

BEFORE THE SURFACE TRANSPORTATION BOARD

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RAILROAD REVENUE ADEQUACY

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

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Reply Verified Statement of Joseph P. Kalt

Reply Verified Statement of Roger Brinner

Reply Verified Statement of Robert D. Willig

The Association of American Railroads (“AAR”) respectfully submits its reply comments in this proceeding. AAR’s Reply Comments are supported by the verified statements of Professor Joseph P. Kalt, Dr. Roger Brinner, and Professor Robert Willig.

I. Introduction

The opening comments submitted by the railroad and shipper parties present a stark contrast. The railroads provided thorough and substantial testimony by multiple, respected economists and other experts regarding the concept and consequences of railroad revenue adequacy in its multiple dimensions.¹ Shipper interests, by contrast, avoided any serious analysis of the meaning of revenue adequacy and its economic and policy implications. They view the Board’s institution of this proceeding as an opportunity to seize upon improved railroad financial performance as a pretext for obtaining new regulatory limits on railroad pricing.

The logic of shipper calls for more vigorous Board rate regulation is unsupported at every juncture. First, shippers construe the ICC’s thirty year old announcement of a revenue adequacy constraint as an invitation to argue for Board regulation of overall railroad profits, rather than regulation of individual rates. A change in course in the direction of profit regulation would be a public policy disaster. The Board must adhere to its market-based regulatory model by addressing only those rates that reflect an abuse of market power and allow the market to

¹ As AAR explained in its opening submission, there are several distinct concepts of revenue adequacy at issue in this proceeding. *See* Opening Comments of the Association of American Railroads, at 1-2 (filed Sept. 5, 2014) (“AAR Op. Comments”). 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, there is the annual revenue adequacy determination, which is required by statute so that the Board can monitor railroads’ progress in attaining and maintaining adequate revenues and the Board’s progress in promoting that goal. Third, the non-statutory “revenue adequacy constraint” fashioned by the ICC in 1985 is a centerpiece of shipper proposals in this proceeding to expand the scope of Board rate regulation.

determine appropriate rate levels on competitive traffic, which predominates in today's rail sector.

Second, shippers argue that regulation of railroad profits is now appropriate because railroads are supposedly earning "excess" revenues. The shippers assume that a firm must be exploiting market power if its rate of return in a given year is above the industry cost of capital, but that assumption is incorrect as a matter of economics, as Professor Kalt and Dr. Brinner explained on opening.² Even if the Board's annual revenue adequacy determinations accurately measured railroad returns on investment, which they do not, for the reasons explained on opening, that would not support a conclusion that railroads are earning "excess" revenues. Moreover, shippers make no attempt to demonstrate that the source of improving railroad financial health is the inappropriate exploitation of market power as opposed to increased contribution from the vast majority of railroad traffic that is competitive or from providing innovative and enhanced service. Shippers' references to "excess" revenues are purely rhetorical and unfounded.

Third, shippers seem to take it as a given that railroads have now attained the status of revenue adequacy, without acknowledging the methodological flaws in the Board's annual determination that overstate rail returns or the many recent years in which railroads were found revenue inadequate even under the flawed methodology. Nevertheless, shippers press for more lenient standards to be applied in annual revenue adequacy determinations so as to increase the likelihood that the Board will erroneously conclude that railroads are revenue adequate. Their proposals cannot be reconciled with either the current statute or sound economic principles. Any measure suggesting that a railroad is revenue adequate when it is not, in fact, earning an

² See, AAR Op. Comments, Verified Statement of Joseph P. Kalt, at 32-35 ("Kalt V.S.") and Verified Statement of Roger Brinner, at 12-13 ("Brinner V.S.").

economic rate of return of at least the industry cost of capital over the long term would conflict with the statutory definition that a revenue adequate railroad should be able to “attract and retain capital in amounts adequate to provide a sound transportation system.” 49 U.S.C. § 10704(a)(2)(B).

Finally, shippers offer no more support for their proposals to implement a revenue adequacy constraint than they do for their claim of a need for such a constraint. Some urge the Board to attempt to regulate firm-wide revenues in a manner that hearkens back to rate-of return regulation for public utilities.³ Other shippers seek rate roll-backs based on the same basic rate-of-return regulation principles.⁴ And yet other shippers suggest that the Board should apply rate freezes⁵ and rate caps⁶ to implement a revenue adequacy constraint. No shipper commenter, however, presents any economic justification for going down a regulatory path of profit regulation that has been largely abandoned even in industries where rate of return regulation was traditionally applied. They cannot explain how attempts to limit a railroad’s firm-wide revenues to a prescribed “revenue adequate” level could be rationally applied when most traffic (and most revenue) is not even subject to regulation. Nor do shipper commenters offer any economic

³ See, Opening Comments of Arkansas Electric Cooperative Corp., at 22-24 (filed Sept. 5, 2014) (“AECC Op. Comments”) (proposing a percent reduction approach that would calculate refunds for shippers with rates above 180% R/VC to eliminate “supracompetitive earnings”).

⁴ See, e.g., Opening Comments of Alliance for Rail Competition, *et al.*, at 24 (filed Sept. 5, 2014) (“ARC Op. Comments”) (urging the Board to return to shippers some of the “excess return” earned by a revenue adequate railroad).

⁵ See, Comments Submitted by Concerned Shipper Associations, at 13 (filed Sept. 5, 2014) (“Concerned Shipper Op. Comments”) (proposing that revenue adequate railroads may not raise rates on market dominant traffic except to account for inflation); Joint Opening Comments of the Western Coal Traffic League, *et al.*, at 30-33 (filed Sept. 5, 2014) (“WCTL Op. Comments”) (same).

⁶ See, ARC Op. Comments at 33 (filed Sept. 5, 2014) (advocating a “Two Benchmark” approach that would apparently cap rates for market dominant traffic at RSAM); Comments Submitted by Olin Corp., at 7-9 (filed Sept. 5, 2014) (“Olin Op. Comments”) (advocating an R/VC rate cap at an unspecified level for “captive” shippers).

rationale or supporting expert testimony for the arbitrary rate freezes and rate caps they propose. As Professor Kalt explains in his reply verified statement, arbitrary price controls would override market signals and harm the public interest by distorting and inhibiting railroad incentives to make investments that reduce costs, improve service and expand capacity.⁷

Unable to formulate a cogent economic rationale to support their various proposals for implementing a revenue adequacy rate constraint, the shippers rationalize their proposals through tangential attacks on the SAC test. Essentially, shipper comments devolve into little more than a complaint about the cost and complexity of the SAC test coupled with opportunistic pleas for more favorable rate reasonableness procedures. To the extent that there are any legitimate concerns about the administration of the SAC test, the proper way to deal with those concerns is to continue to look for ways to make the SAC methodology more accessible and easier to administer without violating the sound economic principles that have guided the Board's rate regulation for three decades.

Since the Staggers Rail Act,⁸ shippers and railroads alike have benefitted from a regulatory system that relies on competition and market forces to determine efficient rail rates for the majority of rail traffic and that calls for regulatory intervention only in those limited circumstances where shippers may be subject to the abuse of market power. The stand-alone cost test used by the Board to determine the reasonableness of rail rates is a standard that simulates, or mimics, the effects of competition. It is based on economic principles that take account of the unique characteristics of the railroad industry, including the mixture of competitive and less competitive traffic, the predominance of long-lived capital assets, and the need to recover joint and common costs from shippers with varying levels of demand. It would

⁷ Reply Verified Statement of Joseph P. Kalt, at 24-26 ("Kalt Reply V.S.").

⁸ Staggers Rail Act of 1980, Pub. L. No. 96-448, 94 Stat. 1895 (1980).

be irresponsible to use improving railroad financial health as a pretext to abandon economically-rational rate regulation and substitute arbitrary maximum rate standards that are grounded on little more than the desire of some shippers to pay lower rates.

II. The Board Should Disavow the Discredited and Harmful Policy of Profit Regulation

Opening comments in this proceeding present the Board with a stark and critical policy choice. Shipper commenters seize upon the ICC's adoption of a revenue adequacy rate constraint nearly 30 years ago in *Coal Rate Guidelines*⁹ to argue for intensified Board rate regulation that would penalize railroads for having improved their financial condition and jeopardize their long-term ability to serve shippers and the general public. These harmful outcomes bear no relationship to either of the Board's key policy goals – promoting a vibrant and sustainable rail network by allowing market forces to guide commercial outcomes to the maximum extent possible and protecting individual shippers from the abuse of market power. Regardless of the rationale for the ICC's adoption of a revenue adequacy constraint – if such a rationale in fact existed – it is time now to disavow any notion that profit regulation should or could play a role in STB rate regulation.

Professor Kalt explains in his reply verified statement that the regulatory policy the Board should apply to ratemaking in non-competitive settings is to “seek to reproduce the pricing results the market would yield if it were competitive.” Accordingly, the “‘mimic competition’ principle is now the guiding principle of most U.S. (and other developed economies’) regulatory policy.”¹⁰

⁹ *Coal Rate Guidelines – Nationwide*, 1 I.C.C. 2d 520 (1985) (“*Guidelines*”), *aff’d sub nom. Consolidated Rail Corp. v. U.S.*, 812 F.2d 1444 (3rd Cir. 1987).

¹⁰ Kalt Reply V.S., at 5.

In contrast to this “mimic competition” principle, the notion of profit regulation invoked by shippers here is a vestige of traditional public utility rate of return regulation, where the regulator identified a level of firm-wide revenues that was necessary to cover the costs of the regulated firm (a monopoly franchisee) and then established a rate structure for the various categories of ratepayers that would in the aggregate generate the prescribed level of revenues. This approach to the regulation of firm-wide revenues and profits was used in sectors of the economy populated by “natural” monopolies, where market conditions and entry costs precluded competition for the services provided by the regulated firm. Under traditional rate of return regulation, the cap on profits of the regulated monopolist was the quid pro quo for the guarantee of adequate revenues.

Rate of return regulation has never been applied in the U.S. freight rail industry, and it could not work because the existence of competitive traffic precludes the possibility of a guarantee that railroads will earn adequate revenues.¹¹ Today, thirty years after *Guidelines* were adopted, rate of return regulation has been widely discredited, even as applied in industries where the regulator was able to guarantee a level of firm-wide revenues through control of the rates paid by the monopoly firm’s entire captive customer base.¹² The sole economist put forward by the shippers to address the revenue adequacy constraint in *Guidelines*, Professor

¹¹ See, *Bessemer & Lake Erie Railroad Co. v. I.C.C.*, 691 F.2d 1104, 1113 (3rd Cir. 1982) (classic public utility regulation is not applied in the railroad industry because railroads are not “assured of a compensable rate of return even on the investment required to serve that traffic”). See also *Arkansas Power & Light Co. Petition to Institute Rulemaking Proceeding – Implementation of Long-Cannon Amendment to the Staggers Rail Act*, 365 I.C.C. 983, 989 (1982) (“The Commission does not regulate the overall rate of return for railroads”).

¹² Professor Sappington, one of Norfolk Southern Railway Company’s witnesses, addressed this issue in detail on opening. Opening Comments of Norfolk Southern Railway Company (“NS Op. Comments”), Verified Statement of David Sappington, at 2-3 (filed Sept. 5, 2104) (“Sappington V.S.”). See also Kalt Reply V.S. at 19.

Faulhaber, likewise notes that “rate-base rate-of-return calculations [have been] virtually abandoned in this country (except at the STB) for well over twenty years.”¹³

Regulation of overall earnings stifles innovation and inhibits investment.¹⁴ One of the reasons that traditional rate of return regulation has been largely abandoned is that regulators have come to understand that firms need incentives to improve service and to respond to changes in demand. Regulation of a firm’s profitability undermines those incentives.¹⁵ If a firm cannot expect to gain by reducing costs or improving service due to a cap on its earnings, it has no reason to seek to improve productivity, to enhance efficiency, or to provide new or better services. Profit regulation would deter risky investments that might improve or expand service since the benefits of taking the risk would be eliminated by the cap on revenues while the downside risks could reduce earnings if the investment does not turn out as planned. At best, railroad service could be expected to stagnate as railroads avoid risky innovations. Professor Kalt notes that rate of return regulation creates perverse incentives for the regulated firm to misallocate resources and price inefficiently, as well as discouraging innovation.¹⁶

¹³ Concerned Shipper Op. Comments, Verified Statement of Gerald R. Faulhaber, at 3 (“Faulhaber V.S.”).

¹⁴ Professor Sappington explained in his opening statement that “a policy that limits a supplier to normal earnings – regardless of its performance – provides the supplier with little or no incentive to excel in the marketplace. In particular, stringent earnings regulation provides no incentive for the regulated firm to engage in the challenging, costly processes of discovering more efficient means of operation and identifying and fulfilling the needs and desires of consumers.” Sappington V.S., at 4.

¹⁵ The impact of profit regulation on investment incentives is also discussed at length in the opening statements of railroad witnesses Professors Cornell and Murphy. See NS Op. Comments, Verified Statement of Bradford Cornell, at 32-36 (“Cornell V.S.”); Opening Comments of Union Pacific Railroad Company (“UP Op. Comments”), Verified Statement of Kevin M. Murphy, at 29-34 (“Murphy V.S.”) (filed Sept. 5, 2014).

¹⁶ Kalt Reply V.S., at 19.

Any attempt to regulate overall profits would not only be unworkable in the rail industry, it would also be pernicious, as it would destroy the possibility of earning adequate revenues. In the railroad industry, imposing an upward limit on revenues that can be earned would lead to a fatal asymmetry because the upside cap on revenues could not be matched with a guaranteed reasonable return on investment.¹⁷ In some periods railroads would earn less than the required return on investment due to competition and changing market conditions, yet they would be precluded from earning revenues in excess of the cap on profits in other periods. Over the long term, revenues would inevitably fall below the levels needed to sustain the firm. Asymmetric profit regulation would condemn railroads to long-term revenue inadequacy.¹⁸

Nevertheless, the idea of using a revenue adequacy constraint to regulate the level of earnings or profitability of a railroad infects certain shipper proposals. For example, AECC expressly urges the Board to adopt a form of discredited rate of return regulation. AECC claims that “the primary focus of a proper revenue adequacy constraint” should be to limit “aggregate contribution to provide earnings that conform to this [revenue adequacy] standard”¹⁹ Other shipper commenters vaguely refer to the possibility of using a revenue adequacy constraint to return to shippers some of the “excess return” earned by a railroad. ARC claims that “[r]ate reductions, and not just limits on future rate increases, should be available, to the extent of excess revenues based on differential pricing of a captive shipper’s traffic”²⁰ Concerned Shippers urge the Board to “develop principles and methods for reducing rates of captive

¹⁷ See, e.g., *Bessemer*, 691 F.2d at 1113-14.

¹⁸ Professor Murphy discussed the harmful effects of capping revenues available on long-term investments that may not be paid back for many years. See *Murphy V.S.* at 29-33. Professor Cornell provided a simple illustration of the impact of asymmetric profit regulation in Exhibit 6b to his opening statement. *Cornell V.S.*, Exh. 6b.

¹⁹ AECC Op. Comments, at 21.

²⁰ ARC Op. Comments, at 24.

shippers . . . at least to the extent that the carrier’s returns, over the relevant time period, exceed its cost of capital.”²¹

Shipper suggestions that the Board should engage in profit regulation under the guise of a revenue adequacy constraint are cynical attempts to exploit an outmoded model of regulatory oversight that was inappropriate for the rail industry 30 years ago when the ICC issued its *Guidelines* decision. The Board should continue to promote the competitive market principles embraced in the rail transportation policy and reject any proposal to apply profit regulation to a rail industry in which most of the traffic is competitive.

III. Shipper Claims that Railroads Are Earning “Excessive” Revenues Are Unfounded

The premise of shipper proposals to adopt more aggressive forms of rate regulation is that railroad earnings are now, or soon will be, “excessive.”²² Shippers rely on the Board’s annual revenue adequacy determinations and other short-term measures of railroad financial performance such as stock prices and improved operating ratios to make claims that most, if not all, railroads are revenue adequate for the purpose of imposing a revenue adequacy constraint.

The assertion that rail revenues are “excessive” is purely rhetorical. It has no substantive legal or economic content. Shippers fail to acknowledge that successful firms in competitive markets regularly earn substantially more than their cost of capital, and there is no reason why railroads that operate predominantly in competitive markets should not be allowed to do so as well. As Professor Kalt and Dr. Brinner explained on opening, it is incorrect as a matter of economics to assume that a firm earns monopoly profits if it earns a rate of return greater than its

²¹ Concerned Shipper Op. Comments, at 11-12.

²² See, e.g., AECC Op. Comments, at 22 (referring to “supracompetitive earnings” and “excess contribution”); ARC Op. Comments, at 24 (urging Board to return “excess revenues” to shippers); Concerned Shipper Op. Comments, at 6 (relying upon unsubstantiated assertion that railroads “have become one of the most profitable industries” as support for new rate constraints).

cost of capital.²³ Dr. Brinner demonstrated that returns that exceed a firm's cost of capital are the expected outcome of financial decisions to invest in projects that are projected to generate returns in excess of a firm's hurdle rate.²⁴ This strategy typically yields average overall returns well above the cost of capital. Shippers have not addressed the reality that improved railroad financial health has resulted from increased contribution from competitive rail traffic, which represents the vast majority of rail commerce. Professor Kalt showed on opening that railroads' improved financial performance in recent years is attributable in large measure to the increased profitability of competitive traffic, not increased margins on potentially market dominant traffic with R/VC ratios above 180.²⁵

Perhaps the most critical flaw with the shippers' reliance on the supposed existence of "excessive" revenue to justify more aggressive rate regulation is that the level of a railroad's firm-wide revenues says nothing about the reasonableness of particular rates. AAR explained on opening that the Board and the ICC have already recognized that nothing can be concluded about the reasonableness of an individual rate from the level of a railroad's firm-wide earnings. The fact that a railroad is not earning the industry cost of capital does not make a challenged rate automatically reasonable. In *Guidelines*, the ICC expressly stated that "a rate may be unreasonable even if the carrier is far short of revenue adequacy."²⁶ The reasonableness of the rate turns on factors and circumstances relating to the individual service provided, not to the

²³ Kalt V.S., at 32-35; Brinner V.S., at 12-13 and Exh. 2.

²⁴ Brinner V.S., at 26-30. *See also*, Cornell V.S., at 34-36 (potential for returns above the cost of capital drives investment and efficiency improvements); UP Op. Comments, Verified Statement of Ram Willner, at 8-11 ("Willner V.S.") ("companies invest only in projects that have expected returns at or above the cost of capital" and limits on returns above the cost of capital would result in less investment").

²⁵ Kalt V.S. at 36-37. *See also*, Murphy V.S., at 43-44 (showing that improved UP financial performance is driven by competitive traffic).

²⁶ *Guidelines*, at 536.

level of the firm's overall revenues. By the same logic, the achievement of financial health cannot make a challenged rate automatically unreasonable and subject to a rate reduction or constraint.

This last flaw applies forcefully to all of the shippers' specific revenue adequacy rate constraints discussed below in section IV.B.

IV. Shipper Proposals for Alternative Measures of Revenue Adequacy and Revenue Adequacy Rate Constraints Are Opportunistic and Flawed.

Shipper commenters make two sorts of proposals based on their unsubstantiated claims that railroads are earning or soon will be earning "excessive" revenues. First, they argue that the Board should adopt alternative measures of revenue adequacy, which they hope would lead to findings of long-term revenue adequacy mentioned in *Guidelines* as the predicate for application of a revenue adequacy rate constraint and thus trigger more aggressive rate regulation. Second, they propose a variety of mechanisms for capping or constraining railroad rates to address the assumed ill of "excessive" revenues. None of the shipper proposals of either category is supported by logic or sound economic analysis.²⁷

A. Proposed Alternative Measures of Revenue Adequacy Do Not Provide Relevant Information about Railroads' Financial Health.

Most shipper commenters simply assume that railroads are already revenue adequate without any analysis. In some instances, shippers simply look to the Board's annual revenue adequacy calculation without confronting the obvious defects in the Board's current

²⁷ Another commenter, Friends of the Earth, does not directly address railroad revenue adequacy issues but instead argues that the Board should prepare an Environmental Impact Statement or Environmental Assessment "to evaluate potential significant environmental impacts of the decisions under consideration" in Ex Parte 722 and Ex Parte 664 (Sub-No. 2). Opening Comments of Friends of the Earth, at 1 (filed Sept. 5, 2014). Friends of the Earth appears not to recognize that the Board has not proposed to take specific actions as an outcome of these current comment proceedings. Therefore Friends of the Earth's request is at best premature.

methodology for performing those calculations. AAR and its member railroads demonstrated on opening that the Board's current methodology has major flaws that render its calculations of ROIC unreliable and inappropriate for regulatory purposes. AAR explained how the Board's treatment of deferred taxes contributes to an overstatement of railroad returns. Moreover, as several economic experts for AAR and the railroads explained²⁸ and as the Board itself has recognized,²⁹ the proper way to assess whether a firm is earning the cost of capital is to calculate its return based on the replacement cost of its investments. For practical reasons, however, the Board has chosen to make its annual calculation based on the book value of rail assets rather than the replacement cost of assets, which results in an overstatement of railroad returns on investment.

Where there is any discussion of the issue of revenue adequacy standards, the shippers' clear objective is to have the Board jettison its existing ROI revenue adequacy standard and adopt alternative standards that would increase the likelihood of the Board finding a railroad to be revenue adequate, either in an annual determination or over the long term. In other words, shippers are doing now exactly what they have been doing since the revenue adequacy concept was introduced in the 4R Act³⁰ – proposing measures of financial health that would portray railroads as revenue adequate whether or not they are earning the cost of capital measured using

²⁸ See, e.g., *Kalt V.S.*, at 28-32, *Brinner V.S.*, at 18-20; *Cornell V.S.*, at 13-18; *Murphy V.S.* at 23-25. See also Opening Comments of CSX Transportation, Inc., at 3-11.

²⁹ See, e.g., *Rate Regulation Reforms*, STB Ex Parte No. 715, slip op. at 15-16 (served July 18, 2013); *Association of American Railroads – Petition Regarding Methodology for Determining Railroad Revenue Adequacy*, STB Ex Parte No. 679, slip op. at 2 (served Oct. 24, 2008) (acknowledging theoretical validity of using replacement cost); *Standards for Railroad Revenue Adequacy*, 364 I.C.C. 803, 818-820 (1981), *aff'd*, *Bessemer & Lake Erie Railroad Co. v. I.C.C.*, 691 F.2d 1104 (3rd Cir. 1982).

³⁰ Railroad Revitalization and Regulatory Reform Act of 1976, Pub. L. No. 94-210, 90 Stat. 31 (1976).

replacement costs.³¹ The WCTL comments, which contain the most extensive discussion of alternative measures, make this purpose explicit. WCTL would have the Board disregard the fact that a railroad is not earning the industry cost of capital even on a book value basis and declare a railroad revenue adequate if the proposed alternative measures “show[] a railroad’s financial position to be strong.”³² The ICC and the courts properly rejected this shipper strategy in the past and the Board should do so now.³³

In pursuing this opportunistic goal of lenient revenue adequacy standards, shipper commenters make several fundamental errors. First, they fail to reconcile their proposed alternative measures of revenue adequacy with the express terms of the statute that address revenue adequacy. The statute defines revenue adequacy in terms of a railroad’s ability to “attract and retain capital in amounts adequate to provide a sound transportation system.” *Id.* § 10704(a)(2)(B). In adopting the current standard, the ICC recognized that a rate of return equal to the cost of capital is “the *minimum* necessary to attract and maintain capital in the railroad, or any other, industry,” a proposition it characterized as “a standard principle of economics.”³⁴ Shippers do not explain how an alternative measure of revenue adequacy designed to show that a

³¹ See, e.g., *Bessemer*, 691 F.2d at 1112 (noting shipper hope that “additional standards will produce a level of revenue adequacy lower than that resulting from application of the current cost of capital standard”).

³² WCTL Op. Comments, at 22.

³³ See *Standards for Railroad Revenue Adequacy*, 364 I.C.C. 803 (1981) (adopting current cost of capital revenue adequacy standard instead of multifactor approach), *aff’d*, *Bessemer*, 691 F.2d 1104 (rejecting shipper assertion that statute required use of additional, less favorable measures of revenue adequacy); *Standards for Railroad Revenue Adequacy*, 3 I.C.C. 2d 261 (1986) (reaffirming decision not to adopt multifactor test for revenue adequacy), *aff’d*, *Consolidated Rail Corp. v. U.S.*, 855 F.2d 78 (3rd Cir. 1988).

³⁴ *Standards for Railroad Revenue Adequacy*, 364 I.C.C. at 809 and n.5 (emphasis added).

railroad is revenue adequate when it is not earning “the minimum necessary to attract and maintain capital” can be reconciled with the statute.³⁵

A second major flaw in the shippers’ advocacy of alternative revenue adequacy standards is that they fail to show how their alternative measures would actually be used to evaluate revenue adequacy, either as a factor used in the annual determination or as an indicator of whether a railroad has achieved the status of long-term revenue adequacy over a series of years. The WCTL comments, which contain the most extensive discussion of potential alternative measures, are both confusing and lacking in detail. WCTL proposes to “develop a composite index” of “financial ratios” and “benchmark the individual railroads’ composite indices to these [*sic.*] of established business entities with demonstrated abilities to attract capital.”³⁶ WCTL asserts that the financial ratios used could consist of “the six (6) generally recognized indicators shown in Dr. Levine, which include a funds flow analysis.”³⁷ In his Verified Statement, however, Dr. Levine appears to rely on only five financial ratios.³⁸ One of these measures – cash flow return on shareholder equity – does contain the word “flow,” but bears no relationship to the funds flow analysis from the late 1970s that the WCTL comments assert should be reintroduced by the Board.³⁹ In sum, WCTL appears confused about what its own expert is

³⁵ Even pre-Staggers when the ICC briefly employed multiple measures of revenue adequacy, the agency did not contemplate that the use of multiple measures would justify regulation that prevented railroads from earning the cost of capital. According to the ICC, the “freedom for carriers to change rates and services should result in permitting the carriers . . . to undertake all potentially profitable investments (all those that could yield *at least* the current cost of capital).” *Adequacy of Railroad Revenue (1978 Determination)*, 362 I.C.C. 199, 201 (1979).

³⁶ WCTL Op. Comments, at 22.

³⁷ *Id.*

³⁸ Levine V.S. at 8-11, 15.

³⁹ That earlier approach envisioned using a model “to project the needed capital outlays and other fund requirements of the railroads, to determine the amount of funds available to them from operations and capital sources, and to ascertain the amount by which the available funds

recommending and presents no coherent or comprehensible proposal to the Board regarding alternative revenue adequacy standards.

Third, the array of alternative measures proposed by shipper commenters share the flaw of failing to address whether railroads are earning enough to attract and retain capital *over the long term*. At best, they present a short-term view of the financial health of a railroad and therefore do not speak to the statutory goal of promoting sustainable revenue adequacy.⁴⁰ The ICC understood the importance of examining long-run measures of financial health. When the ICC first rejected the shippers' multi-factor approach in 1981, it noted that “[f]unds-flow analysis and other minimum standards of revenue adequacy . . . were and are appropriate indicators only of the short-term viability of railroads. They were and are inappropriate as indicators of long-term revenue adequacy and are especially inappropriate as measures to limit rail pricing flexibility”⁴¹

The ICC struck a similar note when it reaffirmed its rejection of alternative measures in 1986, characterizing the “ROI/cost of capital standard [as] an all-inclusive indicator of financial health because it embraces, albeit indirectly, short-run financial considerations as well as the long-run financial needs of railroads.”⁴² The ICC further observed that:

our purposes and perspective are different from those of security analysts. Our concerns center on the long-term viability and capability of the railroads to provide essential rail service. By contrast, security analysts are interested not only in long-term

would fall short of the projected requirements.” *Adequacy of Railroad Revenue (1978 Determination)*, 362 I.C.C. 199, 229 (1979). The cash flow measure referred to by Dr. Levine is simply an alternative measure of return on equity.

⁴⁰ See, e.g., 49 U.S.C. §§ 10101(3), 10704(a).

⁴¹ *Standards for Railroad Revenue Adequacy*, 364 I.C.C. at 808. The limit on pricing flexibility to which the ICC was referring related to the treatment of revenue adequate as opposed to revenue inadequate railroads under the statutory Zone of Rate Flexibility Provisions.

⁴² *Standards for Railroad Revenue Adequacy*, 3 I.C.C. 2d at 268.

viability but also in the potential profits for the short-term. Indeed, sometimes the potential to make a short-term profit may far outweigh their interest in the long-term health and earnings capacity of the railroad.⁴³

No discussion in any comment or verified statement submitted in this proceeding suggests a reasoned basis for the Board to depart from the clear and detailed rationale for the existing ROI revenue adequacy standard set forth by the ICC in the years immediately following the passage of the Staggers Act.

Apart from these common flaws, each of the alternative measures described by WCTL witness Levine has shortcomings that preclude its use for assessing revenue adequacy. In his reply verified statement, Dr. Brinner addresses in detail the problems with the specific measures proposed by Dr. Levine, including the debt-capital ratio, the operating ratio, return on shareholder equity, cash flow return on shareholder equity, and dividend payout rate. As Dr. Brinner points out:

- Dr. Levine’s measures based on shareholder equity – return on equity and cash flow return on equity – provide at best a partial measure of railroad returns because they focus only on the equity component of capital. Such measures are directly affected by factors that have nothing to do with a firm’s overall ability to earn its weighted average cost of capital, which reflects both equity and debt. Measures of return on equity also cannot readily be compared across industries, as Dr. Levine proposes, because those returns are driven by firms’ divergent leverage decisions.
- A firm’s debt-to-capital ratio merely reflects management choices about how much debt and equity capital to employ. The ratio provides no information on the fundamental adequacy of returns.
- Improving operating ratios demonstrate only that a railroad is doing a better job of managing operating expenses than in prior periods and not that a firm is earning “excess” returns. Moreover, operating ratios depend upon the capital intensity of the industry in question and therefore cannot reliably be used for cross-industry comparisons as Dr. Levine purports to do.

⁴³ *Id.* at 267-68.

- A dividend payout rate similar to U.S. Treasury Bonds does not, contrary to Dr. Levine’s assertion, indicate that stocks will be attractive to investors. Treasury Bonds are generally viewed as “risk free” investments whereas equities are not. Equity investors expect to be compensated for the higher risks attendant to investing in stocks, as evidenced by the inclusion of a risk premium in the CAPM model for determining the cost of equity capital that WCTL espouses in EP 664 (Sub-No. 1).

Dr. Brinner also responds to several aspects of Dr. Levine’s analysis, and similar analysis contained in the Rockefeller Report,⁴⁴ that do not appear to be directly related to developing a composite measure of financial ratios for assessing revenue adequacy. With respect to Dr. Levine’s comments on market to book value ratios, Dr. Brinner reiterates the analytical flaws that arise when book value of assets is used instead of replacement cost value as the basis for an assessment of a firm’s financial condition. Dr. Brinner further establishes that both Dr. Levine and the Rockefeller Report draw incorrect conclusions from railroad stock buybacks and dividend payments. Dr. Brinner explains that the discussion in these materials relating to stock buybacks and dividend payments implicitly assumes that any firm able to retain earnings, pay dividends, or repurchase stock in addition to making capital expenditures has “excess” revenues. Such an assumption reflects a fundamental misunderstanding of how firms allocate available capital. Firms routinely do, and are expected to, use revenues for each of these purposes.⁴⁵ If stock buybacks or dividend payments were evidence of excessive revenues or abuse of market power, it would amount to an indictment of the entire U.S. economy.

⁴⁴ Senator Rockefeller submitted a 2013 report prepared for him for the record in this proceeding and several shippers cite the report as confirmation of their own views as to the financial health of the railroad industry. See Office of Oversight and Investigations, Majority Staff, U.S. Senate Committee on Commerce, Science and Transportation, *Update on the Financial State of the Class I Freight Railroad Industry* (2013) (“Rockefeller Report”).

⁴⁵ Brinner Reply V.S., at 13-15. See also Willner V.S., at 7-8 (comparing UP allocation of revenues for capital expenditures/dividends/share repurchases to averages for S&P 500 companies)

WCTL is not content to simply urge the Board to adopt measures of financial health that do not relate to the question of “revenue adequacy.” WCTL also proposes that the Board should adopt an arbitrarily short period for assessing whether a railroad has achieved the status of revenue adequacy: a railroad should be considered revenue adequate if on average it exceeds WCTL’s unspecified annual revenue adequacy measure for four years in a row. As Dr. Brinner explains in his reply verified statement, however, four years is an arbitrary and unduly short period over which to assess railroad financial performance. The proper time-frame within which to evaluate whether a railroad is earning adequate revenues must take into account the life of the assets on which the return is being earned.⁴⁶ Dr. Brinner emphasizes that, as he showed in his opening testimony, rail assets are unusually long-lived. Rail equipment service lives average 28 years and service lives for rail structures average from 38 to 54 years.⁴⁷ Given these asset lives, four years would be far too short a period over which to evaluate financial performance. Indeed, a four-year period would not even encompass the fluctuations of a single business cycle.

WCTL’s support for a four-year period as the time frame for assessing whether a railroad has achieved revenue adequate status is particularly suspect since the trade association that represents many of WCTL’s members advocates an entirely different position before its own regulators. The Edison Electric Institute has argued before the Federal Energy Regulatory Commission that, in order to ensure adequate investment in transmission infrastructure, rates of return must be assessed “with a long-term perspective that will provide regulatory certainty and continuity throughout both the typical five to seven year project construction timeline and the 30-

⁴⁶ *See also* Cornell V.S., at 23.

⁴⁷ Brinner Reply V.S. at 16-17.

40 year life of the transmission asset.”⁴⁸ There is no way to reconcile the position taken before FERC with the assertion that long asset lives should be ignored when evaluating railroad rates of return.

B. Shipper Interests Offer No Principled Basis for Adopting Any Alternative to the Board’s Existing Rate Regulation Standards.

The shipper interests appear to view this proceeding as an exploration into alternative rate regulation approaches that they would like the Board to implement under the rubric of a revenue adequacy constraint. None of the alternatives they describe is a fully developed rate regulation proposal. More importantly, none of the proposals for alternative rate regulation approaches has a foundation in sound regulatory economics and none of the proposals is endorsed or justified by an economic expert. Indeed, Concerned Shippers’ economist, Professor Faulhaber, expressly declines “to suggest a solution to this [rate regulation] problem.”⁴⁹

There are three different categories of shipper rate regulation proposals. In the first category, AECC proposes a firm-wide revenue cap on revenue adequate railroads that it characterizes as a vehicle for “eliminat[ing] the supracompetitive portion of rail earnings. . . .”⁵⁰ AECC constructs an example based on 2012 railroad industry earnings to show how the rates of all shippers with rates above the jurisdictional 180 percent R/VC threshold could be reduced so that railroads would in the aggregate earn no more than an amount necessary to achieve “revenue adequacy” as calculated by the Board in its annual revenue adequacy determinations.⁵¹

⁴⁸ Reply Comments of the Edison Electric Institute, *Promoting Transmission Investment through Pricing Reform*, FERC Docket No. RM11-26-000, at 8 (filed May 18, 2012).

⁴⁹ Faulhaber V.S., at 12.

⁵⁰ AECC Op. Comments, at 22.

⁵¹ *Id.*, at 22-23.

In a second category, Concerned Shippers and WCTL ask the Board to implement a revenue adequacy constraint through a rate freeze mechanism that would prevent future rate increases on market dominant traffic except to recover increases in costs.⁵² WCTL proposes that the rate freeze would apply to shippers receiving transportation under common carrier pricing authorities and to shippers “whose traffic moved under a contract that was set to expire at or before the imposition of the increase.”⁵³

In the third category of proposals, Olin and ARC propose rate ceilings or caps for market dominant shippers based on R/VC ratios. Olin offers no views regarding the level of such an R/VC ceiling or the principles that might guide the setting of the ceiling.⁵⁴ ARC asserts that its rate ceiling should be based on a “Two-Benchmark standard,” although ARC does not explain how the Two-Benchmark approach would be implemented. The two benchmarks that would be used are the $R/VC_{>180}$ and the RSAM, both of which are published annually by the Board.⁵⁵

All of these shipper rate constraint proposals suffer from the same two fundamental flaws and would be contrary to the economic and legal principles that govern Board ratemaking. *First, the proposals are completely untethered from competitive market principles that have been the foundation of ICC and STB rate regulation since the passage of the Staggers Act.* None of the proposals addresses the central economic question of whether a challenged rate is above or below a competitive market level. In contrast, this is precisely the question that the Board’s SAC test addresses. Under each of the proposals, maximum rates would be set without any reference to market forces or market signals. Professor Kalt identifies the shippers’ maximum rate

⁵² Concerned Shipper Op. Comments, at 13; WCTL Op. Comments, at 26.

⁵³ WCTL Op. Comments, at 31.

⁵⁴ Olin Op. Comments, at 7-8 (footnote omitted).

⁵⁵ ARC Op. Comments, at 27-28.

proposals as various forms of “price controls” that would lead to economically inefficient outcomes:

Prices are vital to the efficient allocation of resources toward the satisfaction of consumers’ needs. They are the critical signals which impact choices of product and service offerings and which determine the nature and level of capital investment and ownership structures. Price controls distort these signals and, in turn, distort firms’ decisions about how to structure service offering and where to direct their capital resources.⁵⁶

The public interest in a strong rail network capable of meeting shipper needs would be harmed by over-riding market signals that direct railroads’ service offerings and capital resources. Railroads’ incentives to make investments to reduce costs, improve service and expand capacity would be distorted. Artificial limits on revenues would discourage railroads from undertaking costly efforts to improve service and expand capacity since the potential rewards would be limited while the risks would remain.

The Staggers Act and the 4R Act before it were a reaction to the pricing inflexibility under prior regulation that prevented railroads from responding to changes in market conditions. The clear intent of Congress in the Staggers Act and in ICCTA⁵⁷ was to allow railroads to set prices based on market forces with regulatory protection in the event a railroad sought to abuse market power in a specific instance. Congress did not give the agency power to reintroduce inflexible price controls that, like their pre-Staggers counterparts, are completely insensitive to market forces.

The second fundamental flaw with each of the shipper rate proposals is that maximum rates would be set at arbitrary levels without any reference to the characteristics of the particular movement to which a rate applies. This is flatly contrary to the maximum rate scheme

⁵⁶ Kalt Reply V.S. at 25.

⁵⁷ ICC Termination Act of 1995, Pub. L. No. 104-88, 109 Stat. 803 (1995).

of Staggers and ICCTA which requires the Board to focus both its market dominance and rate reasonableness inquiries on the specific “transportation to which a rate applies.” 49 U.S.C. §§ 10701(d)(1), 10707(a). Setting a maximum rate based on the level of overall firm earnings (AECC), or freezing rates on all market dominant traffic (Concerned Shippers and WCTL), or capping all rates on market dominant traffic at certain R/VC ratios (Olin and ARC) would disregard the reasonableness of a particular rate applicable to a particular commodity moving between a particular origin and a particular destination, contrary to the statutory directives.

The shippers are essentially proposing that the Board *avoid* the rate reasonableness inquiry called for by the statute. This is demonstrated by the fact that under the shipper maximum rate proposals, rates would be deemed to be unreasonably high simply because the defendant railroad is deemed revenue adequate and has market dominance over the movement at issue. (AECC would not even require a showing of market dominance.) No other finding regarding the challenged rate would be required. But neither condition – revenue adequacy or market dominance – could be determinative of the reasonableness of a rate either individually or taken together. The statute expressly states that “a finding of market dominance does not establish a presumption that the proposed rate exceeds a reasonable maximum.” 49 U.S.C. § 10707(c). And, as explained above in section III, the overall level of a railroad’s earnings says nothing about the reasonableness of a particular rate.

Apart from these common and fundamental flaws, each of the three categories of shipper proposals has additional, disqualifying deficiencies.

AECC’s firm-wide revenue cap is a form of profit regulation that would entail all the harmful effects, including stifling railroad investment, discussed in section II above. Such profit regulation would create an asymmetry in railroad earnings that would eliminate the incentive to

make risky investments designed to improve efficiency and that would prevent railroads from sustaining themselves over the long term. In addition, AECC ignores the statutory limits on the Board's regulation of rates to movements over which a railroad has market dominance.⁵⁸ The Board could not lawfully adopt AECC's proposal.

The rate freezes proposed by Concerned Shippers and WCTL would thwart the statutory goal of allowing railroads to earn sufficient revenues to expand the national rail transportation system to meet shipper needs. Rate freezes would disable railroads from increasing rates in the face of increased demand for rail service, thereby foreclosing railroads from earning sufficient revenues to make new investments necessary to meet that increased demand. Rate freezes would also discourage railroads from responding to changes in market conditions that might justify reducing rates since a rate freeze would preclude subsequent increases when market conditions changed. Rate freezes would also undermine incentives for railroads and shippers to enter into rail transportation contracts that have been valuable commercial instruments benefiting railroads and shippers in the post-Staggers era. Railroads would be disinclined to offer the incentive of lower rates that often accompanies a guaranteed volume of traffic under contracts because the shipper proposals provide that the lower rates would be locked in at the termination of the contract. This lock-in feature would also deter shippers from agreeing to pay higher contract rates in exchange for service guarantees or additional services.

Olin's and ARC's proposals to cap rates reflecting R/VC ratios above certain levels exhibit the serious flaws of exclusive reliance on R/VC ratios in rate regulation that have been recognized in the past. While it is unclear what Olin would use as the rate cap, the ARC

⁵⁸ AECC also appears to contemplate a regulatory approach in which the rates charged by individual railroads would be regulated based on industry-wide earnings, but AECC identifies no authority for such a regulatory approach.

proposal relies heavily on the RSAM, which is a calculation based on book value of rail assets and therefore suffers from the numerous deficiencies as a rate regulation tool that have been discussed with respect to the Board's annual revenue adequacy determinations.⁵⁹ By seeking to drive rates no higher than the RSAM, the ARC proposal would effectively implement in one fell swoop the pernicious and prohibited ratcheting down effect of R/VC ratio caps identified by the D.C. Circuit in its 1993 decision in the *McCarty Farms* case.⁶⁰ Moreover, use of R/VC ratios to determine maximum rates would be a disincentive to railroads to reduce costs through improved efficiency.⁶¹ Under an R/VC cap regime, a reduction in railroad variable costs would result in reduced revenues and reduced contribution. Railroads would have no reason vigorously to pursue cost savings as they do today.

In sum, the shipper proposals are the polar opposite of the economically sound maximum rate standards that the Board relies on today. The Board should not hesitate to reject them as unsound and unsupported.

⁵⁹ ARC also proposed its Two-Benchmark approach in Ex Parte No. 665 (Sub-No. 1), *Rail Transportation of Grain, Rate regulation Review*, and the flaws in ARC's proposal were addressed by various railroads in that proceeding. *See, e.g.*, Reply Comments of BNSF Railway Company, at 29-31 (filed Aug. 25, 2014); Reply Comments of Norfolk Southern Railway Company, at 12-19, 29 (filed Aug. 25, 2014); Reply Comments of Union Pacific Railroad Company, at 35-37 (filed Aug. 25, 2014).

⁶⁰ *Burlington Northern Railroad Co. v. ICC*, 985 F.2d 589, 597 (D.C. Cir. 1993). The *McCarty Farms* decision rested in large part on the recognition that setting rates on multiple movements at a level defined by an average R/VC ratio effectively eliminates differential pricing and through repeated application ratchets rates down. ARC attempts to justify its R/VC cap by claiming that there needs to be a "reasonable limit on differential pricing of captive traffic." ARC Op. Comments at 31. ARC ignores the fact that the SAC test was developed precisely for the purpose of identifying a reasonable limit on differential pricing, and it does so by reference to sound economic principles and to the policy objective of ensuring that railroads cover their full costs. The supposedly "reasonable limit on differential pricing" proposed by ARC has no foundation.

⁶¹ *See* Opening Comments of BNSF Railway Company, at 5-6 (filed Sept. 5, 2014).

V. SAC Remains the Best and Most Accurate Method for Establishing Reasonable Rate Levels

The SAC test was adopted after careful and extensive consideration of economic principles that would produce a rational standard for regulating rail rates based on competitive market principles. In contrast, as explained above, the shippers proposing alternative rate regulation standards ignore competitive market principles and offer no economic justification for their approaches. Instead, they urge the Board to use arbitrary and unprincipled forms of rate regulation, citing their concern over the cost and complexity of SAC cases.⁶²

As AAR explained on opening, the improving financial health of railroads should not be used as an excuse to depart from an approach to rate regulation that is economically sound and has been upheld by the courts.⁶³ SAC remains the best and most accurate method for establishing reasonable rate levels.⁶⁴ There is no need for an alternative to SAC to implement a separate revenue adequacy constraint. As the Board has recognized, “the SAC test inherently addresses” revenue adequacy issues because “[t]he very purpose of the SAC test is to determine what [a railroad] needs to charge to earn ‘adequate’ revenues on the portion of its system that is included in the system of the SARR.”⁶⁵ Any challenges in applying SAC to new situations can be addressed in individual cases or in separate rulemakings without abandoning the rational economic principles underlying the SAC test. Simplified alternatives to the SAC test that are

⁶² See, e.g., ARC Op. Comments, at 13-14, 31-32; Concerned Shipper Op. Comments, at 6-7; Olin Op. Comments, at 5-7.

⁶³ AAR Op. Comments, at 43.

⁶⁴ See, e.g., *Simplified Standards for Rail Rate Cases*, STB Ex Parte No. 646 (Sub-No. 1), slip op. at 13 (served Sept. 5, 2007) (“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.”).

⁶⁵ *Public Service Co. of Colorado v. Burlington Northern & Santa Fe Railway Co.*, STB Docket No. 42057, slip op. at 6 (served Jan. 19, 2005), *aff’d sub nom. BNSF Railway Co. v. S.T.B.*, 453 F.3d 473 (D.C. Cir. 2006).

based on the principles underlying the SAC methodology are available for use in rate cases that are not amenable to a full SAC analysis.

Concerned Shippers launch a three decade's late attack on the theoretical validity of applying SAC to regulate rail rates through Professor Faulhaber, who asserts that SAC is not now and never was a valid test for cross-subsidy.⁶⁶ Professor Faulhaber further contends that SAC can only be applied to broader "services" – rather than service for individual customers – provided by firms that are "constrained to earn zero economic profit,"⁶⁷ and that SAC as applied by the Board does not permit complainants to benefit from economies of scale and scope.⁶⁸ These observations do not lead Professor Faulhaber to support Concerned Shippers' proposed rate-freeze constraint, but rather to conclude that "there is no economic model in the literature that points to a theoretical solution" to prescribing reasonable rates, a problem for which he "does not presume to suggest a solution."⁶⁹

As explained in the attached Verified Statement of Robert Willig, one of the principal architects of the SAC approach adopted by the ICC in 1985, the Faulhaber critique of SAC is entirely unfounded. Professor Willig shows in detail that Professor Faulhaber's assertions regarding the deficiencies of SAC are inconsistent with Faulhaber's own prior writings on SAC, inconsistent with the broad endorsement of SAC by a large group of distinguished economists, and inconsistent with the ICC's own thoughtful endorsement of SAC as a regulatory tool. Professor Willig further demonstrates that each component of Professor Faulhaber's critique – *e.g.*, the supposed failure of SAC to allow shippers to benefit from scope and scale economies –

⁶⁶ Faulhaber V.S. at 7.

⁶⁷ *Id.* at 6-7.

⁶⁸ *Id.* at 8.

⁶⁹ *Id.* at 12.

is unfounded. Professor Willig explains that the agency's endorsement of and reliance on the "mimic competition" rationale of SAC has resulted in enlightened rate regulation.

VI. Conclusion

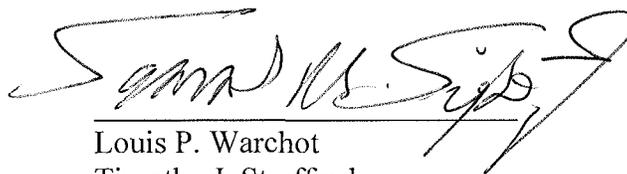
A paramount issue currently affecting railroads and their customers is the surge in demand for rail transportation and the corresponding need for additional rail investment to meet growing and shifting demand. The Board has heard calls from shippers and public officials for greater private rail investment. The Board should make it a priority to encourage such investment, and it should keep that priority in mind as it assesses the comments and testimony in this proceeding.

The financial evidence and economic testimony presented by the freight rail interests in this proceeding show forcefully that U.S. freight railroads must continue to have the opportunity to operate in accordance with market principles and to strive for improved earnings and profitability. Preserving that opportunity will give them the incentive and ability to invest in and expand their networks. Shipper interests have made no case that improved rail financial health should be the occasion for new rate constraints. Embarking on such a course would be a profound mistake. It would inevitably damage rail customers, as well as the carriers and the consuming public that depends on a sustainable rail network.

Respectfully submitted,

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November 4, 2014

**Reply Verified Statement of
Joseph P. Kalt**

BEFORE THE
SURFACE TRANSPORTATION BOARD

RAILROAD REVENUE ADEQUACY

Docket No. EP 722

REPLY VERIFIED STATEMENT OF

PROF. JOSEPH P. KALT, PH.D.

NOVEMBER 4, 2014

I. 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. I am also a senior economist with Compass Lexecon, an economics consulting firm. I hold B.A., M.A., and Ph.D. degrees in economics. I previously filed a Verified Statement in this matter on behalf of the Association of American Railroads (“AAR”). In that Verified Statement, I discussed my qualifications in more detail and provided my complete Curriculum Vita.¹

I have now been asked by the AAR to respond to various parties’ opening comments in this matter. I have been asked to focus, specifically, on the comments of those shipper interests who call for substantial alteration of the Surface Transportation Board’s (“the Board”) ratemaking practices upon claimed demonstration of rail carrier revenue adequacy. I do so below in light of the economic principles that undergird railroad regulatory policy which is consistent with the public’s interest in a well-functioning freight transportation industry and a healthy national economy. In light of these principles, set out and discussed in my prior Verified Statement, I conclude:

- Economically sound regulatory ratemaking is guided by the principle that competitive markets serve the public interest. In practice, this means letting market forces set rates and revenues in workably competitive markets. On the other hand, where workable competition is not viable, rate regulation should strive to set prices so as to mimic competitive market outcomes. In both their proffered standards of railroad revenue adequacy and their recommendations for changes in the Board’s ratemaking policies, the proposals of shipper commenters are strikingly and persistently incompatible with this fundamental principle.
- Shipper commenters fail to provide any economically coherent analysis of the proper definition or measurement of revenue adequacy. As pointed out in my prior Verified

¹ Docket No. EP722, Verified Statement of Joseph P. Kalt, September 5, 2014 (“Kalt VS”).

Statement, adequate revenues under the mimic competition principle would be the revenues needed to attract and sustain the entry of an efficient stand-alone railroad which could provide the system-wide service of an actual incumbent carrier. This principle, in fact, is already embodied in the Board's Stand-Alone Cost ("SAC") approach to maximum rates and adequate revenues in individual rate cases. In place of this principle, shipper commenters either merely take it as given that rail carriers are revenue adequate,² or would have the Board apply financial and accounting metrics which lack any conceptual foundation as indicators of revenue adequacy.

- Shipper commenters' proposed alternatives to the Board's regulation fall into three broad categories: (1) some version of an economically arbitrary capping of the rates paid by putatively "captive" traffic served by rail carriers determined to be generating "adequate" revenue across their overall systems, with caps taking the form of limits on the rate of rate increases or frozen revenue-to-variable-cost ("R/VC") ratios for "captive" traffic;³ (2) a version of rate-of-return regulation that would effectively roll back rates to "captive" shippers to eliminate a carrier's putatively supra-adequate revenues, regardless of whether any such shippers' rates are the source of supra-adequate revenues;⁴ or (3) "non-rate" measures (such as expanding forced access or repealing specific commodity exemptions) that purportedly should be triggered across the system upon a finding of revenue adequacy for all or some railroads.⁵
- Each of these proposals would require the Board to move away from the economically sound "mimic competition" standard which is at the heart of current ratemaking. In doing so, they embrace regulatory approaches that have been widely discredited because of the severely distortive effects they have on rail markets. When divorced from the principle of mimicking competition, rate regulation sends distorted signals and incentives to shippers regarding the need for and value of rail service and, in turn, sends distorted signals to rail and non-rail transportation providers as to how to structure service offerings and where to direct capital resources.

² "U.S. Class 1 railroads today are earning adequate revenues as defined in the applicable statute, and indications are that they will continue to do so for the foreseeable future." Joint Opening Comments of the Western Coal Traffic League, *et al.*, at 2 (filed Sept. 5, 2014) ("WCTL Op. Comments"). "Today, however, with revenue adequacy achieved or imminent for all major railroads,..." Opening Comments of Alliance for Rail Competition, *et al.*, at 13 (filed Sept. 5, 2014) ("ARC Op. Comments"). See also Comments Submitted by Concerned Shipper Associations, at 6 (filed Sept. 5, 2014) ("CSA Op. Comments"); Comments Submitted by Citizens United for Rail Equity, at 1-2 (filed Sept. 5, 2014) ("CURE Op. Comments").

³ See, ARC Op. Comments at 33; Concerned Shipper Op. Comments at 13; WCTL Op. Comments at 26, 30-33; and Comments Submitted by Olin Corp., at 7-9 (filed Sept. 5, 2014) ("Olin Op. Comments").

⁴ See, Opening Comments of Arkansas Electric Cooperative Corp., at 22-24 (filed Sept. 5, 2014) ("AECC Op. Comments"). See also Concerned Shipper Op. Comments at 11.

⁵ See, ARC Op. Comments at 18-19; CURE Op. Comments at 2.

- Shipper commenters have presented no economic evidence to support the notion that the “mimic competition” principles which remain at the heart of the Board’s current ratemaking standards are failing. In particular, they provide no economically coherent demonstration that railroad revenues are excessive, and they make no attempt to put forth evidence that their requests for rate reductions would come from traffic that is claimed to be generating the purportedly excess system-wide revenues. Indeed, I showed in my Verified Statement that claims of the latter type are not supported by the data on the sources of carriers’ revenues.⁶
- In summary, nothing in the various shipper commenters’ filings in this matter contradicts my prior conclusion, that the sound regulatory principles which have guided the Board’s ratemaking and the overall restoration of an efficient rail freight transportation sector under the Staggers Act of 1980, should not be abandoned. Nor do shipper commenters’ various calls for, effectively, blanket reductions in rail rates constitute regulatory policies that would be consistent with the public’s interest in an efficient freight transportation industry and a healthy national economy. Sound policy development should focus on improving the implementation and administration of the Board’s “mimic competition” principles, not abandonment of those principles.

The remainder of this statement is organized as follows: In Section II, in the context of shipper comments, I review and reiterate the basic principles that are central to economically sound regulation in the rail industry. Section III examines shipper commenters’ conceptions and treatment of “revenue adequacy”—its definition and calculation. Section IV then analyzes the litany of regulatory actions shipper commenters suggest should follow from a finding of revenue adequacy. Finally, Section V assesses the scope for principled improvements in railroad regulation that can promote the public interest. That scope lies within the sound regulatory principles which undergird the Board’s current framework of rate cases focused on the demonstration of market power abuse and rate maximums supplied by “mimic competition” principles.

⁶ See Kalt VS at 36-37.

II. THE PRINCIPLES OF SOUND REGULATORY POLICY

As I explained in my prior Verified Statement, competitive markets provide the guiding principles by which rail rate regulation (and economic regulation in general) can serve the *public* interest. I provided an extensive discussion of the “mimic competition” principle in my initial Verified Statement; however, because the concept is so fundamental to constructing sound ratemaking policy, and because it is so conspicuously absent from shippers comments, it warrants reiteration here.⁷

As I pointed out previously, the primacy of competitive market outcomes as promoters of the public interest is not conjecture or ideological predilection; it is the product of Nobel Prize-winning demonstration, research and testing.⁸ Well-functioning competitive markets direct resources toward those activities most highly-valued by ultimate consumers, protecting the overall public’s economic interests and optimally meeting the demands of consumers in the most efficient way possible. Competition does this through its price signals, providing rewards to suppliers for channeling resources where consumers signal they put the highest value and want more supply, and penalizing inefficiency if a supplier cannot bring products and services to market at costs which do not exceed the willingness of consumers to pay.

Overt regulation of prices and service offerings is unnecessary for achieving these public interest objectives when competition can otherwise drive marketplace outcomes. In fact, overt regulation is overwhelmingly destructive of these objectives when competition is present in a market. Regulation is too blunt an instrument in a world of innumerable, diversified, and changeable consumer needs and wants. Competition compels sellers to try to respond dynamically to those needs and wants. Regulation, on the other hand, inevitably introduces

⁷ See Kalt VS at 23-26.

⁸ See Kalt VS at 21-22.

non-economic, rules-based approaches to prices and service offerings, weighting outcomes toward forces of political and legal prowess and away from underlying consumer value and production efficiency.

Of course, notwithstanding the challenges of serving the public interest via non-market, regulatory ratemaking, if implemented coherently, regulatory intervention to set rates can simulate market pricing when competition is not workable and regulation can be designed effectively. The criteria of sound rate regulation follow directly from the critical role of competitive market pricing in serving the public interest: regulatory ratemaking in non-competitive settings should seek to reproduce the pricing results the market would yield if it were competitive.

This “mimic competition” principle is now the guiding principle of most U.S. (and other developed economies’) regulatory policy. In the rail sector, it is the underpinning of the Staggers Act and the Board’s associated standards of exemptions in competitive settings and constrained market pricing in settings of demonstrable market dominance. The latter recognizes that a primary force of competition in pricing is the ability of new sellers to enter markets in the search to seek customers’ business. Familiar to the Board as the economics of “contestable markets,”⁹ rail ratemaking that limits maximum rates under conditions of demonstrated railroad market dominance to no more than the levels that a stand-alone railroad would be able to realize if the markets for the traffic in question were actually *contestable* (i.e., if entry were feasible and unimpeded by any barriers to entry) “induce[s] suppliers to behave as if competition had guided

⁹ As set out, for example, in the work of Panzar, J. C., & Willig, R. D. (1977). “Free Entry and the Sustainability of Natural Monopoly,” *The Bell Journal of Economics*, Vol. 8 (1), 1-22; Baumol, W. J., Panzar, J. C., Willig, R. D., & Bailey, E. E. (1982). *Contestable Markets and the Theory of Industry Structure*, New York, Harcourt Brace Jovanovich.

their actions.”¹⁰ This ensures “consumers the benefits which competition would otherwise bring.”¹¹

Shipper commenters in this proceeding would have the Board effectively untether its ratemaking from the economics of contestable markets and the “mimic competition” principle. Under their various proposals, rather than having the Board first determine if the absence of effective competition warrants rate restrictions and then, if so, set maximum rates according to the “mimic competition” principle, a putative finding of revenue supra-adequacy would trigger some form of capping and even roll-back of all rates for “captive” shippers or for shippers apparently deemed to be “captive” if they pay rates which generate greater than a particular ratio of revenue to variable costs (e.g., an R/VC above 1.80). These proposals illustrate an extreme of “blunt” regulation, justified *not* by economic principles promoting the public interest, but by demagogic claims to the effect that the railroads just don’t need any more money.

Explicit or implicit, albeit undemonstrated, in the recommendations of a number of shipper commenters is the claim or innuendo that the revenue supra-adequacy they purport to have found is the result of increased railroad market power that has gone unchecked by the Board and its ratemaking, merger conditioning, and other policies. Yet, the most exhaustive and rigorous studies of the matter, commissioned by the Board itself, have repeatedly concluded

¹⁰ Willig, Robert D., and William J. Baumol (1987). “Using Competition as a Guide,” *Regulation*, Vol. 1, 28-35, at 32.

¹¹ Baumol, W. J. (1982). “Contestable Markets: An Uprising in the Theory of Industry Structure,” *American Economic Review*, Vol. 72(1), 1-15 at 14.

that improvements in carrier financial performance under the Staggers Act have *not* been the result of enhanced exercise of market power.¹²

This conclusion is supported by independent academic research, which finds that the data:

...do not support an argument that the industry has measurably increased its pricing power since 1987 (the earliest year for which the indices can be estimated), either in the aggregate or for any of the significant capable commodity groups. In fact, for aggregate industry output and prices, and for coal and chemicals, the indices are shown to have decreased.”¹³

To the extent a general upward trend can be seen in rail rates and attendant financial performance in the 2000s, the research finds that the trend is explained by changes in input prices, density economies, and the ratio of fixed to variable costs, *not* by non-competitive withholding of supply to drive prices up:

The Class I railroad industry has experienced reductions in productivity growth and increases in input price growth in recent years, which have added to the upward pressures on the rail rates paid by shippers. Our analysis indicates that changes in density economies and the ratio of fixed to variable costs are important factors that have contributed to recent rate increases, and not the increased exercise of market power.¹⁴

In short, shipper commenters have not identified a *principled* problem to be remedied. This is the noted untethering that would have the Board implement rate caps and/or revenue roll-backs based on rhetorically emotive criteria rather than the public interest standard of “mimic competition.” In fact, even the underlying premise of shipper commenter

¹² Laurits R. Christensen Associates, Inc. (2009). “A Study of Competition in the U.S. Freight Railroad Industry and Analysis of Proposals that Might Enhance Competition: Revised Final Report,” prepared for the Surface Transportation Board, November 2009, Volume 2 at 18-1 -18-9 (“Christensen Vol. 2”).

¹³ McCullough, G. J., & Thompson, L. S. (2013). “A Further Look at the Staggers Rail Act: Mining the Available Data,” *Research in Transportation Business & Management*, Vol. 6, 3-10; Bitzan, J. D., & Keeler, T. E. (2014), “The Evolution of US Rail Freight Pricing in the Post-Deregulation Era: Revenues Versus Marginal Costs for Five Commodity Types,” *Transportation*, Vol. 41(2), 305-324. Bitzan and Keeler (2014) find “no substantial increase in price-cost margins” for “captive shippers” over the period 1986-2008.

¹⁴ See Christensen Vol. 2 at 18-36.

recommendations—revenue supra-adequacy—is unfounded. Not only do shipper commenters offer no evidence that their asserted revenue supra-adequacy is the result of market dominance that is somehow uncontrolled by current regulatory policy, but, as I discuss in the next section, they also provide no coherent definition of, or methodology for, determining revenue adequacy in the first place.

III. SHIPPER COMMENTERS HAVE OFFERED NO COHERENT, PRINCIPLED CRITERIA FOR MEASURING AND ASSESSING REVENUE ADEQUACY

As a threshold matter, any notion of overall railroad-wide revenue adequacy must be consistent with the economics of contestable markets and the “mimic competition” standard for a given railroad as a whole. I pointed out in my prior Verified Statement that this standard points directly to “adequate revenues” as being no less than those that would be required to attract and sustain a system-wide stand-alone railroad (or “SW-SARR”) which could enter and efficiently provide the services, system wide, of an actual incumbent railroad. In terms of rates of return, this implies sustained returns at no less than the cost of capital of a SW-SARR, expressed as a percentage yield on the *replacement cost* of efficiently providing the system-wide service of an incumbent.¹⁵

Asserted “findings” of revenue adequacy cited by shipper commenters ignore these straightforward economics of the “mimic competition” standard, basing their calculated rates of return on ratios of railroad income to depreciated historical book values of assets commonly put into service at values and dates long since overtaken by actual economic costs. At least one expert for shipper commenters recognizes the gross error in such approaches: Prof. Faulhaber correctly notes (quoting Alfred Kahn, “the father of regulatory economics”) that such a measure

¹⁵ Since a SW-SARR would have to reasonably expect such returns on a sustained basis in order to be willing to commit to enter into competition with an incumbent in a contestable market.

of adequate revenues and returns “is fraught with short-comings and severely short-sighted; and the cost of capital estimate it uses as a benchmark against which to judge adequacy is severely flawed as well.”¹⁶ As discussed in my prior Verified Statement, this critique of the use of book values is not a matter of serious economic debate.¹⁷

Avoiding the implications of such basic economics, none of the standards of revenue adequacy explicitly or implicitly employed by shipper commenters offers a sound and coherent description of what must be the first step, *i.e.*, implementing a proper definition of, and methodology for, determining revenue adequacy. Rather, they repeatedly simply assume that railroads are—and will continue to be—no less than revenue adequate,¹⁸ and that the putative push past this point means that railroads are now achieving “supracompetitive” earnings.¹⁹ In fact, in the extreme, shipper commenters recommend that revenue adequacy requires no further calculation and that “Class I railroads should be declared to be revenue adequate.”²⁰ Absent an economically valid method for determining revenue adequacy, such assertions are fatuous. They are also factually baseless: As demonstrated by the opening Verified Statement in this matter by Dr. Roger Brinner, there is no *principled* measure which finds the railroads to be revenue adequate.²¹

The standards by which shipper commenters purport to demonstrate revenue adequacy fall far short of any plausible understanding of what revenue adequacy implies for a well-

¹⁶ Docket No. EP722, Verified Statement of Gerald R. Faulhaber, “Railroad Rates for Captive Shippers: Time for a Reset,” September 5, 2014 (“Faulhaber VS”) at 3-4.

¹⁷ Kalt VS at 28-31.

¹⁸ “U.S. Class 1 railroads today are earning adequate revenues as defined in the applicable statute, and indications are that they will continue to do so for the foreseeable future.” (WCTL Op. Comments at 2.) “Today, however, with revenue adequacy achieved or imminent for all major railroads...” (ARC Op. Comments at 13). See also Concerned Shipper Op. Comments at 6; CURE Op. Comments at 1-2.

¹⁹ AECC Op. Comments at 2.

²⁰ CURE Op. Comments at 2.

²¹ Docket No. EP722, Verified Statement of Dr. Roger Brinner, September 5, 2014 (“Brinner VS”) at 6, 9-12.

functioning capital market. For example, Dr. Levine, on behalf of WCTL, states that revenue adequacy “refers to a business entity being able to attract the *minimum* capital required to sustain a viable for-profit enterprise.”²² Similarly, Prof. Faulhaber reflects a pre-Staggers Act concern for whether railroads are “still on the brink of bankruptcy,” as though that were the relevant standard.²³ Obtaining the *minimum* capital to remain “viable” or merely avoiding bankruptcy is not the competitive standard by which capital markets operate. In an industry with large sunk costs (as in the railroad industry), revenues only need to be able to cover going-forward variable costs to keep a firm viable. But no competitive capital market free of *de facto* expropriation of sunk costs would commit capital to a firm seeking to enter and compete in a market if, once the firm made sunk investments, its revenues would be allowed to cover no more than going-forward costs. Under a standard of “mimic competition,” revenue is required to provide compensatory returns to investors in a system-wide stand-alone railroad *over the life of their investments*. In well-functioning competitive markets, it is that prospect that calls forth the investments that are needed to optimally serve the demands of shippers and the ultimate consumers they serve.

The limited suggestions offered by shipper commenters regarding the definition of, or methodology for determining, revenue adequacy fall into two categories. The first endorses proposed changes to the Board’s calculation of the cost of capital that are addressed elsewhere in the Ex Parte No. 664 proceeding.²⁴ The second would have the Board employ a hodge-podge of various financial indicia unrelated to the economic comparison of rate of return on efficient replacement costs (or even depreciated original “book” cost) and the risk-adjusted cost of

²² Docket No. EP722, Verified Statement of Dr. Harvey A. Levine, September 5, 2014 (“Levine VS”) at 2. (emphasis added)

²³ Faulhaber VS at 4-5.

²⁴ See WCTL Op. Comments at 12; AECC Op. Comments at Appendix A; and Olin Op. Comments at 10.

capital.²⁵ Using a “composite index of these ratios,” the Western Coal Traffic League proposes that a “carrier’s revenue adequacy status would be redetermined based on the composite index” even where the “ROI=COC [rate of return on invested capital = cost of capital] tests suggests that the carrier is nevertheless revenue *inadequate*.”²⁶

The suggestion that revenue adequacy should be divorced from long-run rates of return relative to the cost of capital is *ad hoc* and without coherent economic foundation. Ultimately, revenue adequacy depends on the long-term relationship between the cost of capital and rates of return. The cost of capital reflects the capital market’s evaluation of anticipated returns required by investors to compensate them for the risk of committing their capital to railroads relative to other investment opportunities they could undertake. Revenue adequacy under a proper “mimic competition” standard requires that, over the life of their investments, efficiently run railroads be able to generate returns no less than the risk-adjusted cost of capital on those investments.

Claims of “revenue adequacy” based on other criteria, such as a rising stock price or the willingness of the capital market to fund incremental investments, are unfounded. Equity shares in a firm are fundamentally claims on going-forward expected cash flows; prospects of such cash flows can readily find willing investors and yield rising prices for stock in the company even if the company’s overall revenues provide little or no return on past, sunk investments. But if investors in a firm’s existing assets are unable to obtain a return that fully compensates for those historical investments, investors in going-forward projects would have no reason to believe that their investments will fare any better. In fact, such investors, rationally concerned that a regulator will employ a criterion of revenue adequacy to justify caps on or rollbacks of overall company revenues, will have their incentives to invest distorted, seeking to pull cash

²⁵ WCTL Op. Comments at 22.

²⁶ WCTL Op. Comments at 22. (emphasis in original)

flow out of the railroad when they can or directing management to apply that cash flow toward rail or non-rail investments that are not subject to revenue regulation.²⁷

The litany of financial metrics Dr. Levine asserts should be used, in some unspecified way, in determining revenue adequacy suffer from the above-noted shortcomings. His proffered metrics are just a handful of a long list of financial ratios that can be used to summarize certain aspects of the operation, investments, and financing of a business. They do not, however, provide a basis for determining overall revenue adequacy. As one of the most widely used textbooks in corporate finance puts it, financial ratios “are just a convenient way to summarize large quantities of financial data and to compare firms’ performance. The ratios help you ask the right questions; they seldom answer them.”²⁸

As explained more fully by Dr. Brinner, Dr. Levine’s proposed financial indicators bear no direct connection to the relevant comparison of capital costs to rates of return. How low (or high) do the Debt-Equity Ratio, Operating Ratio, and Dividend Payout have to be for the railroad to be revenue adequate? Such questions are not subject to coherent answers. Indicators such as the Debt-Equity Ratio, the Operating Ratio, or the Dividend Payout do not measure what needs to be measured. Rather, their value is in providing information to management and investors about changes over time and outcomes relative to other companies. It is not surprising that the board of UP, as cited by Dr. Levine, would look to the levels of growth in revenue, operating income, returns on invested capital, and/or earnings relative to other companies in evaluating the performance of senior management. But such practices provide no indication of

²⁷ In this regard, claims (see, for example, WCTL Op. Comments at 9-10; Levine VS at 4-5) to the effect that railroads should be concluded to be revenue adequate because they are observed to have made purchases of and investments in certain non-rail assets have their economics backwards. Such patterns of investment, particularly when the railroads otherwise have demonstrable demands for large levels of investment, tell us that rates of return anticipated from rail investments have not been competitive with returns anticipated elsewhere.

²⁸ See, e.g., Brealey, R.A, Myers, S.C., and Allen, F. (2013). *Principles of Corporate Finance, 11th ed.*, New York, McGraw-Hill Irwin at 719.

revenue adequacy—i.e., that revenues overall are at least sufficient to cover the costs, including the risk-adjusted cost of capital, that would be incurred by an efficient entrant in a contestable market pricing at competitive levels.

Dr. Levine also suggests looking at returns based on accounting (“book”) measures of asset values. Use of such measures would not provide useful or reliable measures of economic returns in a competitive marketplace, nor would they account for the risk of investments. It is widely recognized, textbook economics that, to the extent “book value estimates are outdated and do not reflect the market value of the assets-in-place at the firm, the return estimates are likely to be misleading.”²⁹ This is especially true for railroads given their extremely long-lived assets which have historical cost “book” values which are quite generally less than the competitive market value of those assets.³⁰

Attempts to define and measure revenue adequacy based on quantification of accounting measures of the depreciated, historical 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. As pointed out by Prof. Cornell and Dr. Brinner, there are two major problems with the shipper commenters’ use of accounting values to infer economic returns. First, the depreciated book value of the assets based on historical investment costs likely grossly understates the current competitive market value or replacement cost of these assets.³¹ Historical book accounting does not adjust for the effect of inflation on

²⁹ Damadoran, A (2001). *Corporate Finance: Theory and Practice*, 2nd ed. New York, John S. Wiley & Sons, Inc. at 728.

³⁰ See Brinner VS at 18-20.

³¹ “Older assets may be grossly undervalued in today’s markets conditions and prices,” Brealey, Myers, and Allen at 729.

the value of long-lived capital goods. And railroad assets are especially long-lived.³² The price of rail equipment, parts, and construction twenty, thirty (or more) years ago can be a fraction of the current competitive market value. For example, while the remaining life of a 25-year-old railcar will be less than a new one, the competitive value the market places on the use of that railcar is influenced by the current cost of providing additional, new railcar capacity. The effect of asset price inflation is not reflected in the measure of assets on which returns are calculated. As shown by Dr. Brinner, this has a large impact on estimated rates of return in the rail industry.³³

Second, under the Board's current annual determination of "revenue adequacy", the size of a railroad's asset base on which returns are required is reduced by the accounting measure of deferred taxes. Deferred taxes represent the accumulated difference in taxes calculated under tax versus book accounting rules. For railroads, this difference arises primarily from differences between book and tax depreciation and the amounts are large: the asset base "financed" by deferred taxes exceeds that financed by long-term debt.³⁴ To the extent railroads continue to invest at the same level, this cumulative difference is effectively deferred long term. Current practice in effect assumes that investors expect no return on assets "financed" by deferred taxes. But such an assumption provides no incentive to the investors to keep those assets deployed in the rail industry. They have the incentive to, and would be better off, re-deploying that capital in industries where they could earn their cost of capital. It is

³² More than 80% of UP's book value of all assets arises from property categories with average useful lives of no less than 20 years. In 2013, the average age of a UP railcar was greater than 23 years. Property associated with road and structures is much longer-lived. 2013 10-K.

³³ This mismatch between current and depreciated historical value is further exacerbated by the difference between book and actual economic depreciation: "If book depreciation and economic depreciation are different (they are rarely the same), then the book earnings will not measure true earnings." Brealey, Myers, and Allen at 310.

³⁴ See Class I Railroad Annual Report R-1 for BNSF, CSX, GTW, KCS, SOO, and UP, "Net Accrued Deferred Tax & Total Long-term Liabilities, 2013."

therefore rational that investors do expect to earn a return on deferred taxes and such expectations are reflected in the market-based determinations of the cost of equity used by the STB. Therefore, the STB's exclusion of deferred taxes overstates the attractiveness of railroad industry investments.³⁵

A further flaw in shipper commenter conceptions of revenue adequacy proposals entails the implicit proposition that earning returns above the cost of capital, even if correctly measured, is inconsistent with competitive markets or somehow indicative of "supracompetitive" profit. The proposition is flawed because firms, including firms entering competitive markets, must expect to earn *at least* their cost of capital and must have the incentive to do so. As business conditions change, new investment opportunities arise and, to the extent capital is available, it is in a firm's interest to invest in those opportunities that have expected returns above (or equal to) their cost of capital. Only investments that return amounts greater than the cost of capital can be expected to add to the value of the firm.

It is also the case that returns are generated over time and vary over time. Some shipper commenters acknowledge this, but then argue that revenue adequacy should be evaluated over only "four years"³⁶ or the "length of an average business cycle."³⁷ Given the very long lives of railroad assets, these periods would be too short to conclude that a railroad was actually earning returns above competitive levels even if rates of return were otherwise calculated correctly on the basis of the current competitive market value of assets. With rates of return calculated for periods of time less than the lives of railroad capital inherently being sometimes higher and sometimes lower than the cost of capital, proposals to "roll back" rates to effectively refund

³⁵ See, also, Brinner VS at 16-18.

³⁶ See, WCTL Op. Comments at 24.

³⁷ See, Concerned Shippers Op. Comments at 11.

revenues to shippers when shorter period rates of return are higher than the cost of capital is necessarily a recipe for revenue *inadequacy*. Such an approach would take the tops off of revenues in good times and prevent them from offsetting disappointing returns in the inevitable bad times.³⁸

Finally, as I discussed in my prior Verified Statement, no conclusion of “supracompetitive” pricing in the monopolistic sense in any market can be drawn from aggregate, company-wide rates of return which turn out to exceed the risk-adjusted cost of capital.³⁹ Success in dynamic, competitive markets in anticipating consumers’ needs, changing technology and/or input costs readily yields *efficiency rents* and associated returns in excess of the cost of capital. Indeed, the prospect of successfully out-earning one’s cost of capital drives innovation and investment and is the necessary inducement to investments in efficient capacity expansion and system replenishment, cost saving innovations, and operational responses to the opportunities presented by evolving and dynamic market developments. At the same time, the question of whether freight rates paid by shippers are above competitive levels is inherently a matter that can only be determined by analyzing issues of market dominance and contestable market pricing by stand-alone competitors in relevant *individual* markets. As I discuss below, rhetoric regarding “supracompetitive earnings” does not overturn the fact that this reality is missing from shipper commenters’ calls to have putative determinations of aggregate revenue adequacy automatically trigger rate caps and rollbacks.

³⁸ For additional discussion see, EP 722 & EP 664 (Sub-No. 2), Verified Statement of Bradford Cornell, at 32-34.

³⁹ Kalt VS at 33-35.

IV. DISTORTIVE REGULATORY PROPOSALS

Shipper commenters fail to provide any logical or evidentiary link between claims of overall revenue adequacy and the appropriate level of any individual rate or groups of rates. As a result, they have resorted to suggesting a grab-bag of arbitrary and unprincipled proposals that they contend should be triggered by a finding of “revenue adequacy.” These proposals include calls to:

- “[R]oll back” “supracompetitive earnings” (i.e., earnings above the 180 percent R/VC threshold) for captive shippers to remedy “excessive differential pricing” built into existing rates by past actions,⁴⁰ including a proposal by ARC to establish a two-year ‘look back’ period for reparations.⁴¹
- Limit all future rate increases (described as “additional differential pricing” by ARC) for “captive” traffic.⁴²
- Establish an R/VC cap that railroads must apply to rates paid by captive shippers.⁴³
- Broaden maximum rate prescriptions to include “non-issue traffic that shares use of the facilities addressed in a rate case....”⁴⁴
- Constrain “non-rate” terms and conditions, including routings, service issues, and forced access.⁴⁵
- Modify SAC and simplified SAC by, for example, allowing the use of book values for road and property assets, instead of replacement costs.⁴⁶
- Revisit prior decisions to exempt certain categories of traffic from maximum rate regulation.⁴⁷

⁴⁰ See, for example, ARC Op. Comments at 23-24; AECC Op. Comments at 20-22; Concerned Shipper Op. Comments at 11.

⁴¹ ARC Op. Comments at 26-27.

⁴² See, for example, ARC Op. Comments at 20, 26 and WCTL Op. Comments at 2. WCTL suggests allowing rates to increase by RCAF-A.

⁴³ Olin Op. Comments at 8.

⁴⁴ AECC Op. Comments at 20.

⁴⁵ See, for example, ARC Op. Comments at 18-19; AECC Op. Comments at 27-29; and CURE Op. Comments at 2.

⁴⁶ AECC Op. Comments at 19-20.

⁴⁷ CURE Op. Comments at 2.

Each of these proposals implicitly suggests that the Board should move away, one way or another, from actually examining competitive conditions and rate levels in individual markets. In so doing, the Board would be abandoning the “mimic competition” standard and moving toward a regulatory approach that would portend highly distortive and destructive effects on rail markets.

A. There Is No Link Between Overall Revenue Adequacy and the Regulation of Rates on Individual Movements

As I have stressed, calls for automatic rate regulation for regulated traffic—based only on a determination of overall system-wide revenue adequacy (even if determined with proper reference to the competitive market principles discussed at length in my opening statement)—miss the point that there is no demonstrable link between the revenue adequacy of a railroad as a whole and the competitive market environment faced by, and the costs of providing service to, any individual traffic or group of traffic.

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 individual markets in which they operate. If a railroad’s financial health (as measured by a properly defined metric of revenue adequacy) is the result of superior innovation, more adept responses to changing market conditions, or consistently superior service offerings, then this outcome is consistent with the competitive market standard and there is not only no need for regulatory intervention, it can only do harm.

A showing merely that a railroad is overall “revenue adequate”, even by reference to a properly conceived measure of “adequate”, would not constitute an economically coherent basis for regulatory intervention requiring that “additional differential pricing” be capped and/or that

putative “excess” revenue be returned to shippers to be selected by the regulator (*per* the proposals of AECC, CSA and ARC).⁴⁸ At its core, the general idea of capping firm-wide revenue based on some measure of an adequate rate of return would take the railroad sector into regimes of some form of public-utility-style, rate-of-return regulation. With good reason, such regulation limiting aggregate revenues so as to not exceed a “revenue requirement” determined based upon an allowed, “adequate” rate of return has been widely discredited and largely abandoned by the United States and other developed nations. Independent research summarizes the reasons:

The advent of competition in areas previously reserved for the franchised [public utility] monopoly has made the administration of rate-of-return regulation more contentious than ever...Briefly, rate-of-return regulation gives the firm incentives to misreport cost allocations, choose an inefficient technology (in some cases), undertake cost-reducing innovation in an inefficient way, under-produce in a noncore market, price below marginal cost in a competitive market which happens to be included in the set of core markets regulated by an aggregate rate-of-return constraint, and view diversification decisions inefficiently.⁴⁹

In fact, in this context it is arguably *the* salient economic attribute of the railroads regulated by the Board that they are *not* franchise monopolies, granted exclusive certificates of public convenience and necessity which protect them from competition from each other and from trucks, barges and pipelines. Instead, broad swaths of rail traffic are (and, in its exemption and merger decisions, have been found by the Board to be) forcefully subject to precisely such competition. From natural gas production and airlines prior to the 1980s to hospitals and the old AT&T, attempting to apply notions of aggregate revenue adequacy by limiting pricing to levels aimed at yielding no more than a rate-of-return derived aggregate revenue requirement to

⁴⁸ See ARC Op. Comments at 23-24 and 26-27; Concerned Shippers Op. Comments at 11-12; AECC Op. Comments at 20-22.

⁴⁹ Braeutigam, R. R., & Panzar, J. C. (1989). “Diversification Incentives Under ‘Price-Based’ and ‘Cost-Based’ Regulation. *RAND Journal of Economics*, Vol. 20 (3), 373-391 at 390.

companies that operate largely across markets that are not inherently (or “naturally”) monopolistic has repeatedly proved to be contrary to the overall public interest, no matter how much it may have been in the interest of private parties favored by such regulation. Competition is an extremely important, clever, and ultimately hard-to-control force. To say the least, it does not mix well with regulation that would propose, under the guise of protecting customers against certain specific pockets of market dominance, to control rates, terms of service and customer choice so as to generate no more than “adequate” aggregate revenues of regulated companies.

As noted, shipper commenter proposals suggesting that railroads deemed to be “revenue adequate” be required to “remedy excessive differential pricing”⁵⁰ or otherwise return “excess contribution”⁵¹ to so-called captive shippers implicitly or explicitly assume that such supposed “excess contribution” comes exclusively from the regulated traffic of such shippers. However, in my opening comments I showed that over the last five years, railroads have not increased their markups over variable costs for non-exempt shipments with R/VC ratios above 180%, i.e., the potentially regulated traffic for which shippers claim immediate and drastic rate actions are required. Figure 5 demonstrated that contribution represented 60% of revenue for such traffic in each of 2008 and 2012, and Figure 6 indicated that the overall R/VC ratio has remained static, ticking upward only slightly from 248% to 251% during that period. In fact, review of the contribution in absolute terms further confirms that railroads are not increasing the burden for such potentially regulated traffic. In 2008, the earliest year for which the Expanded Revenue Stratification report is available on the Board’s website, contribution from Exempt shipments and shipments with R/VC ratios below 180% totaled \$7.96 billion. This accounted

⁵⁰ ARC Op. Comments at 23.

⁵¹ AECC Op. Comments at 22.

for 49% of total contribution of \$16.29 billion. Over the next four years, total contribution grew to \$21.33 billion—and Exempt and low-rated shipments accounted for one-half of that growth (\$2.47 billion out of \$5.04 billion). In other words, while overall railroad returns have increased over the last five years, the share of contribution from potentially regulated traffic remains unchanged.

Shipper commenter proposals to limit or eliminate railroads' differential pricing ability are also at odds with sound policy. 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.

The differential pricing that shipper commenters attack is also not properly limited without coherent investigation of competitive conditions in specific relevant markets. Differential pricing is an expected outcome in competitive, contestable markets as a new entrant providing service to multiple types of traffic and shippers over a network of shared capital would price so as to recover shared system-wide costs in accord with the differential values its customers place on the proffered services. Indeed, this is the economic underpinning of why the Staggers Act required the ICC (and its successor, the Board) to rely on competition to set prices to the maximum extent possible, leaving maximum rates to be regulated only where R/VC levels exceeded a threshold and where insufficient competition could be specifically demonstrated in the affected relevant market.

In their opening statements, shippers *assert* what needs to be proved, *i.e.*, that a finding of revenue adequacy is evidence that the railroads have benefitted at the expense of a certain shipper or group of shippers as a result of abuses of market power. That proof cannot be made or assumed by reference to system-wide statistics, but must be demonstrated by reference to the specific markets in which the services provided to that shipper or group of shippers take place. The Board's considerations of traffic exemptions, mergers and merger conditions, and individual rate cases repeatedly demonstrate that determinations of market power abuse necessarily require detailed investigation of specific market facts and circumstances. Neither broad brush review of aggregate system revenues, RSAM values, nor even individual traffic R/VC ratios tell us whether rates exceed the rates a competitive, contestable market would set.

As I have noted, Board ratemaking practices do not permit railroads to assume or assert that any individual regulated rail rate, regardless of its apparent R/VC ratio, is reasonable just because the railroad as a whole has been revenue inadequate. By the same token, shippers cannot now properly assert that individual regulated rates, regardless of (or because of) their respective R/VC ratios, are *unreasonable* simply because the railroad as a whole is putatively revenue adequate. In either case, the specific market conditions and cost-of-service attributes of each movement or relevant group of movements must be analyzed, using the SAC principles the Board has pioneered.

The same principle of sound regulatory policy applies to recommendations by shipper commenters (see above) for the capping or rolling back of rates on non-issue traffic. As proposed, such limits on rates and revenues should be implemented, according to shipper commenters, *not* because of any proper demonstration of market power abuse in rates for such traffic, but simply because such traffic shares facilities with issue traffic putatively found in a

rate case to have above-SAC rates. A similar lack of coherent economic reasoning applies to certain shipper commenters' noted calls for the Board to revisit prior exemptions of traffic already determined to have been subject to competition. These calls are made despite those commenters' failures to actually demonstrate either true revenue adequacy or that claimed revenue adequacy is due to market power abuse in exempt traffic. Then, too, arguably the most egregious abandonment of the coherent economics underlying the Board's SAC tests would come under certain shipper commenters' calls (see above) for the Board to switch to accounting book values, instead of economically proper replacement costs, in its SAC tests when a railroad is deemed revenue adequate. For the reasons I have discussed above, this amounts to asking the Board to knowingly adopt a policy of introducing error into its ratemaking when it makes a determination of revenue adequacy. In other words, "when you determine a railroad to be revenue adequate, you should start making errors in your ratemaking methodology." This is untenable in a sound regulatory system that seeks to serve the public interest.

The noted proposals of certain shipper commenters to have putative determinations of revenue adequacy trigger "non-rate" regulation of routings, service issues, and access are similarly divorced from examination under the Board's contestable market, SAC principles. Forced access, for example, would not constitute implementation of a policy of mimicking competition. Competitive market forces would not generate a system of open access railroads, and no SARR in a contestable market would be expected to enter as a non-integrated facilities company merely charging independent rolling stock carriage companies for the use of the SARR's infrastructure. The coordination of operations across myriad non-fungible traffic movements and the needs for investment in long-lived and shared capital efficiently push the integration of infrastructure and rolling stock activities into a common integrated railroad firm,

rather than a mélange of transactions among arm's-length parties with readily conflicting interests.⁵²

B. The Price Controls Being Sought by Shipper Commenters Would Have Disastrous Consequences for the Railroads, Their Shippers, and Their Investors

At their heart, most shipper commenter proposals effectively represent various versions of requests for *price controls* that would be untethered from the public interest criterion of “mimic competition.” Such interventions have much worse than a checkered history, and they are particularly pernicious in an industry like railroading, in which a large proportion of traffic is subject to potent competitive price and service pressures.

Basic economics tell us why price controls that do not mimic competition have disastrous consequences for both producers and consumers.

[W]hen government adopts a price control...[it] forces all, or a large percentage, of transactions to take place at that price instead of the equilibrium price set through the interaction between supply and demand. Since supply and demand shift constantly in response to tastes and costs, but the government price will change only after a lengthy political process, the government price will effectively never be an equilibrium price. This means that the government price will be either too high or too low.⁵³

Noble Prize winning economist Milton Friedman put it more bluntly:

We economists don't know much, but we do know how to create a shortage. If you want to create a shortage of tomatoes, for example, just pass a law that retailers can't sell tomatoes for more than two cents per pound. Instantly you'll have a tomato shortage. It's the same with oil or gas.⁵⁴

⁵² See, Candell, Amy B. and Joseph P. Kalt, “Open Access for Railroads? Implications for a Non-Hub Congestible Network Industry”, Advanced Workshop in Regulation and Competition, Center for Research in Regulated Industries, May 2000; Gomez-Ibanez, José A. and Dines De Rus (eds.) (2006). *Competition in the Railway Industry: A Comparative International Analysis* (Northampton, MA: Edward Elgar Publishing, Inc.)

⁵³ Scott Morton, Fiona M. (2001). “The Problems of Price Controls”, excerpted from *Regulation*, Vol. 24, (1) in *The Cato Review of Business and Government*.

⁵⁴ "Controls Blamed for U.S. energy woes", Los Angeles Times, February 13, 1977.

Prices are vital to the efficient allocation of resources toward the satisfaction of consumers' needs. They are the critical signals which impact choices of product and service offerings and which determine the nature and level of capital investment and ownership structures. Price controls distort these signals and, in turn, distort firms' decisions about how to structure service offerings and where to direct their capital resources. Rising prices are the market's way of signaling unsatisfied demand and inducing additional investment in a given sector. Price caps prevent prices from adjusting beyond a government-set price and therefore send distorted signals to the market, hiding the unmet demand and failing to induce investment that would benefit consumers.⁵⁵ In the real world of politics and regulation, price controls also tend to discourage price reductions that would otherwise be dictated from time to time by market conditions because the bluntness of regulation often means roadblocks to restoring prices to higher levels when market conditions dictate.

Beyond economic principles, we need not look too far back in our own regulatory history—only to, say, the natural gas and gasoline price control policies of the 1970s and post-war rent control in New York City—to see the distortive and destructive effects of price controls. Gasoline lines and shortages of natural gas in periods of peak demand (i.e., the dead of winter) were the direct products of price controls that purportedly were intended to protect consumers by trying to override the workings of competitive market supply and demand.⁵⁶ The associated political disasters they created ultimately forced their abandonment. In the case of rent controls, trying to regulate thousands of competitors contributed hugely to the creation of slums and haves and have-nots, as controls drove investment out of the rent-controlled areas

⁵⁵ Scott Morton, Fiona M. (2001). "The Problems of Price Controls", excerpted from *Regulation*, Vol. 24, (1)) in *The Cato Review of Business and Government*.

⁵⁶ See Kalt, Joseph P. (1981). *The Economics and Politics of Oil Price Regulation: Federal Policy in the Post-Embargo Era* (Cambridge: MIT Press); MacAvoy, Paul W. (2000). *The Natural Gas Market: Sixty Years of Regulation and Deregulation* (New Haven: Yale University Press).

and channeled the vast bulk of investment into competitive, but unregulated, sectors of the marketplace.⁵⁷ And then, of course, there is the history of rate bureau-imposed rail price controls in the pre-Staggers era. The disasters created for shippers, ultimate consumers and railroads, alike, by that experience need not be recounted further here.⁵⁸

In short, adoption of a regime of maximum rate and/or revenue caps that moves away from identifying and regulating only traffic demonstrated to be dominant – as shipper commenters suggest when they propose rate regulation for *all* captive shippers (and even associated non-issue traffic) based only on a finding of system-wide revenue adequacy without individual inquiry into the competitiveness of the relevant markets, much less whether any particular rate reflects actual market power abuse – threatens the public interest. While the long life of railroad equipment might disguise the deleterious effects and permit reasonable service for a time (just as rent controls on long-lived residential capital do not immediately show up as deteriorating quality), the long-run interests of the public in an efficient freight transportation sector and a healthy national economy can only be harmed.

V. CONCLUSION: SHIPPERS HAVE MADE NO CONVINCING ARGUMENT THAT THE BOARD SHOULD MOVE AWAY FROM THE ECONOMICALLY SOUND REGULATORY PRINCIPLES ALREADY IN PLACE

The Staggers Act properly relied upon the competitive market standard as the foundation for railroad rate regulation. Where markets are workably competitive, price regulation is not required to protect the public interest. In the specific markets where shippers have been shown to have inadequate competitive protections, Staggers era railroad rate regulation appropriately provides protection. It does so under the principles of competitive

⁵⁷ Moon, C and Stotsky, J. G. (1993). “The Effect of Rent Control on Housing Quality Change: A Longitudinal Analysis”, *Journal of Political Economy*, Vol. 101 (6), 1114-1148. Moorhouse, J. (1972). “Optimal Housing Maintenance Under Rent Control”, *Southern Economic Journal*, Vol. 39 (1), 93-106.

⁵⁸ See Kalt VS at 8-10 for a summary.

contestable markets and the Board's stand-alone cost tests. These compare existing rates to the long-run costs that would be incurred for an efficient, hypothetical competitor to enter the market and compete for all of the relevant traffic *because these are the rates that competition would set for entrants and incumbents if the subject rail markets were competitive*. This puts the Board's current regulatory approach on the firmest of public interest principles.

Shipper commenters in this proceeding have presented no evidence to support the notion that the current approach is failing and generating above-competitive aggregate revenues for Class I railroads. Concomitantly, shipper commenters have provided no rationale that would justify any departure from the principles at the heart of Staggers era regulation. Indeed, the overall public's interest lies in having the Board continue to look to competitive market principles to inform the proper definition of revenue adequacy and to regulate maximum rates in pertinent traffic. Under competitive market principles, adequate revenues for a railroad as a whole are at least the long-run costs (including a competitive return to capital) that would be incurred by an efficient, hypothetical stand-alone competitor seeking to serve *all* of the traffic currently handled by the existing railroad at their existing rate levels. I have termed this competitor the System Wide Stand-Alone Railroad, or SW-SARR.

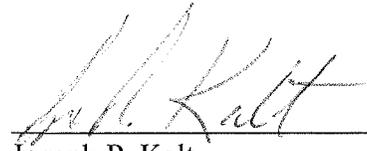
Even in markets which are workably competitive, firms routinely earn revenues in excess of their costs of capital by virtue of superior service, responsiveness, innovation, and skill at anticipating shifts in market dynamics. This means that the competitive market standard does *not* preclude—as shipper commenters universally *assume*—a railroad's earning revenues in excess of its cost of capital, even over an extended period of time. Indeed, the prospect of earning the cost of capital is the minimum necessary to induce advances in technology and innovation and encourage necessary capital investment.

Abuses of market power and above-competitive pricing cannot be discerned by examining a railroad's overall revenues and associated economic rates of return. In making that kind of assessment, there is no substitute for principled inquiry into the competitive conditions of specific markets and their traffic, and concomitant assessment of actual rates against a standard of mimicking competition. Calls to impose broad brush revenue caps or other downward pressure on rates without such inquiry because of putative determinations of company-wide aggregate "revenue adequacy" (even if properly measured) are contrary to the public's interest in sound economic regulation. Rate regulation is appropriate only in instances where specific inquiry demonstrates that a carrier has market power and is abusing that market power *in pricing specific traffic*. This holds regardless of whether or not the railroad is properly determined to be revenue adequate overall. The proper conclusion is that achieving revenue adequacy—on whatever basis—does not provide useful guidance in individual rate disputes. The overall public's interest lies in the Board, the railroads, and shippers continuing to work to make the Board's framework of mimicking competitive outcomes in individual rate cases—and the SAC test in particular—as efficacious as possible *without* sacrificing the competitive market principles that are its underpinnings.

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: November 3, 2014



Joseph P. Kalt

**Reply Verified Statement of
Roger Brinner**

BEFORE THE
SURFACE TRANSPORTATION BOARD

RAILROAD REVENUE ADEQUACY

Docket No. EP 722

REPLY VERIFIED STATEMENT OF

ROGER BRINNER, PH.D.

NOVEMBER 4, 2014

I. Introduction

I am Roger E. Brinner. I submitted a verified statement on behalf of the AAR on opening in this proceeding. My Opening Statement addressed the question of how railroads' financial performance should be assessed by the Board to determine long-term financial viability, concluding that railroad rates of return are markedly low. I have been asked by the AAR to respond to material presented by rail shippers and related parties who make multiple assertions and suggestions regarding the measurement of railroad financial performance that either are a) not supported by financial theory and real-world practice, or b) are irrelevant to the question of long-term financial viability of railroads. These faults are the focus of this report. Essentially, I address in this Reply Statement three principal topics:

1. What return-on-capital metric should the STB use to assess the financial health of a railroad or the rail industry, and are additional financial metrics usefully considered?
2. What significance should the STB place on rail management decisions regarding dividend payments, share repurchases, or debt issuance/redemption?
3. What is the appropriate life-cycle over which the return on capital should be measured?

The shippers' witness put forward to discuss these issues is Dr. Levine, who submitted a statement in support of comments by Allied Shippers.¹ I organize my reply statement as a response to the specific assertions made in the Levine Statement and I follow the structure of the Levine Statement. As I explain below, the assertions in the Levine Statement about the financial state of the railroad industry and how the Board should assess railroad financial performance are

¹ Allied Shippers consist of The Western Coal Traffic League, Consumers Energy Company, and South Mississippi Electric Power.

often effectively a repetition of erroneous or misplaced assertions made in a November 2013 Staff Report for Chairman Rockefeller by the Committee on Commerce, Science and Transportation titled “Update on the Financial State of the Class I Freight Rail Industry”. Some of the shippers cite the Rockefeller Report as evidence of railroad financial health, but like Dr. Levine, the Rockefeller Report focuses on partial and short-term financial metrics that can be misleading when used to assess the long-term financial health of railroads. The flaws that I discuss in the Levine approach to assessing railroad financial performance apply equally to the claims made in the Rockefeller Report.

II. Proper Measures of Financial Health for Use by the STB

A. The Importance of ROIC as the Measure of a Firm’s Long-Term Financial Health

In Section I of his Statement, Dr. Levine introduces his argument that the Board should examine multiple factors in assessing railroad performance and not rely on Return on Invested Capital (ROIC) as the basis for assessing railroad revenue adequacy. Levine emphasizes two particular alternatives to ROIC, return on equity (“ROE”) and market value in excess of book value.

The STB has very correctly, in my judgment, focused on the return on total invested capital and put to the side the narrow, misleading ROE measure suggested by Dr. Levine, which looks only at the return on an arbitrary portion of a firm’s capital. A firm’s ROE is the product of the core ROIC and management decisions on the leverage shareholders would prefer. In other words, **ROIC is the core measure of financial performance, and ROE is a subsidiary**

outcome that reflects the appetite for risk and the relative prevailing cost of debt versus equity and not the fundamental financial performance of an enterprise.

When a firm produces a product or service it uses three types of inputs: capital, labor and materials (including energy). All three inputs are paid for at market prices and, given these prices and technology options, the firm decides on the optimal mix of the three. As to capital, after the firm makes the primary decision of how much capital is needed to be mated with labor and materials, a secondary decision is made to choose between debt and equity sources. This is akin to deciding first how many gallons of diesel fuel are needed and then choosing the supplier, or how many locomotives are needed and then choosing among manufacturers. The secondary decision on how to fund capital needs with debt or equity affects the total cost of capital (because the cost of debt is usually different from the cost of equity) *just as vendor selection affects the total cost of fuel or locomotives*. But the outcomes of these secondary decisions do not reflect the long-term financial health of the firm. It would be a mistake to assess a firm's long-term viability based the firm's performance on secondary decisions like the choice of a vendor. Similarly, the genuine questions for railroad revenue adequacy involve the total amount of capital needed, and the return on that capital as reflected in the ROIC, not the results of secondary decisions on how to fund capital needs.

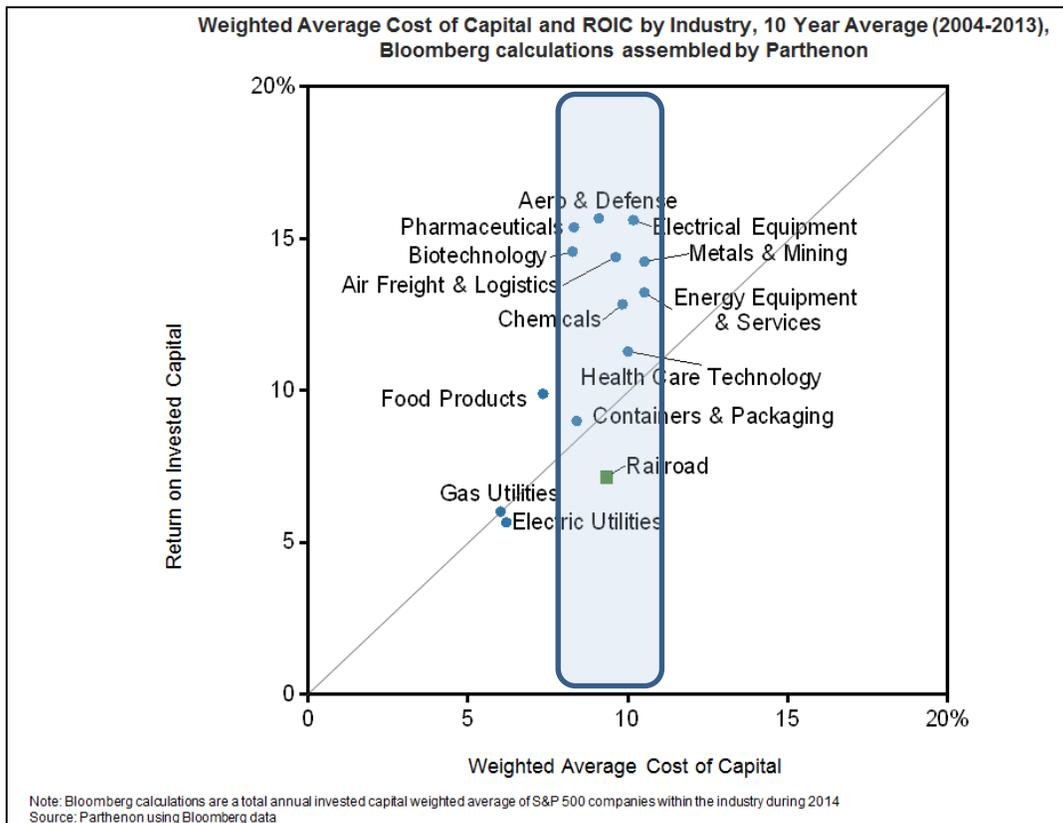
In summary, once the level of needed capital investments is determined, ROIC clearly presents financial performance based on the total invested capital. ROE is a subsidiary metric that looks at the return on only the portion of the total capital that management has decided to fund through equity rather than debt. Equity holders are primarily interested in the returns on the equity portion of invested capital, which explains why the financial press pays so much attention

to ROE; bond holders care about the narrow ability of the firm to cover its debt obligations. But the STB should be concerned with the financial performance of the firm as a whole not just the returns on a portion of capital.

Moreover, only ROIC allows a valid comparison to be made of returns on capital across industries. I presented such a comparison in Exhibit 2 to my Opening Statement, which is reproduced below.

Original Brinner Exhibit 2:

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



As shown in the Exhibit, when the railroad industry return on total capital is compared to the ROIC of other comparable industries, it is clear that railroads' returns are quite low. But no such

comparison across industries can be made using ROE. Any comparison of ROE across industries would be misleading because it would be influenced by firms' secondary leverage decisions.

The other metric that Dr. Levine cites in Section I of his Statement – market value in excess of book value – is completely without value in assessing railroad financial performance. Levine claims that this metric is “the most important evidence of capital attractiveness.” (Levine at 5.) This is simply untrue. This metric totally fails to account for the inadequacy of book value based on historic, depreciated purchase costs in assessing a firm's financial performance. The market, in contrast to Dr. Levine, definitely understands that the book value of assets is not the proper basis for assessing financial performance and for that reason the market routinely prices market values above book values for normal corporations with long-lived assets. In the railroad industry, the market value to book value ratio does not demonstrate “capital attractiveness;” it merely shows that book value substantially understates replacement cost.

In my opening statement, I elaborated on this conclusion that *historic cost measures* of total invested capital grossly understate the capital on which a return should be calculated by the STB and by investors. Take, for example, an old apartment building that has been fully depreciated but is still a viable rental property. The market value of the apartment is clearly going to exceed the book value (which is zero or near zero) since the building is still able to generate revenues. As a consequence, the market value of the apartment building is going to reflect the replacement cost of the building (e.g., the cost of a comparable property in comparable condition), not the book value of the building (which is zero or near zero). The apartment building might be an attractive investment based on existing rental income and cost

conditions, but not because the market value exceeds book value. The difference between market value and book value reflects, among other elements, this flaw of historical cost accounting and not the financial viability of a firm or the attractiveness of an investment in the firm.

B. The Use of Multiple Financial Measures

In Section II of his Statement, Dr. Levine argues that the use of multiple financial measures “to evaluate business performance is ubiquitous.” (Levine at 6.) His argument appears to be that the use of multiple metrics can or should be a substitute for reliance on ROIC in assessing railroad financial performance. As I explained above, ROIC is the core measure of financial performance that must be assessed to determine long-term financial viability and to provide a meaningful comparison of financial results across industries. Other financial measures may provide some partial information about financial performance, if properly used, but those measures cannot substitute for ROIC. A firm that is unable to generate an attractive ROIC relative to comparable firms will be hindered in attracting sufficient capital in competitive markets to ensure long-term viability. Capital will eventually flow to firms with the more attractive returns on capital.

Dr. Levine notes as an example of the use of multiple financial measures the use of select operating ratios in setting railroad executive compensation. (Levine at 6.) I acknowledge that such financial measures are occasionally used for setting executive compensation. But these metrics just set goals for improvement *on the path* toward normal long-term competitive profitability, i.e., profitability sufficient to sustain the firm over the long term. Hitting the targets does not mean final success in achieving full competitive profitability, only achievable meritorious progress over the short-term period relevant for the annual compensation. Since the

Board is trying to measure railroads' long-term revenue adequacy, it must use a metric that will show whether long-term, not short-term, profitability has been achieved.

When discussing capital access, Dr. Levine presents an example of a firm with zero ROI that is nevertheless able to attract capital. But his own example actually works directly against his argument that the STB should focus on short-term access to capital because the example plainly indicates that short-term success in raising external funds is not a test of sufficient current profitability for a firm. Levine notes that even unprofitable firms may be able in the short term to raise external funds because in his own words: "prospects obviously trump historic earnings." (Levine at 7.) This is indeed the fundamental position of the railroad industry in this proceeding: railroads will only be able to continue to attract sufficient funding if their prospects are strong and not dimmed by excessively harsh revenue and return constraints. But short-term access to capital does not say much about a railroad's prospects for long-term financial viability.

Dr. Levine also argues that BNSF's ability to pay dividends and to fund capital expenditures ("capex") is a sign of "long-term enterprise sustainability." (Levine at 8.) This assertion has no basis in theory or practice. The theoretical and empirical norm – taught from one's first accounting course onward and presented in every accounting textbook – is for equity cash flow (profits + depreciation) to be used for capex, to return funds to shareholders through dividends and stock repurchases, *and* retained earnings. The fact that a firm is able to pay dividends, fund capital expenditures, and also have retained earnings is unremarkable. It merely reflects a chosen finance strategy for the use of available funds. It says nothing about long-term sustainability. I return to this subject later in this Reply Statement in my discussion of alternative finance strategies, including dividend payments and share purchases.

C. More Levine-Proposed Alternative Financial Measures

In Section III of his Statement, Dr. Levine proposes 5 financial ratios as alternatives to the Board's current revenue adequacy test. Levine presents the 5 ratios in Table No. 1 for the major railroads. Each of the five metrics is inappropriate, as I explain below. In addition, each of the metrics appears to be intended as a relative benchmark to be compared to other industries, but his Table No. 1 offers no benchmarks or comparisons outside the railroad industry and no explanation as to whether such comparisons could properly be made using these metrics. His explanation of the financial ratios fails to give any valid basis for using the ratios to assess railroads' revenue adequacy.

Debt/Capital

The first inappropriate metric proposed by Dr. Levine is the debt/capital ratio. As I explained earlier, debt-to-capital ratios are not indicators of the fundamental adequacy of returns. The amount of debt for a firm is a financial decision that turns on a number of factors such as the level of interest rates and shifts in Price-Earnings multiples. Indeed, Dr. Levine's point appears to be only that there is nothing unusual or excessive about the amount of debt carried by the large railroads, but this hardly serves as an indicator of long-term viability.

Operating Ratio=Expenses/Revenues

Dr. Levine's second ratio – the operating ratio – is also inappropriate for several reasons. Although the operating ratio is a *useful ratio for an individual firm* to assess its management of operating expenses across years, the cross-firm relative level of the operating ratio does not provide information about a firm's long-term financial viability. The Rockefeller Report emphasizes the improvement in operating ratios that railroads have achieved in recent years,

which reflects improved management of operating expenses. (Rockefeller Report at 5.) But the STB policy question is not whether railroad financial performance has improved recently. Recent financial improvement would not be meaningful if railroads have not yet achieved a sustained and sustainable level of competitive profitability that will ensure long-term financial viability. The basic flaw in the Rockefeller Report is that it equates short-term improvement in various aspects of financial performance with long-term financial health.

Dr. Levine goes beyond the Rockefeller Report and claims that “[a] railroad with a very low operating ratio should be considered financially healthy and sustainable by any objective measure, regardless of whether its ROIC regularly exceeds the STB-determined COC.” (Levine at 9.) His conclusion is patently wrong. The operating ratio is a function not only of the firm’s effectiveness in managing operating expenses but also of the capital intensity of a firm. As I explain below, the relatively low operating ratio of railroads compared to other firms in diverse industries flows from the relatively high required capital intensity of the railroad industry. Therefore, a forceful objection must be made to Levine’s *cross- industry and specific FedEx comparisons* based on operating ratios. It is incorrect to cite operating ratios across industries without acknowledging the absolute need for an adjustment for the relative capital intensities of the businesses. Indeed, after such adjustments are properly made, one arrives back at a comparison of ROICs.

The relationship between capital intensity of an industry and its operating ratio is shown in the following analysis, which starts with the appropriate basis for comparing financial results across industries, i.e., the ROIC. As shown in the Table, firms and industries with high capital intensity (i.e., firms with large capital requirements per dollar of revenue, such as railroads)

should be expected to have high profit margins relative to sales and, equivalently, low expense/revenue or operating ratios. The example below looks at two firms with identical ROIC and revenues and shows that the difference in operating ratio is attributable entirely to the difference in capital intensity.

Table 1

	<u>Firm 1: Low Capital Intensity</u>	<u>Firm 2: High Capital Intensity</u>	Explanation of Values Used
% Return on Invested Capital	15%	15%	same, by assumption
Revenue	\$1,000,000,000	\$1,000,000,000	same, by assumption
Capital Intensity (\$Capital per \$Revenue)	1	2	Firm 2 is 2x Firm 1, by assumption to illustrate the consequences
Capital	\$1,000,000,000	\$2,000,000,000	by arithmetic, Firm 2 is 2x Firm 1
\$ Return on Invested Capital	\$150,000,000	\$300,000,000	by arithmetic, Firm 2 is 2x Firm 1
Expenses (excluding interest and taxes)	\$850,000,000	\$700,000,000	by arithmetic, Firm 2 expenses are below Firm 1 by the amount of additional return required to have the same ROIC
Operating Expense Ratio	85%	70%	Firm 2 <u>expense ratio</u> is below Firm 1, not because it is more efficient, but simply because it must have a lower expense ratio in order to achieve the higher profit margin on revenue so as to have an equal return on capital

The example shows the relationship between operating ratio and capital intensity. It also shows how it would be misleading to focus on the operating ratio instead of the ROIC in assessing long-term financial viability. The example shows that Firm 2 has a lower operating ratio than Firm 1, but despite this difference, it would not be correct to conclude that Firm 2 has a better long-term financial performance than Firm 2. The ROIC of Firm 1 and Firm 2 is identical.

Dr. Levine cites the high operating ratio of FedEx to suggest that railroads with much lower operating ratios than other industries or firms should be considered financially healthy. (Levine at 9.) But the operating ratio comparison totally ignores capital intensity and is meaningless. Certainly, the capital structure and capital requirements of railroads and FedEx are fundamentally different. FedEx is a more labor intensive firm with a lower investment requirement needed to provide its services. For example, according to the most recent SEC filings regarding revenues and operating expenses, per dollar of revenue FedEx spends 70% more on labor compensation than Union Pacific Railroad Company, whereas Union Pacific's capital requirements are 40% higher than FedEx.² Railroads provide their own infrastructure while FedEx gets full use of government-financed roads and airports. A comparison of the operating ratio of a firm like FedEx to that of railroads will not provide any meaningful comparative information about the financial performance or viability of railroads.

Return on Equity (ROE)

I earlier addressed in detail the flaw in Dr. Levine's reliance on the ROE as a substitute for the ROIC in assessing railroads' financial performance. As I explained, ROIC measures the success of a firm's capital investments while the ROE simply reflects management's decisions as to how to spread the capital financing between equity and debt. It would make no sense to use a partial, and potentially misleading, measure of financial performance as a substitute for the more complete picture provided by ROIC.

² See the Union Pacific Railroad Company 10-Q, September 23, 2014 and the FedEx Corp. 10-K, July 14, 2014. These show that FedEx spends 70% more on labor compensation as a share of revenue than does Union Pacific (36.3% versus 21.3%) whereas Union Pacific capital requirements as judged by depreciation charges are 40% higher (8.0% of revenue for UP versus 5.3% for FedEx).

Cash Flow Return on Equity (CFROE)

Dr. Levine's fourth ratio is CFROE. Levine defines this metric as "Cash flow (mainly net income plus depreciation and deferred taxes) as percent of shareholder average equity." (Levine at 15) This metric suffers from several flaws. The first problem with this metric is that, like ROE, CFROE looks at returns on only a portion of the total capital invested in the firm. The numerator here is simply expanded from after-tax profits in ROE to include items such as depreciation and amortization in CFROE, but the denominator looks at only the equity portion of the invested capital. Like ROE, the CFROE will also be affected by leverage decisions that do not reflect on the long-term viability of the firm.

Second, the inclusion of depreciation in the numerator makes CFROE largely irrelevant in cross industry comparisons for the same reason that operating expense ratios are irrelevant: a major adjustment must be made for the cross-industry capital intensities.

Third, the cash flow measure of returns ignores the need for capital expenditures. Capital intensive firms like railroads will generally have high cash flows because they need the cash flow to fund capital expenditures. A financial metric like CFROE is misleading because it looks at the level of cash flows without addressing the need to fund capital expenditures. It would not be appropriate to conclude that a firm like a railroad that needs to make substantial capital investments out of cash flow earns adequate revenues simply because the firm has a relatively high level of cash flow relative to equity. Once again, the only proper measure of long-term revenue adequacy is the return on invested capital.

Dividend Payout Rate

Finally, Dr. Levine is wrong to claim that the dividend payout rate says anything important to the STB about long-term financial prospects. The dividend payout rate is defined by Levine as dividends paid as a percent of the average daily stock price. (Most finance professionals would call this the “dividend yield” and define the payout rate as the ratio of dividends to earnings, but the comments that follow are addressed to Levine’s definition.) Dr. Levine says that the stable dividend payout rate recently observed for rails “indicates that equity investors can expect, at a minimum, to earn returns that are at levels similar to ... Treasury bonds...[and] highlights the railroads’ capital attractiveness.” (Levine at 11.)

The claim that a dividend return equal to a Treasury bond is sufficient to attract or satisfy an equity investor is obviously wrong. U.S. Treasury bonds are seen as default-risk free investments, while returns on stock must compensate an equity investor for risk inherent in the stock market. As further proof of the need for a risk premium I would note some shippers’ exhortation to the Board to rely on the CAPM model to assess the railroad cost of capital: the CAPM model explicitly assumes a risk premium required by investors before purchasing stock. The fact that a firm offers dividend returns comparable to Treasury bonds clearly is not enough to attract investors to the firm’s stock.

III. The Relevance of Rail Capital Management Decisions such as Dividend Payments and Share Repurchases

The second issue I address in this Reply Statement is how the Board should react to management decisions made regarding the use of funds. A dividend payout, as just noted, is not at all a comprehensive measure of profitability or total return: it is a strategic choice made on the use of funds. This same characterization applies to all other attractive capital use options for

good firms such as interest payments, capital expenditures, research and development, and share repurchases.

There appears to be a misconception underlying both the Levine Statement and the Rockefeller Report that the existence of earnings beyond those needed to fund capex is evidence of railroads' long-term revenue adequacy. The Levine Statement and the Rockefeller Report both point to railroads' descriptions of recent share repurchase practices as evidence of financial health. (Levine at 12; Rockefeller Report at 16-20.) As I explained previously, it is a fundamental principle of finance that a company has several basic ways to use funds, including capex as well as dividends, share repurchases, debt reduction and cash retention. (Occasionally a textbook author will include debt reduction and share repurchase in a "sources" tabulation by *subtracting* them from any gross issue of debt and equity but the subtraction acknowledges that this is a use of gross funds; whatever the author's preference is for labeling debt reduction and share repurchase as a negative source or a positive use of funds, the inclusion of these strategic choices for use of funds is fundamental and universal.) The use of funds to pay dividends or repurchase shares could not possibly be seen as evidence of the adequacy of railroad revenues given the pervasive use of dividends and share repurchases by firms in every sector of the U.S. economy. Indeed, the S&P 500 companies have allocated 42% of their earnings to dividends (median value, 1981-2014).

A firm uses its funds to maximize value for its stockholders, and it does this through a combination of capex, which produces value from investment returns exceeding costs in the future, and other more immediate ways of providing value to stockholders such as dividends and share repurchases. As I pointed out in my opening statement, railroads devote a far larger

percentage of cash flow to capex than the average for U.S. industries. (*See* Exhibit 8 to my opening statement.) But it would be very rare for any industry to devote all of its cash flow to capex, or exclusively to any other particular use of funds.

Share repurchase is probably best thought of as an alternative to debt reduction or dividend payment among the choices above for the use of funds. Paying a dividend gives immediate cash to all shareholders. Alternatively, purchasing shares by definition increases market demand for shares and thus can potentially increase the price for all shareholders. Some shareholders sell to achieve the potential benefit; others hold to accept a potential capital gain (unrealized).

Today's low debt cost makes share repurchase by management a very smart option. Widespread share purchases by many firms in many industries in recent years are not signs of strong profitability nor should they be construed as such in the case of rails: instead, repurchases are a sign of an extraordinarily cheap debt compared to the cost of equity. A firm should in such circumstances tap cheap debt and retire equity. It represents an optimal use of funds after necessary capex has been spent. Moreover, the capex decision should have been made as shown in my opening statement such that the marginal accepted investment offered a return at least equal to the weighted-average cost of capital. Thus, both the share repurchase and the capex decisions are optimized, or made consistent with each other, by being subject to the same market conditions of bond yields and equity costs. Of course, the optimal levels of capex and share repurchases could change. If returns on rail investment were constrained, it would not be surprising to see a reallocation of funds away from capex toward other uses of funds.

In short, dividend payments and stock re-purchase decisions reflect financial choices for the use of available funds made to maximize shareholder value. They are not indicators of a firm's long-term financial prospects.

Finally, Dr. Levine and the Rockefeller Report cite laudatory remarks made by rail executives to shareholders about their recent profits and stock market performance as proof that adequate profitability has been achieved to meet STB standards of revenue adequacy. I addressed this issue in some detail in Section 5 of my Opening Statement. As I explained, the strong stock market performance of the rail industry since 2000 reflects an increase of the railroads' ROIC from very low to modest levels. But the actual ROIC is still subpar, particularly when compared to other firms with similar WACC. Purchasers of railroad stock benefitted from the improvement in earnings since 2000, when railroads had very weak profits. But the favorable stock performance is not a sign of excess profitability today.

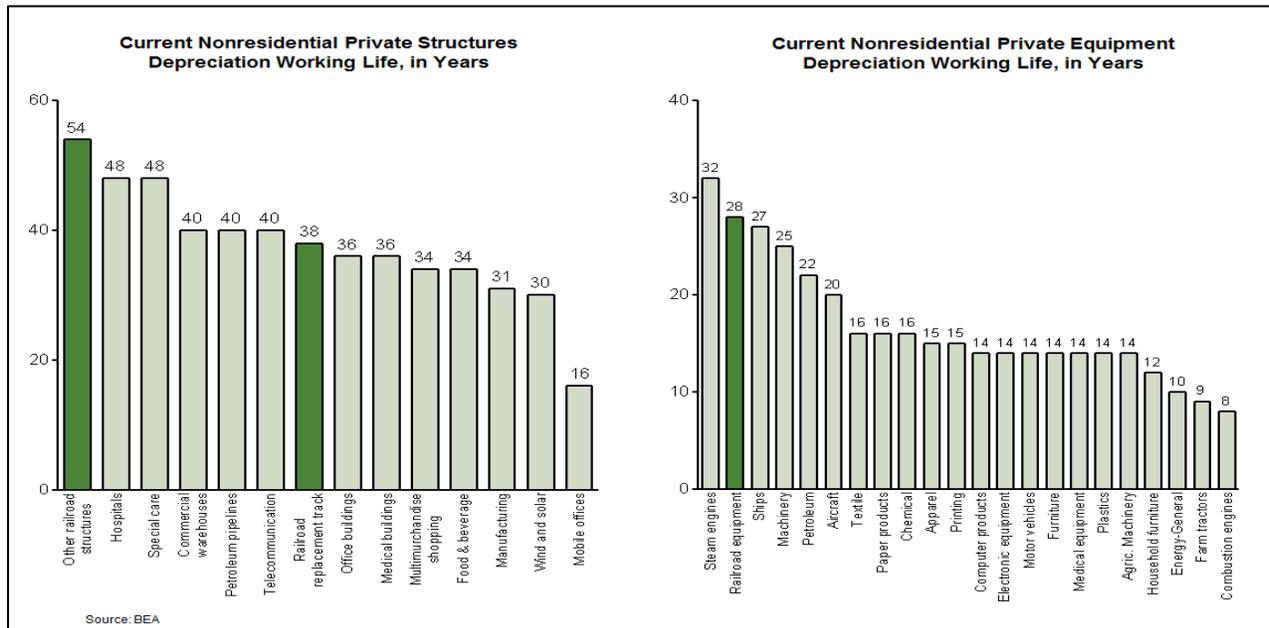
IV. The Appropriate Time Period Over Which the Return on Capital Should Be Measured

As I indicated in my opening statement, an investment cannot be judged fairly except over its full service life. By examining an investment over its life, the full measure of performance can be taken across the range of economic, financial market, commercial traffic, and competitive situations that have existed while the assets were there to be used. Any snapshot of performance less than that is just a partial indication with no guarantee that "past results are indicative of future performance" (in the familiar jargon of any prospectus).

In Section 3 of my Opening Statement, I charted the service lives of assets in multiple industries including rail as reported by the U.S. Department of Commerce, Bureau of Economic

Analysis. Rail equipment service lives are 28 years and structures range from 38 to 54 years. My Exhibit 5, setting out relevant asset lives, is reproduced below. Therefore, to truly and fairly judge the adequacy of revenue to produce a competitive rate of return, the STB would need to take account of the long lives of rail assets. While this may seem to involve quite a long time period, this perception may result from a general financial frame of reference in which service lives in a broad range of industries are more typically half as long, or shorter. Truck fleets, a shipping alternative, are often rotated in 3 years. Computers are sometimes thought to be obsolete in 3 to 5 years. On the other hand, many sophisticated investors do take a 25-40 year perspective: real estate assets are judged by their owners and operators over a multi-decade span, which is why long-term investors such as insurance companies and pension funds are drawn to commercial real estate with a 40-year service life.

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



Some shippers have suggested that the proper time frame for evaluating railroad financial performance should be as little as the last four years. This is totally unreasonable given the service life of rail assets. Indeed, even a typical business cycle would be far shorter than appropriate to assess returns on long-lived rail assets.

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: November 4, 2014



Roger Brinner

**Reply Verified Statement of
Robert Willig**

Before the
Surface Transportation Board

RAILROAD REVENUE ADEQUACY
Docket No. EP 722

Reply Verified Statement of

Robert Willig

Professor of Economics and Public Affairs
Princeton University

On behalf of the Association of American Railroads

November 4, 2014

I. Introduction and Statement Overview

Witness Introduction

My name is Robert Willig. I am Professor of Economics and Public Affairs in the Economics Department and the Woodrow Wilson School of Public and International Affairs of Princeton University. I also serve as a senior consultant to the economics consulting firm Compass Lexecon.

I have done extensive research and economic analysis of the railroad industry over the course of my career.¹ I have also testified before the Surface Transportation Board, and its predecessor, the Interstate Commerce Commission about issues affecting the rail industry on many occasions.

In general, my academic area of focus for teaching and research is microeconomics, with particular specialization in the field of industrial organization, including competition and regulatory policy. I have extensive experience analyzing such economic issues arising under the law. While on leave from Princeton, I served as Deputy Assistant Attorney General in the Antitrust Division of the United States Department of Justice, and in that capacity served as the Division's Chief Economist. I have consulted to international public agencies, national governments, private companies and law firms, and appeared many times as an expert witness before Congress, federal and state courts, federal administrative agencies, and state public utility commissions on subjects involving microeconomics, competition and regulation, in a wide variety of sectors including transportation and railroading specifically.

My curriculum vitae is attached as Appendix A and lists my publications and my other professional activities.

¹ See, for example, "Competitive Rail Regulation Rules: Should Price Ceilings Constrain Final Products or Inputs?" (with W. J. Baumol); *Journal of Transport Economics and Policy*, Vol. 33, Part 1, pp. 43-53 ; "Restructuring Regulation of the Rail Industry," (with Ioannis Kessides), in *Private Sector*, Quarterly No. 4, September 1995, pp. 5-8; "Competition and Regulation in the Railroad Industry," (with Ioannis Kessides), in *Regulatory Policies and Reform: A Comparative Perspective*, C. Frischtak (ed.), World Bank, 1996; "Railroad Deregulation: Using Competition as a Guide," (with W. Baumol), *Regulation*, January/February 1987, vol. 11, no. 1, pp. 28-35; "Pricing Issues in the Deregulation of Railroad Rates," (with W. Baumol), in *Economic Analysis of Regulated Markets: European and U. S. Perspectives*, J. Finsinger (ed.), 1983.

Purpose and Summary of Findings

I have been asked by the Association of American Railroads (“AAR”) to provide my analysis of and reactions to the verified statement of Professor Gerald R. Faulhaber that he filed on September 5, 2014 before the Surface Transport Board in Docket No. EP 722 on behalf of “Concerned Shippers,” and which he titled “RAILROAD RATES FOR CAPTIVE SHIPPERS: TIME FOR A RESET” (Faulhaber V.S.). This verified statement has several averred conclusions that create the danger of misleading the unwary reader because they are at once dramatically worded and unambiguously incorrect. I was asked to focus particularly on the material that concerns the use of the stand-alone cost test.

The principal overarching assertion of Professor Faulhaber is: “The economic models upon which the stand-alone cost test were developed and used bear no relation to the STB-regulated freight industry; the use of the stand-alone cost test for STB rate-making in the freight industry has no economic validity and is unsupported by the economic literature.”² Unambiguously to the contrary, below I shall describe the economic validity and show economists’ support for the use of the stand-alone cost test in the regulation of the freight industry with citations to the literature and many distinguished economists. Indeed, an article coauthored by Professor Faulhaber in the *Journal of Economic Literature* characterized the stand-alone cost test as an innovative practical product of theoretical economic research that is “good for society” in its application by the ICC to the regulation of railroad freight services:

Now, stand-alone cost is itself an example of a recent contribution of economic theory to regulatory practice Though the stand-alone criterion predates the literature on contestable markets, it is the latter that completes the rationale for the criterion as a regulatory instrument consumers are appropriately protected in terms of pricing [by the stand-alone cost test] The contestability literature (Baumol, Panzar, and Willig 1988) adopted the idea from Faulhaber, and showed explicitly that it constituted a key element of a program of rate regulation that, perhaps for the first time, was fully embedded in the logic of economic analysis.³

² Faulhaber V.S. p. 11.

³ Gerald R. Faulhaber and William J. Baumol, “Economists as Innovators: Practical Products of Theoretical Research,” *Journal of Economic Literature*, Vol. 26, No. 2 (Jun. 1988), pp. 595-596.

Thus, this contribution of Professor Faulhaber to the economics literature rebuts his condemnation that the stand-alone cost test has no economic validity and is unsupported by the economic literature.

In addition to his false assertions regarding the economic validity of the stand-alone cost test, the Faulhaber V.S. articulates some dramatic propositions that warrant attention in this summary because they too create a danger of misleading the reader. For example, in several passages, the Faulhaber V.S. avers that rail freight firms are permitted “to charge near-monopoly prices to captive shippers” (Faulhaber V.S. pp. 3, 11). This is patently false. Where there is market dominance, prices charged are subject to maximum rate reasonableness regulation implemented via the stand-alone cost test, and this test mimics the protections against monopoly pricing that shippers would experience in contestable markets.⁴

And despite Professor Faulhaber’s professed concerns with the SAC methodology, (Faulhaber V.S. pp. 11-12), and his faulting of the Board for failing to create some sort of standardized SAC model, he acknowledges that the STB has developed and adopted a Simplified Stand-Alone Cost (“SSAC”) methodology. But despite the importance that Professor Faulhaber accords to the issue, his Verified Statement includes no indication of what it is about the STB’s simplified SAC test that makes it fall so short of what he calls for in a “standard stand-alone cost model.” And his Verified Statement includes no consideration of the possibility that the simplified SAC test solves the problem he perceives of the costliness of the use of SAC, but is not attractive for shippers because it does not show that their rates are excessive under the SAC standard.

Professor Faulhaber argues that shippers’ rates should be lowered by regulation “instantly” because he maintains that they are at “near monopoly” levels and that the railroads are some of the most profitable firms in the US economy (pp. 11-12). Although

⁴ Professor Faulhaber’s paper in the *Journal of Economic Literature*, *op.cit.*, provides adequate evidence here in its description of how the ICC and STB regulatory system of Constrained Market Pricing includes the stand-alone cost test to limit pricing under market dominance (p. 595), and that this ceiling has the competitive characteristics of contestable markets that preclude monopoly pricing (p. 596).

he acknowledges that he does not have a solution to the policy problem of how to deal with his unsupported presumption that railroads are pricing near monopoly levels, he asserts that there is no economic model in the literature that points to a theoretically sound solution. Nevertheless, he contends that the STB should develop practical solutions even if they are not grounded in sound economic principles (p. 12).

This reasoning should be rejected at every step of the way. First, Professor Faulhaber presents no support for his claim that rail rates are at near monopoly levels, and the evidence in the Opening Comments of AAR and individual railroads is to the contrary. Second, basing rate regulation on standards that are without theoretical support is a prescription for induced inefficiency, capital insufficiency, deterioration of service quality and repeat of the underlying causes of the troubled history of the industry before the successful response of the ICC and the STB to the Staggers Act.⁵ Finally, there is every reason to go forward with continued reliance on the economic model that was chosen by the ICC and the STB to underlie Constrained Market Pricing, that was found in and supported by the economic literature, and that still provides competitive standards to guide appropriate regulatory solutions where they are needed. These solutions should be recognized to include appropriate practical measures like the STB's adoption of simplified SAC, while avoiding measures that may appear to be practical but that are dangerously distorting because they are not based on theoretical economic guideposts of competition.

In the sections to follow, I focus on what Professor Faulhaber had to say about the stand-alone cost test. In addition to showing that his asserted negative conclusions are wrong, I present clear examples to show that the test has been well-supported by leading economists. I discuss the conclusions in Professor Faulhaber's Verified Statement and emphasize that they are inconsistent with economic logic and threaten to undermine the dramatic progress in railroad regulation that has been accomplished since the passage and implementation of the Staggers Act.

⁵ For support and development of this point, see for example Willig, R. and W. J. Baumol, "Using Competition as a Guide," *AEI Journal on Government and Society: Regulation*, 1987 No. 1, pp. 28-35.

II. SAC Is Economically Valid, Based on Appropriate Economic Models and Well Supported by the Economics Profession.

The fundamental rationale for the use of SAC in the assessment of maximum rate reasonableness for traffic over which the serving railroad has market dominance has not changed and remains compelling since its first articulation by the ICC as part of its proposal for the regulatory policy labeled Constrained Market Pricing:

The “stand-alone cost” to any given shipper (or shipper group) is the cost of service [to] that shipper alone, as if it were isolated from the railroads’ other customers. It represents that level at which the shipper could provide the service itself. No shipper would reasonably agree to pay more to a railroad for transportation than it would cost to produce in isolation itself, or more than it would cost a competitor of the railroad to provide the service to it. Thus, the stand-alone cost serves as a surrogate for competition: it enforces a competitive standard on rail rates in the absence of any real competitive alternative.

* * *

Because the stand-alone cost represents the cost of obtaining service from another source (i.e. reproducing the service capability), the cost of facilities must be based on replacement cost, or the current cost of producing equipment or plant with equivalent capabilities.⁶

Soon after the ICC published its proposal for Constrained Market Pricing (“CMP”), a group of some of the leading academic economists who had conducted research on the economic underpinnings of regulation submitted a joint verified statement to the ICC on the subject.⁷ They included the above quotation about stand-alone costs from the ICC and characterized CMP as “a breakthrough in bringing federal regulatory policy in line with modern economic theory” (p. 1). Thus, from the start, the testimony of

⁶ *Coal Rate Guidelines, Nationwide*, Ex Parte No. 347 (Sub-No. 1), at 11-12 (Feb. 8, 1983).

⁷ *Verified Statement of Economists Supporting the Principles of Constrained Market Pricing*, (attached) signed by Marcus Alexis (Northwestern University), Kenneth Arrow (Stanford University), Elizabeth Bailey (Carnegie Mellon University), Professor William J. Baumol (Princeton and New York Universities), Professor Charles H. Berry (Princeton University), Ronald R. Braeutigam (Northwestern University), Professor Ann F. Friedlaender (M.I.T.), Professor Richard Gilbert (Stanford University), Stephen M. Goldfeld (Princeton University), Professor Janusz Ordover (New York University), Professor John Panzar (Northwestern University), Professor Almarin Phillips (University of Pennsylvania), Professor James Rosse (Stanford University), Professor David Sappington (University of Pennsylvania), and Professor Robert D. Willig (Princeton University).

leading academic economists demonstrated the falsity of the claim in the *Faulhaber V.S.* (p. 11) that “the use of the stand-alone cost test for STB rate-making in the freight industry has no economic validity and is unsupported by the economic literature.”

The economists’ verified statement proceeded with timeless accuracy to offer an articulation, that deserves repetition here, of the economic theory behind their stated agreement with the SAC analysis of the ICC:

To prevent abuse of any monopoly power, there is no need to regulate prices that are no higher than those which could prevail under effective competition. Where competition is effective, no railroad will be able to charge any shipper rates in excess of the minimum cost (including the capital costs) that would be incurred currently to provide the service in isolation. The reason for this constraint is simple: in a market subject to effective active or potential competition, any railroad charging in excess of that amount would invite entry into the market by a firm willing to charge no more than is necessary just to cover that level of costs. Since the stand-alone cost is the minimum current cost of providing a service in isolation, the stand-alone cost test is the proper means to ensure that rates do not involve any abuse of monopoly power.

The Commission is also correct in recognizing that the stand-alone cost test applies to rates for groups of services or shippers as well as individual services. Just as rates that return revenues in excess of the minimum current cost of providing a single service will invite entry by a competitor willing to charge rates which earn no more than that level of costs, rates consistently in excess of the minimum current cost of providing any group of services will also invite competition.

We agree further, that stand-alone costs must include or reflect the total current replacement costs of providing a service or group of services in isolation. This is so whether current costs are higher or lower than costs that were incurred in the past, for the costs that pricing in competitive markets, i.e. the costs of entry, are always current replacement costs.⁸

The basic economic theory explained here is still the foundation for the appropriate use of stand-alone costs in assessing maximum rate reasonableness for railroads with market dominance over particular shippers. Some twenty years later, an

⁸ *Verified Statement of Economists Supporting the Principles of Constrained Market Pricing* pp. 6-7.

analogous, accurate and more up-to-date articulation appeared in a book intended to convey guidance on regulatory policy under the auspices of the World Bank:

A critical issue for efficiency is the criterion used to set rate ceilings for captive shippers—that is, where the railroad has market dominance. Although rate ceilings derived from fully distributed costs are inimical to the public interest, economically rational ceilings can be obtained from stand-alone costs. These are the costs of serving any captive shipper or group of shippers that benefit from sharing joint and common costs as if the shipper or group were isolated from the railroad’s other customers (see endnote 4 of executive summary). The stand-alone cost method finds the theoretically maximum rate that a railroad could levy on shippers without losing its traffic to a hypothetical competing service offered by a hypothetical entrant facing no entry barriers or by a shipper providing the service itself.⁹

This report for the World Bank then describes why the constrained market pricing approach adopted by the ICC offered a “promising solution” to the regulatory dilemma of how to regulate rates where there is an absence of competition, yet promote efficient rail operations.

[T]he firm cannot adopt a price higher than what an efficient entrant (rival) could afford to charge for the product in a competitive market where inputs are available on competitive terms. This price ceiling is the stand-alone cost of the product or service. A price constrained not to exceed the stand-alone cost ensures that customers pay no more than they would have if the item had been sold in an effectively competitive (contestable) market.¹⁰

The 2004 World Bank Policy Report confirmed that “[t]he main purpose of the stand-alone cost ceiling, aside from its role in eliciting economic efficiency, is to protect consumers from monopolistic exploitation by the regulated firm.”¹¹

In sum, the economic literature plainly supports the Board’s use of the stand-alone cost test. Support is found in the clarity of the fundamental connections between

⁹ Kessides, Ioannis, *Reforming Infrastructure: Privatization, Regulation and Competition*, a World Bank Policy Research Report, published by the World Bank and Oxford University Press, 2004, pp. 193-94.

¹⁰ *Id.* at 273-274 (internal citations omitted).

¹¹ *Id.*

the stand-alone cost test and the valid economics of the competitive standard articulated in Faulhaber's own 1988 contribution to the economic literature. It is found in the 1983 verified statement of the many leading academic economists in support of stand-alone cost principles. And support is found in the 2004 World Bank Policy Report by Ioannis Kessides and several other sources from the economic literature discussed below. The claim that "the use of the stand-alone cost test for STB rate-making in the freight industry has no economic validity and is unsupported by the economic literature" (Faulhaber V.S. p. 11) cannot withstand scrutiny.

Professor Faulhaber offers several reasons for this assertion. He asserts that there is no economic justification for using the stand-alone cost test as a measure of cross-subsidy. He claims that the test does not protect shippers from abuses of market power. And he states that the test deprives shippers of the benefits from railroad economies of scope and scale. Each reason is incorrect, as discussed below.

III. The Cross-Subsidization Interpretation of the Stand-alone Cost Test Is Valid

The first reason offered by Professor Faulhaber for his negative conclusion about the use of SAC is that: "The model of the industry assumed in Faulhaber (1975) bears no relation to the STB regulated freight shipping industry, and never has. Conclusion: there can be no economic justification for the use of the stand-alone cost test as a measure of cross-subsidy for railroads. None" (Faulhaber V.S. p. 7).¹²

The primary distinction between the model analyzed in Faulhaber (1975) and the rail freight shipping industry that Professor Faulhaber points to is that the model assumes that total revenues are equal to total costs, while he avers that "railroads are not subject to a profit constraint and by any measure are highly profitable today" (Faulhaber V.S. p. 7). This distinction appears to be important to Professor Faulhaber due to his logical demonstration in Faulhaber (1975) that if the revenues from some services exceed their stand-alone costs, then given that total revenues equal total costs, it must follow that some other services pay revenues below their incremental costs. Thus, failure of the

¹² Faulhaber (1975) refers to Faulhaber, G.R., "Cross-Subsidization: Pricing in Public Enterprises," *American Economic Review*, 65, 1975, pp. 966-77.

stand-alone cost test by some services, in such a setting, implies that they are providing a cross-subsidy to the other services that are priced below the costs that they cause – their incremental costs. And, it is true that without the assumption that total revenues equal (or are less than) total costs, failure of the stand-alone cost test does not logically imply that some other services are necessarily receiving a cross-subsidy.

There are several significant points to note in response. As a preliminary observation, note that the assumption in Faulhaber (1975) is that total revenues equal total costs, where costs are assessed in the same manner as are stand-alone costs – i.e. on a replacement cost basis. While the Faulhaber V.S. asserts that the railroads “by any measure are highly profitable today,” (Faulhaber V.S. p. 7) he does not claim support for a conclusion that their revenues exceed replacement costs. His problem with deviation of the industry from the assumptions of the model in Faulhaber (1975) would only begin to arise if revenues were to exceed replacement costs.

More significantly, consistent with Faulhaber (1975), it can be logically asserted that rates that produce revenues at or below stand-alone costs cannot be the source of cross-subsidies, regardless of the relationship between total revenues and total costs. Thus, the connection between the stand-alone cost test and cross-subsidization can be maintained, regardless of viewpoints on the railroad’s total finances. The use of SAC for purposes of assessing maximum rate reasonableness for traffic over which the railroad is market dominant is that it ensures that rates that pass the stand-alone cost test are guaranteed to be free of provision of cross-subsidies. The stand-alone cost test thus protects shippers that lack effective competition from the burden that their supplying a cross-subsidy would impose on them, regardless of whether services that would receive the benefits of such a cross-subsidy can be identified or even ascertained, and regardless of the total finances of the railroad.

Contrary to the Faulhaber V.S., economic literature reaches this same conclusion. Meitzen and Larson observe that “SAC can serve as the theoretically correct basis for revenue ceilings, and can serve as an independent cost-based test for cross-subsidies. When a multiproduct firm is constrained to zero economic profits, one can test for the existence of cross-subsidies by performing either a SAC test or an incremental cost test, but both are not needed. Passing a SAC test implies that the appropriate incremental cost

test will also be passed. **Finally, if the revenues for a service (or a group of services) are less than SAC, then this service (or group of services) cannot be said to be the source of a subsidy even if economic profits exist.**¹³

On a more technical point, the Faulhaber V.S. highlights as another distinction between Professor Faulhaber’s model and the industry that “the focus of the cross-subsidy work was on well-defined (by tariff) *services* (not individual customers, such as captive shippers).”¹⁴ However, the Faulhaber V.S. does not explain why or how that distinction makes a difference to the analysis or to the underpinnings of the use of SAC in CMP. Indeed, in another of his contributions to the economics literature, on the subject of cross-subsidy tests, Professor Faulhaber seems to address this issue under the heading of “How Are the Firm’s Services Defined?”¹⁵ He replies to his own question with: “In brief, the answer is that anything the enterprise assigns a separate price to can and should be treated as a separate service.”¹⁶ Although it is not clear that Professor Faulhaber intended this answer to apply generally, despite its wording, on its face it seems to imply that the supply of rail freight transport to a shipper that bears a separate price (as is often the case for substantial shippers) can and should be viewed as a separate service for the purpose of analyzing cross-subsidization with SAC. As such, there would be only limited or no basis for the concerns expressed in the Faulhaber V.S. about the distinction between the focus on services in the model in Faulhaber (1975) and the industry focus on applying SAC to shippers that lack effective competition. In any event, there is no concern based on economic theory about applying the SAC test to the revenues and stand-alone costs of the services supplied to individual or groups of shippers – especially if their rates are not rigidly linked to the rates of other shippers left out of the stand-alone cost traffic group.

¹³ Meitzen, Mark E. and Alexander C. Larson, “Uses and Abuses of Stand-Alone Costs,” *Utilities Policy*, April 1992, p. 137 (emphasis added). The *Verified Statement of Economists Supporting the Principles of Constrained Market Pricing* is in explicit agreement. For example: “Rather, as the Commission recognizes, a cross-subsidy can only occur in an economic sense where a shipper (or group of shippers) pays more than the total cost of serving it alone” (pp. 7-8).

¹⁴ Faulhaber V.S. p. 7.

¹⁵ Faulhaber, G.R., “Cross-Subsidy Analysis with More Than Two Services,” *Journal of Competition Law & Economics*, 1(3), 2005, p. 446.

¹⁶ *Id.*

Finally, on the role of cross-subsidization as a basis for the validity of the role of SAC in CMP, even though the SAC test can be properly interpreted as a test for the possibility that the issue traffic is providing cross-subsidies, as explained above, there is no need to rely on that interpretation of the SAC test. Instead, the SAC test provides shippers that lack effective competition with protections against exploitation of monopoly power over them, just as they would receive from effective competition in contestable markets. This is so regardless of the perceived state of the overall finances of the railroad, and regardless of whether recipients of any cross-subsidies can be identified.

IV. The Stand-alone Cost Test Provides Shippers the Protection From Monopoly Power That They Would Receive From Competition in Contestable Markets

Professor Faulhaber then asserts that the BPW book on contestability also fails to support the STB's adoption of SAC, asserting: "Unfortunately, the failure of STB-regulated rail firms to fit the model of Faulhaber (1975) also applies here. [In] BPW [1982], the firm is also assumed to be a profit-constrained enterprise for which regulators control all the prices of the enterprise, which also apply to services (not individuals)" (Faulhaber V.S. pp. 7-8).¹⁷

This assertion is unambiguously wrong in each of its three prongs. First, the Faulhaber V.S. states, as quoted above, that in BPW (1982) the firm is assumed to be a profit-constrained enterprise. That is not the case. Rather it is proven in BPW (1982) (p. 314, referring back to p. 201) that in the absence of entry barriers, in a sustainable industry configuration (which is a requirement of equilibrium), each firm must earn zero economic profit. Hence, contrary to the claim in the Faulhaber V.S., this characteristic is not an assumption, as it is in Faulhaber (1975), but a conclusion that follows from the properties of the absence of entry barriers in contestable markets.

Second, the Faulhaber V.S. asserts that in BPW (1982) the firm is assumed to be an enterprise for which regulators control all the prices. That is not the case. Instead, to the contrary, the firms and their prices are assumed to be entirely free of regulation. Rather, the firms are under strong competitive pressures, particularly pressures from

¹⁷ BPW (1982) here refers to Baumol, W.J., Panzar, J.C., and Willig, R.D., *Contestable Markets and the Theory of Industry Structure*, New York, 1982, Harcourt Brace Jovanovich.

potential entrants who face no entry barriers by the assumptions of what constitutes contestable markets, and the firms are free to choose their own prices accordingly. BPW (1982) demonstrates that the chosen prices affect demands for the firms' products and must be sustainable in equilibrium in that they do not provide profit incentives for new firms to enter the markets.

Third, and finally, the Faulhaber V.S. asserts that in BPW (1982), as in Faulhaber (1975), the prices of the enterprise apply to services (not individuals). This assertion is wrong. In BPW there is a set of products with no restrictions on them, so that the analysis could represent situations where some products are particular to some one or more consumers, without demand from other consumers, while other products are demanded by consumers generally. It is most germane to recognize that in BPW (1982), on page 313 and 354 for example, in a sustainable industry configuration (a requirement for equilibrium in contestable markets), the stand-alone cost test must be satisfied, in order to remove incentives for entry, for any collection of quantities of the products that are less than or equal to total market demands. In other words, equilibrium in contestable markets forces revenues to be less than or equal to stand-alone costs for any quantities that do not exceed the levels of total market demand for any or all of the markets' products.

So, for example, revenues must not be greater than stand-alone costs for each service and each group of services, if that is the way that the firm organizes its sales.¹⁸ And it is the case that revenues must not be greater than stand-alone costs for the quantities purchased by any given consumer, and also for the aggregate quantities of any group of consumers, and also for any portions of the aggregate quantities of any group of consumers. This is a clear consequence of the nature of contestable markets, since potential entrants have the capability of entering the markets with no entry barriers in order to sell any quantities of the markets' goods to whatever consumers want them, so long as there is demand for them, and so long as the entrant can cover its (stand-alone) costs with revenues from the prices it charges that do not exceed those of the incumbent firms. Consequently, if the incumbents' revenues exceed stand-alone costs for any

¹⁸ It may be worth noting that in BPW pp. 352-356 the work of Faulhaber (1975) is discussed, and it is shown that the results about cross-subsidization derived to hold in contestable markets are substantial generalizations of his earlier results.

feasible quantities of the markets' goods, then there will be positive incentives for entry that disturbs equilibrium. It follows that consumers in contestable markets are protected by competition from having to pay prices that generate revenues that fail any flexibly defined proper stand-alone cost test.

So contrary to Professor Faulhaber's assertions, the BPW (1982) model is amply flexible to fit STB-regulated rail firms, and it shows that the stand-alone cost test provides to shippers the protections against excessive prices that they would have as a result of competition in contestable markets.

This conclusion was fully articulated in the economic literature by Baumol and Willig,¹⁹ as well as by others.²⁰ We began our discussion of the connections between CMP and contestable market theory with this very pertinent quote from the ICC:

A rate level calculated by the SAC methodology represents the theoretical maximum rate that a railroad could levy on shippers without substantial diversion of traffic to a hypothetical competing service. It is, in other words, a simulated competitive price. (The competing service could be a shipper providing service for itself or a third party competing with the incumbent railroad for traffic. In either case, the SAC represents the minimum cost of an alternative to the service provided by the incumbent railroad.) The theory behind SAC is best explained by the concept of 'contestable markets.' This recently developed economic theory augments the classical economic model of 'pure competition' with a model which focuses on the entry and exit from an industry as a measure of economic efficiency. The theory of contestable markets is more general than that of 'pure competition' because it does not require a large number of firms. In fact, even a monopoly can be contestable. The underlying premise is that a monopolist or oligopolist will behave efficiently and competitively where there is a threat of losing some or all of its markets to a new entrant. In

¹⁹ 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.

²⁰ See, e.g., Braeutigam, R.R., "Optimal Policies for Natural Monopolies", in R. Schmalensee and R. Willig. eds. *Handbook of Industrial Organization*, Vol 2, North-Holland, Amsterdam, 1989, p. 1340; Faulhaber, G.R. and William J. Baumol, "Economists as Innovators: Practical Products of Theoretical Research," *Journal of Economic Literature*, Vol. 26, No. 2 (Jun. 1988), pp. 595-596; Kessides, Ioannis, *Reforming Infrastructure: Privatization, Regulation and Competition*, a World Bank Policy Research Report, published by the World Bank and Oxford University Press, 2004, pp.193-194.

other words, contestable markets have competitive characteristics which preclude monopoly pricing.²¹

We then proceeded to give this summary of our own research on the subject:

In perfectly contestable markets, the price of a product will lie somewhere between its incremental and its stand-alone cost, just where it falls in that range depending on the state of demand. One cannot legitimately infer that monopoly power is exercised from data showing that prices do not exceed stand-alone costs, and stand-alone costs constitute the proper cost-based ceilings upon prices, preventing both cross-subsidization and the exercise of monopoly power (see Faulhaber (1975) for tests of cross-subsidy and their equivalence).

* * *

Thus, the forces of idealized potential competition in perfectly contestable markets enforce cost constraints on prices, but prices remain sensitive to demands as well. Actual and potential competition are effective if they constrain rates in this way, and in such circumstances regulatory intervention is completely unwarranted. But if, in fact, market forces are not sufficiently strong, then there is likely to be a proper role for regulation, and the theoretical guidelines derived from the workings of contestable markets are the appropriate ones to apply. That is, prices must be constrained to lie between incremental and stand-alone costs.²²

The formal relationship between SAC and the theory of contestable markets is noted in the chapter of the *Handbook of Industrial Organization* on the optimal regulation of natural monopoly, by Ronald Braeutigam. After discussing two observations about the stand-alone cost test as a subsidy test setting an upper bound on the revenues generated by services, Braeutigam wrote:

Third, in a contestable market, one would expect entry to occur if any of the subsidy tests (on any subset of services) were not satisfied.²³

²¹ *Coal Rate Guidelines, Nationwide*, 1 I.C.C.2d 520, 528 (1985), *aff'd sub nom. Consolidated Rail Corp. v. United States*, 812 F.2d 1444 (3d Cir. 1987).

²² 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. 31-32.

²³ Braeutigam, R.R., "Optimal Policies for Natural Monopolies", in R. Schmalensee and R. Willig, eds. *Handbook of Industrial Organization*, Vol 2, North-Holland, Amsterdam, 1989, p. 1340.

And, as my last, but not least, example of support from the economic literature for the stand-alone cost test, here is the string of quotes from the article by Gerald Faulhaber and William Baumol that I presaged in the introduction:

Now, stand-alone cost is itself an example of a recent contribution of economic theory to regulatory practice Though the stand-alone criterion predates the literature on contestable markets, it is the latter that completes the rationale for the criterion as a regulatory instrument consumers are appropriately protected in terms of pricing [by the stand-alone cost test] The contestability literature (Baumol, Panzar, and Willig 1988) adopted the idea from Faulhaber, and showed explicitly that it constituted a key element of a program of rate regulation that, perhaps for the first time, was fully embedded in the logic of economic analysis.²⁴

V. The Stand-alone Cost Test Allows Shippers to Benefit from Railroad Economies of Scale and Scope.

The final substantive reason offered in the Faulhaber V.S. to discredit the stand-alone cost test is that it allegedly does not permit shippers to benefit fully from economies of scale and scope, and it therefore is an inappropriate tool to determine rate levels. The Faulhaber V.S. asserts:

In the context of cross-subsidy and contestable markets, then, stand-alone costs are an absolute upper limit on pricing, which in themselves do not permit the sharing of the benefits of the scale and scope of the firm, and by no means [are] a prescription for rate-setting (Faulhaber V.S. p. 8).

This assertion is wrong in completely ignoring the fact that the stand-alone cost test empowers a complaining shipper over whom the railroad has market dominance to include in its test any and all the additional traffic that the shipper believes contributes economies of scale or scope to the railroad's provision of its services.²⁵ Through this process, the shipper can assure that it shares in the benefits of the railroad's economies of scale and scope, since the amount of the stand-alone costs that the complaining shipper's

²⁴ Faulhaber, G.R. and William J. Baumol, "Economists as Innovators: Practical Products of Theoretical Research," *Journal of Economic Literature*, Vol. 26, No. 2 (Jun., 1988), pp. 595-596.

²⁵ The topic of how important it is to effectively choose the traffic group included in the SAC test is a primary theme of Faulhaber, G. R., "Cross-Subsidy Analysis with More Than Two Services," *Journal of Competition Law & Economics*, 1(3), 2005, pp. 441-448.

revenues may be called upon to cover decreases whenever more traffic can be added to the stand-alone railroad such that the traffic's incremental revenue exceeds the additional costs incurred by the stand-alone railroad to access and handle that additional traffic. The addition to the cost of the stand-alone railroad due to adding additional traffic is lower, and thus the added traffic is more beneficial to the complaining shipper, the stronger are the economies of scale and scope.

Therefore, the ICC was correct when it concluded that "the presence and extent of production economies can be tested in each case through a stand-alone cost calculation."²⁶ The ICC properly reasoned that "If these economies are significant, the captive shipper can increase the traffic base for the stand-alone system in order to lower the cost to itself. At the point that additional traffic would not lower the cost to the stand-alone group of shippers, production economies are exhausted and the most efficient plant size has been demonstrated. Thus, by adjusting both the plant and the traffic base, the captive shipper can identify and take full advantage of any economies of scope, scale and density."²⁷

A simple numerical example will help to illustrate these principles. In the example depicted in **Figure 1** and **Table 1**, below, the complaining shipper's issue traffic flows from Origin 1 to Destination 1 along facilities that include interchange 1 (I-1) and interchange 2 (I-2). The revenue paid to the railroad for this issue traffic by the complaining shipper, less the variable cost incurred by the railroad to move this traffic, is the net revenue of 13. Underlying these figures is a time frame that for this example applies to the flow of the issue and the other traffic. Over this same time frame, the fixed costs of the railroad's facilities that go from Origin 1 to Destination 1 are $5+5+5 = 15$. Assume for this example that the railroad is market-dominant with respect to the issue traffic. Then, application of the stand-alone cost test to the issue traffic alone shows that the gross revenues, that equal 13 plus the variable costs, are less than the stand-alone costs that equal 15 plus the same variable costs.

²⁶ *Coal Rate Guidelines*, 1 I.C.C.2d at 532.

²⁷ *Id.*

Figure 1

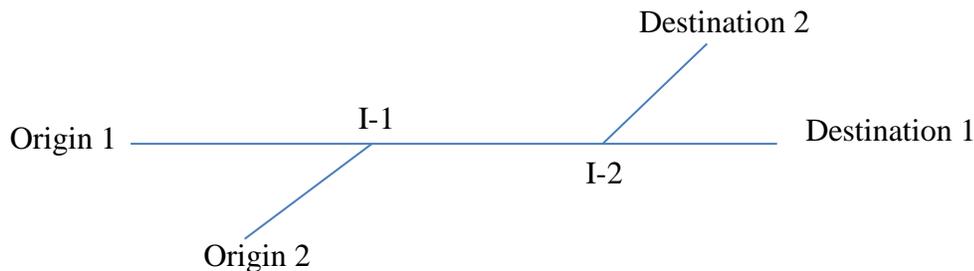


Table 1

Net revenue from issue traffic	13
Net revenue from additional traffic	10
Facilities cost from Origin 1 to I-1	5
Facilities cost from I-1 to I-2	5
Facilities cost from I-2 to Destination 1	5
Facilities cost from Origin 2 to I-1	3
Facilities cost from I-2 to Destination 2	3

In this example, a complaining shipper who ships from Origin 1 to Destination 1 could not prevail under the stand-alone cost test if it only built a SARR to handle its own traffic. However, the complaining shipper may feel that it is not getting the benefit in its rates of the railroad’s economies of scale and scope, since it knows that the facilities that serve its traffic are also utilized to serve other traffic as well. The stand-alone cost test enables shippers to make sure they are getting any benefits of economies of scale and scope that are experienced by the railroad, because the shipper is entitled to consider expanding the domain of the stand-alone cost test to include the revenues and costs that arise from any additional traffic that shares common costs with the issue traffic.

In the example illustrated by **Figure 1** and **Table 1**, the net revenues from the issue traffic together with the additional traffic that flows from Origin 2 to Destination 2 totals 23. The stand-alone cost of the facilities needed to transport both the issue and the additional traffic include the $5+5+5 = 15$ as before, plus the costs of 3 of the facilities needed to bring the additional traffic from Origin 2 to I-1, plus the costs of 3 of the facilities needed to bring the additional traffic from I-2 to Destination 2, for a total facilities stand-alone cost of 21. Here, with the net revenues of all the included traffic of 23 exceeding the needed facilities’ stand-alone cost of 21, the complaining shipper would be shown to be correct that its rates do not reflect the full benefits of the railroad’s

economies of scale and scope, that it is paying more than it would have to with the protections of a fully competitive contestable market, and that regulation under Constrained Market Pricing would not permit those rates to be charged. In this way, complaining shippers can make sure their rates do reflect benefits of the railroad's economies of scale and scope by exercising their ability to expand the ambit of the stand-alone cost test to include traffic that is additional to their issue traffic, and that shares common facilities in a fashion that engenders economies of scale or scope.

Thus, this example well illustrates why it is that the *Faulhaber V.S.* is wrong in its assertion that the SAC test denies to shippers the benefits of railroads' economies of scale and scope, so long as the use of SAC allows the shipper to expand the stand-alone railroad, as does CMP, to include additional traffic that shares common facilities.

VIII. Conclusion

The *Faulhaber V.S.* constitutes a dramatically worded attack on the use of the stand-alone cost test in railroad regulation, but I have shown that each element of Professor Faulhaber's claims is wrong.

The writings of distinguished economists, including the past writings of Professor Faulhaber, affirm that the stand-alone cost test is economically valid, and that it is based on economic modeling that applies to the STB-regulated freight industry. The stand-alone cost test protects shippers without effective competition from exploitation of monopoly power by assuring that they need pay no more than they would have if they were making their purchases in effectively competitive (contestable) markets. In its original articulation, the ICC understood the fundamental economics that still holds: "Thus, the stand-alone cost serves as a surrogate for competition: it enforces a competitive standard on rail rates in the absence of any real competitive alternative."²⁸

The kind of frustrations expressed in Professor Faulhaber's statement about the use of stand-alone costs should be channeled into appropriately constructive practical measures like the STB's adoption of simplified SAC, rather than destructively impelling

²⁸ *Coal Rate Guidelines, Nationwide*, Ex Parte No. 347 (Sub-No. 1), at 11 (Feb. 8, 1983).

false attacks on the economic foundations of SAC. It is most important for the future of the industry to avoid regulatory measures that may appear to be practical but that are dangerously distorting because they are not based on the theoretical economic guideposts of competition. Instead, it should be recognized that it is the sound economics of CMP that still provide an appropriate guide for regulatory solutions, where they are needed, that are based on competitive standards. Accordingly, the Board should reject efforts to have it discard the SAC test as the centerpiece of its CMP Guidelines, and it should be vigilant to guard against suggested “reform” measures that would undermine the sound and well-supported theoretical underpinnings of that test.

VERIFICATION

I, Robert Willig, 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: November 1, 2014


Robert Willig

Appendix A

Curriculum Vitae

Name: Robert D. Willig

Address: 220 Ridgeview Road, Princeton, New Jersey 08540

Birth: 1/16/47; Brooklyn, New York

Marital Status: Married, four children

Education: Ph.D. Economics, Stanford University, 1973
Dissertation: Welfare Analysis of Policies
Affecting Prices and Products.
Advisor: James Rosse

M.S. Operations Research, Stanford University, 1968.

A.B. Mathematics, Harvard University, 1967.

Professional Positions:

Professor of Economics and Public Affairs, Princeton University, 1978-.

Principal External Advisor, Infrastructure Program, Inter-American Development Bank, 6/97-8/98.

Deputy Assistant Attorney General, U.S. Department of Justice, 1989-1991.

Supervisor, Economics Research Department, Bell Laboratories, 1977-1978.

Visiting Lecturer (with rank of Associate Professor), Department of Economics and Woodrow Wilson School, Princeton University, 1977-78 (part time).

Economics Research Department, Bell Laboratories, 1973-77.

Lecturer, Economics Department, Stanford University, 1971-73.

Other Professional Activities

ABA Section of Antitrust Law Economics Task Force, 2010-2012

Advisory Committee, Compass Lexecon 2010 -

OECD Advisory Council for Mexican Economic Reform, 2008 - 2009

Senior Consultant, Compass Lexecon, 2008 -

Director, Competition Policy Associates, Inc., 2003-2005

Advisory Bd., Electronic Journal of I.O. and Regulation Abstracts, 1996-2008.

Advisory Board, Journal of Network Industries, 2004-2010.

Visiting Faculty Member (occasional), International Program on Privatization and Regulatory Reform, Harvard Institute for International Development, 1996-2000.

Member, National Research Council Highway Cost Allocation Study Review Committee, 1995-98.

Member, Defense Science Board Task Force on the Antitrust Aspects of Defense Industry Consolidation, 1993-94.

Editorial Board, Utilities Policy, 1990-2001.

Leif Johanson Lecturer, University of Oslo, November 1988.

Member, New Jersey Governor's Task Force on Market-Based Pricing of Electricity, 1987-89.

Co-editor, Handbook of Industrial Organization, 1984-89.

Associate Editor, Journal of Industrial Economics, 1984-89.

Director, Consultants in Industry Economics, Inc., 1983-89, 1991-94.

Fellow, Econometric Society, 1981-.

Organizing Committee, Carnegie-Mellon-N.S.F. Conference on Regulation, 1985.

Board of Editors, American Economic Review, 1980-83.

Nominating Committee, American Economic Association, 1980-1981.

Research Advisory Committee, American Enterprise Institute, 1980-1986.

Editorial Board, M.I.T. Press Series on Government Regulation of Economic Activity, 1979-93.

Program Committee, 1980 World Congress of the Econometric Society.

Program Committee, Econometric Society, 1979, 1981, 1985.

Organizer, American Economic Association Meetings: 1980, 1982.

American Bar Association Section 7 Clayton Act Committee, 1981.

Principal Investigator, NSF grant SOC79-0327, 1979-80; NSF grant 285-6041, 1980-82; NSF grant SES-8038866, 1983-84, 1985-86.

Aspen Task Force on the Future of the Postal Service, 1978-80.

Organizing Committee of Sixth Annual Telecommunications Policy Research Conference, 1977-78.

Visiting Fellow, University of Warwick, July 1977.

Institute for Mathematical Studies in the Social Sciences, Stanford University, 1975.

Published Articles and Book Chapters:

"Unilateral Competitive Effects" (with Bryan Keating), in The Oxford Handbook on International Antitrust Economics, (Roger D. Blair and D. Daniel Sokol, eds.), Oxford University Press, forthcoming 2014.

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Unpublished Papers and Reports:

"Commentary on Economics at the FTC: Hospital Mergers, Authorized Generic Drugs, and Consumer Credit Markets" (with Nauman Ilias, Bryan Keating, and Paolo Ramezzana), under revision for Review of Industrial Organization.

"Recommendations for Excessive-Share Limits in the Surfclam and Ocean Quahog Fisheries" (with Glenn Mitchell and Steven Peterson), Report to National Marine Fisheries Service and the Mid-Atlantic Fishery Management Council, 5/23/2011.

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"Stimulating Investment and the Telecommunications Act of 1996," (with J. Bigelow, W. Lehr and S. Levinson), 2002.

"An Economic Analysis of Spectrum Allocation and Advanced Wireless Services," (with Martin N. Baily, Peter R. Orszag, and Jonathan M. Orszag), 2002

"Effective Deregulation of Residential Electric Service," 2001

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"The Scope of Competition in Telecommunications" (with B. Douglas Bernheim), 1998 "Why

Do Christie and Schultz Infer Collusion From Their Data? (with Alan Kleidon), 1995.

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"Economic Analysis of Section 337: The Balance Between Intellectual Property Protection and Protectionism," (with J. Ordovery) 1990.

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"Discussion of Regulatory Mechanism Design in the Presence of Research Innovation, and Spillover Effects," 1987.

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"Rail Deregulation and the Financial Problems of the U.S. Railroad Industry," (with W.J. Baumol), report prepared under contract to Conrail, 1979.

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Invited Conference Presentations:

Brookings Institution Conference on The Economics of the Airline Industry

"Airline Network Effects and Consumer Welfare"	2012
AGEP Public Policy Conference on Pharmaceutical Industry Economics, Regulation and Legal Issues; Law and Economics Center, George Mason University School of Law "Pharmaceutical Brand-Generic Disputes"	2012
U.S.-EU Alliance Study Peer Review Conferences "Review of Cooperative Agreements in Transatlantic Airline Markets"	2012
"The Research Agenda Ahead"	2012
Antitrust in the High Tech Sector Conference "Developments in Merger Enforcement"	2012
Georgetown Center for Business and Public Policy, Conference on the Evolution of Regulation "Reflections on Regulation"	2011
Antitrust Forum, New York State Bar Association "Upward Price Pressure, Market Definition and Supply Mobility"	2011
American Bar Association, Antitrust Section, Annual Convention "The New Merger Guidelines' Analytic Highlights"	2011
OECD and World Bank Conference on Challenges and Policies for Promoting Inclusive Growth "Inclusive Growth From Competition and Innovation"	2011
Villanova School of Business Executive MBA Conference "Airline Network Effects, Competition and Consumer Welfare"	2011
NYU School of Law Conference on Critical Directions in Antitrust "Unilateral Competitive Effects"	2010
Conf. on the State of European Competition Law and Enforcement in a Transatlantic Context "Recent Developments in Merger Control"	2010
Center on Regulation and Competition, Universidad de Chile Law School "Economic Regulation and the Limits of Antitrust Law"	2010
Center on Regulation and Competition, Universidad de Chile Law School "Merger Policy and Guidelines Revision"	2010
Faculty of Economics, Universidad de Chile "Network Effects in Airlines Markets"	2010
Georgetown Law Global Antitrust Enforcement Symposium "New US Merger Guidelines"	2010

FTI London Financial Services Conference "Competition and Regulatory Reform"	2010
NY State Bar Association Annual Antitrust Conference "New Media Competition Policy"	2009
Antitrust Law Spring Meeting of the ABA "Antitrust and the Failing Economy Defense"	2009
Georgetown Law Global Antitrust Enforcement Symposium "Mergers: New Enforcement Attitudes in a Time of Economic Challenge"	2009
Phoenix Center US Telecoms Symposium "Assessment of Competition in the Wireless Industry"	2009
FTC and DOJ Horizontal Merger Guidelines Workshop "Direct Evidence is No Magic Bullet"	2009
Northwestern Law Research Symposium: Antitrust Economics and Competition Policy "Discussion of Antitrust Evaluation of Horizontal Mergers"	2008
Inside Counsel Super-Conference "Navigating Mixed Signals under Section 2 of the Sherman Act"	2008
Federal Trade Commission Workshop on Unilateral Effects in Mergers "Best Evidence and Market Definition"	2008
European Policy Forum, Rules for Growth: Telecommunications Regulatory Reform "What Kind of Regulation For Business Services?"	2007
Japanese Competition Policy Research Center, Symposium on M&A and Competition Policy "Merger Policy Going Forward With Economics and the Economy"	2007
Federal Trade Commission and Department of Justice Section 2 Hearings "Section 2 Policy and Economic Analytic Methodologies"	2007
Pennsylvania Bar Institute, Antitrust Law Committee CLE "The Economics of Resale Price Maintenance and Class Certification"	2007
Pennsylvania Bar Institute, Antitrust Law Committee CLE "Antitrust Class Certification – An Economist’s Perspective"	2007
Fordham Competition Law Institute, International Competition Economics Training Seminar "Monopolization and Abuse of Dominance"	2007
Canadian Bar Association Annual Fall Conference on Competition Law	

“Economic Tools for the Competition Lawyer”	2007
Conference on Managing Litigation and Business Risk in Multi-jurisdiction Antitrust Matters “Economic Analysis in Multi-jurisdictional Merger Control”	2007
World Bank Conference on Structuring Regulatory Frameworks for Dynamic and Competitive South Eastern European Markets “The Roles of Government Regulation in a Dynamic Economy”	2006
Department of Justice/Federal Trade Commission Section 2 Hearings “(Allegedly) Monopolizing Tying Via Product Innovation”	2006
Fordham Competition Law Institute, Competition Law Seminar “Monopolization and Abuse of Dominance”	2006
Practicing Law Institute on Intellectual Property Antitrust “Relevant Markets for Intellectual Property Antitrust”	2006
PLI Annual Antitrust Law Institute “Cutting Edge Issues in Economics”	2006
World Bank’s Knowledge Economy Forum V “Innovation, Growth and Competition”	2006
Charles University Seminar Series “The Dangers of Over-Ambitious Antitrust Regulation”	2006
NY State Bar Association Antitrust Law Section Annual Meeting “Efficient Integration or Illegal Monopolization?”	2006
World Bank Seminar “The Dangers of Over-Ambitious Regulation”	2005
ABA Section of Antitrust Law 2005 Fall Forum “Is There a Gap Between the Guidelines and Agency Practice?”	2005
Hearing of Antitrust Modernization Commission “Assessment of U.S. Merger Enforcement Policy”	2005
LEAR Conference on Advances in the Economics of Competition Law “Exclusionary Pricing Practices”	2005
Annual Antitrust Law Institute “Cutting Edge Issues in Economics”	2005
PRIOR Symposium on States and Stem Cells	

“Assessing the Economics of State Stem Cell Programs”	2005
ABA Section of Antitrust Law – AALS Scholars Showcase “Distinguishing Anticompetitive Conduct”	2005
Allied Social Science Associations National Convention “Antitrust in the New Economy”	2005
ABA Section of Antitrust Law 2004 Fall Forum “Advances in Economic Analysis of Antitrust”	2004
Phoenix Center State Regulator Retreat “Regulatory Policy for the Telecommunications Revolution”	2004
OECD Competition Committee “Use of Economic Evidence in Merger Control”	2004
Justice Department/Federal Trade Commission Joint Workshop “Merger Enforcement”	2004
Phoenix Center Annual U.S. Telecoms Symposium “Incumbent Market Power”	2003
Center for Economic Policy Studies Symposium on Troubled Industries “What Role for Government in Telecommunications?”	2003
Princeton Workshop on Price Risk and the Future of the Electric Markets “The Structure of the Electricity Markets”	2003
2003 Antitrust Conference “International Competition Policy and Trade Policy”	2003
International Industrial Organization Conference “Intellectual Property System Reform”	2003
ABA Section of Antitrust Law 2002 Fall Forum “Competition, Regulation and Pharmaceuticals”	2002

Fordham Conference on International Antitrust Law and Policy “Substantive Standards for Mergers and the Role of Efficiencies”	2002
Department of Justice Telecom Workshop “Stimulating Investment and the Telecommunications Act of 1996”	2002
Department of Commerce Conference on the State of the Telecom Sector “Stimulating Investment and the Telecommunications Act of 1996”	2002
Law and Public Affairs Conference on the Future of Internet Regulation “Open Access and Competition Policy Principles”	2002
Center for Economic Policy Studies Symposium on Energy Policy “The Future of Power Supply”	2002
The Conference Board: Antitrust Issues in Today’s Economy “The 1982 Merger Guidelines at 20”	2002
Federal Energy Regulatory Commission Workshop “Effective Deregulation of Residential Electric Service”	2001
IPEA International Seminar on Regulation and Competition “Electricity Markets: Deregulation of Residential Service”	2001
“Lessons for Brazil from Abroad”	2001
ABA Antitrust Law Section Task Force Conference “Time, Change, and Materiality for Monopolization Analyses”	2001
Harvard University Conference on American Economic Policy in the 1990s “Comments on Antitrust Policy in the Clinton Administration”	2001
Tel-Aviv Workshop on Industrial Organization and Anti-Trust “The Risk of Contagion from Multimarket Contact”	2001
2001 Antitrust Conference “Collusion Cases: Cutting Edge or Over the Edge?”	2001
“Dys-regulation of California Electricity”	2001
FTC Public Workshop on Competition Policy for E-Commerce “Necessary Conditions for Cooperation to be Problematic”	2001
HIID International Workshop on Infrastructure Policy “Infrastructure Privatization and Regulation”	2000
Villa Mondragone International Economic Seminar “Competition Policy for Network and Internet Markets”	2000

New Developments in Railroad Economics: Infrastructure Investment and Access Policies “Railroad Access, Regulation, and Market Structure”	2000
The Multilateral Trading System at the Millennium “Efficiency Gains From Further Liberalization”	2000
Singapore – World Bank Symposium on Competition Law and Policy “Policy Towards Cartels and Collusion”	2000
CEPS: Is It a New World?: Economic Surprises of the Last Decade “The Internet and E-Commerce”	2000
Cutting Edge Antitrust: Issues and Enforcement Policies “The Direction of Antitrust Entering the New Millennium”	2000
The Conference Board: Antitrust Issues in Today’s Economy “Antitrust Analysis of Industries With Network Effects”	1999
CEPS: New Directions in Antitrust “Antitrust in a High-Tech World”	1999
World Bank Meeting on Competition and Regulatory Policies for Development “Economic Principles to Guide Post-Privatization Governance”	1999
1999 Antitrust Conference “Antitrust and the Pace of Technological Development”	1999
“Restructuring the Electric Utility Industry”	1999
HIID International Workshop on Privatization, Regulatory Reform and Corporate Governance “Privatization and Post-Privatization Regulation of Natural Monopolies”	1999
The Federalist Society: Telecommunications Deregulation: Promises Made, Potential Lost? “Grading the Regulators”	1999
Inter-American Development Bank: Second Generation Issues In the Reform Of Public Services “Post-Privatization Governance”	1999
“Issues Surrounding Access Arrangements”	1999
Economic Development Institute of the World Bank -- Program on Competition Policy “Policy Towards Horizontal Mergers”	1998
Twenty-fifth Anniversary Seminar for the Economic Analysis Group of the Department of	

Justice		
	“Market Definition in Antitrust Analysis”	1998
HIID International Workshop on Privatization, Regulatory Reform and Corporate Governance		
	“Infrastructure Architecture and Regulation: Railroads”	1998
EU Committee Competition Conference – Market Power		
	“US/EC Perspective on Market Definition”	1998
Federal Trade Commission Roundtable		
	“Antitrust Policy for Joint Ventures”	1998
1998 Antitrust Conference		
	“Communications Mergers”	1998
The Progress and Freedom Foundation Conference on Competition, Convergence, and the Microsoft Monopoly		
	Access and Bundling in High-Technology Markets	1998
FTC Program on The Effective Integration of Economic Analysis into Antitrust Litigation		
	The Role of Economic Evidence and Testimony	1997
FTC Hearings on Classical Market Power in Joint Ventures		
	Microeconomic Analysis and Guideline	1997
World Bank Economists --Week IV Keynote		
	Making Markets More Effective With Competition Policy	1997
Brookings Trade Policy Forum		
	Competition Policy and Antidumping: The Economic Effects	1997
University of Malaya and Harvard University Conference on The Impact of Globalisation and Privatisation on Malaysia and Asia in the Year 2020		
	Microeconomics, Privatization, and Vertical Integration	1997
ABA Section of Antitrust Law Conference on The Telecommunications Industry		
	Current Economic Issues in Telecommunications	1997
Antitrust 1998: The Annual Briefing		
	The Re-Emergence of Distribution Issues	1997
Inter-American Development Bank Conference on Private Investment, Infrastructure Reform and Governance in Latin America & the Caribbean		
	Economic Principles to Guide Post-Privatization Governance	1997

Harvard Forum on Regulatory Reform and Privatization of Telecommunications in the Middle East	1997
Privatization: Methods and Pricing Issues	1997
American Enterprise Institute for Public Policy Research Conference	1997
Discussion of Local Competition and Legal Culture	1997
Harvard Program on Global Reform and Privatization of Public Enterprises	1997
“Infrastructure Privatization and Regulation: Freight”	1997
World Bank Competition Policy Workshop	1997
“Competition Policy for Entrepreneurship and Growth”	1997
Eastern Economics Association Paul Samuelson Lecture	1997
“Bottleneck Access in Regulation and Competition Policy”	1997
ABA Annual Meeting, Section of Antitrust Law	1997
“Antitrust in the 21st Century: The Efficiencies Guidelines”	1997
Peruvian Ministry of Energy and Mines Conference on Regulation of Public Utilities	1997
“Regulation: Theoretical Context and Advantages vs. Disadvantages”	1997
The FCC: New Priorities and Future Directions	1997
“Competition in the Telecommunications Industry”	1997
American Enterprise Institute Studies in Telecommunications Deregulation	1996
“The Scope of Competition in Telecommunications”	1996
George Mason Law Review Symposium on Antitrust in the Information Revolution	1996
“Introduction to the Economic Theory of Antitrust and Information”	1996
Korean Telecommunications Public Lecture	1996
“Market Opening and Fair Competition”	1996
Korea Telecommunications Forum	1996
“Desirable Interconnection Policy in a Competitive Market”	1996
European Association for Research in Industrial Economics Annual Conference	1996
“Bottleneck Access: Regulation and Competition Policy”	1996
Harvard Program on Global Reform and Privatization of Public Enterprises	1996
“Railroad and Other Infrastructure Privatization”	1996

FCC Forum on Antitrust and Economic Issues Involved with InterLATA Entry “The Scope of Telecommunications Competition”	1996
Citizens for a Sound Economy Policy Watch on Telecommunications Interconnection “The Economics of Interconnection”	1996
World Bank Seminar on Experiences with Corporatization “Strategic Directions of Privatization”	1996
FCC Economic Forum on the Economics of Interconnection Lessons from Other Industries	1996
ABA Annual Meeting, Section of Antitrust Law The Integration, Disintegration, and Reintegration of the Entertainment Industry	1996
Conference Board: 1996 Antitrust Conference How Economics Influences Antitrust and Vice Versa	1996
Antitrust 1996: A Special Briefing Joint Ventures and Strategic Alliances	1996
New York State Bar Association Section of Antitrust Law Winter Meeting Commentary on Horizontal Effects Issues	1996
FTC Hearings on the Changing Nature of Competition in a Global and Innovation-Driven Age Vertical Issues for Networks and Standards	1995
Wharton Seminar on Applied Microeconomics Access Policies with Imperfect Regulation	1995
Antitrust 1996, Washington D.C. Assessing Joint Ventures for Diminution of Competition	1995
ABA Annual Meeting, Section of Antitrust Law Refusals to Deal -- Economic Tests for Competitive Harm	1995
FTC Seminar on Antitrust Enforcement Analysis Diagnosing Collusion Possibilities	1995
Philadelphia Bar Education Center: Antitrust Fundamentals Antitrust--The Underlying Economics	1995
Vanderbilt University Conference on Financial Markets	

Why Do Christie and Schultz Infer Collusion From Their Data?	1995
ABA Section of Antitrust Law Chair=s Showcase Program Discussion of Telecommunications Competition Policy	1995
Conference Board: 1995 Antitrust Conference Analysis of Mergers and Joint Ventures	1995
ABA Conference on The New Antitrust: Policy of the '90s Antitrust on the Super Highways/Super Airways	1994
ITC Hearings on The Economic Effects of Outstanding Title VII Orders "The Economic Impacts of Antidumping Policies"	1994
OECD Working Conference on Trade and Competition Policy "Empirical Evidence on The Nature of Anti-dumping Actions"	1994
Antitrust 1995, Washington D.C. "Rigorous Antitrust Standards for Distribution Arrangements"	1994
ABA -- Georgetown Law Center: Post Chicago-Economics: New Theories - New Cases? "Economic Foundations for Vertical Merger Guidelines"	1994
Conference Board: Antitrust Issues in Today's Economy "New Democrats, Old Agencies: Competition Law and Policy"	1994
Federal Reserve Board Distinguished Economist Series "Regulated Private Enterprise Versus Public Enterprise"	1994
Institut d'Etudes Politiques de Paris "Lectures on Competition Policy and Privatization"	1993
Canadian Bureau of Competition Policy Academic Seminar Series, Toronto. "Public Versus Regulated Private Enterprise"	1993
CEPS Symposium on The Clinton Administration: A Preliminary Report Card "Policy Towards Business"	1993
Columbia Institute for Tele-Information Conference on Competition in Network Industries, New York, NY "Discussion of Deregulation of Networks: What Has Worked and What Hasn't"	1993
World Bank Annual Conference on Development Economics "Public Versus Regulated Private Enterprise"	1993

Center for Public Utilities Conference on Current Issues Challenging the Regulatory Process	
"The Economics of Current Issues in Telecommunications Regulation"	1992
"The Role of Markets in Presently Regulated Industries"	1992
The Conference Board's Conference on Antitrust Issues in Today's Economy, New York, NY	
"Antitrust in the Global Economy"	1992
"Monopoly Issues for the '90s"	1993
Columbia University Seminar on Applied Economic Theory, New York, NY	
"Economic Rationales for the Scope of Privatization"	1992
Howrey & Simon Conference on Antitrust Developments, Washington, DC	
"Competitive Effects of Concern in the Merger Guidelines"	1992
Arnold & Porter Colloquium on Merger Enforcement, Washington, DC	
"The Economic Foundations of the Merger Guidelines"	1992
American Bar Association, Section on Antitrust Law Leadership Council Conference, Monterey, CA	
"Applying the 1992 Merger Guidelines"	1992
OECD Competition Policy Meeting, Paris, France	
"The Economic Impacts of Antidumping Policy"	1992
Center for Public Choice Lecture Series, George Mason University Arlington, VA	
"The Economic Impacts of Antidumping Policy"	1992
Brookings Institution Microeconomics Panel, Washington, DC,	
"Discussion of the Evolution of Industry Structure"	1992
AT&T Conference on Antitrust Essentials	
"Antitrust Standards for Mergers and Joint Ventures"	1991
ABA Institute on The Cutting Edge of Antitrust: Market Power	
"Assessing and Proving Market Power: Barriers to Entry"	1991
Second Annual Workshop of the Competition Law and Policy Institute of New Zealand	
"Merger Analysis, Industrial Organization Theory, and Merger Guidelines"	1991
"Exclusive Dealing and the <u>Fisher & Paykel</u> Case"	1991
Special Seminar of the New Zealand Treasury	
"Strategic Behavior, Antitrust, and The Regulation of Natural Monopoly"	1991

Public Seminar of the Australian Trade Practices Commission "Antitrust Issues of the 1990's"	1991
National Association of Attorneys General Antitrust Seminar "Antitrust Economics"	1991
District of Columbia Bar's 1991 Annual Convention "Administrative and Judicial Trends in Federal Antitrust Enforcement"	1991
ABA Spring Meeting "Antitrust Lessons From the Airline Industry"	1991
Conference on The Transition to a Market Economy - Institutional Aspects "Anti-Monopoly Policies and Institutions"	1991
Conference Board's Thirtieth Antitrust Conference "Antitrust Issues in Today's Economy"	1991
American Association for the Advancement of Science Annual Meeting "Methodologies for Economic Analysis of Mergers"	1991
General Seminar, Johns Hopkins University "Economic Rationales for the Scope of Privatization"	1991
Capitol Economics Speakers Series "Economics of Merger Guidelines"	1991
CRA Conference on Antitrust Issues in Regulated Industries "Enforcement Priorities and Economic Principles"	1990
Pepper Hamilton & Scheetz Anniversary Colloquium "New Developments in Antitrust Economics"	1990
PLI Program on Federal Antitrust Enforcement in the 90's "The Antitrust Agenda of the 90's"	1990
FTC Distinguished Speakers Seminar "The Evolving Merger Guidelines"	1990
The World Bank Speakers Series "The Role of Antitrust Policy in an Open Economy"	1990
Seminar of the Secretary of Commerce and Industrial Development of Mexico "Transitions to a Market Economy"	1990

Southern Economics Association	
"Entry in Antitrust Analysis of Mergers"	1990
"Discussion of Strategic Investment and Timing of Entry"	1990
American Enterprise Institute Conference on Policy Approaches to the Deregulation of Network Industries	
"Discussion of Network Problems and Solutions"	1990
American Enterprise Institute Conference on Innovation, Intellectual Property, and World Competition	
"Law and Economics Framework for Analysis"	1990
Banco Nacional de Desenvolvimento Economico Social Lecture	
"Competition Policy: Harnessing Private Interests for the Public Interest"	1990
Western Economics Association Annual Meetings	
"New Directions in Antitrust from a New Administration"	1990
"New Directions in Merger Enforcement: The View from Washington"	1990
Woodrow Wilson School Alumni Colloquium	
"Microeconomic Policy Analysis and Antitrust--Washington 1990"	1990
Arnold & Porter Lecture Series	
"Advocating Competition"	1991
"Antitrust Enforcement"	1990
ABA Antitrust Section Convention	
"Recent Developments in Market Definition and Merger Analysis"	1990
Federal Bar Association	
"Joint Production Legislation: Competitive Necessity or Cartel Shield?"	1990
Pew Charitable Trusts Conference	
"Economics and National Security"	1990
ABA Antitrust Section Midwinter Council Meeting	
"Fine-tuning the Merger Guidelines"	1990
"The State of the Antitrust Division"	1991
International Telecommunications Society Conference	
"Discussion of the Impact of Telecommunications in the UK"	1989
The Economists of New Jersey Conference	
"Recent Perspectives on Regulation"	1989

Conference on Current Issues Challenging the Regulatory Process	
"Innovative Pricing and Regulatory Reform"	1989
"Competitive Wheeling"	1989
Conference Board: Antitrust Issues in Today's Economy	
"Foreign Trade Issues and Antitrust"	1989
McKinsey & Co. Mini-MBA Conference	
"Economic Analysis of Pricing, Costing, and Strategic Business Behavior"	1989
	1994
Olin Conference on Regulatory Mechanism Design	
"Revolutions in Regulatory Theory and Practice: Exploring The Gap"	1989
University of Dundee Conference on Industrial Organization and Strategic Behavior	
"Mergers in Differentiated Product Industries"	1988
Leif Johanson Lectures at the University of Oslo	
"Normative Issues in Industrial Organization"	1988
Mergers and Competitiveness: Spain Facing the EEC	
"Merger Policy"	1988
"R&D Joint Ventures"	1988
New Dimensions in Pricing Electricity	
"Competitive Pricing and Regulatory Reform"	1988
Program for Integrating Economics and National Security: Second Annual Colloquium	
"Arming Decisions Under Asymmetric Information"	1988
European Association for Research in Industrial Economics	
"U.S. Railroad Deregulation and the Public Interest"	1987
"Economic Rationales for the Scope of Privatization"	1989
"Discussion of Licensing of Innovations"	1990
Annenberg Conference on Rate of Return Regulation in the Presence of Rapid Technical Change	
"Discussion of Regulatory Mechanism Design in the Presence of Research, Innovation, and Spillover Effects"	1987
Special Brookings Papers Meeting	
"Discussion of Empirical Approaches to Strategic Behavior"	1987
"New Merger Guidelines"	1990
Deregulation or Regulation for Telecommunications in the 1990's	
"How Effective are State and Federal Regulations?"	1987

Conference Board Roundtable on Antitrust	
"Research and Production Joint Ventures"	1990
"Intellectual Property and Antitrust"	1987
Current Issues in Telephone Regulation	
"Economic Approaches to Market Dominance: Applicability of Contestable Markets"	1987
Harvard Business School Forum on Telecommunications	
"Regulation of Information Services"	1987
The Fowler Challenge: Deregulation and Competition in The Local Telecommunications Market	
"Why Reinvent the Wheel?"	1986
World Bank Seminar on Frontiers of Economics	
"What Every Economist Should Know About Contestable Markets"	1986
Bell Communications Research Conference on Regulation and Information	
"Fuzzy Regulatory Rules"	1986
Karl Eller Center Forum on Telecommunications	
"The Changing Economic Environment in Telecommunications: Technological Change and Deregulation"	1986
Railroad Accounting Principles Board Colloquium	
"Contestable Market Theory and ICC Regulation"	1986
Canadian Embassy Conference on Current Issues in Canadian -- U.S. Trade and Investment	
"Regulatory Revolution in the Infrastructure Industries"	1985
Eagleton Institute Conference on Telecommunications in Transition	
"Industry in Transition: Economic and Public Policy Overview"	1985
Brown University Citicorp Lecture	
"Logic of Regulation and Deregulation"	1985
Columbia University Communications Research Forum	
"Long Distance Competition Policy"	1985
American Enterprise Institute Public Policy Week	
"The Political Economy of Regulatory Reform"	1984
MIT Communications Forum	
"Deregulation of AT&T Communications"	1984

Bureau of Census Longitudinal Establishment Data File and Diversification Study Conference "Potential Uses of The File"	1984
Federal Bar Association Symposium on Joint Ventures "The Economics of Joint Venture Assessment"	1984
Hoover Institute Conference on Antitrust "Antitrust for High-Technology Industries"	1984
NSF Workshop on Predation and Industrial Targeting "Current Economic Analysis of Predatory Practices"	1983
The Institute for Study of Regulation Symposium: Pricing Electric, Gas, and Telecommunications Services Today and for the Future "Contestability As A Guide for Regulation and Deregulation"	1984
University of Pennsylvania Economics Day Symposium "Contestability and Competition: Guides for Regulation and Deregulation"	1984
Pinhas Sapir Conference on Economic Policy in Theory and Practice "Corporate Governance and Market Structure"	1984
Centre of Planning and Economic Research of Greece "Issues About Industrial Deregulation" "Contestability: New Research Agenda"	1984 1984
Hebrew and Tel Aviv Universities Conference on Public Economics "Social Welfare Dominance Extended and Applied to Excise Taxation"	1983
NBER Conference on Industrial Organization and International Trade "Perspectives on Horizontal Mergers in World Markets"	1983
Workshop on Local Access: Strategies for Public Policy "Market Structure and Government Intervention in Access Markets"	1982
NBER Conference on Strategic Behavior and International Trade "Industrial Strategy with Committed Firms: Discussion"	1982
Columbia University Graduate School of Business, Conference on Regulation and New Telecommunication Networks "Local Pricing in a Competitive Environment"	1982
International Economic Association Roundtable Conference on New Developments in the Theory of Market Structure	

"Theory of Contestability"	1982
"Product Dev., Investment, and the Evolution of Market Structures"	1982
N.Y.U. Conference on Competition and World Markets: Law and Economics "Competition and Trade Policy--International Predation"	1982
CNRS-ISPE-NBER Conference on the Taxation of Capital "Welfare Effects of Investment Under Imperfect Competition"	1982
Internationales Institut für Management und Verwaltung Regulation Conference "Welfare, Regulatory Boundaries, and the Sustainability of Oligopolies"	1981
NBER-Kellogg Graduate School of Management Conference on the Econometrics of Market Models with Imperfect Competition "Discussion of Measurement of Monopoly Behavior: An Application to the Cigarette Industry"	1981
The Peterkin Lecture at Rice University "Deregulation: Ideology or Logic?"	1981
FTC Seminar on Antitrust Analysis "Viewpoints on Horizontal Mergers"	1982
"Predation as a Tactical Inducement for Exit"	1980
NBER Conference on Industrial Organization and Public Policy "An Economic Definition of Predation"	1980
The Center for Advanced Studies in Managerial Economics Conference on The Economics of Telecommunication "Pricing Local Service as an Input"	1980
Aspen Institute Conference on the Future of the Postal Service "Welfare Economics of Postal Pricing"	1979
Department of Justice Antitrust Seminar "The Industry Performance Gradient Index"	1979
Eastern Economic Association Convention "The Social Performance of Deregulated Markets for Telecom Services"	1979
Industry Workshop Association Convention "Customer Equity and Local Measured Service"	1979
Symposium on Ratemaking Problems of Regulated Industries "Pricing Decisions and the Regulatory Process"	1979

Woodrow Wilson School Alumni Conference "The Push for Deregulation"	1979
NBER Conference on Industrial Organization "Intertemporal Sustainability"	1979
World Congress of the Econometric Society "Theoretical Industrial Organization"	1980
Institute of Public Utilities Conference on Current Issues in Public Utilities Regulation "Network Access Pricing"	1978
ALI-ABA Conference on the Economics of Antitrust "Predatoriness and Discriminatory Pricing"	1978
AEI Conference on Postal Service Issues "What Can Markets Control?"	1978
University of Virginia Conference on the Economics of Regulation "Public Interest Pricing"	1978
DRI Utility Conference "Marginal Cost Pricing in the Utility Industry: Impact and Analysis"	1978
International Meeting of the Institute of Management Sciences "The Envelope Theorem"	1977
University of Warwick Workshop on Oligopoly "Industry Performance Gradient Indexes"	1977
North American Econometric Society Convention "Intertemporal Sustainability"	1979
"Social Welfare Dominance"	1978
"Economies of Scope, DAIC, and Markets with Joint Production"	1977
Telecommunications Policy Research Conference "Transition to Competitive Markets"	1986
"InterLATA Capacity Growth, Capped NTS Charges and Long Distance Competition"	1985
"Market Power in The Telecommunications Industry"	1984
"FCC Policy on Local Access Pricing"	1983
"Do We Need a Regulatory Safety Net in Telecommunications?"	1982
"Anticompetitive Vertical Conduct"	1981
"Electronic Mail and Postal Pricing"	1980
"Monopoly, Competition and Efficiency": Chairman	1979

"A Common Carrier Research Agenda"	1978
"Empirical Views of Ramsey Optimal Telephone Pricing"	1977
"Recent Research on Regulated Market Structure"	1976
"Some General Equilibrium Views of Optimal Pricing"	1975
National Bureau of Economic Research Conference on Theoretical Industrial Organization	
"Compensating Variation as a Measure of Welfare Change"	1976
Conference on Pricing in Regulated Industries: Theory & Application	
"Ramsey Optimal Pricing of Long Distance Telephone Services"	1977
NBER Conference on Public Regulation	
"Income Distributional Concerns in Regulatory Policy-Making"	1977
Allied Social Science Associations National Convention	
"Merger Guidelines and Economic Theory"	1990
Discussion of "Competitive Rules for Joint Ventures"	1989
"New Schools in Industrial Organization"	1988
"Industry Economic Analysis in the Legal Arena"	1987
"Transportation Deregulation"	1984
Discussion of "Pricing and Costing of Telecommunications Services"	1983
Discussion of "An Exact Welfare Measure"	1982
"Optimal Deregulation of Telephone Services"	1982
"Sector Differentiated Capital Taxes"	1981
"Economies of Scope"	1980
"Social Welfare Dominance"	1980
"The Economic Definition of Predation"	1979
Discussion of "Lifeline Rates, Succor or Snare?"	1979
"Multiproduct Technology and Market Structure"	1978
"The Economic Gradient Method"	1978
"Methods for Public Interest Pricing"	1977
Discussion of "The Welfare Implications of New Financial Instruments"	1976
"Welfare Theory of Concentration Indices"	1976
Discussion of "Developments in Monopolistic Competition Theory"	1976
"Hedonic Price Adjustments"	1975
"Public Good Attributes of Information and its Optimal Pricing"	1975
"Risk Invariance and Ordinally Additive Utility Functions"	1974
"Consumer's Surplus: A Rigorous Cookbook"	1974
University of Chicago Symposium on the Economics of Regulated Public Utilities	
"Optimal Prices for Public Purposes"	1976
American Society for Information Science	
"The Social Value of Information: An Economist's View"	1975
Institute for Mathematical Studies in the Social Sciences Summer Seminar	

"The Sustainability of Natural Monopoly"	1975
U.S.-U.S.S.R. Symposium on Estimating Costs and Benefits of Information Services "The Evaluation of the Economic Benefits of Productive Information"	1975
NYU-Columbia Symposium on Regulated Industries "Ramsey Optimal Public Utility Pricing"	1975

Research Seminars:

Bell Communications Research (2)	University of California, San Diego
Bell Laboratories (numerous)	University of Chicago
Department of Justice (3)	University of Delaware
Electric Power Research Institute	University of Florida
Federal Reserve Board	University of Illinois
Federal Trade Commission (4)	University of Iowa (2)
Mathematica	Universite Laval
Rand	University of Maryland
World Bank (3)	University of Michigan
Carleton University	University of Minnesota
Carnegie-Mellon University	University of Oslo
Columbia University (4)	University of Pennsylvania (3)
Cornell University (2)	University of Toronto
Georgetown University	University of Virginia
Harvard University (2)	University of Wisconsin
Hebrew University	University of Wyoming
Johns Hopkins University (2)	Vanderbilt University
M. I. T. (4)	Yale University (2)
New York University (4)	Princeton University (many)
Northwestern University (2)	Rice University
Norwegian School of Economics and Business Administration	Stanford University (5) S.U.N.Y. Albany