasurer of October 27, 2008 Under Section 44h(1) of Trade Practices Act in Relation to the Application for Declaration of a Service Provided by the Hamersley Rail Network; and Application for Review of the Decision by the Commonwealth Treasurer of October 27, 2008 Under Section 44h(1) of Trade Practices Act in Relation to the Application for Declaration of a Service Provided by the Goldsworthy Railway, Affidavit, July 3, 2009.

PPL Companies

Federal Energy Regulatory Commission, Docket No. EL08-67-00 Protest of the PPL Companies to the Complaint of the RPM Buyers, Affidavit (with A.J. Cavicchi), July 11, 2008; Answer of the PPL Companies to the Motion for Leave to Answer and Answer of the RPM Buyers, Suppl. Affidavit (with A.J. Cavicchi), August 12, 2008.

Association of American Railroads

Surface Transportation Board, Petition of the Association of American Railroads to Institute a Rulemaking Proceeding to Adopt a Replacement Cost Methodology to Determine Railroad Revenue Adequacy, Statement (with J. Klick), May 1, 2008.

Exxon Mobil Corporation

State of Alaska Department of Natural Resources and Alaska Department of Revenue, Call for Public Comments Regarding the TransCanada Alaska Company, LLC..., Statement, March 6, 2008; Before the Alaska State 25th Legislature Third Special Session, Regarding the TransCanada Application Pursuant to the Alaska Gasoline Inducement Act, Statement, July 10, 2008.

P3 Group

Federal Energy Regulatory Commission, Docket No. EL08-34-000, Maryland Public Service Commission v PJM Interconnection, L.L.C., Affidavit (with A.J. Cavicchi), February 19, 2008.

Energy Transfer Partners, L.P.

Federal Energy Regulatory Commission, Docket No. IN06-3-002, Answer of Energy Transfer Partners, L.P., Affidavit (with John R. Morris), October 9, 2007; Suppl. Affidavit Docket No. IN06-3-003 (with John R. Morris), March 31, 2008; Prepared Answering Testimony, March 31, 2009; Deposition, April 21-22, 2009.

American Electric Power Service Corporation, et al.

Federal Energy Regulatory Commission, The People of the State of Illinois, ex rel., Illinois Attorney General Lisa Madigan v Exelon Generation Co., LLC, et al., Docket No. EL07-47-000, Affidavit (with J. Cavicchi), June 18, 2007.

TAPS Carriers (BP Pipelines (Alaska) Inc.; et al.)

Federal Energy Regulatory Commission, In the Matter of: BP Pipeline (Alaska), Inc., et al.; Docket Nos. OR05-2, OR05-3, OR05-10, IS05-82, IS05-80, IS05-72, IS05-96, IS05-107, IS06-70, IS06-71, IS06-63, IS06-82, IS06-66, IS06-1, OR06-2, Testimony (All TAPS Carriers), December 7, 2005; Testimony (Designated TAPS Carriers), December 7, 2005; Answering Testimony (All TAPS Carriers), May 26, 2006; Rebuttal Testimony (All TAPS Carriers), August 11, 2006; Oral Rebuttal Testimony (All TAPS Carriers), November 2-3, 2006.

PPL Corporation

Federal Energy Regulatory Commission, PJM Interconnection, L.L.C., Docket Nos. ER05-1410-000 and EL05-148-000, Motion to Intervene and Protest of the PPL Parties; Affidavit (with A.J. Cavicchi and D. Reishus), October 19, 2005; "A Policy Analysis of PJM's Proposed Four-Year Forward Capacity Market"; submitted in PPL Resource Adequacy Market Proposal, Docket No. PL05-7-000, (with A.J. Cavicchi), June 16, 2005.

SBC Communications, Inc.

Federal Communications Commission, Special Access Rates for Price-Cap Local Exchange Carriers, WC Docket No. 05-25, RM-10593, Statement, June 13, 2005.

Hamersley Iron/Rio Tinto

Before the National Competition Council, Melbourne, Australia, FMG Access Application, Statement, May 2, 2005; Pilbara Infrastructure Party, Ltd. Application, Statement, April 30, 2008.

BNSF Railway Company

Surface Transportation Board, Ex Parte 657, Rail Rate Challenges Under the Stand-Alone Cost Methodology, Statement, April 30, 2005; Oral Statement, April 26, 2005;

Statement, May 1, 2006; Reply Statement, May 31, 2006; Rebuttal Statement, June 30, 2006.

BNSF Railway Company

Surface Transportation Board, STB Docket No. 42088, Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v BNSF Railway Company, Statement, April 19, 2005; Reply Statement, July 20, 2005; Rebuttal Statement, September 30, 2005.

PPL Corporation

State of New Jersey Board of Public Utilities, The Joint Petition of Public Service Electric and Gas Company and Exelon Corporation for Approval of a Change in Control of Public Service Electric and Gas Company, and Related Authorizations, Docket No. EM05020106, OAL Docket No. PUC-1874-05, Testimony, November 14, 2005; Surrebuttal Testimony, December 27, 2005; Oral Testimony, January 12, 2006; Reply Testimony, March 17, 2006; Pennsylvania Public Utility Commission, Surrebuttal Testimony, August 26, 2005.

Federal Energy Regulatory Commission, Docket No. EC05-43-000, Testimony, April 11, 2005; Suppl. Testimony, May 27, 2005; Affidavit, August 1, 2005.

PPL Montana, LLC

Federal Energy Regulatory Commission, RE: PPL Montana, LLC, et al., Docket No. ER99-3491-___, Testimony (with A.J. Cavicchi), November 9, 2004; Affidavit (with A.J. Cavicchi), February 28, 2005; Affidavit (with A.J. Cavicchi), November 14, 2005; First Suppl. Affidavit, (with A.J. Cavicchi), December 23, 2005; Affidavit (with A.J. Cavicchi), February 1, 2006.

TTX Company

Surface Transportation Board, Finance Docket No. 27590 (Sub-No.3), Application for Approval of Pooling Of Car Service with Respect to Flatcars, Statement, January 5, 2004; Rebuttal Statement, May 12, 2004.

Arizona Competitive Power Alliance

Arizona Corporation Commission, Application of Arizona Public Service Company for a Hearing to Determine the Fair Value of the Utility Property..., E-01345A-03-0437, Testimony, February 3, 2004.

Dex Holdings, LLC

Washington Utilities and Transportation Commission, the Application of Qwest Corporation Regarding the Sale and Transfer of Qwest Dex to Dex Holdings, LLC. Rebuttal Testimony, April 17, 2003; Oral Testimony, May 23, 2003.

El Paso Merchant Energy, L.P.

Federal Energy Regulatory Commission, et al., v Sellers of Long-Term Contracts to the California Department of Water Resources, Sellers of Energy and Capacity Under

Long-Term Contracts with the California Department of Water Resources, Testimony, October 17, 2002; Rebuttal Testimony, November 14, 2002; Deposition, November 24, 2002; Oral Testimony, December 10, 2002; Prepared Reply Testimony, March 20, 2003.

El Paso Merchant Energy, L.P.

Federal Energy Regulatory Commission, PacifiCorp v Reliant Energy Services, Inc., et al., Testimony, October 8, 2002; Rebuttal Testimony, November 26, 2002; Deposition, December 5, 2002; Oral Testimony, December 18, 2002.

Mardi Gras Transportation System Inc.

Federal Energy Regulatory Commission, Caesar Oil Pipeline Company, LLC, Affidavit, December 5, 2002; *Proteus Oil Pipeline Company, LLC*, Affidavit, December 5, 2002.

El Paso Merchant Energy, L.P. and Calpine Energy Services, L.P.

Federal Energy Regulatory Commission, Nevada Power Company and Sierra Pacific Power Company v Duke Energy Trading and Marketing, L.L.C., et al.; Southern California Water Company v Mirant Americas Energy Marketing, L.P., et al., v Morgan Stanley Capital Group Inc., Testimony, June 28, 2002; Answering Testimony, August 27, 2002; Deposition, September 24, 2002.

El Paso Merchant Energy, L.P.

Federal Energy Regulatory Commission, Public Utilities Commission of the State of California v El Paso Natural Gas Company, et al., Testimony, May 8, 2001; Oral Testimony, May 29-30, 2001; Oral Rebuttal Testimony, June 6-8, 2001; Oral Surrebuttal Testimony, June 19, 2001; Rebuttal Testimony, March 11, 2002; Oral Testimony, March 26-27, 2002.

Burlington Northern Santa Fe

Surface Transportation Board, STB Ex Parte No. 582, Public Views on Major Rail Consolidations. Statement (with Amy Bertin Candell), February 29, 2000. *STB Ex Parte No. 582 (Sub-No. 1)*, Statement (with José A. Gómez-Ibáñez), November 17, 2000; Rebuttal Statement (with José A. Gómez-Ibáñez), January 11, 2001.

Exxon Company, U.S.A.

Hearing Officer of the Taxation and Revenue Department of the State of New Mexico, Protest to Assessment No. EX-001, Report, April 17, 2000.

American Petroleum Institute

US Department of the Interior Minerals Management Service, Further Supplementary Proposed Rule for Establishing Oil Value for Royalty Due on Federal Leases, Declaration (with K. Grant), January 31, 2000.

Burlington Northern Santa Fe

Surface Transportation Board Union Pacific Corp., et al. -- Control and Merger -- Southern Pacific Rail Corp., et al., Statement, April 27, 1996; Deposition, May 14, 1996, Statement, July 8, 1998; Statement, October 16, 1998.

Association of American Railroads

Review of Rail Access and Competition Issues, Surface Transportation Board, Statement (with D. Reishus), March 26, 1998; Oral Testimony, April 3, 1998.

Market Dominance Determinations—Product and Geographic Competition, Surface Transportation Board, Statement (with R. Willig), May 29, 1998; Reply Statement (with R. Willig), June 29, 1998.

Northern Natural Gas Company

Federal Energy Regulatory Commission, Northern Natural Gas Company, Testimony, May 1, 1998.

Koch Pipeline Company, L.P.

CF Industries, Inc. v Koch Pipeline Company, L.P., Surface Transportation Board. Statement (with A. Candell), November 10, 1997; Deposition, December 12, 1997; Reply Statement, January 9, 1998; Rebuttal Statement, February 23, 1998.

Exxon Company

US Department of the Interior, Minerals Management Service, Review of the Federal Royalties Owed on Crude Oil Produced from Federal Leases in California, Affidavit, February 17, 1998.

CSX Corporation and CSX Transportation, Inc., Norfolk Southern Corporation, et al.

Surface Transportation Board, Testimony, June 12, 1997; Rebuttal Statement, December 15, 1997.

Pro Se Testimony

US Department of the Interior, Minerals Management Service, Establishing Oil Value for Royalty Due on Federal Leases..., Comments, May 27, 1997; Suppl. Comments (with K. Grant), August 4, 1997.

Pennsylvania Power & Light Company

Pennsylvania Public Utilities Commission, Testimony, April 1, 1997; Rebuttal Testimony, August 1997.

Exxon Corporation

Department of Revenue, State of Alaska, Exxon Corporation, Rebuttal Report, April 29, 1996; Deposition, May 21, 1996; Statement, August 26, 1996; Oral Testimony, March 10-11, 1997.

Public Service Company of New Hampshire

New Hampshire Public Utilities Comm., Testimony on Antitrust issues, January 21, 1997.

Northeast Utilities

New Hampshire Public Utilities Commission, Electric Industry Restructuring, Statement (with A. Jaffe), October 18, 1996.

Pro Se Testimony

Federal Energy Regulatory Commission, Alternatives to Traditional Cost-of-Service Ratemaking for Natural Gas Pipelines, Regulation of Negotiated Transportation Services of Natural Gas Pipelines, Statement (with A. Jaffe). May 30, 1996.

Burlington Northern Railroad Company

Surface Transportation Board Burlington Railroad Company -- Crossing Compensation -- Omaha Public Power District. Statement, April 1996.

Northeast Utilities

Massachusetts Department of Public Utilities, Electric Industry Restructuring, Testimony, April and June 1995.

Burlington Northern Railroad Company

Interstate Commerce Commission, Burlington Northern Railroad Company -- Control and Merger -- The Atchison, Topeka and Santa Fe Railway Company, Statements, October 1994 and April/May 1995.

Northern Natural Gas Pipeline Co.

Federal Energy Regulatory Commission, Northern Natural Gas Pipeline Co. (rate filing), Testimony, March 1995.

Houston Lighting and Power Company

Public Utility Commission of Texas, Houston Lighting and Power Company, Testimony, September, December 1994 and February 1995.

Southwestern Public Service Company

Federal Energy Regulatory Commission, El Paso Electric Company and Central and South West Services, Inc., Affidavit, February 25, 1994.

Mojave Pipeline Company

Federal Energy Regulatory Commission, Mojave Pipeline Company, Economic Analysis of Public Policy with Respect to Mojave Pipeline Company's Proposed Expansion, Testimony, January 1994.

ARCO Pipe Line Company, Four Corners Pipe Line Co. and ARCO Transportation Alaska, Inc.

Federal Energy Regulatory Commission, Market-Based Ratemaking for Oil Pipelines, Comments in Response to Notice of Inquiry, Statement, January 1994.

PSI Resources, Inc.

Indiana Utility Regulatory Commission, the Proposed Merger between PSI Resources, Inc., PSI Energy, Inc., Cincinnati Gas & Electric Co., and CENergy Corp., Statement, June 1993.

Gulf Central Pipeline Company

Interstate Commerce Commission Farmland Industries, Inc. v Gulf Central Pipeline Company, et al., Statement, May 1993.

Federal Energy Regulatory Commission, Revisions to Oil Pipeline Regulations Pursuant to the Energy Policy Act of 1992, Comments on the Commission Staff's Proposal, Testimony, May 1993.

Association of American Railroads

Interstate Commerce Commission, Ex Parte No. 346 (Sub-No. 28) Rail General Exemption Authority: Export Corn and Export Soybeans. Statement, December 1992.

National Council on Compensation Insurance`

Commonwealth of Virginia, Corporation Commission, Revision of Workers' Compensation Insurance Rates, Testimony, April, July 1992.

Transcontinental Gas Pipe Line Corporation

United States of America Federal Energy Regulatory Commission, Testimony, March 1992.

Better Home Heat Council

Commonwealth of Massachusetts, Department of Public Utilities, Petition of Boston Gas Company for Preapproval of Suppl. Residential Demand-Side Management Programs, Testimony, June 15, 1991.

Burlington Northern Company

Interstate Commerce Commission, National Grain and Feed Association v Burlington Northern Railroad Co., et al., Testimony, May 14, 1991.

Arco Pipe Line Company

Federal Energy Regulatory Commission, ARCO Pipe Line Company, et al., Testimony, February 1, 1991.

Northeast Utilities Service Company

Federal Energy Regulatory Commission, Northeast Utilities Service Company (Re: Public Service Company of New Hampshire), Testimony, March, July 1990.

Atlantic Richfield Company

Department of Revenue, State of Alaska, Atlantic Richfield Company and Combined Subsidiaries, Oil and Gas Corporate Income Tax for 1978-1981, Testimony, December 1988.

Exxon

Federal Energy Regulatory Commission, Brokering of Interstate Natural Gas Pipeline Capacity, Testimony, July 1988.

Natural Gas Pipeline Company of America

Federal Energy Regulatory Commission, Natural Gas Pipeline Company of America, Testimony, November 1987.

Mojave Pipeline Company

Federal Energy Regulatory Commission, Mojave Pipeline Company, et al., Testimony, June, October 1987.

Exxon

Federal Energy Regulatory Commission, Columbia Gas Transmission Company, Testimony, April 1987.

Cities Service Corp.

Office of Hearings and Appeals, U.S. Department of Energy, U.S. Department of Energy v Cities Service Corporation, Testimony, December 1986, February 1987.

Exxon

Federal Energy Regulatory Commission, Texas Eastern Transmission Corp, Testimony, August 1986.

Mobil Oil Corporation

Federal Energy Regulatory Commission, Northwest Central Pipeline Corp, Testimony, August 1986.

Bethlehem Steel Corporation

Federal Energy Regulatory Commission, ANR Pipeline Co., et al., Testimony, May 1986.

Natural Gas Supply Association

Federal Energy Regulatory Commission, Request for Suppl. Comments Re: FERC Order No. 436 and Related Proposed Rulemakings, Old Gas Decontrol, FERC's Block Billing for Pipelines, and the Winners and Losers in Natural Gas Policy, Statement, February 25, 1986.

**Verified Statement of
Roger Brinner**

BEFORE THE
SURFACE TRANSPORTATION BOARD

RAILROAD REVENUE ADEQUACY

Docket No. EP 722

VERIFIED STATEMENT OF

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Expert Background

My name is Roger E. Brinner. My background as a business and government economics advisor/consultant includes four decades of experience relevant to investment returns, capital formation, market growth, and public policy needed to optimize growth.

Today, I am the Chief Economist of SandPointe, LLC, an investment management firm. As I prepared this testimony through August 31, 2014 when I retired, I was the Co-Chief Economist and a partner of The Parthenon Group, a leading boutique advisory firm with approximately 300 professionals and offices in Boston, London, Mumbai, San Francisco, Shanghai, and Singapore. Since its inception in 1991, the firm has embraced a unique approach to advisory services built on fact-driven insights, long-term client relationships, and an entrepreneurial risk-sharing spirit. This has established the firm as a strategic advisor of choice for CEOs and business leaders of Global 1000 corporations, high-potential growth companies, private equity firms, educational institutions, and healthcare organizations.

Just prior to joining Parthenon (1971-1997), I was a pioneering member of the pre-eminent economic research organization, Data Resources (DRI). After its founding in 1968, this firm compiled massive databases of economic and financial information on what were then revolutionary world-scale time-sharing computers. We used modern econometric tools to build insightful, comprehensive models of over 100 countries and dozens of industries. We then communicated our analyses and forecasts to almost every major global corporation, financial firm and government to inform their business, policy and investment decisions. In short, we translated economic policy decisions into macro- and micro-economy reactions, and then to

client-specific implications. I succeeded the founder, Harvard Professor Otto Eckstein, and served as Executive Director and Chief Economist from 1984-1997.

In both firms, I have counseled corporate and government clients on economic issues specifically relating to their strategies, policies, market growth, investments, pricing and equity valuation. Corporations with whom I have enjoyed long-term advisory relationships have included firms in a broad cross-section of industries, such as Anheuser Busch, ARCO, Catterton Partners, Briggs & Stratton, Chrysler, Cooper Industries, Dow Chemical, Emerson Electric, Exxon, Ford Motor Company, General Electric, GTE, J.M. Huber, McGraw-Hill, Microsoft, Textron, and Thomson Corporation. Government advisory relationships have included the Federal Reserve Board of Governors and the U.S. Cabinet Departments of Treasury, Energy, Commerce and Defense. I have testified frequently before Congress on budget policy, inflation, and growth issues, and was often quoted in the media. My career includes senior positions at respected business, academic, and government institutions.

During my early years with Parthenon, I was simultaneously a Visiting Professor at the Massachusetts Institute of Technology in charge of the core macroeconomics course; earlier I was an economics professor at Harvard University teaching public policy microeconomics and public finance. I served at the White House as Senior Staff Economist in the Council of Economic Advisers, and have been a Visiting Scholar at the Federal Reserve Bank of Boston. I received a Bachelor's degree from Kalamazoo College, and a M.A. and Ph.D. in economics from Harvard University. Board memberships have included Paul Revere Insurance, the YMCA of Greater Boston, the Concord Coalition, the National Association of Business Economists, and Kalamazoo College.

My curriculum vitae is attached as Appendix C and lists specific relevant prior publications and research.

Testimony Objectives and Summary of Findings

I have been asked by the Association of American Railroads (“AAR”) to provide the Surface Transportation Board (Board or STB) with my views from the perspective of a financial advisor and experienced economist with clients in a diverse range of industries on the question of railroad revenue adequacy and how the Board’s analysis of railroads’ rates of return should influence the Board’s regulation of railroads. In the analysis and narrative I share in this testimony, I recommend that the Board be very careful not to make regulatory changes based on a mistaken assumption that railroad earnings are excessive. ***My core and unambiguous conclusion is that the return on capital achieved by railroads is definitively low compared to all relevant benchmarks. It is low compared to the rail cost of capital, it is low compared to a very broad spectrum of other industries (both absolutely and relative to their costs of capital), and the recent recovery in rail profitability has been insufficient to close these gaps.***

There are several different methods for calculating rates of return, varying in this case particularly with the treatment of deferred taxes and the measurement of depreciation. While I will indicate what I believe to be the preferred method in economic and financial theory of addressing these two key issues and how this differs from the current STB approach, this methodological issue is not my primary finding. The most important conclusion is that whatever rate-of-return-calculation methodology is used, railroad rates of return are markedly lower than in other relevant industries.

I bring up the depreciation issue because the use of historic-cost depreciation, and the related book value of assets, by both the STB and conventional financial accounting norms artificially inflates true economic income. As the name plainly states, “historic-cost”

depreciation ignores the fact that the replacement cost of capital goods rises over time due to inflation, and this should be properly reflected in the valuation of the depreciating capital. This major flaw is important here because it creates a larger differential for railroads than for most industries as a consequence of the fact that railroads invest in assets that are far longer-lived than other industries. It is obvious that the longer the useful, depreciable life of an asset, the poorer the representation of depreciation using historic purchase cost rather than current replacement cost. (Indeed, the STB itself recognizes the virtue of current cost in its standard approach for evaluating the rates that a railroad can charge in non-competitive freight circumstances). This differential just further depresses the preferred measured rate of return for railroads relative to most other industries; the return gap is profound whether you do or do not account for this depreciation issue.

A second very important issue that must be addressed is the implication of a rate of return higher than a firm's or industry's cost of capital. There seems to be a false impression that in a competitive market, a firm or industry should only earn an average ROIC (return on invested capital) equal to its weighted average cost of capital (WACC). But this is neither true in economic theory nor empirical experience. The key fallacy derives from a mistaken comparison of the average ROIC across all investments to the WACC. What is instead true in both theory and in practice is that individual investments should be and are pursued in order from best to worst expected individual project ROICs. Firms cut off further investment at the “worst” project whose own ROIC just exceeds the risk-adjusted WACC. This clearly means that all but the last worst-ROIC-accepted project are predicted to earn more—often far more—than the WACC. Hence the average ROIC of the investing firm *will and should* exceed the WACC, even

though the marginal or last incremental project only earns the marginal WACC. The equivalence at the margin only is both what theory calls for and what CFOs and CEOs seek to achieve or surpass; this achieves competitive market profit maximization in microeconomics, and necessarily produces the surplus of the average ROIC above the marginal ROIC or WACC. Such a differential is definitely not an excess return beyond a competitive market norm.

With this clarification, it is clear that even if a proper analysis of railroad rates of return indicated that railroads were earning above their cost of capital, such a conclusion should not result in regulation that limits railroad earnings. Firms in competitive markets usually do earn more than their cost of capital. This is certainly most dramatically true when the economy is near full employment and all invested capacity is fully utilized, but it is equally true when looking through a full business cycle: the average ROIC should, would and does exceed the WACC.

As a result of these considerations, I conclude that if railroads were to be regulated to cap their average rate of return at their cost of capital, they would be put at an extreme disadvantage and would be unable to attract sufficient external investment dollars or to retain adequate earnings so as to maintain and expand the efficient rail network that the nation requires. It seems clear to me that the risks of inappropriate regulation are particularly great in the railroad industry which: a) invests a higher than average share of its revenues; b) has extremely long-lived assets and hence is intrinsically subject to greater risks of shifting markets; and c) must compete with a full array of trucking and shipping industries unfettered by similar rate regulation.

My testimony will review alternative metrics for assessing the rate of return, the differences in numeric magnitudes across calculation modes, and the robustness of the conclusion that rail returns are markedly too low.

Elaboration and Enumeration of Key Findings

- 1. The rail industry rate of return is substantially lower than the returns achieved in the private sector by other relevant or reference industries as they operate and compete with railroads for capital to fund worthwhile investments that benefit shareholders and the nation.**

Different long-term rates of return should be expected across industries in response to investor demands, with higher returns achieved on average (a) by those with greater market uncertainty due to potentially abrupt changes in customer demands, regulatory environments, or business costs and (b) by those with longer service lives (compelling them to make investments and live with the outcomes in a future very different than expected). The rail industry is precisely such an industry: it has long-lived assets placed in service in a market environment with greater than average uncertainty. But the rail industry earns lower than average rates of return on capital compared with other industries that share one or more of these attributes.

To establish a common method of comparing railroad returns with those of firms exhibiting similar characteristics, I use publicly-reported, conventional after-tax historic-cost based returns published by Bloomberg. I have calculated average returns over the period from

2004-2013 to present relevant benchmarks across good economic times and bad.¹ I find that the returns on invested capital for railroads are lower than the returns in other industries similar to rail. “Similarity to rail” is defined as sharing one or more of the following attributes: 1) longer-lived assets and 2) subject to substantial market uncertainty. I discuss the importance of the long life of assets in assessing the risk of investment in the railroad industry in detail below. As to market uncertainty, railroads face uncertainty from regulation, from strong competition from other transportation providers, and from the constant change in the markets served by railroads. The recent changes in coal markets in response to lower natural gas prices are a good example of the unpredictable and dynamic nature of the markets served by railroads. Both of these factors should justify a high rate of return to compensate for the relatively higher risks of earning an attractive return on the investment in the railroad industry.

Yet the Bloomberg data shows that railroads earned 7.2% on average from 2004-2013. As shown in Exhibits 1a and 1b, other industries facing similar environments fare far better, earning more than 2x the rail return: aerospace and defense earned 15.7%, pharmaceuticals earned 15.4%, and electrical equipment manufacturers earned 15.6%.² Railroads’ persistently lower return on invested capital compared to all of these other competitive industries suggests that it would be wrong to infer widespread exercise of rail market power.

¹ I present here the average returns reported for the most recent available decade to present relevant benchmarks across good economic times and bad. For Bloomberg and STB data, I define the last decade as 2004-2013. Given that BEA data is only available through 2012 at the present moment, for BEA data I define the last decade as 2003-2012. I discuss the BEA data in a later section of this Statement.

² Bloomberg calculations are a weighted average of S&P 500 companies within the industry during 2014. For years in which companies lack data on return on invested capital data or total invested capital, they are excluded from the analysis.

Exhibit 1a: Average Post-Tax Return on Capital,

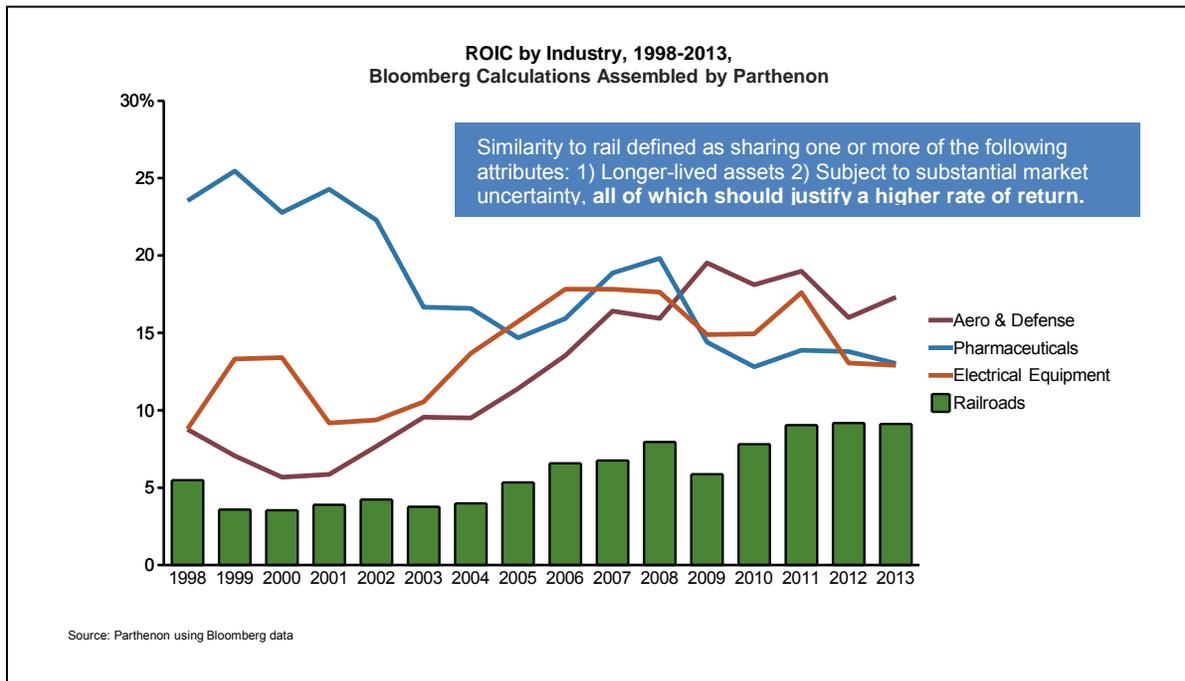
Rail Industry and Similar Industries

Rate of Return Comparison ('04-'13 Average)

<u>Industry</u>	Bloomberg: Conventional Financial Reporting of ROIC
Railroads	7.2%
Aero & Defense	15.7%
Pharmaceuticals	15.4%
Electrical Equipment	15.6%

Exhibit 1b: Annual Post-Tax Returns on Capital,

Rail Industry and Similar Industries



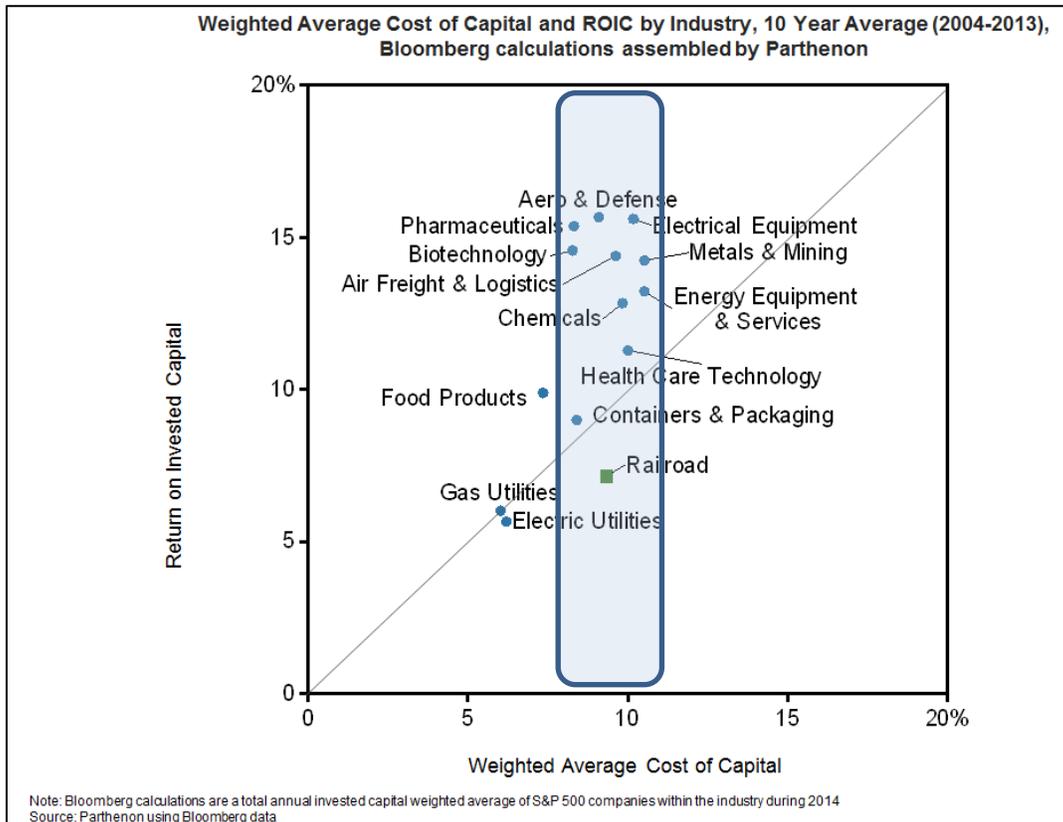
2. The markedly lower railroad industry rate of return relative to other industries does not correspond to or follow from a proportionately lower cost of capital.

The differences in rates of return seen in Exhibits 1a and 1b are not attributable to differences in the cost of capital. Bloomberg provides conventional cost-of-capital estimates across industries, consistent with their post-tax return on capital estimates. I use this data to compare rates of return with cost of capital across a wide range of industries, including rail and the industries that I have described as “similar to rail.”

I am using the Bloomberg estimates of the cost of capital here not to imply that they are superior to the STB’s cost of capital estimates for railroads, but because they are calculated on a consistent basis with Bloomberg’s estimates of the rate of return.³ Exhibit 2 is a scatter plot that maps return on invested capital against cost of capital by industry, based on a ten-year average. An industry located exactly on the 45-degree line running from bottom left to top right earns a return exactly matching its cost of capital. The chart shows railroads, on average, earning less than their cost of capital. It also shows that industries with similar costs of capital to railroads, located in the shaded blue box, earn far greater returns than railroads, and in many cases earn far more than their cost of capital. The returns enjoyed by the other industries, above their cost of capital, are consistent with the point made earlier that firms in competitive markets usually do earn more than their cost of capital. I return to this issue later in my Statement.

³ Bloomberg calculates the cost of capital using an after-tax cost of debt, which is consistent with their method for calculating return on capital and allows for a proper comparison to their ROIC measure. Bloomberg data is used to present an internally consistent comparison of ROIC vs. WACC across different industries.

Exhibit 2: Comparison of Rail Rate of Return to Benchmark Industries with the Same Cost of Capital



Firms with higher rates of return relative to their cost of capital will be more attractive to investors. Investors will look less favorably on investments in rail because their published returns compare less favorably to the cost of capital. Regulation that would limit railroad earnings would only further dissuade investors from investing in railroads.

3. Railroad returns are overestimated by the STB as a result of its treatment of deferred taxes and its use of historic-cost depreciation.

The rate of return estimated by the STB for railroads is high relative to conventionally-measured rates of return (such as the Bloomberg estimates), due in part to the Board's treatment of deferred taxes, which is not consistent with the manner in which investors consider deferred taxes in assessing rates of return. In addition, rail returns are systematically overstated under both the STB and Bloomberg methodologies because of the use of the historic-cost depreciation method rather than the superior current-cost depreciation method. I discuss these issues below.

3.1 The STB's unusual treatment of deferred taxes inflates the measured rail rate of return compared with more standard methodologies.

On average, over the period 2004-2013, the STB-estimated rate of return for the four railroads within the S&P 500 is 2.7 percentage points above the Bloomberg-estimated rate of return for those railroads. A key reason for this gap is the STB's unusual treatment of deferred taxes.

To illustrate this point, I compare the return on invested capital of railroads calculated using: 1) the STB's published calculations; and 2) Bloomberg's published total return on invested capital (ROIC).

Exhibits 3a and 3b compare Bloomberg's calculated rates of return on invested capital for the major railroads within the S&P 500 with the STB's calculated rates of return for Class 1 railroads to directly illustrate the effect of the STB's treatment of taxes. From the Bloomberg data, I have computed a composite rate of return for the "railroad industry" that is a weighted

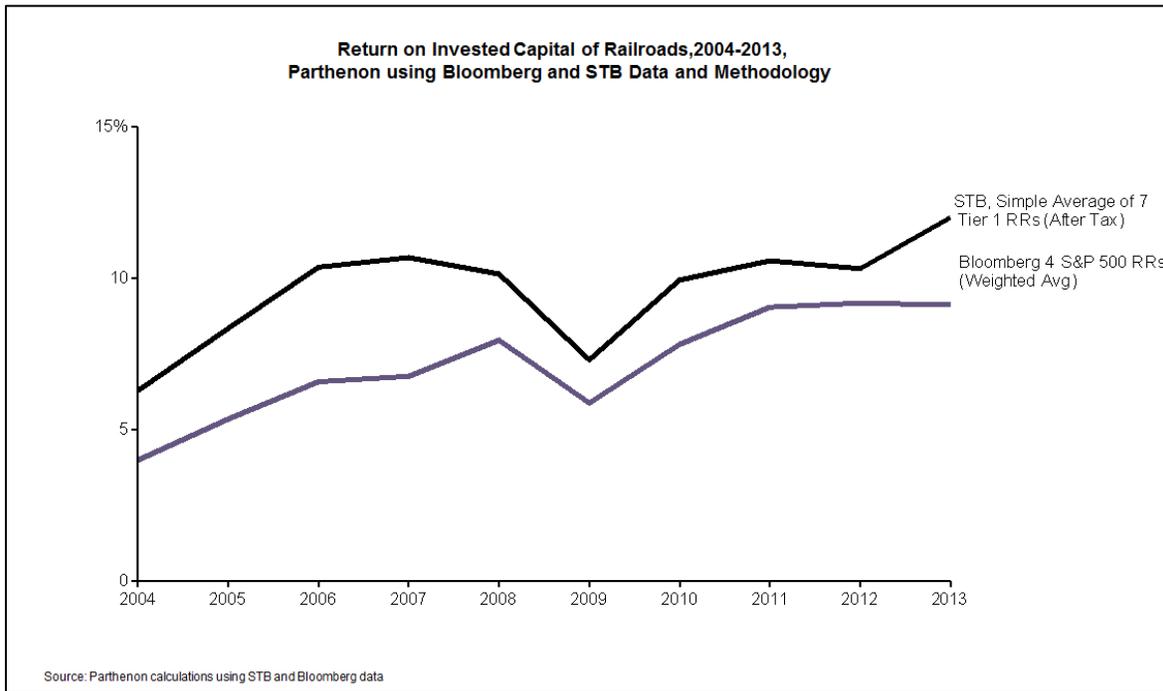
average of the returns of the four major railroad companies that are currently in the S&P 500 (CSX, Kansas City Southern, Norfolk Southern, and Union Pacific).⁴ The total invested capital in a year for each specific company serves as its weight in that year. Exhibit 3b shows that the rate of return for railroads based on the Bloomberg data is consistently below the rate of return for these same railroads calculated by the STB. On average, the Bloomberg-estimated rate of return for the four major S&P 500 railroads, at a 7.2% average from 2004-2013, runs 2.7 percentage points below the return for the same railroads estimated by the STB at 9.9% during the same time period, and this difference is mainly explained by the treatment of taxes.

Exhibit 3a: Impact of STB Accounting Treatment on Mean Rail Post-Tax Return

<i>STB and Bloomberg Railroad Industry Rates of Return</i>	'04-'13 Average
STB, Average of 7 Class 1 Railroads' Rates of Return	9.6%
STB, Average for 4 RRs available in Bloomberg S&P 500 data (CSX, Union Pacific, Norfolk Southern, Kansas City Southern)	9.9%
— Adjustments for deferred taxes and other accounting differences	
= Bloomberg: 4 RRs reported by Bloomberg S&P 500	7.2%

⁴ We use a simple average when calculating the average railroad rate of return using the STB data for ease of recognition within the STB's internal reports. We calculate a weighted average railroad rate of return using invested capital with the Bloomberg data to match standard conventions. Kansas City Southern lacks Bloomberg ROIC data for 2005 and thus is excluded from the calculations during that time period.

Exhibit 3b: Impacts of STB Treatment on Annual Rail Post-Tax Returns



Both rate of return calculations involve the division of a post-tax income numerator by a denominator measuring a capital stock. Income and the capital stock are measured net of depreciation, where depreciation represents the portion of the capital stock “used up” during the course of each year. Net income represents income less the current year’s depreciation charge, while the net capital stock represents cumulative investment less accumulated depreciation charges.⁵ The STB’s after-tax rate of return adjusts for both actual and deferred taxes. In the income calculation, both actual and deferred income taxes are subtracted. Deferred income taxes arise, for example, if depreciation for tax purposes is more front-loaded than depreciation for accounting purposes. Extra depreciation early in an asset’s life reduces current taxes, but creates

⁵ Details of the STB and Bloomberg calculation methods are given in Appendix A.

a future tax liability. Therefore, the tax is deferred but not eliminated. The STB also makes an adjustment for deferred taxes in its net capital stock calculation, where accumulated deferred income tax credits are subtracted from the depreciated value of the capital stock to give a “tax-adjusted” net investment base.

The Bloomberg rate of return is also an after-tax measure, like the STB measure, but unlike the STB measure it adjusts only for actual taxes, not for deferred taxes. In the income calculation, Bloomberg deducts actual income taxes from returns, but it does not deduct deferred income taxes. In the net capital stock calculation, Bloomberg correspondingly makes no adjustment for accumulated deferred income taxes.

The STB’s adjustment for deferred income taxes reduces the net capital stock (proportionally) much more than it reduces income, and is a primary reason why the STB’s rate of return consistently exceeds the Bloomberg estimate. My four- S&P500-railroads estimate for 2013, based on the STB’s data, indicates that the deferred tax assumption increased the STB rate of return 1.8 percentage points; this accounts for 62% of the total 2.9 percentage point gap between the STB and Bloomberg ROICs.

These taxes are deferred and remain invested in the companies. The Board’s treatment of deferred taxes is not consistent with the manner in which investors consider deferred taxes in assessing rates of return. Rail shareholders expect to earn a return on these tax reserves, and the tax reserves should not be deducted from invested capital. Likewise, shareholders in other non-railroad companies expect to earn a return on deferred tax reserves, so the STB’s exclusion of deferred taxes creates a distortion in the rate of return calculations relative to other industries, thereby overstating the potential attractiveness of railroad industry investments. It causes the

Board to consider railroads' rates of return to be much higher than do investors as they consider committing their capital to the railroad industry.

There are other differences between the STB and Bloomberg's rate of return methodologies for taxes, but I do not consider these to be controversial. In particular, the treatment of interest payments also acts to raise the STB return relative to the Bloomberg return. The STB allows the benefit of tax deductibility of interest payments to be reflected in net income, by lowering corporate taxes paid. In contrast, Bloomberg treats income paid out as interest as if it were being taxed at the same rate as all other income.

In this treatment of interest, the STB assumption is perfectly appropriate. The tax benefit of the deductibility of interest payments can be taken into account either in the calculation of the rate of return (raising it), or in the calculation of the cost of capital (lowering it), but not both, which would be double-counting. Since the STB's measure of capital costs *does not* take account of the tax deductibility of interest payments, its rate of return measure should do so, and does. Bloomberg's measure of the cost of capital, in contrast, *does* take account of the tax deductibility of interest payments, so its rate of return measure should not, and does not.

3.2 Rail returns are further overstated, both in absolute terms and relative to other industries, by the convention of using historic cost accounting rather than current cost accounting for depreciation.

The historic-cost method of accounting measures depreciation in the prices of the periods in which the assets were purchased or acquired. This is the procedure used in the STB and Bloomberg rate of return calculations. To be consistent, the rate of return denominators are the

historic-cost estimates of the net stock of fixed assets, i.e. the depreciated values of the original acquisition costs of the assets. In other words, the asset values used in the STB and Bloomberg rate of return calculations are the “book value” of assets.

The current-cost method, in contrast, makes an explicit allowance for changes in asset values based on replacement cost. Current-cost depreciation is measured in the prices of current assets rather than the prices of the period in which the original assets were purchased. Likewise, current-cost estimates of the net stock of fixed assets are the depreciated values of the remaining assets repriced upwards to the prices of the current period. If the inflation rate is positive, then current-cost depreciation will exceed historic-cost depreciation, and the current-cost net stock of capital will exceed the historic-cost net stock of capital.

From an investment perspective, the current-cost method is more appropriate. When evaluating investment opportunities, investors certainly apply current-cost and market value methods, rather than examining the value of assets at the time when they were purchased. In order to compete in the railroad industry, a new market entrant would have to invest in the necessary property and equipment, paying *current-cost* for these investments. The price of such assets to Class 1 railroads years ago is irrelevant.

The use of historic-cost depreciation is particularly distorting when applied to long-lived assets, such as those employed by railroads. If the capital stock (the denominator in the rate of return calculation) has a short lifetime and turns over rapidly, then the historic-cost capital stock will differ little from the current-cost capital stock, because there is little time for inflationary distortions to build up. But for long-lived assets there is a larger, compounding impact of inflation and there will be a bigger difference between the value of the current-cost capital stock

and the historic-cost capital stock. Said another way, there will be an exponentially rising difference between what was originally paid at the beginning of the life of the asset and what would be needed to pay currently to replace the asset.

As a result, the historic-cost depreciation method (i.e., the use of book value) systematically overstates the rate of return for railroads compared to the more precise alternative current-cost depreciation method, which values capital at current prices rather than the historical prices at which equipment and structures were acquired. Indeed, the STB fully recognizes the superiority of this current-cost principle because it utilizes it in its “rate reasonableness” analysis for freight situations where a fully competitive market is shown not to exist.⁶

I cannot produce a comparison of historic-cost and current-cost post-tax rates of return using the STB or Bloomberg data because of data limitations. Neither set of data allows me to estimate the value of assets on a current-cost basis to compare to the book value of assets based on historic cost. However, to demonstrate the relative importance of the asset valuation approach I can make a comparison of pre-tax rates of return for the rail and other industries on a historic-cost and current-cost basis by using official Bureau of Economic Analysis (BEA) data and methods.

The BEA does not publish data for individual companies, but it does publish data on income, depreciation and capital stocks for major industries in the U.S. economy, including

⁶ It is important to note the difference between the Board’s current cost approach in Stand-Alone Cost cases - which starts with undepreciated current replacement cost and then uses a DCF model to reflect economic depreciation over the life of assets - and the current-cost approach that is discussed here, which examines the current replacement cost of depreciated assets. Both approaches, however, are based on the principle that asset values must be based on the current replacement cost of assets rather than accounting values.

railroads. The BEA data are not directly comparable to the STB data and I am not presenting the BEA data as alternatives to the STB data. For example, the BEA definition of the railroad industry is wider than Class I railroads, so the BEA-based calculations are not directly comparable to the STB's calculations for Class I railroads. The treatment of taxes is also different. The BEA-based estimates show pre-tax rather than post-tax returns. There are numerous other differences in the sources of data.

While the BEA data are therefore not directly comparable to the STB data, the BEA data allow me to show that the use of current cost valuation of assets has a very large impact on the measurement of the rate of return and that the impact of using current costs is particularly large in an industry like the railroad industry with long-lived assets. The BEA publishes estimates of depreciation and the net capital stock on both a historic-cost and a current-cost basis, thus allowing calculation of rates of return for railroads and for other industries using both historic-cost and current-cost depreciation. The BEA also affirms the preference for current replacement cost by using it in all official measures of U.S. income and output, such as the widely covered GDP reports.

A detailed walk through of my calculations using BEA data for a sample year is set out in Appendix B to this statement. On the income side, I start with gross operating surplus, which consists of gross industry output less the cost of intermediate inputs, less wages and salaries, less

indirect taxes, plus subsidies.⁷ I then deduct depreciation from gross operating surplus to derive my income measure.

Depreciation represents the decline in the value of the stock of assets due to wear and tear, obsolescence, accidental damage, and aging. In the case of railroad equipment and structures, the BEA assigns normal service lives based on lives submitted by railroads to the Interstate Commerce Commission as part of their 1983 annual reports. Instead of applying simple straight-line depreciation over those lifetimes, the BEA applies a geometric depreciation rate. Geometric depreciation means that depreciation is a fixed percentage of the *remaining value* of a particular asset, rather than a fixed percentage of the *original value* of that asset. It means that assets always have some residual value, however small, since their value is never completely depreciated to zero.

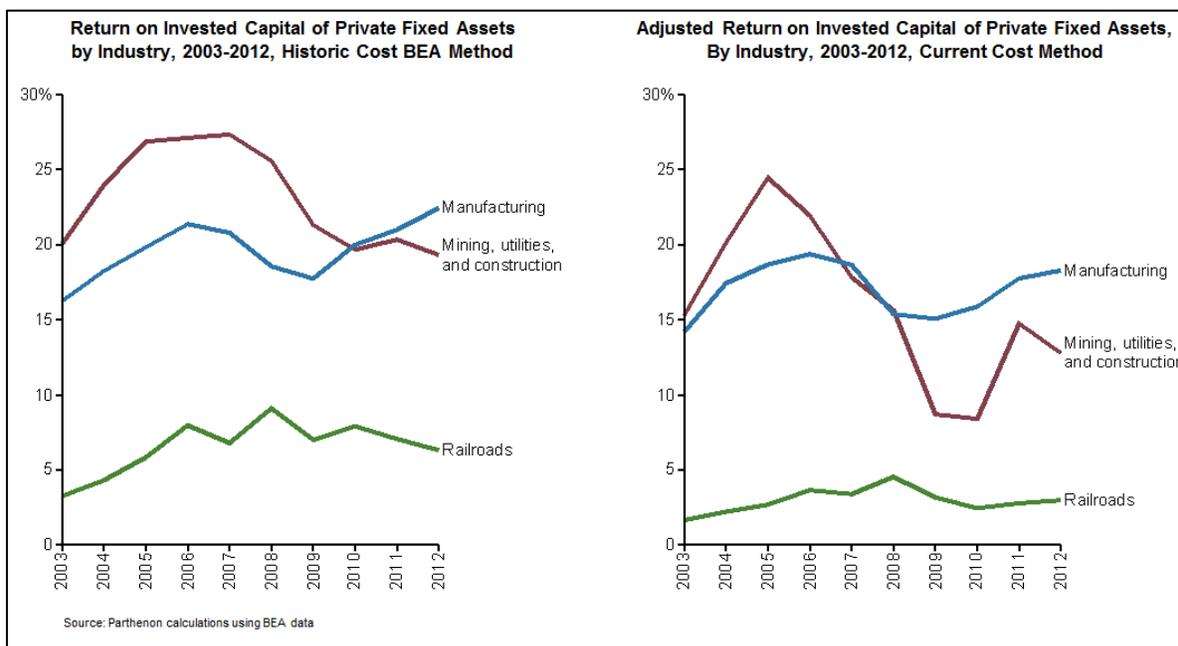
In the case of railroad equipment, the geometric depreciation rate is faster than the straight-line rate, on the view that equipment loses value relatively rapidly in its initial years in use. In contrast, for railroad structures, the geometric depreciation rate is slower than the straight-line rate. In both cases, however, the depreciation is intended to reflect the remaining value of the assets today rather than an arbitrary accounting-based calculation. The BEA's objective is for the depreciation pattern to represent economic depreciation. As far as possible, it bases depreciation patterns on the patterns of observed market prices for used assets.

⁷ Income taxes are not deducted. As mentioned earlier, the BEA-basis rate of return is a pre-tax measure, unlike STB and Bloomberg, which are both measured after-tax (with slight methodological differences).

The denominator in the rate of return calculation, the net capital stock, is calculated consistently with depreciation. The net stock of fixed assets by industry represents cumulative investment in fixed assets by industry (including equipment, structures, and intellectual capital) less accumulated depreciation.

Calculating returns using the historic-cost method on BEA data shows an average 6.6% pre-tax rate of return for the railroad industry from 2003-2012. As Exhibit 4 illustrates, the rail rate of return is consistently lower than theoretically and logically appealing benchmarks such as the average return in either total manufacturing or total industrial excluding manufacturing (i.e. construction, mining, and utilities). This repeats the pattern of low rail returns evident in the Bloomberg data.

Exhibit 4: Impact of Historic vs. Current Cost Accounting of Industry Returns



Please note the symmetry of my adjustments to both numerator and denominator in my calculations based on the current-cost methodology, reflected in the graph to the right in Exhibit

4: I replace historic-cost depreciation with current-cost depreciation in the income numerator, and replace net historic-cost capital stock with net current-cost capital stock in the denominator. These adjustments mean that the capital stock denominator now includes cumulative revaluations in the stock of invested capital due to inflation. To place income fully on the same footing, I make one further adjustment, adding to each year's income that year's revaluation of the current-cost capital stock due to price inflation. This means that the inflation-based appreciation of surviving assets is counted as income.

This final adjustment avoids what would otherwise be an understatement of returns under current cost. If an investor is going to sell an investment, it will sell at current cost. This needs to be taken into account when thinking about return. The value of the investment has not depreciated as much as historical cost would indicate. The adjusted calculation modifies the rate of return calculation by including asset revaluations as part of income. This adjustment puts the historic-cost and current-cost calculations on the same footing relative to the industry's nominal cost of capital – the inflation adjustment allows the current-cost returns to be compared to a nominal cost of capital, just as the historic-cost returns can be compared to a nominal cost of capital.

Applying my adjusted current-cost depreciation methodology to the BEA data, the rail return averages 2.9% from 2003-2012, 56% below the 6.6% historic-cost return.⁸ Net income is reduced, because current-cost depreciation exceeds historic-cost depreciation, while the net

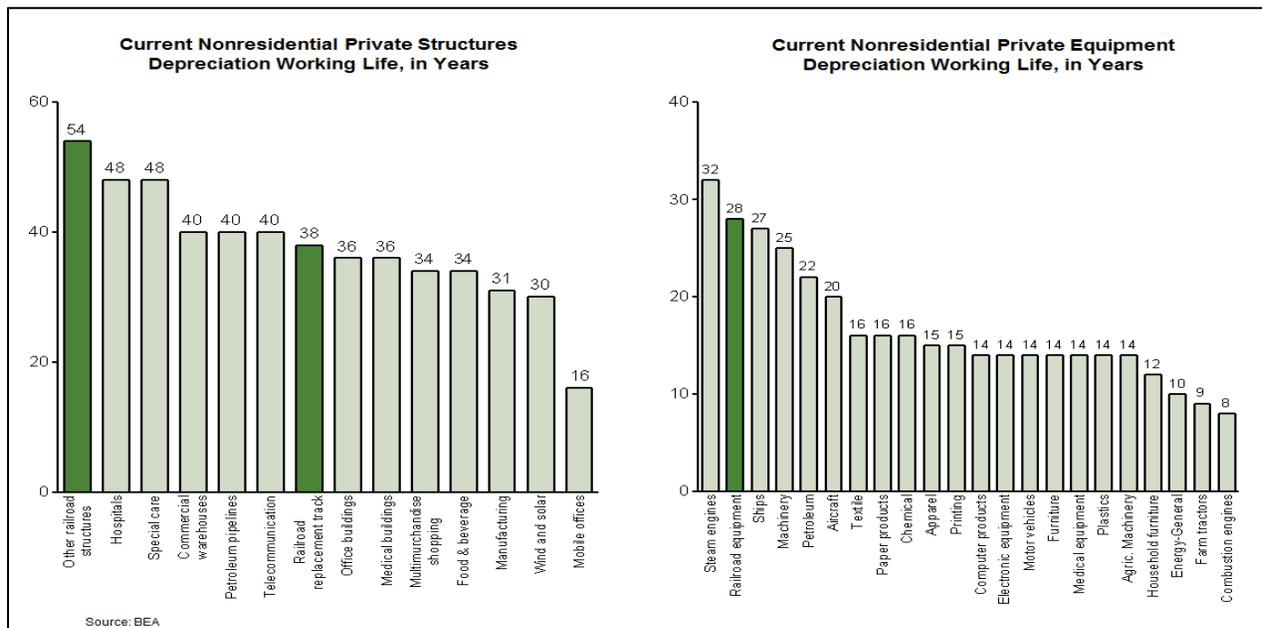
⁸ As explained above, my current-cost calculations measure both depreciation and the capital stock on a current-cost basis, and also make an upward adjustment to gross income to add the inflation-based appreciation of surviving assets. This adjustment makes the current-cost rate of return comparable to a nominal cost of capital.

capital stock is raised, because the current-cost value of the capital stock far exceeds its historic-cost value. The capital stock adjustment far outweighs the income adjustment, so the overall rate of return is reduced.

Current-cost returns for other industries are also lower than their historic-cost returns. The current-cost methodology reduces the returns for manufacturing by 13% (from 19.6% to 17.1% from 2003-2012), and for construction, mining, and utilities by 31% (from 23.2% to 16.0%). But the reduction is proportionally larger for railroads (56%) than for other sectors.

The difference between historic-cost and current-cost returns is logically and empirically far greater for railroads than for other industries, because the service lives of rail equipment and structures are far longer than average. Exhibit 5 confirms through official U.S. Government data for structures and for equipment – the two fundamental categories of capital spending – that railroad assets have far longer working lives.

Exhibit 5: The Degree to Which Rail Assets Are Exceptionally Long-Lived



My BEA-based calculations provide quantitative support for the argument that returns based on replacement costs of assets for firms generally, and for railroads in particular, are much lower than returns based on historic costs. As long as the Board relies on its existing historic-cost method to measure capital stock and depreciation, its rate of return conclusions will fail to represent meaningful measures from a true economic/financial viewpoint. While it may take some effort to implement rules based on current-cost due to difficulties of calculation, the Board risks damaging consequences if it imposes rate regulations based upon flawed historic-cost calculations that suggest a bloated rate of return for railroads exceeding the cost of capital.

- 4. My analysis of comparable industry returns demonstrates empirically that firms usually earn more than their cost of capital. Moreover, both economic theory and business capital budgeting practices call for such a positive differential in fully competitive markets.**

The ICC quotation used by the Board in its decision initiating this proceeding states: “[The] revenue adequacy standard [i.e., earning your cost of capital] 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.” The implication of this quotation – from an earlier ICC decision – is that a restraint on railroad revenues might become appropriate once railroads are found to be earning their cost of capital.

As I have shown above, railroads’ rates of return are very low when properly measured and they clearly do not exceed their cost of capital. However, even if railroads were earning

their cost of capital, this would not be a justification on its own for restraining railroad revenues through regulatory mandates. Firms will invest in all projects where the return exceeds or matches their cost of capital. Even though the last project accepted will have a return that only matches the cost of capital, the first projects accepted will have returns that exceed the cost of capital. So the **marginal** or “last dollar” of incremental return equals the cost of capital (which is itself a marginal concept), while the **average** return appropriately exceeds the cost of capital. Firms in competitive markets do have the incentive and opportunity to earn average returns in excess of their cost of capital as shown previously in Exhibit 2.

In my experience advising business leaders while at Parthenon and Data Resources, I have seen first-hand how CEOs and CFOs make decisions on whether or not to invest in a new project. Moreover, their behavior matches what I learned and taught in economics and what MBAs learn in their finance courses. They set a hurdle rate based on their corporate cost of capital, and then typically add a few additional points to account for project-specific uncertainty or project manager “excess enthusiasm.” They then compare all project requests across divisions, dismissing any project whose projected internal rate of return falls short of the hurdle rate. Clearly different projects have different levels of risk and the most risky may be asked to surpass the cost of capital by a significant added risk premium.

This process is illustrated by the linked Exhibits 6a and 6b below, where potential investment projects under consideration by a hypothetical CEO or CFO are ranked in descending order of expected project ROIC. The CEO/CFO will approve projects up to the point where the rate of return drops below the cost of capital.

Exhibit 6a: The Schedule of Projects Under Consideration in a Hypothetical Budget

CEO/CFO's Potential Project Investments (Hypothetical Data)				
Project ROIC Rank	Project Investment (\$M)	Project ROIC	Cumulative Investment (\$M)	Cumulative ROIC
1	\$0.70	23%	\$0.70	23%
2	\$0.50	21%	\$1.20	22%
3	\$1.00	19%	\$2.20	21%
4	\$0.40	16%	\$2.60	20%
5	\$0.80	14%	\$3.40	19%
6	\$0.60	11%	\$4.00	17%
7	\$1.10	8%	\$5.10	15%
8	\$0.20	6%	\$5.30	15%
9	\$0.70	3%	\$6.00	14%
10	\$0.80	2%	\$6.80	12%

CEO/CFO Hurdle Rate (equal to or exceeds corporate WACC) = 11%

The second column cites the dollars required for a specific project, whose ROIC rank is in the first column and whose own return is in the third column (justifying the rank). The fourth column simply adds the invested dollars of a project to the sum of all the higher ranked projects above it. Likewise, the final column shows the cumulative return of a project and all superior to it. The dashed line cutting across the columns is the hurdle rate any project needs to surpass on its own to be accepted; in this illustration, the hurdle rate is 11%, and reflects a pure WACC of perhaps 9% plus a typical additional management-imposed risk premium of 2%.

The CEO/CFO will cut off further investment at the project (#6 above) whose ROIC just matches the risk-adjusted WACC (which, in this case, is assumed to be 11%). This means that all but the last-accepted project (#1 through #5) are predicted to earn more—often far more—

than the WACC. Repeating this process year after year, the average ROIC of the investing firm will and should exceed the WACC, even though the marginal or last incremental projects each year only earn the marginal risk-adjusted WACC. In this example, the average ROIC of projects #1 through #6 (shown in Exhibit 6a as Cumulative ROIC) is 17%, well above the 9% WACC.

Exhibit 6b: Charting the Implied Returns Achieved by the Schedule of Projects Under Consideration in a Hypothetical Budget

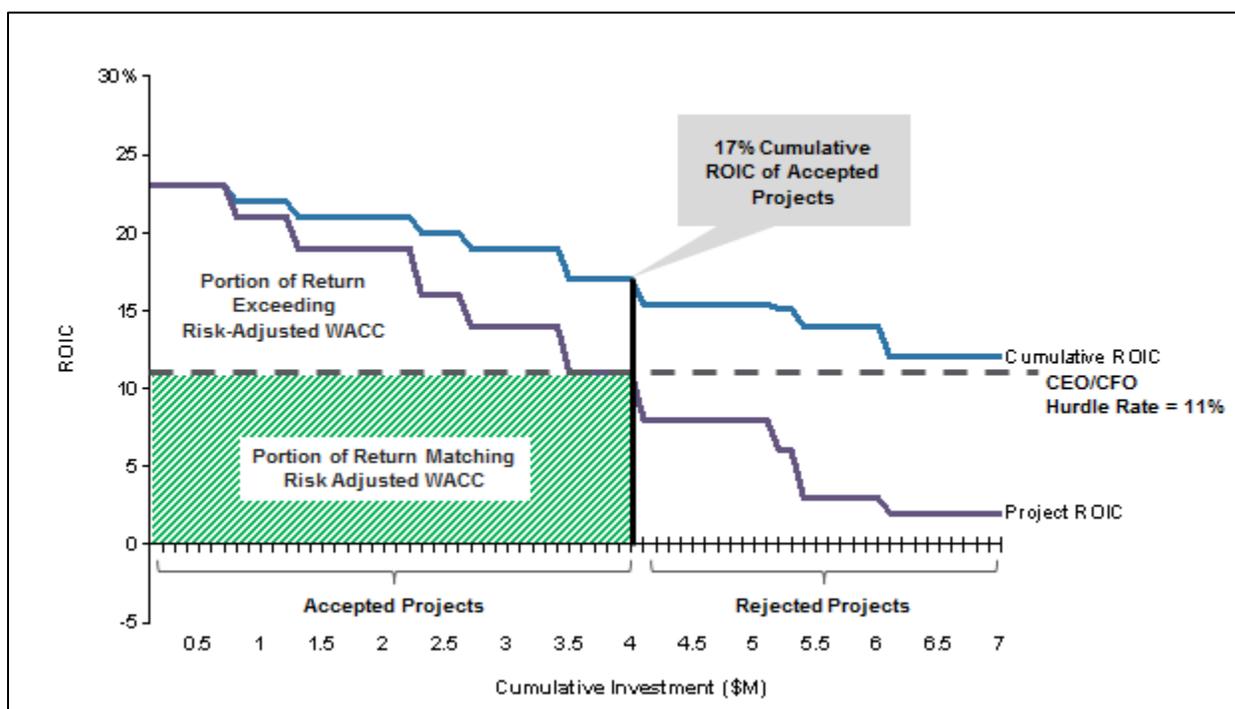


Exhibit 6b shows exactly the same data in graphical form, plotting ROIC against cumulative investment. The blue line (cumulative ROIC) would equal the WACC only if the firm were to invest in projects beyond the point where the marginal project ROIC matches WACC. Since the firm rejects all projects where ROIC is less than the risk-adjusted WACC, the average ROIC at the point where investment stops (17%) is above the risk-adjusted WACC

(11%), even though the ROIC on the last project accepted (11%) matches the risk-adjusted WACC.

The equivalence of ROIC and risk-adjusted WACC *at the margin only* is both what theory calls for and what CFOs and CEOs seek to achieve or surpass; this achieves competitive market profit maximization in microeconomics, and necessarily produces a higher average ROIC than the marginal ROIC or WACC. Such a differential is definitely not an excess return beyond a competitive market norm.

5. Recent strong rail stock market returns should not be mistaken for high or excessive profitability.

The strong stock market performance of the rail industry since 2000 may mistakenly prompt some to claim that the industry is now doing very well. The industry has merely raised its ROIC from very low to modest and is still subpar. Based on Bloomberg public reports, from 2000 to 2003, the average railroad ROIC was 3.9%; for the past four years ROIC has averaged 8.8%, or a 128% increase.

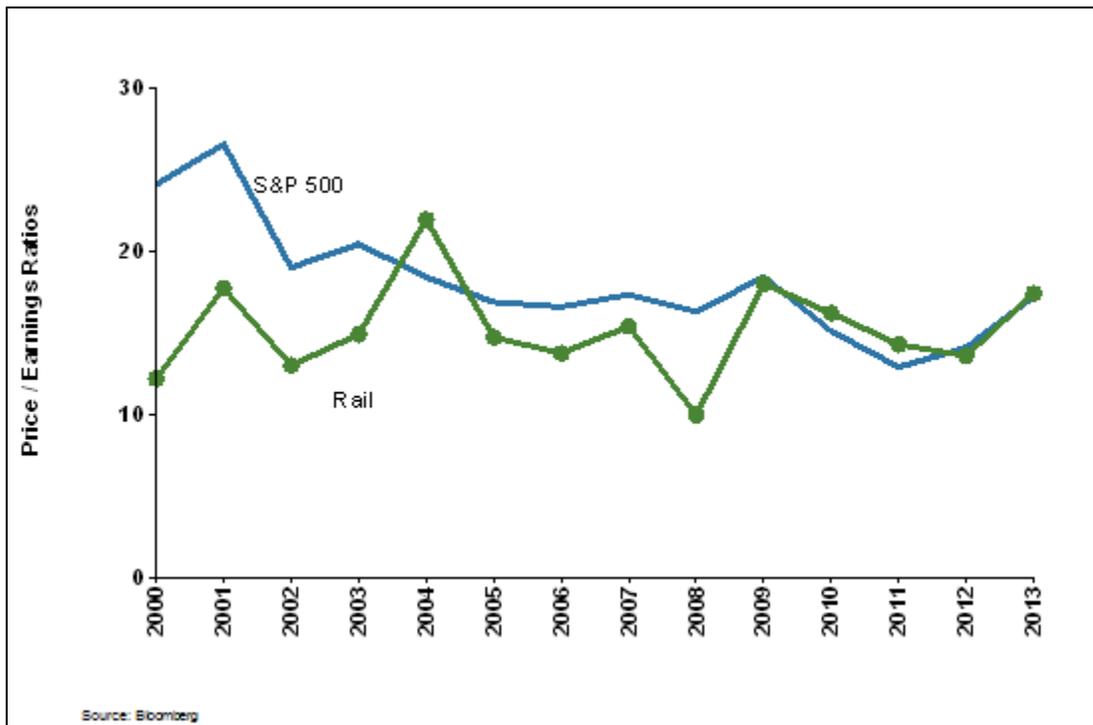
Invested capital has also greatly increased, leading to a substantial earnings gain as the new investments began to produce increased revenues. The level of earnings is the most dominant driver of a firm's share price and hence market capitalization. Compared to the universe of companies in the Standard & Poor's 500, net income for the railroads has risen 260% while the S&P 500 earnings per share have risen 132% (comparing the 2010-2013 average versus the decade prior 2000-2003 average, using such averages to smooth volatility).

After earnings, the other driver of share prices is naturally the Price/Earnings Ratio ("PE") given the identity: $\text{Share Price} = \text{Earnings} \times \text{PE}$, or $\text{Total Market Capitalization} = \text{Net}$

Income x PE. This PE multiple reflects investor growth expectations at the firm level plus, for the entire equity market as well, the PE reflects the level of interest rates on Treasury bonds competing with stocks for investor affection and the perception of equity risk relative to bonds. The railroad PE for the decade – using the same 2000-2003 average vs. 2010-2013 average basis I have used above – rose a minimal 6% from 14.5 to 15.4, while the S&P 500 PE fell sharply in the wake of the bursting internet bubble, down 34% from 22.6 to 14.8. For the last three years, the rail PE has been virtually identical to the S&P 500 PE, suggesting risk-adjusted growth expectations today are very similar.

Exhibit 7: Rail and S&P 500 Price-Earnings Ratios (P-E) = Net Income-Market Cap Ratios

(Source: Bloomberg)



Putting together the ROIC improvement (from horrible to modest and subpar) which drove earnings with a relatively consistent PE multiple, the market capitalization of the four publicly traded railroad companies in the S&P 500 for the same reference period has almost tripled. This is a great outcome for those who bought shares when rail had miserably weak profits in the early 2000s but is not a sign of excess profitability today. Apparently, given this superior stock market performance, no adverse rate regulation is currently feared by the market. If such adverse rate regulation were to occur, earnings would be lower. This would provoke a lower PE multiple and would definitely raise the cost of capital (WACC). In other words, revenue capping would both cut the ROIC from its abnormally low level and raise the WACC, quite possibly pushing the industry back into an unjustified deficit position with costs above returns.

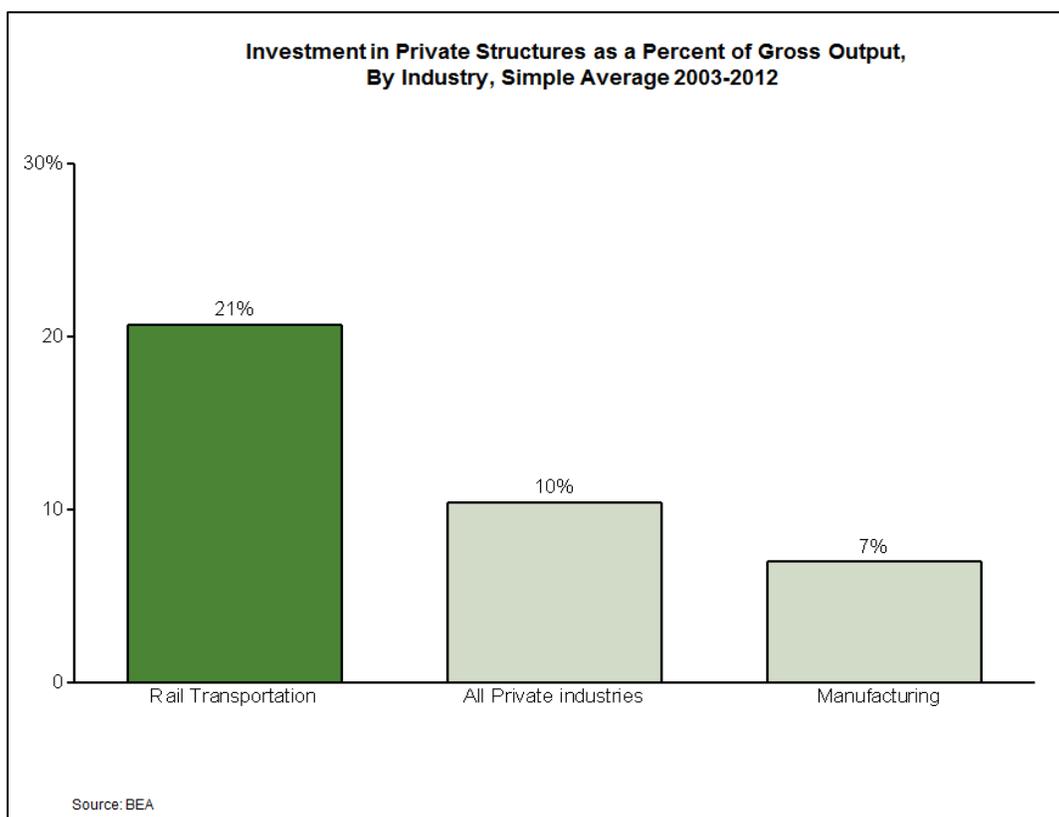
6. Railroads need exceptionally robust access to capital to build and maintain the infrastructure that the nation needs for efficient and reliable surface freight.

As I have shown above, railroads' rates of return, when properly measured and in comparison to industries with which the railroads compete for capital, are actually very low. The rail industry needs to earn a far higher rate of return than it does today to be seen by investors as earning returns comparable to firms that share some of the most important characteristics of railroads, namely long-lived assets and exposure to substantial market risks.

Railroads need to be able to earn returns on investment over the long term that will provide funding and incentives to make necessary investments in productivity and capacity. Price signals provide incentives for investment and they should not be overridden by artificial constraints on the revenues that railroads can earn. Failure to allow railroads to respond to price

signals in the market, by limiting revenues through regulatory mandates, will discourage necessary investment. Exhibit 8 shows that railroads have a particularly critical need for funds, needing to reinvest a higher percentage of revenue in fixed assets than other industries in order to build a critical national transportation network that efficiently, reliably supports many other industries.

Exhibit 8: Rail Needs Proportionately Greater Capital Investment



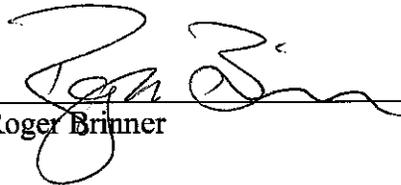
Conclusion

In summary, there is no valid financial basis for concluding that railroad rates of return are excessive and should be capped or reduced. On the contrary, railroads should be earning a far higher rate of return than they do today. Railroad returns are markedly lower than other industries, a gap that does not correspond to or follow from a proportionately lower cost of capital. If the STB were to measure returns on a current-cost depreciation basis, and with deferred taxes treated the way investors would treat them, the railroads' rate of return would be far below their cost of capital. But, even if their returns slightly exceeded their cost of capital, there is no justification for imposing revenue constraints, because in competitive markets firms usually do earn more than their cost of capital. Moreover, because of the high capital needs of the railroad industry, regulation of the railroad industry rate of return would put railroads at a severe disadvantage in capital markets in raising the funds necessary to maintain and expand an efficient rail network.

VERIFICATION

I, Roger Brinner, verify under penalty of perjury under the laws of the United States that the foregoing is true and correct and that I am qualified and authorized to file this statement.

Executed: September 5, 2014



Roger Brinner

APPENDIX

Appendix A

Explanation of Rate of Return Calculations by Methodologies						
		BEA-Current Cost	BEA-Historic Cost	BEA-Current Cost w/ Capital Gains	STB (Historic Cost)	Bloomberg (Historic Cost)
Numerator	Operating Income:	Gross Operating Surplus (gross output, less cost goods & employee compensation, similar to EBITDA)	Gross Operating Surplus	Gross Operating Surplus	Net railway operating profit + interest income from Working Capital Allowance - Gain or (Loss) from reclassification to non rail-status	Trailing 12 month net operating profit
	Taxes	None	None	None	Actual & deferred taxes	Actual cash taxes plus value of tax deductibility of interest payments
	Depreciation	Geometric based on an economic lifetime; current cost method	Geometric based on an economic lifetime; historic cost method	Geometric based on an economic lifetime; current cost method	Accepted financial accounting principles	Accepted financial accounting principles
	Amortization of goodwill	N/A	N/A	N/A	Subtracted in net RR operating profit	Subtracted in net operating profit
	Revaluation of capital stock	N/A	N/A	Revaluation of capital stock due to price changes**	N/A	N/A
Denominator	Net Capital Stock: Value of fixed assets stock	Depreciated value of fixed assets (equipment, structures, intellectual property) plus inventories under current cost methodology (railroad inventories assumed zero)	Depreciated value of fixed assets (equipment, structures, intellectual property) plus inventories under historic cost methodology (railroad inventories assumed zero)	Depreciated value of fixed assets (equipment, structures, intellectual property) plus inventories under current cost methodology (railroad inventories assumed zero)	Investment in RR Property Used in Transportation*** - Interest During Construction + Net Rail Assets of Rail Related Affiliates - Accumulated Deferred Income Tax Credits	Total Invested Capital = Short Term debt + Long Term Debt + Deferred Income Tax + Common Stock & Additional Paid in Capital + Retained Earnings + Preferred Equity
<p>Note: *Depreciation included in revaluation; **Revaluation to numerator includes Gross Operating Surplus - (Net Produced Assets - Net Produced Assets) - Investments in fixed Assets; - Investments in Inventories; ***Average of current and previous year's investment in RR Property Used in Transportation</p> <p>Source: Partnership calculations using BEA, Bloomberg and STB data</p>						

Appendix B

BEA Calculation Methodologies				
		Parthenon Using BEA; Historic Cost	Sample Year: 2012	Source
Numerator		Gross Operating Surplus (\$B)	\$18.3	Pulled from BEA; Gross Operating Surplus is Gross output less cost goods & employee compensation; similar to EBITDA
		MINUS: Depreciation of Structures, Equipment and Investment, Historic Cost (\$B)	\$7.7	Pulled from BEA
Denominator		Average Net stock of Structures, Equipment and Investment, Historic	\$168.0	BEA uses the average of the current and previous years net stock in its rate of return calculation
		<i>Return on Invested Capital, Historical Cost</i>	<i>6.3%</i>	<i>Equation is (18.3-7.7) / 168.0 = 6.3%</i>
		Parthenon with Additional Necessary Adjustments to BEA Current Cost	Sample Year: 2012	Source
Numerator	Change in net stock attributable to valuation	Gross Operating Surplus (\$B)	\$18.3	Pulled from BEA; Gross Operating Surplus is Gross output less cost goods & employee compensation; similar to EBITDA
		PLUS: Change in Net Produced Assets	\$13.7	Pulled from BEA, difference between the 2011 and 2012 number
		MINUS: Investments in Fixed Assets	\$20.5	Pulled from BEA, difference between the 2011 and 2012 number
		MINUS: Investments in Inventories	\$0.0	Pulled from BEA, difference between the 2011 and 2012 number; assumed to be zero for Railroads
		Equals	\$11.5	
Denominator		Average Net stock of Structures, Equipment and Investment, Current Cost (\$B)	\$386.1	BEA uses the average of the current and previous year's net stock in its rate of return calculation
		<i>Parthenon with Additional Necessary Adjustments to BEA Current Cost Rate of Return</i>	<i>3.0%</i>	<i>Equation is (18.3 + (13.7 - 20.5 - 0)) / 386.1 = 3%</i>

Appendix C

Roger Brinner Curriculum Vitae

My name is Roger E. Brinner. My background as a business and government economics advisor/consultant includes four decades of experience relevant to investment returns, capital formation, market growth, and public policy needed to optimize growth.

Today, I am the Chief Economist of SandPointe, LLC, an investment management firm. As I prepared this testimony through August 31, 2014 when I retired, I was the Co-Chief Economist and a partner of The Parthenon Group, a leading boutique advisory firm with approximately 300 professionals and offices in Boston, London, Mumbai, San Francisco, Shanghai, and Singapore. Since its inception in 1991, the firm has embraced a unique approach to advisory services built on fact-driven insights, long-term client relationships, and an entrepreneurial risk-sharing spirit. This has established the firm as a strategic advisor of choice for CEOs and business leaders of Global 1000 corporations, high-potential growth companies, private equity firms, educational institutions, and healthcare organizations.

Just prior to Parthenon (1971-1997), I was a pioneering member of the pre-eminent economic research organization, Data Resources (DRI). After its founding in 1968, this firm compiled massive databases of economic and financial information on what were then revolutionary world-scale time-sharing computers. We used modern econometric tools to build insightful, comprehensive models of over 100 countries and dozens of industries. We then communicated our analyses and forecasts to almost every major global corporation, financial firm and government to inform their business, policy and investment decisions. In short, we translated economic policy decisions into macro- and micro-economy reactions, and then to

client-specific implications. I succeeded the founder, Harvard Professor Otto Eckstein, and served as Executive Director and Chief Economist from 1984-1997.

In both firms, I have counseled corporate and government clients on economic issues specifically relating to their strategies, policies, market growth, investments, pricing and equity valuation. Corporations with whom I have enjoyed long-term advisory relationships have included firms in a broad cross-section of industries, such as Anheuser Busch, ARCO, Catterton Partners, Briggs & Stratton, Chrysler, Cooper Industries, Dow Chemical, Emerson Electric, Exxon, Ford Motor Company, General Electric, GTE, J.M. Huber, McGraw-Hill, Microsoft, Textron, and Thomson Corporation. Government advisory relationships have included the Federal Reserve Board of Governors and the U.S. Cabinet Departments of Treasury, Energy, Commerce and Defense. I have testified frequently before Congress on budget policy, inflation, and growth issues, and was often quoted in the media. My career includes senior positions at respected business, academic, and government institutions.

During my early years with Parthenon, I was simultaneously a Visiting Professor at the Massachusetts Institute of Technology in charge of the core macroeconomics course; earlier I was an economics professor at Harvard University teaching public policy microeconomics and public finance. I served at the White House as Senior Staff Economist in the Council of Economic Advisers, and have been a Visiting Scholar at the Federal Reserve Bank of Boston. I received a Bachelor's degree from Kalamazoo College, and a M.A. and Ph.D. in economics from Harvard University. Board memberships have included Paul Revere Insurance, the YMCA of Greater Boston, the Concord Coalition, the National Association of Business Economists, and Kalamazoo College.

PROFESSIONAL EXPERIENCE

2014- Partner and Chief Economist, SandPointe, LLC

1998-2014 Partner and Chief Economist

The Parthenon Group, Boston, Massachusetts

Dr. Brinner was the Chief Economist of The Parthenon Group. He is well known as an expert economist and articulate analyst of the U.S. and international economies, and he has many long-term relationships with corporate clients on issues relating to enterprise strategies and planning. Dr. Brinner's experience includes senior positions at respected business, academic, and government institutions.

1995, 1999- 2002 Visiting Professor of Economics, Massachusetts Institute of Technology

1997-1998 Visiting Scholar, Federal Reserve Bank of Boston

1993-1997 Executive Director and Chief Economist

Member, Senior Management Committee

DRI/McGraw-Hill, Lexington, Massachusetts

Responsible for DRI's Global Research and Business Activities. Executives reporting direct to Dr. Brinner managed all research, client support, data-banking, computer operations, marketing.

1983-1992 Executive Research Director/Chief Economist and Group Vice President

Responsible for management of DRI's Research and U.S. Operations.

1978-1983 Group Vice President

Energy, Utility and International Divisions

Responsible for all related consulting and research at DRI, serving utilities, energy producers, corporations and governments. As Chief Energy and International Economist, authored or co-authored the DRI models for all international nations plus U.S. Energy and World Oil.

1977-1978 Sr. Staff Economist, Council of Economic Advisers, the White House; **Chief**, U.S. Govt. Delegation to OECD Short-Term Forecasters Meetings; **Member**, U.S. Govt. Delegation on Technical Forecasting Consultation with Government of Japan.

1975-1977 Director of Long-Term Studies and Senior Economist

U.S. Research Group at Data Resources

1973-1976 Assistant Professor of Economics, Harvard University

Public Finance, Macroeconomics, Public Policy Microeconomics

PROFESSIONAL AFFILIATIONS

2008-Present Board of Directors, National YMCA

2004-Present Board of Directors, YMCA of Greater Boston

2003-Present Board of Advisors, Taurus Investment Holdings

2003-2005 Business Week CFO Forum Advisory Member

2000/2002-Present President of The Boston Economic Club 2000 to 2002, Current Member

1999-2002 Board of Directors, Concord-Assabet Family & Adolescent Services

1985-1990,
1999-2006 Board of Trustees, Kalamazoo College
1995-Present Vice Chairman, Board of Directors, Concord Coalition, the national organization promoting responsible federal budget policies.
1994-1997 Board of Directors, The Paul Revere Corporation
(Paul Revere acquired by Provident 1997)
1986-1990 Board of Directors, National Association of Business Economists
1986-1990 Board of Corporators, Emerson Hospital, Concord, MA

EDUCATION

1969 B.A., *Magna cum Laude*, Kalamazoo College
National Merit Scholar; Chrysler International Scholar
1971 M.A. Economics, Harvard University
1973 Ph.D., Economics, Harvard University
Woodrow Wilson Fellow; National Science Foundation Fellow

SELECTED PUBLICATIONS

I. Parthenon Publications

When the Eagles are Silent, the Parrots Begin to Jabber, May 2009

Economic Indicators, May 2009

Creating Hot Opportunities in a Cold Economy, Feb/March 2009

The Smart Manager, *Fundamentally All Right*, September 2008

The Journal of the National Association for Business Economics, *Fiscal Realities for the State and Local Governments*, April 2008

Economic Forces and Patterns Determining the Outlook, Winter 2008

A Non-Random Walk Down Wall Street, Summer 2007

Over a Barrel? Oil and the Global Economy, Winter 2006

Where is the Consumer Taking the Economy?, Fall 2006

Fiscal Realities for the States: Economic Causes and Effects, 2006

The Dollar: Further to Fall or Ready to Rise?, Spring 2005

Special Strategic Situation: The Near-Term Potential for Sharply Higher Corporate Valuation,
July 2004

Pricing: The Neglected Orphan, June 2004

Viewpoints on the Economy and Presidential Election, December 2003.

The Time to Invest, Spring 2003

Double Dip Doubts, Fall 2002

Myths versus Realities in the Markets, June 2002

The Journal of the National Association for Business Economics, *State Revenue Prospects and Strategies*, June 2002

Recovery Prospects: Before & After the September Terrorist Shock, October 2001

Strategic Insights into Share Prices, Summer 2000

II. Regular DRI Publications

DRI Review of the U.S. Economy, monthly, *Forecast Summary* and *Special Studies*, 1983-1997.

Comment on Money & Credit, weekly commentary on financial news, 1983-1997.

DRI Energy Review, quarterly, 1980 through 1983.

International Energy Bulletin, quarterly, 1981 through 1983.

World Bulletin, semiannual, 1979 through 1983.

European Review, monthly, September 1978 through December 1980.

III. Capital Formation, Taxation and Productivity

“Economic Forecasts and the Roles of Deficit Reduction and Productivity Growth,” testimony presented to the United States House of Representatives, House Committee on the Budget, March 7, 1995.

“Growth Formula: Cut Consumption, Raise Investment,” Forum, Winter 1993.

“Appropriate Use of the ‘Peace Dividend’,” testimony presented to the United States House of Representatives, Committee on Armed Services, May 30, 1992.

“The Revenue Outlook for Massachusetts,” testimony before the Commonwealth of Massachusetts, House and Senate Committees on Ways and Means, April 7, 1992.

“Investing in Growth,” testimony presented to the Senate Appropriates Committee, Subcommittee on Transportation, February 26, 1992.

“A Positive Look at U.S. Economic Prospects and Policies and Remembering First Principles of Taxation,” testimony to the House Budget Committee, December 11, 1991.

“Avoiding the Massachusetts Massacre or Discovering Fiscal Room to Maneuver,” testimony presented to the Progressive Legislative Caucus, June 6, 1991.

“The Massachusetts Economy and Its Impact on State Revenues,” testimony presented to the Commonwealth of Massachusetts, State Senate Committee on Ways and Means, May 1, 1991.

“Positive U.S. Economic Prospects and Policy Options,” testimony presented to the United States Congress, Joint Economic Committee Hearing, March 8, 1991.

“The Essential Federal Deficit Problem: Borrowing but Not Investing,” testimony presented before the House Budget Committee, February 28, 1990.

“Opportunities and Uncertainties on the Postwar Economy,” testimony presented before the United States Congress, Joint Economic Committee Hearing on the Economic Adjustment After the Cold War, December 19, 1989.

“Fiscal Policy Planning: Assessing the Mid-Session Review of the Budget,” testimony presented before the United States Congress, Joint Economic Committee, July 27, 1989.

“The United States Economic and Budget Outlook,” testimony presented before the United States House of Representatives, Budget Subcommittee, March 2, 1998.

“The Economic Consequences of Tax Reform as Proposed by the House of Representatives,” testimony presented before the Senate Committee on Finance, March 28, 1985.

“Tax Reform II: The President’s Tax Proposals for Fairness, Growth & Simplicity,” testimony presented before the Senate Finance Committee, June 27, 1985.

“The Treasury Tax Proposal: Steps Toward Neutrality,” testimony presented before the House of Representatives, Subcommittee on Economic Stabilization of the Committee on Banking, Financial and Urban Affairs, March 28, 1985.

“Taxation, Inflation and Stock Prices: Is There a Rational Linkage?” published as “Stock Prices,” in H. Aaron and J. Pechman (editors) How Taxes Affect Economic Behavior, The Brookings Institution, Washington, 1981.

“The Anti-Inflation Leverage of Investment” in C. Walten (ed.) Inflation and National Survival, The Academy of Political Science, New York, 1979.

“The Proper Medicine for Stagflation,” Technology in Society, June 1978.

“The Complicated Question of Capital Gains Tax Reform,” testimony submitted to the Senate Finance Committee, Subcommittee on Taxation and Debt Management, United States Senate, June 29, 1978.

Technology, Labor and Economic Potential, Data Resources, Economic Study Series, November 29, 1977.

Manufacturing Productivity Growth, Capital Formation and Policy—Outlook and Options to 1990, Roger Brinner, The Future of Productivity, 1977.

“The Peculiar Taxation of Capital Gains,” Tax Notes, February 1976.

“Capital Formation and Tax policy,” testimony submitted to the Subcommittee on Financial Markets of the Committee on Finance, United States Senate, 1976.

“Inflation, Deferral and the Neutral Taxation of Capital Gains,” National Tax Journal, December 1975.

The Capital Shortage: Near-Term Outlook and Long-Term Prospects (with Allen Sinai), Data Resources, Economic Study Series, November 18, 1975.

“Impact of Defense Reductions on the U.S. Economy in the 1990s,” Downsizing Defense, 1993.

IV. International Competition

“The U.S. as an International Competitor,” testimony presented before the Joint Economic Committee, Subcommittee on Economic Goals and Intergovernmental Policy, March 12, 1985.

“World Oil Markets and the Global Recession,” Data Resources Long-Term Review, April 1982.

”Iran Crises: Economic Implications of a Petroleum Shortfall,” (with James Osten, William Empey, Ron Napier, and Virginia Rogers), Data Resources Review, March, 1979.

Sterling and Sterling Lawyers for BASF: an FTC antitrust hearing regarding comparative German, U.S. and Japanese manufacturing costs.

Bethlehem Steel-U.S. Steel Workers: Written and oral testimony on macroeconomic analysis and support of steel import quota and tariff filing.

V. Energy Markets and the Environment

“Optimizing Tax Strategies to Reduce Greenhouse Gases Without Curtailing Growth” (with Michael G. Shelby, Joyce M. Yanchar, and Alex Cristofaro), The Energy Journal, Volume 12, Number 4.

“Carbon Tax Recycling: Converting Costs into Benefits,” (with Michael G. Shelby, Joyce M. Yanchar, Alex Cristofaro, and Mary Novak), DRI/McGraw-Hill, Review of the U.S. Economy, September 1991.

“Gas Taxes: How Good an Answer to Global Warming?” (with Michael G. Shelby, Joyce M. Yanchar, and Alex Cristofaro), DRI/McGraw-Hill, Review of the U.S. Economy, March 1991.

Southern Bell-Florida Bell: Written and oral testimony on intrastate message toll and coin phone demand.

Southern Bell-North Carolina Bell: Written and oral testimony on intrastate message toll and coin phone demand.

Central Maine Power Company: Written and oral testimony on alternative fuel costs in support of capacity expansion requests.

VI. Business/Financial Conditions and Modeling

“Raising the Minimum Wage in Massachusetts: A Misguided Option Trying to Help, but Instead Hurting Workers,” testimony presented to Massachusetts State House, April 12, 1995.

“Economic Forecasts and the Roles of Deficit Reduction and Productivity,” testimony presented to the United States House of Representatives, House Committee on the Budget, March 7, 1995.

“A Comparative Analysis of the DRI and BEA Models,” co-authored with Albert A. Hirsch and Lawrence R. Klein (editor) Comparative Performance of U.S. Econometric Models, Oxford Press, 1991.

“Repercussions of Grand Experiments in U.S. Economic Policy,” in Ryuzo Sato and John A. Rizzo (eds.), Unkept Promises, Unclear Consequences, Cambridge University Press, 1988.

Economic Issues and Parameters of the Next Four Years, Data Resources, Economic Study Series, November 27, 1977.

“The Death of the Phillips Curve Reconsidered,” Quarterly Journal of Economics, 1977.

“Inflation and the Definition of Taxable Personal Income,” H. Aaron, editor, in Inflation and the Tax System, Brookings Institution, 1977.

“Inflation-Included Tax Problems for the Capital Markets,” in Trade, Inflation and Ethics, Lexington Books, 1976.

“An Economic Appraisal of State Lotteries” (with Charles Clotfelter), National Tax Journal, December 1975.

The Inflation Process in the United States (with Otto Eckstein), Joint Economic Committee Study, 1972.

**Verified Statement of
Emil H. Frankel**

BEFORE THE SURFACE TRANSPORTATION BOARD

STB Ex Parte No. 722

RAILROAD REVENUE ADEQUACY

Verified Statement of

EMIL H. FRANKEL

September 5, 2005

VERIFIED STATEMENT OF EMIL H. FRANKEL

Introduction and Overview

I am Emil H. Frankel, an independent consultant on transportation policy and public management issues. I am currently a Visiting Scholar at the Bipartisan Policy Center (BPC), a Washington, DC-based think tank, where I directed BPC's transportation policy project from 2007 to 2012, and a Senior Fellow at the Eno Center for Transportation. From 1991 to 1995, I served as Commissioner of the Connecticut Department of Transportation, and from 2002 to 2005, I was Assistant Secretary for Transportation Policy of the United States Department of Transportation (US DOT) under President George W. Bush. As Assistant Secretary, I led the preparation of the Administration's legislative proposals to reauthorize federal highway, transit, and highway safety programs.

Between my state and federal service, I was Of Counsel to Day, Berry & Howard (now, DayPitney) in that law firm's Stamford, Connecticut, office. In 1995, I was a Joint Fellow at the Center for Business and Government and the Taubman Center for State and Local Government at Harvard University's John F. Kennedy School of Government, and from 1995 to 2001, and, again, in 2008 and 2009, I was a Visiting Lecturer at Yale University's School of Management and School of Forestry and Environmental Studies. Currently, I serve on the Boards of Directors of Cambridge Systematics, Inc., and of the Regional Plan Association and on the Board of Advisors of the Institute of Transportation Studies, University of California, Los Angeles.

My work at both the state and federal levels, and as a consultant, teacher, and writer on transportation issues for almost 25 years, has provided me with an opportunity to observe the roles of the various modes and actors in the transportation sector. In particular, I have been involved in the development of policies on freight and goods movement, and, in that capacity, I

have come to understand the role of each of the modes, including – importantly – the freight railroads, in meeting the goals of national policy.

The purpose of my statement is to present the perspective of a transportation policymaker on the key role that the freight rail industry has played, and must continue to play, in the implementation of a broad and significant range of national transportation policies. For the last several years, the level of public investment in all modes of surface transportation has stagnated. Given budget and fiscal pressures at all levels of government, these circumstances are unlikely to change anytime soon. On the other hand, for the last several years, capital expenditures by the private freight railroads have consistently been at very high levels. It is essential that they continue this pattern of investment if national transportation policy goals are to be met.

Deregulation of the transportation industry in the late 20th Century was, arguably, one of the most important achievements of domestic policy during this time. It was a bipartisan accomplishment with support from successive Democratic and Republican Administrations and across the aisle in Congress. Since the adoption of the Staggers Act in 1980, a consolidated freight rail industry has had the freedom and the resources to invest in equipment and infrastructure, to build more efficient and productive networks, to compete more effectively with other modes of transportation, and to adapt to rapidly changing markets, customer demands, and technological changes.

The efficient and reliable movement of freight and goods by the freight railroads is essential to a competitive and growing American economy. In setting this national goal, Congress expected that the railroads would have the opportunity to earn a level of revenues and achieve a level of profitability sufficient to meet their long-term service needs. Were the Surface Transportation Board (STB) now to impose inappropriate limitations on the railroads' revenues

and profitability, it would inhibit their capacity to invest in the maintenance, restoration, and expansion of their equipment and infrastructure, to adapt to new market opportunities, and otherwise to carry out critical national policies and purposes.

I. National Transportation Policy and the Private Freight Railroads

Freight rail is critical to America's economy and the economies of most states. Railroads have the largest share of freight on a ton-mile basis in the United States (40 percent) and carry about one-third of U.S. exports, such as wheat and coal. In its Progress Report on the National Rail Plan (September 2010), US DOT's Federal Railroad Administration (FRA) noted that America's economic transformation requires "... an interconnected and balanced transportation network" and that "... a key to integrating these systems is higher-performing rail."

The private freight rail industry plays a crucial role in the development and implementation of national freight and transportation policies. Freight rail services are "... essential to American businesses, households, and communities. Moreover, the performance and costs of our freight transportation systems are important ingredients in the comparative advantage of the United States when competing with other economies" (FRA 2010 Progress Report). In its Fiscal Year (FY) 2015 Budget Request, US DOT's Federal Highway Administration (FHWA) noted that the American economy depends on an efficient and reliable freight transportation system to link businesses with their suppliers and their markets throughout the nation and the world.

Administrations of both parties have acknowledged that a productive and efficient transportation system is critical to America's international competitive position. FHWA's 2015 budget request noted, "Wholesalers and retailers depend on fast and reliable transportation to obtain inexpensive or specialized goods through extensive supply chains."

The key elements of national transportation policy, as they apply to the freight railroad industry (each of which will be discussed in more detail later in this statement), are the following:

- Promoting the capacity, efficiency, and productivity of the freight railroads including the elimination of choke-points at key locations of rail interconnections and intermodal transfers;
- Innovating and adapting to new markets;
- Maintaining and increasing the railroads' share of freight traffic;
- Enhancing the safety of freight rail networks and facilities; and
- Reducing the environmental and community impacts resulting from the movement of freight and goods, and increasing the resiliency of the freight transportation system to the effects of severe weather events and of climate change.

In addressing each of these challenges, the freight railroads will need to maintain the flexibility of operations and the adequacy of revenues and capital investments that will permit these private companies, almost entirely dependent upon their own resources, to fulfill their roles under national policy. Flexibility, adaptability, and pursuit of adequate revenues have been the essential elements of the deregulated environment in which the freight rail industry has operated since the passage of the Staggers Act in 1980. Under the oversight of STB, those elements require continued emphasis, if national transportation goals are to be achieved.

II. Capacity, Efficiency, and Productivity

The state of America's transportation infrastructure is poor, although its importance to an economically competitive and prosperous nation is obvious. Much of the system is aging, deteriorating, and congested. In its most recent "report card," the American Society of Civil Engineers (ASCE) gave U.S. infrastructure (including, but not limited to, transportation) a grade

of D+. Despite the poor state of America's transportation facilities and networks and their importance to the nation's economy and quality of life, there is a broad consensus that we are under-investing in our transportation system.

The nation's freight railroads are the exception to this assessment of American surface transportation. In giving the rail sector (both freight and passenger) a higher C+ grade, ASCE made note of the resurgence of the freight railroads and of their heavy investments in infrastructure and equipment in the years after the passage of the Staggers Act. It is notable that these private companies made these investments from their own resources in a largely deregulated environment.

A. Railroads' Response to Staggers

Following the enactment of the Staggers Act, a series of mergers occurred in the rail industry, creating expanded networks able to provide single line service between more origin and destination points. Thousands of miles of unprofitable low-density rail lines were abandoned, freight rail networks were right-sized, and traffic density on the remaining tracks more than doubled. Between 1980 and 2006, rail density (measured by revenue tons per mile of railroad) increased by 238 percent. During this period the average train carried more freight, revenue per locomotive increased, and freight rail fuel efficiency improved by over 100 percent.

Overall, as densities increased, revenues went up, and costs went down. The greater profitability of the freight railroads in the years after deregulation allowed them to invest in bringing their remaining infrastructure and equipment into a state of good repair. Capital investments by the railroads steadily increased from less than \$3 billion a year on infrastructure and equipment, prior to deregulation, to \$6 billion to \$8 billion annually in the 1990s, and to \$13 billion to \$14 billion a year, currently. Returns on those investments similarly increased. Most

of these capital investments were related to bringing rail facilities, equipment, and networks to, and maintaining them in, a state of good repair.

A sort of “virtuous circle” emerged: the rationalized rail networks allowed for greater densities that led to improved profit margins and positive cash flows that allowed the railroads to make greater investments in technology, infrastructure, and equipment that, in turn, contributed to greater productivity and efficiency.

According to economist Clifford Winston, in the new environment of deregulation under the Staggers Act, the freight railroads were able to achieve levels of revenue and profits that enabled them to invest in operational and technological improvements, to raise service quality, and to reduce costs. He noted, “. . . As rail’s cash flow improved it was able to upgrade technology and replace worn out capital. For example, railroads revitalized their plants with stronger and better-maintained track that reduced train derailments and cut the time that track is taken out of service for rebuilding. Rail carriers also acquired newer, larger, and more reliable locomotives to handle the growth in traffic” (Clifford Winston, “The Success of the Staggers Rail Act of 1980,” AEI-Brookings Joint Center for Regulatory Studies, October 2005).

During the 25 years after passage of the Staggers Act, driven by an expanding population and increasing demands by American consumers for a wide variety of goods, rail freight movements increased substantially, absorbing much of the excess capacity of a more concentrated freight rail network.

B. Future Capacity Expansion

Pressures on the freight railroads to maintain their systems in good repair and to increase capacity will only increase in the next 20 years. America’s population is projected to grow by 70 million between now and 2035, generating 2.8 billion more tons of freight, a 22 percent increase.

In a 2006 report to the National Surface Transportation Revenue and Policy Study Commission (the Policy Commission), the Association of American Railroads (AAR) concluded that the private freight rail companies would have to expand the capacity of their systems if they were to meet expected demand. This report estimated that an investment by the private freight railroads of \$148 billion by 2035 for expansion of their infrastructure (tracks, signals, bridges, terminals, and service facilities, but not for the acquisition of equipment, such as locomotives and freight cars) would be necessary just to keep up with forecasted freight demand. Most of that required investment, \$135 billion, would be by the Class I railroads. Without this investment, it was predicted that almost one-third of rail miles in primary corridors would be capacity-constrained, creating the likelihood of severe congestion and loss of reliability.

The economic downturn that occurred in 2008 and 2009 (and the nation's subsequent slow recovery from this downturn) led to a scaling back of the projections of growth in freight demand and traffic, but investment needs for the private freight rail companies, even if reduced from earlier forecasts, are still significant. Some delays due to congestion are currently experienced on limited portions of the national rail freight network, and they will increase in the future unless there is substantial investment of private rail capital in capacity expansion.

To deal with these circumstances, ASCE noted in its 2013 "report card" that capacity would have to be added in key rail corridors, and serious choke-points would have to be addressed to avoid congestion and loss of productivity, efficiency, and reliability. FRA, in its September 2010 Progress Report on the National Rail Plan, stated that meeting projected economic and demographic growth in the United States ". . . will require modernized corridors that have the capacity to allow both passenger and freight trains to operate without interfering with each other" and that economic growth depends upon "time-sensitive rail freight . . . [and]

requires investment in upgraded tracks, reduced curvature, improved signal and control systems, and operating capabilities to facilitate the expeditious movement of freight.”

It is a critical national goal that America’s rail system be maintained in a state of good repair and that it be expanded to meet projected demand. These actions are essential to assuring a reliable and efficient freight rail system. However, only limited public funds have been, and will be, available to the railroads to meet these national purposes. It will largely be up to them to meet maintenance and expansion requirements through the investment of private funds and to eliminate or alleviate major choke-points in the system.

Projects that seek to reduce congestion, increase velocity, and improve reliability often involve addressing inadequate intermodal connections (between railroads, trucks, and/or marine shipping) and congested and unsafe interconnections between freight and passenger rail lines; rebuilding rail tunnels to accept double-stacking of rail intermodal containers; strengthening rail bridges to carry heavier loads; and improving or replacing a significant number of at-grade rail crossings.

Public funding or financing for such projects, as the Alameda Corridor Project in the 1990s to improve rail service in the Ports of Long Beach and Los Angeles, California, is an exception to the general rule that the freight railroads must largely use their own resources to alleviate choke-points in the rail system. Future projects to address choke-points and to enhance reliability and efficiency will require billions of dollars of private investment. They include such major projects as the reconstruction of major urban rail tunnels, such as the Howard Street Tunnel in Baltimore, Maryland, and the Virginia Avenue Tunnel in Washington, D.C., and the restoration of major rail bridges, such as those over the Mississippi River.

For the freight railroads to carry out their responsibilities under national transportation policy, they will have to meet the national transportation goals of enhanced capacity, productivity, and efficiency, which will require the freight railroads to invest billions of dollars of their own capital over the next two decades. It would, I believe, be contrary to national transportation policy for STB to take any actions that would limit freight rail revenues or the railroads' access to the capital from which these investments are to be made.

III. Innovation, Adaptation, and New Markets

In enacting Staggers, Congress hoped that its deregulatory legislation would put freight railroads in a position to achieve financial stability, but Congress could not have anticipated the extraordinary degree to which the freight railroads would act upon their new found incentives and commercial freedoms to take advantage of technological advances and emerging market opportunities.

After 1980, as the renewal, consolidation, and rationalization of the rail network went forward, the railroads had the freedom and the resources to adapt. As noted by Laurits R. Christensen Associates, Inc., in its November 2009 report to STB, "The deregulation of the railroad industry ushered in increased market flexibility, competitive and differential rates for rail service, and *a climate open to innovation*" (emphasis added). Economist Clifford Winston stated, "In general, an industry's adjustment to deregulation is shaped by the increased operating freedoms and intensified competition that force it to become more technologically advanced, to adopt more efficient operating and marketing practices, and to respond more effectively to external shocks" (2005 AEI-Brookings Joint Center).

Specifically, during the post-Staggers period, the private freight railroads were able to take advantage of three largely unanticipated, but significant, opportunities: (1) the revolution in

information technology and communications; (2) changing markets in the shipments and logistics of coal, grain, and domestic (shale) oil; and (3) the extraordinary increase in intermodal freight traffic.

A. Investment in Information Technology

First, the newly stabilized and more profitable freight railroads were able to accelerate investment in a range of newly available information technology (IT) tools and systems. These IT investments enabled railroads to improve safety through the use of advanced dispatching and train control technology, to improve service quality through the use of car location technology (as well as improved dispatching and train control), and to lower transaction costs and improve management processes through the use of operations management technology. Railroads also improved infrastructure planning and capital management processes through the integration of network-wide engineering with design and field operations. They were able to increase the density of freight traffic by using simulation modeling to plan freight movements and to concentrate heavy freight volumes on those rail lines best able to accommodate them.

The investment in and implementation of these IT systems made key contributions to the increased operational productivity and profitability of the freight railroads and thereby facilitated the progress towards achievement of national transportation policy goals. They helped the newly consolidated Class I railroads to concentrate heavy volumes of freight on main lines, thereby facilitating an increase in the number of single-line long haul manifest and unit trains (both for carload traffic and for bulk shipments, like coal and intermodal freight).

B. New and Expanding Markets for Coal, Grain, and Domestic Oil

Second, at the beginning of the period of rail deregulation in 1980, the extent of increased volumes and the shifting patterns of coal and grain shipments, and the new market in shale oil

traffic that occurred in the subsequent 25 years could not have been predicted with certainty.

While both coal and grain had always been important rail freight commodities, the character of these shipments was significantly modified and became much more cost-efficient both for the railroads and for their customers.

In the case of coal shipments, through much of the 20th Century, traffic had moved largely between mines in Appalachian states, such as Virginia, West Virginia, Pennsylvania, and Kentucky, to markets that had been established for decades. However, the development of huge coal-mining operations in the Powder River Basin and other areas of the western United States spurred significant investments by the freight railroads to move this commodity from new sources to domestic and international markets. With their increased productivity and profitability, the deregulated private freight railroads had the resources and the freedom to invest in the necessary infrastructure and equipment, and thereby to increase coal shipments.

The logistics supply chain for the shipment of grain, in terms of both origins and destinations, is scattered geographically. These circumstances increase the complexity of freight rail planning and operations, making it more difficult to achieve economies of density and reduction of costs in grain shipments. However, the flexibility and financial resources that the railroads realized as a result of deregulation allowed them to institute programs and to make investments in their infrastructure to achieve the necessary densities of shipments, to improve operational efficiency and reliability, and to reduce costs for grain shippers. These achievements by the private freight railroads met important national goals to market American grain more competitively in a volatile and expanding world market.

Only in the last few years did the freight railroads experience a significant growth in the shipments of oil, particularly shipments from shale deposits in North Dakota and, to a lesser

degree, from Texas and Oklahoma. While still a small share of total rail freight, these shipments grew from fewer than 20,000 carloads of crude oil in 2009 to about 400,000 in 2013.

Since rail represents a more geographically flexible way of serving these producers than the construction of pipelines, it is expected that these shipments will continue to increase, but could well shift to new locations. The availability of adequate resources and the freedom to adapt to new circumstances in a deregulated business environment allowed the freight railroads to serve this new market and thereby to contribute to the achievement of a key national goal to reduce American dependence on foreign oil.

The sudden emergence of shale oil illustrates that it is hard to know where rail traffic growth will occur next or what the commodity or commodities might be. It seems very likely that, as in the case of shale oil, railroads will need resources to respond to new traffic and to assure the availability of sufficient capacity to accommodate it.

C. The Surge in Intermodal Traffic

Third, the growth of container traffic that enabled just-in-time logistics was one of the most dramatic of the changes experienced by the railroads. From a base of 9.2 percent of rail carloads in 1980, intermodal freight has grown to 43.2 percent of rail carloads in 2012 (STB Carload Waybill Sample, 1980 and 2012).

Intermodal freight represented an expanding opportunity for the private freight railroads in the last years of the 20th Century and the beginning of the 21st. In partnership with the trucking industry, intermodal rail freight provided connections between major ports and inland producers and consumers (American Association of State Highway Transportation Officials (AASHTO), *Transportation Invest in America, Freight-Rail Bottom Line Report*). Global trade, enabled by ever-larger ocean-going container ships and increased traffic in marine containers,

the dependence of American retailers and manufacturers on logistics and “just-in-time” supply chains, and investment in the nation’s major ports created intermodal freight as a new and growing business opportunity for the railroads. The North American Free Trade Agreement (NAFTA), adopted and implemented in the 1990s and early years of this century, established new trade patterns, new transportation routes, and new market opportunities for the railroads.

Rail service emerged as the critical link in this explosion of the nation’s intermodal freight transportation system. For the railroads, containerization and intermodal freight, both domestic and international, represented a business opportunity, and, for the nation, these developments contributed to important national purposes, including dramatically increased global trade, reduced logistics costs, rising productivity, and increased profits.

The emergence of these markets for the freight railroads could not have been foreseen, when the Staggers Act passed, but the resources and flexibility of the railroads to respond and adapt to them were direct results of deregulation. Today, the transport of coal and of intermodal containers, together, represent over 40 percent of the gross revenues and almost 50 percent of the carloads of the private freight railroads. The freedom, the revenues, and the capital resources that the private freight railroads achieved in a deregulated environment allowed them to take risks and make investments to adapt to these new and expanding markets.

D. Future Market Changes

Changes in freight demand and traffic patterns in the next 25 years are certain, even if their specific nature is currently unknown. Broad international economic trends could bring the production of some goods and parts closer to American retail establishments and manufacturers, imposing changes in logistics and supply chains and new demands on freight rail networks. We are already witnessing a growth in domestic intermodal traffic (particularly, in response to

NAFTA), greater than in international containers, imposing requirements for new investments in intermodal facilities and in improved and expanded north-south rail infrastructure.

Continued evolution in the rail shipments of coal, grain, and shale oil is likely, as the patterns of the movements of these commodities shift over time. For example, if Midwestern and Eastern utilities become less dependent on coal from the West, more of this coal may move to ports (particularly to ports on the West Coast) for export, and changes in international grain markets could require significant changes in the operations and infrastructure of the freight railroads.

In addition, expansion of the Panama Canal could bring changing market opportunities and growing intermodal traffic to the railroads, but the exact nature of those changes is uncertain. This expansion could lead to more container traffic at Eastern and Gulf ports, requiring investments, not only in the expansion of these ports, but also in improvements to rail and marine connections. Alternatively, more international containers could come to West Coast ports with greater requirements for the railroads to move them to domestic markets. The very uncertainty of the impacts of Panama Canal expansion and of international trade patterns demonstrate why it is so important for the freight railroads to have the freedom, the revenues, and the resources to adapt to changing market conditions and opportunities under the revenue adequacy standards to be applied by STB.

Ten years ago no one foresaw the development of a crude oil by rail market. Similarly, no one knew what the next boom commodity for rail might be or where on the national rail network additional capacity might be needed to handle it. We do know that changes in supply chains and logistics requirements will require new investments by the freight railroads to maintain and grow their markets and their shipments. It is important, and consistent with the

goals of national policy, that the freight rail companies have the financial capacity and the operational agility to respond to future challenges. The freight railroads are, however, private companies without access to public subsidies. It would be inconsistent with important national purposes for STB now to restrict the revenues of the freight railroads and thereby to limit their capacity to innovate, to adapt to new opportunities, and to carry out important national purposes.

IV. Maintaining and Increasing Freight Rail's Market Share

National transportation policy seeks to shift more freight from highways and trucks to rail, in order to lessen highway congestion and to use a mode that is more energy-efficient and makes fewer negative impacts on the environment. As noted in AASHTO's Freight-Rail Bottom Line Report, an expansion of freight rail could provide ". . . the cost-effective transport needed to serve national and global markets; relieve pressure on overburdened highways; and support local social, economic, and environmental goals." In particular, FRA's National Rail Plan seeks a substantial increase in rail intermodal freight traffic through the railroads' capturing a greater share of trips of 500 miles.

FRA's September 2010 National Rail Plan Progress Report stated that "Improving freight rail's intermodal market share and connections to ports supports the President's National Export initiative. . . . With improvements in service and facilities, rail intermodal can be competitive in shorter distances, thereby absorbing some of the projected growth in freight." The FRA Progress Report further stated that, if the private freight railroads were to move as much as 50 percent of the 500-mile and greater intermodal freight traffic, they would need to carry 18.2 million more containers than their current market share. However, even to add 15.3 million intermodal rail units would require a doubling of capital investments by the freight railroads to \$4.6 billion annually. Such a modal shift in the shipments of intermodal containers would relieve highway

congestion and reduce fuel consumption and greenhouse gas (GHG) emissions, obvious goals of national transportation, energy, and environmental policies.

If the modal shift sought by national policy were to occur, an investment by the freight railroads in their infrastructure (such as more double-tracking, stronger bridges, or improved intermodal facilities and terminals), greater than that now projected to meet projected increases in current markets, will be required. For the past several years, only 15 to 20 percent, on average, of the freight railroads' investments have been directed to capacity enhancements. For the railroads to serve new intermodal markets and capture a larger portion of forecasted growth in freight demand, as sought by national policy, they will have to make substantially greater investments than currently projected and will have to be able to access adequate sources of investment capital.

V. Enhancing Safety

In its September 2010 Progress Report on the National Rail Plan, FRA identified rail safety, as the Agency's highest priority. The recently constituted National Freight Advisory Commission (NFAC), in its June 2014 report to US DOT, listed the encouragement of safety practices in the freight system as its first recommendation.

Safety and security are, and have been for many years, top priorities of national transportation policy. To a significant degree, investments by the freight railroads in assuring that all elements of their networks – tracks, switching and signaling systems, bridges and tunnels, and equipment – are in a state of good repair have been, and remain, the most important measures that can be undertaken to enhance rail safety. In fact, the extraordinary increases in capital and operating maintenance spending by the railroads since deregulation have led to a remarkable record of safety progress.

Both NFAC's recent recommendations and FRA's May 2008 Rail Safety Action Plan emphasized the adoption of new safety technologies as an important way to enhance rail safety. Innovative technologies (including greater use of monitoring and sensors to assess the condition of significant elements of rail tracks, structures, and switches) are major goals of national policy. The most significant safety technology imposed on private freight railroads by national policy (contained in the Rail Safety Improvement Act of 2008) requires the broad installation of positive train control (PTC) systems by December 31, 2015. The railroads will have to bear the full cost of PTC, currently estimated at \$8 billion.

Although the cost of new or rebuilt tank cars for the shipment of shale oil (the safety of these shipments is another area of strong and urgent national interest) will fall on the shippers, it may be anticipated that the private freight railroads will incur increased capital expenses for improved infrastructure and equipment and additional operating expenses, in connection with enhancing the safety of these movements.

Improving rail safety is a critical national goal, the achievement of which depends largely on the investments and operations of the private freight railroads. The railroads need to have the resources and the flexibility to implement expected (and, in many cases, required) safety standards. Were the STB now to limit the railroads' revenues, their abilities to spend on technology, infrastructure, equipment, and enhanced operating procedures (such as monitoring and inspections) could be severely impacted.

VI. Energy, Environmental Sustainability, and Resilience to Climate Change

There are few areas of public policy affecting the national economy that are more important in the future than energy, environment, and climate change. In earlier portions of this statement I have noted the freight railroads' adaptation to growing and changing patterns of shipments of coal and shale oil, two key energy related commodities. The strengthened financial positions of the freight railroads and their ability to respond to the changing markets for these commodities have enabled them to contribute to meeting the national goal of energy independence

Freight railroads are also well positioned to contribute to the achievement of national environmental goals, which include reduced impacts of carbon-emitting activities on the environment. I have already noted that railroads are more fuel efficient than trucks and that FRA has advocated growth in rail market share to move a higher percentage of freight by lower emitting trains instead of trucks.

National energy and environmental policies both suggest that it is appropriate for the railroads to seek alternative sources of energy for their own networks. The transportation sector is responsible for almost one-third of the nation's GHG emissions. There is no real possibility for the United States to meet its goals for the reduction of GHG emissions in the next 35 years without major contributions from transportation.

While the railroads are responsible for only a small portion of transportation's total GHG emissions, they are examining ways to reduce their use of diesel as the primary fuel for their trains. The freight railroads have already improved the fuel efficiency of their locomotives and are investigating the possibility of using natural gas as an alternative fuel (there are commercial reasons for such a shift, as well, as natural gas is currently less expensive than diesel fuel). In either event, a significant investment in equipment to conserve energy and to reduce emissions of

GHGs and other pollutants can be expected in the next few years. The capital for such investments will have to be generated by the freight railroads, themselves.

Adaptation to climate change, in particular, reconstructing rail infrastructure following ever more frequent and catastrophic weather events, and retrofitting rail networks and facilities, so that they are more resilient to rising sea levels, coastal and river flooding, intense precipitation, and more severe storm surges, could impose very substantial investment requirements on the freight railroads. In that connection, as private companies, they will have to look to their own revenues and resources to generate this capital.

Among the specific climate change impacts that the freight rail industry should address are the following: rail-track deformities, as a result of increases in very hot days and heat waves; inundation of rail rights-of-way and flooding of rail tunnels, as a result of increases in sea levels, combined with storm surges (as occurred with the Hudson and East River tunnels in Super-Storm Sandy); erosion of rail track bases and bridge supports; increases in flooding and washouts of track beds and rail lines, damages to rail-bed support structures, landslide and mudslide damage to tracks, as a result of intense rainstorms; and failures of infrastructure (such as bridges), from severe weather events, such as hurricanes, Transportation Research Board (TRB), Special Report 290, *Potential Impacts of Climate Change on U.S. Transportation*, 2008.

Two major hurricanes that struck the Gulf Coast in August and September 2005 (Katrina and Rita) demonstrated the risks of natural catastrophes to freight rail assets and the costs of recovery and reconstruction. During these storms, key rail bridges were destroyed, and significant portions of track were washed-out. The Class I railroad that suffered the most serious damage from these hurricanes, CSX, estimated its reconstructions costs at \$250 million to \$300 million, about one-quarter of its annual revenues available for capital investment. A presentation

in 2008 by Alan Clark of Houston-Galveston Area Council and Michael Savonis of FHWA reported that 9 percent of rail miles operated in the Gulf Region and 20 percent of rail freight facilities were at risk to projected sea level rise. Thirty-three percent of rail miles operated in the Region and 43 percent of freight facilities were at risk to storm surges.

Studies of the effects of these two hurricanes demonstrated that the costs of strengthening and protecting existing freight rail facilities and of the possible relocation of rail rights-of-way and facilities, vulnerable to the threats and risks of rising sea levels and more frequent severe weather events, would be extraordinarily high, but these risks and potential investments must be considered by the freight railroads in planning their capital programs.

Decisions about the design, construction, and reconstruction of rail infrastructure necessarily have very long time horizons, so the demands to adapt particularly vulnerable parts of freight rail networks will continue over extended periods during which the assessments of vulnerability can and will change. The capital requirements for the freight railroads, thus, will be variable, but almost certainly substantial. There needs to be adaptability in the investment decision-making process, and the railroads must have sufficient revenue sources and accessible capital, in order to be able to make these investments in resiliency, when necessary and appropriate.

Conclusion

One potential issue before the STB in this proceeding is whether the Board should interpret the concept of “revenue adequacy” as a directive to constrain the revenues of freight railroads that might achieve revenue adequate status and, thereby, inhibit their ability and their incentive to invest in the maintenance and expansion of their networks. Alternatively, should the revenue adequacy concept be interpreted to allow the railroads to establish levels of revenue and

profitability that will enhance their capacities to meet a range of national economic, safety, environmental, and social goals?

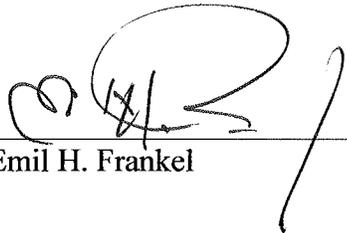
It should be the purpose of STB to construe the revenue adequacy concept so as to maximize the rail industry's ability to contribute to the achievement of national transportation policy goals. The private freight rail system is essential to the national economy and to the quality of life of all Americans.

Alone among the nation's surface transportation modes, freight rail is privately owned and operated. It is expected that these private companies will invest in order to maintain their systems in states of good repair, to expand their networks and facilities to meet projected demand, and to earn an increasing modal share of freight and goods movements. These are defined and articulated national policy goals, and it is critical that "revenue adequacy" be interpreted and applied in such a manner that it will allow the railroads to carry out these national purposes.

VERIFICATION

I, Emil H. Frankel, verify under penalty of perjury under the laws of the United States that the foregoing is true and correct and that I am qualified and authorized to file this statement.

Executed: September 2, 2014



Emil H. Frankel

**Joint Verified Statement of B.
Kelly Eakin, Mark E. Meitzen
& Philip E. Schoech
("Christensen V.S.")**

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

**STB EX PARTE NO. 722
RAILROAD REVENUE ADEQUACY**

JOINT VERIFIED STATEMENT

OF

B. KELLY EAKIN

MARK E. MEITZEN

AND

PHILIP E. SCHOECH

CHRISTENSEN ASSOCIATES

SEPTEMBER 5, 2014

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INTRODUCTION

We are B. Kelly Eakin, Mark E. Meitzen, and Philip E. Schoech of Christensen Associates. We have been asked by the American Association of Railroads (AAR) to submit this verified statement on the importance of railroad productivity in the performance of the industry since the passage of the Staggers Act. We reported on Class I railroad productivity in the Christensen Associates' railroad competition studies.¹ In an article in *Regulation*, we documented the role that productivity has played in the post-Staggers railroad industry recovery.² Drs. Eakin and Schoech submitted a report on railroad productivity to, and Dr. Eakin testified before, Presidential Emergency Board 243, which mediated a recent labor impasse.³ Drs. Meitzen and Schoech have produced numerous productivity studies for the telecommunications industry, including testimony on productivity issues before the Federal Communications Commission and state regulatory bodies. Dr. Schoech also directs Christensen Associates calculation of the official total factor productivity measure for the United States Postal Service. This measure, which was adopted by the Postal Service in 1983, appears in its Annual Reports and is submitted to the Postal Regulatory Commission.

SUMMARY OF COMMENTS

The Board is seeking comments that:

[D]iscuss the Board's methodology in fulfilling its statutory mandate to determine railroad revenue adequacy, as well as the revenue adequacy

¹ With our colleagues, A. Thomas Bozzo, Douglas W. Caves, Laurits R. Christensen, and Joseph A. Swanson, we produced *A Study of Competition in the U.S. Freight Railroad Industry and Analysis of Proposals that Might Enhance Competition* in November 2008 (revised November 2009) for the Surface Transportation Board. We produced *An Update to the Study of Competition in the U.S. Freight Railroad Industry* in January 2010.

² B. Kelly Eakin, A. Thomas Bozzo, Mark E. Meitzen and Philip E. Schoech, "Railroad Performance under the Staggers Act," *Regulation*, Winter 2010-2011, pp. 32-38.

³ Report of Dr. B. Kelly Eakin and Dr. Philip E. Schoech, Carrier's Exhibit No. 8, submitted to Presidential Emergency Board No. 243, October 11, 2011.

component of the Board's standard for judging the reasonableness of rail freight rates, with a view to what, if any, changes the Board can and should consider.⁴

We do not address the issue of methodology. With respect to changes the Board should consider, we do not believe there is a compelling reason for the Board to add to the regulatory framework by incorporating a revenue adequacy component into its review of market dominant rates. Our review of the performance of the Class I railroads since the Staggers Act indicates the regulatory framework has worked, resulting in substantial benefits to shippers and greatly improved health of the industry. Underlying this success has been tremendous productivity growth.

In this statement, we extend our previous analyses of railroad productivity. We describe the important role productivity growth has played and continues to play in the financial recovery of the railroad industry. We examine the sources of the productivity growth and we document how railroad productivity growth has shifted from network rationalization. Today productivity is achieved mainly through capital investment in new equipment and structures that embody technological advances. We are concerned that adding to the regulatory framework could adversely impact productivity by reducing the incentive and financial capability of the railroads to maintain a high level of capital investment.

THE IMPORTANCE OF RAILROAD PRODUCTIVITY GAINS IN THE PERFORMANCE OF THE INDUSTRY SINCE THE STAGGERS ACT

Railroad productivity since the Staggers Act

Productivity growth has been the underlying phenomenon that has allowed the railroad industry to move from dire financial straits to a situation of relative financial health, all the while providing substantial benefits to shippers. In this section, we examine the sources of the

⁴ Notice, Ex Parte 722, April 1, 2014, p. 4.

productivity growth, and we document how depletion of these sources has led to a dramatic productivity slowdown in recent years. Today, railroad productivity growth results mainly through technological advances, which are largely embodied in new equipment and structures brought about by capital investment. We are concerned that adding to the regulatory framework could adversely impact productivity by reducing the incentive and financial capability of the railroads to maintain a high level of capital investment.

The regulatory framework established by the Staggers Act and implemented by the Board and its predecessor agency has worked well, giving the industry latitude to respond to market conditions. The result has been a productivity growth rate that has far exceeded the rate achieved in the economy as a whole. Recent trends demonstrate, however, that productivity growth has slowed and railroads will need capital investment in new technologies to achieve continuing productivity gains.

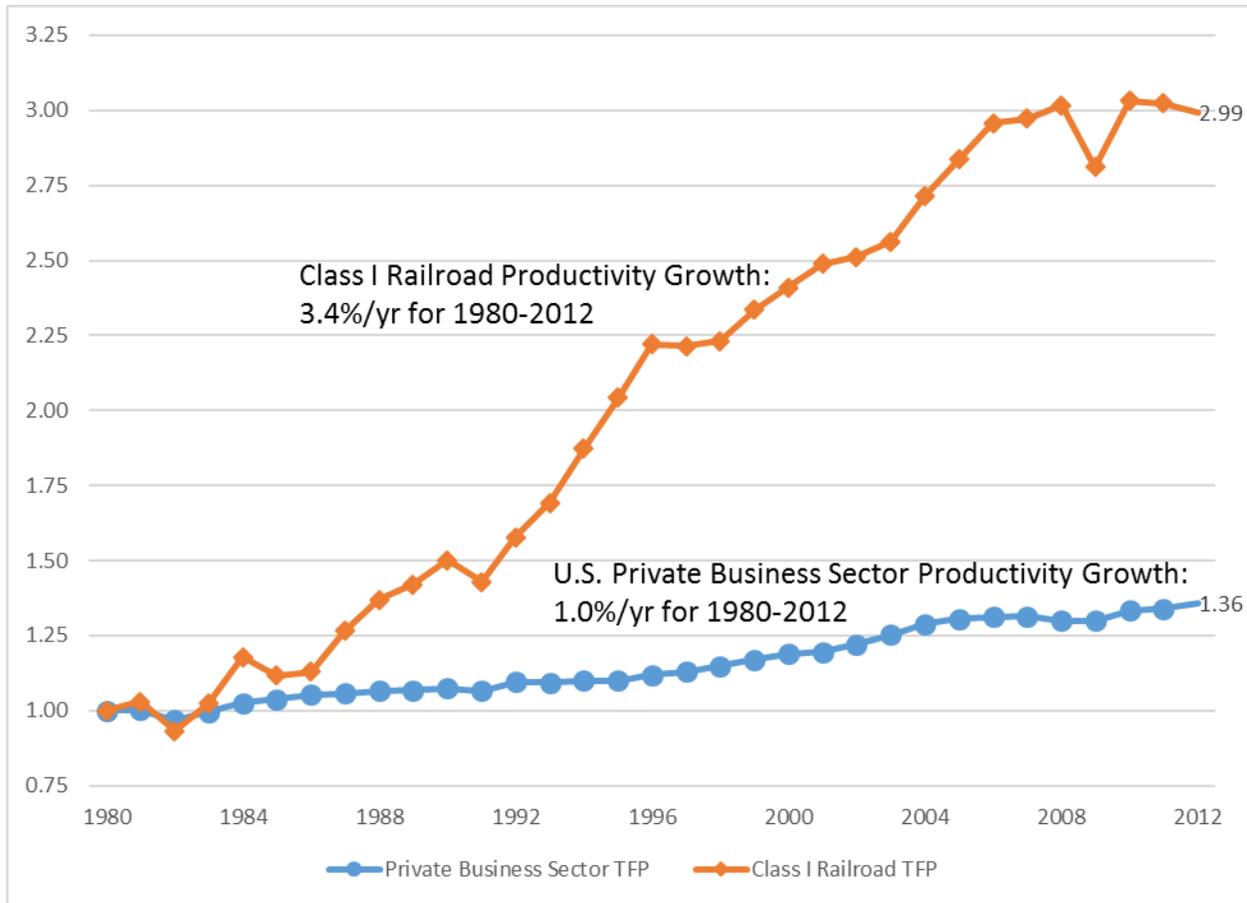
Simply put, productivity is a measure of how effectively economic inputs are converted into output. Typically, several inputs (e.g., labor, capital, materials, energy) are used to produce an industry's output. Consequently, we calculate railroad productivity using a measure of productivity that considers the combined impact of all inputs involved in the provision of rail freight transportation. This productivity measure is called total factor productivity (TFP).

We updated the pioneering railroad productivity analysis by Caves, Christensen and Swanson⁵ for our *Regulation* article and our report to the Presidential Emergency Board. In this statement, we further extend the railroad TFP analysis through 2012, the most recent year for which the data are available. Our calculations show that railroad TFP has tripled since the

⁵ Douglas W. Caves, Laurits R. Christensen, and Joseph A. Swanson, "Productivity in U.S. Railroads, 1951-1974," *Bell Journal of Economics*, Spring 1980, Vol. 11, pp. 166-181.

passage of the Staggers Act, growing 3.4 percent per year on average. As shown in Figure 1, this is more than three times the productivity growth rate achieved in the private sector of the U.S. economy over this same period.⁶

**FIGURE 1: CLASS I RAILROAD VERSUS PRIVATE BUSINESS SECTOR TOTAL FACTOR PRODUCTIVITY
1980-2012**



The post-Staggers railroad productivity growth has benefited both the industry and its customers. The industry has moved away from the brink of financial collapse to substantially

⁶ The productivity growth rate for the private business sector is taken from the U.S. Bureau of Labor Statistics multifactor productivity index for that sector (<http://www.bls.gov/mfp/>). The terms multifactor productivity and total factor productivity are synonymous.

improve its financial health. At the same time, adjusting for general inflation, the rates charged to shippers have declined substantially since 1980.⁷

Changes in railroad TFP over time can be separated into components indicating the share of productivity gains that get passed through to shippers in the form of lower rates and the share that is retained by the railroads. We present our method and calculation of the shippers' share of the post-Staggers productivity gains in the Appendix to this statement. About three-fourths of the TFP gains have gone to the shippers. The share of TFP gains retained by the railroads has allowed the industry to improve its financial health. But Figure 1 also shows that railroad productivity growth in recent years has slowed dramatically. Railroad TFP may differ considerably from year to year, but it displays trends over spans of years.

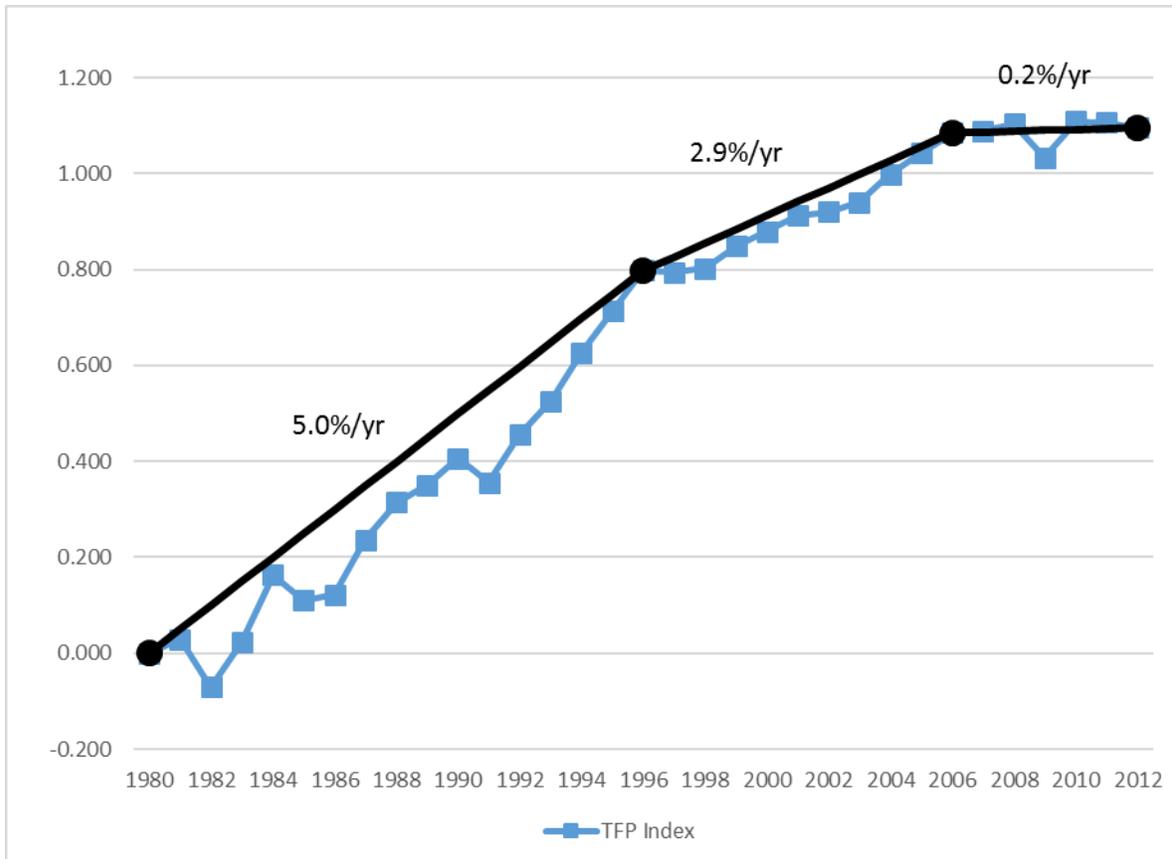
Figure 2 below shows the logarithmic values of the railroad TFP index.⁸ This figure reveals three distinct periods of post-Staggers productivity growth. From 1980 to 1996, railroad TFP grew at an average rate of 5.0 percent per year. Railroad productivity growth slowed noticeably after 1996, such that from 1996 to 2006 railroad TFP growth averaged only 2.9 percent per year. And, since 2006, railroad TFP growth increased only 0.2 percent per year.⁹ In contrast, private business sector productivity grew at 0.6 percent per year between 2006 and 2012.

⁷The STB's "Study of Railroad Rates 1985-2007" (Surface Transportation Board, July 16, 2009) shows the real rail rate index declining by 34.5 percent between 1985 and 2007. Also, *The Railroad Ten-Year Trends* indicate that constant dollar revenue per ton-mile has decreased by about 40 percent between 1980 and 2012.

⁸ With the index presented in logarithmic values, the slope of a line segment between any two points indicates the average annual growth rate over that time span.

⁹ This pattern of productivity growth slowdown is also indicated by the productivity adjustment factor (PAF) in the calculation of the Rail Cost Adjustment Factor (RCAF). PAF is a partial productivity measure rather than a total factor productivity measure. PAF grew at average rates of 4.5 percent per year from 1989Q1 to 1996Q4, 3.5 percent per year from 1996Q4 to 2006Q4, and 1.3 percent per year from 2006Q4 to 2012Q4.

**FIGURE 2: CLASS I RAILROAD TOTAL FACTOR PRODUCTIVITY GROWTH
1980-2012
(LOGARITHMIC INDEX)**



Sources and Slowdown of Railroad TFP

The post-Staggers productivity gains come from several sources. Examination of the causes helps explain the slowdown in TFP growth. The primary causes underlying railroad TFP growth are consolidation, operational efficiencies, economies of density, length of haul economies, and technology. However, since 2006, the main opportunities for productivity growth have come from technology, which requires and will require capital investment.

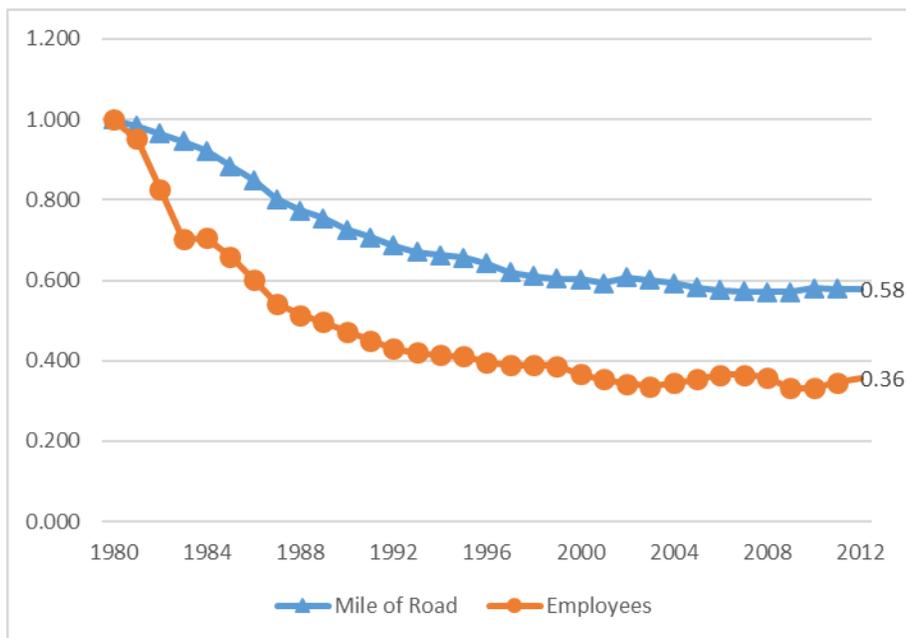
Consolidation: Consolidation of the Class I railroad industry was occurring throughout the 1960s and 1970s. The passage of the rail reform acts (the Regional Rail Reorganization Act of 1973, the Railroad Revitalization Regulatory Reform Act of 1976 and the Staggers Act of

1980) facilitated further consolidation. Consequently, consolidation accelerated in the 1980s. When the Staggers Act was passed in 1980, there were still 39 Class I railroads. By 1987 only 17 remained. Consolidation slowed, but continued into the 1990s. Notable were the large mergers between BN and ATSF to form BNSF in 1995 and between UP and SP in 1996. Also, in the late 1990s, Conrail was absorbed, in roughly equal parts, into CSX and Norfolk Southern. Finally, in 1999, CN combined with Illinois Central. Since this last combination among Class I railroads, the industry structure has been stable with 7 Class I railroads.

Operational efficiencies: The flexibilities enabled by the Staggers Act led to a new managerial mindset. Managers faced increased incentives to search out value, often by reducing organizational slack and abandoning unprofitable routes and service, but also by developing new services. The most obvious adjustments were the contraction in the miles of road and the reduction in employment. Since passage of the Staggers Act, the miles of road operated by the Class I railroads has declined by 42 percent, from about 165,000 miles of road in 1980 to about 95,000 in 2012. Likewise, employment has declined by 64 percent, from about 458,000 employees in 1980 to about 164,000 in 2012. This “right-sizing” of the industry is shown in Figure 3.¹⁰ This figure shows that since about 2001, employment and miles of road have been relatively stable with the fluctuations being largely reflective of normal business conditions rather than ongoing downsizing.

¹⁰ Data underlying Figures 3, 4, 5 and 6 come from the AAR's *Railroad Ten-Year Trends*.

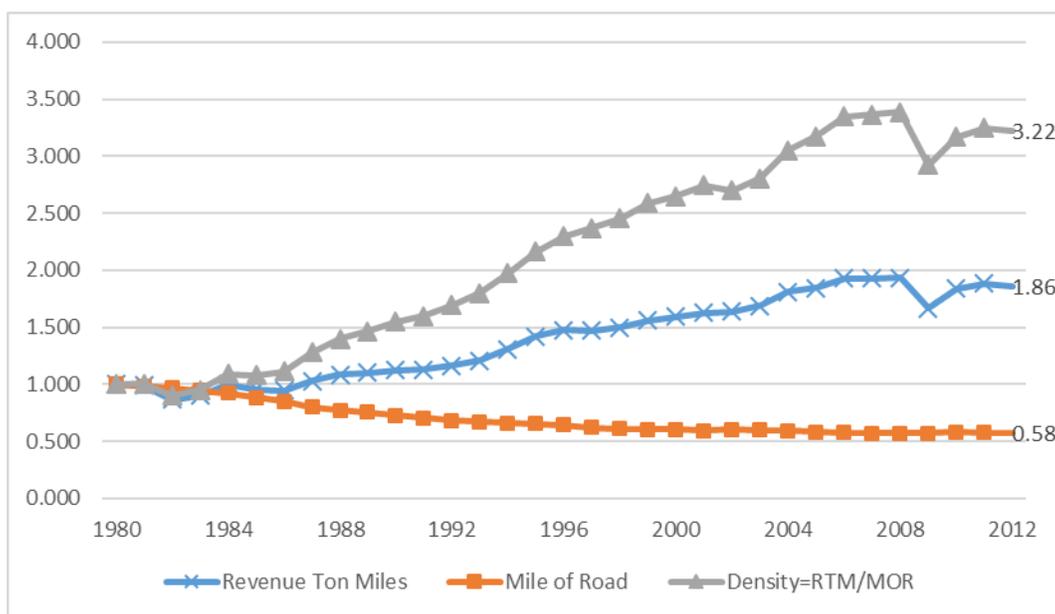
**FIGURE 3: CLASS I RAILROADS MILES OF ROAD AND EMPLOYMENT
1980-2012**



Economies of density: Between 1980 and 2012, revenue ton-miles increased by 86 percent, reaching a peak in 2008. And, as discussed above, miles of road decreased over the same period by 42 percent. The result is that density, measured as revenue-ton miles per mile of road, more than tripled. This increase is illustrated in Figure 4. This figure also shows that density decreased during the Great Recession and has yet to fully recover. While the growth in density has slowed (or actually declined) in recent years, so has the impact on cost of a given increase in density.¹¹ The combined effect is that the impact of economies of density on productivity has declined substantially. In short, achieving more density has become increasingly difficult, and, when achieved, density increases have substantially less impact on productivity than in earlier years.

¹¹ We reported in our competition studies that economies of density have been decreasing over time. See *An Update to the Study of Competition in the U.S. Freight Railroad Industry*, January 2010, pp. 3-5 – 3-7.

FIGURE 4: TRAFFIC DENSITY



Length of haul economies: In 1980, the average length of haul for a Class I railroad was 616 miles. With consolidation and product mix changes, the length of haul has steadily increased to about 917 miles in 2011, about a 58 percent increase.¹² Consolidation reduced interline switching and led to an increase in the average length of haul. The longer hauls and reduction in switching increased productivity by reducing work events, by allowing yards to close, and by improving car utilization. In the recent EP 711 proceeding, the reduced network and operational complexity resulting from reduced interline switching was identified as a significant source of railroad performance improvement.¹³ Also, the development of the Powder River Basin coal deposits and passage of the Clean Air Act Amendments of 1990, which increased the demand for lower-sulfur western coal, resulted in more coal shipments going

¹² During 2012, certain rebilled shipments began being reported as *received traffic* instead of *originated traffic* in the Freight Commodity Statistics report. Among other things, this change affected the calculation of the length of haul, causing a huge increase. Consequently, the 2012 average length of haul (973 miles) is not comparable to the average length of haul reported for earlier years. See *Railroad Ten-Year Trends, 2003-2012*, p. 42.

¹³ See the verified statement of William J. Rennie in *Ex Parte No. 711*, Petition for Rulemaking to Adopt Revised Competitive Switching Rules, before the Surface Transportation Board, March 1, 2014, pp. 10-17.

longer distances. Finally, the growth of intermodal traffic, particularly international trade with the Pacific Rim countries, led to more transcontinental shipments to and from western ports.

Technological advances: Technological advances also have been an important source of railroad productivity growth. Most of these advances are brought about through investment in new equipment and computerization of train operations. They are capital intensive. Specifically, the past thirty years has seen the development of locomotives with greater tractive effort and cars that handle heavier loads, such that the average train-load weight in 2012 was 56 percent greater than in 1980. Technological advances have also resulted in improved track, labor-saving and safety-enhancing advances in right-of-way maintenance, and improved scheduling, dispatching, train-handling, and communications.

Table 1 identifies the sources of railroad productivity gains across four sub-periods of the post-Staggers era. From 1980 to 1996, all of the sources discussed above were strongly in play. By the early 1990s, most of the opportunities for weeding out operational inefficiencies had been implemented – “the low hanging fruit harvested.” Thus, after 1996, “other managerial efficiencies” became harder to achieve and the gains were smaller. From 1996 to 2001 some industry consolidation continued, but at a pace less than what had occurred a decade earlier. Also, during this period, density continued to increase, but the impact of the increased density was lessening. While lessening, reductions in miles of road and employment continued to play a substantial role in productivity growth as did increased traffic, increased length of haul, and technological advances. After 2001, reduction in miles of road and employment stabilized, and economies associated with length of haul and density continued to weaken, leaving traffic growth and technological advances as the key drivers of productivity growth. In 2006, traffic (revenue-ton miles) plateaued, stayed fairly level in 2007 and 2008, and

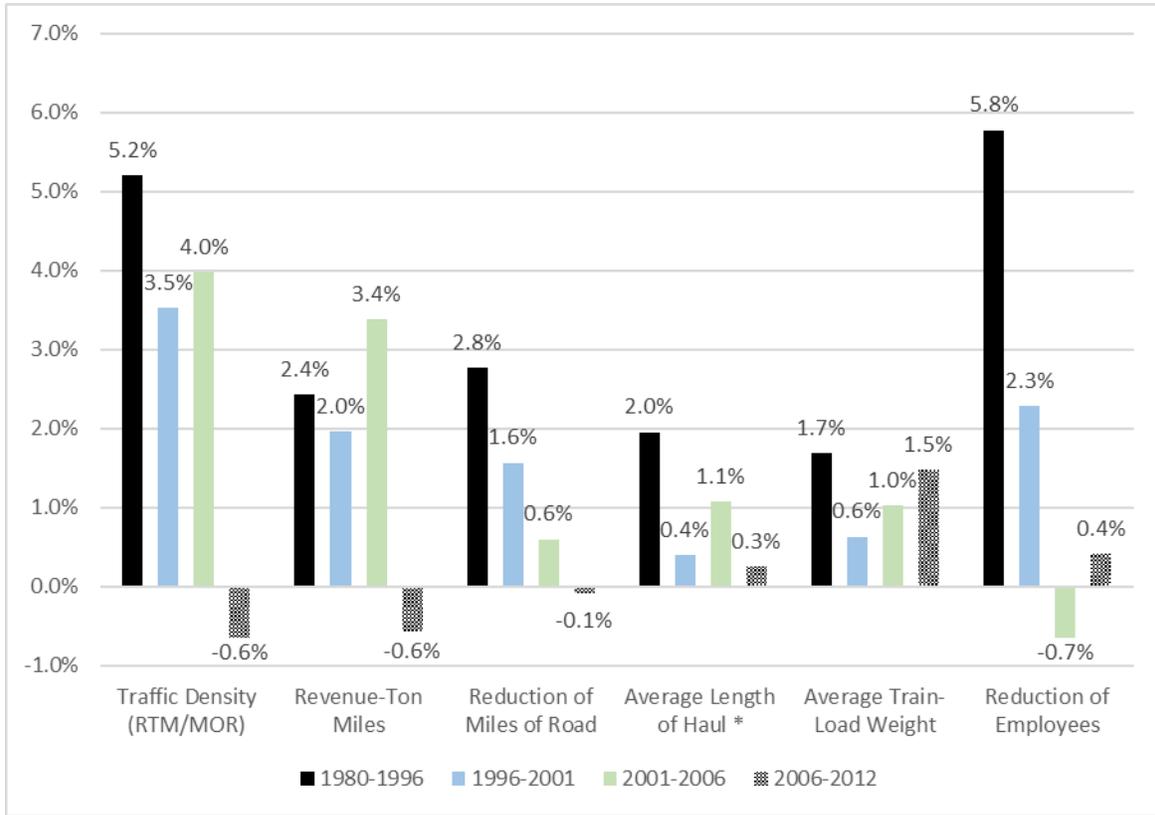
then declined substantially during the Great Recession. Thus, since 2006, productivity growth has come about because of technology advances and capital investment.

Figure 5 quantifies some of the qualitative trends in sources of productivity shown in Table 1. Specifically, Figure 5 shows the average annual changes in the productivity sources across the four post-Staggers sub-periods identified in Table 1. Between 1980 and 1996 all of the sources were strong contributors to productivity growth. The most obvious were employment falling 5.8 percent per year and traffic density increasing 5.2 percent per year (with slightly more density growth coming from the reduction of miles of road than from revenue-ton mile growth).

TABLE 1: SOURCES OF RAILROAD PRODUCTIVITY GAINS

Source	1980-1996	1996-2001	2001-2006	2006-2012
Consolidation	√	Yes, but less		
Reducing Miles of Road	√	√		
Decreasing Employment	√	√		
Other Managerial Efficiencies	√	Yes, but less	Yes, but less	Yes, but less
Increased Traffic	√	√	√	
Increased Length of Haul	√	√	Yes, but less	
Economies of Density	√	Yes, but less	Yes, but less	
Technological Advances	√	√	√	√

FIGURE 5: AVERAGE ANNUAL CHANGE IN PRODUCTIVITY SOURCES



From 1996 to 2001, traffic density continued to increase, but at a more moderate pace of 3.5 percent per year (and it was revenue ton-mile growth that contributed slightly more than miles of road reduction). Also, employment continued to decrease, but at a much slower rate of 2.3 percent per year. The average length of haul had only a small increase in this period.

Between 2001 and 2006, there was a resurgence in revenue-ton miles while the reduction in the miles of road approached zero and employment actually increased by a small amount. The net effect of the changes in revenue-ton miles and miles of road was a four percent per year increase in traffic density.

Since 2006, growth of almost all of the sources of productivity gain were close to zero, or even negative. Only average train-load weight showed meaningful improvement in this last

period. Concerning network size, railroads may have reached the point where changes in miles of road may be positive and reflect market forces realigning industry capacity with the locations where growth is occurring. This period reflects the impacts of the decline in industrial activity during the Great Recession. While there has been some post-recession recovery, it has been limited by electricity generation shifting away from coal (due to increased environmental regulations and declines in natural gas prices) and by declines in grain production (due to drought).

Average train-load weight corresponds to the technological advances as the increases are likely reflective of stronger locomotives, cars and track. Growth in average train-load weight has been relatively stable over the entire post-Staggers era, averaging about 1.4 percent increase per year.¹⁴ The period 1980 to 1996 showed 1.7 percent annual growth in train-load weight, which likely represents a combination of increased coal traffic, improved operational efficiencies and technological advances. Train-load weight increases in the later periods are more reflective of technological advances alone.

Future Technological Change Requires Investment

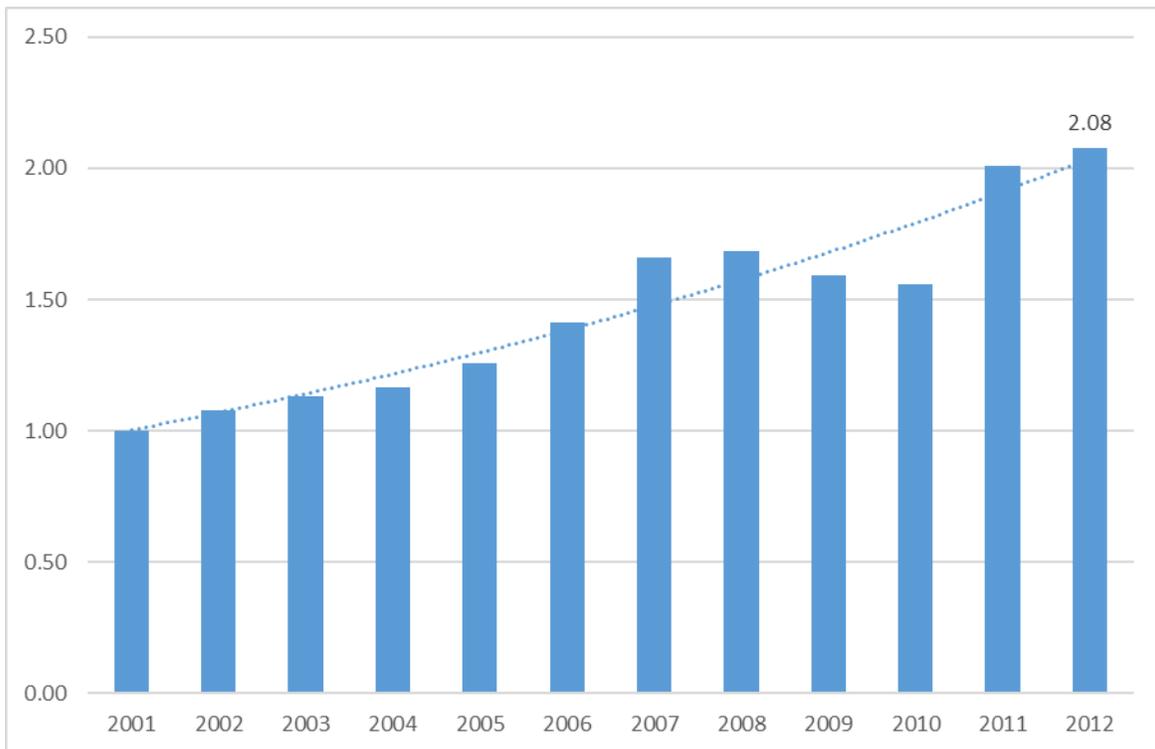
The railroad industry has performed well in the post-Staggers era, significantly improving the railroads' financial situation while benefitting shippers through lower real rates. Simultaneous financial recovery of the industry and lower real rates for shippers have come about because of the tremendous productivity achieved by the industry. Much of the productivity gain occurred early on in the post-Staggers era, as the industry reduced

¹⁴ Looking at the increase in average train-load weight masks the fact that some train-loads got much heavier (we understand anecdotally, for example, UP South Powder River Basin average trainloads increased from 11,200 tons in 1990 to 15,876 tons in 2013) while the growth of intermodal and shipment of automobiles added loads that were considerably lighter weight than average.

organizational slack, found other operating efficiencies and took advantage of density and length-of-haul economies brought about by the simultaneous reduction of miles of road and the growth of coal and intermodal traffic. However, it appears that opportunities for operational efficiencies and density and length-of-haul economies are largely depleted such that today railroad productivity gains are much smaller and driven primarily by technological advances embodied in capital investment. Thus, ongoing productivity gains will require substantial and ongoing capital expenditures coupled with the diligence of the railroads to wring out as much productivity as possible from these investments.

Fortunately, the Class I railroads have invested substantial amounts so far this century. Figure 6 shows the index of real dollar capital expenditures by the Class I railroads since 2001. The trend shows that capital expenditures, adjusted for inflation, have been increasing over time. Between 2001 and 2006, capital expenditures grew on average by 4.8 percent per year. Between 2006 and 2012, the pace of growth in real capital investment accelerated to an average of 6.5 percent per year, even taking into account the downturn during the Great Recession.

FIGURE 6: INDEX OF REAL DOLLAR CAPITAL EXPENDITURES



Examples of investment that enable technological advances include:

- improved equipment such as new locomotives that can pull heavier loads and new cars that can accommodate heavier loads;
- expansion of the use of distributive power technology beyond the coal corridors to grain, manifest and intermodal traffic to enable distributing locomotives throughout the train to apply power more efficiently, allowing longer trains and heavier loads as well as reducing stress on equipment and structures;
- improved structures such as new sidings, siding extensions and improved signalization to better handle the longer trains enabled by new technology;
- improved track materials including concrete ties and better alloy rail;

- more automated maintenance such as automated ballast distribution trains and continuous action tampers, and track renewal trains;
- state-of-the-art diagnostic systems such as track evaluation cars with ultrasound imaging, and ultrasonic and wayside laser wheel inspection facilities; and
- improved communication technology for greater safety and more efficient scheduling and billing.

The railroads have been investing increasing amounts and capital expenditures are as great as they have ever been. However, we note a few caveats. First, the payoff to this investment takes time to show up as productivity improvement. In fact, an investment may cause a slight decrease in measured productivity at a point in time because more capital input is used without immediate increase in output. Second, because there are typically economies of size, continued traffic growth is needed to get the full payoff to investment. Third, adding to the regulatory framework could hinder investment and future productivity. In particular, it is important to avoid any regulation that would reduce the incentive to make capital investments, reduce the railroads' financial capability to make investments, or restrict the industry's ability to take advantage of investments.

CONCLUSION

Our fundamental conclusion is that adding a revenue adequacy component to the Board's standard for judging the reasonableness of rail freight rates is unwarranted and would be unwise.

The rail regulatory reform acts, culminating with the Staggers Act of 1980, liberalized railroad regulation by moving away from overly intrusive regulation. The post-Staggers

regulatory framework defers to market forces where feasible, while providing a regulatory safety net to protect shippers who lack effective competitive alternatives. Liberalization of regulation facilitated the large productivity gains that underlie the post-Staggers success. The vast majority of the productivity gains have been passed on to the shippers. This framework has worked well. Shippers enjoy lower real rates and a wider array of services, while railroads are in a much better financial condition.

Since the passage of the Staggers Act in 1980, the U.S. freight railroad industry has been improving the quality of its infrastructure and its financial performance. Productivity growth has been crucial to this recovery. It is through tremendous productivity growth that the industry achieved the twin goals of the Staggers Act – a financially sound industry and substantial benefits to shippers.

The early productivity gains enabled by deregulation have largely been realized so that today railroad productivity is growing at a much slower rate. Most of the railroad productivity growth now comes from technological advances and innovations embodied in new equipment and structures and increased computerization of operations. These technological gains are driven by capital investments.

Railroads have made substantial capital investments so far this century. These capital expenditures provide the seeds for future productivity gains. It is imperative that the railroads continue to have the incentive and the ability to make substantial capital expenditures and that regulatory policy not restrict the industry's ability or incentive to do so nor hinder the potential productivity gains from those investments.

Adding a revenue adequacy component to the regulatory framework would be a step backwards, toward the pre-Staggers era of cost-of-service regulation. Doing so could endanger future productivity – the engine of the post-Staggers success – by reducing the incentives and the financial capability of the railroads to make investments in improved technologies, to the detriment of shippers and the public interest.

APPENDIX: METHOD FOR DETERMINING DISTRIBUTION OF RAILROAD PRODUCTIVITY GAINS

Our method to determine how productivity gains have been shared is founded on an equation reflecting the industry's margin. That is,

$$M = (P \cdot Y) / (W \cdot X) \quad (1)$$

M expresses the margin as the ratio of revenue to cost where P and Y are indexes of output price and output, respectively, and W and X are indexes of input prices and input usage, respectively.¹⁵ The logarithmic form of (1) is

$$\ln M = \ln P + \ln Y - \ln W - \ln X \quad (2)$$

Differentiating (2) with respect to time gives the percentage changes in the variables over time.

That is,

$$\dot{M} = \dot{P} + \dot{Y} - \dot{W} - \dot{X} \quad (3)$$

where $\dot{M} = d \ln M / dt$, $\dot{P} = d \ln P / dt$, $\dot{Y} = d \ln Y / dt$, $\dot{W} = d \ln W / dt$, and $\dot{X} = d \ln X / dt$. Total factor productivity is given by the output index relative to the input index,

$$TFP = Y/X \quad (4)$$

Productivity growth is simply

$$TFP = \dot{Y} - \dot{X} \quad (5)$$

Substituting (5) into (3) and rearranging gives

¹⁵ The margin ratio is a re-arrangement of the firm's accounting identity presented as equation (1) in Diewert, W. E. and K. J. Fox (2000): "Incentive Indexes for Regulated Industries," *Journal of Regulatory Economics*, 17, 5-24.

$$\dot{TFP} = \dot{M} + (\dot{W} - \dot{P}) \quad (6)$$

Thus, TFP growth separates into the gains kept by the railroads in the form of increased margin and gains to the shippers in the form of rate increases being less than industry cost inflation.

The shares of productivity gain are

$$\text{Railroads' Share} = \dot{M} / \dot{TFP} \quad (7)$$

$$\text{Shippers' Share} = (\dot{W} - \dot{P}) / \dot{TFP} \quad (8)$$

To implement this formula we need indexes of output price and input price, in addition to the total factor productivity index. The output price index is primarily based on the 1998 and 2009 STB rate index studies, which provide an index of output prices between 1982 and 2007.¹⁶ This index is extended backward to 1980 and forward to 2012 based on calculations from our 2010 railroad competition study and trends in revenue per ton mile. The input price index is based on the railroad cost recovery index (RCRI). The RCRI is published annually by the Association of American Railroads (AAR).

The following table shows the logarithmic percentage change in W, P, M, and TFP between 1980 and 2014.

¹⁶ Surface Transportation Board (1998): Office of Economics, Environmental Analysis and Administration, *Rail Rates Continue Multi-Year Decline* and Surface Transportation Board (2009): Office of Economics, Environmental Analysis and Administration, *Study of Railroad Rates: 1985-2007*.

Time Period	Percentage Change in:					Share of Gains		
	W	P	M	TFP		Shippers	Railroads	Total
1980-2012	132%	51%	28%	110%		74%	26%	100%

As can be seen in the table, shippers received 74% of the productivity gains, while the railroads received 26% of the gains.

VERIFICATION

I, B. Kelly Eakin, verify under penalty of perjury under the laws of the United States that the foregoing is true and correct and that I am qualified and authorized to file this statement.

Executed: September 3, 2014

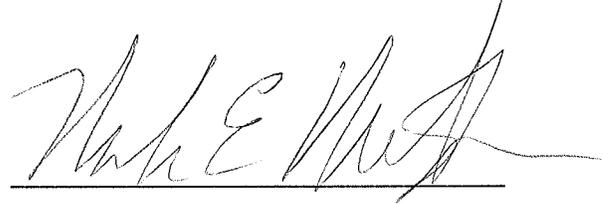


B. Kelly Eakin

VERIFICATION

I, Mark E. Meitzen, verify under penalty of perjury under the laws of the United States that the foregoing is true and correct and that I am qualified and authorized to file this statement.

Executed on September 3, 2014.

A handwritten signature in black ink, appearing to read 'Mark E. Meitzen', written over a horizontal line. The signature is cursive and somewhat stylized.

Mark E. Meitzen

VERIFICATION

I, Philip E. Schoech, verify under penalty of perjury under the laws of the United States that the foregoing is true and correct and that I am qualified and authorized to file this statement.

Executed: September 3, 2014



Philip E. Schoech