BEFORE THE

SURFACE TRANSPORTATION BOARD

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Ex Parte No. 722

RAILROAD REVENUE ADEQUACY

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Ex Parte No. 664 (Sub-No. 2)



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

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# Reply Comments

submitted by

# CONCERNED SHIPPER ASSOCIATIONS

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American Chemistry Council

The Fertilizer Institute

The Chlorine Institute

The National Industrial
Transportation League

Dated: November 4, 2014

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In a decision served on April 2, 2014, the Surface Transportation Board ("Board" or "STB") issued a Notice announcing that it would receive comments in Docket No. Ex Parte 722 to explore the Board's methodology for determining railroad revenue adequacy and the revenue adequacy component used in judging the reasonableness of rail freight rates; as well as comments in Docket No. Ex Parte 664 (Sub-No. 2) on how it calculates the railroad industry cost of capital. On September 5, 2014, the American Chemistry Council, The Fertilizer Institute, The Chlorine Institute, and The National Industrial Transportation League, collectively denominated the "Concerned Shipper Associations," submitted opening Comments to the Board in these combined proceedings. These Concerned Shipper Associations respectfully submit these Reply Comments to the Board. Attached to these Reply Comments as Appendix A is the reply Verified Statement of Gerald R. Faulhaber, Professor Emeritus, Wharton School, University of

Pennsylvania, and Law School, University of Pennsylvania ("Faulhaber Reply V.S."); attached to these Reply Comments as Appendix B is the Verified Statement of Dr. Hal J. Singer, Principal, Economists, Incorporated, Washington, D.C., Senior Fellow, Progressive Policy Institute, and Adjunct Professor, Georgetown University McDonough School of Business; and Dr. Kevin W. Caves, Senior Economist, Economists, Incorporated., Washington, D.C. ("Singer/Caves V.S."). Finally, attached as Appendix C to these Reply Comments is an article by Russell Pittman, "Against the stand-alone cost test in U.S. freight rail regulation," *Journal of Regulatory Economics,* 38, 313-326 (2010).

## I. EXECUTIVE SUMMARY OF REPLY COMMENTS

In their opening Comments in this proceeding, these Concerned Shipper Associations urged the Board to develop standards and procedures for implementing the revenue adequacy constraint adopted by the ICC in its decision in Coal Rate Guidelines to provide for an alternative, and potentially more efficient and cost-effective, method to determine the reasonableness of freight rates. In these Reply Comments, these parties show that:

- The record in this proceeding strongly supports the adoption of standards and procedures to implement a revenue adequacy constraint;
- Contrary to the assertions of the railroads, a revenue adequacy constraint is consistent with, and logically flows from, the words and framework of the statute and is consistent with the procedures in the proceeding that resulted in the agency's decision in Guidelines;
- A revenue adequacy constraint is, in fact, required by the framework of Ramsey Pricing that has been adopted by the agency in Guidelines, and that failure to establish such a

constraint, as the railroads urge, would be inconsistent with the Board's own adoption of Ramsey Pricing as the proper economic framework for regulating the rail industry;

- In their reply statement, witnesses Caves and Singer state, "If revenue adequacy were ignored…railroads would be permitted to earn excess returns in perpetuity. This is flatly inconsistent with Ramsey principles, which show how economic welfare can be improved by placing a constraint on such returns;"
- The adoption of a revenue adequacy constraint is necessary because the Board's current methodology for determining stand-alone costs is not justified by economic theory and has become utterly unworkable;
- In his reply statement, witness Gerald Faulhaber, who was one of the original developers of the "stand-alone cost" concept, states that its application in railroad regulation "is so far from the models in which it was originally developed as to be unrecognizable." He concludes, "there are several possible right answers to how to test for rate reasonableness, but the current Stand-Alone Cost model is without a doubt the wrong answer;"
- A major thrust of the railroads' objections to the a revenue adequacy constraint in this proceeding is based on a construct that neither the Board outlined in Guidelines nor shippers in this proceeding have advocated, since a properly-designed revenue adequacy constraint should insure that only captive traffic is not generating revenues differentially higher than necessary to meet the revenue adequacy goals under the statute;
- Caves and Singer note that when a rail carrier is earning revenues in excess of those needed for revenue adequacy, "Ramsey principles tell us that economic welfare can be increased by lowering some rates. In particular, the markups for captive shippers should

not reflect 'differentially higher rates' if the differential is no longer necessary to cover the railroad's fixed costs."

- The Board should use market measures to supplement its depreciated original cost calculations in determining revenue adequacy, and should not use replacement costs.

These Reply Comments conclude by outlining the standards and procedures that the Board should use in developing a revenue adequacy constraint, and ask the Board to consult this information in developing simple, timely, cost-effective and predictable standards and procedures in a Notice of Proposed Rulemaking.

## II. THE RECORD IN THIS PROCEEDING SUPPORTS THE IMPLEMENTATION OF A REVENUE ADEQUACY CONSTRAINT

In their opening Comments in this proceeding, these Concerned Shipper Associations noted that, as rail carriers have become revenue adequate in recent years, it is time for the Board to develop procedures for implementing the revenue adequacy constraint adopted by the Interstate Commerce Commission in Ex Parte No. 347 (Sub-No. 1) Coal Rate Guidelines Nationwide, 1 I.C.C. 2d 520, 534 (1985), aff'd sub. nom. Conrail v. United States, 812 F.2d 1444 (3rd Cir. 1987)("Guidelines"), to provide an alternative, and potentially more efficient and cost-effective, method to determine the reasonableness of rail freight rates.

In those opening Comments, the Concerned Shipper Associations discussed the broad and unequivocal statements in the agency's 1985 decision in Guidelines that provide the basis for a "revenue adequacy constraint," that would limit "the extent to which a railroad may charge differentially higher rates on captive traffic . . ." Guidelines at 534. In that decision, the Board noted specifically that "captive shippers should not be required to continue to pay differentially higher rates than other shippers when some or all of that differential is no longer necessary to ensure a financially sound carrier capable of meeting its current and future service needs." Id. at

536. In their opening Comments, these Concerned Shipper Associations noted that in recent years, the railroad industry has experienced a widely-acknowledged "pricing renaissance," which has propelled many of the nation's rail carriers to achieve or even exceed the Board's own exceedingly high threshold of adequate revenues. Comments, p. 5. These Concerned Shipper Associations also noted the fact that a revenue adequacy constraint is also necessary because the primary standard for protecting captive shippers – the Stand-Alone Cost constraint – has become increasingly unworkable, particularly as the Board has been faced with numerous rail rate reasonableness complaints involving high-rated carload traffic. Comments, p. 6.

Therefore, in their opening Comments, the Concerned Shipper Associations urged the Board to develop rules and standards for applying the revenue adequacy constraint discussed in Guidelines. Supporting the Concerned Shipper Association opening Comments was the Verified Statement of Gerald R. Faulhaber, Professor Emeritus, Wharton School, University of Pennsylvania and Law School, University of Pennsylvania ("Faulhaber V.S."). In his analysis, Dr. Faulhaber urged the Board to use financial market data to determine if individual railroads were earning their cost of capital. Dr. Faulhaber indicated that his analysis of financial data reveals that Class I railroads "have been 'revenue adequate' for quite some time." Faulhaber V.S., p. 5. Dr. Faulhaber also noted that, with respect to the Board's Stand Alone Cost mechanism, "whatever minimal use the stand alone cost test may have had, it now has none." Id., p. 11. Dr. Faulhaber noted that the SAC model bears no relationship to the STB-regulated rail industry underlying the original concept, id., pp. 7-8, nor does it provide a practical means of evaluating the reasonableness of rail freight rates. Id., pp. 9-10. The Concerned Shipper Associations also submitted into evidence the May 2001 testimony of Dr. Harvey A. Levine, and the February 1997 statements of Professor Alfred E. Kahn and Professor Jerome Hass on railroad

revenue adequacy standards. That testimony also supported the use of market-based measures of a railroad's financial health, such as market-to-book ratios, retention rates, and debt ratings.

A variety of other parties also submitted comments. These included shipper associations such as the Western Coal Traffic League and two associated individual shippers (Allied Shippers), Consumers United for Rail Equity (CURE), and the Alliance for Rail Competition (ARC). The Allied Shippers argued that the Board should restore the use of a funds flow analysis as a check on the Board's return on investment/cost of capital test for revenue adequacy, and should incorporate such market-based measures as operating ratios, return on shareholders' equity, market-to-book ratios and other financial indicators into the revenue adequacy determination. Like the Concerned Shipper Associations, the Allied Shippers also argued that revenue adequate railroads should be prohibited from increasing rates on captive traffic beyond actual cost inflation, through the use of the Rail Cost Adjustment Factor Adjusted for Productivity ("RCAF-A"). Similarly, in its Comments, CURE indicated that the return on investment/cost of capital test used by the STB to determine revenue adequacy fails to reflect the judgments of the financial markets, and that the railroad industry is and has been revenue adequate for a number of years. In the same vein, ARC argued that the Board should not delay in implementing a revenue adequacy constraint. Finally, individual shippers such as Olin Corporation (Olin) and Arkansas Electric Cooperative Corp. (AECC) submitted comments. Olin noted, inter alia, that the SAC constraint has been ineffective in protecting carload chemical shippers; and AECC indicated both that the rail industry is revenue adequate using a variety of measures, and that the Board should implement a variety of reforms to assist captive rail customers.

Railroad industry submissions took a very different view. The Association of American Railroads (AAR), in comments echoed in the filings of individual rail carriers, argued that, even though a railroad might earn a rate of return greater than its cost of capital, there is no public policy rationale for limiting railroad revenue under a revenue adequacy constraint applied to captive shippers. AAR Comments, p. 6. The AAR argued that the Board's rate of return/cost of capital methodology for measuring revenue adequacy overstates the railroads' returns, and that the Board should revise its revenue adequacy measure by using replacement costs instead of depreciated original cost, and by including deferred taxes in the rate base. AAR Comments, p. 11. Going even further, the AAR argued that, despite the Board's pronouncements in Guidelines, the statute does not authorize a revenue adequacy constraint, id., p. 20, and claimed that the Board's pronouncements in Guidelines were unsupported in the record. Id., pp. 32-36. The concept of revenue adequacy, AAR contended, is only a goal, not a cap or ceiling, no matter how far above an "adequate" revenue a railroad might earn on the rates of captive shippers. Id., pp. 21-25. Indeed, AAR asserted that any revenue adequacy constraint would be inconsistent with the scheme of rate regulation under the statute. Id., p. 37. Individual railroads all supported the AAR's arguments, see, e.g., BNSF Comments, p. 1, and the Opening Comments of some carriers went even further.

These Concerned Shipper Associations strongly disagree with the contentions of the AAR and the individual railroads. The principles of a revenue adequacy constraint that was set forth in Guidelines are perfectly consistent with, and indeed necessarily and logically flow from, both the words of and the framework of regulation established by the Staggers Act and the principles of Ramsey pricing upon which the Board's entire theory of regulation has been built. Indeed, the thrust of the railroads' comments are in fact misdirected, because neither the Board

nor shippers in this proceeding are advocating a revenue adequacy constraint that would reduce railroad revenues that would exceed an "adequate" level, as long as such revenues are produced by competitive traffic. But captive traffic should not be forced to differentially provide revenues in excess of revenue levels that are "adequate" under the statute. Moreover, AAR and its railroad members are wrong about the use of replacement costs and the inclusion of deferred taxes in the revenue adequacy calculation. Rather, the Board should use market measures of revenue adequacy to supplement its depreciated original cost calculation in determining which carriers are revenue adequate.

In these Reply Comments, these Concerned Shipper Associations discuss in detail the AAR's legal and policy assertions and show that they are completely unfounded; and in the attached Verified Statements, submit evidence to the Board that discusses the errors in the evidence submitted by the carriers.

## III. THE PRINCIPLES OF A REVENUE ADEQUACY CONSTRAINT ANNOUNCED IN GUIDELINES ARE CONSISTENT WITH THE FRAMEWORK OF REGULATION ESTABLISHED BY THE STAGGERS ACT AND THE THEORY OF RAMSEY PRICING UPON WHICH THE FRAMEWORK OF THE BOARD'S REGULATION IS BUILT

### A. A Revenue Adequacy Constraint Is Consistent With the Words and Framework of the Statute and the Board's Procedures in Guidelines

As the Board indicated in its Notice in this proceeding, "[t]he concept of revenue adequacy is also a component of the Board's standards for judging the reasonableness of rail freight rates, as set forth in Guidelines." Notice, p. 3. Specifically, Guidelines provides that the concept of revenue adequacy imposes a "constraint[] on the extent to which a railroad may charge differentially higher rates on captive traffic . . , " because "[c]arriers do not need greater revenues than this standard permits, and we believe that, in a regulated setting, they are not entitled to any higher revenues." Id. at 534-535 [emphasis added]. "Captive shippers," the

agency declared, "should not be required to continue to pay differentially higher rates than other shippers when some or all of that differential is no longer necessary to ensure a financially sound carrier capable of meeting its current and future service needs." Id. at 536 [emphasis added].

It is significant that the agency in Guidelines focused its attention on, and indeed specifically limited the revenue adequacy constraint to, "captive shippers" in a "regulated setting" – because this is precisely the focus of the statute. Both the National Rail Transportation Policy and the Board's authority over rail rates to captive shippers support the concept of a revenue adequacy constraint.

Section 10101(6) of the Act – part of the national rail transportation policy – explicitly charges the Board to maintain "reasonable" rates where there is a lack of effective competition and "where rail rates provide revenues which exceed the amount necessary to maintain the rail system and to attract capital." 49 U.S.C. 10101(6). Thus, under the plain words of the National Rail Transportation Policy, where rail rates on captive shippers provide revenue that in fact exceeds those "necessary" amounts, the Board may find such excess amounts to be "unreasonable" and may maintain "reasonable" rates through its administrative action.

Moreover, under Section 10704(a), the Board is required to "maintain and revise as necessary standards and procedures for establishing revenue levels for rail carriers . . . that are adequate, under honest, economical and efficient management, to cover total operating expenses . . . plus a reasonable and economic profit or return (or both) on capital employed in the business." Under the statute, these revenue levels must provide a flow of net income that is "adequate to support prudent capital outlays, assure the repayment of a reasonable level of debt, permit the raising of needed equity capital[,] cover the effects of inflation . . . and attract and retain capital...." 49 U.S.C. 10704(a) [emphasis added]. But where revenue levels exceed these

standards, by definition such a revenue stream is not "adequate" – it is more than what is necessary to meet the statutory goals, and therefore that excessive "flow of net income" does not meet the statutory definition of revenues that are "adequate" for the purposes set forth in the statute.

In addition, under Section 10701(d)(1) of the statute, if the Board determines that the carrier has market dominance over the transportation to which a rate applies under Section 10707, the Board has extremely broad authority to determine if a rate is "reasonable." If the rates to captive shippers exceed the levels that the Board has determined to be "adequate" under Section 10704, the Board may legally determine that such a rate is not "reasonable" under its broad reasonableness authority. Thus, if such excessive revenue levels do occur, the Board is fully justified in taking action to ensure that market dominant traffic does not contribute to the extent of the excess.

The railroads cite favorably to §10704(a)(2)(A) and (B) to assert that Congressional intent was simply to promote the financial health of the railroad industry.[1] However, the Court in Consolidated Rail Corp. v. United States, 812 F.2d 1444 (3d Cir. 1987), in reviewing the ICC's maximum rate constraints developed in Guidelines, read the section together with its requirement of adequate revenue "under honest, economical, and efficient management." The Court stated that the 4 R Act directed the ICC to "ensure reasonable rates charged to captive shippers and so, had to develop constraints on those rates which were nevertheless consistent with the basic requirement of revenue adequacy."[2]

[1] AAR Comments, p. 21 (AAR cites originally codified version 49 USC §15(a)(4)(1976)).
[2] Consolidated Rail Corp. v. United States, 812 F.2d 1444, 1450 (3d Cir. 1987),

The railroads also argue that Congress envisioned the status of railroad revenue adequacy only as a goal and not a ceiling. But the Third Circuit summarized revenue adequacy quite differently. In explaining the Bessemer[3] decision, the Court said:

> In *Bessemer* this court upheld the ICC standard for revenue adequacy—rate of return on net investment equal to the current cost of debt and equity capital. By imposing revenue adequacy as a ceiling, the ICC intends to insure that a captive shipper will "not be required to continue to pay differentially higher rates than other shippers when some or all of that differential is no longer necessary to ensure a financially sound carrier capable of meeting the current and future service needs." [Citing Guidelines]. In other words when a carrier has achieved revenue adequacy, the rate charged to a captive shipper will be the same as that determined by competition for non-captive shippers.[4]

Most importantly, the Third Circuit noted that "[t]he Final Guidelines embodied in Ex Parte No. 347 impose four constraints on market dominant carrier rates for captive coal shippers" – including, of course, the revenue adequacy constraint – and the Court flatly "hold[s] that the four constraints in the Final Guidelines are consistent with the 4 R Act and the Staggers Act." Consolidated Rail Corporation, 812 F.2d at 1449 [emphasis added]; see also id. at 1450 ("the ICC was directed to ensure reasonable rates charged to captive shippers and so, had to develop constraints on those rates which were nevertheless consistent with the basic requirement of revenue adequacy"; and id. at 1455, in which the Court specifically considered challenges to the agency's revenue adequacy constraint ). The Court's holding thus explicitly supports the notion that the revenue adequacy constraint is consistent with the statute, and any suggestion by the railroads to the contrary is flatly wrong.

Thus, under both the National Rail Transportation Policy and the specific provisions of the statute, the concept of revenue adequacy is both a goal and a ceiling, and the Board is fully justified in exercising its discretion and authority.

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[3] Bessemer & L. E. R. Co. v. Interstate Commerce Com., 691 F.2d 1104 (3d Cir. 1982)
[4] Consolidated Rail Corp., 812 F.2d at 1450-51.

Moreover, on a more general level, Congress in the Staggers Act clearly envisioned that the role of the regulator would be to address circumstances where market forces were inadequate to constrain railroads' exercise of market power. Thus, if captive traffic is contributing to revenue levels in excess of those that are "adequate" under the statute, the Board has both the right and the duty to step in – captive traffic should not be so differentially priced so as to result in revenue levels that exceed the levels determined to be "adequate" under the statute. Under the railroads' theory of Staggers Act regulation, no matter how high a railroad's revenues are above what the agency determines to be an "adequate" level (and no matter how an "adequate" level is defined), and no matter how much captive shippers are forced to pay revenues to that carrier that exceed those that are determined to be "adequate," the Board must blind itself to those firm-wide circumstances in determining that a rate is "reasonable." These Concerned Shipper Associations respectfully submit that such a practice would not be "consistent with" the theory and framework of regulation under the Staggers Act, as the AAR contends, but would be flatly antithetical to it. AAR Comments, pp. 37-38.

As support for the proposition that Congressional intent is solely deregulation of rates, the railroads quote the Congressional Record in stating, that pertaining to competitive traffic railroads and shippers should have the freedom to contract to "treat[] the American railroad industry as any other business."[5] Yet, in the same Congressional Record the railroads cite above, Representative Staggers also said " I do not mean that we should turn them [the railroads] completely loose because we need to know what is going on and we need to protect the American public." 126 Cong. Rec. 28,431 (1980). The intent of the Staggers Act is clear: where

[5] AAR Comments, p. 39, citing Burlington Northern R.R. Co.. v. Public Utility Comm'n of Texas, 812 F.2d 231, 235 (5th Cir. 1987)(citing 126 Cong. Rec. 28,431 (1980)(statement of Rep. Staggers)).

markets are workably competitive, the market should control; but where workable competition is not present, the agency must protect captive shippers.

The railroads cite the Bessemer Third Circuit case for the theory that the "court's discussion of the new standard made it clear that the revenue adequacy provisions in the statute were not intended as a tool for rate regulation." AAR Comments, p. 25. But yet, following the Bessemer decision, the Third Circuit rejected shipper lawsuits complaining that the "[f]inal Guidelines are inconsistent with the 4 R and Staggers mandates to protect captive shippers from unreasonable rates, in that they give too much weight to the achievement of revenue adequacy and too little to the interests of shippers." The Court did not accept the shipper's assertion that revenue adequacy is illusory because no carrier at that time had yet achieved revenue adequacy.[6] Rather, the court, citing Bessemer states, "we are convinced that the ICC's basic approach on revenue adequacy is consistent with the 4 R and Staggers Acts."[7] The railroad's narrow reading of the Third Circuit case law ignores the fact that the Court did consider revenue adequacy provisions as a tool for rate regulation and concluded that Congress understood that revenue adequacy could be one of the tools to utilize to regulate rates to captive shippers.

Finally, the AAR argues that the Board's adoption of a revenue adequacy constraint in Guidelines was procedurally flawed because the final decision allegedly deviated from the notice of the proposal in the case. See, AAR Comments, p. 32. But the AAR's argument is based on a complete misreading of the Board's notice. The premise of the AAR's current argument appears to be that Guidelines will lead the Board to impose a firm wide cap on railroad revenues, what the AAR terms an "overall revenue cap as a rate constraint." AAR Comments, p. 36. The Guidelines' language with which AAR is concerned declares "[c]arriers do not need greater

[6] Consolidated Rail Corp, 812 F.2d at1455.
[7] Consolidated Rail Corp., 812 F.2d at 1456.

revenues than this standard permits, and we believe that, in a regulated setting, they are not entitled to any higher revenues." Guidelines at 535. AAR claims that this language is ambiguous and leads it to question the "significance of the phrase "in a regulated setting." But this language is clear: it refers to the regulation of reasonable rates for captive shippers. As the agency noted in that same discussion: "[i]n other words, all captive shippers should not be required to continue to pay differential higher rates than other shippers when some or all of that differential is no longer necessary to ensure a financially sound carrier capable of meeting its current and future needs. Id. at 535-36 [emphasis added].

Contrary to the AAR's assertion, the 1985 Guidelines did not deviate from the ICC's notice in *Coal Rate Guidelines, Nationwide* Ex Parte No. 347 (Sub-No. 1)(Feb. 8, 1983)("*Guidelines NPRM").* Under the *Guidelines NPRM,* the ICC solicited comments for "scrutinizing rates on captive traffic once revenue adequacy is achieved" under a method that would "retain the "railroads' incentive and ability to increase efficiency, while protecting captive shippers from exploitation." Id. at slip op 20. The ICC requested comments as to "[w]hat factors should be considered in determining the reasonableness of rates for revenue adequate carriers." Id. It was within this request that it promulgated Guidelines.

In the *Guidelines NPRM* the ICC states that a rigidly applied revenue adequacy constraint would be problematic. Id. AAR utilizes these statements in an effort to support its argument against a firm wide revenue cap, a cap that Guidelines clearly does not propose. AAR then concludes, that the alleged scheme for a revenue cap proposed in Guidelines is inconsistent with the notice provided in the *Guidelines NPRM.* See, AAR Comments, p. 36. But the proposal in the *Guidelines NPRM* clearly intended to utilize revenue adequacy only to regulate captive traffic. The notion that revenue adequacy is a construct intended to cap all railroad revenues is

an idea wholly invented by the railroads in their Comments in this proceeding and was not proposed in Guidelines.

### B. A Revenue Adequacy Constraint Is Consistent With The Theory and Framework of Ramsey Pricing That Has Been Adopted By the Agency, and The Failure To Establish a Revenue Adequacy Constraint Would Be Antithetical To the Principles of the Agency's Own Acceptance of Ramsey Pricing

In its decision in Guidelines, the agency discussed at length two economic theories that were "central" to the Constrained Market Pricing proposal adopted in that decision: "differential pricing and the contestability of markets." Guidelines, p. 525. The agency noted that it believed that "the cost structure of the railroad industry necessitates differential pricing of rail services." Id., p. 526. "Railroads' long-run marginal costs are less than their long-run average costs, and this differential cannot be assigned directly to specific movements." Id. These "unattributable costs" must be covered through differential pricing. Id. The agency then noted that "Ramsey pricing," that is, "pricing in accordance with demand," is a "widely recognized method of differential pricing," by which unattributable costs "are allocated among the purchasers or users of rail service in inverse relation to their demand elasticity." Id., p. 526-527. The agency noted that, "applied to the railroad industry, Ramsey pricing would permit an efficient rail carrier to cover all of its costs (including the cost of capital) and thus become revenue adequate." Id. [emphasis added] Similarly, "[t]he objective of Ramsey pricing is to permit recovery of unattributable costs in accordance with variations in demand." Id., p. 533 [emphasis added]. But it is clear from these statements that Ramsey pricing is not designed to recover more than these unattributable costs, including the cost of capital.

The agency did not adopt pure Ramsey pricing as a rate constraint. The agency believed that it was not "practical to impose pure Ramsey pricing as a regulatory requirement for across-the-board application in all cases," because it was too difficult and burdensome to calculate both

the marginal cost and the elasticity of demand for every movement. Id., p. 527. Instead, "[a]s an alternative to pure Ramsey pricing," the agency proposed Constrained Market Pricing (CMP), including both the revenue adequacy constraint and the SAC theory of contestable markets. Id. The agency made clear that "our purpose in CMP is to approximate Ramsey pricing." Id., p. 534 [emphasis added]

> Ramsey pricing seeks to establish the maximum rate for each product or service . . . on the basis of long-run marginal costs, demand elasticities, and the amount of unattributable costs which must be covered through differential pricing . . . The resulting Ramsey price model represents the logical pricing pattern of an efficient firm.
>
> CMP approaches the same task more directly. It establishes constraints on the pricing freedom of the railroads which induce them to price all traffic efficiently. As with Ramsey pricing, services are priced according to market demand and to cover only the total costs of an efficient carrier. CMP provides two approaches for determining the revenue requirements of an efficient carrier. They can be calculated for the existing carrier on a system-wide basis by applying the revenue adequacy and management efficiency constraints. Alternatively, they can be hypothesized using a potential "stand-alone cost" system. . . . CMP will have defined the total amount of unattributable costs to which the shipper must contribute and focused on the traffic which can reasonably be expected to pay those costs. . . . The result of this process is a rate structure which reflects long-run marginal costs, demand elasticity, and differential pricing of unattributable costs – the same result that occurs under Ramsey pricing. Thus, in spite of the lack of mathematical precision in CMP, it should yield rates similar to those produced by Ramsey pricing.

Id., p. 534.

Several things are clear from this discussion. First, Ramsey pricing is designed to recover the unattributable costs in the railroad industry that occur because long-run marginal costs are less than long-run average costs, on the basis of demand elasticities. Second, Ramsey pricing is not designed to recover more than such unattributable costs. Third, CMP was designed to yield rates similar to those produced by Ramsey pricing. And fourth, CMP did this through both a revenue adequacy constraint and a SAC constraint.

The key question, then, is this: if, as the railroads argue, there should be no revenue adequacy constraint, would such a result be consistent with the theory of Ramsey pricing, which underlays the entire framework of the Board's regulation of rail prices since Guidelines?

The answer to this question is emphatically "NO." The Board made clear in Guidelines that the purpose of Ramsey pricing was to recover a railroad's unattributable costs. Failure to provide a revenue adequacy constraint would permit a railroad to recover more than that. In fact, the elimination of a revenue adequacy constraint would make Ramsey pricing meaningless. Even if the Board could immediately and confidently determine marginal cost and demand elasticities so as to eliminate the practical difficulties in determining Ramsey prices, what would be the point of that exercise if the railroads could simply decide that they wanted to charge prices above the levels need for revenue adequacy? Thus, under the Board's own theory in Guidelines, the applicability of Ramsey pricing to the railroad industry logically demands that revenue adequacy be a ceiling on railroad prices, since pricing inversely to demand would be pointless if railroads could simply decide to charge more than Ramsey prices to captive shippers to produce revenue in excess of that needed to cover all unattributable costs, including their cost of capital.

The railroads' argument is also inconsistent with economic theory. As discussed at length in the Verified Statement of Dr. Hal Singer and Dr. Kevin Caves, if a railroad is found to be earning revenues in excess of revenue adequacy, the STB can infer that the railroad's captive traffic is paying rates in excess of the levels implied by Ramsey principles. See, Caves/Singer V.S., pp. 1-2, 9-16. As witnesses Caves and Singer note:

> The ICC correctly identified revenue adequacy as the key constraint embedded in the Ramsey-optimization framework. The revenue adequacy standard articulated by the ICC is consistent with Ramsey principles because it allows an incumbent railroad to recover all incremental costs and fixed costs, plus a reasonable return on investment, taking all relevant efficiencies into account. The stand-alone cost of individual network

> components cannot meaningfully inform the revenue adequacy constraint. If one were to sum the stand-alone costs of the various components that make up the rail network, the result would substantially exceed the total costs that would be incurred by an efficient incumbent. (For example, any shared costs would be duplicated). The AAR and its economists are therefore incorrect to argue that the revenue-adequacy constraint can be ignored, or that SAC can serve as a viable proxy for the constraint.

Caves/Singer V.S., p. 11. Indeed, witnesses Caves and Singer note that even the AAR's own economist endorses a Ramsey-compatible revenue adequacy standard, by acknowledging that the revenue adequacy constraint should reflect the full range of system-wide efficiencies, in positing a system-wide SAC test which is effectively a restatement of the Ramsey constraint. Id., p. 12. As witnesses Caves and Singer note, when a rail carrier is earning revenues in excess of those needed for revenue adequacy,

> Ramsey principles tell us that economic welfare can be increased by lowering *some* rates. In particular, the markups for captive shippers should not reflect 'differentially higher rates' if the differential is no longer necessary to cover the railroad's fixed costs."
>
> If revenue adequacy were ignored...railroads would be permitted to earn excess returns in perpetuity. This is flatly inconsistent with Ramsey principles, which show how economic welfare can be improved by placing a constraint on such returns.

Caves/Singer V.S., pp. 13-14.

### C. The Development Of a Revenue Adequacy Constraint Is Necessary Because the Board's Methodology for Determining Stand-Alone Costs Is Not Justified By Economic Theory and Has Become Utterly Unworkable

In the Verified Statement attached to these Reply Comments, Dr. Gerald R. Faulhaber responds to the assertions of the AAR and the individual railroads that Stand-Alone Cost is the "gold standard" of rate setting and that it "mimicked competition." In his reply statement, Dr. Faulhaber, who was one of the original developers of the "stand-alone cost" concept nearly forty years ago, notes that the use of the stand-alone cost concept used in railroad regulation "is so far from the models in which it was originally developed as to be unrecognizable." Faulhaber Reply

V.S., p. 2. Indeed, Dr. Faulhaber notes that even the SAC theory developed in the work of Baumol, Panzar and Willig assumed the firm to be a profit-constrained enterprise for which regulators control all of the prices of the enterprise – clearly a situation not applicable to the railroad industry. Id., p. 3.

Moreover, Dr. Faulhaber notes that the model of SAC used by the agency – in which the shipper must posit an origin-to-destination SARR in order to "mimic competition" – makes economic sense only within the model of a regulated monopoly, a situation not applicable to the rail industry. Id., p. 5. Dr. Faulhaber notes that the STB's current "origin to destination" SARR model would be "highly unlikely" to result in the "least-cost" option, and that if the "mimic competition" argument is to be used to justify the use of stand-alone costs, then the shipper should be able to choose a variety of SARR options, based on the rail system that actually exists in real life. Id., p.5-6.

Finally, Dr. Faulhaber notes that the agency's current SAC model "has been enormously complex and costly for both shippers and the STB, and continues to be so. . . The extreme complexity is no accident and should be no surprise; it evolved as part and parcel of the regulatory process." Id., p. 7. Dr. Faulhaber notes that the agency could have avoided this conundrum by adopting a general SAC computer model, as did other federal agencies in developing regulatory standards for the industries that they regulate. Id., p. 7. Dr. Faulhaber concludes that "there are several possible right answers to how to test for rate reasonableness, but the current Stand-Alone Cost model is without a doubt the wrong answer." Id., p. 9.

The analysis developed by witness Faulhaber in this proceeding is not unique. In his opening Verified Statement, Professor Faulhaber refers to an analysis by R. Pittman (2010), "Against the Stand-Alone Cost Test in U.S. Freight Rail Regulation," *Journal of Regulatory*

*Economics,* 38, 313-326.[8] That article also notes the weak economic underpinnings of the Board's SAC standard and the lengthy and expensive analysis that it requires, and suggests that the agency might develop a ceiling on the price-to-variable cost ratio that would act as a constraint on the degree to which Ramsey pricing is permitted. Id.

The analysis set forth in witness Faulhaber's Verified Statement is complemented by the analysis in the Verified Statement of witnesses Caves and Singer, who note that "SAC does not inform the economically efficient pricing structure, which is given by the answer to a Ramsey pricing problem. Ramsey prices permit incumbents to recover all fixed and variable costs plus a reasonable return on investment, while simultaneously maximizing economic efficiency by preventing prices from rising to fully monopolistic levels. Focusing on SAC to the exclusion of Ramsey principles gives incumbents with market power both the incentive and the ability to engage in inefficient and unconstrained monopoly pricing." Caves/Singer V.S., pp. 2-3; see also, pp. 3-5. Witnesses Caves and Singer discuss in detail how the SAC standard does not inform or approximate a rate structure consistent the economic efficiency under the Board's own adoption of Ramsey Pricing. See, id., pp. 5-9. The revenue adequacy constraint, on the other hand, defines a key constraint governing Ramsey Pricing. Id., pp. 11-12. Witnesses Caves and Singer also analyze and rebut in detail the argument presented by the various economists testifying for the AAR and the individual railroads. Id., pp. 12-16.

[8] Dr. Pittman is the Director of Economic Research, Economic Analysis Group, Antitrust Division, U.S. Department of Justice, and visiting professor, New Economic School, Moscow. For the Board's convenience, a copy of the article is attached hereto as Appendix C.

## IV. THE THRUST OF THE RAILROADS' COMMENTS IS MISDIRECTED, BECAUSE A REVENUE ADEQUACY CONSTRAINT IS NOT DIRECTED AGAINST REVENUE LEVELS PRODUCED BY COMPETITIVE TRAFFIC. A REVENUE ADEQUACY CONSTRAINT SHOULD ENSURE THAT CAPTIVE TRAFFIC SHOULD NOT GENERATE REVENUE LEVELS IN EXCESS OF THOSE THAT ARE "ADEQUATE" UNDER THE STATUTE

Significant portions of the railroad industry's comments in this proceeding – both the AAR's and the individual railroads' filings – are directed toward two general tactics: one to scare the Board away from implementing the principles of a revenue adequacy constraint set forth in Guidelines, and the other to lull the Board into believing that a revenue adequacy constraint is unnecessary.

But the first tactic – an argument that a revenue adequacy constraint would create disincentives for railroads to invest – is simply wrong, because it rests on a "boogeyman" version of a revenue adequacy constraint that no one – including the Board in Guidelines – is advocating. And the second tactic – an argument that the Board need not be concerned with excessive revenues because the recent financial health of the railroad industry is not based upon increases in captive shipper rates and does not indicate an exercise of market power – is simply irrelevant as long as any captive shipper is contributing to the excess revenue by paying differentially higher rates.

### A. A Properly-Focused Revenue Adequacy Constraint Is Not Directed Against Revenue Levels Produced by Competitive Traffic, But Should Ensure That Captive Traffic Is Not Paying Rates In Excess of Adequate Levels. Since Carriers Can Keep All Revenues From Competitive Traffic, There Are No Investment Disincentives

In its Comments, the AAR argues that the public interest is best served by a regulatory regime that "incentivizes" railroads to invest to meet transportation needs. AAR Comments, pp. 12-16. The AAR cites its experts for the proposition that the goal of earning revenues in excess of the cost of capital is a "fundamental driver of innovation and productivity gains," and that

investors "want and expect" returns in excess of the cost of capital, and that without it, the "incentive to invest is significantly diminished." Id., at 12.

These arguments are echoed in spades by the various individual railroads. Much of BNSF's comments are directed to showing "the wide variety of market forces and competitive conditions that influence the rates charged by BNSF," and BNSF argues at length that it "should not be penalized for successfully participating in and expanding competitive markets." BNSF Comments, p. 2 and 6; see also, pp. 2-4, 6-8. NS argues that substantial investments are needed in the freight rail industry, NS Comments, pp. 40-51, and that a revenue adequacy constraint would "stifle innovation and productivity," "sharply discourage investment," and "create a cloud of uncertainty." id., pp. 58, 59-63, 69-70. UP begins its comments by asserting that a revenue adequacy rate constraint would "encourage the flight of capital," and concludes by arguing that a revenue adequacy constraint would discourage investment. Id., pp. 3, 50-56.

All of these arguments miss the point, and all are designed to frighten the Board into abandoning the concept of a revenue adequacy constraint out of the fear that investments in the rail industry would be discouraged. But we should be clear here: no one is arguing that, to the extent that increased financial returns to the railroad industry result from increased returns in competitive markets, these returns should be taken from the railroads. If railroads are now able to compete more effectively in competitive markets and accrue higher returns in those markets, these Concerned Shipper Associations applaud that result: they strongly believe that winners in the competitive race – in competitive markets -- should be able to keep – and reinvest – the fruits of their labor.

Indeed, the railroads themselves are arguing that the large majority of their markets are competitive, and that their improved financial condition is a result of their activity in these

competitive markets. See, e.g., UP's Comments, pp. 7-24. If that is true, a properly-designed revenue adequacy constraint should permit railroads to keep those returns, and therefore would not "discourage" investment. If in fact the railroads are correct that the large majority of their markets are competitive, then the railroads, under a properly-designed revenue adequacy constraint, would continue to have a similarly large incentive to invest and reinvest.

But to the extent that the railroads are achieving returns greater than those needed to fulfill the revenue adequacy goals in the statute by charging rates to captive shippers that are differentially higher than the rates being charged to competitive shippers, then this is not proper. A properly-designed revenue adequacy constraint should proportionally return to captive shippers the excess returns above those needed for revenue adequacy that have been generated by the differentially higher rates paid by such captive movements. In some respects, the design of the statute itself would lead to that result, since the Board is not empowered to prescribe rates lower than a revenue to variable cost ratio of 180 percent, which is well above the R/VC ratio needed on average from all traffic for a rail carrier to be revenue adequate, and well above the rates on most competitive traffic. Thus, the design of the Board's regulation ensures that captive shippers will almost always pay more than competitive shippers.

### B. A Revenue Adequacy Constraint Is Necessary Even If the Improved Financial Condition Of a Railroad Is Due to Increased Returns on Competitive Traffic, As Long As Captive Shippers Are Paying Differentially Higher Rates Than Similar Competitive Movements To a Carrier Whose Revenue Exceeds the Level Necessary for Revenue Adequacy

Large sections of the individual railroads' comments are directed to showing that the improved financial condition of the railroad industry is based upon increased returns from competitive traffic. For example, UP's comments discuss at length the proposition that UP's improved financial conditions results from competitive conduct and competitive markets. UP Comments, pp. 22-39. BNSF's Comments discuss its competitive position in various markets,

and argue that is "successfully participating in and expanding competitive markets." BNSF Comments, pp. 4-5 and 6-8. NS argues that rail revitalization has not come at the cost of competition. NS Comments, p. 22.

These arguments miss the point, and are designed to lull the Board into believing that, since the improved financial condition of the rail industry is based on improved railroad performance in competitive markets, the Board need not be concerned with railroad pricing behavior in captive markets. This is wrong. As discussed immediately above, these Concerned Shipper Associations applaud the railroads' efforts to compete more effectively in competitive markets, and believe that the returns that the railroads achieve in those competitive markets are theirs to keep. But to the extent that the railroads are achieving returns in excess of those needed for revenue adequacy because captive shippers are paying differentially higher rates than shippers in competitive markets, this is not what is contemplated by the statute nor the entire structure of the Board's regulation of rail rates to captive shippers. That situation should be corrected by a properly-designed revenue adequacy constraint, by which returns in excess of those needed for revenue adequacy and in excess of those paid by similarly-situated shippers with effective competition should be returned to captive shippers.

Of course in making these comments, the Concerned Shippers Associations do not mean to suggest that markets containing two, or a very few, railroads are, in fact, competitive markets. As was pointed out by Christensen Associates, Inc. in An Update to the Study of Competition in the U.S. Freight Railroad Industry, Final Report, January 2010:

> Theories of oligopoly suggest that parallel behavior (whether coordinated or not) is more likely in situations where the industry has only a few firms, each offering a fairly standard product and facing similar cost structure. Our cost analysis indicates that BNSF and UP face similar cost structures, and the same is true for

CSX and NS. In particular, the similarities in marginal cost, because of its fundamental relationship to price, suggest conditions favorable for parallelism.[9]

Thus, in any comparison of competitive versus captive markets, care must be taken to show that the "competitive" market is truly competitive and not merely the result of parallel behavior.

## V. THE BOARD SHOULD USE MARKET MEASURES TO SUPPLEMENT ITS DEPRECIATED ORIGINAL COST CALCULATION IN DETERMINING WHICH CARRIERS ARE REVENUE ADEQUATE. USE OF REPLACEMENT COSTS TO DETERMINE THE INDUSTRY'S COST OF CAPITAL IS UNJUSTIFIED IN THEORY AND IMPOSSIBLE IN PRACTICE

### A. The Board Should Use Market Measures to Supplement Its Depreciated Original Cost ROI Calculation In Determining Which Carriers Are Revenue Adequate For Purposes of A Revenue Adequacy Constraint

In their opening Comments, the AAR argued the Board's annual measurements of revenue adequacy overstate the true economic return earned by railroads, in particular because the Board's methodology is based on depreciated original cost instead of replacement costs. AAR Comments, p. 8. AAR argued that the Board should use replacement costs instead of book value in its revenue adequacy determinations. Id., pp. 27-30. The AAR's arguments were reiterated by a number of individual railroads. See, e.g., CSXT Comments, pp. 1-10, 13-26; NS Comments, pp. 71-73. But the AAR and the railroads are wrong: the Board's refusal to examine market measures of revenue adequacy understates the extent to which the rail industry and individual rail carriers are revenue adequate.

In their opening Comments, these Concerned Shipper Associations noted that the Board's own revenue adequacy determinations indicated that many Class I rail carriers have been meeting or even exceeding the Board's own standards for adequate revenues for a number of years. Comments, pp. 5-6. These parties also submitted the Verified Statement of Gerald R.

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[9] In its footnote on this subject, the Christensen Report goes on to say: "We are deliberate in the choice of the term 'parallel behavior.' It should not be interpreted as 'collusion.' In fact, theory suggests that with very few firms facing very similar conditions, 'conscious parallelism' makes collusion unnecessary." (Emphasis supplied)

Faulhaber, an eminent economist, who noted that the rail industry is in fact highly profitable, especially in light of the financial judgments of the markets. Faulhaber V.S., p. 4. The use of market measures of revenue adequacy are fully consistent with the statute, which gives the Board broad discretion in determining how to define whether the industry and individual rail carriers are earning adequate revenues, and would provide more data points for the Board's determination of revenue adequacy.

The record in this proceeding supports those comments. The Allied Shippers, for example, argued that by any reasonable, recognized and objective measure of financial health, U.S. Class I railroads today are earning adequate revenues, and the Board should change its current test for revenue adequacy by adding other metrics of financial health. Similarly, CURE noted that the method used by the STB to determine revenue adequacy fails to accurately reflect what Wall Street investors have indicated for several years. CURE Comments, p. 1. See also, AECC Comments, pp. 3-4, 10, and 13-14.

### B. The Board Should Not Use Replacement Costs To Determine Which Carriers Are Revenue Adequate

The Board should reject the railroads' call for the use of replacement costs in its revenue adequacy determinations, for both theoretical and practical reasons. Though the railroads decry as mere "accounting" rates of return produced by the Board's depreciated original cost methodology, as opposed to allegedly "economic" rates of return produced by a replacement cost methodology, the fact of the matter is that the calculation of replacement costs is rife with as many – and more – "accounting" calculations and assumptions as is depreciated original cost. Whether or not a carrier is "revenue adequate" can ultimately be determined only by the financial markets, using a variety of financial indicators that the markets regularly consult: return on equity, free cash flow, operating ratios, and the like. The fact of the matter is that return on

investment calculated using replacement costs is not used by the market in evaluating the financial health of individual railroads. UP's evidence in this very proceeding is telling: UP's own Board of Directors has selected fourteen "peer group" companies to evaluate the financial performance of the railroad, and UP's own expert uses "return on invested capital," which is "similar to the Board's measure of return on investment" to compare UP's and the peer group companies' financial performance. See, UP Comments, pp. 41-42. UP's own expert also uses other "market" measures, such as the use of cash for capital expenditures, dividends, and stock buybacks, to evaluate UP's financial performance. UP Comments, pp. 41-43. Significantly, when a real-live company decides to make real-live financial judgments, replacement costs are nowhere mentioned.

There is a reason why the financial markets do not consult replacement costs in evaluating financial performance: it is impossible to do so. The calculation of replacement costs requires the use of a large number of assumptions regarding what investments would be "used and useful." In its Comments, CSXT argued that the large majority of rail assets are now "used and useful," given the capacity constraints evident in the rail industry. See, CSXT Comments, p. 23. But just because the rail system has become more capacity constrained does not mean that the entire rail system is used and useful: bottlenecks can occur on a rail system at specific points that may interfere with effective service overall, while other portions of the rail system are relatively unused. The Board cannot simply assume away the problem of determining what portions of the rail system are used and useful, as CSXT contends.

More importantly, the use of replacement costs also demands a large number of assumptions and calculations as to how and at what cost investments would be replaced, especially as technology changes over the years. For example, signaling systems installed in

1980 would not be "replaced" using the same technology today, but would be "replaced" with modern PTC systems whose cost and configuration would be far different. In its 1986 decision in Standards for Railroad Revenue Adequacy, the agency exhaustively detailed the numerous uncertainties that would inhere in any attempt to develop the replacement cost for railroad land values (which the agency noted "def[y] a practice solution, id. at 279), pricing of railroad equipment, pricing of road property accounts, and the effects of changing engineering and construction standards. Id., at 281. The agency concluded that "[a] complete reevaluation of the railroads' investment base is beyond our foreseeable resources and would, in any case, be of questionable validity," and there is "no practical and reliable current valuation methodology that is available to us. Id., at 282, 283. What was true in 1986 is true today. Moreover, as the agency noted in its 1986 decision, if a current (replacement) cost approach is used for valuing the investment base, then the agency must also compute a real cost of capital, i.e., the nominal cost of capital minus the rate of inflation. Id., at 276. This has its own problems and complications: indeed, the agency itself noted in its 1981 decision that "an additional problem" with the use of replacement costs is that it "requires the use of the current, real cost of capital," which "cannot be observed directly . . ." Standards for Railroad Revenue Adequacy, 364 I.C.C. 803, 819 (1981).

CSXT's assertion that the Board's SAC procedures show that the calculation of replacement costs is now possible is laughable. In fact, current SAC procedures show just the opposite. The time, money and expertise that go into a multi-year, multimillion dollar rate case that develops a SARR for one portion of one rail carrier would be multiplied many-fold to develop the replacement cost for the entire investment of every railroad in the country. The

exercise would be incredibly expensive and time-consuming, would lead to ongoing, multi-year litigation, and would not produce a reliable answer.

### C. The Board Should Continue To Deduct Deferred Taxes From the Rate Base

In its Opening Comments, the AAR argues that the exclusion of the deferred taxes from the railroads' rate base, as the Board has done for nearly thirty years, results in an "unwarranted" increase in railroad ROI, and creates a "disincentive" for further investment in railroad assets. See, AAR Comments, pp. 9-10 and 30; see also, NS Comments, pp. 74-75. In addition, the AAR argues that the Board "never explicitly considered the proper treatment of deferred taxes for revenue adequacy purposes," though it cites the agency's 1986 decision on this question. AAR Comments, p. 9. In fact, however, the agency exhaustively considered this matter in 1986, and evaluated the views of numerous parties, including DOT, numerous shipper parties, and the AAR itself. The agency carefully evaluated three alternative procedures for recognizing the cost-free nature of deferred taxes, and carefully selected the method that it has used since 1986, a method that was approved by the reviewing court. See, Standards for Railroad Revenue Adequacy, Ex Parte 393 (Sub-No. 1), 3 I.C.C.2d 261, 269-275 (1986), aff'd sub nom., Consolidated Rail Corporation v. United States, 855 F.2d 78, 93 (3d Cir. 1988).

In its 1986 Standards for Railroad Revenue Adequacy decision, the agency carefully concluded that "[w]e continue to believe that a deferred tax adjustment is necessary to more accurately reflect the effects of deferred taxes . . . on the railroads' revenue requirements. Nothing in the evidence has convinced us otherwise. . . . Deferred tax reserves are clearly a no-cost source of capital. To assume that the railroads need a return on that capital in order to achieve revenue adequacy is especially inappropriate, given [their] huge increases in deferred tax reserves. . ." Id., at 272. The agency continued:

> In our view, when we allowed railroads to treat deferred taxes as an expense without a corresponding reduction in the net investment base, we allowed railroads a double benefit: they were allowed to demand rates sufficient to cover tax liabilities not yet paid and also to collect additional profits on the funds held in reserve to pay such deferred taxes. We now view this as the unfair distortion of the railroads' revenue adequacy that shippers have long argued. Indeed, the prevailing judicial view is that it is inequitable to allow railroads or public utilities to receive returns on the funds generated through deferred taxes at no cost, and that to avoid a double benefit, the deferred taxes must be deducted from the net investment base. [citations omitted]

Id. Interestingly, the agency specifically rejected the very same "disincentive" argument that the AAR now raises:

> The AAR argues against making any deferred tax adjustment primarily on the grounds that to do so would create a disincentive for investment in the railroads. We disagree. Even with a deferred tax adjustment, the railroads will still be able to take full advantage of the tax law which allows them to defer the payment of some income taxes. The adjustment in no way requires the railroads to forfeit any cash flow benefits which they are entitled to under the tax law and allows them to invest the proceeds as they see fit. [citation omitted]

Id.

The Board should reject the railroads' arguments in 2013 as it so carefully did in 1986.

## VI. THE BOARD SHOULD DEVELOP STANDARDS AND PROCEDURES FOR A REVENUE ADEQUACY CONSTRAINT AS SUGGESTED IN THE CONCERNED SHIPPER ASSOCIATION OPENING COMMENTS

In their Opening Comments, the Concerned Shipper Associations urged the Board to develop principles and methods for challenging the rates imposed by rail carriers on captive shippers that transport goods on rail carriers subject to the revenue adequacy constraint, as well as simplified and expedited procedures to limit the ability of rail carriers subject to the revenue adequacy constraint from increasing rates to captive shippers in excess of increases in their cost of operations. Comments, pp. 11-13. These standards and procedures for bringing a complaint under the Guidelines' revenue adequacy constraint should be simple, timely, cost-effective and

predictable. The Concerned Shipper Associations believe that the record in this proceeding supports the Board's development of such a proposal and the initiation of a Notice of Proposed Rulemaking. These two categories – challenges to existing rates, and challenges to rate increases – are discussed immediately below in light of the record.

### A. Revenue Adequacy Constraint – Rate Challenges

In developing principles and methods for challenging rates to captive shippers under a revenue adequacy constraint, the Board would need to develop at least the following steps:

1) Annual Determination of Revenue Adequacy – As it has done for many years, a revenue adequacy constraint would need to be based on the Board's annual determination of revenue adequacy for each rail carrier. These Concerned Shipper Associations believe that the Board's ROI/depreciated original cost methodology should be informed and adjusted by market measures of revenue adequacy. These Concerned Shipper Associations also support the Petition of the Western Coal Traffic League in Ex Parte 664 (Sub-No. 1) as an appropriate means to more accurately determine the railroads' cost of equity capital. The goal of this exercise should be to determine, as the Board does now, an ROI that is "adequate" to support the requirements of the statute, and to identify annually, for each Class I carrier, the amount of revenue, if any, that exceeds the level of revenue determined to be "adequate" by the Board. These Concerned Shipper Associations strongly oppose any effort to use replacement costs or to include deferred taxes in the rate base.

2) Determination of the Measure of Time Over Which A Revenue Adequacy Constraint Should Apply – In order to apply a revenue adequacy constraint, the Board should develop a time period over which it would examine the carrier's revenue adequacy status, to determine whether a carrier should be subject to the revenue adequacy constraint or not. These

Concerned Shipper Associations believe that the time period over which the Board should measure the applicability of a revenue adequacy constraint should not be longer than a business cycle. Since business cycles vary and because it is impossible to tell how long the current business cycle will last, the Board should develop a practical rule and standard for determining this time period. These Concerned Shipper Associations believe that one possibility would be to determine the length of an average business cycle.. See Comments, p. 11, fn. 4.[10] Witnesses Caves and Singer also note the fact that Guidelines suggest that a typical macroeconomic business cycle may help to delineate an appropriate timeframe, and provide additional information as to the length of such a typical cycle. Caves/Singer V.S., pp. 13-14.

3) Determination of Total Revenue in Excess of the Revenue Needed for Revenue Adequacy Over the Relevant Time Period – Once the Board has determined the annual measure of revenue adequacy, the amount of annual revenue above or below that needed for revenue adequacy in any one year, and the time period over which the revenue adequacy constraint should be applied, the Board can then determine whether the carrier, on net over the relevant time period, has earned revenues above or below the revenue adequate level.

4) Determination of Market Dominance – The Concerned Shipper Associations' opening Comments noted that the statute requires a shipper seeking the determination of a "reasonable" rate must be determined to be without effective competition. Thus, the Board should, in developing standards and procedures for adjudicating a revenue adequacy constraint,

[10] In its Comments, the Norfolk Southern suggests that revenue adequacy should be measured over the average life of railroad investments. See NS Comments, p. 76. Significantly, though NS clearly would have such information, at least for its own investments, the railroad did not reveal it. The suggestion should be rejected. The suggestion would likely mean that a railroad could not be found to be revenue adequate unless its returns exceeded its cost of capital for many years – perhaps decades. The AAR itself concedes that rail carriers' assets have "unusually long lives." See, AAR Comments, p. 29.

indicate that it will determine whether a particular carrier is market dominant over the transportation to which the rate being charged by a carrier that is subject to the revenue adequacy constraint applies. The procedures for determining market dominance must permit shippers without effective competition to access the Board's procedures. This will require determinations that are sensitive to actual economic realities. For example, just because a shipper is served by two railroads does not, by itself, indicate that there is effective competition, if those railroads have tacitly agreed not to compete, or if the one carrier cannot effectively serve the shipper.

5) Determination of Method for Proportional Rate Reductions To Captive Traffic Based on the Contribution of Excess Revenue From Captive Traffic -- In their opening Comments, these Concerned Shipper Associations noted that, once the above determinations were made, the Board would have to decide upon a means to fairly allocate the excess returns above an "adequate" level that were generated by captive shippers, in order to determine the reparations that a shipper might receive under the revenue adequacy constraint. See, Comments, p. 12. The Concerned Shipper Associations noted that there may be many means of fairly calculating reparations in such a circumstance, and urged the Board to take comments in a future proceeding on various means of doing so. The Verified Statement of witnesses Singer and Caves suggests two possible approaches. See, Singer/Caves V.S., pp. 20 to 24. In addition, the paper by Mr. Pittman, attached as Appendix C, suggests a third approach, namely, the development of a ceiling on the price-to-variable cost ratio that would act as a constraint on the degree to which Ramsey pricing is permitted. Regarding these various approaches, as noted by Singer and Caves,

> [I]t bears emphasis that even an approximate solution can result in substantial improvements in economic efficiency: whenever the revenue adequacy constraint is satisfied, adjusting prices downward toward incremental costs decreases the average deadweight loss in the system,

> even if full Ramsey pricing is not achieves. Stated differently, whenever the revenue adequacy constraint is satisfied, moving prices further away from marginal costs will generate additional economic losses to society.

Singer/Caves V.S., p. 20.

Of course, the Board itself has also dealt with the issue of allocating costs and revenue in its own consideration of rate prescriptions and reparations in Stand Alone cost cases. See, Major Issues in Rail Rate Cases, STB Ex Parte No. 657 (Sub-No. 1), served October 30, 2006, slip op. at 9-23 (Major Issues). In Major Issues, for example, the Board noted that it had used a "percent reduction" method in past cases to allocate total SAC costs to determine if a challenged rate were unreasonably high, and adopted the "Maximum Markup Methodology" ("MMM") based on an analysis of R/VC ratios, a methodology that the Board noted "reflects the important principle that a railroad should recover as much of its costs as possible from each shipper served before charging differentially higher rates to its captive shippers," Id., p. 16; see also, pp. 18-23. Indeed, the Board noted that the MMM methodology would "restrain the degree of differential pricing permitted" so that the carrier "could engage in enough demand-based differential pricing to earn adequate revenues, but no more." Major Issues, p. 21 [emphasis added].

6) Determination of Duration of Remedy –In their opening comments, these Concerned Shipper Associations noted that, if a practical revenue adequacy constraint were to be adopted, the Board would also need to determine how long any rate prescription under the revenue adequacy constraint should last, and suggested several possible options. Again, these parties believe that the Board should take comments in a future proceeding on this issue.

7) Railroad Ability to Rebut – As noted by these parties in their opening Comments, in Guidelines, the agency developed principles that might be applicable to a railroad seeking to retain revenues above those needed for revenue adequacy. These parties believe that those

principles establish a sound starting place for developing standards and procedures for such extraordinary circumstances.

### B. Revenue Adequacy Constraint – Rate Increases

In their opening Comments, these Concerned Shipper Associations indicated that, in developing a revenue adequacy constraint, the Board should establish standards and procedures for expedited complaints should a carrier that is subject to the revenue adequacy constraint attempt to increase rates for market dominant traffic by more than changes in the RCAF-A. These parties continue to believe that such an expedited procedure would provide a fair and expeditious means of limiting excessive rate increases to captive traffic where the carrier is already earning revenues in excess of those needed to fulfill the statutory standard.

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These Concerned Shipper Associations appreciate the opportunity to submit these Reply Comments, and urge the Board to consult them in developing further proposals to implement its revenue adequacy constraint.

Respectfully submitted,

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*On Behalf of:*
American Chemistry Council
The Fertilizer Institute
The Chlorine Institute
The National Industrial Transportation League

Dated: November 4, 2014

# APPENDIX A

# VERIFIED STATEMENT

of

Gerald R. Faulhaber*

# STAND-ALONE COST – RESPONSE TO COMMENTS

In their filings before the Surface Transportation Board in Docket Ex Parte No. 722, September 5, 2014, a number of railroads and their consultants discussed the Stand-Alone Cost test, calling it the "gold standard" of rate setting and noting that it "mimicked competition," among other items. Unfortunately, they did not have the opportunity to read my September 5 comments (submitted with the Concerned Shipper Associations filing) that debunked these claims, based on my original paper[1] and the follow-on work by Baumol, Panzar and Willig[2]. This response provides the opportunity to discredit these overblown claims in detail.

I group the incorrect statements made in these filings into three categories: (1) Stand-Alone Cost is the "gold standard" for testing rate reasonableness; (2) the Stand-Alone Cost test "mimics competition"; and (3) Stand-Alone Cost (and its simplifications) are practical and effective regulatory tools. I cover each category in turn.

## 1. Claim: "Stand-Alone Cost is the 'gold standard' for rate reasonableness"

This common claim is repeated in all the railroad filings. Here are several examples:

> "The Stand-Alone Cost test, which judges the reasonableness of a challenged rate by comparison to the rate that would prevail in a competitive market, rests on a sound economic foundation..." [3]
>
> "The Stand-Alone-Cost test—which is rooted in sound economics—is available to all shippers..."[4]

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[1] Faulhaber, G.R. (1975) "Cross Subsidization: Pricing in Public Enterprises" *American Economic Review*, 65, pp.966-977.

[2] Baumol, W.J., Panzar, J.C, & Willing, R.D. (1982) *Contestable Markets and the Theory of Industry Structure* New York: Harcourt, Brace Jovanovich.

[3] Association of American Railroads (2014), comments in Railroad Revenue Adequacy, STB Docket Ex Parte No. 722, September 5 pp. 39-40.

[4] Norfolk Southern Railway (2014) comments in Railroad Revenue Adequacy, STB Docket Ex Parte No. 722, September 5, p. 25.

"Stand-Alone Cost is indisputably the 'most accurate procedure available for determining the reasonableness of rail rates where there is an absence of effective competition.'"[5]

"...the Stand-Alone Cost constraint...is widely and consistently recognized by the Board, courts, and economists as the gold standard."[6]

"Stand-Alone Cost is the acknowledged gold standard for rate reasonableness analysis."[7]

*Response:* As the original author of SAC, I should be quite flattered by all these encomia ... if any of it were true. Unfortunately, the use of Stand-Alone Cost in railway rate regulation is so far from the models in which it was originally developed as to be unrecognizable. Let's review the economic model in which Stand-Alone Cost was developed:

**Economic World of Stand-Alone Cost/Contestable Markets**

*Monopoly;* there is only one firm that produces the good or service in question.

*Profit-constraining regulation;* prices are regulated to ensure the entire firm makes no more that its cost of capital.

*Each and every price is regulated;* as is investment, innovation, entry and exit.

The key question asked in the Faulhaber (1975) paper was cross-subsidy; under what conditions did the regulated prices lead some services to provide a subsidy to other services? For example, the industry that best fit the Stand-Alone Cost economic model was the then-regulated telecommunications industry: was long-distance service providing a subsidy to local exchange service? The Faulhaber (1975) paper provided an economically sound approach to answering that question, within the context of a fully-regulated monopoly telecommunications market of the 1970s. The Baumol, Panzar Willig work (1982) extended this work to encompass competition, expressed using the concept of contestable markets. In the former work, Stand-Alone Cost measured whether a particular service (or group of services) was providing a subsidy to other services. In the latter work, Stand-Alone Cost was a measure of whether a particular service (or group of services) would attract competitive entry in the specialized world of contestable markets.

**Economic World of Class I US Freight Railroads**

*Four major rail freight carriers;* down from dozens due to consolidation, that compete for much (but not all) traffic.

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[5] *op cit.* p. 25.
[6] *op cit.* p. 77.
[7] CSX Transportation (2014) comments in Railroad Revenue Adequacy, STB Docket Ex Parte No. 722, September 5, p. 28.

*Only prices to captive shippers are regulated by the Surface Transportation Board;* rail prices in competitive markets are completely deregulated.

*No firm-wide profit constraint*: because all prices in competitive markets are completely deregulated, the Staggers Act constrains the Board from imposing a firm-wide profit constraint upon railway firms.

These two worlds are completely different economic models; conclusions from one set of papers addressing one economic model have no relevance to addressing problems encountered in a completely different economic model. As I pointed out in Faulhaber[8], if the firm is not profit-constrained, the stand alone cost has no meaning in the context of cross-subsidy. As a consequence, the use of the stand alone cost test by the STB has nothing to do with cross-subsidy, as railroads are not subject to a profit constraint and by any measure are highly profitable today. But perhaps the Baumol, Panzar, Willig (BPW) may provide such justification for using Stand-Alone Cost in rail rate regulation? Unfortunately, no; in Baumol, Panzar, Willig, 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). Again, the BPW model simply doesn't fit the STB-regulated rail firms; it is not even close. This provides no economic justification for imposing stand-alone cost regulation. None.

## 2. Claim: The proper test for rate reasonableness is to "mimic" (or simulate) competition in a contestable market

This claim was made by most railroad parties, but particularly by the economic consultants:

> "The Stand-Alone Cost test, which judges the reasonableness of a challenged rate by comparison to the rate that would prevail in a competitive market..."[9]

> "the Stand-Alone Cost test in the rail industry prevents the abuse of market power and implements the "mimic competition" principle of rate regulation in the public interest...the Stand-Alone Cost test rest on the economics of "contestable markets."[10]

> "The Stand-Alone Cost constraint is intended to simulate a competitive rate, which the Board specifies as 'the rate a hypothetical efficient railroad would need to charge to serve the complaining shipper, while fully covering all of its costs, including a reasonable return on investment.' This competitive rate is precisely the sort of protection that the Board has been charged with making available to shippers for movements where effective competition is absent."[11]

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[8] Faulhaber, G.R. (2005), "Cross-Subsidization with More Than Two Services" *Journal of Competition Law & Economics*, **1**(3), 441-448.

[9] American Association of Railroads, *op cit.* pp. 39-40.

[10] *op cit.*, Verified Statement of Joseph Kalt. p.26

[11] Norfolk Southern Railway *op cit.* Verified Statement of Bradford Cornell p. 5.

"In 2014, the U.S. Court of Appeals for the District of Columbia reaffirmed the intent of the Stand-Alone Cost constraint, commenting:

> 'The ultimate aim of the Stand-Alone-Cost test is to require that 'railroads functioning in a noncompetitive market . . . price as if alternatives to their services were available' to the captive shipper.'"[12]

"This regulation is designed to afford shippers that lack effective competition the protection they would enjoy in a contestable market."[13]

*Response:* I am in complete agreement with all these filings insofar as they claim, to quote the DC Circuit Court, that "the ultimate aim...is to require that 'railroads functioning in a noncompetitive market price as if alternatives were available' to the captive shipper", using the assumptions of contestable markets. I am in complete *dis*agreement that, in the world of today's railroad industry, the Stand-Alone Cost test is the proper tool to simulate contestable market competition. In fact, it is precisely the *wrong* tool to accomplish this laudable objective.

This might appear to fly in the face of the Baumol, Panzar, Willig work (1982) on contestable markets, in which Stand-Alone Cost was indeed used as the measure of potential entry by firms outside the monopoly. But to do so would be to ignore the major differences in the regulated monopoly market of Faulhaber (1975) and Baumol, Panzar, Willig (1982) as discussed in the previous section.

In particular, in the monopoly world posited by the earlier work, the *only alternative* to the monopoly supplier would be a totally new entrant, with no existing facilities or operations in the business at hand. Thus, the Stand-Alone Cost measured the only way in which competition might occur in that market.

In the actual world of the railroad industry, there is no monopoly; there are, in fact, seven Class I freight railroads operating in the US, any of which could be a potential source of competition (in a contestable market). If the purpose of the cost exercise is, and the DC Circuit Court opinion noted above, to simulate competitive options for shippers, then all competitive options available in today's actual world of the railroad industry, assuming contestable markets, must be considered, not just the option of a wholly independent Stand-Alone railroad to serve the particular shipper's needs.

An example suffices to demonstrate such competitive options. Suppose we have a chemical shipper whose factory is at location F, shipping sulfur to a customer at location C; it is currently a captive shipper of railroad R, which has built a spur from F to its nearest switch point on its US rail network, over which it ships the sulfur from F to C. Should the shipper object to the rate charged by R, it would have to design and cost out an entire rail network between F and C (the

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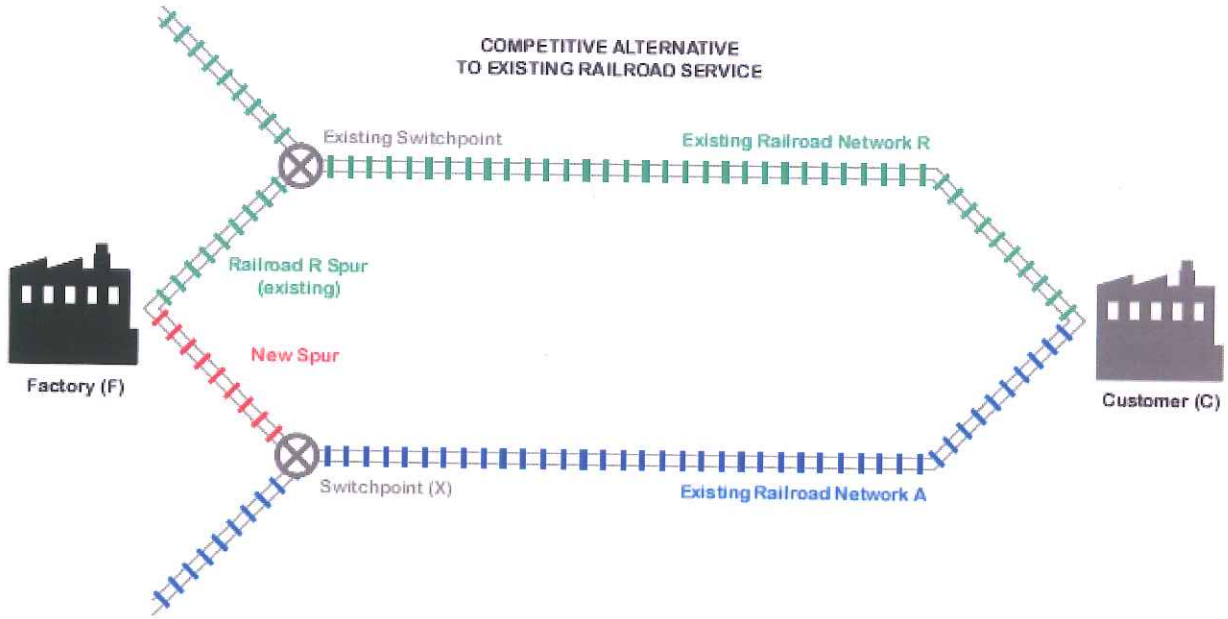
[12] *op cit.* pp. 5-6

[13] *op cit.*, Verified Statement of David Sappington p. 5-6.

Stand-Alone railroad) and compare the total cost to the rate it is currently being charged. This assumes that a potential competitor, under the assumption of a contestable market, would have to build an entirely new rail network to carry this traffic, a very unlikely scenario. Far more likely, a competitor could build a spur from F to the next-nearest railroad switch point X to connect with the existing alternative railroad A. That railroad would then charge the shipper its competitive rate to ship sulfur from X to C, as shown in the figure below.




Again assuming a contestable market, railroad A would be willing to ship the sulfur at its already-established market-based rate.[14] In this case, what is the price of this competitive alternative? It is (i) a price sufficient to cover the Stand-Alone Cost of building and operating the spur from F to X plus (ii) the market-based price of railroad A to carry the sulfur from X to C. And this should be *a* price that would "mimic competition," and should thus be compared to the rate that railroad R is actually charging the captive shipper. We note that in this example, this competitive option is simply one of perhaps many competitive options, using access to existing railroads at existing (or new) switch points, each of which would have a price, calculated as above. Clearly, the lowest price so calculated would best "mimic competition" when judging the rate reasonableness being charged the captive shipper by railroad R.

It could be argued that in practice, the next-nearest railroad A may choose not to carry the shipper's sulfur, perhaps because of a tacit understanding with railroad R. We acknowledge that such an outcome is certainly possible, perhaps likely, in today's transportation marketplace, but recall that we are assuming a contestable market in order to "mimic competition;" in this world, firms aggressively pursue new business, and are willing to provide

[14] Should a market-based competitive rate not be available, contestable market theory suggests that railroad A would be willing to carry this traffic at any price in excess of its (long-run) incremental cost of carriage. Thus, long-run incremental cost could be used as an alternative to an actual market-based price.

service if it can be offered at a price that covers its cost of doing that business. The "mimic competition" model of regulation that the STB has used for decades is based on the contestable market assumption, in which competition which may not occur in existing markets will take place.

Note that one competitive alternative is to build and operate a totally self-contained *de novo* rail system, specifically for this shipper's traffic. Doing so corresponds to the current Stand-Alone Cost test. I certainly agree that such an alternative could in theory be computed. However, it is highly unlikely that this competitive option would be the least-cost option, and a complaining shipper should be free to choose which competitive option it presented for analysis, limited only by the existing rail system.[15]

Limiting shippers to only use one competitive option, a totally self-contained *de novo* system, only makes economic sense within the model of regulated monopoly, in which no alternative suppliers are available. Since this is not the world in which we live, shippers should be able to choose which option they present for testing rate reasonableness.

I conclude that I am in full agreement that "mimicking competition" is an excellent way to test for rate reasonableness, but using only Stand-Alone Cost to do so is a grave mistake. Shippers should be permitted to construct the competitive option(s) that best "mimic competition" for its business, and use these options to test for rate reasonableness. Such options should be constrained by the existing rail network structure and pricing, as well as making use of contestability theory. Only then will the STB truly "mimic competition" in testing for rate reasonableness.

## 3. Stand-Alone Cost (and its simplifications) are practical and effective regulatory tools

Again, a few examples from the filings:

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

[15] Another, perhaps preferable, alternative would be for the shipper to request service from F to X from railroad R, and then arrange with railroad A to complete the shipment to C. The rate railroad R would be permitted to charge the captive shipper for shipment from F to X would be no more than the Stand-Alone Cost of this spur. Of course, the shipper would also be responsible for paying railroad A's rate from X to C, presumably reflecting actual market conditions at X.

uncertainty into the SAC process. The issues are then debated vigorously, often in a series of cases, sometimes even on appeal. Eventually, the ICC or STB settles the issue."[16]

"To the extent there are concerns with the high cost of using SAC to determine "mimic competition" rate levels, the proper approach is to seek to *simplify* the procedures for implementing SAC as the Board has successfully done in the past,"[17]

*Response:* The thrust of these comments is that for almost thirty years, Stand-Alone Cost test methodology has been enormously complex and costly for both shippers and the STB, and continues to be so. The best advice this filing can muster is to simplify it, as if the ICC and the STB hadn't considered this over the past three decades.

The reason that Congress suggested simplified versions of the Stand-Alone Cost test, and that the STB has come up with easier means to prove a rate is excessive, demonstrates that the current implementation of the Stand-Alone Cost test is unwieldy in the extreme: unnecessarily complex and expensive to implement, and (in the case of carload shippers) unlikely to ever meet the demands of the STB (and railroad interveners) to capture every last jot and tittle of railroad costs. The extreme complexity is no accident and should be no surprise; it evolved as part and parcel of the regulatory process.

Could this have been avoided? Definitely; what is missing is that the STB has failed to develop a general Stand-Alone Cost computer model, into which shippers, regulators or railroads could plug in parameters and data particular to their issue and have the model calculate the Stand-Alone Cost. Such a model would have built into it the complexities and connections of building and operating a Stand-Alone railroad, and would be approved for use by the STB. Having shippers build their own model for each rate case is extraordinarily wasteful and duplicative, and in the end unsuccessful. Two decades ago, the Federal Communications Commission faced a similar problem when it adopted a long-run incremental cost standard for rate-making purposes; it's solution was to commission a model to be built which permitted the calculation of incremental costs, called TELRIC (total element long-run incremental cost), which become the standard regulatory cost model. Requests for rate approval and challenges to rates all used TELRIC, drastically reducing the costs of everyone, not least the FCC, of conducting business. The STB has developed a model for determining variable costs, the Uniform Railroad Costing System (URCS), for use as an industry standard, apparently successfully. For whatever reason, STB has chosen not to introduce a stand-alone cost model in spite of having developed URCS, leading to a huge waste of time and money for the parties involved.

Another point causing some confusion:

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[16] Association of American Railroads, *op cit.* p. 45.

[17] Association of American Railroads, *op cit.* Verified Statement of Joseph Kalt p.39

> "driv[ing] rates on some regulated traffic down below SAC levels – *i.e.*, below the level necessary to cover full long-run costs – contrary to the competitive market principles underlying the Board's approach to rate regulation."[18]

*Response:* This is simply an economic error. The rate level required to cover long-run costs for any portion of the railroad's business is long-run *incremental* cost; i.e., the *additional* cost that the service/product/customer in question causes the railroad. Stand-Alone Cost is the cost of the service/product/customer in question if a separate railroad is built for just that traffic. As a rule, long-run incremental cost is much less than Stand-Alone Cost, particularly in a business characterized by scale and scope economies.

> "Railroads and shippers regularly resolve disagreements over rates by reference to the likely outcome of SAC cases. A practice of "regulatory contestability" has taken hold in the rail sector. That is to say, potential litigants avoid the costs and other burdens of complex rate litigation by simulating the likely outcomes of litigation through negotiated resolution of disputes....– a successful regime should result in *fewer*, not more, cases."[19]

> "...the fact that most shippers never feel the need to bring rate cases is not a sign of regulatory failure—it is a sign of regulatory success."[20].

*Response:* This claim was mentioned throughout the reviewed filings. The point is that rate cases are only brought if there is disagreement among the parties about the outcome of such a case. If there is no disagreement, then the case will be settled prior to legal action via negotiation. This is true, but not because the regulation in question is *good*, but only that it is *certain.* If both parties are completely certain of the outcome of a case, they will indeed bargain to that solution rather than file rate cases. But this is true if the outcome is inefficient or unfair, as well as if the outcome is efficient and fair. It is therefore not true that failure to bring cases "is a sign of regulatory success." It is a sign of regulatory certainty, not regulatory success.

## 4. Conclusion

The fundamental flaw in the reviewed filings is that the Stand-Alone Cost test is the economically appropriate standard for testing rate reasonableness because it "mimics competition." In fact, while "mimics competition" is a very plausible standard for testing rate reasonableness, the Stand-Alone Cost test does not do this in the economic world of the rail industry; it is not even close. Stand-Alone Costs were developed for an economic world of profit-constrained rate regulated monopoly, which is not at all like the largely unregulated, not profit-constrained and world of seven major rail networks that constitute this industry. I have

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[18] American Association of Railroads, *op cit.* p. 41

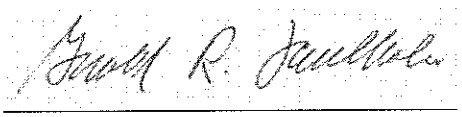
[19] *op cit.* pp. 46-47.

[20] Norfolk Southern Railroad, *op cit.* p.82

given a simple example of how competitive options could be developed for this world, based on the same principles of Faulhaber (1975) and Baumol, Panzar, Willig (1982), that would be far more suitable for testing rate reasonableness. In sum, there are several possible right answers to how to test for rate reasonableness, but the Board's current Stand-Alone Cost model is without doubt the wrong answer.

VERIFICATION

I, Gerald R. Faulhaber, verify under penalty of perjury that I have read this Verified Statement, that I know the contents thereof, and that the same are true and correct based on my knowledge, information and belief. Further, I certify that I am qualified and authorized to file this Statement.



Gerald R. Faulhaber

Executed on November 3, 2014

# APPENDIX B

VERIFIED STATEMENT

of

Kevin Caves and Hal Singer[1]

## ASSIGNMENT

We are competition economists with extensive experience and publications in the area of access pricing and regulated rates.[2] We have been asked to assess the economic testimony submitted in this proceeding to date, and to offer economic opinions relating to three questions:

(1) *Is stand-alone cost ("SAC") an appropriate standard for setting the rates paid by captive shippers?*;

(2) *Is revenue adequacy an appropriate standard for setting the rates paid by captive shippers?*;

(3) *Assuming revenue adequacy is an appropriate standard, how should the Surface Transportation Board ("STB") implement that standard when a railroad is revenue adequate?*

## SUMMARY OF CONCLUSIONS

In considering the two rate standards, the STB should not lose sight of its stated overarching objective—to approximate the economically efficient Ramsey outcome. Under Ramsey, prices are allowed to diverge from the *incremental cost* of each service in proportion to the inverse elasticity of demand for the service; these margins must provide sufficient cash flows to cover the railroad's unattributable *fixed costs* plus a reasonable return on investment. The revenue adequacy standard is best understood as serving as the constraint to the optimization problem in the Ramsey framework, which computes prices that maximize total welfare (equal to economic surplus net of total costs), while still allowing sufficient markups over marginal cost to recover the firm's fixed costs plus a reasonable rate of return.

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[1] Kevin Caves is a Senior Economist for Economists Incorporated. Hal Singer is a Principal for Economists Incorporated, a Senior Fellow at Progressive Policy Institute, and an Adjunct Professor at the McDonough School of Business at Georgetown University.

[2] Copies of Dr. Caves' and Dr. Singer's current CVs are attached at Appendix 1.

When the revenue adequacy constraint is not satisfied—that is, when a railroad is not revenue adequate at prevailing rates—prices are, by definition, below the levels implied by the Ramsey result, and must rise to permit further fixed-cost recovery. But when a railroad earns revenues significantly in excess of what would be required to cover its costs and earn a reasonable rate of return, economic welfare can be improved by narrowing the gap between price and marginal cost. In contrast to Ramsey, the SAC standard focuses the regulator on the inefficiently high costs of a hypothetical network, and inappropriately rewards the railroad for its incumbent position by linking its prices to those of a less-efficient hypothetical rival. In this way, focusing on SAC to the exclusion of Ramsey principles gives incumbents with market power both the incentive and the ability engage in inefficient and unconstrained monopoly pricing in perpetuity.

## I. The Stand-Alone Cost Standard

Economists define the stand-alone cost of a given service (or group of services) as the cost that a firm would incur if it were to provide the service on its own, without offering any additional services.[3] Any shared costs or other efficiencies that the firm may enjoy by virtue of offering additional services in the actual world are, by definition, excluded from consideration in the but-for world contemplated by SAC. In the railroad industry, SAC has traditionally been used as a reference point by regulators to delineate an upper bound to the price that a regulated incumbent is permitted to charge a captive shipper. Unfortunately, SAC does not inform the economically efficient pricing structure, which is given by the answer to a Ramsey pricing problem. Ramsey prices permit incumbents to recover, via a markup over incremental costs, all fixed costs plus a reasonable return to investment, while simultaneously maximizing economic efficiency by preventing prices from rising to fully monopolistic levels. Focusing on SAC to the exclusion of Ramsey principles

[3] *See, e.g.,* Gerald R. Faulhaber, *Cross-Subsidy Analysis With More Than Two Services,* 1(3) JOURNAL OF COMPETITION LAW & ECONOMICS 441-448 (2005).

gives incumbents with market power both the incentive and the ability engage in inefficient and unconstrained monopoly pricing.

## A. Review of the Stand-Alone Cost Standard in the ICC's *Coal Rate Guidelines*

According to the *Coal Rate Guidelines* issued by the Interstate Commerce Commission ("ICC"), the SAC test provides a proxy for the rate that a hypothetical entrant, free of barriers to entry or exit, would charge the captive shipper. The ICC noted that

> 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.[4]

According to the ICC, the SAC was designed to simulate the competitive discipline that a hypothetical competitive entrant would provide. However, the hypothetical entrant is granted the benefit of operational efficiently (i.e., cost minimization) *only over the network chosen by the hypothetical entrant,* which in practical application, is virtually always substantially smaller than that of the actual incumbent.

As the ICC made clear in the passage below, the entrant is, by definition, deprived of any efficiencies that may accrue to the incumbent over the remainder of its network:

> If the current carrier is fully efficient and realizes economies of scale, scope and density, its existing configuration will yield the lowest overall cost structure. *If not,* a captive shipper can have its rates based on the lower costs of an alternative, 'stand-alone' systems in which the plant size and traffic base are designed to maximize the efficiencies and production economies.[5]

Thus, the ICC recognized that the "lowest overall cost structure" [6] could be the result of efficiencies that, by definition, are available only to the integrated railroad, rendering irrelevant the comparatively inefficient cost structure of a hypothetical stand-alone network. Nevertheless, captive shippers are assumed to be deserving of

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[4] Coal Rate Guidelines – Nationwide, 1 I.C.C. 2d 520 (1985) (hereafter, "Coal Rate Guidelines") at 528 (emphasis added).
[5] *Id.* at 542 (emphasis added).
[6] *Id.*

rates based on SAC *only* in the event that the hypothetical stand-alone network somehow achieves greater efficiencies than the existing integrated network.

Such a scenario appears highly implausible, given that the stand-alone network will generally be able to capture only a fraction of the efficiencies available to its fully integrated counterpart. Even if the stand-alone railroad is assumed to capture the same volume of traffic on a given route for a given product, it would still be deprived of scale economies from traffic on complementary routes, as well as scope economies relating to shared equipment (e.g., locomotives, switches), and shared overhead (e.g., managerial costs). Indeed, to the extent that there are *any* economies of scale and scope that the stand-alone railroad lacks, the stand-alone railroad is presumptively less efficient than the integrated railroad. This presumption disappears only if one assumes that the integrated railroad somehow fails to capture all of the efficiencies available to it. But this would squarely contradict elementary economic principles, according to which firms minimize costs in the process of maximizing profits.[7]

Setting aside whether the fully integrated network would be more or less efficient than the hypothetical stand-alone network, the ICC's reasoning presumes that the SAC could fall below the incumbent's profit-maximizing monopoly price, which (if true) would bring at least *some* relief to some captive shippers. The ICC's logic is revealed in the passage below:

> We recognize that a stand-alone facility would, in reality, seldom, if ever, be constructed. However, by identifying the costs that would be incurred if it were, an appropriate rate cap can be determined. In this way, railroads functioning in a noncompetitive market will be required to price as if alternatives to their services were available.[8]

The requirement that an incumbent in a noncompetitive market charge prices no higher than the SAC implies that the incumbent would otherwise be tempted to increase profits by pricing above the SAC. Yet as we explain below, the SAC could easily exceed the railroad's profit-maximizing monopoly price, in which case the

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[7] *See, e.g.,* HAL VARIAN, MICROECONOMIC ANALYSIS 81 (W.W. Norton & Company, 3rd. ed. 1992) (explaining the relationship between profit maximization and cost minimization).

[8] Coal Rate Guidelines at 542.

standard provides no relief whatsoever to captive shippers. The frequency with which the SAC exceeds the profit-maximizing price is an empirical question, the answer to which turns on the size of the elasticity of demand and the magnitude of the scale and scope economies available to the integrated network. However, even when the SAC is less than the monopoly price, there is still reason to believe that the SAC standard would confer little relief to shippers, as explained below.

More fundamentally, a price cap based on SAC cannot be expected to maximize economic efficiency, because it fails (even in theory) to offer the relief called for under the Ramsey approach. The basic principle underlying Ramsey pricing is to maximize economic welfare by narrowing the gap between prices and marginal costs, while still allowing the incumbent to earn sufficient margins to cover fixed costs plus a reasonable return on capital. In an industry with constant returns to scale, there is no need to invoke Ramsey pricing; economic welfare is maximized when price is set equal to marginal cost. However, when fixed costs are high relative to marginal costs, strict marginal-cost pricing may be financially infeasible, because marginal cost may lie below average cost. The challenge lies in determining the extent to which different prices should be permitted to rise above marginal costs. Ramsey pricing solves this problem by recognizing that the increase should be proportional to the inverse elasticity of demand for each product in order to minimize the resulting distortions in economic activity.[9]

## B. Economic Opinion

In this section, we explain why SAC fails to achieve economic efficiency. We also explain key flaws in the arguments put forth by the railroads, and by economists on behalf of the railroads.

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[9] *See, e.g.*, JEAN-JACQUES LAFFONT & JEAN TIROLE, A THEORY OF INCENTIVES IN PROCUREMENT AND REGULATION 200 (MIT Press 1993). To illustrate, note that raising the price of a product with a nearly vertical demand curve is not very distortionary, because the quantity bought and sold does not change by very much. In contrast, a product with a nearly horizontal demand curve would exhibit a large quantity response if its price were increased by the same amount.

### 1. The SAC Standard Does Not Inform or Approximate A Rate Structure Consistent With Economic Efficiency

As the ICC's explanation of Ramsey pricing makes clear,[10] the SAC simply does not inform the social-welfare-maximizing rate. In particular, the Ramsey approach permits sufficient markups over an efficient incumbent's *actual* incremental costs such that the excess revenues permit the incumbent to recover the *actual* fixed costs of the efficient integrated network, as well as reasonable returns to investment (the "revenue adequacy" constraint). Stand-alone costs, which are based on the *hypothetical* costs that would be incurred by a *less-efficient* competitor, simply do not enter the Ramsey calculus.

To see what incremental protection (if any) the SAC standard affords a shipper, consider the following hypothetical negotiation *in the absence of regulation.* Suppose the railroad and the shipper agree that the SAC is $50 million, which amounts to $10 for every ton shipped. Suppose further that the railroad's profit-maximizing monopoly price is $15 per ton. The railroad might initiate the negotiation by demanding $15 for every ton shipped. The shipper might attempt to gain leverage by threatening to walk away from the negotiation and construct its own stand-alone alternative at a cost of only $10 per ton, which may induce the railroad to marginally reduce its price. However, the negotiated rate will approach the SAC only if this threat of self-supply is credible. In other words, incumbents have presumably priced that "best alternative" *discounted by its probability* into the rate on captive lines. Thus, the SAC is partially (if not fully) imputed in the negotiated rate absent any regulation. Therefore, under the most generous interpretation, the STB's use of SAC can be understood as attempting to increase the credibility of the shipper's outside option of self-supply. Indeed, the ICC itself characterizes the SAC standard as "netting out"[11] barriers to entry in the railroad industry. Two cases should be considered, both of which highlight the fact that SAC-based regulation is likely ineffectual in many cases:

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[10] *See* Part II.A, *infra*.
[11] Coal Rate Guidelines at 529.

Case 1: SAC>IMP Importantly, the SAC could easily *exceed* the railroad's profit-maximizing independent monopoly price (IMP), particularly when the shipper's elasticity of demand is relatively low, and when the integrated network enjoys substantially greater efficiencies than would be available to even the most efficient stand-alone network. When the SAC exceeds the monopoly price, offering shippers the SAC does not constitute meaningful relief, because the railroad can fully exploit its monopoly power without exceeding the SAC.

Case 2: SAC<IMP Even when the SAC is less than the independent monopoly price, offering shippers the SAC confers relief only to the extent that the STB-enforced SAC (which assumes away barriers to entry, such as environmental permits) differs from the outcome that would be negotiated in the absence of regulation. The negotiated outcome is determined by a shipper's best alternative to a negotiated agreement (BATNA), which may or may not differ substantially from the STB-enforced SAC. In particular, to have any hope of gaining the right to pay the STB-enforced SAC, complainants must incur substantial costs and risks, which may mirror the barriers to entry associated with self-supply in the absence of regulation.[12] Even in cases where the STB-enforced SAC offers non-trivial relief relative to the monopoly price, there is no basis for concluding that the outcome would replicate the socially optimal rate, even approximately.[13]

It bears emphasis that reverting from the incumbent's efficient network (which enjoys very substantial economies from shared routes and other shared inputs), to a stand-alone network (which does not), perversely rewards the railroad for its incumbent position. The Ramsey framework guarantees at least a portion of

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[12] *See* Verified Statement of Gerald Faulhaber, Sept. 5 2014 (hereafter, "Faulhaber Statement") at 9-10.

[13] Of course, if captive shippers are assumed to price-takers, then the bargaining framework does not apply, and the monopoly price will prevail.

the cost savings associated with an efficient network will be passed on to customers; the SAC standard does not.[14]

**2. Response to Comments in the Record**

Comments submitted by the Association Of American Railroads ("AAR") endorse the SAC test as the "best and most reliable standard for determining the reasonableness of rail rates on market dominant traffic,"[15] because it "embraces the competitive market framework for rate regulation by identifying a competitive price in a contestable market that assumes away barriers to entry."[16] Similarly, Professor Kalt opines that "the core insights of contestable market theory have been successfully applied to the rail industry by considering how the benefits of competitive entry (or its threat) would constrain railroad pricing assuming entry were feasible."[17]

While recognizing correctly that contestable market theory assumes away barriers to entry and exit, Professor Kalt and the AAR endorse an STB-enforced SAC standard that purports to simulate the existence of a contestable market by removing such costs from the calculation when implementing the SAC test. However, this appeal to contestable market theory does not withstand scrutiny for several reasons. *First*, the contestable market framework applies to a regulated industry constrained to earn zero economic profits.[18] In reality, no such constraint applies to railroads. *Second*, contestable market theory assumes that competitive entry can occur more rapidly than prices can be adjusted by incumbent firms; if this condition does not hold, then equilibrium prices may substantially exceed competitive levels.[19] In the railroad industry, it is highly unrealistic to assume that a new firm could enter—or that a shipper could bring a successful complaint—without granting the incumbent years of leeway to charge supracompetitve prices.

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[14] Faulhaber Statement at 8 ("[I]f a particular service is offered at stand-alone cost, then by definition, it is sharing *none* of the benefits of scale and scope.") (Emphasis in original).
[15] Opening Comments Of The Association Of American Railroads, Sept. 5 2015, at 5.
[16] *Id.*
[17] Verified Statement of Joseph P. Kalt, Sept. 5 2014 (hereafter, "Kalt Statement") at 27.
[18] Faulhaber Statement at 6-8.
[19] *See* W. KIP VISCUSI, JOHN M. VERNON, & JOSEPH E. HARRINGTON, ECONOMICS OF REGULATION AND ANTITRUST, (MIT Press 2nd ed. 1996), at 164.

*Third*, and perhaps most importantly, when prices are based on SAC, contestable markets do not (even in theory) achieve economically efficient pricing; the contestable market framework was developed to prevent prices from rising to the point that entry by inefficient competitors would be induced—not to prevent prices from rising above economically efficient levels.[20] Would-be entrants are therefore assumed to submit competitive bids to serve a less-efficient, stand-alone component of the network. But no matter how competitive the bidding, the resulting price structure cannot be expected to reflect efficiencies not available to stand-alone entrants. It is therefore unsurprising that the adoption and application of the SAC test in the railroad industry has been found to suggest "only a tenuous connection with its claimed intellectual foundations."[21]

## II. The Revenue-Adequacy Standard

SAC has traditionally been the only regulatory standard applied in the railroad industry, in part because no railroad had consistently achieved revenue adequacy. Given substantial improvements in railroad profitability in recent years, the STB is now considering how it might develop a means of implementing the revenue adequacy standard. Fortunately, the ICC has already established important conceptual foundations to guide the implementation of such a standard, recognizing correctly that revenue adequacy defines the key constraint embedded in the Ramsey framework. Consistent with Ramsey principles, the revenue adequacy standard articulated by the ICC allows an efficient railroad to recover, via margins above incremental costs, all fixed costs plus a reasonable rate of return. Revenue adequacy cannot be meaningfully assessed based on the stand-alone costs of individual network components; if one were to sum these costs, the result would substantially exceed the total costs that would be incurred by an efficient incumbent. Indeed, the AAR's own economist endorses a Ramsey-compatible revenue-adequacy standard, by acknowledging that the revenue-adequacy constraint should reflect the full range

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[20] *See, e.g.*, Russell Pittman, "Against the Stand-Alone-Cost Test in U.S. Freight Rail Regulation," 38 *Journal of Regulatory Economics*, 313-326 (2010), at 319-320.
[21] *Id.* 313.

of efficiencies available to hypothetical entrant capable of providing "*all* of the service for *all* of the incumbents' traffic," [22] (as opposed to only a portion of it).

**A. Review of the Revenue Adequacy Standard in the *Coal Rate Guidelines***

The ICC articulated a revenue adequacy standard grounded in the basic economic principle that the railroad industry, like any other sector of the economy, must ultimately cover its costs and deliver sufficient returns to attract and retain investment over the long run.[23] To satisfy this standard, a railroad's markups over incremental costs should be sufficient to cover not only its fixed costs, but also to deliver a normal return on the capital investments that the railroad ultimately relies on to fund its operations. In other words, the incumbent should recover the opportunity costs associated with deploying assets in a railroad and not elsewhere in the economy. Importantly, the ICC also recognized that the revenue adequacy standard also implies the existence of an upper limit to the rates that should be paid by captive shippers, noting that "captive shippers should not be required to continue to pay differentially higher rates than other shippers when some or all of that differential is no longer necessary to ensure a financially sound carrier capable of meeting its current and future service needs."[24]

In its discussion of Ramsey pricing as a theoretical template for rate regulation, the ICC correctly recognizes the connection between Ramsey pricing and revenue adequacy: Ramsey prices are the result of a constrained optimization problem, and revenue adequacy is what defines the relevant constraint:

> Under Ramsey pricing, each price or rate contains a mark-up above *the long-run marginal cost* of the product or service to cover a portion of the unattributable costs. The unattributable costs are allocated among the purchasers or users in inverse relation to their demand elasticity. Thus, in market [sic] where shippers are very sensitive to price changes, a highly elastic market, the mark-up would be smaller than in a market where shippers are less price sensitive. The sum of the mark-ups equals the *unattributable costs of an efficient producer*. Applied to the railroad industry,

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[22] Kalt Statement at 28 (emphasis added).
[23] Coal Rate Guidelines at 535. ("If railroads cannot earn the fair market rate of return, their ability both to retain existing investments and obtain new capital will be impaired, because both the existing and prospective funds could be invested elsewhere at a more attractive rate of return.")
[24] *Id.* at 535-36.

> Ramsey pricing would permit an efficient carrier to cover all of its costs (including the cost of capital) and thus become *revenue adequate*.[25]

As the ICC observes, Ramsey pricing is based on two costs of the network provider: (1) the long-run incremental costs; and (2) the unattributable or fixed costs of an efficient network that exploits all available efficiencies (such as economies of scale and scope). Conspicuously absent from the discussion is any notion of stand-alone costs: because the Ramsey result is designed to maximize total economic welfare, it focuses on the most efficient cost structure permitted by existing technologies and production techniques, as opposed to inefficient alternatives derived from artificially constraining the exploitation of these efficiencies.

## B. Economic Opinion

In this section, we explain why the ICC was correct in equating revenue adequacy with the key constraint in the Ramsey problem. We also respond to arguments put forth by the railroads, and by economists on behalf of the railroads.

### 1. Revenue Adequacy Defines the Key Constraint Governing Ramsey Pricing

The ICC correctly identified revenue adequacy as the key constraint embedded in the Ramsey-optimization framework. The revenue adequacy standard articulated by the ICC is consistent with Ramsey principles because it allows an incumbent railroad to recover, via margins over incremental costs, all fixed costs plus a reasonable rate of return, taking all relevant efficiencies into account. The stand-alone costs of individual network components cannot meaningfully inform the revenue adequacy constraint. If one were to sum the stand-alone costs of the various components that make up a rail network, the result would substantially exceed the total costs that would be incurred by an efficient incumbent. (For example, any shared costs would be duplicated). The AAR and its economists are therefore incorrect to argue that the revenue-adequacy constraint can be ignored, or that SAC can serve as a viable proxy for the constraint.

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[25] *Id.* at 526-27.

Even the AAR's own economist endorses a Ramsey-compatible revenue adequacy standard, by acknowledging that the revenue adequacy constraint should reflect the full range of system-wide efficiencies. Professor Kalt agrees with the ICC that revenue adequacy requires that an incumbent recover sufficient revenues to cover all relevant costs, including the cost of attracting capital,[26] and endorses a Ramsey-compatible revenue adequacy standard to satisfy this constraint. Professor Kalt observes correctly that "adequate revenues...are the revenues that would be realized under a SAC test for a SW-SARR – i.e., a hypothetical entrant capable of providing *all* of the service for *all* of the incumbents' traffic," [27] that would "seek to design and operate itself as efficiently as possible."[28] Importantly, note that the stand-alone cost for such a railroad is merely a synonym for the total, system-wide costs of after all available economies of scope and scale have been exploited. Professor Kalt's system-wide SAC test is therefore a restatement of the Ramsey constraint, which allows the railroad *as a whole* to recover, via margins on variable costs, all fixed plus a reasonable return to capital.

**2. Response to Comments in the Record**

Professor Kalt claims incorrectly that revenue adequacy "must be understood with reference to a competitive standard – i.e., based on what a railroad would earn in equilibrium over the long term if it was compelled by competition to charge rates consistent with competition."[29] Professor Kalt fails to recognize that one can assess the revenue adequacy of a railroad without any consideration of the market structure (or market performance) in which the railroad operates. To illustrate, suppose that a railroad's fixed costs (plus reasonable return) came to $100 million. It is clear that *any* a rate structure that permits recovery of $100 million from the margins earned above incremental costs will satisfy the definition of revenue adequacy, because it will permit the railroad to attract and retain sufficient financial capital to fully fund its operations. This result is obtained no

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26 Kalt Statement at 28.
27 *Id.* (emphasis added).
28 *Id.*
29 *Id.* at 27.

matter what one assumes about the competitive conditions facing the railroad in its output markets.

Professor Kalt also makes the inapposite claim that "a finding of revenue adequacy provides no basis for concluding that every movement or group of movements is paying rates that are unreasonably high."[30] This is beside the point; a finding of revenue adequacy implies that the railroad is earning revenues significantly in excess of what is required to cover all of its costs and to deliver a reasonable return to this investors. Under these circumstances, Ramsey principles tell us that economic welfare can be increased by lowering *some* rates. In particular, the markups for captive shippers should not reflect differentially higher rates to the extent that the differential between price and incremental cost is no longer necessary to cover the railroad's fixed costs.

Union Pacific criticizes the revenue adequacy framework through its economist Kevin Murphy. Professor Murphy offers a series of straw-man arguments against revenue adequacy.[31] He first argues that such a standard would somehow automatically deny railroads the chance to earn a return in excess of its cost of capital when demand is strong to offset losses when demand is weak. The unstated assumption in this argument is that the revenue adequacy standard would focus only on short-run investment returns, while ignoring the long run. Yet there is nothing to prevent the STB from calibrating revenue adequacy based on returns to investment over the long run. For example, the *Coal Rate Guidelines* suggest that the duration of a typical macroeconomic business cycle may help to delineate the appropriate timeframe.[32] On the other hand, if revenue adequacy is simply ignored, as Professor Murphy proposes, railroads would be permitted to earn excess returns on captive shippers in perpetuity. This is flatly inconsistent with Ramsey principles,

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30 *Id.* at 38.

31 Verified Statement of Kevin M. Murphy, Sept. 5 2014 (hereafter, "Murphy Statement").

32 Coal Rate Guidelines at 536. According to the National Bureau of Economic Research, for the years 1945-2009, the average business cycle duration was between 58.4 and 69.5 months, depending on how the cycles are measured. *See* http://www.nber.org/cycles.html.

which show how economic welfare can be improved by placing a constraint on such returns.

Professor Murphy also claims incorrectly that a finding of revenue adequacy gives the STB "no guidance"[33] in identifying unreasonable rates. To take Professor Murphy's own example, if 80 percent of a railroad's traffic is presumptively competitive, and if the railroad is found to be earning revenues in excess of revenue adequacy, the STB can infer that the remaining 20 percent of traffic is, on average, paying rates in excess of the levels implied by Ramsey principles. It bears emphasis that any adjustment that lowers these rates closer to incremental cost yields a net economic benefit, because it allows for additional transactions to occur in which the benefit to the shipper exceeds the incremental cost to the railroad. Professor Murphy claims that adopting a revenue adequacy standard would harm railroad investment. [34] But this would be the case only if railroads were constrained to earn returns insufficient to cover their cost of capital over the long run. As long as revenue adequacy is properly calibrated, incumbents' incentives to invest will be maintained.

Norfolk Southern criticizes the revenue adequacy framework through its economist Bradford Cornell. His first critique of the revenue adequacy standard is that a system-wide measure of a railroad's financial health fails to inform whether any particular rate is reasonable.[35] This is directly analogous to Professor Murphy's critique that finding of revenue adequacy gives the STB "no guidance"[36] in identifying unreasonable rates. As noted previously, a finding of revenue adequacy implies that economic welfare can be increased by lowering some rates closer to their incremental cost. Because the STB has jurisdiction only over the rates charged to captive shippers, it is obvious these rates, or some subset of them, should be adjusted downward. Precisely which rates are adjusted, and by how much, will depend on the benchmark that is employed. Nevertheless, Ramsey principles tell us

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33 Murphy Statement at 26.
34 *Id.* at 28.
35 Verified Statement of Bradford Cornell, Sept. 5 2014 (hereafter, "Cornell Statement") at 30.
36 Murphy Statement at 26.

that *any* adjustment that moves prices closer to incremental costs (while still satisfying the revenue adequacy constraint) delivers increased economic efficiency.

Professor Cornell's next critique is that return-on-investment metrics are short-term and backward looking, whereas investors must expect to earn their cost of capital over the next 20 years.[37] This is best characterized not as a critique of the revenue adequacy a standard itself, but rather as one point of view in the dispute over how best to measure revenue adequacy. There are clearly tradeoffs involved in selecting the optimal timeframe for assessing revenue adequacy; the thrust of Professor Cornell's critique is that choosing too short of a timeframe may fail to capture the relevant time horizon from investors' perspective. At the opposite extreme, if too long a timeframe is chosen, railroads will be permitted to charge inefficiently high monopoly prices to captive shippers in near perpetuity. Similarly, Professor Cornell opines that capping returns at the cost of capital would prevent railroads from earning the cost of capital in the long run, discouraging investment.[38] As before, this is best viewed as a critique over the optimal implementation of the revenue adequacy standard, which should allow the *average* returns across the relevant period to exceed cost of capital.

Professor Cornell also claims that the revenue adequacy standard, by placing limits on investment returns, would suppress important market signals and discourage innovation.[39] Yet the cost of capital is, by definition, the rate of return required to bring forward investment. As long as investors can expect to receive such returns, investment and innovation will not suffer. Investment would be diminished only if returns were constrained below the cost of capital on average over the relevant period.

Professor Cornell also claims that improvements in system-wide financial health are driven largely by greater efficiency and productivity on a railroad's competitive traffic (as opposed to on its captive traffic), and that "[t]riggering by competitive traffic does nothing to...protect shippers that may lack effective

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37 Cornell Statement at 31.
38 *Id.* at 32.
39 *Id.* at 34.

transportation alternatives; it instead confuses matters by sending a false signal that railroads need new price regulation."[40] Given that the STB has no authority to regulate competitive traffic, it is not clear what Professor Cornell means by "new price regulation." In any case, to the extent that railroads are able to recover all (or nearly all) of their fixed costs from competitive traffic via margins above incremental costs, this provides more (not less) justification for price cuts in the captive segment, which should not jeopardize revenue adequacy. To illustrate, suppose that 99 percent of lines are presumptively competitive in period 1, and suppose the railroad is not revenue adequate in that period. Suppose further that increases in efficiencies on competitive routes in period 2 permit the firm to be freshly revenue adequate (over some reasonable time horizon). At this point economic efficiency can be enhanced by reducing rates in the 1 percent of the market over which the regulator has jurisdiction.

## III. Implementing Revenue Adequacy When a Railroad Is Revenue Adequate

Recent evidence indicates that a significant proportion of railroads have achieved revenue adequacy. To the extent that the revenue adequacy constraint is now amply satisfied for these railroads, there may be scope for improving economic welfare by lowering rates to captive shippers. Accordingly, we present two potential methods—the Yardstick Method and the Rebate Method—that could be used to calibrate rates closer to economically efficient levels.

### A. Recent Evidence On Revenue Adequacy

Several Class 1 railroads have been revenue adequate for some time. In November 2013, the Senate Committee on Commerce, Science, and Transportation issued a report that reviewed the financial health of rail industry.[41] The report found that the industry is highly profitable, as indicated by improving operating ratios,[42]

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[40] *Id.* at 36.

[41] Senate Committee on Commerce, Science, and Transportation Update on the Financial State of the Class I Freight Rail Industry, Nov. 21, 2013, available at http://nitl.org/UpdatedCommerceCommRpt-FinancialStateofRRs11.21.13.pdf (accessed Oct. 28, 2014).

[42] *Id.* at 5.

increasing operating income,[43] and record earnings per share.[44] The Committee reviewed STB revenue adequacy filings to determine whether a railroad was earning its cost of capital in any given year from 2002 through 2012.[45]. For example, with the exception of 2009, Norfolk Southern's ROI has either exceeded, met, or come close to meeting the cost of capital in every year since 2003.[46] While CSX was reporting ROIs below the cost of capital in from 2003 to 2005, the company has come within a few basis points of meeting, or has exceeded, its cost of capital since 2010.[47] Union Pacific has earned an ROI in excess of its cost of capital since 2010.[48] In 2014, the STB determined five carriers (BNSF, Grand Trunk, Norfolk Southern, Soo Line Corporation, and Union Pacific) to be revenue adequate for 2013, in the sense that they enjoyed returns on investment in excess of the industry's cost of capital (11.32 percent).[49]

Depending on the relevant timeframe for assessing revenue adequacy, it is possible that the revenue adequacy standard could have a differential impact on the railroads in terms of liability. For example, if one required revenue adequacy to be achieved, hypothetically, for four out of the last five years, then Union Pacific would be subject to a rate decrease on its captive routes only if it achieved revenue adequacy in 2013 (year four) or 2014 (year five). In contrast, CSX would not face a rate adjustment on its captive routes until 2016 at the earliest (assuming it was revenue adequate from 2013 through 2016).

### B. Ramsey Pricing and the Revenue Adequacy Constraint

Revenue adequacy must always be achieved for a pricing structure to be consistent with Ramsey principles. If the railroad is not achieving adequate revenues, the Ramsey framework dictates that prices should be increased over

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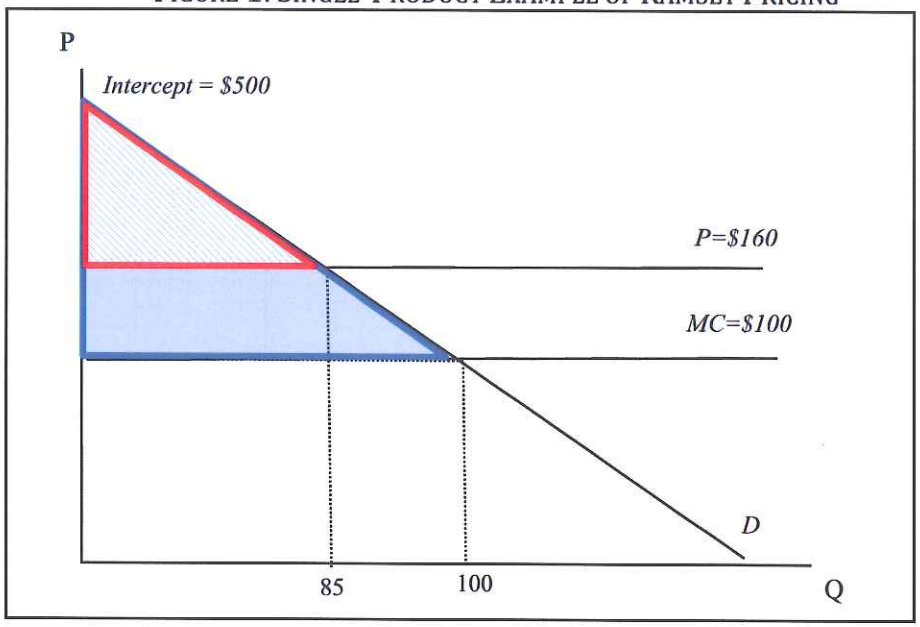
[43] *Id.* at 6.
[44] *Id.* at 6.
[45] *Id.* at 7.
[46] *Id.* at 9.
[47] *Id.* at 9.
[48] *Id.* at 9.
[49] Surface Transportation Board, Docket No. EP 552 (Sub-No. 18), Railroad Revenue Adequacy—2013 Determination, *available at* http://www.stb.dot.gov/decisions/readingroom.nsf/fc695db5bc7ebe2c852572b80040c45f/697d356f1bf8e07385257d47004db520?OpenDocument.

incremental costs to cover fixed costs. In contrast, when a railroad is earning revenues safely in excess of what would be required to cover its costs and earn a reasonable rate of return, Ramsey principles imply that economic welfare can be enhanced by lowering rates to captive shippers. This holds true even if it is infeasible to compute the Ramsey prices precisely.

For illustrative purposes, Figure 1 provides a simple example using a single-product railroad (one route, one product). The vertical axis measures the price charged for service, while the horizontal axis measures quantity. The downward-sloping curve gives the shipper demand schedule facing the railroad, while the horizontal line gives the marginal cost (MC) that an (efficiently operated) railroad would incur. For illustrative purposes, assume that MC = $100; in addition, assume that the railroad also incurs an additional fixed cost (FC) of $5,000, regardless of the quantity shipped over its network. (For ease in exposition, we will assume that these costs include the railroad's cost of capital). Finally, let the market price for the route, P, be given the function P = $500 – 4Q, where Q is market quantity demanded. This implies that the intercept in Figure 1—the "choke price," where Q is zero—is equal to $500.

FIGURE 1: SINGLE-PRODUCT EXAMPLE OF RAMSEY PRICING




Within this framework, aggregate economic welfare would be maximized by setting P = MC = $100, resulting in a market quantity of 100 shipments (note that $100 = $500 – 4*100). This would yield consumer surplus (CS) valued at $20,000 (equal to the large blue triangle under the shipper demand curve and above MC, or 0.5*100*(500-100)). The net economic benefit to society would be $15,000 (equal to CS – FC). Unfortunately, the railroad's total revenue of $10,000 would cover only its incremental costs (equal to $100*100), and not its fixed costs. Accordingly, the railroad is not revenue adequate, and in fact incurs losses of $5,000.

To achieve revenue adequacy, price must therefore rise above MC. However, the more prices diverge from marginal costs, the more the net economic benefit to society decreases. Therefore, Ramsey principles dictate that price should rise only by enough for the railroad to achieve revenue adequacy. In this example, revenue adequacy is achieved when the railroad charges a price of approximately $160, resulting in a market quantity of approximately 85 shipments (note that $160 = $500 – 4*85). The railroad's total revenues (85*$160) are now approximately equal to its total costs (85*$100 + $5,000). However, at this higher price, CS is now valued at only about $14,450 (equal to the smaller, red triangle, or 0.5*85*($500-$160)). After accounting for producer surplus of approximately $5,100 (equal to 85*($160 –

$100), the net economic benefit to society comes to approximately $14,450 + $5,100 - $5,000 = $14,550.

Therefore, total economic welfare has fallen by about $450, relative to the case where P = MC. Further, it is evident that, the more that prices rise above marginal costs, the higher the net economic loss to society will be.[50] Therefore, to be *fully* consistent with Ramsey principles, prices must be set to approximately $160, because this is the only price that maximizes economic welfare while still satisfying the revenue adequacy constraint. However, note also that *any* adjustment that moves rates closer to MC—while still satisfying revenue adequacy—will deliver economic benefits to society.

But how can Ramsey principles be implemented in practice? Below we present two methodologies designed to approximate Ramsey pricing. Although computing exact Ramsey prices exactly is almost certainly infeasible (outside of stylized examples), it bears emphasis that even an approximate solution can result in substantial improvements in economic efficiency: whenever the revenue adequacy constraint is satisfied, adjusting prices downward towards incremental costs decreases the aggregate deadweight loss in the system, even if full Ramsey pricing is not achieved. Stated differently, whenever the revenue adequacy constraint is satisfied, moving prices further away from marginal costs will generate additional economic losses to society.

### C. The Yardstick Approach

Because profit-maximizing firms set prices in (inverse) proportion to demand elasticities, the rates observed on competitive routes can provide a useful proxy for the Ramsey rate. Accordingly, one potential solution for bringing rates closer to economically efficient levels is for the captive shipper to pay the rates observed in comparable movements of competitive traffic (the "yardstick approach"). With sufficient pricing and shipment data, one could predict the

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[50] To illustrate, note that the profit-maximizing monopoly price in this example is $300 (triple the marginal cost) and the monopoly quantity is Q = 50. Aggregate economic welfare under monopoly pricing falls to just $10,000. Thus, monopoly pricing leads to substantial economic losses to society, compared with the net economic benefits under Ramsey pricing (approximately $14,550).

competitive rate for a given route-product pair. Importantly, the yardstick approach works for high-fixed-costs industries where marginal cost is less than average cost so long as the competitive benchmark permits the firm to earn a positive margin that contributes towards paying down the fixed costs. We suspect that rates in so-called competitive areas are not so close to incremental costs so as to prevent any fixed-cost recovery.[51] Furthermore, given that even so-called competitive areas are typically served by duopolies, and given that the railroads and their economists readily concede that the railroad industry is far from perfectly contestable,[52] there is reason to believe that the yardstick approach is inherently conservative.

To the extent that the margins in the competitive segment are *not* sufficient to cover the railroad's fixed costs (plus a reasonable return), then the railroad is relying on the non-competitive segment to achieve revenue adequacy. Rates could still be lowered even here if current margins in the non-competitive segment are significantly higher than what is necessary to make up the difference. In the alternative, it might be impossible to lower rates in the non-competitive segment without making the railroad revenue-inadequate. In general, competitive rates can be imported into the non-competitive segment, except when doing so jeopardizes the railroad's global revenue adequacy. This would have to be handled on a case-by-case basis.

Professor Jean Tirole, this year's winner of the Nobel Prize in economics, recognized the value of the yardstick approach in his seminal book on regulation:

> Because informational asymmetries between the regulator and the firm reduce the efficacy of regulation, the regulator ought to use all available information to reduce these asymmetries. One way of learning about the technology parameter is to compare the firm's performance to that of other firms facing a similar technological environment.[53]

He explained the challenge facing the adoption of the yardstick approach:

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[51] A number of the railroads claimed that their financial condition has improved over the years because they have higher revenues in competitive markets. *See, e.g.,* Opening Comments Of Union Pacific Railroad Company, Sept. 5, 2014, at 22-39.

[52] *See, e.g.,* Kalt Statement at 27.

[53] LAFFONT & TIROLE, *supra*, 84 (MIT Press 1993).

> Similar clauses indexing an electric utility's price to the fuel cost of other electric utilities are meant to filter out the common shocks in the price of fuel and encourage the utility to purchase its fuel at a low cost. However, despite its attractive properties, relative performance evaluation has not been used much in regulation. The problem is that regulated firms are not often comparable. That is, idiosyncrasies often prevail over common features. Nevertheless, we can expect an increased use of yardstick competition in segments of regulated industries such as water and electricity distribution.[54]

Indeed, the Federal Communications Commission has embraced the use of yardsticks to regulate the price of must-have programming that is owned by a cable operator. To eliminate the influence of vertical integration, which induces the network to drive a harder bargain, one can look at the price of comparable independent networks.[55]

A study by Escalation Consultants ("Escalation") provides an illustration of the type of price-cost margin data that could inform the yardstick method. Escalation analyzed nearly 50,000 chemical records in the Public Use Waybill Sample; the study found that revenue per chemical carload increased over 25 percent from 2005 to 2010, and that chemical shippers pay higher rates than other key commodity groups.[56] In 2010, 75 percent of all chemical traffic that originated or terminated in the United States was subject to rates with revenue-to-variable-cost (RVC) ratios in excess of 180 percent, an increase from 60 percent in 2005.[57] Escalation calculated the "premium" paid by shippers of a given type of chemical (for example, chlorine, plastic, or alcohols) for carloads with RVC in excess of 180 percent (the "high RVC group") by assuming that those shippers, in a more competitive environment, would pay the *average* RVC on carloads with RVC below 180 percent for the same chemical type and same territory (the "low RVC group"); the difference in the average rates from the high RVC group and the average rates from the low RVC group multiplied by the number of cars in the high RVC group

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[54] *Id.* at 85-86.

[55] *See* Kevin Caves, Chris Holt & Hal Singer, *Vertical Integration in Multichannel Television Markets: A Study of Regional Sports Networks*, REVIEW OF NETWORK ECONOMICS (2013).

[56] Escalation Consultants, Inc., Analysis of Freight Rail Rates for Chemical Shippers, Dec. 2012, Exhibit 1.

[57] *Id.* at 2.

(controlling for product type and territory) yielded an aggregate premium of nearly $4 billion in 2010.[58] The estimated premium on plastics ($1.0 billion) and alcohols ($0.5 billion) accounted for 28 and 13 percent, respectively, of the aggregate premium paid by chemical shippers.[59] The largest rate difference between high RVC and low RVC groups was for chlorine ($4,810 per carload).[60]

To the extent that the low RVC group serves as a reasonable proxy for the competitive rate on comparable traffic, this methodology could prove fruitful in estimating a yardstick. It is possible that certain carloads observed in the high RVC group are competitively served in the sense that shippers have more than a single choice in transport, even though its associated RVCs exceeds 180 percent. Conversely, the low RVC group may include shipments are not competitively served, even through the RVC is less than 180 percent. In other words, the low RVC group could be under-inclusive or over-inclusive. Despite this issue, we are optimistic that a similar method could be used to develop competitive benchmarks or yardsticks in future ratemaking cases. Finally, in Canada, where inter-switching mandates allow an industry to have access to all of the railroads that serve a station within 18 miles of the station, chemical shippers enjoyed significantly lower rates—for example, 40 percent of Canadian chemical carloads enjoy RVCs below 180 percent (compared to only one quarter of chemical carloads in the United States).[61] This suggests that Canadian rates for comparable traffic could serve as a yardstick.

### D. The Rebate Approach

An alternative approach would be to rebate captive shippers, relative to extant rates, the "excess" revenue (over and above revenue adequacy) *from only the captive routes on the railroad's network* in proportion to various factors, such as the amount of traffic, the ratio of revenue to variable costs, etc. If one were attempting to replicate Ramsey results, then the effective price net of the rebate would consider the incremental cost of providing the service (which the STB keeps) and the

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[58] *Id.* at 3.
[59] *Id.* at Exhibit 3.
[60] *Id.* at Exhibit 5.
[61] *Id.* at 6-7.

shipper's elasticity of demand, which would be estimated from transaction and (shipper) cost data or inferred from an observed price-cost margin using the monopoly-pricing rule.

The rebate approach effectively places a ceiling on the amount that the incumbent network is permitted to charge to captive shippers. Consistent with Pittman (2010), the fundamental objective would be to combine "the efficiency properties of differential pricing with some limitation on the railroad's ability to exploit its monopoly position vis-à-vis particular shippers."[62]

To illustrate, suppose that there are two shippers that, absent regulation, would pay monopoly prices of $10 and $7.50 based entirely on differences in demand elasticities. If the railroad's variable cost to serve each shipper is $5, then the incumbent earns monopoly margins of 50% and 33% on the two shippers, implying that their respective demand elasticities are 1/0.5 = 2.0 and 1/0.33 = 3.0. The rebate approach could be operationalized by paying rebates that leave both shippers with lower prices, without upsetting their relative price-cost margins. For example, if each of the incumbents' margins were lowered by a factor of one half, the adjusted price-cost margins would be 25% and 16.7%. This adjustment would leave the relative price-cost margins in proportion to the relative elasticities, consistent with Ramsey principles. (The adjusted prices would come to $6.67 and $6.00).

## IV. Conclusion

As the STB itself has observed, the revenue adequacy standard is properly understood as the constraint to the optimization problem in the Ramsey framework. When a railroad earns revenues significantly in excess of what would be required to cover its costs and earn a reasonable rate of return, Ramsey principles show that economic welfare can be improved by narrowing the gap between price and marginal cost. In contrast, the SAC standard focuses the regulator on the inefficiently high costs of a hypothetical network, and inappropriately rewards the railroad for its incumbent position by presupposing that the railroad's pricing

[62] Pittman, *supra*, at 324.

should be constrained only by whatever competitive discipline a less-efficient hypothetical rival might be able to muster. Accordingly, the STB should develop workable methodologies, such as the yardstick and benchmark approaches, to approximate Ramsey pricing outcomes for captive shippers whenever a railroad's revenues are sufficiently adequate.

# APPENDIX 1: CURRICULUM VITAE

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B.S. Tulane University, *magna cum laude*, 1994, Economics. Dean's Honor Scholar (full academic scholarship). Senior Scholar Prize in Economics, 1994.

## Current Position

ECONOMISTS INCORPORATED, Washington, D.C.: Principal 2014-present.

PROGRESSIVE POLICY INSTITUTE, Washington, D.C.: Senior Fellow, 2013-present.

## Employment History

NAVIGANT ECONOMICS, Washington, D.C.: Managing Director, 2010-2013.

GEORGETOWN UNIVERSITY, MCDONOUGH SCHOOL OF BUSINESS, Washington, D.C.: Adjunct Professor, 2010, 2014.

EMPIRIS, L.L.C., Washington, D.C.: Managing Partner and President, 2008-2010.

CRITERION ECONOMICS, L.L.C., Washington, D.C.: President, 2004-2008. Senior Vice President, 1999-2004.

LECG, INC., Washington, D.C.: Senior Economist, 1998-99.

U.S. SECURITIES AND EXCHANGE COMMISSION, OFFICE OF ECONOMIC ANALYSIS, Washington, D.C.: Staff Economist, 1997-98.

THE JOHNS HOPKINS UNIVERSITY, ECONOMICS DEPARTMENT, Baltimore: Teaching Assistant, 1996-98.

**Authored Books and Book Chapters**

THE NEED FOR SPEED: A NEW FRAMEWORK FOR TELECOMMUNICATIONS POLICY FOR THE 21ST CENTURY, co-authored with Robert Litan (Brookings Press 2013).

*Net Neutrality Is Bad Broadband Regulation*, co-authored with Robert Litan, in THE ECONOMISTS' VOICE 2.0: THE FINANCIAL CRISIS, HEALTH CARE REFORM AND MORE (Aaron Edlin and Joseph Stiglitz, eds., Columbia University Press 2012).

*Valuing Life Settlements as a Real Option*, co-authored with Joseph R. Mason, in LONGEVITY TRADING AND LIFE SETTLEMENTS (Vishaal Bhuyan ed., John Wiley & Sons 2009).

*An Antitrust Analysis of the World Trade Organization's Decision in the U.S.-Mexico Arbitration on Telecommunications Services*, co- authored with J. Gregory Sidak, in HANDBOOK OF TRANS-ATLANTIC ANTITRUST (Philip Marsden, ed. Edward Elgar 2006).

BROADBAND IN EUROPE: HOW BRUSSELS CAN WIRE THE INFORMATION SOCIETY, co-authored with Dan Maldoom, Richard Marsden, and J. Gregory Sidak (Kluwer/Springer Press 2005).

*Are Vertically Integrated DSL Providers Squeezing Unaffiliated ISPs (and Should We Care)?*, co-authored with Robert W. Crandall, in ACCESS PRICING: THEORY, PRACTICE AND EMPIRICAL EVIDENCE (Justus Haucap and Ralf Dewenter eds., Elsevier Press 2005).

**Journal Articles**

*Econometric Tests for Analyzing Common Impact,* 26 RESEARCH IN LAW AND ECONOMICS (2014), co-authored with Kevin Caves.

*Is the U.S. Government's Internet Policy Broken?*, 5 POLICY AND INTERNET (2013), co-authored with Robert Hahn.

*Avoiding Rent-Seeking in Secondary Market Spectrum Transactions*, 65 FEDERAL COMMUNICATIONS LAW JOURNAL (2013), co-authored with Jeffrey Eisenach.

*Vertical Integration in Multichannel Television Markets: A Study of Regional Sports Networks*, 12(1) REVIEW OF NETWORK ECONOMICS (2013), co-authored with Kevin Caves and Chris Holt.

*Assessing Bundled and Share-Based Loyalty Rebates: Application to the Pharmaceutical Industry*, 8(4) JOURNAL OF COMPETITION LAW AND ECONOMICS (2012), co-authored with Kevin Caves.

*Assessing Competition in U.S. Wireless Markets: Review of the FCC's Competition Reports*, 64 FEDERAL COMMUNICATIONS LAW JOURNAL (2012), co-authored with Gerald Faulhaber and Robert Hahn.

*An Empirical Analysis of Aftermarket Transactions by Hospitals*, 28 JOURNAL OF CONTEMPORARY HEALTH LAW AND POLICY (2011), co-authored with Robert Litan and Anna Birkenbach.

*Addressing the Next Wave of Internet Regulation: Toward a Workable Principle for Nondiscrimination*, 4 REGULATION & GOVERNANCE (2010), co-authored with Robert Hahn and Robert Litan.

*Class Certification in Antitrust Cases: An Economic Framework*, 17 GEORGE MASON LAW REVIEW (2010), co-authored with Robert Kulick.

*The Economic Impact of Eliminating Preemption of State Consumer Protection Laws*, 12 UNIVERSITY OF PENNSYLVANIA JOURNAL OF BUSINESS LAW 781 (2010), co-authored with Joseph R. Mason and Robert B. Kulick.

*Why the iPhone Won't Last Forever and What the Government Should Do to Promote its Successor*, 8 JOURNAL ON TELECOMMUNICATIONS AND HIGH TECHNOLOGY LAW 313 (2010), co-authored with Robert W. Hahn.

*What Does an Economist Have to Say About the Calculation of Reasonable Royalties?*, 14 INTELLECTUAL PROPERTY LAW BULLETIN 7 (2010), co-authored with Kyle Smith.

*Is Greater Price Transparency Needed in the Medical Device Industry?*, HEALTH AFFAIRS (2008), co-authored with Robert W. Hahn and Keith Klovers.

*Evaluating Market Power with Two-Sided Demand and Preemptive Offers to Dissipate Monopoly Rent*, 4 JOURNAL OF COMPETITION LAW & ECONOMICS (2008), co-authored with J. Gregory Sidak.

*Assessing Bias in Patent Infringement Cases: A Review of International Trade Commission Decisions*, 21 HARVARD JOURNAL OF LAW AND TECHNOLOGY (2008), co-authored with Robert W. Hahn.

*The Effect of Incumbent Bidding in Set-Aside Auctions: An Analysis of Prices in the Closed and Open Segments of FCC Auction 35*, 32 TELECOMMUNICATIONS POLICY JOURNAL (2008), co-authored with Peter Cramton and Allan Ingraham.

*A Real-Option Approach to Valuing Life Settlement Transactions*, 23 JOURNAL OF FINANCIAL TRANSFORMATION (2008), co-authored with Joseph R. Mason.

*The Economics of Wireless Net Neutrality*, 3 JOURNAL OF COMPETITION LAW AND ECONOMICS 399 (2007), co-authored with Robert W. Hahn and Robert E Litan.

*Vertical Foreclosure in Video Programming Markets: Implication for Cable Operators*, 3 REVIEW OF NETWORK ECONOMICS 348 (2007), co-authored with J. Gregory Sidak.

*The Unintended Consequences of Net Neutrality*, 5 JOURNAL ON TELECOMMUNICATIONS AND HIGH TECH LAW 533 (2007), co-authored with Robert E. Litan.

*Does Video Delivered Over a Telephone Network Require a Cable Franchise?*, 59 FEDERAL COMMUNICATIONS LAW JOURNAL 251 (2007), co-authored with Robert W. Crandall and J. Gregory Sidak.

*The Competitive Effects of a Cable Television Operator's Refusal to Carry DSL Advertising*, 2 JOURNAL OF COMPETITION LAW AND ECONOMICS 301 (2006).

*Uberregulation without Economics: The World Trade Organization's Decision in the U.S.-Mexico Arbitration on Telecommunications Services*, 57 FEDERAL COMMUNICATIONS LAW JOURNAL 1 (2004), co-authored with J. Gregory Sidak.

*The Secondary Market for Life Insurance Policies: Uncovering Life Insurance's "Hidden" Value*, 6 MARQUETTE ELDER'S ADVISOR 95 (2004), co-authored with Neil A. Doherty and Brian A. O'Dea.

*Do Unbundling Policies Discourage CLEC Facilities-Based Investment?*, 4 TOPICS IN ECONOMIC ANALYSIS AND POLICY (2004), co-authored with Robert W. Crandall and Allan T. Ingraham.

*Foreign Investment Restrictions as Industrial Policy*, 3 CANADIAN JOURNAL OF LAW AND TECHNOLOGY 19 (2004), co- authored with Robert W. Crandall.

*Regulating the Secondary Market for Life Insurance Policies*, 21 JOURNAL OF INSURANCE REGULATION 63 (2003), co-authored with Neil A. Doherty.

*Interim Pricing of Local Loop Unbundling in Ireland: Epilogue*, 4 JOURNAL OF NETWORK INDUSTRIES 119 (2003), co-authored with J. Gregory Sidak.

*The Benefits of a Secondary Market for Life Insurance*, 38 REAL PROPERTY, PROBATE AND TRUST JOURNAL 449 (2003), co- authored with Neil A. Doherty.

*The Empirical Case Against Asymmetric Regulation of Broadband Internet Access*, 17 BERKELEY TECHNOLOGY LAW JOURNAL 954 (2002), co-authored with Robert W. Crandall and J. Gregory Sidak.

*How Can Regulators Set Nonarbitrary Interim Rates? The Case of Local Loop Unbundling in Ireland*, 3 JOURNAL OF NETWORK INDUSTRIES 273 (2002), co-authored with J. Gregory Sidak.

*Vertical Foreclosure in Broadband Access*, 49 JOURNAL OF INDUSTRIAL ECONOMICS (2001) 299, co-authored with Daniel L. Rubinfeld.

*Open Access to Broadband Networks: A Case Study of the AOL/Time Warner Merger*, 16 BERKELEY TECHNOLOGY LAW JOURNAL 640 (2001), co-authored with Daniel L. Rubinfeld.

*Cable Modems and DSL: Broadband Internet Access for Residential Customers*, 91 AMERICAN ECONOMICS ASSOCIATION PAPERS AND PROCEEDINGS 302 (2001), co-authored with Jerry A. Hausman and J. Gregory Sidak.

*Residential Demand for Broadband Telecommunications and Consumer Access to Unaffiliated Internet Content Providers*, 18 YALE JOURNAL ON REGULATION 1 (2001), co-authored with Jerry A. Hausman and J. Gregory Sidak.

*Determining the Source of Inter-License Synergies in Two-Way Paging Networks*, 18 JOURNAL OF REGULATORY ECONOMICS 59 (2000).

*A General Framework for Competitive Analysis in the Wireless Industry*, 50 HASTINGS LAW REVIEW 1639 (2000), co-authored with J. Gregory Sidak and David Teece.

*Capital Raising in Offshore Markets*, 23 JOURNAL OF BUSINESS AND FINANCE 1181 (1999), co-authored with Ian Gray and Reena Aggarwal.

**Expert Testimony Since 2005**

Lindsay Kamakahi and Justine Levy, et al v. American Society for Reproductive Medicine and Society for Assisted Reproductive Technology, Case No.: 3:11-CV-1781 JCS (N.D. Ca.).

Salud Services, Inc. et al v. Caterpillar, Inc., Case No.: 1:12-cv-23927 (S.D. Fl.).

Gnanh Nora Krouch v. Wal-Mart Stores, Inc., Case No. CV-12-2217 (N.D. Ca.).

In the Matter of Petition for Rulemaking to Eliminate the Sports Blackout Rule, MB Docket No. 12-3 (Federal Communications Commission).

In the Matter of Review of Wholesale Services and Associated Policies, File No. 8663-C12-201313601 (Canadian Radio-Television and Telecommunications Commission).

Crafting a Successful Incentive Auction: Stakeholders' Perspectives (U.S. Senate, Committee on Commerce, Science, and Transportation).

Altergy Systems v. Enersys Delaware, Inc., Case No. 74-198-Y-001772-12 JMLE (American Arbitration Association).

In re New York City Bus Tour Antitrust Litigation, Master Case File No. 13-CV-07I1 (S.D. NY).

SOCAN Tariff 22.A (Online Music Services, 2011-2013), CSI Online Music Services (2011-2013), SODRAC Tariff 6 - Online Music Services, Music Videos (2010-2013) (Copyright Board Canada).

Imperial Premium Finance, LLC, v. Sun Life Assurance Company of Canada (S.D. Fl.).

Michelle Downs and Laurie Jarrett v. Insight Communications Company, L.P., Civil Action No. 3:09-Cv-93-S (W.D. Ky.).

The Satellite Television Law: Repeal, Reauthorize, or Revise? (U.S. House of Representatives, Committee on Energy and Commerce).

Marchbanks Truck Service, et al. v. Comdata Network Inc., et al., Civil Action No. 07-1078-JKG (E.D. Pa.).

Patricia Reiter v. Mutual Credit Corporation, et al., Case No. 8:09-cv-0081 AG (RNBx) (C.D. Ca.).

In re Photochromic Lens Antitrust Litigation, MDL Docket No. 2173 (M.D. Fl.).

In the Matter of the Arbitration Between Washington Nationals Baseball Club v. TCR Sports Broadcasting Holdings, L.L.P. (Major League Baseball Revenue Sharing Definitions Committee).

Miguel V. Pro and Davis Landscape et al. v. Hertz Equipment Rental Corporation, No. 2:06-CV-3830 (DMC) (D.N.J.).

Game Show Network, LLC v. Cablevision Systems Corp., File No. CSR-8529-P (Federal Communications Commission).

In Re Florida Cement and Concrete Antitrust Litigation, Master Docket No. 09-23493-Civ-Altonaga/Brown (S.D.Fl.).

Karen Ann Ishee Parsons et al. v. Bright House Networks, Case No. CV-09-B-0267-S (N.D. Al.).

In Re Cox Enterprises, Inc. Set-Top: Cable Television Box Antitrust Litigation, Case No. 5:09-ML-02048-C (W.D.Ok.).

Review of the Regulatory Framework Relating to Vertical Integration, Broadcasting Notice of Consultation CRTC 2010-783 (Canadian Radio-television Telecommunications Commission).

Apotex, Inc., v. Cephalon, Inc., Barr Laboratories, Inc., Mylan Laboratories, Inc., Teva Pharmaceutical Industries, Ltd., Teva Pharmaceuticals USA, Inc., Ranbaxy Laboratories, Ltd., and Ranbaxy Pharmaceuticals, Inc.,. Case No. 2:06-cv-02768-MSG (E.D. Pa.).

United States, et al. v Amgen, Inc., International Nephrology Network, et al., Civ. Action No. 06-10972-WGY (D. Mass.).

Carl Blessing et al. v. SIRIUS-XM Radio, Inc., Case No. 09-cv-10035 (HB) (S.D. N.Y.).

DISH Network L.L.C., v. Comcast Corporation, Comcast SportsNet California, Inc., Case No. 16 472 E 00211 10 (American Arbitration Association).

In Re Airline Baggage Fee Antitrust Litigation, Civil Action No. 1:09-Md-2089-Tcb (N.D. Ga.).

Applications of Comcast Corporation, General Electric Company and NBC Universal, Inc. for Consent to Assign Licenses or Transfer Control of Licensees, MB Docket No. 10-56 (Federal Communications Commission).

T-Mobile West Corporation v. Michael M. Crow, et al., Case No: 2:08-cv-1337 PHX-NVW (D. Az.).

Metlife Insurance Company of Connecticut and General American Life Insurance Company v. Thomas Petracek, Minnesota Estate

Service, Inc., Michael J. Antonello, and Michael J. Antonenllo & Associates, Ltd., No. 08-CV-06095 DSD-FLN (D. Minn).

Tennis Channel, Inc. v. Comcast Cable Communications, LLC, File No. CSR-8258 (Federal Communications Commission).

MEMdata, LLC, v. Intermountain Healthcare, Inc., and IHC Health Services, Inc., Civil No. 2:08-cv-190 (C.D. Utah).

Caroline Behrend, et al. v. Comcast Corporation, Civil Action No. 03-6604 (E.D. Pa.).

In the Matter of Distribution of the 2000-03 Copyright Royalty Funds, Dkt. No. 2008-2 CRB CD 2000-03 (Copyright Royalty Judges).

Cindy Johnson et al. v. Arizona Hospital and Health Care Association et al., Case No. 07-01292 (SRB) (D. Az.).

Southeast Missouri Hospital, et al. v. C.R. Bard, Inc., Case No. 1:07CV0031 TCM (E.D. Mo.).

TCR Sports Broadcasting Holding, L.L.P. v. Comcast Corporation, File No. CSR-8001-P (Federal Communications Commission).

Meijer, Inc. & Meijer Distribution, Inc., et al. v. Abbott Laboratories, Case No. C 07-5985 CW (N.D. Ca.).

NFL Enterprises LLC. v. Comcast Cable Communications, LLC, File No. CSR-7876-P (Federal Communications Commission).

Medical Mutual of Ohio Inc. v. GlaxoSmithKline PLC and SmithKline Beecham Corporation, Civil Action No. 05-396 (E.D. Pa.).

TCR Sports Broadcasting Holding, L.L.P., D/B/A Mid-Atlantic Sports Network v. Time Warner Cable Inc., American Arbitration Association, Case No. 12 494 E 000326 07 (Federal Communications Commission).

Coors Brewing Company v. Hipal Partners Ltd., Case No. 71 155 00358 07 (American Arbitration Association).

Natchitoches Parish Hosp. Serv. Dist., et al. v. Tyco Int'l, Ltd. et al., Civil Action No. 05-12024 (D. Mass.).

Ralph O. Stalsberg, et al. v. New York Life Insurance Company, New York Life Insurance and Annuity Corporation, Case No. 2:07-Cv-29-Bj (D. Utah).

In Re Tricor Indirect Purchaser Antitrust Litigation, C.A. No. 05-360 (KAJ) (D. Del.).

**White Papers**

The Consumer Benefits of Efficient Mobile Number Portability Administration (prepared for Neustar) (Mar. 8, 2013).

Economic Analysis of the Implications of Implementing EPA's Tier 3 Rules (prepared for Emissions Control Technology Association), co-authored with George Schink (June 14, 2012).

Are Google's Search Results Unfair or Deceptive Under Section 5 of the FTC Act? (prepared for Google), co- authored with Robert Litan (May 1, 2012).

Bundles in the Pharmaceutical Industry: A Case Study of Pediatric Vaccines (prepared for Novartis), co-authored with Kevin Caves (July 13, 2011).

Are U.S. Wireless Markets Effectively Competitive? A Critique of the FCC's 14th and 15th Annual Wireless Competition Reports (prepared for AT&T), co-authored with Gerald R. Faulhaber, Robert W. Hahn (July 11, 2011).

Do Group Purchasing Organizations Achieve the Best Prices for Member Hospitals? An Empirical Analysis of Aftermarket Transactions (prepared for Medical Device Manufacturers Association), co-authored with Robert Litan (Oct. 6, 2010).

The Economic Impact of Broadband Investment (prepared for Broadband for America), co-authored with Robert Crandall (Feb. 23, 2010).

Why the iPhone Won't Last Forever and What the Government Should Do to Promote Its Successor (prepared for Mobile Future), co-authored with Robert Hahn (Sept. 21, 2009).

The Economic Impact of Eliminating Preemption of State Consumer Protection Laws (prepared for the American Bankers' Association), co-authored with Joseph R. Mason (Aug. 21, 2009).

Economic Effects of Tax Incentives for Broadband Infrastructure Deployment (prepared for the Fiber to the Home Council), co-authored with Jeffrey Eisenach and Jeffrey West (Dec. 23, 2008).

The Effect of Brokered Deposits and Asset Growth on the Likelihood of Failure (prepared for Morgan Stanley, Citigroup, and UBS), co-authored with Joseph Mason and Jeffrey West (Dec. 17, 2008).

Estimating the Benefits and Costs of M2Z's Proposal: Reply to Wilkie's *Spectrum Auctions Are Not a Panacea* (prepared for CTIA), co-authored with Robert W. Hahn, Allan T. Ingraham and J. Gregory Sidak (July 23, 2008).

Irrational Expectations: Can a Regulator Credibly Commit to Removing an Unbundling Obligation? AEI-Brookings Related Publication No. 07-28, co-authored with Jeffrey Eisenach (Dec. 30, 2007)

Is Greater Price Transparency Needed in The Medical Device Industry? (prepared for Advanced Medical Technology Association), co-authored with Robert W. Hahn (Nov. 30, 2007).

Should the FCC Depart from More than a Decade of Market-Oriented Spectrum Policy? Reply to Skrzypacz and Wilson (prepared for CTIA), co-authored with Gerald Faulhaber and Robert W. Hahn (Jun. 18, 2007).

Improving Public Safety Communications: An Analysis of Alternative Approaches (prepared for the Consumer Electronics Association and the High Tech DTV Coalition), co-authored with Peter Cramton, Thomas S. Dombrowsky, Jr., Jeffrey A. Eisenach, and Allan Ingraham (Feb. 6, 2007).

The Budgetary Impact of Eliminating the GPOs' Safe Harbor Exemption from the Anti-Kickback Statute of the Social Security Act (prepared for the Medical Device Manufacturers Association) (Dec. 20, 2005).

Reply to "The Life Settlements Market: An Actuarial Perspective on Consumer Economic Value" (prepared for Coventry First), co-authored with Eric Stallard (Nov. 15, 2005).

19. The Competitive Effects of Telephone Entry into Video Markets (prepared for the Internet Innovation Alliance), co-

authored with Robert W. Crandall and J. Gregory Sidak (Nov. 9, 2005).

How Do Consumers and the Auto Industry Respond to Changes in Exhaust Emission and Fuel Economy Standards? A Critique of Burke, Abeles, and Chen (prepared for General Motors Corp.), co-authored with Robert W. Crandall and Allan T. Ingraham (Sept. 21, 2004).

Inter-City Competition for Retail Trade in North Texas: Can a TIF Generate Incremental Tax Receipts for the City of Dallas? (prepared for Harvest Partners), co-authored with Thomas G. Thibodeau and Allan T. Ingraham (July 16, 2004).

An Accurate Scorecard of the Telecommunications Act of 1996: Rejoinder to the Phoenix Center Study No. 7 (prepared for BellSouth), co-authored with Robert Crandall (Jan. 6, 2004).

Competition in Broadband Provision and Implications for Regulatory Policy (prepared for the Alcatel, British Telecom, Deutsche Telekom, Ericsson, France Telecom, Siemens, Telefónica de España, and Telecom Italia), co- authored with Dan Maldoom, Richard Marsden, and Gregory Sidak (Oct. 15, 2003).

The Effect of Ubiquitous Broadband Adoption on Investment, Jobs, and the U.S. Economy (prepared for Verizon), co-authored with Robert W. Crandall (Sept. 17, 2003).

The Deleterious Effect of Extending the Unbundling Regime on Telecommunications Investment (prepared for BellSouth), co-authored with Robert W. Crandall (July 10, 2003).

Letter Concerning Spectrum Auction 35 to the Honorable Michael K. Powell, Chairman, Federal Communications Commission, from Peter C. Cramton, Robert W. Crandall, Robert W. Hahn, Robert G. Harris, Jerry A. Hausman, Thomas W. Hazlett, Douglas G. Lichtman, Paul W. MacAvoy, Paul R. Milgrom, Richard Schmalensee, J. Gregory Sidak, Hal J. Singer, Vernon L. Smith, William Taylor, and David J. Teece (Aug. 16, 2002).

**Speaking Engagements**

*New Principles for a Progressive Broadband Policy,* PROGRESSIVE POLICY INSTITUTE, Washington, D.C. Mar. 13, 2014.

*The Open Internet: Where Do We Go From Here?* PROGRESSIVE POLICY INSTITUTE, Washington, D.C. Jan. 29, 2014.

*Does Platform Competition Render Common Carriage Irrelevant in an IP world?* PROGRESSIVE POLICY INSTITUTE, Washington, D.C. Nov. 20, 2013.

*The 41st Research Conference on Communication, Information and Internet Policy*, TELECOMMUNICATIONS POLICY RESEARCH CONFERENCE, George Mason University School of Law, Arlington, VA, September 27, 2013.

*The Broadband Technology Explosion: Rethinking Communications Policy for a Mobile Broadband World*, Pepperdine School of Public Policy, Menlo Park, CA. June 20, 2013.

*Net Neutrality: Government Overreach or the Key to Innovation?*, NORTHWESTERN JOURNAL OF TECHNOLOGY AND INTELLECTUAL PROPERTY EIGHTH ANNUAL SYMPOSIUM, Chicago, IL., Mar. 8, 2013.

*Internet Everywhere: Broadband as a Catalyst for the Digital Economy*, The Brookings Institution, Washington, D.C., Nov. 27, 2012.

*Can Broadband Power an Economic Recovery?*, Advanced Communications Law & Policy Institute at New York Law School, Washington, D.C., July 10, 2012.

*Using Regression in Antitrust Cases*, UNIVERSITY OF PENNSYLVANIA LAW SCHOOL, Philadelphia, PA., April 12, 2012.

*Mergers: The Road to Duopoly or Path to Competitive Panacea?* NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS, Los Angeles, CA., July 20, 2011.

*State of the Mobile Net*, CONGRESSIONAL INTERNET CAUCUS, Washington, D.C., May 27, 2011.

*Waves of Innovation: Spectrum Allocation in the Age of the Mobile Internet*, INFORMATION TECHNOLOGY & INNOVATION FOUNDATION, Washington D.C., May 17, 2011.

*With or Without Merit, Class Certification Requires Commonality*, ABA SECTION OF ANTITRUST LAW 59TH ANNUAL SPRING MEETING, Washington, D.C., Mar. 30, 2011.

*4th Annual Future of Private Antitrust Enforcement Conference*, AMERICAN ANTITRUST INSTITUTE, Washington, D.C., Dec. 7, 2010.

*Jobs and Technology*, NEW DEMOCRATIC LEADERSHIP COUNCIL, Washington, D.C., Sept. 22, 2010.

*Regulation and Broadband*, ADVANCED COMMUNICATIONS LAW & POLICY INSTITUTE, NEW YORK LAW SCHOOL, New York, N.Y., July 14, 2010.

*13th Annual Symposium on Antitrust*, GEORGE MASON LAW REVIEW, Washington, D.C., Feb. 4, 2010.

*Broadband Infrastructure and Net Neutrality*, ADVISORY COMMITTEE TO THE CONGRESSIONAL INTERNET CAUCUS' STATE OF THE NET, Washington, D.C., Jan. 22, 2010.

*The Consequences of Net Neutrality Regulations*, AMERICAN CONSUMER INSTITUTE CENTER FOR CITIZEN RESEARCH, Washington, D.C., Nov. 19, 2009.

*Wireless Innovation Luncheon*, MOBILE FUTURE, Washington, D.C., Nov. 3, 2009.

*Second Life Settlements & Longevity Summit*, INSURANCE-LINKED SECURITIES & LIFE SETTLEMENTS, New York, N.Y., Sept. 30, 2009.

*Perspectives on Investment and a National Broadband Plan*, AMERICAN CONSUMER INSTITUTE, Washington, D.C., Sept. 4, 2009.

*Markets and Regulation: How Do We Best Serve Customers?*, Wireless U. Communications Policy Seminar, UNIVERSITY OF FLORIDA PUBLIC UTILITY RESEARCH CENTER, Tampa, FL., Nov. 13, 2008.

*The Price Of Medical Technology: Are We Getting What We Pay For?* HEALTH AFFAIRS BRIEFING, Washington, D.C., Nov. 10, 2008.

*Standard Setting and Patent Pools*, LAW SEMINARS INTERNATIONAL, Arlington, VA., Oct. 3, 2008.

*The Changing Structure of the Telecommunications Industry and the New Role of Regulation*, INTERNATIONAL TELECOMMUNICATIONS SOCIETY BIENNIAL CONFERENCE, Montreal, Canada, June 26, 2008.

*The Debate Over Network Management: An Economic Perspective*, AMERICAN ENTERPRISE INSTITUTE CENTER FOR REGULATORY AND MARKET STUDIES, Washington, D.C., Apr. 2, 2008.

*Merger Policy in High-Tech Industries*, GEORGE MASON UNIVERSITY SCHOOL OF LAW, Washington, D.C., Feb. 1, 2008.

*Telecommunications Symposium*, U.S. DEPARTMENT OF JUSTICE ANTITRUST DIVISION, Washington, D.C., Nov. 29, 2007.

*Wireless Practice Luncheon*, FEDERAL COMMUNICATIONS BAR ASSOCIATION, Washington, D.C., Nov. 29, 2007.

*Association for Computing Machinery's Net Neutrality Symposium*, GEORGE WASHINGTON UNIVERSITY, Washington, D.C., Nov. 12, 2007.

*Regulators' AdvanceComm Summit*, NEW YORK LAW SCHOOL, New York, N.Y., Oct. 14, 2007.

*Annual Conference*, CAPACITY USA 2007, New York, N.Y., Jun. 26, 2007.

*William Pitt Debating Union*, UNIVERSITY OF PITTSBURGH, SCHOOL OF ARTS & SCIENCES, Pittsburgh, PA., Feb. 23, 2007.

*Annual Conference*, WIRELESS COMMUNICATIONS ASSOCIATION INTERNATIONAL, Washington, D.C., June 27, 2006.

*Annual Conference*, MEDICAL DEVICE MANUFACTURERS ASSOCIATION, Washington, D.C., June 14, 2006.

*Annual Conference*, ASSOCIATION FOR ADVANCED LIFE UNDERWRITING, Washington, D.C., May 1, 2006.

*Entrepreneur Lecture Series*, LAFAYETTE COLLEGE, Easton, PA., Nov. 14, 2005.

**Editorials and Magazine Articles**

*Life After Comcast: The Economist's Obligation to Decompose Damages Across Theories of Harm,* ANTITRUST (Spring 2014) (co-authored with Kevin Caves).

*The FCC's Incentive Auction: Getting Spectrum Right,* PROGRESSIVE POLICY INSTITUTE PAPER (Nov. 2013).

*Clash of the Titans: How the Largest Commercial Websites Got That Way*, MILKEN INSTITUTE REVIEW (Second Quarter 2013), co-authored with Robert Hahn.

*Lessons from Kahneman's Thinking Fast and Slow: Does Behavioral Economics Have a Role in Antitrust Analysis?*, The ANTITRUST SOURCE (August 2012), co-authored with Andrew Card.

*Wireless Competition: An Update*, GEORGETOWN CENTER FOR BUSINESS AND PUBLIC POLICY ECONOMIC POLICY VIGNETTES (May 3, 2012), co-authored with Robert Hahn.

*Book Review of Tim Wu's The Master Switch*, MILKEN INSTITUTE REVIEW (January 2012).

*Economic Evidence of Common Impact for Class Certification in Antitrust Cases: A Two-Step Analysis*, ANTITRUST (Summer 2011).

*The AT&T/T-Mobile Deal: Should We Fear Wireless Consolidation?* FORBES, June 3, 2011.

*In FCC's Report on Wireless Competition, an Agenda?, HARVARD BUSINESS REVIEW*, Apr. 15, 2011, co-authored with Gerald Faulhaber.

*Will the Proposed Banking Settlement Have Unintended Consequences?* HARVARD BUSINESS REVIEW, Mar. 29, 2010, co- authored with Joseph R. Mason.

*Should Regulators Block AT&T's Acquisition of T-Mobile?*, HARVARD BUSINESS REVIEW, Mar. 22, 2010.

*The Black Hole in America's Retirement Savings*, FORBES, Dec. 21, 2010, co-authored with Robert Litan.

*Broken Compensation Structures and Health Care Costs*, HARVARD BUSINESS REVIEW, Oct. 6, 2010, co-authored with Robert Litan.

*Net Neutrality Is Bad Broadband Regulation*, THE ECONOMISTS' VOICE, Sept. 2010, co-authored with Robert Litan.

*Why Net Neutrality Is Bad for Business*, HARVARD BUSINESS REVIEW, Aug. 13, 2010, co-authored with Robert Litan.

*Why the iPhone Won't Last Forever and What the Government Should (or Shouldn't) Do to Promote Its Successor*, MILKEN INSTITUTE REVIEW (First Quarter 2010), co-authored with Robert W. Hahn.

*Streamlining Consumer Financial Protection*, THE HILL, Oct. 13, 2009, co-authored with Joseph R. Mason.

*Foxes in the Henhouse: FCC Regulation through Merger Review*, MILKEN INSTITUTE REVIEW (First Quarter 2008), co-authored with J. Gregory Sidak.

*Don't Drink the CAFE Kool-Aid*, WALL STREET JOURNAL, Sept. 6, 2007, at A17, co-authored with Robert W. Crandall.

*The Knee-Jerk Reaction: Misunderstanding the XM/Sirius Merger*, WASHINGTON TIMES, Aug. 24, 2007, at A19, co- authored with J. Gregory Sidak.

*Net Neutrality: A Radical Form of Non-Discrimination*, REGULATION, Summer 2007.

*Telecom Time Warp*, WALL STREET JOURNAL, July 11, 2007, at A15, co-authored with Robert W. Crandall.

*Earmarked Airwaves*, WASHINGTON POST, June 27, 2007, at A19, co-authored with Robert W. Hahn.

*Not Neutrality*, NATIONAL POST, Mar. 29, 2007, at FP19.

*Should ATM Fees Be Regulated?*, NATIONAL POST, Mar. 8, 2007, at FP17, co-authored with Robert W. Crandall.

*Life Support for ISPs*, REGULATION, Fall 2005, co-authored with Robert W. Crandall.

*No Two-Tier Telecommunications*, NATIONAL POST, Mar. 7, 2003, at FP15, co-authored with Robert W. Crandall.

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*Life After Comcast: The Economist's Obligation to Decompose Damages Across Theories of Harm*, 28 ANTITRUST (Spring 2014), co-authored with Hal J. Singer.

*Mobile Wireless Performance the EU and the US: Implications for Policy*, 93 COMMUNICATIONS & STRATEGIES (Q1 2014), co-authored with Erik Bohlin and Jeffrey A. Eisenach.

*Econometric Tests for Analyzing Common Impact*, co-authored with Hal J. Singer, in THE LAW AND ECONOMICS OF CLASS ACTIONS: 26 RESEARCH IN LAW AND ECONOMICS 135-160 (James Langenfeld, ed., Emerald Publishing 2014).

*Testing for Antitrust Impact with Common Econometric Methods*, AMERICAN BAR ASSOCIATION (Spring 2013), co-authored with Hal J. Singer.

*Vertical Integration in Multichannel Television Markets: A Study of Regional Sports Networks*, 12 REVIEW OF NETWORK ECONOMICS 61-92 (2013), co-authored with Hal J. Singer and Chris Holt.

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*Modeling the Welfare Effects of Net Neutrality Regulation: A Comment on Economides and Tåg*, 24 INFORMATION ECONOMICS & POLICY 288-292 (2012).

*Economic and Legal Aspects of FLSA Exemptions: A Case Study of Companion Care*, 63 LABOR LAW JOURNAL 174-202 (2012), co-authored with Jeffrey A. Eisenach.

"What Happens When Local Phone Service Is Deregulated?," *Regulation* (Fall 2012), co-authored with Jeffrey A. Eisenach.

*The Bottle and the Border: What can America's failed experiment with alcohol prohibition in the 1920s teach us about the likely effects of anti-immigration legislation today?* 9 THE ECONOMISTS' VOICE (June 2012).

"What a Nobel-Prize Winning Economist Can Teach Us About Obamacare," *The Atlantic* (May 23, 2012), co-authored with Einer Elhauge. Reprinted in *Obamacare on Trial*.

*Quantifying Price-Driven Wireless Substitution in Telephony*, 35 TELECOMMUNICATIONS POLICY 984-998 (December 2011).

*Structural Identification of Production Functions*, ECONOMETRICA (co-authored with Daniel Ackerberg and Garth Frazer, revise and resubmit, December 2006).

*State Dependence and Heterogeneity in Aggregated Discrete Choice Demand Systems: An Example from the Cigarette Industry* (UCLA Dissertation, December 2005).

**White Papers**

*Mobile Wireless Performance in Canada: Lessons from the EU and the US* (prepared with support from TELUS, co-authored with Erik Bohlin and Jeffrey A. Eisenach, September 2013).

*Mobile Wireless Performance in the EU & the US* (prepared with support from GSMA, co-authored with Erik Bohlin and Jeffrey A. Eisenach, May 2013).

*Estimating the Economic Impact of Repealing the FLSA Companion Care Exemption (prepared with support from National Association for Home & Hospice Care*, co-authored with Jeffrey A. Eisenach, March 2012).

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*Bundles in the Pharmaceutical Industry: A Case Study of Pediatric Vaccines* (prepared with support from Novartis, co-authored with Hal J. Singer, July 2011).

*Evaluating the Cost-Effectiveness of RUS Broadband Subsidies: Three Case Studies* (prepared with support from The National Cable & Telecommunications Association, co-authored with Jeffrey A. Eisenach, April 2011).

*Video Programming Costs and Cable TV Prices: A Reply to CRA* (prepared with support from The National Association of Broadcasters, co-authored with Jeffrey A. Eisenach, June 2010).

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*The Benefits and Costs of I-File* (prepared with support from The Computer & Communications Industry Association, co-authored with Jeffrey A. Eisenach & Robert E. Litan, April 2008).

*The Effects of Providing Universal Service Subsidies to Wireless Carriers* (prepared with support from Verizon Communications, co-authored with Jeffrey A. Eisenach, June 2007).

**Expert Reports and Filings**

*In the Matter of Petition of USTelecom for Forbearance Pursuant to 47 U.S.C. § 160(c) from Obsolete ILEC Regulatory Obligations that Inhibit Deployment of Next-Generation Networks*, Expert Declaration of Kevin W. Caves, Federal Communications Commission (October 6, 2014).

*In the Matter of 2014 Quadrennial Regulatory Review – Review of the Commission's Broadcast Ownership Rules and Other Rules Adopted Pursuant to Section 202 of the Telecommunications Act of 1996*, (MB Docket No. 14-50), Expert Report of Kevin W. Caves and Hal J. Singer: "Competition in Local Broadcast Television Advertising Markets" Federal Communications Commission (August 2014).

*In the Matter of Special Access for Price Cap Local Exchange Carriers; AT&T Corporation Petition for Rulemaking To Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services* (WC Docket No. 05-25 & RM-10593), Declaration of Kevin W. Caves and Jeffrey A. Eisenach, Federal Communications Commission (March 2013).

*In the Matter of Amendment of the Commission's Rules Related to Retransmission Consent*, (MB Docket No. 10-71), Reply Declaration of Jeffrey A. Eisenach and Kevin W. Caves, Federal Communications Commission (June 2011).

*In the Matter of Amendment of the Commission's Rules Related to Retransmission Consent*, (MB Docket No. 10-71), Declaration of Jeffrey A. Eisenach and Kevin W. Caves, Federal Communications Commission (May 2011).

*Guardian Pipeline, L.L.C., v. 295.49 acres of land, more or less, in Brown County, Calumet County, Dodge County, Fond du Lac County, Jefferson County*

*and Outagamie County, Wisconsin, et al.*, Case No. 08-C-28 (E.D. Wis.), Declaration Of Kevin W. Caves, Ph.D. (September 2010).

**Speaking Engagements**

*Competition and Monopsony In Labor Markets: Theory, Evidence, and Antitrust Implications*, New York State Bar Association, Antitrust Law Section, New York, NY, (April 23, 2014).

*Econometric Tests of Common Impact*, Covington & Burling LLP, Washington, DC., (May 23, 2013).

*Vertical Integration in Cable Networks: A Study of Regional Sports Networks*, Federal Communications Commission (May 21, 2013).

*Regression Methods: Theory and Applications of Fixed-Effects Models*, O'Melveny & Myers LLP, Washington, DC., (July 16, 2012).

*Regression Methods: Theory and Applications*, Antitrust Practice Group, Cohen Milstein Sellers & Toll PLLC, Washington, DC., (June 4, 2012).

*Using Regression in Antitrust Cases*, University of Pennsylvania Law School, Philadelphia, PA., (April 12, 2012).

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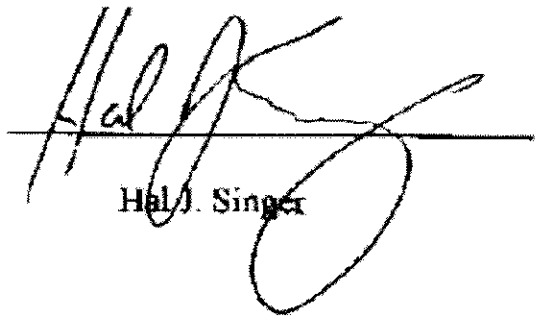
VERIFICATION

I, Hal Singer, verify under penalty of perjury that I have read this Verified Statement, that I know the contents thereof, and that the same are true and correct based on my knowledge, information and belief. Further, I certify that I am qualified and authorized to file this Statement.



Hal J. Singer

Executed on November 4, 2014

VERIFICATION

I, Kevin Caves, verify under penalty of perjury that I have read this Verified Statement, that I know the contents thereof, and that the same are true and correct based on my knowledge, information and belief. Further, I certify that I am qualified and authorized to file this Statement.

Kevin Caves

Executed on November 4, 2014

# APPENDIX C

J Regul Econ (2010) 38:313–326
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ORIGINAL ARTICLE

# Against the stand-alone-cost test in U.S. freight rail regulation

**Russell Pittman**

Published online: 27 October 2010


**Abstract** The stand-alone-cost test has become an expensive, extensive, and time-consuming component of the regulatory practice of the U.S. Surface Transportation Board in the performance of its statutory duty to protect "captive shippers" from monopoly rail rates. A close examination of the history of its adoption and application suggests only a tenuous connection with its claimed intellectual foundations. It is time to retire this notion and replace it with something simpler and more effective and transparent.

**Keywords** Railroads · Regulation · Stand alone cost · Surface Transportation Board · Cross-subsidy · Contestability

**JEL Classification** K23 · L51 · L92

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## 1 Introduction

Rate regulation for the majority of freight movements on U.S. railroads was eliminated by the Staggers Act (49 U.S.C., Public Law 94-473) in 1980. However, one category of traffic remains subject to potential regulation: that represented by so-called "captive shippers," those shippers with no economic alternative to the use of a single railroad.[1] Over the past 25 years, the Interstate Commerce Commission (ICC) and its successor agency, the Surface Transportation Board (STB), have crafted a complex system of protection for such shippers that permits their serving railroads to charge differential, "Ramsey" pricing, but only within limits—limits in practice based largely on the concept of "stand-alone cost" (SAC), the regulator's estimate of the cost that would be faced by a hypothetical new railroad constructed to serve the route in question.

This paper argues that the stand-alone-cost test has become an expensive, extensive, and time consuming component of STB regulatory practice—a forum for high transactions costs from rent seeking—without in fact providing a rate ceiling that can be defended on grounds of either efficiency or fairness. In particular, a close examination of the original textual foundations for the test suggests that its application in this setting has much less justification than is usually believed and cited.

Section 2 of the paper outlines the specific features of the STB's regime for the protection of captive shippers, demonstrating the great and seemingly limitless complexity and disputation called forth by the SAC test. Section 3 examines the origins of the SAC test in the works of Faulhaber (1975) and Baumol et al. (1982). Section 4 argues that, as applied by the ICC and then the STB, the SAC test is not well founded or justified, either by these original sources or by considerations of efficiency or fairness, and briefly considers alternatives.

## 2 Protecting captive shippers: "constrained market pricing"

One of the central provisions of the large scale deregulation of the U.S. freight rail sector in the last quarter of the twentieth century was the removal of regulatory controls on rates. Especially following the Staggers Act and the regulatory decisions implementing its provisions, freight railways have had the freedom not only to engage in long term, confidential contracts with their shippers but also to charge those shippers whatever the market will bear. The result has been a broad revival of the U.S. rail industry following the deterioration and bankruptcies of the midcentury years (Winston et al. 1990; Burton 1993; Ellig 2002; Christensen Associates 2008).

However, rates have not been completely decontrolled. Those freight shippers that are determined by the STB to lack economic alternatives to a single railroad company for the transportation of their products retain some regulatory protection from the monopoly prices that they might otherwise be charged. The remaining freight rate regulatory regime may be briefly summarized as follows.

[1] In a companion paper (Pittman 2010), I discuss legislative proposals to strengthen the protections offered to captive shippers in a manner unrelated to the stand-alone-cost test: by removing the partial antitrust exemption currently enjoyed by U.S. freight railways.

First, the STB determines whether a railroad enjoys actual, statutory "market dominance" over a particular shipper. This involves both a qualitative investigation of potential alternative providers of transportation, either by rail or by other modes, and an analysis of the mark-up over cost represented by the rate: rates that are no more than 180 percent of the rail carrier's variable costs of providing the transport service constitute a non-rebuttable indicator of non-dominance.[2]

If the railroad is found to be in a dominant position vis-à-vis that shipper, the STB regulations require that the rates charged to that shipper must be "reasonable". In 1985 the predecessor agency to the STB, the ICC, issued its *Coal Rate Guidelines, Nationwide*, which set out the standards by which the regulator would evaluate the "reasonableness" of rates charged to captive shippers.[3] These standards went under the label "constrained market pricing" (CMP)—a label that could alternatively be phrased "constrained differential pricing".

In formulating CMP, the ICC acknowledged the welfare advantages of differential or Ramsey pricing—prices set inversely to the demand elasticities of customers—in the presence of economies of scale sufficient to render marginal cost pricing impractical, and so permitted such differential pricing. However, the freedom of the railroads to set differential prices would not be unlimited. The regulations set three constraints on differential pricing: the "management efficiency" constraint, the "revenue adequacy" constraint, and the "stand-alone cost" constraint.

In particular, and respectively, a railway company that was found by the regulator to be managed inefficiently—clearly a difficult conjecture to verify—could not charge high rates to compensate its shareholders for this, and, conversely, a railroad company that was found to be earning "economic profits" could not charge high rates to add to those. However, even if the railroad company was found to be managed efficiently and to be earning less than its cost of capital, it was still limited in the charges it was permitted set to each "captive shipper" to the amount that would have been charged by a hypothetical stand-alone railroad (SARR) built to serve a subset of the real world railroad's shippers that included the shipper in question: the SAC test.[4] The SAC test has been described by successive STB chairpersons as "the most commonly used CMP constraint".[5]

It is worth quoting at length from an STB decision that describes the degree of detail involved in this exercise (and note that the STB is simply stating the facts here, not arguing that the degree of detail is excessive).

> To make a SAC presentation, a shipper designs a hypothetical new carrier (a stand-alone railroad, or SARR) that is specifically tailored to serve an optimum traffic group with the optimum physical plant (rail system) needed for that

[2] *Major Issues in Rail Rate Cases*, STB Ex Parte No. 657 (Sub-No. 1), October 30, 2006.

[3] 1 I.C.C. 2d 520 (1985).

[4] *Major Issues in Rail Rate Cases*, at 6–7; *BNSF Railway v. STB*, U.S.C.A. (D.C. Circuit) No. 06-1372, May 20, 2008.

[5] Linda J. Morgan, Testimony before the Senate Committee on Commerce, Science, and Transportation, March 27, 2002; W. Douglas Buttrey, Testimony before the Senate Subcommittee on Surface Transportation and Merchant Marine, June 21, 2006.

> traffic. Projected traffic volumes, operating speeds, and traffic densities must be calculated to determine the requirements for locomotives, cars, and train operating personnel. A detailed operating plan must be developed to further define the physical plant that would be needed for the SARR. For example, roadway must be sufficient to permit the attainment of the speeds and density that are presumed. The length and frequency of passing sidings must be able to accommodate the specific train lengths and frequency of train meets that are assumed, and traffic control devices must be designed to allow trains traveling in opposite directions on the same track to be handled safely and efficiently based on the density and congestion assumed in the operating plan.[6]

These detailed assumptions are then used to calculate the rates and revenues required to cover the SARR's investment costs (including a return on investment and taking account of the time value of moneys expended during the construction period), operating costs, and tax liabilities.

In the case whose STB decision was just quoted, the shipper posited a SARR of 1400 route miles, traversing five states, connecting coal mines in the Powder River Basin (PRB) of Wyoming with eleven coal-fired power plants in four states. The SARR was even given a name: the West Texas Railroad. Another shipper posited a 3000-mile SARR, dubbed the Overland Railroad, extending from Portland, OR to Chicago, IL and Kansas City, MO, with a 375-mile extension into the PRB coal fields.[7] In that case the Appendix alone of the STB decision, which specifies the details of the SARR configuration, operating plan, and revenue analysis, runs to almost 100 pages.

Unfortunately, in the decades following the ICC's issuance of the *Coal Rate Guidelines*, this third component of the constraints imposed by CMP, the SAC test, has become what a reviewing court feared it would be: "a full employment bill for economists".[8] Shippers have estimated their costs of bringing a full SAC case in the range of US $3–4.5 million, and one railroad has estimated its costs of defending a case as in the same range.[9] (It should be noted, though, that some recent modifications in the SAC process have been designed precisely to reduce these costs on both sides.) The STB has estimated that it spends US $417 thousand itself on the average full SAC case.[10]

The reason for the large expenditures is straightforward and has been stated clearly by one of the participants: "Full SAC cases are very costly in large part because the

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[6] *West Texas Utilities Company v. BN Railroad*, 1 S.T.B. 638 (1996), at 13–14 (parentheses in original).

[7] *FMC Wyoming Corporation and FMC Corporation v. Union Pacific Railroad*, STB Ex Parte No. 346 (Sub-No. 29A), May 10, 2000.

[8] *Consolidated Rail Corp. v. U.S.*, 812 F.2d 1444 (3d Cir. 1987), at 1463 (Becker, J., concurring in part).

[9] Reply Submission of Union Pacific Railroad Company, May 31, 2006, *Major Issues in Rail Rate Cases*, STB Ex Parte No. 657 (Sub-No. 1), at 40; Supplemental Comments of CSX Transportation, Inc. and Norfolk Southern Railway Company, February 26, 2007, *Simplified Standards for Rail Rate Cases*, STB Ex Parte No. 646 (Sub-No. 1), at 8. See also *Simplified Standards for Rail Rate Cases*, STB Ex Parte No. 646 (Sub-No. 1), September 4, 2007, at 5.

[10] *Regulations Governing Fees for Services Performed in Connection with Licensing and Related Services—2010 Update*, STB Docket No. EP 542 (Sub-No. 17), July 22, 2010.

stakes are so high."[11] Although STB decisions against the railroads in major rate cases have been relatively infrequent—around one every other year since the STB opened for business on January 1, 1996—awards have increased in size in recent years, from US $11.4 million in reparations in *West Texas Utilities v. BN* in 1997 to an estimated US $30 million in rate reductions and reparations in *Kansas City Power & Light v. UP* in 2008 and an estimated US $345 million ("in current dollars") in rate reductions and reparations in *Western Fuels Association and Basin Electric Power Cooperative v. BNSF* in 2009.[12]

Under such circumstances, both sides in a rate case have strong incentives to add increasing layers of complexity to the inherently uncertain exercise of simulating the costs of a SARR—so long, of course, as each new layer either adds to or subtracts from the costs, as desired. A process such as this one is inevitably plagued with both problems of asymmetric information and the resulting incentives for high transactions costs from rent seeking: in particular, incentives for every party in a proceeding to pick and choose among all available private information in order to further its own agenda.

Among the issues litigated have been the following:

(a) Whether a one-year, ten-year, or twenty-year SAC analysis is most appropriate;[13]
(b) Since the SAC analysis may include twenty years of future SARR operations, whether expected average productivity improvements in freight railroads generally should be applied without adjustment to the SARR, or whether, since the SARR would be ex hypothesi newly built and so at the frontier of productivity, whether such industry-wide improvements should be factored in only gradually (and if gradually, how gradually);[14]
(c) Whether a shipper may rely on the trackage rights that one railroad holds over track belonging to a second railroad;[15]
(d) How to allocate the rates paid by traffic that travels partly over the SARR and partly over existing lines of the defendant railroad between the two parts of the routing;[16]

[11] Supplemental Comments of Union Pacific Railroad Company, February 26, 2007, *Simplified Standards for Rail Rate Cases*, STB Ex Parte No. 646 (Sub-No. 1).

[12] *West Texas Utilities Company v. Burlington Northern Railroad*, 1 S.T.B. 638 (1996) and 2 S.T.B. 683 (1997); *Kansas City Power & Light Company v. Union Pacific Railroad Company*, Decision, STB Docket No. 42095, May 29, 2008; *Western Fuels Association and Basin Electric Power Cooperative v. BNSF Railway*, Decision, STB Docket No. 42088, February 17, 2009. For the experience between 1996 and 2006, see W. Douglas Buttrey, Testimony before the Senate Subcommittee on Surface Transportation and Merchant Marine, June 21, 2006.

[13] *Major Issues in Rail Rate Cases*, at 61–66.

[14] *BNSF Railway v. STB* (2008).

[15] Arizona Electric Power Cooperative v. STB, U.S.C.A. (D.C. Circuit), No. 05-1136, July 18, 2006, at 2; see also *Pennsylvania Power & Light Co. vs. Consolidated Rail Corp*, Decision, ICC Docket No. 38186S, July 24, 1984.

[16] *BNSF Railway v. STB* (2008), at 24–39.

(e) Whether train "dwell times" at points of traffic interchange should be assumed to be 30, 45, 60, or 90 min;[17]
(f) Whether culverts designed to substitute for bridges would be built with sufficiently wide entryways;[18]
(g) How many acres of the farmland adjacent to the SARR would require seeding;[19] and
(h) When new information becomes available—as it does inevitably for a ten- or twenty-year (hypothetical) forecast—whether the STB should continue to examine the reasonableness of the challenged rate within the framework of the prior SAC analysis or dismiss the older proceeding and open a new proceeding, inviting the presentation of a new SAC analysis.[20] The decision cited here was written in 2007 and concerned an STB ruling originally made in 1996.

In response to the extensive and expensive regulatory proceedings that followed from the creation of this incentive structure, Congress in 1996 directed the STB to "establish a simplified and expedited method for determining the reasonableness of challenged rail rates in those cases in which a full stand-alone cost presentation is too costly, given the value of the case."[21] However, no cases were brought under the simplified guidelines issued by the STB in response, and so the STB in 2006 created a simplified stand-alone cost ("Simplified-SAC") procedure for use in medium-size rate disputes and a "Three-Benchmark" method for small rate disputes "for which even a Simplified-SAC presentation would be too costly, given the value of the case."[22]

Such refinements, however, seem only to highlight the importance of a set of more fundamental questions. When does a SAC presentation become "too costly"—not "given the value of the case" but given its contribution to an efficient and/or equitable outcome to a rate dispute? Where did the SAC test come from, and to what degree do its analytical origins and foundations justify the importance granted it by the STB—not to mention the resulting expenditures of real resources on its use by shippers, carriers, and the STB—in large rate disputes? How much justification is there for the STB's stated view that "the SAC test, which judges the reasonableness of a challenged rate by comparison to the rate that would prevail in a competitive market, rests on a sound economic foundation…."?[23] The answers to these questions are not reassuring.

[17] *Western Fuels Association and Basin Electric Power Cooperative v. BNSF Railway*, Decision, STB Docket No. 42088, February 17, 2009, at 17–18.

[18] Ibid. at 4.

[19] *McCarty Farms, Inc. v. Burlington Northern*, 1997 WL 472908.

[20] *West Texas Utilities Company v. BNSF Railway Company*, STB Decision, Docket No. 41191, September 2007, at 7.

[21] 49 U.S.C. 10701(d)(3).

[22] *Simplified Standards for Rail Rate Cases*, STB Ex Parte No. 646 (Sub-No. 1), September 4, 2007, at 4.

[23] Ibid. at 13.

## 3 The origins of the stand-alone-cost test

Where did the SAC test come from? The ICC decision that introduced CMP, *Coal Rate Guidelines, Nationwide*, places its origins squarely within the concept of contestable markets:

> Two economic theories are central [to] Constrained Market Pricing – differential pricing and the contestability of markets. They provide the analytical basis for determining those costs for which a shipper may properly be charged and the extent to which the shipper should bear the costs.... Our use of SAC introduces the competitive standard of contestability into a non-competitive market.[24]

Similarly, an appeals court decision notes that "the SAC test... [is] rooted in the concept of contestable markets...."[25]

In turn, the *locus classicus* for contestable markets, (Baumol et al. (1982), hereinafter BPW), credits the concepts of stand-alone cost and the stand-alone-cost test to Faulhaber (1975). So it is to that paper that we turn first.

Faulhaber addresses "the problem of pricing commodities produced in the presence of common costs by a publicly owned or regulated enterprise" that is constrained to earn zero economic profits. He notes that, while economists have focused on the efficiency properties of such pricing regimes, policy makers have also been concerned about issues surrounding distribution, equity, and fairness: "Does a proposed price structure for the multicommodity enterprise 'unduly' favor the consumers of one commodity at the expense of the purchasers of another commodity, i.e., does the price structure result in cross-subsidy?" (p. 966) Faulhaber proceeds to posit the "intuitively appealing notion" that, for a multicommodity firm subject to a zero-profit constraint, a pricing structure is "subsidy-free" if there is no set of commodities whose prices are set at a higher level than they would pay by themselves.

This "intuitively appealing notion" might seem to suggest a "fairness" argument, but Faulhaber quickly backs away from this line of thinking. First he notes that "we [are not] entitled to assume that such [subsidy-free] price structures are morally superior to their subsidy-prone fellows on grounds of social justice" (p. 967); then in a footnote he explicitly and forcefully contrasts his own analysis with that of other papers that recommend a certain method of setting prices in public enterprises "on the basis of its purported 'fairness' and 'equity'."

In fact, Faulhaber's reasoning is based unambiguously on what BPW will later term "sustainability". His game-theoretic analysis asks the question: what is the highest price that a profit-constrained, multiproduct monopolist may charge a particular group of customers without giving that group the incentive to break away and engage in self-supply? This price is the SAC, the cost that such a group would have to pay to supply itself only. If any prices are set above this level, some group of customers will have the incentive to "go it alone," even though supply by a single source is uniquely the most efficient production arrangement (p. 968).

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[24] *Coal Rate Guidelines, Nationwide*, at 5, 9.

[25] *PPL Montana v. STB*, U.S.C.A. (D.C. Circuit) No. 04-1369, February 17, 2006, at 9.

Again, Faulhaber emphasizes that subsidy-free prices "do not necessarily promote the common weal or bring about social justice." Furthermore, "there is no *a priori* reason to expect that prices which maximize welfare subject to a break-even constraint [i.e., Ramsey prices] will necessarily be subsidy-free...." Efficient prices are computed from demand elasticities and marginal costs, while subsidy-free prices are based on alternative supply costs, so "it is no surprise that the two ideas are not necessarily compatible." (p. 973)

When BPW take up Faulhaber's concept of SAC, it is once again with an emphasis on the prevention of inefficient entry:

> If the revenues collected from the sale of a subset of products ... exceed the cost of providing the same quantity of those products independently, a profitable entry opportunity is offered to anyone willing to supply the same bundle at a slightly lower price and, in a perfectly contestable market, entry will occur.... Equilibrium in perfectly contestable markets requires that the revenues earned on any part of the total output of the industry be no more than the stand-alone production cost of that part. (pp. 352 and 354)

Elsewhere, Baumol (1987) has remarked that the SAC of a service "might better have been called its entry-inducing rate level".

Unlike Faulhaber, however, BPW take the argument for the SAC test a significant step beyond sustainability. Both Faulhaber and BPW demonstrate that, in the presence of a zero-profit constraint on the firm, the failure to pass the SAC test for one set of products necessarily implies the failure to pass the incremental cost (IC) test on some other set of products: if one set of products is priced at higher than its SAC, some second set of products is necessarily priced at below its IC. BPW note that such a situation of cross subsidies has often raised concerns relating to equity and fairness—why is the former group of customers "subsidizing" the latter?—but such cross subsidies may also be associated with real inefficiencies, both static and dynamic, since both customers choosing among potential substitutes and potential entrants into the subsidized market are acting on faulty price signals.

According to Faulhaber and BPW, then, the stand-alone-cost test is motivated and justified mostly by concerns for the sustainability of the natural monopoly in the face of potential inefficient entry. In addition, failure to satisfy the test may suggest that certain Ramsey prices are cross-subsidizing other prices and are thus potentially inefficient as well as in some sense unfair—though the fairness argument itself is specifically abjured by Faulhaber and not developed by BPW.

## 4 Evaluating the stand-alone-cost test in light of its origins

We have seen that the scholarly works upon which the STB has relied for support in its use of the SAC test base the application of the test to rates charged to customers of a monopolist constrained to earn zero economic profits on demonstrations that the test insures that, in a contestable market,

(a) costly and inefficient entry does not take place, and

(b) one group of customers is not forced to cross-subsidize another group of customers—a situation that may be regarded as either unfair or as likely to indicate competitive distortions in the market for the subsidized good.

This would suggest the relevance of a few questions regarding the choice by the STB of SAC tests to evaluate rates charged to "captive" freight rail shippers.

First, is the railroad industry contestable? Of course not: a necessary (but not sufficient) requirement for contestability of an industry is that "entry is absolutely free and exit absolutely costless,"[26] and the *Coal Rate Guidelines, Nationwide*, freely concede that "the railroad industry is recognized to have barriers to entry and exit and thus is not considered contestable for captive traffic."[27] (The last three words seem unnecessary.) The STB statement that its "use of SAC introduces the competitive standard of contestability into a non-competitive market"[28] has a reasonable sound but does not really explain why such an exercise is in any sense welfare-, efficiency-, or fairness-enhancing.

Similarly, other STB statements justifying the use of the SAC test seem more to avoid than to address the questions of economic efficiency and total welfare:

> Our use of SAC introduces the competitive standard of contestability into a non-competitive market.... This cost calculation produces a *simulated competitive price standard* against which actual rates can be compared.[29]

> A SAC analysis seeks to determine whether a complainant is bearing costs resulting from inefficiencies or costs associated with facilities or services from which it derives no benefit; it does this by simulating the competitive rate that would exist in a "contestable market."... This analysis produces a *simulated competitive rate* against which we judge the challenged rate.[30]

Second, in the freight railroad sector, is SAC analysis an important tool for regulators actually seeking to prevent inefficient entry? That seems quite unlikely: new entry into the freight railroad business in the U.S. has been extremely rare, in part because until fairly recently the industry had been in a long period of shedding excess capacity. Furthermore, it is entirely in the interest of the incumbent railroad to price in such a way that entry into its territory is not induced. In addition, the STB has the authority to deny applications for new line construction if the presence of the new capacity would "unduly harm existing services."[31]

The single major project for new railroad construction proposed and advanced in recent years has been for the construction by the Dakota, Minnesota & Eastern

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26 *Coal Rate Guidelines, Nationwide*, at 8, quoting testimony by Baumol.

27 Ibid.

28 Ibid. at 9.

29 Ibid. (emphasis added).

30 *Major Issues in Rail Rate Cases*, at 7 (emphasis added).

31 *Dakota, Minnesota & Eastern Railroad Construction into the Powder River Basin*, STB Finance Docket No. 33407 (3 S.T.B. 847; 1998 STB LEXIS 968) (December 10, 1998), citing 49 U.S.C. 10901(c) and *Tongue River R.R.—Rail Construction & Operation—Ashland to Decker, MT*, STB Finance Docket No. 30186 (Sub-No. 2) (Nov. 8, 1996).

Railroad (DM&E) of a new line into the PRB, the coal producing area served by the two western Class I railroads, the UP and the BNSF. In the lengthy STB proceedings that authorized construction (which has not yet taken place, and may not),[32] the principal participating shippers' group, the Western Coal Traffic League, argued that "access to the PRB by an additional... rail carrier would assist in mitigating UP's and BNSF's capacity shortcomings, and thereby improve rail service reliability."[33]

The STB decision alludes briefly to the possibility (and relevance) of harm to existing *carriers* as an instance or cause of harm to existing *services*, but the decision does not so much as mention any evidence that the UP and/or BNSF would be significantly harmed by DM&E entry into the PRB, evidence that would seem to be at least related to the sustainability question. It rather focuses entirely on the seemingly odd issue of whether the magnitude of the proposed investment project and the possibility of its failure might constitute threats to existing service *by the DM&E* to its existing, non-PRB customers—an additional instance in which the railroad company itself might seem to have the proper incentives to avoid problems.[34] Remarkably, then, in the single major recent STB case in which the sustainability issue is at least in principle relevant, the agency decision avoids the issue almost entirely.

Finally, are freight railroad companies in the U.S. constrained to earn zero economic profits? Again, the principal reason for the importance of this question is the result that in the presence of a zero profit constraint and under the assumption of efficient operations, if one group of shippers is paying more than SAC, it necessarily follows that some other group is paying less than its incremental cost—i.e., is being subsidized.

The answer to the question is no: the "revenue adequacy constraint" referred to above provides a possible avenue for captive shipper challenges to their rates based on a finding that railroad firm-wide economic profits exceed the estimated cost of capital, but that fact is (obviously) not the same as a zero profit constraint. In fact, a large-scale study recently commissioned by the STB concludes that the U.S. Class I railroads are now near or at the point of earning economic profits (Christensen Associates 2008). And yet, in a recent paper that evaluates the experience of regulatory application of the concepts in his original paper, Faulhaber (2005) notes that

> In non-regulated enterprises, ... the focus of cross-subsidy analysis shifts entirely to the IC tests. *The SAC tests are not helpful under conditions of positive economic profits.* (p. 446; emphasis added)

[32] See U.S. Federal Railroad Administration, "FRA Administrator Denies DM&E Powder River Basin Loan Application Citing Unacceptable Risk to Federal Taxpayers," February 26, 2007.

[33] *Dakota, Minnesota & Eastern Railroad Corporation Construction into the Powder River Basin*, 3 S.T.B. 847 (1998), at 7.

[34] Ibid.; see also the subsequent STB decision granting approval for construction following investigation of possibly averse environmental impacts, *Dakota, Minnesota & Eastern Railroad Corporation Construction into the Powder River Basin*, 2002 STB LEXIS 74, and the decision granting final approval for construction following court appeal and remand, *Dakota, Minnesota & Eastern Railroad Corporation Construction into the Powder River Basin*, Decision, STB Finance Docket No. 33407, February 15, 2006.

If the lack of a zero-profit constraint on the firm breaks the link between SAC and IC, then failure to satisfy SAC for one set of products does not imply cross subsidization of a second set—and thus says nothing about possible inefficiencies in the latter market.

We would seem to be left only with arguments for the SAC test related to fairness (though even these lose some of their force in the absence of a zero-profit constraint, since in that case failure to pass the SAC test does not imply cross-subsidization). As I discuss in the companion paper to this one (Pittman 2010), fairness is a highly relevant topic for discussion regarding rates charged to captive shippers; as is well known, in a sector with a high level of fixed and sunk costs, there is no single, optimal way to set rates for full cost recovery (Kahn 1970). Particularly once the railways are earning their cost of capital—as they are now, arguably—any increase in rates to the railroads (part of which goes to stockholders, but part of which goes to labor, and part to maintaining and improving capacity) comes at the expense of coal mine owners and labor and investment, electric utilities, and electricity rate payers (and customers of commercial rate payers).

What is the right mix of charges to those diverse groups? Rates set at "what the market will bear" economize on judicial and regulatory costs and fund railroad investment. Rates constrained to be below this level leave more resources in the hands of the coal and electricity industries and electricity customers but less for future investment in the capital-intensive railway sector. Ramsey prices achieve revenue adequacy at a minimum cost to total welfare, but customers with the fewest economic alternatives may pay very high—even "unfair", even in some sense "cross subsidizing"—rates. Ramsey prices constrained by SAC analysis may leave shippers with a small share of the economies of scope of the overall railway enterprise.[35] We have not even touched on the question of environmental externalities: whether, as complainants argued in the DM&E matter before the STB, lower rates for shipping coal may be a *bad* thing if they encourage the construction of more coal-fired power plants and the consumption of more electricity.[36] Complex tradeoffs and large sums of money are at stake here, and political resolutions may be inevitable.

What seems clear, however, is that a focus on the preferred level and framework of rates is much to be preferred to a lengthy and expensive examination of various cost issues that are not obviously relevant to the desirability of the rates themselves. Whatever is the fairest or best or most equitable way to divide the available rents among various claimants, it would seem to have little to do with the choices of rules

[35] In principle, Ramsey prices for a particular group of shippers should be less than or equal to the SAC of serving them—and equal only if (a) there are no economies of scope between that group of shippers and the remaining shippers on the railroad, and/or (b) the profit constraint that determines the Ramsey prices is no lower than the returns on investment calculated in the SAC test. A Ramsey price should exceed SAC only if the railroad and the STB calculate costs differently—since in practice it is the railroad that is setting Ramsey prices and the STB that is calculating SAC—or if different profitability constraints are used for the two calculations. Since, as noted, the STB has on multiple occasions determined that existing prices exceed SAC, one or both of these factors may be in play. Alternatively, to the degree that the railroads are now earning their cost of capital, they may be no longer effectively constrained in setting their prices: Ramsey prices may have been replaced by monopoly prices for some captive shippers.

[36] See especially *Mid States Coalition for Progress vs. STB*, 345 F.3d 520 (8th Cir. 2003) and *Dakota, Minnesota & Eastern Railroad Corporation Construction into the Powder River Basin*, Decision, STB Finance Docket No. 33407, February 15, 2006.

for introducing expected productivity improvements or for cost sharing on two sections of track on a hypothetical railroad over a twenty year period in the future—or with any of the other myriad of complex and expensive details that constitute the SAC test as it is implemented in the context of U.S. freight rail regulation.

A more difficult issue is to specify a methodology for the regulation of rates charged to captive shippers that is simpler, more straightforward, cheaper, and above all focused on the question at hand (fairness) rather than a different one (the hypothetical cost structure of a hypothetical railroad). The broad idea behind CMP—combining the efficiency properties of differential pricing with some limitation on the railroad's ability to exploit its monopoly position vis-à-vis particular shippers—seems appealing, so the task may be as simple (or as complicated) as coming up with a better candidate for the price ceiling than the SAC test.

One possibility is a ceiling on the price-to-variable-cost ratio for captive shippers, corresponding to the floor on this ratio below which the STB lacks jurisdiction to challenge rates. A potential objection to this would be the difficulty of measuring variable cost, but there is already a standard methodology for this in the railroad industry, called the Uniform Rail Costing System (URCS), and subject to ongoing STB examination and improvement. This methodology is used, as mentioned, for the STB's P/VC *floor* on rates that may be considered indicative of market dominance by a carrier, as well as in other STB contexts.[37]

In fact some recent STB jurisprudence seems promising in this respect. First of all, the STB has abandoned its past practice of considering adjustments proposed by both sides in rate disputes to the VC measures provided by the URCS, ruling that in the agency's experience a great deal of disputation and expertise were devoted to arcane debates which ended up not changing VC estimates much from what was provided by URCS.[38] Second, in a submission as part of that STB rulemaking, one railroad estimated that its litigation costs for a recent case in which the dispute focused on VC only were "less than one-third" its costs in a contemporaneous SAC case.[39] Third, a recent rate case in which the STB awarded reparations to be paid by the railroad to the shipper included disputes regarding the measurement of both VC and SAC. The original decision included an appendix of 29 pages examining the R/VC issue and four appendices totaling 107 pages examining the SAC/SARR issue.[40] The subsequent decision replying to petitions for reconsideration on both sides devoted 6 pages to VC issues and 15 pages to SAC issues.[41]

[37] STB, *Surface Transportation Board Report to Congress Regarding the Uniform Rail Costing System*, May 27, 2010. It is true, however, that the two functions of determining whether a rate falls under STB jurisdiction and is reasonable are the two "most significant" uses of the VC measure (p. 1).

[38] *Major Issues in Rail Rate Cases*, Decision, STB Ex Parte No. 657 (Sub-No. 1), at 47–61.

[39] Reply Submission of Union Pacific Railroad Company, May 31, 2006, *Major Issues in Rail Rate Cases*, STB Ex Parte No. 657 (Sub-No. 1), at 40.

[40] *Texas Municipal Power Agency v. The Burlington Northern and Santa Fe Railway Company*, Decision, STB Docket No. 42056, 6 S.T.B. 573 (2008).

[41] *Texas Municipal Power Agency v. The Burlington Northern and Santa Fe Railway Company*, Decision, STB Docket No. 42056, 7 S.T.B. 803 (2004).

From this recent experience, one might take three tentative inferences. First, disputes about actual variable costs may be considerably less complex than disputes about hypothetical stand-alone costs. Second, current STB regulatory practice already includes disputation concerning both actual variable costs and hypothetical stand-alone costs, and it is not obvious why removing any rationale for the latter would automatically result in an increase in the former. Third, as the STB has recently closed the door to certain types of adjustments regarding variable cost estimates, rent dissipation going forward in this area may be expected to be even less than in the past.

All of this does risk assuming away a potentially serious objection to this proposal, raised in fact by Professor Faulhaber in comments on an earlier version of this paper: given the very large level of rents subject to dispute in captive shipper rate cases, *any* methodology for setting a ceiling on rates will evoke large volumes of rent-dissipating regulatory proceedings, counter-proceedings, and court challenges. Based on the corresponding level of disputation that surrounded the adoption of CMP, it is difficult to reject this hypothesis—but mainly as a one-time event, as a set of maneuverings around the adoption of both such a new ceiling in principal and the particular ratio chosen as the specific ceiling. Once this event were past, however, the incentives and ability for such rent-dissipating behavior may be much less, since, as noted, the methodology for measuring variable costs in the railroad industry, while undeniably imperfect, is already established and used in a variety of settings.

A final potential objection relates to the well known poor incentive properties of any such variant on rate-of-return regulation (Kahn 1970). However, since the overall price and profit levels of the railroad firm would not be constrained, the broad incentives for the firm to keep costs low would seem not significantly harmed.[42]

As for the precise ceiling ratio itself, there is clearly no optimal or otherwise "correct" level suggested by economic analysis, and one should not pretend otherwise. This would be a judgment call, in principle involving fairness and in practice involving politics. There may be a danger that a legislator or regulator would decide, based on the structure of downstream markets, the nature of downstream customers, or competitive conditions in the shipper industry, that different ceiling ratios would be appropriate for different industries—a virtual invitation to case-by-case or at least industry-by-industry rent dissipation. On the other hand, as noted by former STB chairman Roger Nober, the captive shipper issue is primarily a coal shippers issue, with chemical and grain shippers probably a distant second and third in importance.[43] Once a P/VC ceiling for coal shippers were chosen, however imperfectly, it seems likely that it could be accepted and applied for all situations currently subject to full SAC proceedings.

[42] Cf. the STB response to the suggestion by a shippers' organization that the use by the agency of a certain model for calculating the cost of capital of the railroads might give the railroads incentives to game the system: "We have only a limited role in the economic regulation of the carriers, because the vast majority of railroad traffic is beyond our rate review authority.... The regulatory benefits would pale in comparison to the loss of profits and competitiveness that a particular carrier would face...." STB Ex Parte No. 664, *Methodology to Be Employed in Determining the Railroad Industry's Cost of Capital*, Decision, January 17, 2008.

[43] *Railroad Shipper Issues: Hearing on Railroad Shipper Issues and S. 919 Before the Senate Subcommittee on Surface Transportation and Merchant Marine*, 108th Congress (2003).

In fact, the STB has imposed exactly such a rate ceiling as a remedy in at least two matters where the shipper was able to demonstrate that the rates it had been paying had been greater than SAC,[44] and in another such matter it imposed a rate ceiling that would be the higher of a P/VC ratio and the rate calculated under the SAC test.[45] Thus it seems clear that such a rate ceiling would not be impractical or unworkable as an alternative to the pure SAC test. Certainly such a policy would have its own, undeniable imperfections, but it would seem much simpler than the SAC test—much less an invitation to rent seeking—to implement on a case-by-case basis, while at the same time (a) skirting the appearance of precision misleadingly offered by the stand-alone-cost test, and (b) moving the attention and debate away from a tangential issue, the hypothetical costs of a hypothetical railroad, to the issue actually at the center of the controversy, the degree to which it is "fair" for a monopoly railroad to charge high prices to its captive shippers.

## References

Baumol, W. J. (1987). Direct testimony, U.S. Postal Rate Commission, Docket No. R87-1 (USPS-T-3).

Baumol, W. J., Panzar, J. C., & Willig, R. D. (1982). *Contestable markets and the theory of industry structure*. New York: Harcourt Brace Jovanovich.

Burton, M. L. (1993). Railroad deregulation, carrier behavior, and shipper response: A disaggregated analysis. *Journal of Regulatory Economics, 5*, 417–434.

Christensen Associates. (2008). *A study of competition in the U.S. freight railroad industry and analysis of proposals that might enhance competition*, prepared for the Surface Transportation Board, November 2008.

Ellig, J. (2002). Railroad deregulation and consumer welfare. *Journal of Regulatory Economics, 21*, 143–167.

Faulhaber, G. R. (1975). Cross-subsidization: Pricing in public enterprises. *American Economic Review, 65*, 966–977.

Faulhaber, G. R. (2005). Cross-subsidy analysis with more than two services. *Journal of Competition Law and Economics, 1*, 441–448.

Kahn, A. (1970). *The economics of regulation: Principles and institutions*. New York: Wiley.

Pittman, R. (2010). The economics of railroad 'captive shipper' legislation. *Administrative Law Review, 62*, 919–936.

Winston, C., Corsi, T. M., Grimm, C. M., & Evans, C. A. (1990). *The economic effects of surface freight deregulation*. Washington, DC: Brookings.

[44] *West Texas Utilities Company v. BN Railroad* (1996); *Western Fuels Association and Basin Electric Power Cooperative v. BNSF Railway* (2009).

[45] *Texas Municipal Power Agency v. BN & SF Railway*, 6 S.T.B. 573 (2003).