BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Ex Parte No. 711 (Sub-No. 1)

Reciprocal Switching

SUPPLEMENTAL COMMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS

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February 14, 2022

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I. INTRODUCTION

Shippers ask the Board to adopt a forced switching rule for one simple reason: so that they can pay lower rates. *See infra*, Part III.B.7 (collecting dozens of shipper comments and ex parte meeting summaries to that effect). The ostensible purpose of that rule is to force a carrier to offer switching services that the carrier has no reason to offer, and the shipper has no need for, because the carrier already has other ways of getting the shipper's traffic from origin to destination. But shippers will demand reduced origin-destination rates, negotiating in the shadow of the threat of regulatory orders requiring those switching services, regulatory orders setting their prices, and regulatory orders about how that switching must occur. Whether by negotiation in the shadow of Board compulsion, or by direct Board order, the end result would be to pad shippers' profits at the expense of the carriers.

As discussed below, this is misguided policy and unlawful; the Board's charge from Congress is not moving money from one industry's pocketbook to another's. But before confronting those overarching problems, pause to ask: Why should the Board even want to boost the profitability of, say, chemical and industrial shippers at the expense of railroads?

- Not because that would enhance the rail industry's service to the public. To the contrary, the Proposed Rule can only discourage future investment by railroads.

- Not because railroads should share the wealth. To the contrary, the industries clamoring for the Proposed Rule have much higher returns on investment compared to their cost of capital than does the rail industry.

- Not because railroads gained an upper hand through consolidation in the 1990s. To the contrary, the efficiencies won through consolidation have benefitted everyone. The theory that consolidation has increased single-served shippers is refuted by the data: A *smaller* percentage of shipments today move to and from stations with single service than was the case in the early 1990s.

- Not because all shippers should pay the same rates. To the contrary, there is wide agreement that differential pricing is necessary to the rail network's future viability.

- Not because forced switching would alleviate pressure on supply chains. To the contrary, additional switching means additional complexity and points of potential delay.

- Not because workers would benefit. To the contrary, railroads have higher rates of union employment than their customers. And because all railroad operations carry risks of accident or injury, the complex switching operations required by the Proposed Rule only create more safety risks for those workers.

- Not because it would help the environment. To the contrary, actions that increase operational complexity—as forced switching typically would—tend to decrease operational efficiency and increase greenhouse gas emissions. And less investment in fuel-efficient rail options means more trucking, along with more highway congestion and greenhouse gas emissions.

- Not because existing rates are unreasonably high. Nobody has done the necessary rate studies—but if they showed a problem, then the Board would be fully justified in ordering rate relief directly. True, many are frustrated with the difficulty of rate-reasonableness proceedings. But those inquiries are required to avoid market distortions and economic inefficiencies—risks that are at least as acute in a forced switching proceeding, and which will demand forced switching proceedings that are no less complex than rate reasonableness proceedings.

All this leaves the Board in a most peculiar position. Lacking even a desirable concrete goal, why would it embark on a program to re-regulate the industry? Efforts to brand the Proposed Rule as "competition" notwithstanding, the substance is all regulatory. The foundation of the rule is a government mandate to provide a complex and inefficient service that free market

actors have avoided. And past experience—in the telecommunications industry, for example—teaches that the regulation won't stop there: Where will the service be ordered? Whose facilities will be used? Whose equipment? What will the price be? What happens when there are operational disagreements or service failures? What happens when the conditions that once justified switching are gone? If forced switching is widespread enough to matter, then the Board will be called upon time and again to answer these questions. Each time it does, the rail network will become a little more a creature of the Board's regulation, and a little less the natural and adaptable product of free market actors.

And that gets to the root of the problem with the Proposed Rule: Especially in the midst of one of the most disruptive global events in living memory, now is not the time to turn the clock back to the dark days before ICCTA, the Staggers Rail Act, and the 4-R Act—the days of inefficient duplication of routes, shipper control over routing, and suffocating regulatory constraints that threatened the industry's very survival. The Board has the opposite mandate: It should promote the shared interests of the industry, shippers, and the public in a sustainable, functional, and efficient rail system organized by free competition. The *existing* rule serves those ends by offering a remedy when a railroad has abused its market power to compromise those interests. The Proposed Rule does nothing to advance those goals, and much to harm them. The Board should not adopt it.

II. SUMMARY OF COMMENTS

A. The Proposed Rule fails to identify and respond to a present problem for which forced switching is a lawful or wise policy solution. Identifying a problem is a basic requirement of reasoned agency decisionmaking under the Administrative Procedure Act (APA), particularly where substantial reliance interests exist and sound public policy supports the existing framework. There are extraordinary reliance interests in the existing rule that have been built up

by railroads, shippers, and other stakeholders over the last forty years. This includes the nearly $740 billion that freight railroads have invested in their networks from 1980-2020 with the expectation of returns on that investment from providing services to shippers who benefit from those investments. Those reliance interests also include the location choices and other investment decisions shippers have made with respect to their facilities and operations. Passenger rail service has likewise relied on being able to operate in busy terminal areas alongside efficient freight switching operations. The Proposed Rule would sweep all those reliance interests away, picking new winners and losers.

Every rationale floated by the Board and other interested parties for why a new forced switching rule is needed now is either demonstrably unsound, contradicted by existing or new analyses of the relevant data, or both. To begin, much has been made of the fact that the existing rule "essentially consolidate[s]" the two statutory prongs of Section 11102(c) into a single standard, and that approach "is overly restrictive in today's environment." *Petition for Rulemaking to Adopt Revised Competitive Switching Rules*, at 15-16 (STB served July 27, 2016) (Notice of Proposed Rulemaking ("NPRM")). But, given how the ICC interpreted the existing rule from its first invocation, that simply is not the case. As the D.C. Circuit's decision in *Midtec Paper Corp. v. United States*, 857 F.2d 1487, 1503 (D.C. Cir. 1988), makes explicit, the existing rule (and the ICC's and Board's decisions under it) already recognize distinct circumstances in which the existing rule can apply. A bare desire to explicitly delineate two pathways provides no justification at all for the Proposed Rule.

Characterizations of the current regime as "dormant" and the observation that there is a "dearth of cases" are misplaced. Under a deregulatory statute, the absence of regulatory disputes is a mark of success, not failure; it indicates a mature industry guided by clear principles.

Moreover, quantitative data bear this out—showing: (1) that there is no probative evidence of widespread market power abuse; (2) that there has not been a meaningful increase in real rail rates over time; and (3) that rail rates continue to compare favorably to rail's main competitor, trucking, whose rates *have* increased substantially during the existing rule's tenure.

Similarly, rail carrier consolidation during the 1990s does not justify a change to the rule. Shippers have gained substantially from enhanced single-line service enabled through consolidation, aided by the merger conditions put in place by the ICC and the Board. Indeed, the success of those measures is borne out by data that show an overall *decrease* in the relative proportion of single-served traffic—*i.e.*, carload traffic originating or terminating at stations served by a single Class I carrier—when comparing the "pre-merger" and "post-merger" periods.

Nor does the state of rail carriers' financial condition justify a change to the rule. Penalizing success is bad public policy, and regardless, the rail industry has not in fact been wildly profitable. When returns on invested capital are compared to S&P 500 companies in recent years, Class I railroads trail behind many other sectors and, most significantly, far behind the shipper industries most zealously advocating for a rule change here.

The other justifications put forward likewise fail to provide the necessary support for the Proposed Rule. For instance, no evidence in the record shows that additional switching would solve service concerns. Even if such evidence existed, the existing rule is capable of addressing inadequate service that arises from market power abuse (*Midtec* explicitly recognizes as much); shippers have simply found no cause to use it. The same is true of inefficient routing that could arise from market power abuse: No specific evidence in the record demonstrates that inefficient routing exists, much less that it reflects an abuse of market power—and if it did, the existing rule can address such concerns.

The record is unequivocal that the Proposed Rule is championed as a way to give shippers lower rail rates. That justification remains unlawful and unwise. It would contravene the statutory framework defining the Board's authority (and the limits on that authority) to regulate rates. And data unambiguously show that the Proposed Rule's "competitive access" pathway would blast a huge hole in the existing maximum rate framework.

B. New and existing evidence in the record also continues to show that the Proposed Rule's risks and downsides vastly exceed any possible benefits that could inure to the public at large. This is because the purported public benefits are either speculative or nonexistent. No reason exists to believe that any rate reductions caused by the Proposed Rule would increase efficiency and overall social welfare. Nor is there a basis to assume that the Proposed Rule would lead to cost reductions for the public, increased rail traffic, improved service, or increased investment—the sort of things that would be necessary for there to be a public benefit.

Moreover, the record shows that the Proposed Rule would impose serious burdens on the public, the Board, and railroads (passenger and freight alike)—downsides that vastly outweigh the limited and speculative benefits. These downsides include significant operational burdens from increasing the number of required movements—burdens that would erode service and productivity gains achieved by the industry through rationalization of rail networks and reduction of interchanges, switches, and car handlings. Comparisons to merger conditions or the Canadian interswitching model are inapt and do not show that the Proposed Rule's operational impacts will be negligible in the United States. In fact, the operational downsides of the Proposed Rule have become even more acute in light of recent experience with COVID-19 supply chain disruptions. This experience underscores how local operational problems can have broad and far-reaching

effects, especially when many local disruptions ripple across an interdependent supply chain network.

The Proposed Rule would discourage vital private infrastructure investment by the railroad industry. The Board has a statutory obligation to ensure that its regulatory rules support the willingness and ability of railroads to make necessary investments in their infrastructure. Yet the Proposed Rule will increase the industry's cost of capital; reduce investment by depressing returns on equipment, facilities, and operations subject to forced access; and adversely affect revenues across the industry.

It will be difficult or impossible to identify who bears the true costs of forced switching if the Proposed Rule is adopted—in some combination, it will be railroads, disfavored shippers, labor, passenger rail, the public, and the Board itself. Moreover, the volume and nature of forced switching proceedings under the Proposed Rule may impose an extreme burden on the Board and other stakeholders. This is due both to the volume of traffic potentially affected and the fact that the Proposed Rule could result in a substantial number of new cases—cases that are likely to be extremely complicated in practice, because there are multiple different potential points of dispute between the affected parties, each of which individually could end up before the Board for resolution.

C. More fundamentally, the Proposed Rule threatens to restructure the entire rail industry through regulation. That directly conflicts with Congress's clear preference for market-based solutions, which, in line with sound economic principles, requires minimizing the Board's regulatory intervention. The Proposed Rule is pervasively regulatory because it treats forced switching as a government-granted right for shippers, as opposed to a remedy that may be available to counteract an identified market failure. In other words, the Proposed Rule would

offer forced switching without a showing of *necessity*, transforming forced switching from a *remedy* for railroad abuses of market power into a *right* enjoyed by shippers in general. This transformation is particularly pernicious because it allows shippers to demand forced switching only where a shipper wants it. That has parallels in the failed regulatory experiments with forced sharing in the telecommunications industry, which overwhelmed regulators with complex proceedings, created market imbalance and inefficiency, and allowed cherry-picking of high-return opportunities.

D. Even if the Proposed Rule were sound in concept, its current formulation continues to have additional flaws that also make it unlawful and unworkable. First, the Proposed Rule is legally unsound because it extends reciprocal switching beyond a terminal area, exacerbating the proposal's overreach. Section 11102(c) has always been understood to refer to switching of traffic originating or terminating *within* a terminal area. It would be unlawful for the Board to interpret the Proposed Rule's "reasonable distance" requirement in a manner that allows switching outside the terminal area. Second, lack of an access pricing rule remains an untenable gap in the Proposed Rule. A pricing rule is a legally indispensable element of any forced sharing regime. But the Board's proposal to date has been so open-ended that it amounts to little more than a statement that the Board would adopt some pricing rule. The APA's requirements for notice-and-comment rulemaking demand something more specific.

III. THE PROPOSED RULE FAILS TO IDENTIFY AND RESPOND TO A PRESENT PROBLEM FOR WHICH ENTITLING SHIPPERS TO FORCED SWITCHING IS A LAWFUL OR WISE POLICY SOLUTION

The existing rule is more capable than its detractors admit. Not only does it address classical categories of anticompetitive conduct, but it also can remedy inadequate service and substantially inefficient routing if those reflect an abuse of market power. The Proposed Rule

regulates far beyond what is needed to address those abuses, and yet does so without identifying what documented market failure justifies such a sweeping change.

A. Principles of Administrative Law and Sound Policymaking Demand that the Board Identify the Problem It Proposes to Solve Before Changing Longstanding Rules

1. The APA requires an agency to provide a reasoned explanation for a change in longstanding policy. "[A]n 'unexplained inconsistency' in agency policy is 'a reason for holding an interpretation to be an arbitrary and capricious change from agency practice.'" *Encino Motor Cars, LLC v. Navarro*, 579 U.S. 211, 221–22 (2016) (quoting *Nat'l Cable & Telecomm. Ass'n v. Brand X Internet Servs.*, 545 U.S. 967, 981–82 (2005)) (alteration omitted). Where the agency's "prior policy has engendered serious reliance interests," it is particularly important that the agency provide "a reasoned explanation … for disregarding facts and circumstances that underlay or were engendered by the prior policy." *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515–16 (2009).

Railroads and shippers alike have relied—to an extraordinary degree—on the existing principles governing forced switching. From 1980 to 2020 (roughly the period since the current rules were adopted), freight railroads have invested nearly $740 billion in their networks. Shapiro & Stuttgen V.S. at 3. That massive deployment of private capital was made on an understanding of the projected returns that could be made on those investments, under the current stable and predictable regulatory framework. Just as the Proposed Rule jeopardizes railroads' future investment (*see infra*, Part IV.B.3), it also departs from the principles that have guided railroads' past investment.

Shippers, too, have reliance interests. Not all shippers support the Proposed Rule, and those that have concerns recognize that it would disrupt the rail service they have come to rely on. *See, e.g.*, Comments of United Parcel Service (filed Oct. 26, 2016); Comments of Intermodal

Association of North America (filed Feb. 10, 2022).[1] Forced switching will have a range of operational spillover effects. *See infra*, Parts IV.B.1, IV.B.2. Those effects may or may not be felt by the shippers who may benefit from switching—but they will certainly be felt by other shippers that rely on the network—and by passenger rail users as well. *See, e.g.*, Comments of National Railroad Passenger Corp. (filed Dec. 2, 2016) ("Amtrak is concerned that the new reciprocal switching policy may adversely impact the performance of our national network trains, particularly in congested terminal areas such as Chicago."); Comments of California's Intercity Rail Corridors Linking Everyone (filed Feb. 9, 2022) ("[Adoption of the Proposed Rule] would not only harm freight rail; increased network congestion and complexity would have impacts on intercity passenger operators and overseeing state agencies, who rely on freight railroad tracks to operate."); Comments of Metra (filed Feb. 11, 2022) ("Metra asks that the board carefully consider the potential impacts—both immediate and over the long term—that their ruling may have on passenger rail operations in the Chicago area.").

Even shippers that might generally favor the Proposed Rule have relied on the existing rule. As a new analysis of the Board's confidential Carload Waybill Sample (CWS) shows, *hundreds* of new stations served by a single Class I carrier have come online while the existing rules have been in place. Baranowski & Zebrowski V.S. at 16. Nobody forced shippers to choose those new locations. They did so knowing that there may be certain disadvantages to single service, but the marketplace presumably provided greater offsetting benefits—whether lower land prices, taxes, or local wage scales, efficient integration with existing operations, or other advantages. Some even did so in close collaboration with the railroads that they would

[1] Except where otherwise noted, references to comments and ex parte meeting summaries are to filings in Ex Parte No. 711 (Sub No. 1).

now attack with the Proposed Rule. Adopting the Proposed Rule would be a windfall to those shippers, and a direct affront to the shippers that made a different choice to locate where multiple Class I carriers are available. The Board lacks the compelling justification needed to sweep all those reliance interests away and pick new winners and losers. As the Board itself has recognized, a rule that "would lead to problems regarding fairness among different categories of shippers" is intolerable. NPRM at 13, 15.

2. Even if the APA did not exist, sound policymaking would still counsel the Board to begin by clearly articulating the problem it seeks to solve. Without that fixed starting point, nobody can claim to know that a change in policy is necessary or sufficiently justified, and nobody will know if a changed policy has succeeded. Fagan V.S. at 2–3. Moreover, defining the problem to be solved allows the Board first to evaluate whether regulatory structures already exist that can address the problem with minimal disruption to parties' expectations. *Id.*

Those principles of sound regulatory policymaking are longstanding and uncontroversial. For example, President Clinton's Executive Order 12866 directed that "[e]ach agency shall identify the problem that it intends to address (including, where applicable, the failures of private markets or public institutions that warrant new agency action) as well as assess the significance of that problem"; and "shall examine whether existing regulations (or other law) have created, or contributed to, the problem that a new regulation is intended to correct and whether those regulations (or other law) should be modified to achieve the intended goal of regulation more effectively." Exec. Order No. 12866 § 1(b)(1)–(2), 58 Fed. Reg. 51,735 (Sept. 30, 1993). The Board should follow those principles here.

B. Current Conditions, Updated Analysis, and New Studies Confirm that the Proposed Rule Is Not a Legitimate Response to Any Present Problem

During this proceeding and in ex parte meetings, the Board, individual Members, and interested parties have offered a raft of potential rationales for the Proposed Rule—rationales that have shifted over time. Those rationales have been unsound from the time they were offered, but in some instances, additional information since the prior round of comments underscores just how weak they are. We focus below on new information and newly offered theories, while putting those new developments in context by summarizing prior relevant comments explaining why the proffered justifications for the Proposed Rule are unsound.

1. A Bare Desire to Explicitly Delineate Two Pathways to Forced Switching Does Not Justify the Proposed Rule's Substantive Changes

The Board has suggested that a new rule is necessary because the ICC "essentially consolidated" the two statutory prongs of Section 11102(c) into a single standard, and that approach "is overly restrictive in today's environment." NPRM at 15–16. In recent conversations, some shipper groups likewise have suggested Congress intended reciprocal switching to remedy different circumstances. *See, e.g.*, Summary of Ex Parte Meeting held by video conference August 10, 2021 between Shipper Associations and Surface Transportation Board Member Michelle Schultz, at 8 (filed Aug. 13, 2021).

Those criticisms of the existing rule are unfounded because the existing rule (and the ICC's and Board's decisions under it) already recognize two concepts. As the D.C. Circuit noted in *Midtec*, the ICC's decision there had recognized that reciprocal switching could remedy situations where "the railroad has used its market power to extract unreasonable terms on through movements; or … shown a disregard for the shipper's needs by rendering inadequate service." 857 F.2d at 1503 (quoting *Midtec Paper Corp. v. Chicago & N.W. Transp. Co.*, 3 I.C.C.2d 171, 181 (1986)). It also recognized there are the "classical categories of competitive

abuse: foreclosure; refusal to deal; price squeeze; or any other recognizable forms of monopolization or predation." *Id*.

Those concepts are naturally understood as corresponding to the statutory references to Board-ordered remedial "agreements … in the public interest" and "agreements … necessary to provide competitive rail service," 49 U.S.C. § 11102(c)(1). Where a railroad with market power abuses that power to insist on "unreasonable terms," or to provide "inadequate service," then the "public interest" may be served by an order directing terminal switching traffic, provided there is "actual necessity" for that relief. *See Jamestown, N.Y., Chamber of Commerce v. Jamestown, Westfield & N.W. R.R. Co.*, 195 I.C.C. 289, 292 (1933). But absent such a failing resulting from an abusive flexing of market power, no regulatory intervention is warranted.

As for the "classical categories of competitive abuse," *Midtec*, 857 F.2d at 1503, those are the ways in which a dominant actor can frustrate the competitive process, thereby depriving customers of the benefits of "competitive rail service," 49 U.S.C. § 11102(c)(1). Whatever the outer limits of the "classical categories of competitive abuse," they cannot include an ordinary refusal to share facilities. "As a general rule, businesses are free to choose the parties with whom they will deal, as well as the prices, terms, and conditions of that dealing." *Pac. Bell Tel. Co. v. linkLine Commc'ns, Inc.*, 555 U.S. 438, 448 (2009). Thus, for example, a grocery chain store—even the only one in town—does not behave anticompetitively in refusing to share its space with a competing chain, even if doing so might benefit the competitor and lower prices to customers. Where the law requires otherwise, it says so expressly (*e.g.*, 49 U.S.C. § 10742), not through oblique references to "competitive rail service."

Within that framework, it is particularly clear that Section 11102(c)'s reference to "the public interest" is not an open invitation to restructure control over the industry's existing assets;

rather, it is a tool for responding to the abuse of market power. And it is similarly clear that "necessary to provide competitive service" does not mean "necessary to provide rail service by more than one competitor." Courts and the ICC have said as much, for as long as the current regulations have existed: "As the [D.C. Circuit] noted in *Baltimore Gas & Electric*, the Commission properly rejected the notion that the Staggers Act is a mandate for it to compel restructuring of the rail industry to create more rail-to-rail competition." *Intramodal Rail Competition—Proportional Rates*, Ex Parte No. 445, 1990 WL 287993, at *2 (ICC Apr. 17, 1990) (citing *Baltimore Gas & Elec. Co. v. United States*, 817 F.2d 108, 115 (D.C. Cir. 1987). Moreover, as the ICC also recognized, and the D.C. Circuit affirmed in *Baltimore Gas & Electric*, a central purpose of the Staggers Act was to *end* the system of open routing that led to railroads inefficiently maintaining multiple service options for a given origin-destination pair. *See Western Railroads—Agreement*, 364 I.C.C. 635, 649 (1981) ("To the extent that our [decision] will result in the loss of some routes and a consequent reduction in the number of routing options available to shippers, that effect is outweighed by the desirability of more efficient routing."). Nothing Congress has done in the years since has changed that paradigm. Rather than regressing to a pre-Staggers regime, the Board can reaffirm the existing principles under which forced switching can be ordered.

2. A Dearth of Cases Brought Under an Existing Rule Does Not Justify a Change to the Rule.

a. The Board found it appropriate to revisit its regulations because the current switching remedy has "become dormant." NPRM at 9. Chairman Oberman also has raised this point in ex parte meetings. Summary of Ex Parte Meeting between Norfolk Southern Railway Company and Surface Transportation Board Chairman Martin Oberman November 30, 2021, at 2 (filed Dec. 10, 2021) ("Chairman Oberman responded that no new cases have been brought

since *Mid-Tec* and the shipper's bar has expressed the belief that reciprocal switching cases are not winnable under the *Mid-Tec* standard. The meeting participants discussed whether the lack of cases brought under the *Mid-Tec* standard signals a problem with the standard and is sufficient justification for changing the rule.").

Even if a "dearth of cases" (NPRM at 9) brought under the existing framework was a reason to study the existing approach, the record reflects that the absence of disputes is a mark of success, not failure. Disputed cases should be infrequent if market participants are not engaged in competitive abuse. Such stable conditions fulfill Congress's desire, expressed in the RTP, "to allow, to the maximum extent possible, competition and the demand for services to establish reasonable rates for transportation by rail" and "to minimize the need for Federal regulatory control over the rail transportation system." 49 U.S.C. § 10101(1), (2). As AAR's prior comments describe, the railroad industry is a mature industry in which stakeholders have had decades to establish working commercial arrangements, including voluntary reciprocal switching arrangements and other modes of multi-carrier access where such mechanisms are economically and operationally rational. *See* Comments of AAR, at 20–24 (filed Oct. 26, 2016) ("AAR Opening Comments"). Indeed, if a "dearth of cases" were a justification for regulation, then regulations would ratchet upward forever, in a repeated cycle of new regulations, followed by industry changes to conform to the new regulations, followed by a dearth of active cases. A lack of cases rings especially hollow as a justification for change here, because at least some Members have expressed hope that a *new* rule also would not increase the number of switching cases. *See* NPRM at 33 (Vice Chairman Miller, commenting) ("[I]t is my hope that the Board will rarely be called upon to impose the reciprocal switching remedy"). Shippers who view the

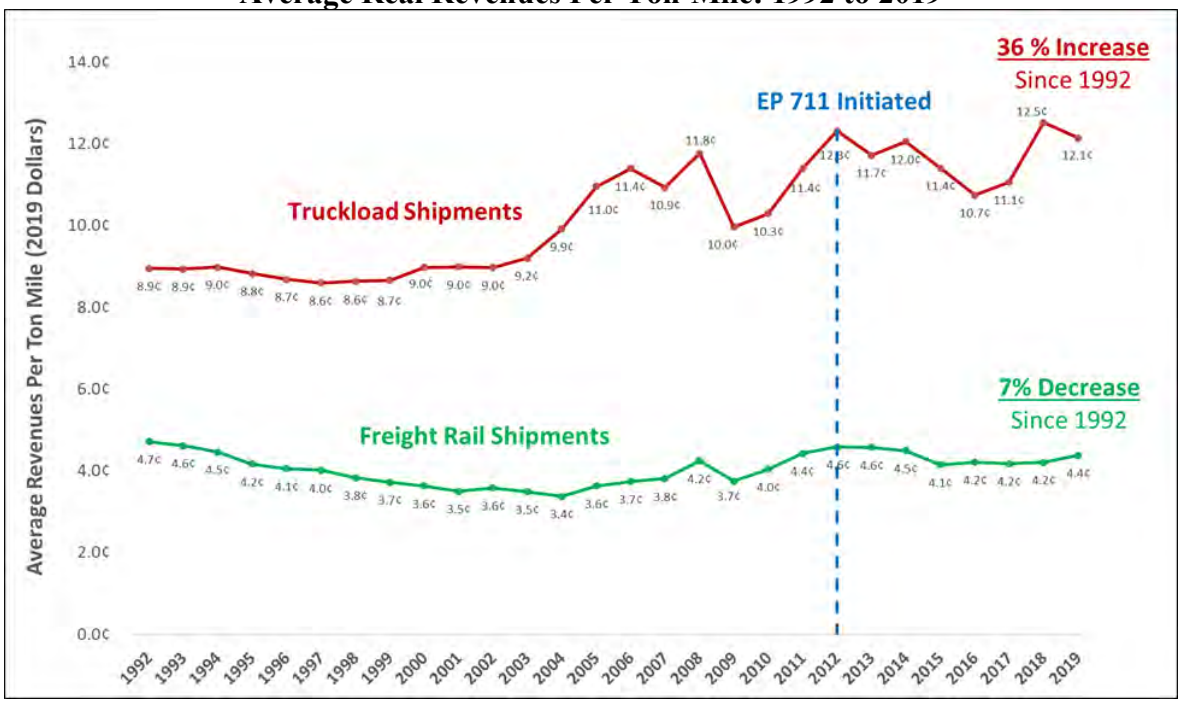
Proposed Rule not as an operational remedy but a negotiating cudgel likewise do not intend for the number of switching cases to increase.

b. The data continue to show that existing regulations are doing their job. The baseline, of course, is the Board-commissioned Christensen Study. That independent study concluded (as the Department of Transportation explained) "that railroad deregulation has been a success, that the industry must be able to engage in differential pricing to remain viable, and that overall there is no probative evidence of market power abuse—rate increases in recent years notwithstanding." Comments of U.S. Department of Transportation, at 1, *Study of Competition in the Freight Railroad Industry*, STB Ex Parte No. 680 (filed Dec. 19, 2008); *see* AAR Opening Comments at 23–24. The lack of disputes confirms that the existing rule is an effective complement to a well-functioning market.

No convincing showing exists that those conclusions are wrong today. To the contrary, updated analysis confirms the Christensen Study's results in two respects. First, there has not been a meaningful increase in real rail rates over time—not since the "pre-merger" period reflected in the CWS (1992 to 1996), nor since Ex Parte No. 711 was initiated. For example, although there have been some fluctuations over time, the Board's recent annual rate study shows that the rate index of real revenue per ton-mile in 2019 (73.4) is essentially unchanged from what it was in 1992 (72.1) and slightly down from what it was when this proceeding began in 2012 (78.2). STB, *Annual Rail Rate Index Study: 1985-2019*, at 1 (Dec. 2, 2021), https://www.stb.gov/wp-content/uploads/Annual_Rail_Rate_Index_Study_2019.pdf. Indeed, the annual rail rate index study shows an overall flat trend in real revenue per ton-mile from 2008 to 2019. Thus, the Board's own analysis does not suggest that some industry-wide pricing problem emerged in the 1990s (or any time since).

Second, rail rates continue to compare favorably to rail's main competitor—trucking. For example, using the real revenue per ton-mile data underlying the Board's rate study (without the Tornqvist indices, so as to meaningfully compare rail and truck rates), average real freight rail revenue per ton-mile has *decreased* by 7% from 1992 to 2019 and remained largely constant in the last decade, while average real revenue per loaded net ton-mile for major long-distance trucking companies has *increased* 36% from 1992 to 2019. Baranowski & Zebrowski V.S. at 18–19.

Comparison of Freight Rail and Long-Distance Truckload
Average Real Revenues Per Ton-Mile: 1992 to 2019



Id. at 19 (Chart 3). In other words, not only have real rail rates declined or stayed constant over time since the early 1990s, but rail's competitive position relative to trucking has improved over time.

3. Rail Carrier Consolidation in the 1990s Does Not Justify a Change to the Rule

The Board has asserted that rail carrier consolidation since the Staggers Act "likely reduces the chance of naturally occurring reciprocal switching." NPRM at 9. The topic of consolidation among rail carriers also has arisen in recent ex parte meetings with individual Members. *E.g.*, Summary of Ex Parte Meeting held on April 4, 2019, between the American Chemistry Council and National Industrial Transportation League and Chairman Begeman, at 2 (filed Apr. 11, 2019); Summary of Ex Parte Meeting held by video conference August 4, 2021 between Shipper Associations and Surface Transportation Board Chairman Martin Oberman (filed Aug. 12, 2021); Summary of Ex Parte Meeting held by video conference August 4, 2021 between Shipper Associations and Surface Transportation Board Vice Chairman Robert Primus (filed Aug. 12, 2021).

We are not aware of evidence to support the Board's speculation about "naturally occurring reciprocal switching." But even accepting the premise that "naturally occurring" switching has declined, that decline would not be evidence of a problem that must be solved. Through railroad consolidation, shippers have gained substantially from single-line service that involves less switching, which the ICC and the Board have long recognized *enhances* efficiency and *benefits* the network. AAR Opening Comments at 25–27; *see especially id.* at 26 n.44. Indeed, the consolidation at issue occurred many years before the Christensen Study, which found that consolidation to be beneficial, not harmful. The Proposed Rule reflects an unexplained shift from a longstanding policy favoring efficient service that broadly benefits the public, to a new policy that would degrade efficiency to benefit a limited group of shippers.

a. Forced switching is not an end in itself. Rather, even the strongest proponents of the Proposed Rule view switching as a means to an end: Shippers seek the availability of

multiple rail service options, rather than a single rail service option, at a given station, with the expectation of lower rates to follow. Accordingly, the proper inquiry is whether consolidation has reduced the availability of multiple service. We are not aware of a location-by-location study of that issue (which would inevitably pose complicated questions about the reasons why particular stations transitioned from single service to multiple service, or vice versa). But the theory that mergers produced a systemic increase in single service is utterly refuted by analysis of data of actual shipments reflected in the CWS data going back to 1992. Single service at stations has always been a dominant feature of the rail industry, as the ICC explicitly acknowledged in *Midtec*.[2] In the "pre-merger" period reflected in the CWS data (1992 to 1996), the great majority of shipments originated or terminated at stations served by a single Class I rail carrier. This ranged from 55.6% of all carload traffic during this period to 70.1% of all non-exempt carload traffic with a revenue-to-variable cost (R/VC) ratio greater than 180%. Baranowski & Zebrowski V.S. at 15 (Table 8). These figures are entirely unsurprising in light of the high capital costs and other operational resources needed to support multiple service at a given station—single service is often the most economically rational. Orszag & Eilat V.S. ¶¶ 25–28.

Significantly, however, shipments to and from stations with single service have become less prevalent (and shipments to and from stations with multiple service have become more prevalent) over time. This is exactly the opposite of the trend that would be observed if consolidation had forced shippers into using stations with only single service. In particular, CWS

[2] *See, e.g.*, Joint Brief for Respondents Interstate Commerce Commission and United States of America, *Midtec Paper Corp. v. ICC*, No. 87-1032, at 17 n.11 (D.C. Cir.) (filed Mar. 14, 1998) ("ICC *Midtec* Brief") ("The repercussions of an open-ended use of forced switching, as Midtec and intervenors advocate here, should not be underestimated. The majority of the shippers in this country that receive rail service are served directly by a single rail carrier.").

data show that the proportion of carload traffic originating or terminating at stations served by a single Class I railroad has declined when comparing the "pre-merger" period (1992 to 1996) to the most recent "post-merger" period (2015 to 2019). Baranowski & Zebrowski V.S. at 15 (Table 8). In fact, non-exempt carload traffic with an R/VC ratio greater than 180% (the traffic most directly addressed in the Proposed Rule) saw the most significant such decline—dropping from 70.1% to 61.4%. *Id.* That drop directly refutes any suggestion that consolidation in the industry has given Class I railroads broader power to use single-served stations to differentially price at R/VC ratios above 180%.

Percent of Traffic Originations and Terminations at Stations Served by Single Class I Carrier

Traffic	1992-1996 period	2015-2019 period	Difference
All Carload Traffic	55.6%	52.2%	-3.4%
Non-Exempt Carload Traffic	59.4%	53.7%	-5.8%
Non-Exempt Carload Traffic Above R/VC 180%	70.1%	61.4%	-8.7%

Id.

The CWS data further show that the vast majority of carloads potentially affected by the competitive access pathway—ranging from 92.7% to 94.5%, depending on certain assumptions—originates or terminates at a station that has not historically had service options from multiple Class I rail carriers. Baranowski & Zebrowski V.S. at 17 (Table 9). "[O]nly a small minority of traffic that would be potentially eligible for forced switching under the competitive access pathway of the Proposed Rule originates or terminates at a station that has in recent decades offered service options involving multiple Class I carriers. And of that already small minority, the shifts from multiple Class I carriers to a single Class I carrier do not generally appear merger-related." *Id.* at 17. This is consistent with the view that historical merger conditions have been appropriately targeted to allow stations to remain open to multiple Class I railroads. *See id.* at 17 & n.14. Giving

multiple carriers access to such stations would not restore something lost in a merger—it would impose something that never existed before and would not arise in a free market.

Moreover, a share of that single-served traffic today involves *new* stations that were established in the time since the "pre-merger" (1992 to 1996) period. More than 81% of those new stations (438 out of 542) are served by a single Class I railroad, Baranowski & Zebrowski V.S. at 16—and because those hundreds of stations with single service are *new* stations, they presumably reflect shippers' own choices to establish their operations or tender their shipments at stations where single service is offered. Those widespread decisions to locate at single-served stations presumably reflect shippers' strategic choices about tradeoffs between the advantages of multiple rail service, on the one hand, and other industrial development and operating costs or benefits, on the other. That is, the many new single-served stations must be understood as shippers making competitive choices—not railroads abusing their competitive position.

b. These data-driven conclusions reflect the success of the efforts of the Board and the ICC to establish merger conditions as required to prevent an unwarranted reduction in competition that a large consolidation might otherwise cause on particular routes. *See* AAR Opening Comments at 25 n.43 (citing merger cases demonstrating the Board's longstanding policy to preserve competition in such decisions). Indeed, years after consolidations in the 1990s, the Board itself correctly explained to the Antitrust Modernization Commission that, in evaluating merger transactions, "the Board uses its broad conditioning powers to fashion other appropriate means of preserving and enhancing competition (such as requiring that the merged carrier afford trackage rights to other carriers to serve traffic that would otherwise be adversely affected)." Off. of Gen. Counsel, STB, *Written Statement of the Surface Transportation Board Before the Antitrust Modernization Commission* 7 (Dec. 1, 2005), *available at*

https://govinfo.library.unt.edu/amc/commission_hearings/pdf/Atkins_Statement.pdf. It is clear that those conditions have achieved their goals.

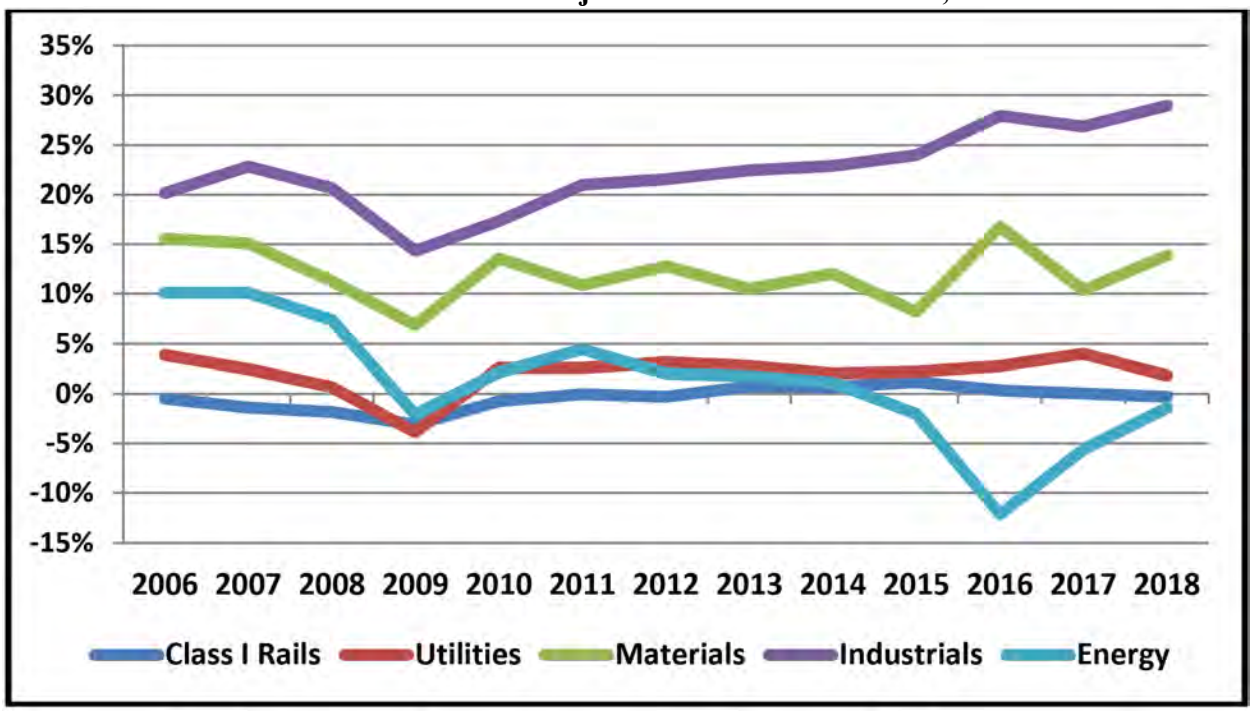
4. The State of Rail Carriers' Financial Condition Does Not Justify a Change to the Rule

The Board has suggested that the railroad industry's improved financial health may justify a reversal in policy. Some shipper groups have raised this same topic in ex parte meetings. *See, e.g.*, Summary of Ex Parte Meeting held Aug. 10, 2021 between Shipper Associations and STB Member Michelle Schultz, at 2 (filed Aug. 13, 2021) ("Given the greatly improved financial health of the railroads, the original ICC concerns about the impact of reciprocal switching no longer exist.").

Penalizing success with new regulations is bad policy. "The successful competitor, having been urged to compete, must not be turned upon when he wins." *United States v. Aluminum Co. of Am.*, 148 F.2d 416, 430 (2d Cir. 1945) (Hand, J.). Adopting regulations because the industry is healthy is directly contrary to the statute. The RTP requires the Board to *support* carriers' ability to earn adequate revenues (49 U.S.C. § 10101(3)), while minimizing regulatory interference with the market (*id*. § 10101(2)). Modest progress toward revenue adequacy is no ground for abandoning the regulatory minimalism demanded by Congress. Moreover, Congress has further explained that carrier revenues should be adequate "for the infrastructure and investment needed to meet the present and future demand for rail services." *Id.* § 10704(a)(2). In that regard, the Proposed Rule is especially counterproductive because it will increase the costs and risks associated with private investment and innovation. *See* AAR Opening Comments at 27–29; *infra*, Part IV.B.3 (addressing how the Proposed Rule would discourage infrastructure investment).

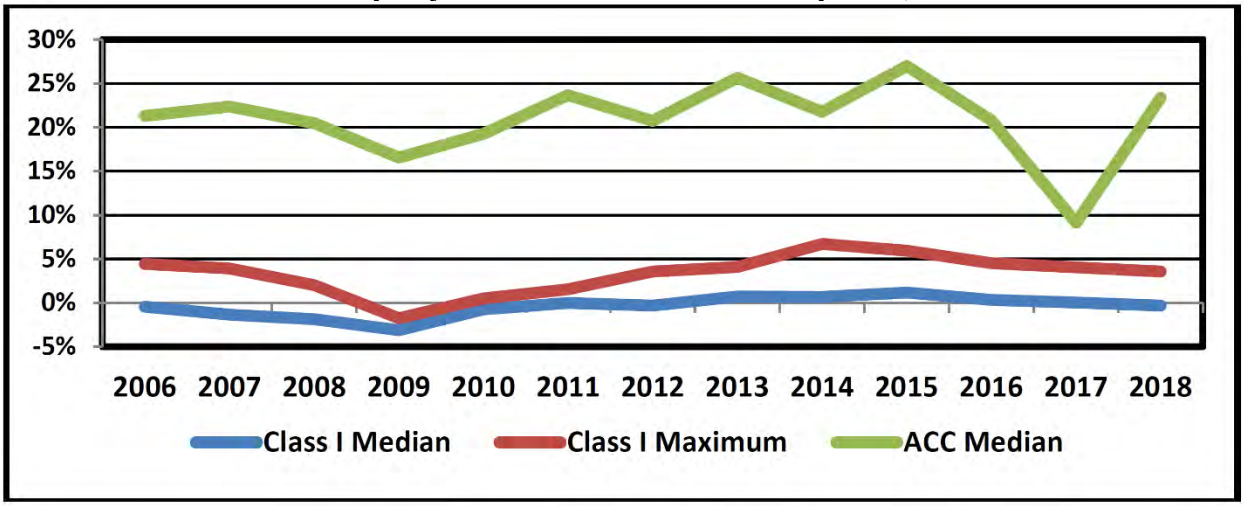
In any event, realistic analysis of the financial position of Class I railroads shows that the earning potential of railroads is not a reason to adopt the Proposed Rule. *Cf.* NPRM at 33 (Vice Chairman Miller, commenting) ("[T]here is no doubt that the railroads today find themselves in a difficult environment" and "additional regulation could impact their ability to weather this storm"). Looking at railroads' median returns on invested capital minus the average cost of capital, Class I railroads have only recently had years in which some were revenue adequate under the Board's standards. Shapiro & Stuttgen V.S. at 7. And comparing the median return on investment to cost of capital for major sectors of the S&P 500 shows the rail industry lagging behind:

Median ROI–COC for Five Major Sectors of the S&P 500, 2006–2018



Id. (Figure 2). Key shipper industries are in far better standing: For example, the *median* revenue adequacy figure of ACC members exceeded the *maximum* revenue adequacy figure for any Class I railroad by 15 to 20 percentage points every year between 2006 and 2018, with only one exception:

Revenue Adequacy of Railroads vs. ACC Companies, 2006–2018



Id. at 8–9 (Figure 3). Using snapshots of the financial position of railroads to justify permanent regulation will hamstring the industry and compromise its ability to compete fairly and equally for capital investment. *See* Supplemental Comments of AAR, *Hearing on Revenue Adequacy*, STB Ex Parte No. 761, *Railroad Revenue Adequacy*, STB Ex Parte No. 722, at 14 (filed Feb. 13, 2020) ("AAR Supplemental Revenue Adequacy Comments").

As the record in connection with the Board's *Hearing on Revenue Adequacy* shows, any earnings-based regulatory approach that would prevent railroads from earning a return above their cost of capital is whole inappropriate. Better years balance out lean years, so a railroad's return on investment must be allowed to fluctuate above the cost of capital to ensure that the return on investment can justify the cost of capital over the longer term. Shapiro & Stuttgen V.S. at 6, 12. If the Board rejects that basic arithmetic, then investors will expect that the Board will counteract opportunities for compensatory returns, and they will look to deploy their capital elsewhere. The regulatory uncertainty that the Board generates here could reverberate far beyond the actual orders for forced switching, and it could be very difficult for future Boards to reverse those damaging expectations. The Board should not jeopardize carriers' ability to raise the capital that is needed to invest in improving service offerings and quality.

5. The Existing Rule Is Capable of Addressing Service Concerns Arising from Abuse of Market Power, and There Is No Record of Any Service Concerns that Additional Switching Would Solve

a. The Board cites "continued shipper concerns about competitive options and quality of service" as a basis for a change to the existing rules. NPRM at 9. Service concerns have come up frequently in ex parte meetings with Board members. *See, e.g.*, Summary of Ex Parte Meeting held Aug. 10, 2021 between Shipper Associations and STB Member Michelle Schultz, at 1–2 (filed Aug. 13, 2021); Summary of Ex Parte Meeting held by video conference August 4, 2021 between Shipper Associations and Surface Transportation Board Chairman Martin Oberman, at 1–2 (filed Aug. 12, 2021). But the asserted "concerns" are so vague and general that they do not provide a reasoned basis for the Proposed Rule. AAR Opening Comments at 22–23 & n.38.

Although the existing rule recognizes that forced terminal switching can in theory address some kinds of service issues, it certainly cannot and should not address all service problems—and if deployed in the wrong place will *create* service issues. As the Board is aware, service issues come in many different kinds, with many different causes. In a complex supply chain and large transportation network, the causes of degraded service are often overlapping and can be largely or entirely beyond the control of any one railroad, or indeed the entire industry, as recent global shipping disruptions and COVID-19-related issues have vividly illustrated. Fagan V.S. at 5–11. Many service issues are relatively transient, though some may be more persistent. Because the nature of service issues varies, the solutions to those issues vary. Equally importantly, nothing in the record suggests that abuse of market power is a cause of inadequate service. The Proposed Rule cannot plausibly be justified as a response to service issues when it gives shippers a broad-based entitlement to forced switching without particular regard to whether service issues exist, what the precise nature of those issues is, or what causes those issues.

Moreover, the Board has other tools for responding to widespread service problems. For example, when a serving carrier's line is embargoed, the Board may rectify the temporary service failing and ensure continued service to the carrier's customers by ordering the switching of traffic to another carrier capable of reaching the destination for the duration of the embargo. *Cf. Joint Petition for Serv. Ord. (Rail Service in the Western United States)*, 2 S.T.B. 725 (1997) (detailing emergency service orders to address the "transportation emergency in the West … specifically with respect to the Houston area," requiring, *inter alia*, switching operations to allow shippers to designate traffic to the Texas Mexican Railway). The Board's response to the transportation emergency in the Houston region further illustrates that a variety of measures other than terminal switching may be better adapted to a particular problem. And as the Board recognized in recently streamlining the process for allowing emergency temporary trackage rights to take effect, the industry's experience has been that service disruptions due to external factors, such as extreme weather events, can be addressed by voluntary cooperation, with relatively light Board involvement. *Petition for Rulemaking—Railroad Consolidation Procedures—Exemption for Emergency Temporary Trackage Rights*, 86 Fed. Reg. 68,926 (Dec. 6, 2021) (adding 49 C.F.R. § 1180.2(d)(9)).

Forced switching is also unlikely to be a helpful response to concerns about first-mile / last-mile service. By definition, in the location where reciprocal switching occurs, it does not change the serving carrier's first-mile (or last-mile) operations to or from the customer—the serving carrier still serves the customer—so a switching order cannot solve problems with that leg of the journey. Rather, it can only make things *worse*: A forced switching order imposes additional points of delay and potential failure by layering another short-distance move—a switch from the serving carrier to the alternative long-haul carrier—on top of the existing

operation. AAR Opening Comments, Verified Statement of William J. Rennicke (filed Oct. 26, 2016) ("Rennicke 711.1 Op. V.S.") at 2–4. Conceivably, a situation could exist where a terminal switch in one location could address a first-mile / last-mile service issue at another location by facilitating a completely different service design—but that requires a very specific combination of factors, and no record exists of widespread problems of that nature, let alone a record that such problems reflect an abuse of market power.

b. The proper question before the Board is whether there are persistent service issues that (a) trace to an abuse of market power and (b) could be solved by expanded forced terminal switching. No record exists of such service issues. If those issues arose, the existing standard already authorizes forced switching as a potential remedy—and the Proposed Rule does nothing to improve upon that standard. As the D.C. Circuit put it in *Midtec*: "Evidence of the carrier's actual (or threatened) conduct—such as the adequacy of the service it provides to a captive shipper—is the most direct and probative evidence by which to assay whether the carrier has acted (or is likely to act) anticompetitively." 857 F.2d at 1511. Even without engaging in classically anticompetitive conduct, "a monopolist may extract monopoly rents either by increasing its prices *or by decreasing the quality of its product or service*." *Id.* (emphasis added). Of course, mere gestures at areas for service improvement do not suffice; a complaining shipper must show "some actual necessity or compelling reason" for relief. *Id.* at 1502. The Proposed Rule does not improve upon that approach.

6. No Record Exists of Concerns About Inefficient Routing Arising from Abuse of Market Power, but Even If It Did, the Existing Rule Is Capable of Addressing Such Concerns

Some shippers have recently raised routing inefficiencies as a basis for forced switching in discussions with Board members. *See, e.g.*, Summary of Ex Parte Meeting Between CF Industries and Surface Transportation Board Member Martin J. Oberman, at 11 (filed June 18,

2019); Summary of Ex Parte Meeting Between PotashCorp, The Fertilizer Institute, and Vice Chairman Daniel Elliott, at 1–2 (filed Sept. 28, 2017). But forced terminal switching is already available—under the existing rule and Board and ICC decisions interpreting it—to remedy substantially inefficient routing in connection with an abuse of market power.

By longstanding statutory rule, an originating carrier generally has the right to provide long haul service for traffic it originates. *See* 49 U.S.C. § 10705(a)(2); *United States v. Great N. Ry. Co.*, 343 U.S. 562, 567–68 & n.4 (1952). Certainly, that principle has its limits; if a shipper could obtain a substantially more efficient routing via a short haul from its serving carrier to another carrier, then it may be appropriate for the serving carrier to interchange that traffic, rather than insist on routing via its own main line. *Cf.* 49 U.S.C. § 10705(a)(2)(B) (allowing a prescribed through route to short haul a carrier if failing to do so "would make the through route unreasonably long when compared with a practicable alternative"). But voluntary agreements are likely to resolve such circumstances, because everyone involved likely has something to gain by eliminating inefficiency: The shipper gets a better route; the serving carrier can be fairly compensated for the switch without bearing the cost of an inefficient route; and the other carrier obtains additional business. Orszag & Eilat V.S. ¶ 31.

Because the free market is generally able to address inefficient routing, it is unsurprising that inefficient routing is not offered by the Board as a reason for the Proposed Rule. Certainly, nobody contends that irrational route structures have permeated the network. And the Board already has the tools to respond to a breakdown in the market when necessary: The ICC decision reviewed in *Midtec* recognized that "the comparative efficiency of routings" could shed light on "a possible abuse of market power" that would justify an order of forced switching. *Midtec*, 857 F.2d at 1504. Likewise, the Board has considered efficiency of routing in evaluating analogous

requests. *See Entergy Arkansas, Inc. & Entergy Services, Inc. v. Union Pac. R.R. Co.*, NOR 42104, 2011 WL 888237, at *6 (STB served Mar. 15, 2011) (explaining that existing rules permit the Board to grant relief in a proper case if a party establishes that forced access would lead to "more efficient" routing); *see also Cent. Power & Light Co. v. S. Pac. Transp. Co.*, 1 S.T.B. 1059, 1063–64 (served Dec. 31, 1996) ("[T]here is nothing in our competitive access regulations to preclude a competitive access remedy" where the proposed access would "provide[] benefits, advantages, and projected efficiencies that would make the proposed service … better than that presently offered"), *aff'd sub nom. MidAmerican Energy Co. v. STB*, 169 F.3d 1099 (8th Cir. 1999).

7. Forced Switching Remains an Unlawful and Unwise Tool to Address Rate Complaints

The record in this matter is blunt and unequivocal: Supporters of the Board's rule view forced switching as a path to lower rail rates. *See* Reply Comments of AAR, at 5–7 & nn.10–16 (filed Jan. 27, 2017) ("AAR Reply Comments"); Summary of Ex Parte Meeting held Aug. 10, 2021 between Shipper Associations and STB Member Michelle Schultz, at 2 (filed Aug. 13, 2021); Summary of Ex Parte Meeting held by video conference August 4, 2021 between Shipper Associations and Surface Transportation Board Chairman Martin Oberman, at 5 (filed Aug. 12, 2021); Summary of Ex Parte Meeting Between CF Industries and STB Member Martin J. Oberman, at 1–2 (filed June 18, 2019). But that objective contravenes the statutory design, which carefully delineates the Board's authority to regulate rates and does not permit the use of Section 11102(c) to augment that power. *See* AAR Reply Comments at 5–11; AAR Opening Comments at 29–33.

a. Railroads have the discretion to establish the rates they charge in the first instance, and the statute sets out specific substantive and procedural requirements for the Board

to get involved. A complaining shipper must make a threshold showing of quantitative and qualitative market dominance, which triggers the Board's jurisdiction to *evaluate* rate reasonableness but does not *answer* whether a rate is reasonable. Rather, the shipper must also show that the level of the challenged rate exceeds a reasonable maximum. 49 U.S.C. § 10707(c), (d). The statute also contains multiple provisions addressed to the procedures to be applied by the Board in adjudicating rate reasonableness cases. *Id.* §§ 10701, 10704, 10707.

Invoking forced switching to affect rates is an open affront to those statutory requirements. The Board cannot interpret a provision such as Section 11102(c) in a manner that is "inconsisten[t] with the design and structure of the statute as a whole." *Univ. of Tex. Sw. Med. Ctr. v. Nassar*, 570 U.S. 338, 353–54 (2013). It makes no sense for Congress to tailor the limits of rate regulation if the Board and shippers can opt out of those limitations by invoking a different statute—one that says nothing at all about rates—for the express purpose of rate relief. That is why the D.C. Circuit in *Midtec* rejected the shipper's effort to use Section 11102 as "an alternative means of obtaining rate relief." 857 F.2d at 1505. And that has likewise been the Board's consistent understanding of its competitive access rules. *See Entergy Arkansas*, 2011 WL 888237, at *11 ("[T]he competitive access rules were promulgated not to provide shippers with an alternative form of rate relief, but to offer a competitive remedy where a bottleneck carrier has exploited its market power.") (citation omitted). Even Congress itself has repeatedly rejected requests to transform forced switching into an alternative pathway to lower rates. Comments of Norfolk Southern Railway Company, at 43–44 & n.34 (filed Oct. 26, 2016) (identifying 18 bills that were introduced in the House or the Senate that would have altered the *Midtec* standard).

Let there be no misunderstanding: The Proposed Rule would blast a huge hole in the existing maximum rate framework. The Board explicitly acknowledges that, under the proposed competitive access pathway, "the proposed rules would apply the Board's existing market dominance test to determine the intramodal/intermodal competition element under the competition prong." NPRM at 23. This is precisely the threshold inquiry that the Board has developed and regularly applied in the rate reasonableness context. Yet if the Board were to adopt the Proposed Rule, a significant proportion of potential rate cases would become eligible for a shortcut to rate relief—via forced switching—even without any showing of entitlement to such relief under the Board's adopted rate methodologies and the statute.

Indeed, focusing on all non-exempt traffic with an R/VC ratio greater than 180% as a proxy for potential rate cases, Baranowski and Zebrowski estimate that between one-sixth and *two-thirds* of that traffic would be potentially affected by the competitive access pathway and potentially eligible for relief under the Proposed Rule. Baranowski & Zebrowski V.S. at 6 (Table 1). In other words, a substantial fraction of potential rate cases could avoid the rate case procedures (and limitations) entirely and receive rate relief instead via switching.[3]

b. More recently, shippers that support the Proposed Rule have claimed that forced switching will have a "[d]eregulatory [i]mpact," because (they argue) on a route where the Board would otherwise consider an origin-destination rate, the Board can instead force switching to a

[3] The Board has stated that it would even entertain double-dipping: A shipper that obtained an order of forced switching could *also* pursue rate relief. NPRM at 23. In that circular circumstance, the existence of a switching order (even if based on a showing of market dominance) would simply "be treated in the same way as any other transportation alternative that would be assessed in our market dominance inquiry." *Id.* That approach piles regulation atop regulation: The Board would use the market dominance standard to justify regulatory intervention in switching cases, only to turn around and give the resulting switching order only the mildest power to counsel against *further* regulation in the original rate-case domain.

competing railroad and regulate the rate on only the captive segment. *See, e.g.*, Summary of Ex Parte Meeting held Aug. 10, 2021 between Shipper Associations and STB Member Michelle Schultz, at 6 (filed Aug. 13, 2021).

That Orwellian usage of "deregulatory" rests on numerous false premises. *See* AAR Opening Comments at 29–33. For one thing, it is not "deregulatory" for the Board to force a carrier to use its infrastructure and equipment to carry competing traffic, rather than allow the free play of market forces within the boundaries of rate regulation that Congress established. Indeed, on the routes on which shippers seek lower rates through the Proposed Rule, the Board is not presently engaged in regulation at all because the shippers have not shown that the threshold criteria for rate regulation are satisfied (let alone that the rates in question are unreasonable).

Segmenting the route by regulation—into a switch segment and a line-haul segment—and then regulating the switch rate rather than the origin-destination rate is an unsound mode of rate regulation. That approach is entirely new, not just under ICCTA and the Staggers Act, but under the pre-Staggers regime, where the ICC had authority only over origin-destination rates and the rates that individual railroads offered for service held out to the public. *See* AAR Comments, *Hearing on Revenue Adequacy*, STB Ex Parte No. 761, *Railroad Revenue Adequacy*, STB Ex Parte No. 722, at 52-56 (filed Nov. 26, 2019); *Union Pac. R. Co. v. STB*, 202 F.3d 337, 339 (D.C. Cir. 2000) ("It has been a venerable principle of railroad rate regulation that the reasonableness of a rate is to be assessed" based on "the rate of the origin-to-destination route as a whole, rather than the reasonableness of rates charged for a particular segment of the route."). That history reveals that the Proposed Rule is, in important respects, *more regulatory* than anything that has gone before, and shows how it would restructure the entire industry. The very essence of the Proposed Rule is to force the serving carrier to perform an inefficient switching

service that it has not held out to the public and the shipper does not need—all as a roundabout way to control the rate for an origin-destination route that the carrier has held out to the public and already provides the service the shipper needs. That novel approach will have a toxic ultimate effect of undermining the differential pricing that is "necessary for long-term capital investment and, ultimately, for a safe and efficient rail system." *MidAmerican Energy*, 169 F.3d at 1109.

IV. UPDATED ANALYSIS CONTINUES TO SHOW THAT THE PROPOSED RULE'S RISKS AND DOWNSIDES VASTLY EXCEED ANY POSSIBLE BENEFITS TO THE PUBLIC

"[R]easonable regulation ordinarily requires paying attention to the advantages *and* the disadvantages of agency decisions." *Michigan v. EPA*, 576 U.S. 743, 753 (2015). An agency decision that would "impose massive costs far in excess of any benefit" is unreasonable. *See id.* at 769 (Kagan, J., dissenting). Here, the Board itself has acknowledged its general responsibility to evaluate the benefits and burdens of proposed regulations. *See* AAR Opening Comments at 29–30. Indeed, the Board delayed acting on NITL's proposal here because it recognized the imperative to first "fully gauge [the proposal's] potential impact." AAR Opening Comments at 29. Certainly, the advantages and disadvantages of a contemplated regulation may sometimes be "difficult to quantify"—but even so, there should at least be "a reasoned determination that the benefits of the intended regulation justify its costs," all of which requires a fair assessment of the Proposed Rule's impact. Exec. Order No. 12866 § 1(b)(6).

Within this framework, the legitimate public benefits of the Proposed Rule remain speculative or nonexistent, while it comes with large risks and high costs. To the extent these negative effects have been previously addressed in prior comments, we repeat them here in summary form purely to provide context. The discussion below, and the accompanying verified

statements, offer more detail based on updated information and perspective on the costs of the Proposed Rule.

A. The Public Benefits of the Proposed Rule are Speculative or Nonexistent

The claimed benefit of the Proposed Rule is that it would reduce rates, which some have equated with a public benefit. That reasoning is erroneous. Although *some* rate reductions have public benefits, it does not follow that *all* rate reductions do. Indeed, some rate reductions are affirmatively harmful because they prevent market forces from identifying the best use of society's resources. Here, moreover, updated financial information—about the profitability of railroads relative to some of the shippers most keen on the Proposed Rule—shows that the Proposed Rule may well transfer wealth from railroads to shippers that are already significantly more profitable than the railroads themselves. *See, e.g.*, Shapiro & Stuttgen V.S. at 8–9.

1. No Reason Exists to Believe that Rate Reductions Caused by the Proposed Rule Would Benefit the Public

A "fundamental constraint" on agency action is that a "decision must be taken in order to further a public purpose rather than a purely private interest." *Webster v. Doe*, 486 U.S. 592, 608 (1988) (Scalia, J., dissenting). Rate reductions—on their own—simply transfer wealth between private parties. Moving money from a railroad's pocketbook to a shipper's yields no public benefits. For forced switching to create public value, it must spur sustained competition-driven efficiencies, cost reductions, service improvements, investments, or expansion of rail traffic attracted from more expensive transportation modes. Fagan V.S. at 4. Other parties have mistakenly assumed that lower prices for certain shippers would naturally lead to such outcomes. Nothing supports that assumption other than wishful—and perhaps naïve—thinking.

No Basis for Assuming Increased Efficiency. If productivity or efficiency gains were available through modified switching operations, then carriers would have the incentive to

pursue them voluntarily, without the need for regulatory intervention. Indeed, voluntary switching arrangements demonstrate that carriers will engage in switching where it makes sense to do so. Orszag & Eilat V.S. ¶ 31. Because market forces generally tend to reach an efficient allocation of resources, a regulatory intervention will increase efficiencies only if it targets an identified market failure. *Id.* ¶¶ 12–13, 29. The Proposed Rule does not do so. It seeks to increase the number of rail competitors serving a particular route. But a lack of competitive choices among railroads is not itself a market failure. When a market does not generate enough revenue to support the entrance of another competitor, it is neither socially efficient nor individually rational for a competitor to move into that market. *Id.* ¶¶ 25–26.

No Basis for Assuming Cost Reductions. It is theoretically possible that lower rates for a shipper could cause the shipper to increase its production or lower its prices to its customers. But such effects depend on factors affecting any given shipper's other costs of production and supply and demand in the shipper's market—factors that the Board is in a poor position to evaluate. Orszag & Eilat V.S. ¶¶ 67–68. Without a detailed analysis of individual manufacturers' businesses, any gains in social welfare are purely speculative. *Id.* What is not theoretical is that switching increases costs in the form of crew time, locomotive time, track time, fuel usage, planning and coordination costs, and added safety risks. *Id.* ¶ 54.

No Basis for Assuming Increased Rail Traffic. For similar reasons, there is no guarantee that lower rates for transportation would increase volume from single-served shippers. Orszag & Eilat V.S. ¶¶ 64, 68. Empirical research tends to support the contrary conclusion—that a rate reduction by virtue of forced switching does *not* translate into more traffic from a single-served shipper. Fagan V.S at 5. Under any normal circumstances, a railroad subject to forced switching under the Proposed Rule cannot gain more business: The premise for single-served

shippers' demand for switching is that they lack competitive transportation alternatives, which means the railroad *already* has won all of that shipper's business—there is nothing more to gain. In other words, when carriers can profitably increase volume through switching (*e.g.*, by winning over cargo that would otherwise be carried by trucks), they already do so voluntarily. Orszag & Eilat V.S. ¶ 31.

No Basis for Assuming Service Improvements. The inefficiencies and costs introduced by forced switching translate into a decline in service: Congestion means train delays, and more touches of railcars means a higher risk of service failure. Orszag & Eilat V.S. ¶ 61. That reflects the basic principle that every additional link in a supply chain increases the risk that the entire supply chain will fail. Fagan V.S. at 8–9. And such failures not only will affect the traffic directly at issue, but also will reverberate across the network. *Id.* at 6–11.

No Basis for Assuming Increased Investments. As explained in greater detail below, forced switching—and the assumed reduction of rates below market—will depress investment, not increase it. Shapiro V.S. at 3–5; Fagan V.S. at 10–11. In high fixed-cost industries, higher prices are often necessary to incentivize market participants to invest in ways that ultimately benefit consumers through increased service quality, operational efficiencies, and reduction in safety risks. *See* Orszag & Eilat V.S. ¶¶ 9, 19, 48–49. The Proposed Rule looks in the opposite direction.

* * *

Forced switching is intended to lead to rate reductions, but without a plausible explanation for non-speculative competition-driven public benefits, those rate reductions are nothing more than a wealth transfer from the railroads to the shippers. As AAR has previously noted, that result is consistent with the outcome of introducing open access on railroads in

Australia, a regulatory shift that was not preceded by a reasoned weighing of the expected costs and benefits: Open access primarily heralded a wealth transfer from the rail industry to shippers, and the promise of competition leading to efficiency, investment, and increased shipping volume via rail failed to materialize. Fagan V.S. at 4–5; Reply Comments of AAR, *Petition for Rulemaking to Adopt Revised Competitive Switching Rules*, STB Ex Parte No. 711, Verified Statement of Mark Fagan (filed May 30, 2013); AAR Opening Comments, Verified Statement of Mark Fagan (filed Oct. 26, 2016).

2. Updated Analysis Confirms that the Proposed Rule Is Likely to Transfer Wealth to Highly Profitable Shippers from the Relatively Less-Profitable Railroad Industry

The private wealth transfer brought on by a forced switching regime—converting railroad revenues to shipper savings—cannot be rationalized by the financial status of either the rail industry or the industries in which shippers operate. The leading proponents of the Proposed Rule are far more profitable than the rail industry, which means that forced switching perversely places railroads in the position of subsidizing the more profitable shippers that have already sought out rail transport as their most cost-effective transportation option. Shapiro & Stuttgen V.S. at 7–10; *supra*, Part III.B.4. Even if the Board had a mandate to redistribute wealth among private parties, the Proposed Rule should be rejected as a reverse-Robin Hood regulation.

B. The Proposed Rule Would Impose Serious Burdens on the Public, the Board, and Railroads

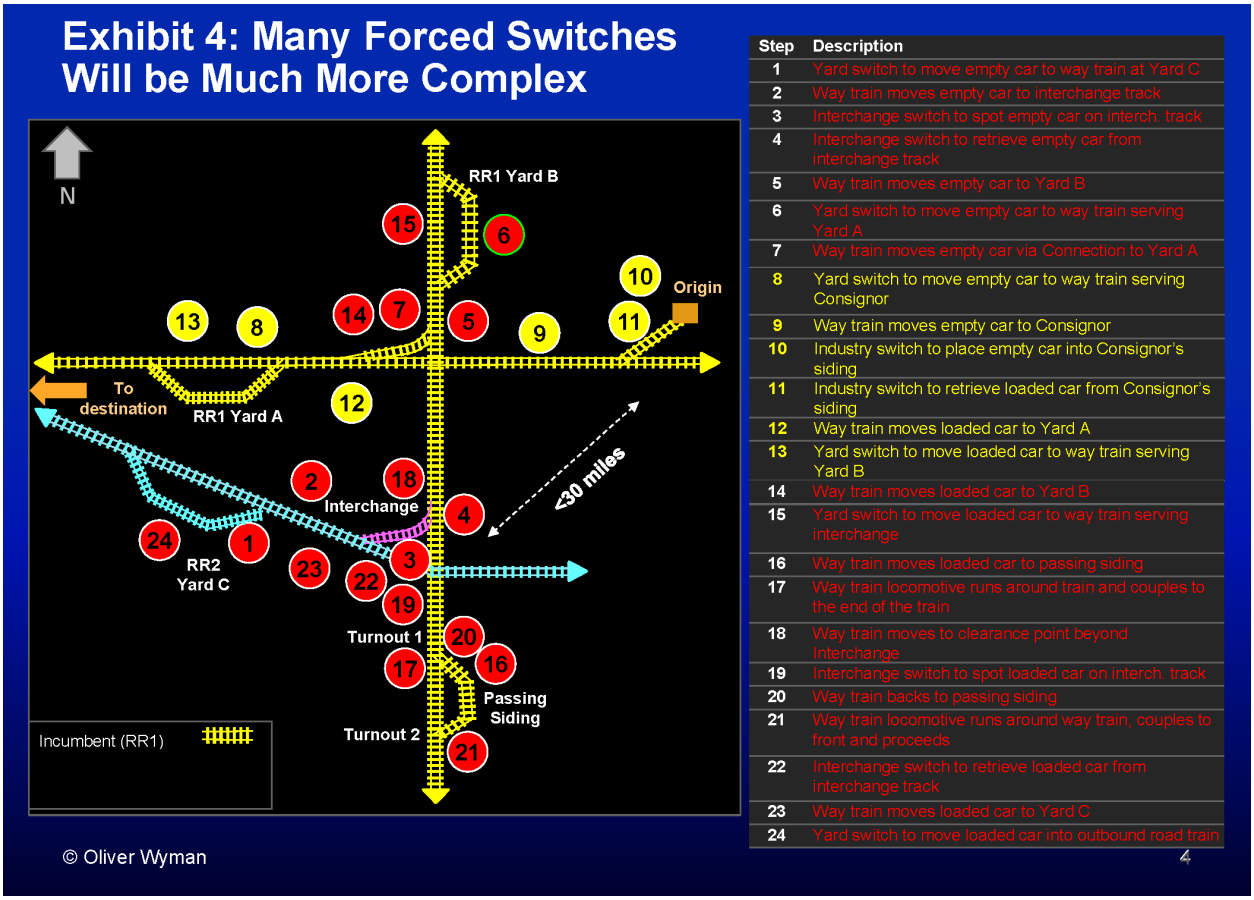
The risks and downsides of the Proposed Rule vastly outweigh the limited and speculative benefits described above.

1. The Proposed Rule Will Create Significant Operational Burdens

a. AAR has previously explained that the rail industry has made service and productivity improvements since the 1980s through rationalization of rail networks and reduction

of interchanges, switches, and car handlings. *See* Comments of AAR, *Petition for Rulemaking to Adopt Revised Competitive Switching Rules*, STB Ex Parte No. 711, Verified Statement of William J. Rennicke (filed Mar. 1, 2013) ("Rennicke 711 Op. V.S."); Rennicke 711.1 Op. V.S.; AAR Opening Comments 34–37; *see also* AAR Opening Comments at 35 (summarizing member railroad comments to the same effect).

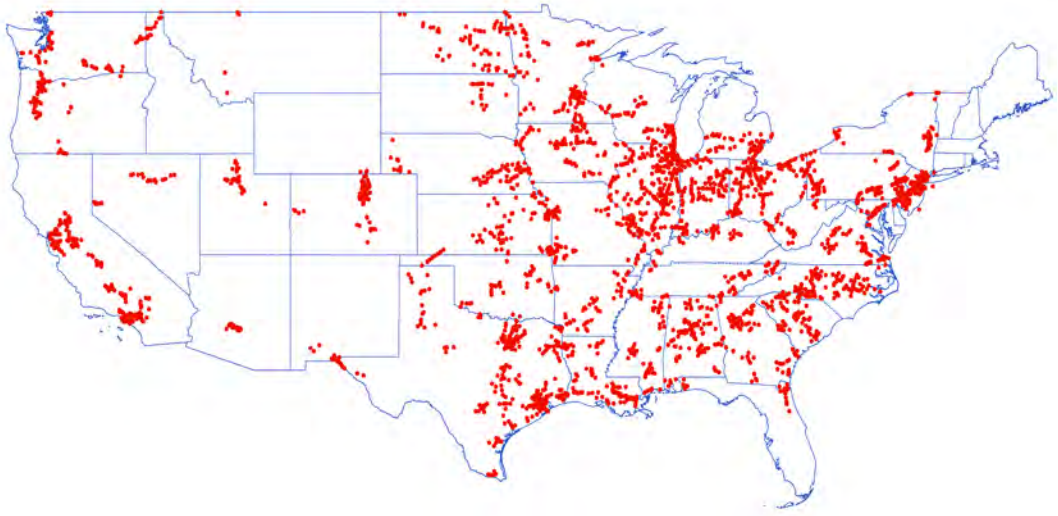
The Proposed Rule would erode those gains. In its most basic form, forced switching requires abandoning a relatively streamlined on-line switching operation, and replacing it with two, three, or even more discrete series of movements. Rennicke 711.1 Op. V.S. at 4–12. The diagram below illustrates how a forced switch can involve two dozen touchpoints.



Testimony of Phil Ireland: Exhibits, STB Ex Parte No. 711 (filed Mar. 25, 2014). An animated version of such operations is available at https://youtu.be/watch?v=pH0oafZKiDY.

Each touchpoint of a forced switch comes with operational costs and risks of a service failure. Rennicke 711.1 Op. V.S. at 4–16. And the harms are greater than they might appear at first: Although safety is every railroad's first priority, it is impossible to eliminate all risks of accidents and worker casualties; because switching operations are relatively riskier than line-haul operations, adding more switching means putting workers at greater risk. Comments of SMART-TD, at 5 (filed Oct. 26, 2016) (noting concerns of the largest railroad operating union about the Proposed Rule's "potential to [a]ffect safety, allow crews to work in unfamiliar territories, and disrupt collective bargaining agreements"); Orszag & Eilat V.S. ¶ 54. Moreover, because forced switching will compromise operational efficiency, it is almost certain to increase fuel consumption and greenhouse gas emissions. Orszag & Eilat V.S. ¶¶ 54, 64. Every one of those risks and costs would be particularly acute at locations that are not designed for switching—of which there are an enormous number:

Map of Junction Points That May Be Used
by Potentially Affected Traffic at 30-Mile Rail Distance Threshold



Baranowski & Zebrowski V.S. at 11 (Chart 2).

This is a particular concern in a network industry like the railroad industry because an individual shipper's benefits gained through forced access can generate widespread, but

dispersed, negative externalities throughout the network—burdens of increased congestion, transit time, and inefficient routing that are borne by all users of the network, including shippers and passenger rail service. Orszag & Eilat V.S. ¶¶ 52, 65; Fagan V.S. at 6–11 (discussion of supply chain dynamics and bullwhip effect of costs, inefficiencies, and failure rippling throughout entire supply chain). In practice, therefore, it is extremely difficult to evaluate how introducing inefficiency in one part of the network will affect other areas. *See* Fagan V.S. at 4-5, 8–11.

b. Some shippers have recently criticized the foregoing analysis as unnecessarily pessimistic. *E.g.*, Summary of Ex Parte Meeting held by video conference August 10, 2021 between Shipper Associations and Surface Transportation Board Member Michelle Schultz, at 3, 7–8 (filed Aug. 13, 2021). Their objections fall into two categories. First, they contend that operational impacts are irrelevant because no switching will actually occur—that the mere threat of a forced switch will prompt rate reductions. Respectfully, that seems less like regulation and more like a game of chicken. The Board would abdicate its role as a neutral body by adopting a rule that *everyone agrees would require inefficient operations* simply because it wants to pressure one set of private interests to blink first to avoid that bad outcome.

The second objection is that forcing a switch to occur in one location may obviate the need for a switch in another location, resulting in no net increase in switching. As an initial matter, the assumption that a shipper should dictate the route and points of interchange of its traffic is legally flawed; that assumption would regress the American rail industry to the failed open routing approach that nearly destroyed it. *See supra*, Part III.B.1. Legal impediments aside, the "trade one switch for another" theory is just wrong on the facts. A new analysis of the CWS shows that the great majority (between 69% and 74%) of traffic potentially eligible for

forced switching under the competitive access pathway *is not interlined*, and therefore *does not have an existing interchange* to substitute for. Baranowski & Zebrowski V.S. at 12 (Table 5). On top of that, a great majority of potentially eligible traffic originates or terminates at stations where no local interchange operations exist in the vicinity. *Id.* at 13 (Table 6). This points to yet another grave error in the "trade one switch for another" theory: Switching currently occurs in facilities that are designed to efficiently accommodate it with relatively larger blocks of railcars, while the Proposed Rule would create switching routes elsewhere with relatively smaller blocks of railcars. The constraints of existing infrastructure mean that forcing switching to occur in locations not designed to interchange traffic can require movement through multiple yards. Rennicke 711.1 Op. V.S. at 4–12. Replacing an efficient existing interchange with an inefficient forced switch is not a trade anyone should want. The upshot is that a vanishingly small fraction of shipments are even theoretically amenable to the "trade one switch for another" theory: Of the shipments potentially subject to the Proposed Rule's competitive access pathway, only a tiny fraction (far less than 10%) is *both* currently interlined *and* originates or terminates at a station near an existing switching operation. Baranowski & Zebrowski V.S. at 13 (Table 7). Trading switches doesn't work when there are no switches available to trade.

Regardless, speculation that forced switching might be operationally costless on *some* routes does not address the disadvantages it has on *all other routes*. Even assuming the "any relevant factor" approach of the Proposed Rule's "public interest" pathway could reliably identify and reject forced switching on routes where it would be inefficient, the same is not true of the "necessary to provide competitive rail service" pathway. Under the Proposed Rule, operational inefficiency is not a ground for refusing switching under the "necessary to provide competitive rail service" pathway. Rather, switching is *required* unless it is "not feasible" or

"w[ould] unduly hamper the ability … to serve … shippers." 49 C.F.R. § 1145.2(a)(2)(iv) (proposed). Nothing in the record justifies forcing railroads, shippers, or the public to bear the high operational price of inefficient switching under that pathway.

c. Others have recently suggested that the operational costs of forced switching would prove to be minimal because reciprocal switching, trackage rights, or other conditions have been successfully imposed as conditions of merger approvals. As an initial matter, we do not know what particular merger conditions the proponents of the Proposed Rule believe are relevant here, so the Board does not even have a concrete point of comparison before it. But regardless, such merger conditions are not a useful guide here, for both legal and practical reasons.

Legally, the purpose of such a merger condition is to prevent or offset the loss of existing competition that free market forces had produced—a complete contrast to the Proposed Rule's attempt to create new "competition" by regulatory force. The merger regulations direct parties' attention to "remedies to mitigate and offset competitive harms"—those that "preserve competitive and market options" or "offset harms that would not otherwise be mitigated" by "propos[als that] would enhance competition." 49 C.F.R. § 1180.1(c)(2)(i) & (iv); *accord* 49 C.F.R. § 1180.1(d) ("The Board will condition the approval of Class I combinations to mitigate or offset harm to the public interest."); 49 C.F.R. § 1180.1(d) (2000) (prior rules) ("The Board has broad authority to impose conditions on consolidations, including those that might be useful in ameliorating potential anticompetitive effects of a consolidation."). In the same vein, after the Staggers Rail Act was enacted, the ICC began rejecting historical merger conditions that required merging railroads to keep open existing junctions and gateways and to allow shippers to route traffic over routes and gateways of their choice. The ICC correctly concluded that those

conditions went too far in "interfering with the natural operation of competitive forces in a market economy." *See Bhd. of Maint. of Way Emps. v. ICC*, 698 F.2d 315, 316 (7th Cir. 1983); AAR Opening Comments at 24–25. Any given merger condition reflects the ICC's or Board's policy judgment that preservation of existing competition should be prioritized over operational efficiency in the interests of the network as a whole. And as a remedy to prevent the merger transaction from causing a loss of competition, such conditions are of a piece with the *Midtec* standard that recognizes forced switching as a remedy for other anticompetitive acts that amount to "[a]n abuse of market power by a railroad," but not as a prophylactic to enhance artificial competition. *See* 857 F.2d at 1507, 1511. In short, past practice relating to merger conditions supports the existing rule, not its proposed revision.

Moreover, in practice, merger conditions are about preserving *existing* multiple service options. Necessarily, where conditions were imposed, the pre-merger services *already* entailed some measure of operational complexity that had arisen from market forces. And because the railroads involved had (a) voluntarily embraced that operational complexity before the merger, and (b) found the merger condition acceptable within the context of the anticipated combined operation, the Board could have confidence that switching was at least reasonably efficient and feasible. By contrast, the very aim of the Proposed Rule is to introduce operational complexity at places that *do not* currently accommodate that complexity, where market forces have *avoided* that complexity. Because the practical circumstances that typically exist in merger cases are absent here, the Board can take no comfort from the operational experience under merger conditions.

d. Finally, the Board has expressed interest in whether the Canadian interswitching regime provides a suitable model for forced switching in the U.S. rail network. *See* Ex Parte

Meeting Summary of Matters Discussed (filed Feb. 1, 2022) (describing Members' meeting with Canadian Transportation Agency staff). As an initial matter, the Canadian statute authorizing orders of forced switching lacks the limits on agency discretion that ICCTA imposes. *Compare* 49 U.S.C. §§ 10705, 11102(c), *with* Canada Transportation Act, Section 127(2) (Interswitching) ("If the point of origin or destination of a continuous movement of traffic is within a radius of 30 km of an interchange, the Agency may order … one of the companies to interswitch the traffic"). More importantly, the Canadian experience of interswitching is not a useful analog for how the Proposed Rule will impact the United States network because of fundamental differences in prevailing market conditions, and in the history and character of the rail industry in each country. *See* Reply Comments of AAR, at 31–34, *Petition for Rulemaking to Adopt Revised Competitive Switching Rules*, STB Ex Parte No. 711 (filed May 30, 2013) ("AAR 711 Reply Comments"); AAR 711 Reply Comments, Reply Verified Statement of Phil C. Ireland & Rodney E. Case ("Ireland & Case V.S.").

The Canadian interswitching regulations arose over 100 years ago and remained in place in a national system that was firmly rooted in government subsidy and ownership of railroads—the polar opposite of the United States network today, which rests on explicit Congressional intent to *minimize* government involvement. One of Canada's two Class I railroads (Canadian National Railway Company) remained in government hands from 1918 until it was privatized in 1995, with the government subsidizing both operating losses and capital expenditures. Canada's other Class I railroad (Canadian Pacific Railway) received various subsidies for certain lines and services for decades. Ireland & Case V.S. at 11–15. Because Canadian railways have not historically been reliant only on revenues from customers for their capital requirements, it has long been the case that the Canadian government could impose regulations to serve other policy

objectives irrespective of the impact of those measures on the ability of the carriers to earn adequate returns and re-invest in infrastructure. To that end, Canadian interswitching—when it was implemented over 100 years ago—was *not intended to produce price competition.* *Id.* at 7, 13. At the time, Canadian railroads did not even compete on the basis of prices, which were regulated. Instead, the purpose of interswitching was to avoid duplicative overbuilding of rail lines in urban areas. *Id.*

Today, it is widely recognized that mandatory interswitching in Canada is a policy inherited from an era of broad government control. Even in 1987, when current Canadian short-distance interswitching regulations were enacted, the Canadian National Railway Company was still government-owned and nearly 60% of the network was supported by government subsidies. Ireland & Case V.S. at 7. More recently, a panel commissioned by Canada's Parliament to review the policies of the Canada Transportation Act recognized that "[a]lthough interswitching rates have long been a feature of the regulatory landscape," they are in part "an anomaly" from the era of pervasive government regulation. *Id.* at 14 (quoting *Vision and Balance: Report of the Canada Transportation Act Review Panel* 63 (June 2001)). The panel further observed that any expansion of the interswitching regulations "would *worsen* the market-distorting aspects of the interswitching rate regime and *would be a step backward*" in light of the Canadian government's move toward more market-based regulation. *Id.* (emphasis added). Consistent with this market-based approach, Canada enacted in 2018 new "Long-Haul Interswitching" provisions (LHI), a remedy available for traffic beyond the regulated interswitching limits but only upon application. Significantly, LHI rates are based on comparable commercial rates (not costs) and many exclusions exist to take into account competitive options and limit LHI's effect on high-density

corridors where additional interchange activities would disturb rail operations. Canada Transportation Act, Sections 129 and 135.

The long and distinctive legacy of Canadian interswitching means that it yields no insight into what would come from the Proposed Rule's dramatic policy shift in the United States. Canadian railways have made their decisions—about where to build facilities, how much capacity to support at specific interchanges, whether to invest in new track, and how to design train service and yard operating plans—with full knowledge of the mandatory interswitching statute. Shippers, too, have made decisions against that background—about where and how to build facilities and what transportation services to expect at what cost. As a result, the Canadian rail network has been constructed with the necessary capacity and logistics (including adequate track at interchange points) to support an appropriate volume of interswitched traffic. *See* Reply Comments of CSX, at 42–47, *Petition for Rulemaking to Adopt Revised Competitive Switching Rules*, STB Ex Parte No. 711 (filed May 30, 2013). By contrast, over the past 40 years, United States railroads have worked to rationalize their networks in a deregulated regime, eliminating inefficient interchanges and consolidating traffic flows over a smaller number of high-volume routes and interchanges. *Id.* at 44–45. The Proposed Rule would upend and overextend the rationalized United States network in a manner unlike anything experienced by the Canadian system.

More generally, the respective experiences of the United States and Canada with forced switching cannot be compared simply because of the completely different rail networks of the two countries. Canada is a much smaller country than the United States in terms of population and population density; Canada has far fewer large metropolitan regions than the United States; and those regions are located in a narrow band along the southern edge of Canada, unlike the

dispersion in the United States. Thus the Canadian rail network is a simplified east-to-west system, with networks that are largely linear and parallel. By comparison, the United States has 51 major urban areas, located on all three coasts and throughout the nation's interior. To serve these numerous and diverse population centers, the United States has a significantly different, larger, and complex web-like rail system, comprising seven major railroads (compared to Canada's two) with multiple interconnected hub-and-spoke systems. Ireland & Case V.S. at 8–9. A visual comparison of the two systems casts their differences in high relief:

Id. at 17, 19. All told, there are potentially 1,500 interchange points in the United States where forced switching could occur, compared to 67 regulated interswitching locations in all of Canada. And there are no rail hubs in Canada that come close to the level of complexity of U.S. urban rail hubs such as Chicago, St. Louis, Houston, Kansas City, or New Orleans. *Id.* at 8–9.

The Board itself has already recognized these radical differences. In the NPRM, the Board expressed concern that the Proposed Rule would cause "operational challenges in gateways and terminals that are vital to the fluidity of the rail network." NPRM at 17. The Board described the complex, interconnected nature of the U.S. network, in which most major gateways and terminals are served by at least two Class I carriers (and up to six, in the cases of Chicago and New Orleans), and "local congestion can turn quickly into regional and national

backlogs, affecting shippers of all commodities." *Id.*; *see also id.* at 35 (Commissioner Begeman, dissenting in part) (expressing concern about the impact of the Proposed Rule "on network efficiency and service, particularly at major gateways and terminals" like Chicago). The Board's own observations underscore that there is no reasonable parallel between (a) Canada's experience of longstanding reciprocal switching in a comparatively simple network and (b) the risks in the United States of instability, congestion, service deterioration, investment disincentives, and other impacts that will arise from imposing forced switching on an already-complex network.

2. Recent Experience with COVID-19 Supply Chain Disruptions Underscores How Local Operational Problems Can Create Far-Reaching Disruption

Introducing more operational complexity and potential failure points into the rail network would be unwise, particularly in light of concerted efforts by the federal government, together with its state and local counterparts, to unwind current supply chain sticking points. Railroads, themselves a network requiring coordination of operations and resources, are effectively a supply chain operating within other supply chains linking raw materials and finished goods—which means that the impact of any disruption or inefficiency in service on rail compounds and reverberates throughout other supply chains. Fagan V.S. at 8-9.

Effective supply chains depend on the successful navigation of certain principles—such as the maintenance of resilience and agility; the need for extensive collaboration and the exponential difficulty in collaborating with each new participant; and the fact that the weakest link degrades the overall performance of the entire supply chain. Fagan V.S. at 6–8. The dynamics are much like a relay race, in which participants must coordinate the handoff of the baton in sequence, requiring extensive practice for seamless transition, and the slowest runner or the least coordinated baton passer can sharply reduce the entire team's chances of winning. Any

failure or shortcoming at a single point propagates up and down the supply chain, and the intensity of the failure actually increases in relation to the distance from the failure point—a well-documented phenomenon known as the "bullwhip effect." *Id.* at 7–8. The way that the blockage of the Suez Canal by a single container ship, the *Ever Given*, wreaked havoc on supply chains around the globe keenly illustrates how failure at a single node can seize an entire supply chain. For every day the *Ever Given* blocked the canal, dozens of other container ships carrying cargo worth billions of dollars were stalled in their journeys, halting the manufacturing and downstream commerce that depended on their cargo reaching their destinations timely. *Id.* at 9.

With these principles in mind, it becomes clear that the Proposed Rule is likely to diminish the performance of the supply chains railroads participate in.

First, the Proposed Rule creates a new node and link to be managed, introducing complexity and risk not just for the railroads, but for the entirety of any interconnected supply chain. Fagan V.S. at 8–9. The added complexity manifests in the needed coordination of people, equipment, infrastructure, and information. *Id.* Because all processes introduce a degree of failure, any disruption or failure risk is compounded across the supply chain. For instance, if there are three participants in a supply chain, and each perform at a 95% success rate, the projected success rate for the supply chain is only 86%. *Id.* Consider the impact of an airline flight that has been rerouted because of a thunderstorm: The aircraft and its crew miss their next flight, the travelers on this flight and the expected next leg of the plane's journey fail to arrive at their destinations on time, if at all; this impact repeats and reverberates for every connection dependent on that original cancelled flight. *Id.*

Second, by creating a greater need for coordination, the Proposed Rule increases managerial and operational costs. Fagan V.S. at 9–10. Although extensive collaboration leads to

better performance in a supply chain, collaboration requires time, and time incurs cost. *Id.* To mitigate the downside risk of less-than-perfect collaboration, supply chain managers create "safety stock"—which for railroads means spare crews, power, terminal, and line of road capacity. *Id.* But all of this adds cost—cost that shippers are surely not eager to underwrite.

Third, the Proposed Rule reduces resiliency and agility. Fagan V.S. at 10–11. Resiliency requires redundancies—*e.g.,* the "safety stock" mentioned above, collaboration of all supply chain participants, rapid response and recovery, and end-to-end data-driven control systems. *Id.* All those things require investment in infrastructure and operations to accommodate unexpected shocks, yet the Proposed Rule reduces the incentive for such investment. *Id.* Agility requires the ability to respond and adapt quickly to unexpected events, achieved through collaboration. *Id.* But there is little incentive for the railroads to engage in that behavior under the Proposed Rule due to differences in priority for servicing a particular customer's traffic on any given day. *Id.* A lack of resiliency and agility in supply chains is vividly illustrated by the number of ships waiting to unload off the Ports of Los Angeles and Long Beach, which grew exponentially during the latter half of 2021 and continues today. The growing flotilla of ships demonstrates the Ports are unable to rapidly respond to the spike in imports by increasing capacity to offload ships. *Id.* Fixed infrastructure components of a supply chain cannot quickly respond to the need for greater capacity. *Id.* For example, at the Ports, there was a lack of availability of truck drivers as well as equipment and warehouse capacity. Without the trucks to move it, or space to store it, backups of rail yards and terminals ensued. *Id.*

* * *

There have been many calls—from President Biden on down—to develop more secure and resilient supply chains, a need laid bare by the disruptions and panic buying of the COVID-

19 pandemic. The Proposed Rule does not answer those calls; rather, the Proposed Rule would exacerbate the vulnerabilities in supply chains and would likely lead to further and more dramatic reductions in performance.

3. The Proposed Rule Would Discourage Vital Infrastructure Investment

"Compelling … firms to share [access to the assets that are] the source of their advantage … may lessen the incentive … to invest in those economically beneficial facilities." *Verizon Commc'ns Inc. v. L. Offs. of Curtis V. Trinko, LLP*, 540 U.S. 398, 407–08 (2004). Here, the Proposed Rule would undermine future investment in the infrastructure that is necessary to meet national transportation goals. The NPRM does not address how the Proposed Rule would affect railroad revenues and future investment. Continued silence on that issue will doom any rule on judicial review, because the Board is bound by statutory policy to examine how the Proposed Rule will support the willingness and ability of railroads to make necessary investments. *See* 49 U.S.C. § 10704(a)(2) (defining "adequate" revenues as those sufficient "to support prudent capital outlays," "permit the raising of needed equity capital," and cover "the infrastructure and investment needed to meet the present and future demand for rail services"); *cf. Ass'n of Am. R.R. v. STB*, 237 F.3d 676 (D.C. Cir. 2001) ("*AAR v. STB*") (remanding rulemaking to the Board because it had failed to consider statutory policy).

The Proposed Rule will seriously dampen future railroad investment in at least three distinct ways—to the detriment of everyone who relies on those investments, including freight railroads themselves, shippers, and passenger rail. *First*, uncertainty about when and how the new regulation will be applied will deter potential investors, which will increase the industry's cost of capital and limit prospective investment. Shapiro & Stuttgen V.S. at 3–4; Orszag & Eilat V.S. ¶¶ 55, 62. *Second*, the Proposed Rule would directly reduce investment by depressing

returns on equipment, facilities, and operations subject to forced access. Because the rule will mandate artificially lower prices for shippers using certain facilities, railroads will not be able to reliably recoup their investments and justify new or upgraded infrastructure for underserved locations. Orszag & Eilat V.S. ¶¶ 12–17, 49, 54. The predictable result, over time, is that the rail network will suffer when railroads facing reduced returns on investment have weaker incentives and capacity to build out and improve their facilities. Shapiro & Stuttgen V.S. at 4–5. *Third*, the congestion and inefficient use of resources that will result from forced access at lower rates will slow railroad operations, increase costs, and erode profits across the network. Orszag & Eilat V.S. ¶¶ 54–65. That will harm the industry as a whole and undermine its ability to compete with freight trucking. Shapiro & Stuttgen V.S. at 5.

4. It Will be Difficult or Impossible to Identify Who Bears the True Burdens of Forced Switching

Increased forced switching will increase both direct and indirect costs across the industry. Orszag & Eilat V.S. ¶¶ 51–68. Switches are complex and involve direct expenses such as crew time, locomotive time, track time, and fuel usage, as well as technical costs and planning costs. Switching also entails safety risks: Specifically, forced switching will increase the yard activity hours needed for a shipment, and that work entails relatively greater risk of worker injury or casualty than line-haul activity. *Id.* ¶ 54 & n.29. The Proposed Rule will also create indirect costs, including network distortions (such as costs to quality, inefficient routing, and increased risk of service failure); uncertainty that depresses investment; the creation of relative winners and losers among shippers, which may negatively impact competition in downstream markets and exacerbate inefficient resource allocation in the economy; and environmental costs, including increased use of fuel and greenhouse gas emissions, as well as potential increased use of trucking and resulting highway congestion. *Id.* ¶¶ 60–65.

With all these effects in play, the Board cannot hope to accurately determine where the ultimate burden of forced switching will lie. It may be that railroads absorb most of these costs. It may be that the loss of ability to differentially price services for some shippers means railroads must focus rate increases on other shippers. The precise burden on workers is uncertain, but the Proposed Rule seems likely to disadvantage them. *See* Comments of Brotherhood of Maintenance of Way Employees, at 3 (filed Oct. 26, 2016) ("[I]t is the experience of the Unions that structural and regulatory changes to the industry and financial losses for the railroads have adverse consequences for their members"); Comments of SMART-TD, at 5 (filed Oct. 26, 2016) (explaining that the Proposed Rule "could have a chilling ripple effect on areas affecting labor, including the wages, rules and working conditions of employees" because "[a]ny reduction to railroads' revenue will directly impact employees' wages and benefits"). In short, the Proposed Rule creates a framework within which it will be impossible to gauge the rule's actual effects.

5. The Volume and Nature of Proceedings Under the Proposed Rule Are Likely to Put Extreme Burdens on All Stakeholders and the Board Itself

The Proposed Rule is a regulatory mandate that railroads do things they would not do in a free market. Switching required by Board order is a form of forced sharing, where a railroad is compelled to operate its facilities and equipment for the advantage of someone else. Orszag & Eilat V.S. ¶ 39. Other efforts at forced sharing—most notably, in the telecommunications industry, *see infra,* Part V.C—have proven highly contentious in practice. Anyone acquainted with human nature should not expect otherwise: When a business is *compelled* to provide a service, disputes are certain to arise over whether service should be provided, what service should be provided, who should bear the costs of that service, what the price of that service should be, and whether that service is being performed adequately. Considerable resources would be required to establish those financial and operational conditions of forced switching

(something the Board has seen firsthand in recent and pending proceedings involving, for example, trackage rights). Those resources are demanded of the railroads involved, the shippers, and the Board and its staff. All those demands will be multiplied by the sheer scale of operations potentially subject to the Proposed Rule. Although many have expressed dissatisfaction with the burdens of other types of proceedings—most notably, rate reasonableness inquiries—"there are really no shortcuts and no magic solutions," Orszag & Eilat V.S. ¶ 7. The Board should have a realistic understanding that, compared to those rate proceedings, the proceedings under the Proposed Rule are likely to be even more difficult and contentious.

(a) Updated Analysis Continues to Show That Both Pathways of the Proposed Rule Would Potentially Apply to a Massive Volume of Traffic

The Proposed Rule has the potential to affect a significant volume of traffic and have considerable effects across the industry. Both pathways under the Proposed Rule cast a wide net, although just how wide depends on how the Board interprets the requirement that "there is or can be a working interchange between the Class I carrier servicing the party seeking switching and another Class I rail carrier within a reasonable distance of the facilities of the party seeking switching." 49 C.F.R. § 1145.2(a)(1)(ii) & (2)(ii) (proposed).[4]

Under the Proposed Rule's "public interest" pathway, for example, shippers are allowed to seek a forced switching order regardless of market conditions, rate levels, or current availability of transportation alternatives. Using current CWS data, this pathway is estimated to affect 76% of all non-exempt carloads (and 80% of the associated revenues, or about $34 billion annually) if one assumes a "reasonable distance" is 10 rail miles to the interchange junction.

[4] As discussed below, the statute only allows switching within a terminal area. *See infra*, Part VI.A. But for purposes of the updated analysis that follows, we assume that a "reasonable distance" will be measured in rail miles from origin (or destination) to interchange.

Baranowski & Zebrowski V.S. at 7 (Table 2). The percentage of non-exempt traffic eligible under the Proposed Rule only increases at larger "reasonable distances":

Summary of Carloads and Revenues in 2019 CWS Potentially Affected by Proposed Rule's Public Interest Pathway

Distance to Junction	Potentially Affected Carloads	Percent of Total Non-Exempt Carloads (Including Boxcars)	Revenues for Potentially Affected Traffic ($Millions)	Percent of Total Revenues for Non-Exempt Traffic
Within 10-Rail Miles	10,745,381	76%	$33,821	80%
Within 15-Rail Miles	11,115,104	79%	$34,798	82%
Within 30-Rail Miles	11,796,166	84%	$36,797	87%
Within 50-Rail Miles	12,361,226	88%	$38,697	92%
Within 100-Rail Miles	12,928,654	92%	$40,663	96%
Total Non-Exempt Carloads (Including Boxcars)	14,082,047	100%	$42,226	100%

Id.

The "competitive access" pathway also will affect a significant amount of carload traffic, particularly non-exempt traffic with an R/VC ratio greater than 180%—traffic that is the backbone of differential demand-based pricing by railroads and a vital way of supporting the joint and common costs associated with their networks. At a "reasonable distance" of 10 rail miles, 16% of all non-exempt carload traffic with an R/VC ratio greater than 180% is eligible for switching under the competitive access pathway. Baranowski & Zebrowski V.S. at 6 (Table 1). This percentage rises with increasing "reasonable distance":

Summary of Carloads and Revenues in 2019 CWS Potentially Affected by Proposed Rule's Competitive Access Pathway

Distance to Junction	Potentially Affected Carloads	Percent of Total Non-Exempt Carloads With R/VC > 180%	Revenues for Potentially Affected Traffic ($Millions)	Percent of Total Revenues for Non-Exempt Carloads With R/VC > 180%
Within 10 Rail Miles	973,525	16%	$3,344	16%
Within 15 Rail Miles	1,471,010	24%	$4,851	23%
Within 30 Rail Miles	2,252,862	36%	$7,545	36%
Within 50 Rail Miles	3,214,393	52%	$10,810	52%
Within 100 Rail Miles	4,169,895	67%	$14,265	69%
Total Non-Exempt Carloads With R/VC > 180%	6,232,563	100%	$20,696	100%

Id. These effects would, of course, be even more pronounced if the Board were to revoke certain commodity exemptions it is considering in Ex Parte No. 704. *Id.* at 8–9 (Tables 3 & 4). The staggering lesson of this analysis is that potentially a full *two-thirds* of the traffic (and revenues) that Class I railroad carriers rely on most for demand-based pricing could be thrown into proceedings before the Board, and on little more than a showing of quantitative and qualitative market dominance.

(b) Proceedings Under the Proposed Rule Are Likely to Be Very Complicated in Practice

"Enforced sharing also requires … identifying the proper price, quantity, and other terms of dealing…." *Trinko*, 540 U.S. at 408. In other words, regulation begets more regulation. Once the Board determines to compel a switch, a host of further questions can arise, and there is no assurance that there will be easy agreement among the railroads involved (or the affected shipper(s), to the extent they are involved). Commissioner Begeman recognized exactly this problem years ago, raising a host of pointed questions about how the Board will adjudicate the substantive standards and manage the procedural morass created by its proposal. NPRM at 34–

36. The Board cannot reasonably adopt its proposal without addressing concerns of that kind, yet the answers only spawn more questions.

The Proposed Rule already recognizes that a number of factors may bear on whether a railroad should be forced to switch traffic at all—a difficult regulatory question in its own right. Orszag & Eilat V.S. ¶¶ 12–17. But assuming the Board decides to force one railroad to switch traffic to another, what should the price of that switch be? As the Board knows, even conceptually simple pricing methodologies can produce considerable disagreement in their application. The D.C. Circuit in *Midtec* recognized the cascade of problems created by regulatory intervention in pricing, and explained how it is inconsistent with the Staggers Rail Act:

> [T]he carrier favored by mandated reciprocal switching may have every incentive to avoid agreement on switching rates, and to petition the Commission to fix the compensation. Once the switching charge is fixed, the benefited carrier retains the ability to engage in demand-based ratemaking, adjusting its charges according to the dictates of the market for particular transportation services. Because that carrier publishes "single line" rates, the switching carrier has no effective voice in determining those rates, and is not entitled to a division of the proceeds. As the Commission observed in this case, the switching carrier thus "lose[s] the ability to price its portion of the through service in response to the varying demands for different commodities or movements." *Midtec II*, at 6. In this sense, therefore, prescribing reciprocal switching may invite more, rather than less, reliance on the Commission's regulatory powers to establish reasonable rates than would prescribing through routes.

Midtec, 857 F.2d at 1501.

Disputes are unlikely to end, however, with Board-ordered switching under a Board-established pricing rule, because so many operational questions would remain. In what general area should that switch take place? Railroads often "touch" each other in multiple places, and disagreements about the proper place of interchange can easily arise. *Cf. Canexus Chems. L.P. v. BNSF Railway Co.*, NOR 42131, 2012 WL 426210, at *3–6 (STB served Feb. 8, 2012). If the switch is to take place in a general area, how precisely should the operation be conducted? The

exact sequence of switches and timing can easily become a point of contention when the two railroads' existing separate operations are not in sync and the shipper will naturally want the fastest switching possible. Who should bear the costs of providing the facilities and equipment needed for those operations? Although the Proposed Rule correctly recognizes that it would be wholly inappropriate to require construction of facilities as part of a forced switching order, NPRM at 21, the repurposing of existing facilities and equipment comes with its own costs. How will labor protection be provided in answering each of those questions? *See* 49 U.S.C. § 11102(c)(2). And once the complex new switching operation is underway, what happens when something goes wrong, and the shippers and railroads involved are all pointing fingers at one another?

Every one of those disputes could land before the Board, and each time one does, the Board will be drawn further into the thicket of regulation that the Staggers Rail Act and ICCTA sought to abolish.

V. THE PROPOSED RULE THREATENS TO RESTRUCTURE THE RAIL INDUSTRY THROUGH REGULATION, IN DIRECT CONFLICT WITH CONGRESS'S CLEAR PREFERENCE FOR MARKET-BASED SOLUTIONS

Courts "do not … construe statutory phrases in isolation; [they] read statutes as a whole," and take into account the context and purpose of the statute. *United States v. Morton*, 467 U.S. 822, 828–34 (1984). Over the past half century, Congress has repeatedly and deliberately sought to give railroads control over rate- and route-setting decisions so that market forces rather than regulatory mandates would govern commercial decisions. AAR Opening Comments at 8–12; *see also* AAR Supplemental Revenue Adequacy Comments at 5–8, 16–18. The Proposed Rule looks in exactly the opposite direction. The sheer volume of commerce swept under the Proposed Rule (as described above) tells the tale: Even if a "reasonable distance" for switching is limited to 10 miles, then more than *three-quarters of all non-exempt traffic* can be the subject

of a "public interest" pathway claim for switching. Moreover, under the "competitive access" pathway at the 10-mile radius, one-sixth of all non-exempt traffic with an R/VC ratio greater than 180% potentially has a claim, and the Board will have very little ability to say "no" under that pathway. And under the "competitive access" pathway at the 100-mile radius some shippers have urged, a staggering *two-thirds* of all non-exempt traffic with an R/VC ratio greater than 180% would be largely beyond the Board's control. Baranowski & Zebrowski V.S. at 6 (Table 1). In plain terms, the Proposed Rule is a regulatory mandate affecting the vast majority of traffic (and revenues) under the Board's jurisdiction—a significant step toward restructuring the railroad industry in the exact opposite direction of Congress's intent.

A. Congress's Clear Policy Instruction and Sound Economic Principles Require Minimizing Regulatory Intervention

In the 4-R Act, Congress sought to restore railroads' financial health by reducing the ICC's over-regulation and giving carriers greater flexibility in rate-setting. Four years later, the Staggers Rail Act reinforced that deregulatory strategy. As the ICC explained in its brief to the D.C. Circuit in *Midtec*, the "central philosophy of the Staggers Act" is that "regulation should be reserved for situations where it is needed to protect against abuses." Joint Brief for Respondents Interstate Commerce Commission and United States of America, *Midtec Paper Corp. v. ICC*, No. 87-1032, at 25 (D.C. Cir.) (filed Mar. 14, 1988). In ICCTA, Congress "buil[t] on the deregulatory policies that have promoted growth and stability in the surface transportation sector," "keep[ing] bureaucracy and regulatory costs at the lowest possible level, consistent with affording remedies only where they are necessary and appropriate." H.R. Rep. No. 104-311, at 93 (1995); *see also* AAR Opening Comments at 11.

The RTP expresses Congress's unmistakable intent to minimize regulatory intervention. The Board must "allow, to the maximum extent possible, competition and the demand for

services to establish reasonable rates for transportation by rail," 49 U.S.C. § 10101(1), and "minimize the need for Federal regulatory control over the rail transportation system," *id.* § 10101(2). Those objectives are two sides of the same coin: They express a "forceful[]" preference *for* market independence and *against* government intervention. *AAR v. STB*, 237 F.3d at 680. And their pairing underscores that excessive regulation will itself create a need for continued intervention—again, regulation begets regulation.

The RTP is not a loose preference to be considered when convenient. It is "important language" that "guide[s] the Commission in applying the rail provisions" of the statute. *AAR v. STB*, 237 F.3d at 680–81 (quoting *Chesapeake & Ohio Ry. v. United States*, 704 F.2d 373, 375–76 (7th Cir. 1983)). Accordingly, the Board's rulemaking is arbitrary and capricious if it fails to explain how it took the RTP into account. *Id.* The Board recognized in the NPRM that the RTP constrains its decisionmaking, and even listed the "RTP factors relevant to [its] analysis," before proclaiming that "[t]he two-pronged approach would be consistent with the RTP in weighing issues such as competition and market power, rail service needs (for complaining and non-complaining shippers), the impact on the involved carriers, and whether specific facilities are appropriate for particular switching operations." NPRM at 16. That conclusory statement does nothing to reconcile the Proposed Rule's increased regulatory intervention and impedance of market forces with the RTP's clear preference for the opposite.

Under sound economic principles, moreover, the Board should intervene only if it has identified a market failure, concluded that the issue is not addressed by the existing regulatory scheme, and carefully tailored a regulatory solution. Orszag & Eilat V.S. ¶¶ 12–17; *see also* Fagan V.S. at 2-3; Exec. Order No. 12866 § 1(b). A poorly crafted regulatory intervention will undermine, rather than support, market forces. In this case, imposing forced switching will not

create "competition" over a bottleneck asset. Orszag & Eilat V.S. ¶¶ 32, 21–28. Rather, the Board has to set the access prices (or the principles in whose shadow those prices will be negotiated), making the Proposed Rule just a new and unlawful form of rate regulation. *See supra*, Part III.B.7; *infra*, Part VI.B. For that reason, the Proposed Rule does not actually align with prior executive guidance to implement "pro-competitive rulemaking and regulations," contrary to the Board's purported aim. NPRM at 9 n.9 (quoting Exec. Order No. 13725, 81 Fed. Reg. 23,417 (Apr. 15, 2016)). The Proposed Rule stands in contrast to one-time interventions (such as breaking up a company into smaller ones) that will change the market structure in pursuit of some proper purpose, and then allow firms to compete without further interference. Regulated switching on a particular route will result in regulation on that route, and it will not create free market competition on some other route. Orszag & Eilat V.S. ¶ 33. In short, forced access rules do not actually create competition, but only the appearance of competition. *Id.* ¶¶ 11, 34–36.

B. The Proposed Rule Is Pervasively Regulatory Because It Treats Forced Switching as a Government-Granted Right for Shippers, Rather Than as a Remedy for an Identified Market Failure

The Proposed Rule departs from the existing rule by offering forced switching not because a shipper *needs* it, but merely because the shipper *wants* it. In other words, the Proposed Rule transforms forced switching from a *remedy* into a *right*. The Board is experienced in providing remedies for specific conduct that is unlawful or contrary to established policy. But, by design, the statute does not task the Board with establishing shippers' rights to require railroads to conduct operations on Board-determined terms and conditions. Rather, railroads make investments and operating plans with the expectation that they—not the Board—will decide how to provide their services, so long as they meet the obligation to carry shipments from

origin to destination upon reasonable request. And yet the Proposed Rule would thrust the Board into that regulatory role.

As AAR has previously explained, Section 11102(c) has long been understood to require a showing of necessity—that the Board's intervention was required to ensure rail service. *See* AAR Opening Comments at 1–2, 8–10. Established law dating back long before the Staggers Act held that a shipper must show "actual necessity" to demonstrate that forced terminal access is in the "public interest." *Jamestown*, 195 I.C.C. at 292. Congress deliberately imported that standard into the statutory language of Section 11102(c), both in the "public interest" prong (which incorporates preexisting law) and in the "*necessary* to provide competitive rail service" prong (which makes necessity explicit). AAR Opening Comments at 8–9. The ICC recognized that a showing of need was required under the statute, and that approach is also demanded by the RTP. *Id.* at 8–10.

Stripped of that key limitation, forced switching becomes a freestanding entitlement granted to some shippers. And entitlements do not arise from market forces; they arise because a government confers them. Orszag & Eilat V.S. ¶¶ 12–17, 32. This result is flatly inconsistent with the D.C. Circuit's decision in *Midtec*: "If the Commission were authorized … to prescribe reciprocal switching … whenever such an order could enhance competition between rail carriers, it could radically restructure the railroad industry. We have not found even the slightest indication that Congress intended the Commission in this way to conform the industry more closely to a model of perfect competition." 857 F.2d at 1507.

Moreover, in conferring such an entitlement, the Proposed Rule largely ignores the broader competitive landscape that it would disrupt. Most prominently, railroads face a range of competitive constraints, stemming not just from competition by other railroad carriers and other

modes of transportation services (*e.g.*, trucks, ships, barges, pipelines, etc.), but also from other alternatives potentially available to a shipper. Orszag & Eilat V.S. ¶ 47. These other alternatives "include a shipper's ability to produce or rely on a different product as a suitable substitute that does not require the services of the incumbent railroad carrier" and "a shipper's ability to ship its goods to a different destination using another carrier and/or to obtain the product it needs from a different source using another carrier." *Id.* ¶ 27. Yet the Proposed Rule's reliance on "the Board's existing market dominance test," NPRM at 23, means that it will not account for consideration of such competitive forces associated with product and geographic competition. *See Market Dominance Determinations—Product & Geographic Competition*, 3 S.T.B. 937 (1998); *see also* NPRM at 27; *Notice of Public Hearing*, at 4 (STB served Dec. 28, 2021). Regulatory intervention ostensibly predicated on the state of competition in the market should actually account for, and modulate the regulatory intervention in response to, the true competitive landscape.

At bottom, the Proposed Rule is a striking and novel expansion of the Board's authority into a space that Congress never expected the Board to occupy. The Board claims that "reciprocal switching would not be 'open' to any party 'on demand,'" NPRM at 19, but fails to explain how its intentionally "flexible" standards, NPRM at 18, will reliably avoid that outcome in practice. If the Board "asserts newfound authority to regulate … without regard" for Congress's direction, courts will not "stand on the dock and wave goodbye as [the agency] embarks on this multiyear voyage of discovery." *Util. Air Regul. Grp. v. EPA*, 573 U.S. 302, 328 (2014).

C. The Board Should Take Caution from the Failed Regulatory Experiments with Forced Sharing in the Telecommunications Industry

Although misguided, it is not novel to think that forcing incumbents to share bottleneck elements of a network with competitors could be beneficial: The Telecommunications Act of 1996 ("TCA") operated on the same premise. The family resemblance between the Proposed Rule and the TCA—and the cost and havoc it wrought on the telecommunications industry over the past 25 years—offers a compelling cautionary tale for the Board in considering the Proposed Rule. Aron V.S. at 2–3. As background, the TCA required incumbent local exchange carriers to provide elements of their networks to entrants to enable those entrants to provide local services in competition with the incumbents. The Federal Communications Commission ("FCC") was charged with implementing the new legal regime. The regulatory trench warfare and industry chaos that followed should give the Board serious pause about what the Proposed Rule would mean for this industry and for this Board, as well as future Boards which will be left with the fallout of any ill-considered policy. We summarize here the account offered by a veteran of those regulatory disputes in the telecom industry. *See generally* Aron V.S.

The TCA, and the FCC's repeated attempts at crafting a workable framework for implementing the TCA, foundered for reasons that are already visible in the Proposed Rule. First, the FCC had to grapple with where, and under what circumstances, an incumbent would be required to share its network elements with competitors, Aron V.S. at 5–8—a threshold question which the Board also confronts in the NPRM in determining at what locations forced switching conceivably could be ordered, and under what circumstances. With the aid of considerable input from industry participants, businesses, economists, governmental agencies, and consumer groups, the FCC tried again and again to craft a workable rubric for determining under what circumstances an incumbent would be forced to share networked elements with a competitor. *Id.*

The FCC's first attempt—a tome of more than 700 pages—spawned years of litigation leading to a rejection of the standards by the Supreme Court as overly broad. *Id.* at 6; *see AT&T Corp. v. Iowa Util. Bd.*, 525 U.S. 366 (1999). The FCC's second attempt was again followed by years of litigation, culminating in rejection by the D.C. Circuit. *See U.S. Telecom Ass'n v. FCC*, 290 F.3d 415 (D.C. Cir. 2002) ("*USTA I*"). The FCC's third time was not the charm—the D.C. Circuit again rejected key aspects of the FCC's approach. *See U.S. Telecom Ass'n v. FCC*, 359 F.3d 554 (D.C. Cir. 2004) ("*USTA II*"). The FCC's fourth attempt paired a new standard with an order that ended the most contentious form of forced network sharing. Aron V.S. at 8.

Next, the issue of pricing—how much should the competitor pay the incumbent for the forced sharing arrangement—was one that haunted the FCC in years of endless regulatory proceedings and cycles of judicial review. Aron V.S. at 8–10. Forced network sharing requires a policy on price, and the TCA simply tethered this element to "cost." To this day, economists do not agree on how to set prices "based on cost." *Id.* And yet, the method for determining price greatly impacts not just incentives for the incumbents, competitors, and investors, but also creates opportunities for wealth transfer and arbitrage. So, not surprisingly, the FCC's cost-based methodology was also heavily litigated, and at one point overturned by the Eighth Circuit but then reinstated by the Supreme Court. *Id.* at 9; *see Iowa Utils. Bd. v. FCC*, 120 F.3d 753 (8th Cir. 1997), *aff'd in part, rev'd in part sub nom. AT & T Corp. v. Iowa Utils. Bd.*, 525 U.S. 366 (1999). Once the FCC had a workable pricing methodology, the disputes shifted to industry participants that were tasked in the first instance with putting that price methodology to practice in negotiations. The expectation that incumbents and competitors would come to ground on a mutually agreeable price was, at best, unrealistic. This breakdown in negotiations meant the incumbent, competitor, and regulator were tied up for years dealing with complex and expensive

arbitrations and cost proceedings. *See* Aron V.S. at 11–12. These proceedings not only drained the resources of the agency and stakeholders, but also destabilized the industry as carriers struggled to adapt to unpredictable and constantly changing rules. *Id.* at 10–14. Similar difficulties are likely to arise in any forced sharing regime; when properly functioning market forces have not brought about voluntary sharing, regulatory compulsion is more likely to meet resistance than cooperation when it comes to pricing.

And even after sorting through years of regulatory disputes and discord to answer the questions of where, when, and at what price, there were still intractable quarrels and litigation among incumbents and competitors with respect to the logistics of implementation. The type of coordination, operations, and priorities required for a smooth sharing of networked elements was more than could be expected of rivals. Aron V.S. at 12–15. This failure was especially telling because, under the TCA, there were significant incentives for incumbents to cooperate—and yet those spawned disputes rather than harmony. *Id.* at 14–15.

Every reason exists to think that the rail experience will not be as bad as the telecommunications experience—it will be even worse. Tracks and yards are not computers and wires; they cannot be reprogrammed at will. Railcars are not infinitesimal electrons; only so many railcars can pass through a facility in one day. Heavy rail equipment and hazardous commodities pose risks to workers and communities that fiber optic cables do not. Unlike highly standardized telecommunications protocols, each rail location has a highly customized operating plan. Cases will be not be few in number or easy in substance. *See supra*, Part IV.B.5. And the basic incentives that gave telecommunications reformers hope for success are completely absent from the Proposed Rule: Nobody expects the Proposed Rule to attract a wave of new entrants to the capital-intensive rail industry. Nor is there any upside for incumbent railroads to embrace the

new regime in the way incumbent local telecommunications carriers were incentivized to open their facilities in exchange for new opportunities of their own.

VI. THE PROPOSED RULE CONTINUES TO HAVE ADDITIONAL BASIC FLAWS THAT MAKE IT UNLAWFUL AND UNWORKABLE

Even if the Proposed Rule were otherwise sound in concept, its execution remains flawed in at least two respects. First, the Proposed Rule is legally unsound because it extends reciprocal switching beyond a terminal area. Second, the Proposed Rule does not include a pricing rule. Pricing is an indispensable element of any forced sharing regime. The Board has sought comment on such a wide range of potential pricing rules that it cannot proceed to a final rule without first proposing and taking comment on some more specific proposal.

A. Updated Analysis Continues to Show that the Failure to Expressly Limit the Proposed Rule to Switching Within a Terminal Area Exacerbates Its Overreach

AAR and other commenters have previously explained that it is contrary to law for the Board to adopt a forced switching rule that is not expressly limited to the terminal area. AAR Opening Comments at 27, 45–46; AAR Reply Comments at 20–26. Under both prongs of the Proposed Rule, a shipper seeking forced switching must show that "there is or can be a working interchange between the Class I carrier servicing the party seeking switching and another Class I carrier *within a reasonable distance* of the facilities of the party seeking switching." NPRM at 18–19 (emphasis added). And shippers have urged the Board to adopt an expansive definition of "reasonable distance," to maximize the availability of such switching. The statute does not permit that approach.

Section 11102(c) does not refer to switching within a "reasonable distance" outside a terminal at all. *Compare* 49 U.S.C. § 11102(a) (requiring incumbent railroad to make "main-line tracks" available to another railroad "for a reasonable distance outside of a terminal" under

certain circumstances). Rather, the precursor to Section 11102(c) has always been understood to refer to switching of traffic originating or terminating *within* a terminal area among railroads operating within the terminal area. *See* AAR Reply Comments at 23–24 (describing case law to this effect); *e.g.*, *Cent. States Enters., Inc. v. ICC*, 780 F.2d 664, 675 (7th Cir. 1985) ("Reciprocal switching occurs at stations or terminals served by more than one carrier. A common station or terminal area is, therefore, a prerequisite for such switching."). Indeed, the word "reciprocal" denotes something that operates (or at least can operate) in equal and complementary fashion. *See Webster's Third New International Dictionary* 1895 (1971) (defining "reciprocal" as "corresponding to each other: being equivalent or complementary"). Although two carriers can switch traffic to each other if both are in the same terminal area, they cannot do so if only one is in the terminal area, and must carry traffic on a line haul outside the terminal to reach the other railroad. When Congress used the words "reciprocal switching" in Section 11102(c), it imported the established meaning of that term into the statute. AAR Reply Comments at 24.

Moreover, it would be unlawful to apply a reciprocal switching rule outside the terminal area because doing so would conflict with the express statutory directives for prescribed through routes. *See* AAR Opening Comments at 27, 45–46; AAR Reply Comments at 20–26. A "reciprocal switch" to an interchange outside a terminal area is nothing more or less than a prescribed through route via the point of interchange. The Board recognized as much when it observed that "from a theoretical perspective, some of the issues addressed in this proceeding could arguably apply to through routes as well." NPRM at 26. But through routes are the domain of Section 10705(a), which has important qualifications. Regulation of rail carriers has long been based on the fundamental policy that favors the right of carriers to long-haul movements. *See, e.g.*, *Chi., Milwaukee, St. Paul & Pac. R.R. v. United States*, 366 U.S. 745,

750–51 (1961) (quoting 45 Cong. Rec. 3475– 76) ("The road that initiates the freight and starts its on its movement in interstate commerce should not be required … to transfer its business from its own road to that of a competitor … when the commerce initiated by it can be as promptly and safely transported … by its road as by the line of its competitor."). Section 10705 incorporates that principle by limiting the circumstances in which the Board "may require a rail carrier to include in a through route substantially less than the entire length of its railroad" to specific circumstances. Section 10705 also explicitly requires the Board to "give reasonable preference" to the originating carrier. 49 U.S.C. § 10705(a)(2).

Section 10705(a)(2)(A) sets out an exception to the overall policy favoring long hauls and protecting originating carriers for switching orders under Section 11102(c). But under the Proposed Rule, that limited exception would swallow the rule: If reciprocal switching under Section 11102(c) were defined only by reference to an unspecified "reasonable distance," shippers could seek prescription of through routes under the guise of reciprocal switching—without satisfying the conditions set out in Section 10705(a)(2). Regardless of the merits of changes to rules governing a terminal area, the statute forbids the Board from evading the statutory requirements of Section 10705 simply by labeling any order to interchange at any place a "switch" and subjecting it to a different standard under Section 11102(c).

The Proposed Rule's failure to expressly limit switching to terminal areas means that the Board's interpretation of "reasonable distance" has the potential to lead to dramatic overreach. As discussed above, updated analysis of CWS data shows that at a supposedly "reasonable distance" of 100 rail miles to the interchange junction the "public interest" pathway is potentially open to nearly *all* non-exempt carloads (92%); this is meaningfully more than the 76% affected at 10 rail miles—a distance that more closely aligns with relatively large terminal areas.

Baranowski & Zebrowski V.S. at 7 (Table 2). Likewise, at a 100-mile radius, the competitive access pathway affects 67% of all non-exempt carload traffic with an R/VC ratio greater than 180%, versus 16% at a 10-mile radius. *Id.* at 6 (Table 1).

B. The Proposed Rule's Lack of an Access Pricing Rule Remains an Untenable Gap

The Proposed Rule does not articulate the principles that the Board proposes to use in establishing compensation for a forced switch. Although the Board proposed two "alternatives," those alternatives were described at such a conceptual level, and with so many possible variations, that the rule does not fairly propose any particular access pricing rule at all. That "general notice that a new standard will be adopted" is inadequate as a matter of law, because it "fail[s] to give interested parties sufficient notice of the form" that the final "standard might take, undermining the aims of meaningful participation and informed decisionmaking." *Horsehead Res. Dev. Co. v. Browner*, 16 F.3d 1246, 1268–69 (D.C. Cir. 1994) (citing *Small Refiner Lead Phase-Down Task Force v. US EPA*, 705 F.2d 506, 549 (D.C. Cir. 1983)). The Board cannot proceed to a final rule without filling this gap through proper notice-and-comment procedures.

First, an access pricing rule is likely to be important in practice. Certainly, the Board was correct to recognize that the statute commits the pricing question to negotiation between the carriers; neither the Board nor the shippers have any role to play. *See* 49 U.S.C. § 11102(c); NPRM at 24. But no reason exists to suppose that the serving carrier and the alternative carrier will always agree on compensation; sometimes they will not. Basic economic principles suggest that where an efficient reciprocal switching arrangement can exist, the carriers involved are very likely to have voluntarily established one already. Orszag & Eilat V.S. ¶ 31. Thus, the operations affected by the Proposed Rule—and about which the Board should be concerned—are ones where a commercially advantageous agreement is relatively *unlikely* to exist. The Board

therefore cannot treat the question of pricing as a mere detail to be worked out on an as-needed basis.

Second, and more fundamentally, it is impossible to make policy about forced sharing without also making policy about pricing. Orszag & Eilat V.S. ¶ 59. The pricing question is especially consequential because the rail industry's viability rests on the availability of demand-based differential pricing. *See, e.g.*, *Intramodal Rail Competition—Proportional Rates*, Ex Parte No. 445 (Sub-No. 2), 1990 WL 287993, at *2 (ICC Apr. 17, 1990); AAR Opening Comments at 47–49. The agency has expressed that principle repeatedly and the federal courts have endorsed it as well. *See* AAR Opening Comments at 47–48 & n.72. Moreover, the ICC has explained *why* this is so:

> [T]here is a large amount of common (unattributable) costs inherent in the railroad industry cost structure, and the mix of competitive and captive traffic handled by railroads prevents a carrier from being able to recover a pro rata portion of those common costs from all traffic. Therefore, railroads must be able to price their services differentially so as to recover a greater percentage of their common costs from traffic with a greater degree of captivity (i.e., less demand elasticity).

Amstar Corp. v. ATSF, 1995 ICC LEXIS 256 at *12–13 (served Sept. 28, 1995) (citation omitted). When the Board requested comments in the original Ex Parte No. 711 proceeding, it recognized those principles, stating: "To remain financially sound, carriers must be allowed to engage in 'demand-based differential pricing' …. If a railroad is unable to recover these joint and common costs, it will not be able to earn adequate revenues." *Petition for Rulemaking to Adopt Revised Competitive Switching Rules*, Ex Parte No. 711, at 7 (STB served July 25, 2012). Yet the Proposed Rule and the NPRM fail to articulate any clear pricing scheme, never mind one that would satisfy the indisputable need to preserve differential pricing.

In short, there are practical and policy imperatives to establish the access pricing rule that the Board would apply when called upon to do so. The Board has failed to meaningfully identify

the "particular aspects" of a pricing proposal that "are open for consideration." *Env't Integrity Project v. EPA*, 425 F.3d 992, 998 (D.C. Cir. 2005). And when everything is open for consideration in theory, nothing in particular has been proposed in practice. Accordingly, the Board cannot meet its notice-and-comment obligations by resting on its 2016 proposal. "A contrary rule would allow an agency to reject innumerable alternatives in its Notice of Proposed Rulemaking only to justify *any* final rule it might be able to devise by whimsically picking and choosing within the four corners of a lengthy 'notice.'" *Id.*

VII. CONCLUSION

The Board should not adopt the Proposed Rule. It should retain its existing rule, including the decisional law that accompanies it. That existing law appropriately regards forced switching not as a government-granted right for select shippers, but rather as a remedy for competitive abuses. That law has engendered substantial reliance by railroads and shippers alike, and nothing in the record justifies the radical departure reflected in the Proposed Rule. As the D.C. Circuit made clear in *Midtec*, "If the Commission were authorized … to prescribe reciprocal switching … whenever such an order could enhance competition between rail carriers, it could radically restructure the railroad industry. We have not found even the slightest indication that Congress intended the Commission in this way to conform the industry more closely to a model of perfect competition." 857 F.2d at 1507.

Dated: February 14, 2022

Respectfully Submitted,

/s/ *Benjamin J. Horwich**

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** Mr. Horwich will appear as a witness at the Board's upcoming hearing to address legal issues raised in these and prior AAR comments.*

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Ex Parte No. 711 (Sub-No. 1)

Reciprocal Switching

Verified Statement and

Written Testimony of

Michael R. Baranowski and Nathaniel S. Zebrowski

February 14, 2022

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I. INTRODUCTION

We are Michael R. Baranowski and Nathaniel S. Zebrowski of FTI Consulting. Mr. Baranowski has previously submitted testimony in this proceeding, Ex Parte 711 (Sub-No. 1), on October 26, 2016 and in the predecessor proceeding Ex Parte 711 on March 1, 2013. Mr. Baranowski is a Senior Managing Director of FTI Consulting, Inc. and leader of the firm's Network Industries Strategies ("NIS") practice. Since 1980, he has been involved in projects analyzing the engineering, operational, and financial aspects of the railroad industry. He has testified before the Surface Transportation Board, the Competition Bureau Canada, state and federal courts, and in arbitrations. Mr. Zebrowski is a Managing Director in FTI's NIS practice. He joined the practice in 2011 and has over a decade of experience analyzing freight railroad traffic patterns, operations, and costs including developing numerous evidence submissions to the Surface Transportation Board, Federal courts, and arbitration boards. Details of our backgrounds and qualifications are set forth in Exhibits 1 and 2 to this verified statement and written testimony.

In response to the Surface Transportation Board's ("Board") 12/28/2021 decision requesting comments in the Ex Parte 711 (Sub-No. 1) proceeding in advance of a scheduled hearing, we have been asked by counsel for the Association of American Railroads ("AAR") to update analysis submitted in 2016 estimating the amount of traffic potentially affected by the Board's proposed forced switching rule ("Proposed Rule") as laid out in its 7/25/2016 Notice of Proposed Rule Making ("NPRM")[1] accounting where necessary for relevant changes affecting

[1] Mr. Baranowski has reviewed his prior submissions in this proceeding; he stands by them and will address them as necessary in his testimony before the Board at the March 15-16, 2022 hearing.

the results. For example, we extend this analysis to account for changes in commodity exemptions under consideration in Ex Parte 704.

We have also been asked to address comments raised in ex parte communications since October 25, 2016. These include certain claims made by the American Chemistry Council ("ACC") and other groups regarding the asserted ease of performing forced switches. These also include assertions that changes stemming from a series of mergers and acquisitions in the railroad industry in the mid-to-late 1990s (approved by the Board and its predecessor agency, the Interstate Commerce Commission ("ICC")) are cause for adopting the Proposed Rule. Specifically, in response to shipper comments attempting to tie the rationale for the forced switching proposal to railroad industry consolidation, we examine how Class I origin and destination service options for carload traffic have evolved since 1992. Finally, as additional context for evaluating the effects of structural changes in the railroad industry, we provide a comparison of freight rail and long-haul trucking rates over the 1992 to 2019 period.

II. SUMMARY OF FINDINGS

Our analysis results in the following determinations:

- Up to 67% of all non-exempt carload traffic with a revenue-to-variable cost (R/VC) over 180% that is originated or terminated by a Class I carrier in 2019 (representing 4.2 million of 6.2 million total carloads) would potentially be affected under the competitive access pathway of the Proposed Rule. If extended to include commodities considered for exemption revocation in Ex Parte 704, this figure would be 68% (5.2 million of 7.7 million carloads).

- Up to 92% of non-exempt carload traffic originated or terminated by a Class I carrier in 2019 (representing 12.9 million of 14.1 million total carloads) may potentially be affected under the public interest pathway. Adding commodities considered for exemption revocation under Ex Parte 704, this figure would still be 92% (17.1 million of 18.5 million carloads). These figures include boxcars which are exempt from rate regulation but not regulations pertaining to switching.

- Less than one-third of potentially affected traffic under the competitive access pathway is currently interlined, so ACC's suggestion that forced switches would simply entail moving the location of interchange could not apply in most cases.

- ACC also is incorrect to suggest that existing interchange operations may be used to accommodate forced switches. Our analysis indicates that for the vast majority of potentially affected traffic under the competitive access pathway, no such operations exist. As such, it should be expected that any forced switching orders would require Class I railroads to establish new local interchange operations, adding cost, complexity, and congestion as explained by other witnesses in this proceeding.

- The data does not support the notion that consolidation in the railroad industry in the 1990s left shippers with fewer competitive options. To the contrary, a *smaller* share of traffic is originated or terminated at stations served by a single Class I carrier now than prior to this period of consolidation. Specifically, 59.4% of Class I originations and terminations of non-exempt carload traffic occurred at single-served stations between 1992 and 1996, compared to only 53.7% between 2015 and 2019. These data also reflect that single service has long been the norm in the United States.

- The vast majority of traffic potentially affected under the competitive access pathway involves shipments originating or terminating at stations that have never had access to multiple Class I railroads. The Proposed Rule cannot plausibly be regarded as a tailored response to origin or destination access issues arising from the approved mergers.

- The decline in the share of non-exempt traffic at single-served origins or terminations would have been even greater—except for the fact that stations reported in the waybill sample for the first time in the post-consolidation period are disproportionately at locations served by a single Class I carrier. We estimate that over 81% of such facilities are at locations served by a single railroad. The existence of traffic at these stations (of which there are hundreds) is presumptively the product of shippers' choices to use those new stations.

- Measured in terms of real revenues per ton-mile as contained in the Board's recent rate study, average rail freight rates have decreased 7% from 1992 to 2019 (from 4.7 cents to 4.4 cents per ton-mile). In the same period, as developed using publicly available truck company information, average long-distance truckload freight rates have increased 36% (from 8.9 cents to 12.1 cents per ton-mile).

Details of our analyses and expanded results are provided in the remainder of this statement.

III. ESTIMATING POTENTIALLY AFFECTED TRAFFIC UNDER THE PROPOSED FORCED SWITCHING RULE

We update the analysis submitted in 2016 estimating traffic potentially affected by the forced switching rule proposed in the 7/25/2016 NPRM to use Carload Waybill Sample (CWS) data from the most recent available year of 2019.[2] The methodology for this estimate is fully explained in Mr. Baranowski's previous 2016 verified statement.[3] We follow the same process here as previously applied except for a minor adjustment refining the definition of total non-exempt Class I traffic,[4] as well as extending our analysis to cover boxcar movements as part of non-exempt traffic under the public interest pathway.[5] Due to the lack of clarity on what distances the Board may ultimately consider for ordering forced switches, we also add 50- and 100-mile thresholds to account for a wider range of potential outcomes. In addition to using 2019 instead of 2014 CWS data, we also use current versions of the Junction Interchange File and

[2] CWS data for 2020 became available on February 2, 2022, but there was insufficient time to obtain access to and include the 2020 data in this analysis. The analysis submitted in 2016 used 2014 CWS data, which was the most recent available CWS data when the analysis was prepared at the time.

[3] See AAR Opening Comments, EP 711.1, Verified Statement of Michael R. Baranowski (filed Oct. 26, 2016) at 1-4.

[4] Specifically, when identifying all Class I non-exempt traffic, we now require a Class I carrier to originate or terminate the movement rather than requiring both as done before. This better corresponds with our analysis of potentially affected traffic which considers all traffic originating or terminating on a Class I carrier at station that is served by a single Class I, regardless of whether a Class I carrier serves the other end of the movement.

[5] This is because 49 C.F.R. 1039.14 specifies that the Board retains jurisdiction over reciprocal switching involving boxcars. Boxcar movements are presumed not market dominant consistent with the reasons articulated in the original exemption finding and, accordingly, we continue to exclude this traffic from our analysis of traffic potentially affected under the competitive access pathway. Regardless, were it to be included in that analysis, the effects on results would be minimal.

Centralized Station Master as well as ALK's PC Miler version 27.

A. Update of Previous Estimates of Potentially Affected Traffic Using 2019 Instead of 2014 Data

As discussed in detail in prior testimony, our calculations estimate the amount of traffic moving in a given year where the shipper may be able to obtain a forced switching order under either the competitive access pathway or the public interest pathway contained in the Proposed Rule. This process generally involves identifying non-exempt traffic within certain distances of Class I railroad junctions, which we do first using radial miles, and then refine using rail miles. We then determine (within the limits of the available data and uncertainty in how the Board might apply the Proposed Rule) which subsets of this traffic may meet the further criteria the Proposed Rule sets forth for each pathway.

1. 2019 Traffic Potentially Affected Under the Competitive Access Pathway

For the competitive access pathway, the Board proposes three eligibility criteria that shippers must satisfy to obtain a switching order: (1) that the facilities of the shipper(s) and/or receiver(s) for whom such switching is sought are served by a single Class I rail carrier; (2) intermodal and intramodal competition is not effective with respect to the movements of the shipper(s) and/or receiver(s) for whom switching is sought; and (3) there is or can be a working interchange between the Class I carrier servicing the party seeking switching and another Class I rail carrier within a reasonable distance of the facilities of the party seeking switching.

For our analysis of the potential number of carloads affected by the Proposed Rule's competitive access pathway, we identified all of the non-exempt Class I railroad carloads originating or terminating at single-served stations with revenue to variable cost ratios at or

above 180%.[6] The mileage bands we used are 10, 15, 30, 50, and 100 rail miles from the nearest junction. Under the competitive access pathway in the NPRM, we estimate that in 2019 up to 4.2 million carloads out of 6.2 million total carloads of non-exempt traffic above a revenue-to-variable (R/VC) ratio of 180% would potentially be affected. This is summarized in Table 1 below.

Table 1: Summary of Carloads and Revenues in 2019 CWS Potentially Affected by Proposed Rule's Competitive Access Pathway

Distance to Junction	Potentially Affected Carloads	Percent of Total Non-Exempt Carloads With R/VC > 180%	Revenues for Potentially Affected Traffic ($Millions)	Percent of Total Revenues for Non-Exempt Carloads With R/VC > 180%
Within 10 Rail Miles	973,525	16%	$3,344	16%
Within 15 Rail Miles	1,471,010	24%	$4,851	23%
Within 30 Rail Miles	2,252,862	36%	$7,545	36%
Within 50 Rail Miles	3,214,393	52%	$10,810	52%
Within 100 Rail Miles	4,169,895	67%	$14,265	69%
Total Non-Exempt Carloads With R/VC > 180%	6,232,563	100%	$20,696	100%

2. 2019 Traffic Potentially Affected Under the Public Interest Pathway

For the public interest pathway, the Board proposes three eligibility criteria that shippers must satisfy to obtain a switching prescription: (1) that the facilities of the shipper(s) and/or

[6] The NRPM states that "the proposed rules would apply the Board's existing market dominance test to determine the intramodal/intermodal competition element under the competition prong" (NPRM at 23); this is the same test that applies in the rate reasonableness context. Thus, in order to assess the proportion of potential rate cases that could be turned into forced switching cases if the Proposed Rule were adopted, the table below presents potentially affected traffic under the competitive access pathway as a percentage of all non-exempt traffic above a revenue-to-variable (R/VC) ratio of 180%.

receiver(s) for whom such switching is sought are served by Class I rail carrier(s); (2) that there is or can be a working interchange between the Class I carrier servicing the party seeking switching and another Class I rail carrier within a reasonable distance of the facilities of the party seeking switching; and (3) that the potential benefits from the proposed switching arrangement outweigh the potential detriments.

For our analysis of the number of carloads potentially affected by the Proposed Rule's public interest pathway, we identified all of the non-exempt Class I railroad carloads originating or terminating at stations served by more than one Class I railroad and at single-served stations within the same five distinct rail mileage bands from junctions (10, 15, 30, 50, and 100 rail miles). Under the proposed public interest pathway, we estimate up to 12.9 of 14.1 million total non-exempt carloads would potentially be affected. This is summarized in Table 2 below.

Table 2: Summary of Carloads and Revenues in 2019 CWS Potentially Affected by Proposed Rule's Public Interest Pathway

Distance to Junction	Potentially Affected Carloads	Percent of Total Non-Exempt Carloads (Including Boxcars)	Revenues for Potentially Affected Traffic ($Millions)	Percent of Total Revenues for Non-Exempt Traffic
Within 10-Rail Miles	10,745,381	76%	$33,821	80%
Within 15-Rail Miles	11,115,104	79%	$34,798	82%
Within 30-Rail Miles	11,796,166	84%	$36,797	87%
Within 50-Rail Miles	12,361,226	88%	$38,697	92%
Within 100-Rail Miles	12,928,654	92%	$40,663	96%
Total Non-Exempt Carloads (Including Boxcars)	14,082,047	100%	$42,226	100%

B. Adjusted Estimates of 2019 Traffic Potentially Affected Including Commodities Considered for Exemption Revocation in Ex Parte 704

To account for regulatory developments since 2016, we run a scenario that adds those commodities considered for exemption revocation in Ex Parte 704. In other words, this analysis treats those specific commodities as non-exempt.

1. 2019 Traffic Potentially Affected Under the Competitive Access Pathway

Under the competitive access pathway, and assuming that exemptions were revoked for all commodities considered for revocation in Ex Parte 704, we estimate up to 5.2 million out of 7.7 million non-exempt carloads would potentially be affected. This is summarized in Table 3 below.

Table 3: Summary of Carloads and Revenues in 2019 CWS Potentially Affected by Proposed Rule's Competitive Access Pathway Incorporating Effects of Revocations Being Considered in EP 704

Distance to Junction	Potentially Affected Carloads	Percent of Total Non-Exempt Carloads With R/VC > 180%	Revenues for Potentially Affected Traffic ($Millions)	Percent of Total Revenues for Non-Exempt Carloads With R/VC > 180%
Within 10-Rail Miles	1,237,999	16%	$4,010	16%
Within 15-Rail Miles	1,871,376	24%	$5,829	24%
Within 30-Rail Miles	2,988,114	39%	$9,216	38%
Within 50-Rail Miles	4,121,842	54%	$12,869	53%
Within 100-Rail Miles	5,228,064	68%	$16,669	68%
Total Non-Exempt Carloads With R/VC > 180%	7,689,226	100%	$24,418	100%

2. 2019 Traffic Potentially Affected Under the Public Interest Pathway

Under the public interest pathway, assuming that exemptions were revoked for all

commodities considered for revocation in Ex Parte 704, we estimate up to 17.1 million out of 18.5 million non-exempt carloads would potentially be affected. This is summarized in Table 4 below.

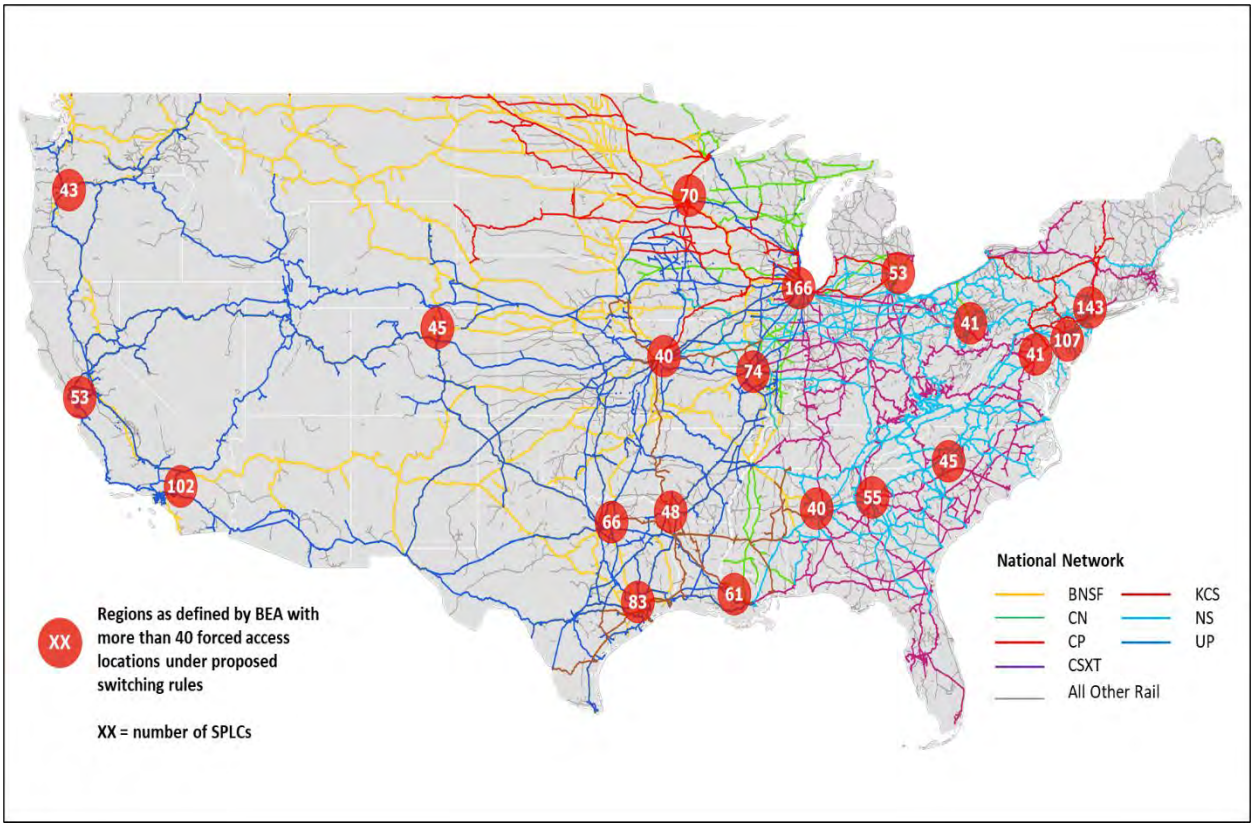
Table 4: Summary of Carloads and Revenues in 2019 CWS Potentially Affected by Proposed Rule's Public Interest Pathway Incorporating Effects of Revocations Being Considered in EP 704

Distance to Junction	Potentially Affected Carloads	Percent of Total Non-Exempt Carloads (Including Boxcars)	Revenues for Potentially Affected Traffic ($Millions)	Percent of Total Revenues for Non-Exempt Traffic
Within 10-Rail Miles	14,189,803	77%	$44,895	81%
Within 15-Rail Miles	14,692,965	79%	$46,240	83%
Within 30-Rail Miles	15,660,393	85%	$48,908	88%
Within 50-Rail Miles	16,385,481	89%	$51,199	92%
Within 100-Rail Miles	17,056,170	92%	$53,529	96%
Total Non-Exempt Carloads (Including Boxcars)	18,504,311	100%	$55,679	100%

C. Maps of Affected Stations and Junctions

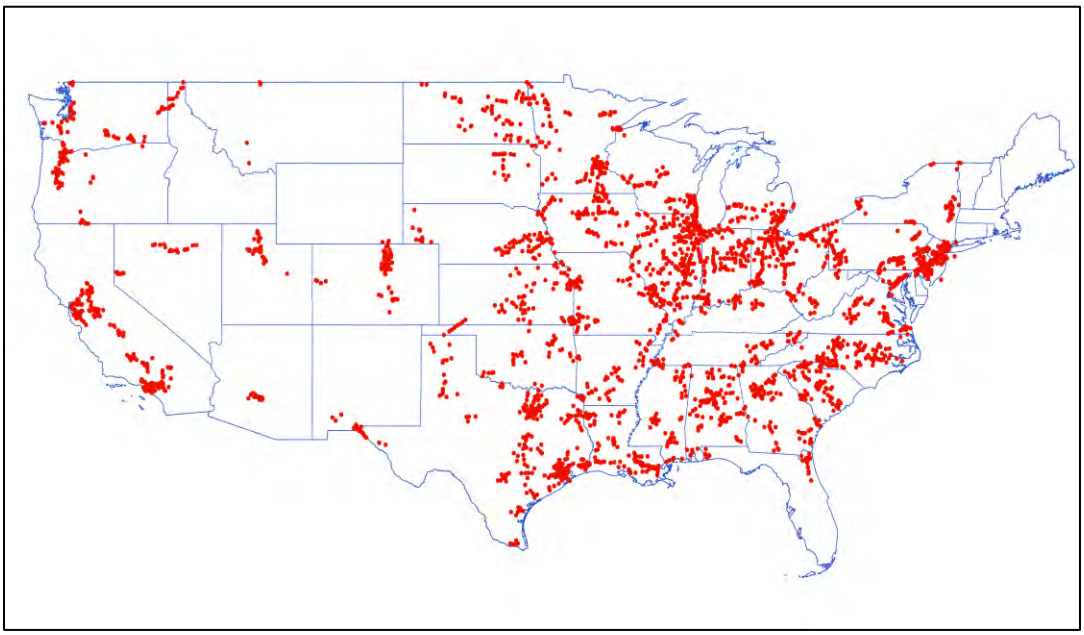
The below map (Chart 1) depicts all regions where we identified at least 40 stations originating or terminating traffic potentially affected by either pathway of the Proposed Rule (either public interest pathway or competitive access pathway).

Chart 1: Map of Regions With At Least 40 Potentially Affected Stations



The below map (Chart 2) depicts all junctions that could be involved in handling traffic under either pathway of the Proposed Rule.

Chart 2: Map of Junction Points That May Be Used by Potentially Affected Traffic at 30-Mile Rail Distance Threshold



D. Operating Parameters of Potentially Affected Traffic Under the Competitive Access Pathway

We also break out the estimates of potentially affected traffic to address claims made by ACC and other shipper groups in recent ex parte meetings that railroads have overstated operational impacts of forced switching. In ACC's view, forced switching could involve "merely changing the switch location of an existing multi-line movement from one existing interchange point to another."[7] This claim conflicts with the nature of the traffic we identified as potentially affected, where the majority does not have an interchange to begin with. Table 5 below shows that over two-thirds of the traffic potentially affected under the competitive access pathway is not interchanged.

[7] Summary of Ex Parte Meeting held April 4, 2019 Between Chairman Begeman and ACC at page 2.

Table 5: Summary of Carloads in 2019 CWS Potentially Affected by Proposed Rule's Competitive Access Pathway Identifying Portion Not Involving an Interchange

Distance to Junction	Potentially Affected Carloads Under the Competitive Access Pathway	Portion Not Involving an Interchange (i.e., Local Traffic)[8]	Percentage
Within 10-Rail Miles	973,525	713,929	73%
Within 15-Rail Miles	1,471,010	1,082,255	74%
Within 30-Rail Miles	2,252,862	1,553,410	69%

Even if there were an interchange that could theoretically be moved, this does not mean there would be a suitable location to move the interchange to under a forced switch. We identified which stations potentially affected under the competitive access pathway may be in areas with existing local interchange operations present.[9] Table 6 below shows that there are no existing local interchange operations in place that could potentially be adapted to accommodate the vast majority of traffic potentially affected under the competitive access pathway.

[8] This includes only non-rebilled traffic reporting the same origin and termination Class I railroad and no interchanges.

[9] While CWS data reports interchanges associated with linehaul interchanges, it does not cover local switching activities occurring prior to or after the linehaul movement. Of course, a local interchange switch operation, which involves a myriad of customer-specific track facilities and nearby yard and interchange infrastructure, is different from linehaul interchanges, which involve moving cars from the through train of one carrier to the through train of another carrier and often occur at large yards designed for this purpose. Due to this limitation, it is not possible to identify the volumes of traffic involved in existing local interchange operations among railroads. Although measuring volumes is not possible with available data, the Revenue Switch SPLC field in the AAR's CSM identifies locations where such local interchange operations may occur. The CSM manual explains that "[i]f the station is within the switching limits of another station, data identifying the other Location's SPLC is provided." That said, the mere listing of a station does not mean there is currently an existing local interchange operation, or that any such existing operation could practicably be extended to the traffic subject to a forced switching order. We identify those records in the CSM where the Location SPLC and Revenue Switch SPLC fields differ as an indicator for where a serving railroad at one station *may* have established operations to interchange certain locally switched traffic to another railroad at a nearby station. We then cross reference this list against the relevant stations identified in our analysis of potentially affected traffic.

Table 6: Summary of Carloads in 2019 CWS Potentially Affected by Proposed Rule's Competitive Access Pathway Identifying Portion Where No Possible Existing Local Interchange Operations Potentially Related to Forced Switch

Distance to Junction	Potentially Affected Carloads Under the Competitive Access Pathway	Portion With No Possible Existing Local Interchange Operations	Percentage
Within 10-Rail Miles	973,525	756,439	77.7%
Within 15-Rail Miles	1,471,010	1,197,422	81.4%
Within 30-Rail Miles	2,252,862	1,847,239	82.0%

This means that Class I railroads would be required to establish new local interchange operations to accommodate the vast majority of traffic potentially affected by a forced switching order under the competitive access pathway.

Table 7 below shows the small portion of all potentially affected traffic under the competitive access pathway that may align with ACC's simplified view of moving the location of an existing interchange—traffic that is currently both interlined and involves a location where there may be an existing local interchange operation.

Table 7: Summary of Carloads in 2019 CWS Potentially Affected by Proposed Rule's Competitive Access Pathway Identifying Interlined Portion Where There May Possibly Be an Existing Local Interchange Operation

Distance to Junction	Potentially Affected Carloads Under the Competitive Access Pathway	Interlined Portion Where There May Possibly be An Existing Local Interchange Operation	Percentage
Within 10-Rail Miles	973,525	66,170	6.8%
Within 15-Rail Miles	1,471,010	86,782	5.9%
Within 30-Rail Miles	2,252,862	151,653	6.7%

This shows that a tiny fraction of potentially affected traffic under the competitive access pathway could theoretically achieve the sort of interchange shift that ACC suggests.

IV. CHANGES IN CLASS I STATION SERVICE FROM 1992 TO 2019

The Board's 12/28/2021 hearing order states that some parties in favor of forced switching provide the rationale that it is necessary to "foster competition among rail carriers at a time when (due to mergers and acquisitions) shippers' rail transportation options are limited." During a 2/21/2017 Ex Parte meeting, rail union representatives expressed the opposing view that "[t]he current structure of the industry and current arrangements for switching are the product of the consolidation transactions in the 1990s that were all reviewed and approved by the ICC and STB" and that "proposals for changes to reciprocal switching rules are an effort to partially re-litigate and revise the merger and control decisions of the 1990s that were deemed to be in the public interest."[10] Our analysis of the data confirms the validity of the rail union representatives' view and strongly suggests that the ICC's and Board's merger conditions were successful in achieving their objectives of preserving existing competitive rail service offerings.

To assess these claims, we compare the relative amount of traffic originating and terminating at Class I stations served by a single carrier between the period from 1992 to 1996—prior to when the effects of the last wave of Class I mergers were realized—to the recent period from 2015 to 2019 that includes the effects of these mergers. We start with the CWS data provided by the Board and classify as single-served those stations where (a) only a single Class I railroad is reported originating or terminating carload traffic respectively during the 1992 to 1996 or 2015 to 2019 periods and (b) the AAR's CSM reports a single Class I carrier as having

[10] Summary of 2/21/2017 Ex Parte meeting between Vice Chairman Elliot and representatives of Brotherhood of Maintenance of Way Employees Division/IBT, et al.

operating access to that station during the applicable period.[11] The remaining stations with Class I volumes are classified as multiple-served stations.

A. Relative Amount of Carload Traffic Served by Single Class I Carrier During 1992 to 1996 and 2015 to 2019 Periods

Based on applying these station classifications, Table 8 below summarizes the percent of all traffic (measured by carloads) originated or terminated by Class I carriers at stations served by a single Class I carrier.

Table 8: Percent of Traffic Originations and Terminations at Stations Served by Single Class I Carrier

Traffic	1992-1996 period	2015-2019 period	Difference
All Carload Traffic	55.6%	52.2%	-3.4%
Non-Exempt Carload Traffic	59.4%	53.7%	-5.8%
Non-Exempt Carload Traffic Above R/VC 180%	70.1%	61.4%	-8.7%

This analysis shows that a *smaller* share of traffic was originated or terminated at stations served by a single Class I carrier during the 2015 to 2019 post-merger period than compared to the 1992 to 1996 pre-merger period. The claim that mergers resulted in a reduction in the availability of multiple service is inconsistent with this reduction in share of single-served traffic. We also note that the percentages reflect the fact that single-served facilities have been a

[11] For the 1992 to 1996 period the following railroads listed in the AAR's annual publication "Analysis of Class I Railroads" are defined as Class I: CSXT, BN, NS, CR, UP, ATSF, SP, CNW, IC, CP, KCS, and CN. Due to common control issues, MP and WRPI are treated as part of UP, GTW as part of CN, and SSW and DRGW as part of SP. We remove intermodal, non-US, and non-Class I traffic from our analysis. We do not count Rule 11 forwarded movements as part of terminated traffic, and we do not count Rule 11 received movements as part of originated traffic.

dominant fixture of the industry for many years.

The reduction in the share of single-served traffic would have been greater but for new shippers disproportionately locating at stations served by a single railroad. Our analysis of pre- and post-merger CWS data identified 1,141 stations reporting volumes during the 2015 to 2019 period but not during the 1992 to 1996 period. These represent situations where shippers may have established new facilities generating railroad traffic. To control for sampling issues, we further restricted our identification of potentially new stations to those that did not report any volumes from 1992 to 1999, but did report volumes in at least five years from 2000 to 2019. The majority of these stations—438 of the 542 that remained on our list, representing over 81%—are served by a single Class I railroad.

B. Relative Amount of 2019 Traffic Potentially Affected Under the Competitive Access Pathway That Has Not Historically Been Served by Multiple Class I Railroads

Using the station classifications developed above, we determine what portion of the potentially affected traffic under the competitive access pathway originates or terminates at a station that has not historically had service options from multiple Class I carriers. This is summarized in Table 9 below at the lower distance thresholds considered in our initial analysis of potentially affected carloads under the competitive access pathway.[12]

[12] When potentially affected carloads involve forced switches at both ends of the move, we consider the classification of both the origin and destination stations for purposes of developing Table 9 below.

Table 9: Summary of Carloads in 2019 CWS Potentially Affected by Proposed Rule's Competitive Access Pathway, Isolating Portion Not Historically Served by Multiple Class I Carriers

Distance to Junction	Potentially Affected Carloads Under the Competitive Access Pathway	Portion Not Historically Served by Multiple Class I Carriers	Percentage
Within 10-Rail Miles	973,525	919,877	94.5%
Within 15-Rail Miles	1,471,010	1,387,413	94.3%
Within 30-Rail Miles	2,252,862	2,089,125	92.7%

This indicates that only a small minority of traffic that would be potentially eligible for forced switching under the competitive access pathway of the Proposed Rule originates or terminates at a station that has in recent decades offered service options involving multiple Class I carriers. And of that already small minority, the shifts from multiple Class I carriers to a single Class I carrier do not generally appear merger-related.[13] This is not surprising because the approved mergers commonly included conditions requiring that 2-to-1 stations remain open to multiple Class I railroads where carriers had competed in the past.[14] In short, the Proposed Rule is not a tailored response to consolidation because it would largely affect traffic at stations that were not affected by losing multiple service options due to consolidation.

[13] In other words, a station may have been historically served by two Class I carriers during the 1992 to 1996 period based on volumes reported in the CWS, and these two carriers did not since merge, but the station has only been served by a single Class I carrier in the most recent 2015 to 2019 period. These situations are not merger-related, and may occur for a variety of reasons, including commercial choices made by the shipper to enter long-term agreements committing all volumes to a single carrier, or multiple carriers serving the same customer, but changing the reporting convention for which station is associated with these volumes.

[14] See, e.g., BN/ATSF Merger Decision (FD No. 32549, Decision No. 38) at pp. 82-88 and pp. 93-103, UP/SP Merger Decision (FD No 32760, Decision No. 44) at pp. 144-156 and pp. 178-199, and NS/CSXT Conrail Acquisition Decision (FD No. 33388, Decision No. 89) at pp. 277-327.

V. HISTORICAL COMPARISON OF RAIL AND TRUCK RATES FROM 1992 TO 2019

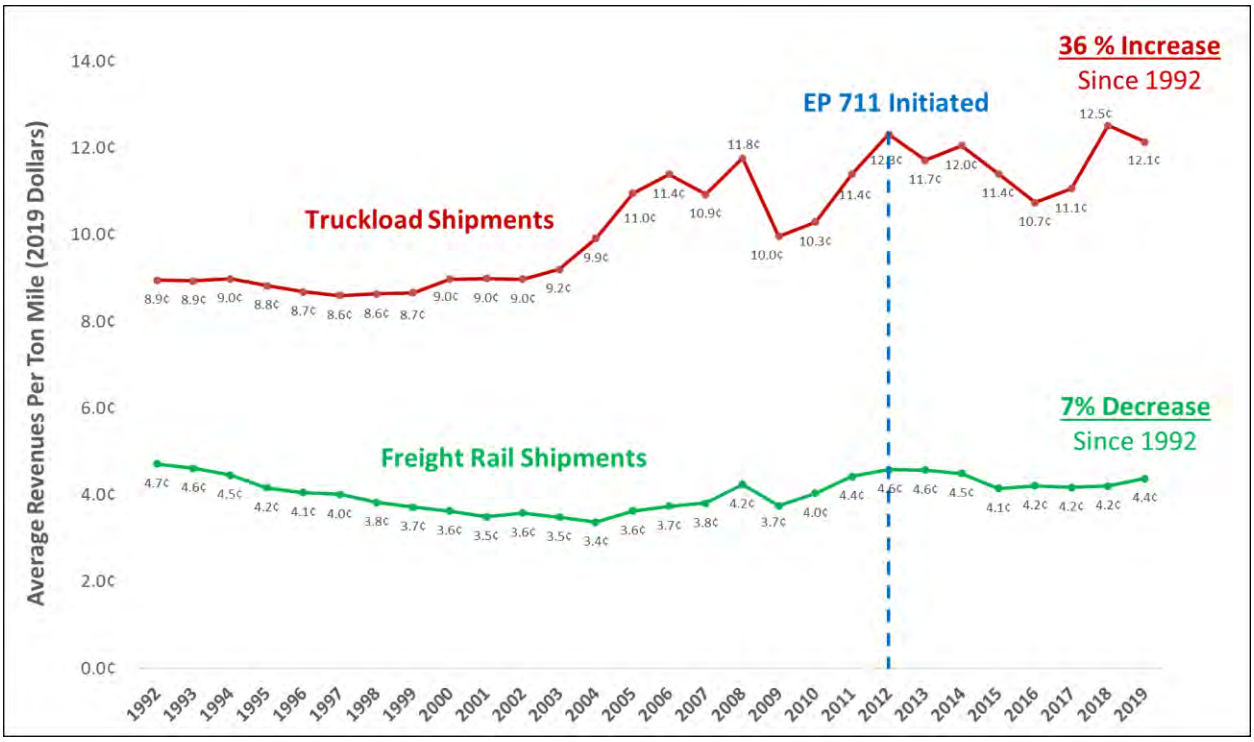
To put the changes in the freight railroad industry in context, we developed comparative trends between rail and truckload freight rates back to 1992. Rail rates were developed using the real revenues per ton-mile developed in the Board's most recent rate study.[15] Truckload rates were developed using revenue-per-mile figures derived from Form 10-K annual reports of select long-distance trucking companies,[16] which were then converted to real revenues per ton-mile figures using the same GDP deflator as used in the Board's most recent rate study and an

[15] The Tornqvist indexes that control for changes in traffic mix included in the STB's rate study yield slightly different results from those presented here. We use the underlying overall revenue per ton-mile figures included in the STB's rate study in order to make an apples-to-apples comparison of absolute rate levels between rail and truckload freight transportation.

[16] Specifically, we considered all long-distance trucking companies reporting 10-Ks as identified in the SEC's Edgar database, and used those which: offered predominantly or exclusively truckload services as opposed to less-than-truckload (LTL) services, either did not extensively use intermodal services as part of truckload movements or reported intermodal usage separately, provided the mileage and revenue data necessary to determine average rate levels, and covered a sufficient timeframe to be relevant in comparing to rail rates over the 1992-2019 period. These criteria resulted in the following six trucking companies being included: Celadon Group Inc., Covenant Logistics Group Inc., JB Hunt Transport Services Inc., P.A.M. Transportation Services Inc., U.S. Xpress Enterprises Inc., and USA Truck Inc. Due to the nature of the marketplace in which truckload operators compete, it is reasonable to view this group of companies as representative of prevailing rate levels in the truckload industry. We also considered measuring historical changes in truck rates using information contained in the National Transportation Statistics' (NTS) data published by the Bureau of Transportation Statistics and the Long-Distance Truckload Producer Price Index (PPI) published by the Bureau of Labor Statistics. The NTS showed both higher truck rate levels and higher rate increases than we estimated; we rejected these data because the reported truck rates may be elevated by inclusion of LTL services. The PPI showed lower increases than we estimated (and lower increases compared to many other trucking PPI indexes); we rejected these data because the reported truck index includes truckload movements using intermodal services, and thus would be depressed by an increasing use of rail intermodal services by certain truckload companies, which is a trend we saw referenced in some of the Form 10-Ks we reviewed. On balance, we believe the data reported in trucking companies' financial reports is the most reliable source for this purpose.

assumed average lading weight of 20 tons.[17] As Chart 3 below depicts, while truckload rates increased more than 36% in real terms from 1992 to 2019, railroad rates decreased 7%.

Chart 3: Comparison of Freight Rail and Long-Distance Truckload Average Real Revenues Per Ton-Mile: 1992 to 2019



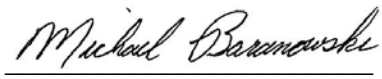
This supports the view that structural changes lessening competition have not occurred in the railroad industry.

[17] This lading weight is developed based on an average 35,000 pound tare weight of a tractor-trailers conservatively assumed to be loaded at or near the maximum 80,000 pound gross weight limit on the interstate highway system.

VERIFICATION

I, Michael R. Baranowski, declare under penalty of perjury that the foregoing is true and correct and that I am qualified and authorized to file this verified statement and written testimony.

Executed on February 14, 2022.



Michael R. Baranowski

VERIFICATION

I, Nathaniel S. Zebrowski, declare under penalty of perjury that the foregoing is true and correct and that I am qualified and authorized to file this verified statement and written testimony.

Executed on February 14, 2022.

Nathaniel S. Zebrowski

EXHIBIT 1

Michael Baranowski

Senior Managing Director
Economic Consulting

8251 Greensboro Drive, Suite 1111 – McLean, VA 22102
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Education

B.S. in Accounting, Fairfield University

Supplemental Finance Studies, Kean College

Mike Baranowski heads FTI's Network Industries Strategies practice and provides strategic, financial, and economic consulting services to the telecommunications and railroad and pipeline transportation industries. He has special expertise in analyzing and developing complex costing and cash flow models, conducting detailed operations analysis, and transportation engineering. Much of his work involves providing oral and written expert testimony before courts, arbitration panels and regulatory bodies.

He is a recognized expert in railroad regulatory economics and has assisted FTI's railroad clients in a broad range of litigation and regulatory engagements involving pricing of services, contract disputes, damage calculations and analyses of the specific effects of pending or proposed changes in policy or regulation.

Some of Mr. Baranowski's representative experience includes:

- Development of strategic litigation analyses for large network industry regulatory rate proceedings based on the theory of Constrained Market Pricing and the Stand-Alone cost test. Theory assumes the existence of a hypothetical, efficient competitor and involves detailed analysis of short and long run operations, expenses, capital expenditures and revenues.
- Analysis of market dynamics effecting pricing and development of a suite of modeling tools to assess the regulatory risk of tariff and contract transportation rates for a mix of commodities and services based on key cost drivers and forecasts.
- Expert testimony related to the determination of damages in a variety of commercial contract disputes in the railroad, telecommunications, pipeline and trucking industries.
- Evaluation of market effects of proposed railroad mergers and identification of merger related efficiencies and quantification of the associated savings.

- Going concern and liquidation value estimates for railroad related assets as the basis for trackage rights and competitive access compensation.
- Develop detailed cost and revenue allocation metrics to assess relative profitability of individual asset groups or segments of complex network industries.

Mr. Baranowski holds a B.S. in Accounting from Fairfield University in Fairfield, Connecticut and has pursued supplemental finance studies at Kean College in Union, New Jersey.

Select Railroad Testimony

Surface Transportation Board

January 6, 2011	Docket No. 42056 Texas Municipal Power Agency v. BNSF Railway Company, BNSF Reply to TMPA Petition for Enforcement of Decision, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher
October 28, 2011	Docket No. FD 35506 Western Coal Traffic League - Petition for Declaratory Order, Opening Evidence of BNSF Railway Company, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher
November 10, 2011	Docket No. 42127 Intermountain Power Agency v. Union Pacific Railroad Company, Reply Evidence of Union Pacific Railroad Company
November 28, 2011	Docket No. FD 35506 Western Coal Traffic League - Petition for Declaratory Order, Reply Evidence of BNSF Railway Company, Joint Reply Verified Statement of Michael R. Baranowski and Benton V. Fisher
May 10, 2012	Docket No. 42056 Texas Municipal Power Agency v. BNSF Railway Company, BNSF Reply to TMPA Petition to Reopen and Modify Rate Prescription, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher
November 30, 2012	Docket No. 42125 E.I. DuPont De Nemours & Company v. Norfolk Southern Railway Company, Reply Evidence of Norfolk Southern Railway Company
December 7, 2012	Docket No. Ex Parte 715, Rate Regulation Reforms, Reply Comments of the Association of American Railroads, Verified Statement of Michael R. Baranowski
January 7, 2013	Docket No. 42130 SunBelt Chlor Alkali Partnership v. Norfolk Southern Railway Company, Reply Evidence of Norfolk Southern Railway Company
March 1, 2013	Ex Parte No. 711 Petition for Rulemaking to Adopt Revised Competitive Switching Rules, Opening Comments of the Association of American Railroads, Verified Statement of Michael R. Baranowski and Richard W. Brown
April 12, 2013	Docket No. 42136 Intermountain Power Agency v. Union Pacific Railroad Company, Reply Evidence of Union Pacific Railroad Company

April 30, 2013	Ex Parte No. 711 Petition for Rulemaking to Adopt Revised Competitive Switching Rules, Reply Comments of the Association of American Railroads, Verified Statement of Michael R. Baranowski and Richard W. Brown
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September 5, 2014	Ex Parte No. 722 Railroad Revenue Adequacy, Opening Comments of Norfolk Southern Railway Company, Verified Statement of Michael R. Baranowski
November 4, 2014	Ex Parte No. 722 Railroad Revenue Adequacy, Reply Comments of Norfolk Southern Railway Company, Verified Statement of Michael R. Baranowski
September 4, 2015	Docket No. FD 35743 Application of the National Railroad Passenger Corporation Under 49 U.S.C. § 24308(a) - Canadian National Railway Company, Opening Evidence of Illinois Central Railroad Company and Grand Trunk Western Railroad, Joint Verified Statement of Michael Baranowski and Benton Fisher
October 7, 2015	Docket No. 42121 Total Petrochemicals & Refining USA, Inc. v. CSX Transportation, Inc., Supplemental and Compliance Evidence of CSX Transportation, Inc.
October 23, 2015	Docket No. FD 33760 (Sub-No. 46) BNSF Railway Company - Terminal Trackage Rights -- Kansas City Southern Railway Company and Union Pacific Railroad Company, BNSF Rebuttal Statement, Verified Statement of Michael R. Baranowski
November 20, 2015	Docket No. 42121 Total Petrochemicals & Refining USA, Inc. v. CSX Transportation, Inc., Reply to Supplemental and Compliance Evidence
March 7, 2016	Docket No. 42142 Consumers Energy Company v. CSX Transportation, Inc., Reply Evidence of CSX Transportation, Inc.
July 18, 2016	Docket No. FD 35842 New England Central Railroad, Inc. -- Trackage Rights Order – Pan Am Southern LLC, Pan Am Southern Reply Evidence, Verified Statement of Michael R. Baranowski
July 26, 2016	Ex Parte No. 704 (Sub-No. 1) Review of Commodity, Boxcar, and TOFC/COFC Exemptions, Comments of the Association of American Railroads, Verified Statement of Michael R. Baranowski and Benton V. Fisher
August 26, 2016	Ex Parte No. 704 (Sub-No. 1) Review of Commodity, Boxcar, and TOFC/COFC Exemptions, Comments of the Association of American Railroads, Verified Statement of Michael R. Baranowski and Benton V. Fisher

October 11, 2016	Ex Parte No. 431 (Sub-No. 4) Review of the General Purpose Costing System, Comment of the Association of American Railroads, Verified Statement of Michael R. Baranowski and Benton V. Fisher
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November 7, 2016	Ex Parte No. 431 (Sub-No. 4) Review of the General Purpose Costing System, Reply Comments of the Association of American Railroads, Verified Statement of Michael R. Baranowski and Benton V. Fisher
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January 12, 2018	Docket No. FD 32760 (Sub-No. 46) BNSF Railway Company - Terminal Trackage Rights -- Kansas City Southern Railway Company and Union Pacific Railroad Company, BNSF Petition to Establish Conditions of Use and Compensation, Verified Statement of Michael R. Baranowski
July 16, 2018	Docket No. FD 32760 (Sub-No. 46) BNSF Railway Company - Terminal Trackage Rights -- Kansas City Southern Railway Company and Union Pacific Railroad Company, BNSF Rebuttal, Verified Statement of Michael R. Baranowski
April 26, 2019	Docket No. 42144 North American Freight Car Association, et al v. Union Pacific Railroad Company, Verified Statement of Michael R. Baranowski
January 26, 2021	Docket No. FD 32760 (Sub-No. 46) BNSF Railway Company - Terminal Trackage Rights -- Kansas City Southern Railway Company and Union Pacific Railroad Company, BNSF Opening Statement on Compensation, Verified Statement of Michael R. Baranowski
January 29, 2021	Ex Parte No. 704 (Sub-No. 1) Review of Commodity, Boxcar, and TOFC/COFC Exemptions, Comments of the Association of American Railroads, Verified Statement of Michael R. Baranowski and Benton V. Fisher
April 12, 2021	Docket No. FD 32760 (Sub-No. 46) BNSF Railway Company - Terminal Trackage Rights -- Kansas City Southern Railway Company and Union Pacific Railroad Company, BNSF Reply Statement on Compensation, Verified Statement of Michael R. Baranowski
May 12, 2021	Docket No. FD 32760 (Sub-No. 46) BNSF Railway Company - Terminal Trackage Rights -- Kansas City Southern Railway Company and Union Pacific Railroad Company, BNSF Rebuttal Statement on Compensation, Verified Statement of Michael R. Baranowski
June 21, 2021	Docket No. FD 36500, Canadian Pacific Ry. – Control – Kansas City Southern, Canadian Pacific Applicants' Response to KCS Reply, Verified Statement of Michael R. Baranowski
October 29, 2021	Docket No. FD 36500, Canadian Pacific Ry. – Control – Kansas City Southern, Railroad Control Application, Verified Statement of Michael R. Baranowski

U.S. District Court for the Northern District of Texas, Fort Worth Division

November 7, 2017	Civil Action No. 4:16-cv-1061-O, BNSF Railway Company v. Panhandle Northern Railroad LLC, Expert Report of Michael R. Baranowski
November 22, 2017	Civil Action No. 4:16-cv-1061-O, BNSF Railway Company v. Panhandle Northern Railroad LLC, Reply Expert Report of Michael R. Baranowski
December 21, 2017	Civil Action No. 4:16-cv-1061-O, BNSF Railway Company v. Panhandle Northern Railroad LLC, Rebuttal Expert Report of Michael R. Baranowski

Arbitrations and Mediations

July 25, 2011	American Arbitration Association Case No. 58 147 Y 0031809, BNSF Railway Company and Kansas City Southern Railway Company, Expert Report of Michael R. Baranowski on behalf of BNSF Railway Company
April 25, 2013	JAMS REF #1340009009, Union Pacific Railroad vs. Canadian Pacific and Dakota, Minnesota & Eastern Railroad Arbitration, Expert Report of Michael R. Baranowski on behalf of Union Pacific Railroad Company
September 6, 2013	IN JAMS ARBITRATION, Case No. 1220044715, Union Pacific Railroad Company v. BNSF Railway Company, Expert Report of Michael R. Baranowski
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January 1, 2014	IN JAMS ARBITRATION, Case No. 1220044715, Union Pacific Railroad Company v. BNSF Railway Company, BNSF Post-Argument Submission, Affidavit of Michael R. Baranowski
April 14, 2017	American Arbitration Association Case No. 01-15-0004-4830 and 01-15-0004-4931, Arbitration Between FirstEnergy Generation LLC and CSX Transportation, Inc. & BNSF Railway Company, Expert Report of Michael R. Baranowski
November 22, 2017	American Arbitration Association Case No. No. 01-16-0003-6208, CSXT Transportation, Inc. v. JEA and Florida Power & Light Co., Expert Report of Michael R. Baranowski
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February 16, 2018	American Arbitration Association Case No. 01-16-0005-5615, BNSF Railway Company & Norfolk Southern Railway Company v. FirstEnergy Generation, LLC, Rebuttal Expert Report of Michael R. Baranowski
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April 17, 2018	American Arbitration Association Case No. 01-17-0000-0130, J.B. Hunt Transport, Inc. and BNSF Railway Company, Reply Expert Report of Michael R. Baranowski
June 22, 2018	JAMS REF #1100088262, BNSF Railway Company v. Union Pacific Railroad Company, Expert Report of Michael R. Baranowski

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April 26, 2019	American Arbitration Association Case No. 01-17-0000-0130, J.B. Hunt Transport, Inc. and BNSF Railway Company, Reply Expert Report of Michael R. Baranowski
January 18, 2021	American Arbitration Association Case No. 01-18-0001-3283, BNSF Railway Company & Norfolk Southern Railway Company, and Dynegy Midwest Generation, LLC, Expert Report of Michael R. Baranowski on Behalf of BNSF & NS
February 5, 2021	American Arbitration Association Case No. 01-18-0001-3283, BNSF Railway Company & Norfolk Southern Railway Company, and Dynegy Midwest Generation, LLC, Expert Reply Report of Michael R. Baranowski on Behalf of BNSF & NS
January 14, 2022	Arbitration between The Port of Vancouver, USA and BNSF Railway Company, Reply Expert Report of Michael R. Baranowski

Select Pipeline Testimony

Federal Energy Regulatory Commission

November 20, 2019	Docket Nos. OR18-7-002, et al. (Consolidated), Epsilon Trading, et al v. Colonial Pipeline Company, Prepared Answering Testimony of Michael R. Baranowski on behalf of Colonial Pipeline
March 20, 2020	Docket Nos. OR18-7-002, et al. (Consolidated), Epsilon Trading, et al v. Colonial Pipeline Company, Prepared Answering Testimony to Trial Staff of Michael R. Baranowski on behalf of Colonial Pipeline

EXHIBIT 2

Nathaniel S. Zebrowski

Managing Director
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8251 Greensboro Drive, Suite 1111 – McLean, VA 22102
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Education

B.A. in Economics, Northwestern University

Graduate Certificate in Transportation Policy, Operations, and Logistics, George Mason University

Nathan Zebrowski is a Managing Director in the Network Industries Strategies group of the Economic Consulting segment, located in McLean, VA. He provides financial and economic consulting services to the transportation and energy industries.

Mr. Zebrowski's work combines economic and statistical training with deep industry expertise and project experience. His work includes freight transportation market analysis; competitive assessments and valuations for transportation assets, services, and systems; contract evaluation, negotiation support, regulatory risk assessment, and damages determinations; litigation and expert witness testimony; rate reasonableness inquiries including application of regulatory tests; M&A related analysis and support; and operational, capital investment, and cost studies.

In Mr. Zebrowski's work evaluating network enterprises, he is informed by an intimate knowledge of the fundamental economics related to long-lived network assets, the unique realities affecting network operations and the highly individualized nature of the regional and commodity markets in which transportation businesses participate. He has special expertise in developing complex computer models assessing traffic flows over railroad networks and conducting detailed studies on costs, operations, and pricing of freight transportation services.

Representative Engagements:

Railroad Testimony

March 7, 2016	Docket No. 42142 Consumers Energy Company v. CSX Transportation, Inc., Reply Evidence of CSX Transportation, Inc.
October 29, 2021	Docket No. FD 36500, Canadian Pacific Ry. – Control – Kansas City Southern, Railroad Control Application, Verified Statement of Nathaniel S. Zebrowski and Richard W. Brown

Preparation of Evidence (Sponsored by Others)

Surface Transportation Board

November 30, 2012	Docket No. 42125 E.I. DuPont De Nemours & Company v. Norfolk Southern Railway Company, Reply Evidence of Norfolk Southern Railway Company
December 7, 2012	Docket No. Ex Parte 715, Rate Regulation Reforms, Reply Comments of the Association of American Railroads, Verified Statement of Michael R. Baranowski
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Federal Courts

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Federal Energy Regulatory Commission

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March 20, 2020	Docket Nos. OR18-7-002, et al. (Consolidated), Epsilon Trading, et al v. Colonial Pipeline Company, Prepared Answering Testimony to Trial Staff of Michael R. Baranowski on behalf of Colonial Pipeline

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Ex Parte No. 711 (Sub-No. 1)

Reciprocal Switching

Verified Statement and

Written Testimony of

Mark Fagan

February 14, 2022

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Verified Statement and Written Testimony of Mark Fagan

I. INTRODUCTION AND EXECUTIVE SUMMARY

I am Mark Fagan. I am a Lecturer in Public Policy at Harvard Kennedy School, Harvard University, where I teach courses on operations management, policy, advocacy, and supply chains. One of my more recent course offerings at Harvard Kennedy School is "Service Delivery Via Systems Thinking and Supply Chain Management." Previously I was a Senior Fellow at the Center for Business and Government at Harvard Kennedy School where I conducted research on the impacts of open access on the railroad industry. I have worked with shippers and carriers as a management consultant for more than 35 years. As Vice President of Mercer Management Consulting (now operating as Oliver Wyman), I helped clients in a range of industries improve their supply chain efficiency and cost effectiveness. During my time at Mercer, I developed a distinctive expertise in sourcing strategy, helping clients negotiate lower total lifecycle costs with suppliers, including transportation providers. Since co-founding Norbridge, Inc., a management consulting firm with distinctive expertise in transportation and logistics, I have worked with Class I and shortline railroads in the United States and with a major freight railroad in Australia to enhance their operational and commercial performance. I previously submitted verified statements regarding forced switching in Ex Parte No. 711, *Petition for Rulemaking to Adopt Revised Competitive Switching Rules*, on behalf of the Association of American Railroads (filed May 30, 2013); and in this docket, *Reciprocal Switching*, Ex Parte No. 711 (Sub-No.1), on behalf of the Association of American Railroads (filed Oct. 26, 2016). I have reviewed and stand by that testimony, which I elaborate on here.

My research at Harvard Kennedy School includes examining the impact of regulation on markets, including the impact of open access regulation on public value creation. The term "public value creation" refers to an actual increase in economic value rather than a simple transfer of wealth between entities. Thus, to create new public value, new competition in the rail industry must lead to sustained competition-driven efficiencies, cost reductions, service improvements, investments, or expansion of rail traffic attracted from more expensive transportation modes, not simply reduced railroad margins. I have written about the impact of deregulation in the railroad industry, including a paper published by *Transportation* examining the impact of regulatory differences on rail freight share between the United States and the European Union.

The purpose of my submission is to describe an appropriate framework for determining whether the proposed rule ("Proposed Rule") for forced switching reflected in the Notice of Proposed Rulemaking (NPRM)[1] issued by the Surface Transportation Board (the "Board") creates public value and is therefore in the public interest. That framework involves, first, clearly defining the problem that the rule is intended to solve. Without a clear articulation of the problem, it is impossible to assess whether the proposed policy would be effective. If there are less intrusive interventions, or existing regulations, to address the identified problem, then

[1] *Petition for Rulemaking to Adopt Revised Competitive Switching Rules*, STB Ex Parte No. 711 (Sub-No. 1) (served July 27, 2016).

the Board should not entertain a significant change in policy and new regulatory structure. Only if the regulatory intervention under consideration is found to be the least disruptive means to address the identified problem is it then appropriate—indeed, necessary—to evaluate whether the Proposed Rule would create a net public benefit.

The role of those who create regulations is to "maximize the net benefits of these regulations to society. Such a concern requires that we assess both the benefits and costs of these regulatory policies and attempt to maximize their difference."[2] Engaging in this analysis requires an assessment of the public benefits flowing from the proposal, and identifying the likely costs and negative externalities. But the Board's proposed methodology for evaluating forced switching decisions only on a case-by-case basis is not a substitute for macro-level analysis. The railroad system is a network—indeed, it is a supply chain that is itself a participant in a multitude of supply chains—and failure to recognize the outsized network impacts of the Proposed Rule will inevitably lead to sub-optimal decision making. As a result, the Proposed Rule threatens to cause substantial disruption to supply chains in the United States. Moreover, it is a mistake to assume that the expected rate reduction to be enjoyed by those shippers benefiting from forced switching is itself a public benefit. Without something more—such as greater efficiency, cost reductions, improvements in service, or increase in investment—such a rate reduction is merely a wealth transfer from the railroads to shippers. A private wealth transfer, to be clear, is not a public benefit relevant to the Board's assessment here. In light of these considerations, the Board's Proposed Rule cannot be justified on the grounds of any reasoned decision-making process.

II. PROPER FRAMEWORK FOR ASSESSING THE EFFECTIVENESS FOR ANY REGULATORY INTERVENTION

Over the span of four decades, sound policymaking and logic have compelled policy makers to engage in a rigorous thought process for defining and evaluating their proposed policy, all with an eye towards ensuring that any policy action undertaken by the government generates more benefits than costs from a societal perspective. Both OMB Circular A-4[3] and Executive Order 12866,[4] issued by President Clinton, formalize the guiding principles and a structured methodology for approaching policymaking. This begins with an articulation of what is to be accomplished: What is the problem to be solved?

"If the regulation is designed to correct a significant market failure," OMB Circular A-4 instructs "you should describe the failure both qualitatively and (where feasible) quantitatively." OMB Circular No. A-4 at 4. From there, the agency must demonstrate that it examined relevant alternatives, such as evaluating whether regulatory structures already exist which can address the problem with minimal disruption to parties' expectations based on existing regulation. For instance, Executive Order 12866 directed that "[e]ach agency shall identify the problem that it intends to address (including, where applicable, the failure of

[2] Viscusi, Vernon, and Harrington, *Economics of Regulation and Antitrust* (4th ed.), at 9.

[3] Office of Management and Budget, Executive Office of the President, Circular No. A-4 (Sept. 17, 2003), 2003 WL 24011971, *available at* https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A4/a-4.pdf.

[4] Exec. Order No. 12866, 58 Fed. Reg. 51735 (1993).

private markets or public institutions that warrant new agency action) as well as assess the significance of that problem"; and "shall examine whether existing regulations (or other law) have created, or contributed to, the problem that a new regulation is intended to correct and whether those regulations (or other law) should be modified to achieve the intended goal of regulation more effectively." Exec. Order No. 12866 § 1(b); *see also* OMB Circular No. A-4 at 7 (an agency should "explore modifications of some or all of a regulation's attributes or provisions to identify appropriate alternatives"). Even facially useful regulations can "impede market efficiency," and therefore, "[i]n light of both economic theory and actual experience, a particularly demanding proof is required to demonstrate the need for" regulation constituting "price controls in competitive markets." *Id.* at 6.

Only once these steps have been undertaken—and a determination has been reached that there is no less intrusive means of addressing the identified problem—does it become appropriate to evaluate the benefits and costs of the proposed action and confirm that the expected benefits outweigh the costs.

A. The Board Fails to Identify the Problem It Seeks to Solve Through New Forced Switching Rules.

The Board acknowledges that its Proposed Rule represents a significant change in decades of policy on reciprocal switching, and that such a dramatic shift in statutory interpretation must be based on "reasoned analysis." Yet the Board has not offered such an analysis. There is no demonstration of the problem that has arisen in the intervening years since the existing regulation was adopted. And there has been no discussion of the range of possible solutions to an identified problem or why forced switching is the best of the possible solutions. In the absence of a clearly articulated problem, it is impossible to know that the proposed policy will address a valid concern that needs to be addressed. And without problem clarity, it is impossible to analyze the range of possible solutions to that problem or why forced switching is the best of the possible solutions.

The Board has failed to provide a concrete and measurable objective for its proposed policy change, at least in part because it has failed to specifically identify the underlying problem. Moreover, the Board does not consider other policy options to achieve whatever objective it has in mind. The Board must ask itself what aspect of its objective here is not being addressed—or is not capable of being addressed—under the current and long-standing reciprocal switching rules. The Board already has the authority to require switching "if the agency determines that it 'is necessary to remedy or prevent an act that is contrary to the competition policies of 49 U.S.C. 10101 or is otherwise anticompetitive.'" NPRM at 3. The Board also has authority to use its rate reasonableness process to address unreasonable rates. Anticompetitive behavior, behavior contrary to the competition policies of 49 U.S.C. §10101, or unreasonable rates, cannot justify the dramatic policy change represented by the Proposed Rule.

B. Case-by-Case Litigation Is Not a Substitute for Sound Policymaking.

The Board proposed a case-by-case process, after the forced switching rule is adopted, as a means to "weigh and balance the various rail transportation policy factors." NPRM at 15. "Case-by-case" sounds appealing inasmuch as it recognizes that the best remedies often depend on the specific circumstances. However, the case-by-case approach is not a substitute for a structured methodology in weighing costs and benefits when establishing a macro-level policy (such as forced switching) that will apply across an interconnected network.

Policymaking requires analysis of proposed actions and their impacts on social welfare before an idea is adopted as a policy. Macro-level analysis would enable the Board to understand the impacts of the Proposed Rule prior to adoption. Such insight would increase the likelihood that the right rule is adopted. Indeed, the Board has stated that it does not even intend to consider in case-by-case litigation the broad and important policy objectives that would be the subject of a macro-level analysis, such as Congress's desire to minimize regulatory intrusion into rail markets. Similarly, such an approach overlooks the cumulative impact of forced switching in terms of negative impact on service quality and efficiency of the rail system as a whole. Such a myopic approach ignores that railroads are themselves supply chains, and are also participants in greater global supply chains. Small impacts in one area can quickly reverberate throughout the entire chain and cause significant disruption.

C. Rate Reductions In Themselves Are Not Public Benefits, But Rather a Private Wealth Transfer from Railroads to Shippers.

A decision to implement the forced switching rule must be supported by the creation of net public value, a determination that begins with identifying the public benefits that flow from the proposal. Various shippers, including the National Industrial Traffic League whose proposal indirectly triggered this proceeding, appear to mistakenly assume that lower rates created by forced switching would on their own create public value. However, in the absence of sustainable cost reductions—resulting from competition (such as increased productivity or greater efficiency), improvements in service for the customer, and/or expansion of rail traffic attracted from more expensive transportation modes—the outcome of mandated access would be only a wealth transfer from the railroads to the shippers, not a creation of public value. The public does not benefit from a mere wealth transfer.

D. The Inefficiencies and Costs of Forced Switching Overwhelm Any Theoretical Advantages.

Even if some public benefits resulted from forced switching, net public value would be created only if the benefits outweighed all costs resulting from forced switching. Yet forced switching often results in additional interchanges. There are extra costs for handling as the incumbent interchanges the traffic to the competitor railroad seeking access. The railroads and shippers may also incur costs as transit times lengthen and become more variable. This reduces the timeliness of shipments for shippers that obtain access as well as other shippers whose traffic could be affected by congestion. There are also a host of indirect costs such as carriers

maintaining resources (cars, crews, terminal space) just in case they are given the business, as well as costs associated with congestion and inefficient use of existing capacity.

My research, including that described below, indicates that the costs of coordinating the access may well be sizeable, and coordination costs must be factored into the decision-making process. Coordination costs in this context refer to the full range of costs associated with access, from redundant terminal capacity to additional interchange expenses to longer transit times for shippers.

I have investigated open access in Australia, with the specific objective of determining whether Australia's open access regulation led to sustained public value creation. Australian regulators did not engage in the reasoned decision-making described herein before implementing the new regulatory framework, and therefore did not make any determinations regarding expected advantages and disadvantages of the forced access.

From my research, I come to the following conclusions regarding new access mandates for rail. First, the primary outcome of mandating access is a wealth transfer from railroads to shippers, rather than public value creation. The promise of competition leading to efficiency, investment, innovation, or increased quality of service did not materialize in Australia, nor did access-based competition appear to have increased rail share. In the absence of these benefits, the rate reductions which have resulted from forced access are simply a shift in profits from railroads to shippers. Second, the costs of coordination are significant. Operational costs stem from more hand-offs and the need to integrate rail operations. The administrative and regulatory costs associated with mandated access in Australia have also been significant. In sum, the ample costs of coordination are greater than any benefits gained once the private wealth transfer is appropriately disregarded: Forced access did not result in net public value creation.

III. THE PROPOSED RULE THREATENS TO CAUSE SIGNIFICANT DISRUPTION TO SUPPLY CHAINS.

We are currently living through a period of unprecedented strain on our supply chains.[5] From a shortage of toilet paper, to the lack of critical personal protective equipment (PPE) for our health care workers, to a shortage of semiconductors for auto production, supply chain problems are negatively impacting the country's safety, security and economy. The causes of the current supply chain failures are wide-ranging but three interacting factors sit at the root. First, unexpected demand spikes resulting from COVID-19-related changes in buying patterns outstripped capacity to meet orders. Second, long lead times are needed to coordinate changes in supply chains, especially complex chains. Third, most supply chains had become

[5]As defined by the Council of Supply Chain Managers, supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies.
https://cscmp.org/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.aspx

complex, but were left with little ability to quickly accommodate changes—demonstrating a lack of resiliency and agility.

Rectifying the supply chain problems is a top priority for the Biden Administration as outlined in Executive Order 14017.[6] The Executive Order called for a "comprehensive review of critical US supply chains to identify risks, address vulnerabilities and develop a strategy to promote resilience," reasoning that "[m]ore secure and resilient supply chains are essential for our national security, our economic security, and our technological leadership."[7] Below, I outline the dynamics at play in any supply chain, which can explain the success of some supply chains and failure of others. From these underlying principles of supply chains, I then draw conclusions regarding the impact of the Board's Proposed Rule: Put simply, the rule threatens to cause significant disruptions to supply chains which would reverberate through the rail network as well as the supply chains the railroads participate in.

A. Supply Chain Dynamics

Effective supply chains depend on the successful navigation of six principles, discussed further below. In the case of railroads, these forces at work within supply chains have outsized impact given that railroads are both their own networked supply chains—ensuring they have the resources to operate efficiently and effectively—and are also participants in even more complex supply chains, providing critical links between raw materials and finished goods. Thus, railroads must not only coordinate their plans and operations with a range of domestic and global partners, they also must operate multiple internal supply chains encompassing people, rolling stock, infrastructure and information.

Principle 1: Supply chains must simultaneously provide quality, efficiency, resilience, and agility.

Quality supply chains provide reliability, responsiveness, and assurance that expectations will be met. *Efficiency* reflects utilization of people, facilities, and information. *Resilience* focuses on how extensively shocks somewhere in the supply chain impact performance and how quickly the supply chain returns to steady state or a better state. *Agility* addresses how policy, processes, physical infrastructure, and information systems support effective supply chain performance. Success requires the mastery of each of these elements; failure on any single element can undermine an entire supply chain.

Principle 2: Holistic/systems thinking is the foundation for supply chain management.

Supply chains are, as the name implies, the integrated linkage of all participants. Taking a holistic view is necessary because optimizing one link in the supply chain does not guarantee optimizing the whole, whereas just one failed link can disrupt the entire supply chain. System dynamics modelling, which enables the operation of complex systems to be evaluated, provides

[6] Exec. Order No. 14017, 86 Fed. Reg. 11849 (2021).
[7] *See* https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf (White House Report describing the Executive Order).

strong evidence to support this proposition. For example, a system dynamics model of the spread of COVID-19 in Bozeman, Montana demonstrates that independently improving individual factors in the system has little impact on the overall spread. Rather, a successful intervention requires many aspects of the system to be modified in concert with each other.[8]

Principle 3: Supply chains require extensive collaboration for success.

The successful operation of supply chain systems requires extensive collaboration across all supply chain participants. The collaboration focuses on sharing management practices and information ranging from planning, to operations, to responding as unexpected events evolve. The greater the collaboration, the better the performance. However, several factors limit collaboration. Collaboration is expensive; it requires managerial time, as well as investment in integrated information technology and data sharing; and collaboration is typically predicated on trust between the parties, which is built with the benefit of time and aligned interests. And, notably, detailed collaboration is an unnatural act; most organizations focus their energy on enhancing performance within their own silo.

Principle 4: Increasing the number of participants in the supply chain makes collaboration exponentially more difficult.

The more participants in the supply chain, the greater the effort needed for collaboration. Alignment of incentives also becomes more difficult with more participants. If only one participant fails to fully collaborate the entire supply chain can collapse. Failure can also result if one participant focuses on its own performance, rather than that of the system. A relay race provides a useful analogy. Individual speed is necessary, but not sufficient. Beyond speed, the participants in the relay must coordinate the handoff of the baton which takes extensive training time. One failed handoff and the race is lost. The same logic applies in operating supply chains.

Principle 5: The weakest link of the supply chain degrades the overall performance of the supply chain.

The strength of the supply chain is limited by its weakest link. This is because any failure in the system propagates up and down the chain. Moreover, the intensity of failure increases with distance from the failure point. An example of this phenomenon is the "bullwhip effect," which is "defined as the demand distortion that travels upstream in the supply chain from the retailer through to the wholesaler and manufacturer due to the variance of orders which may be larger than that of sales."[9] One effective way to reduce the bullwhip effect is integrated planning, forecasting, operations, and performance measurement.[10] Returning to the relay

[8] https://metasd.com/2020/03/community-coronavirus-model-bozeman/
[9] https://www.cips.org/knowledge/procurement-topics-and-skills/operations-management/bullwhip-effect-in-supply-chain/
[10] https://www.cips.org/knowledge/procurement-topics-and-skills/operations-management/bullwhip-effect-in-supply-chain/

race analogy, the slowest runner or least effective baton passer limits the ability of the entire team to win the race.

Principle 6: Accurate and timely forecasts are required for supply chain success.

Understanding the workload of the supply chain is essential for quality and efficient performance. Each participant must understand the demand on its system. Moreover, the forecast must be sufficiently forward-looking for the supply chain to be able to adjust to changes in demand, whether up or down, before the changes occur. This is achieved by sharing real-time data and forecasts throughout the supply chain. Walmart understood the importance and power of fast, integrated data sharing to enable more accurate forecasts. Its successful execution of this idea revolutionized information sharing across the retail supply chain,[11] which has enabled Walmart to weather the COVID-related supply chain storms.

B. The Proposed Rule Increases Complexity and Costs, While Reducing Efficiency, Resiliency, and Agility.

Examining the role of railroads in supply chains through the lens of the principles described above, I reach the overarching finding that the Board's Proposed Rule would likely hinder the performance of the internal and external supply chains railroads participate in. This finding is premised on the following three conclusions:

Conclusion 1: The Proposed Rule introduces complexity and risk not just for the railroads, but for the entirety of any interconnected supply chain.

A forced switch creates a new node and link to be managed within the railroad network. Both carriers need to adjust their internal supply chains to accommodate the change. This requires redesigning the service plan not only at the interchange point but also at the shipper/receiver or any intervening touch points. Because railroads are themselves supply chains, the bullwhip effect applies to them internally as it does across supply chain partners. The added complexity requires more coordination of people, equipment, infrastructure, and information.

The forced switch introduces a new player in the supply chain and, in line with Principles 3 and 4 above, successful supply chains require extensive collaboration and communication which becomes more difficult with more participants. The requisite collaboration begins with forecasts of demand, timing, commodities, and so on. It extends to daily operations and includes how to handle unexpected events—from a hurricane to a shipment not ready to be placed or pulled at the customer. Even the best intentions for collaboration can go awry when the priorities of the two interacting railroads diverge. Given the complexity of railroad

[11] https://www.researchgate.net/publication/320239187_Wal-Mart%27s_Successfully_Integrated_Supply_Chain_and_the_Necessity_of_Establishing_the_Triple-A_supply_Chain_in_the_21st_century

operations, it is likely that the originating carrier's operational priorities at the switch location will not be the same as the interchange carrier's operational priorities.

Every node/link introduces risk to the supply chain because all processes have a degree of failure. Airline on-time arrival performance (74-87% in 2019 for the major airlines[12]) and even air safety (22 incidents and 297 deaths in 2019[13]) illustrate this point. The individual impact of failure risk is compounded across the supply chain. For example, an airline flight rerouted due a thunderstorm at the destination results in the aircraft and its crew missing their subsequent flights. The travelers also face impacts ranging from delayed arrival at their destinations to needing to find accommodations until they can be rebooked. This is not simply theoretical; the impact of supply chain risk can be quantified. Consider a supply chain with three participants, each performing at a 95% success rate. The concept of Rolled Throughput Yield projects the success rate for the entire supply chain is only 86%.[14]

A unique aspect of supply chains is that a failure in only one place can ripple through the entire supply chain. This is illustrated by the blockage of the Suez Canal by the Ever Given which disrupted supply chains around the globe. Each day the Suez Canal was blocked by this one ship, there were dozens of other container ships, and billions of dollars' worth of cargo, delayed. The alternative for some shippers was the far less efficient route of traveling around the tip of Africa. Perhaps unsurprisingly, there were bottlenecks at ports around the globe for weeks following the Ever Given's release from the Suez Canal. President Biden highlighted the cascading impacts of supply chain failures when he signed the "America's Supply Chains" Executive Order: "'For want of a nail, the shoe was lost. For want of a shoe, the horse was lost.'"[15] The White House's report on the Executive Order elaborated: "And on, and on until the Kingdom was lost. Small failures even at one point in supply chains can impact America's security, jobs, families, and communities."[16]

Conclusion 2: The Proposed Rule increases costs and reduces efficiency.

Focusing exclusively on the supply chain costs of the Proposed Rule (as distinguished from the operational costs of the Proposed Rule), the Board's Proposed Rule creates the need for coordination between railroads and creates associated managerial and operational costs. Railroads would be compelled to introduce a switch into the movement of goods—most likely creating a less efficient routing for those goods—without regard to the costs of coordinating and executing this inefficient hand-off in the supply chain. In supply chains the coordination costs are real and often non-trivial. I use a computer-based simulation of the beer supply chain to illustrate this with my graduate students. One group of students are able to collaborate; another group may not. The results show better performance through collaboration, but the

[12] https://www.travelmarketreport.com/articles/US-Airlines-On-Time-Performance-Improved-in-2019
[13] https://www.flightglobal.com/flight-international/how-fatal-lapses-impacted-airline-safety-in-2021/147053.article
[14] https://www.isixsigma.com/dictionary/rolled-throughput-yield-rty/
[15] https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf
[16] https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf

collaboration is extremely time-consuming and is predicated on trust, which must be built over time. Collaboration requires time, and time incurs cost. An ongoing real-world illustration of this can be seen in the continued challenges of distributing COVID-19 vaccines. Some states, such as Massachusetts, created mass vaccination sites yet still needed to coordinate with many smaller organizations to ensure the vaccination supply was widely available in all communities. In furtherance of this goal, Massachusetts invested large amounts in building a website and data infrastructure for scheduling vaccination appointments—yet the site promptly crashed when it went live given the surge of residents logging on.[17]

Supply chains work best when they are stable; the Proposed Rule reduces stability, especially given the case-by-case nature of the rule. Stability is present where the supply chain participants are constant; and where the associated policies, procedures and information flows are well understood and persist. Lack of stability limits the opportunity for continuous improvement. It also risks efficiency losses or higher costs to protect for variability. In supply chains, variability is mitigated through "safety stock"—extra resources to ensure the supply chain integrity can be maintained. Individual households during the COVID-19 pandemic have built up their own safety stock in the form of toilet paper, canned goods, and frozen meat. The evidence of this was the startlingly empty store shelves during the initial months of the pandemic. For railroads, "safety stock" capable of responding to uncertain operational requirements can translate into spare crews, power, terminal and line of road capacity—all of which is costly.

Conclusion 3: The Proposed Rule reduces resiliency and agility.

Supply chain resilience is the "ability of a given supply chain to prepare for and adapt to unexpected events; to quickly adjust to sudden disruptive changes that negatively affect supply chain performance; to continue functioning during a disruption; and to recover quickly to its pre-disruption state or a more desirable state."[18] The core tenets of resilience are: (1) rapid detection, response and recovery; (2) end-to-end data-driven-control; (3) redundancies (e.g., safety stock mentioned above); (4) collaboration of all supply chain participants; and (5) effective processes for demand planning.[19] Many of the core tenets require investment in infrastructure and operating practices to be able to accommodate unexpected shocks.

Rather than encouraging investment, the Proposed Rule reduces the incentive for investment; the possibility for switching puts at risk the return on investment for the incumbent's infrastructure and raises the hurdle rate. Lower investment increases the likelihood of failure from a shock, extends the recovery time and makes building back better more difficult. Evidence of a lack of resiliency in supply chains can be seen in the waters off the Port of Los Angeles in Long Beach. The spike in demand resulting from COVID-19 increased the volume of imports to Los Angeles and Long Beach, which led to a backlog because the Ports

[17] https://www.masslive.com/coronavirus/2021/02/massachusetts-covid-website-crash-pissed-off-gov-charlie-baker-says-his-hair-is-on-fire-as-officials-scramble-to-fix-appointment-process.html
[18] https://www.brookings.edu/techstream/how-to-build-more-secure-resilient-next-gen-u-s-supply-chains/
[19] https://www.brookings.edu/techstream/how-to-build-more-secure-resilient-next-gen-u-s-supply-chains/

were unable to rapidly respond and increase their capacity to offload ships. The growth in the backlog of ships stalled in the Ports over 2021 shows in a quantitative fashion the inability to respond to the spike. Offloading ships requires the Ports to have greater capacity, which is something that fixed infrastructure components of the supply chain could not rapidly offer. Similarly, the rest of the supply chain could not adapt; for example there was a lack of availability of truck drivers as well as equipment and warehouse capacity. Without the trucks to move it, or space to store it, backups of rail yards and terminals ensued.

Agility is the ability to respond quickly and effectively to changes in the internal and external environment, and in supply chains is largely achieved through constant and detailed information exchange and close ties among the partners. There is little incentive for the railroads to engage in this exchange under the forced switching rule. Even if incentives are aligned, on any given day what is a top priority for one railroad might be a low priority for another. The priority asymmetry can therefore lead to disruptions in the supply chain and failure to meet customer expectations. The Proposed Rule may create the possibility of an optionality (having a choice of carriers and routes), but the costs of coordination to make this operational change work are likely to swamp any potential benefits.

IV. CONCLUSION

The impetus for the Proposed Rule appears to be a desire to reduce rates for shippers. If that is the problem to be addressed, then the Board must clearly define the problem, determine whether it is a legitimate problem, assess the options, and then for those options, measure their benefits and advantages compared to their costs and downsides. In doing so, the Board must ensure that the identified benefits are, in fact, public value gains, and not just private wealth transfers from railroads to shippers. Experience with mandated access in Australia, as well as logic, teaches that there is significant downside risk to the Board's forced switching proposal, including an increase in coordination and operational costs, decreases in efficiency, and potentially significant disruption to the supply chains that railroads are connected to. Without a methodical analysis of the net benefits that the forced switching rule is assumed to generate, the Board lacks the basis for concluding that the NPRM could be in the public interest.

VERIFICATION

I, Mark Fagan, declare under penalty of perjury that the foregoing is true and correct and that I am qualified and authorized to file this verified statement and written testimony.

Executed on February 13, 2022.

Mark Fagan

APPENDIX 1

MARK FAGAN CV

Mark L. Fagan

Harvard Kennedy School, Harvard University

2015 – present: Lecturer in Public Policy

2011 – 2015: Adjunct Lecturer in Public Policy

Mr. Fagan teaches several courses at Harvard Kennedy School. Operations Management (MLD-601) focuses on delivering quality public services effectively. Service Delivery via Systems Thinking and Supply Chain Management (MLD-605) provides an in depth examination of creating public value though effective supply chains. He also teaches Policy Design and Delivery (API-501) for the first year Master in Public Policy students. In the past he has taught Lobbying: Theory, Practice and Simulations (DPI-351M) and a Field Lab course focused on the development and implementation of autonomous vehicles policy (API-510M).

Fagan is Faculty Chair for the Delivering Public Services: Efficiency, Equity and Quality Executive Education program at the Kennedy School. He is also a primary faculty member for a month-long executive education program for senior government officials focused on cross-boundary collaboration. He is the faculty lead for the Taubman Center at Harvard Kennedy School's Autonomous Vehicles Policies Initiative. Fagan conducts research that focuses on the impact of regulation on competitive markets. A focus has been on the impact of open access regulation on social welfare. He has examined rail open access regimes, especially for heavy haul railroads, across the globe. He has also published research results on the risk externality of hazardous materials transportation.

2004 to 2011: Senior Fellow, Center for Business and Government

Mr. Fagan was a Senior Fellow at the Mossavar-Rahmani Center for Business and Government at Harvard Kennedy School researching the effects of regulation on monopoly industries. He has written about the impact of deregulation in the railroad industry including a paper published by *Transportation* examining the impact of regulatory differences on rail freight share between the United States and the European Union. He has also examined the impact of electricity restructuring in the United States. The research in electricity markets has been published in the *Electricity Journal* and cited in the *New York Times*. Other research papers include the role of government in the financing of small and medium size enterprises to foster growth in China and the need for institutional innovation to support technology and globalization, a collaboration between Mr. Fagan and the Vice Minister for Science and Technology in China. In conjunction with his fellowship, Mr. Fagan has written a variety of teaching case studies.

Mark Fagan

Boston University School of Law

2008 – 2013: Lecturer in Law (part-time)

Mr. Fagan has taught three courses at Boston University School of Law. Trust and Honesty in the Real World (JD-965) enabled students to explore the reasons why business ethics is at a crossroads and what can be done to tip the scales toward trust and honesty. The course was taught through a series of case studies drawn from real business experiences which provide the students an opportunity to assess and discuss, within a specific business context, the motivations and actions of business leaders and lawyers that support or undermine trust and honesty. Securitization (JD-987A) provided students with the rationale for securitization as well as an overview of the process for completing transactions. Simulation exercises provided business and public policy context for securitization. Mr. Fagan also taught Lobbying and the Law (JD-727) where the students learned the legal foundation for lobbying, the strategies for success and the ethical issues of advocacy in the US and around the globe.

Norbridge Inc.

1994 – 2018: Partner and Co-founder

Mark Fagan is a founding partner of Norbridge, Inc. a general management consulting firm that has a distinctive competence in the transportation sector. Mr. Fagan specializes in helping companies solve commercial and operations management challenges. He works with clients in the transportation, telecommunications and utility industries as they grapple with increasing shareholder value in a deregulated world. His engagements include driving top line improvements from volume growth and pricing optimization. He also conducts assignments focused on cost elimination/reengineering. He has streamlined functions ranging from customer service to finance to operations. He also assists clients optimize their infrastructure, especially in light of evolving competition.

Mercer Management Consulting Co.

1979 – 1994: Vice President, Principal, Senior Associate, Associate, Consultant

Education

1977 – 1979: Harvard University, Masters Degree in City and Regional Planning

1973 – 1977 Bucknell University, BA

Mark Fagan

Publications - Books

- "Lobbying: Business, Law and Public Policy," Fagan, Vandeplas Publishing, 2015.
- "Lobbying," Gimate-Welsh, Fagan, Bermudez, Universidad Autonoma Metropolitana, Biblioteca Nueva, 2015.
- "Law and The Financial System: Securitization and Asset Backed Securities," Frankel and Fagan, Vandeplas Publishing, 2009.
- "Trust and Honesty in the Real World," Fagan and Frankel, Fathom Publishing, 2007.

Publications – Journal Articles, Working Papers and Conference Papers

- Autonomous Vehicles are Coming: Five Policy Actions Cities Can Take Now to Be Ready, Fagan, Comeaux and Gillies, 2021. https://www.hks.harvard.edu/sites/default/files/Taubman/Research/Autonomous%20Vehicles%20Are%20Coming_Five%20Policy%20Actions%20Cities%20Can%20Take%20Now%20to%20Be%20Ready.pdf
- Developing Urban Mobility Policy in Response to Autonomous Vehicles, Fagan and Eliot, 2021. https://www.hks.harvard.edu/sites/default/files/Taubman/AVPI/Taubman%20AVPI%20Simulation_11-2021.pdf
- Transportation of Toxic Inhalant Hazards: Addressing the Double Dichotomy, Mark Fagan, *Journal of Transportation Law, Logistics and Policy*, Vol 79, Number 1, 2012.
- Between Safety and Security: The Policy Challenges of Transporting Toxic Inhalation Hazards, Branscomb, Ellis and Fagan, *Journal of Homeland Security and Emergency Management,* 2012.
- Book review: Public Administration and Law, Rosenbloom et al, Third Edition, *Public Organization Review*, Volume 11, March 2011.
- Open Access for Heavy Haul Railroads: A Questionable Strategy for Social Welfare Gains, Fagan and Barcham, Transportation Research Forum Annual Conference (unpublished), 2010.
- Introducing Competition into Natural Monopoly Industries: An Evaluation of Mandated Access to Australian Freight Railroads, Regulatory Policy Program Working Paper RPP-2007-05, MR-CBG Kennedy School of Government, Harvard University.
- Nature versus Nurture: Why do Railroads Carry Greater Freight Share in the United States than in Europe, Jose Vassalo and Mark Fagan, *Transportation*, 34:177-193, 2007.
- Catalyzing Institutional Innovation, Shang Yong and Mark Fagan, *International Journal of Technology and Globalization*, Volume 2, Nos. 3/4, 2006.
- Measuring and Explaining Electricity Price Changes in Restructured States, Mark Fagan, *The Electricity Journal*, Volume 19, Issue 5, June 2006.

Mark Fagan

- Understanding the Patchwork Quilt of Electricity Restructuring in the United States, Mark Fagan, *Law and Society Review*, School of Law at Pontifical Universidad Catholic del Peru, 2006.
- SME Financing in China: Current Situation, Problems and Possible Solutions, Shanghais Zhao and Mark Fagan, Working Paper No. 2, Financial Sector Program Center for Business and Government, Harvard University, June 2005.

Published Cases

- Mark Fagan, "Preventing another Madoff: Reengineering the SEC's Investigation Process," HKS Case # 1950.0, July 22, 2015.
- Dante Perez and Mark Fagan, "Out Foxing the Flu," HKS Case # 2046.0, August 31, 2015.
- Dante Perez and Mark Fagan, "Queuing Theory to the Rescue: Managing Security Screening Lines at Logan Airport," HKS Case # 2049.0, September 27, 2015.
- Guy Stuart and Mark Fagan, "Improving the Flow of People: The Victoria Station Redesign," HKS Case # 2109.0, August 27, 2017.
- Benjamin Gilles and Mark Fagan, "Cashing Out: The Future of Cash in Israel," HKS Case # 2100.0, January 29, 2018.
- Jonathan Hui and Mark Fagan, "The Boston Public Schools' Student Assignment Process," HKS Case # 2067.0, August 27, 2018.
- Michal Rubin and Mark Fagan, "Fighting Counterfeit Currency through Cross Boundary Collaboration *Case A*," HKS Case # 2169.0, March 31, 2020.
- Michal Rubin and Mark Fagan, "Fighting Counterfeit Currency through Cross Boundary Collaboration *Case B*," HKS Case # 2170.0, March 31, 2020.
- Laurent Boinot, Marie Harnly and Mark Fagan, "Designing and Optimizing a Supply Chain: Keeping Drivers Safe in the Winter," HKS Case # 2185.0, June 30, 2020.
- Mark Fagan and Hugh Verrier, "Monetizing Regulations: TSA Generated Opportunities," HKS Case # 2189.0, September 28, 2020.
- Mark Fagan, Mayumi Cornejo and Tess Cushing, "Architect Pilot Scale Improve: A Framework and Toolkit for Policy Implementation," HKS Case 2216.0, May 12, 2021.
- Raina Gandhi and Mark Fagan, "OneBlood and Covid-19: Building an Agile Supply Chain," HKS #2233, October 20, 2021.

Forthcoming Publications:

- Mark Fagan and Sophie Dover, "Casa Pueblo: Community Based Electricity Resilience in Puerto Rico," HKS Case
- Mark Fagan and Tess Cushing, "Conflict Minerals: Influencing the Supply Chain for Public Purpose," HKS Case
- Mark Fagan, "Lobbying Course Mini Videos," HKS Videos
- Mark Fagan, "Lobbying Course Podcasts," HKS Podcasts

Mark Fagan

Testimony – Regulatory Proceedings

- Spill Response Information Order Expert Report, submitted to the British Columbia Ministry of Environment and Climate Change Strategy, June 2019.
- Verified Statement of Mark Fagan, before the Surface Transportation Board, STB Ex Parte No 711, Reciprocal Switching, October 2016.
- Verified Statement of Mark Fagan, before the Surface Transportation Board, STB Ex Parte No 711, Petition for Rule Making to Adopt Revised Competitive Switching Rules, May 2013.

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Ex Parte No. 711 (Sub-No. 1)

Reciprocal Switching

Verified Statement and

Written Testimony of

Debra J. Aron

February 14, 2022

Verified Statement and Written Testimony of Debra J. Aron

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I. Introduction and Executive Summary

My name is Debra J. Aron. I am a Vice President at Charles River Associates, an international consulting and expert services firm that provides, among other services, economic expertise for litigation, regulatory proceedings, policy debates, and business strategy. As laid out in greater detail at the end of this Statement and in my CV submitted as Appendix 1, I have deep expertise relating to economic and antitrust principles of competition and regulation, including competition, costing, pricing, and regulation issues in the telecommunications industry. I understand that the purpose of this proceeding is to consider whether the Board should modify the regulations governing reciprocal switching, an arrangement whereby the incumbent would be required to provide certain of its facilities to its competitor to enable the competitor to provide a particular service in competition with the incumbent.[1] The telecommunications industry became subject to a legal requirement in 1996 by which incumbent carriers were required to provide components of their networks to their competitors to enable their competitors to provide certain competitive services. I have been asked by the AAR to provide a description of the regulatory process that ensued to implement those requirements, their effects on the industry, and the lessons learned in the telecommunications industry that may be useful for the Board as it considers imposing its own new network sharing obligations on the railroad industry.

The Telecommunications Act of 1996 ("TCA" or "the Act") was passed with the intent of reducing prices, increasing quality, and encouraging innovation. As part of the TCA, incumbents were required to share certain network elements--to be determined by regulators--with their competitors. The Federal Communications Commission ("FCC") was assigned the task of implementing the TCA. This included deciding which elements should be shared based on standards provided in the TCA as well as defining how the shared elements should be priced.

[1] I understand that under the proposed regulations, "the Board would require the establishment of a switching arrangement when the switching arrangement either was practicable and in the public interest or was necessary to provide competitive rail service." Surface Transportation Board Notice, Docket No. EP 711 (Sub-No. 1), Reciprocal Switching, Decided: December 27, 2021 (hereafter, *STB Notice of Public Hearing*), p. 3. I understand that reciprocal switching refers to an arrangement by which an incumbent would be required to transport a shipper's traffic to an interchange point, where the rail cars would be switched to a competing carrier, thereby enabling a competing carrier the ability to offer its own single-line rate from the shipper's facility to the destination even where it does not have facilities that reach the shipper's facility. *STB Notice of Public Hearing*, p. 2.

What ensued over the next decade and beyond was not a smooth and successful opening of markets to competition. Instead,

- Despite advice and input from scores of industry participants, scholars, consumer groups, and other governmental agencies, the FCC's extensive efforts to determine workable standards for identifying if and when network components should be shared were repeatedly rejected by the courts;
- The multiple rounds of rejections of FCC rules by the Courts, and revisions by the FCC in attempts to respond, significantly destabilized the industry and were associated with industry-altering market reconfigurations;
- Regulators and industry participants instead devoted extensive resources over many years to arbitrations and other proceedings to fashion and then attempt to implement a pricing methodology, and regulators ultimately came to second-guess their own decision, leaving many issues unanswered to this day in an open proceeding at the FCC;
- By establishing rules for network sharing without consideration of the regulatory history of the industry, including the role of differential pricing, the FCC created opportunities for cherry-picking and undermining policy goals;
- The expectation envisioned by the TCA that the price for shared elements would be determined by negotiations between the incumbent and the competitor proved to be naïve as negotiations routinely failed despite the fact that the TCA provided an exceptionally attractive "carrot" intended to provide incentives for incumbents to cooperate.

II. Brief Background on the Telecommunications Act of 1996

The Telecommunications Act of 1996 was intended to advance competition in local wireline telephone service markets to reduce prices, increase quality, and encourage innovation.[2] The theory behind the TCA was that certain components of the wireline telecommunications network were potentially competitive, and other parts were not. Those that were not—for

[2] Telecommunications Act of 1996, Pub. LA. No. 104-104, 110 Stat., (hereafter, *TCA*), Preamble. At the time of the passage of the *TCA*, wireline telephony was the dominant form of voice communication and voice grade lines were frequently used to provide low levels of broadband access. Wireless technology was nascent and its eventual near-decimation of wireline service was not only unanticipated by most policy makers but was viewed by many industry observers as closer to science fiction than an inevitability. Voice grade lines connected to modems were used to access the Internet, and in some cases electronics were used to provide broadband service over a pair of voice grade lines.

example, certain "last mile" facilities that reached customers—were a bottleneck that purportedly impaired competition. Incumbent local telephone companies were required to share those bottleneck elements with their competitors. Sharing, or providing certain network components or elements to competitors, was known in the telecommunications industry as "unbundling" or "providing network elements on an unbundled basis." Those elements that had to be provided on an unbundled basis by the incumbent telephone companies to competitors could then be combined by the competitors with their own network elements or service components to offer a competitive service.[3] Incumbent telephone companies were also required to interconnect their networks with competitors' networks so that a call that was originated by a competitor's customer could be delivered to the incumbent's customer, and vice versa.[4]

To determine whether a network element had to be provided by incumbents on an unbundled basis to competitors, the statute established a standard that came to be known as the "necessary and impair" standard. The Commission was required to consider "at a minimum" whether "failure to provide access to such network elements would impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer."[5] The Commission was also required to consider whether access to proprietary elements was "necessary."[6]

Network elements that were required to be provided to competitors were to be provided at regulated rates. The law provided that the rates were to be based on "cost."[7] However, the law did not define what "cost" meant or what concept of "cost" was relevant to determining the regulated prices.

Predating the TCA was the US policy goal of "universal service." At the time, the universal service goal was that all households have access to (and subscribe to) wireline

[3] See *TCA*, Sec. 251(c)(3). Some exceptions and exemptions were included in the law, in particular for some rural incumbents. See *TCA*, Sec. 251(f) and First Report and Order, *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, and Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers*, Before the Federal Communications Commission, CC Docket Nos. 96-98 and 95-185, FCC 36-325 (Released: August 8, 1996), (hereafter, *First Report and Order*), ¶ 38.
[4] *TCA*, Sec. 251(c)(2).
[5] *TCA*, Sec. 251(d)(2)(B).
[6] *TCA*, Sec. 251(d)(2)(A).
[7] *TCA*, Sec. 252(d)(1)(A)(i).

telephone service. To achieve universal service, pre-TCA regulators had established differential retail pricing structures that entailed below-cost prices for some residential customers in high-cost areas, subsidized by residential customers in low-cost areas and by business customers, as well as by long distance service. In addition, to cover shared and common costs of the network while still satisfying universal service objectives, the regulated retail pricing structure generally imposed higher prices on business customers (who were thought to have less elastic demand) than on residential customers, even where residential prices were above incremental costs.[8] The TCA preserved universal service goals and did not require deregulation of retail prices or modification of retail pricing structures. The prescriptions of the TCA opening markets to competition and requiring network sharing at regulated rates caused friction with the existing complex system of differential retail pricing.

Several decisions had to be made by the FCC to implement the TCA, including (1) which components of incumbents' networks must be shared; and (2) how network components should be priced. These, and many other implementation decisions, instigated waves of regulatory proceedings and legal disputes; implicated business decisions by incumbents, potential entrants, and alternative technology providers; and triggered additional waves of regulatory disputes and litigation. The network sharing requirements did not, however, lead to widespread and sustained competition. I discuss these outcomes in the next sections.

III. The FCC Struggled to Devise Rules for Determining If and Where Incumbents Would Be Required to Share Specific Network Elements with Competitors

The TCA ordered the FCC to implement the high-level directives in the law. Regulators and the Courts struggled for years to develop and apply a workable understanding of the TCA's "necessary and impair" standard for when incumbents were required to make a particular network element available to competitors.

[8] Paul W. MacAvoy, THE FAILURE OF ANTITRUST AND REGULATION TO ESTABLISH COMPETITION IN LONG-DISTANCE TELEPHONE SERVICES (Cambridge, MA: The MIT Press, 1996), pp. 9-10 and Robert W. Crandall, AFTER THE BREAKUP: U.S TELECOMMUNICATIONS IN A MORE COMPETITIVE ERA (Washington, DC: The Brookings Institution, 1991), (hereafter, *Crandall 1991*), p. 28.

1. The FCC's first major attempt to interpret the TCA came six months after its passage, in what is known as the FCC's First Report and Order.[9] The First Report and Order was a 737-page document and was the outcome of extensive commenting, ex partes, and input by elite economists, legal scholars, industry participants, consumer groups, businesses, and governmental agencies.[10] In that Order, the FCC initially chose a broad standard governing the incumbent telephone companies' duty to share components of their networks.[11] Notwithstanding the detailed arguments and analyses provided by the FCC in its First Report and Order, the requirements imposed therein were hotly contested. Years of litigation followed.

The numerous challenges initially brought by the incumbent carriers and the states to the FCC's rules were consolidated in the Eighth Circuit, which affirmed the FCC's broad standards governing the incumbents' duty to share in 1997.[12] However, the Supreme Court reviewed and reversed the Eighth Circuit's order in January 1999. The Supreme Court found the FCC's standards for identifying which network components must be shared to be overly broad.[13]

2. In November 1999, the FCC responded to the Supreme Court's remand by issuing the UNE Remand Order,[14] in which it reevaluated its interpretation of impairment and the unbundling obligations of the ILECs and established new unbundling rules.[15] The UNE Remand Order was a 262-page document that again incorporated input from industry participants,

[9] *First Report and Order*.
[10] See *First Report and Order*, Appendix A, and comments footnoted throughout the Order.
[11] *First Report and Order*, ¶¶ 277-288.
[12] The Eighth Circuit invalidated the FCC's pricing principles, however, as discussed in the next section. The Supreme Court subsequently reversed the Eighth's Circuit on this issue as well, affirming the FCC's pricing methodology. See Section IV below and 525 U.S. 366 (1999), p. 366.
[13] The Supreme Court ruled that the FCC must apply "some limiting standard" on the scope of unbundled elements that is "rationally related to the goals of the Act." (525 U.S. 366 (1999), p. 388).
[14] Third Report and Order and Fourth Further Notice of Proposed Rulemaking, *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, Before the Federal Communications Commission, CC Docket Nos. 96-98, FCC 99-238 (Released: November 5, 1999) (hereafter, *UNE Remand Order*). "UNE" was telecom shorthand for "unbundled network elements," referring to network elements required to be shared.
[15] Order on Remand, *In the Matter of Unbundled Access to Network Elements and Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers,* Before the Federal Communications Commission, WC Docket No. 04-313 and CC Docket No. 01-338, FCC04-290 (Released: February 4, 2005) (hereafter, *Triennial Review Remand Order*), ¶ 8.

consumer groups, businesses, and state commissions.[16] In this Order, the FCC established a new, more limiting standard for determining which network components must be shared.[17]

This new standard was, again, the subject of years of rancorous dispute and litigation. In 2002, the D.C. Circuit Court held that the FCC's new standards as applied in the UNE Remand Order violated the TCA. In the FCC's words, "the D.C. Court held that the Commission's impairment decision was insufficiently 'granular' because its analysis did not account for differences in particular markets and particular customer classes."[18] The Court also held the FCC failed to balance the advantages of network sharing, in terms of fostering competition, and its costs, in terms of disincentives to invest in innovation and creating complex issues of managing shared facilities.[19]

3. In 2003, the FCC responded to the D.C. Circuit's decision and once again tried to establish unbundling standards in its Triennial Review Order.[20] The new standards were indeed mindful of the Court's admonition that requiring a local exchange carrier to provide components of its network to its competitors must entail a granular consideration of location-specific and customer-specific evidence. In practice, to comply with the new rules, incumbent carriers had to collect detailed evidence and develop sophisticated business case models, and then present those findings in adversarial proceedings. The Triennial Review Order thus led to the commitment of substantial resources by incumbents and potential competitors to more regulatory proceedings, hearings, and litigation.

In addition, the incumbent carriers contested the Triennial Review Order in the courts. In March 2004, with the regulatory hearings required by the Triennial Review Order already

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[16] See *UNE Remand Order*, Appendix A and statements footnoted throughout the Order

[17] The FCC determined that, "[T]he failure to provide access to a network element would 'impair' the ability of a requesting carrier to provide the services it seeks to offer if, taking into consideration the availability of alternative elements outside the incumbent's network, including self-provisioning by a requesting carrier or acquiring an alternative from a third-party supplier, lack of access to that element materially diminishes a requesting carrier's ability to provide the services it seeks to offer." *UNE Remand Order,* ¶ 51.

[18] *Triennial Review Remand Order*, ¶ 8.

[19] See *United States Telecom Ass'n v. FCC*, 359 F.3d 554 (D.C. Cir. 2004) (hereafter, *USTA II*), p. 9.

[20] Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, *In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange carriers and Implementation of the Local Competition Provisions of the Telecommunications Act of 1996 and Deployment of Wireline Services Offering Advanced Telecommunications Capability*, Before the Federal Communications Commission, CC Docket Nos. 01-338, 96-98, and 98-147, FCC 03-96 (Released: August 21, 2003) (hereafter, *Triennial Review Order*), ¶ 7.

underway, the D.C. Circuit Court again found the FCC's unbundling approach unsound and remanded it to the FCC.[21] While the Court credited the FCC for purporting to adopt in the Triennial Review Order a more granular approach, it faulted the FCC for promulgating a still-ambiguous standard. The Court also vacated the Commission's approach in other respects, including decisions regarding one heavily disputed network element known as mass market switching.[22]

4. In response to the D.C. Circuit's March 2004 remand of the FCC's Triennial Review Order (the 3rd time the Courts had remanded or rejected the FCC's unbundling rules), the FCC issued its Order on Remand in 2005.[23] In that Order on Remand the FCC imposed a standard that considers whether a hypothetical competitor of "reasonable" efficiency would be impaired, rather than whether a particular competitor would be impaired.[24] That standard encourages further dispute about the costs of the hypothetical company. In the same order, however, the FCC effectively put an end to the most contentious form of network sharing by removing mass market local switching as a required unbundled element.[25]

IV. The FCC's Efforts to Prescribe a Pricing Methodology Also Engendered Years of Litigation, Industry Instability, and Inefficiency

A regulatory requirement of network sharing requires a policy on price. As noted, the TCA required that prices be based on "cost," but did not provide additional guidance, leaving the interpretation of "cost" to the FCC. Economists did not, and do not, agree on what it means for prices to be "based on cost." In the months leading up to the First Report and Order (and in subsequent years) some economists argued that cost-based prices should be prices that cover historical costs, including a contribution to shared and common costs. Numerous other proposals were also advanced.[26]

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[21] *USTA II*, pp. 61-62.
[22] *USTA II*, pp. 12. In telecommunications, switching is the network component that connects lines and trunks and provides the intelligence to route calls toward the right destination.
[23] *Triennial Review Remand Order*.
[24] *Triennial Review Remand Order*, ¶ 24.
[25] *Triennial Review Remand Order*, ¶ 199.
[26] Some argued that cost-based prices should be based on "actual forward-looking" costs, which is to say, costs that the incumbent would incur in the future to replace existing network elements. Some argued that cost-based prices should be based on a hypothetical concept of what an "efficient" incumbent with an ideally designed

The FCC decided in the First Report and Order to adopt a concept it called Total Element Long Run Incremental Cost ("TELRIC").[27] TELRIC costs are forward-looking costs of a hypothetical network. It is likely that any methodology chosen by the FCC would have been contentious, because so many decisions made by market participants, investors, and others depend on the prices that are set, and some methodologies are more favorable to incumbents, some to competitors, and some to customers. Cost methodology affects the incentives for competitors to use shared elements, the incentives for incumbents and competitors to make investments, the ability of the incumbents to recover their costs (including their shared and common costs), the predictability of network demand, the ability of industry participants to provide a return to their investors, the potential for wealth transfers, the efficiency of the network, and the opportunities for arbitrage. In addition, all regulatory pricing rules run a risk of creating economic inefficiency.

Extensive resources were spent litigating regulatory and court disputes over the FCC's selection of a cost methodology.[28] At one point, the FCC's policy was invalidated by the Eighth Circuit Court, but the Supreme Court reversed that decision and upheld the FCC's action.[29]

Even though the FCC prevailed in its defense of its cost methodology in the courts, it nonetheless came to second-guess its own methodology after years of disputes and after observing its implementation in practice. In September 2003, the FCC issued a Notice of Proposed Rulemaking in which it invited proposals to revise TELRIC in light of the fundamental disputes about its methodology, the concerns about the prices that had ultimately been established, and concerns that those prices had discouraged investment. [30]

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network given then-current configuration of demand and technology would incur to build network elements. Some argued that cost-based prices should reflect the opportunity cost of the incumbent, including the incumbent's forgone contributions to its profits or its shared and common costs. Disputes also arose regarding whether "cost" should include a premium for the risk incurred by the incumbent for the potential created by unbundling for stranded investments and for the "real option" value unbundling creates for competitors.

[27] *First Report and Order*, ¶¶ 678-90.

[28] The TELRIC methodology, in practice, tended to result in prices that understated the incumbent's actual historical costs. Hence, it is not surprising that it was vigorously challenged by incumbents and defended by competitors. See Debra J. Aron, Kevin Dunmore, and Frank Pampush, "Worldwide Wait? How the Telecom Act's Unbundling Requirements Slow the Development of the Network Infrastructure," *Industrial and Corporate Change* 7, no. 4, (1998).

[29] *United States Telecom Ass'n v. FCC*, 290 F.3d 415 (D.C. Cir. 2002) (hereafter, *USTA I*), pp. 3-4.

[30] Notice of Proposed Rulemaking, *In the Matter of Review of the Commission's Rules Regarding the Pricing of Unbundled Network Elements and the Resale of Service by Incumbent Local Exchange Carriers*, Before the

Although the FCC has issued numerous orders related to unbundling since 2005, it appears that many of the issues raised in the TELRIC NPRM remain unresolved to this day.[31]

V. Repeated Revisions to the FCC's Rules in Response to Legal Challenges Disrupted the Market for Incumbents and Competitors

The struggles at the FCC to navigate the complex issues related to forced network sharing had significant negative impacts on both incumbents and competitors. Because of the uncertainty arising from repeated revisions to the FCC's sharing requirements, it was considerably more difficult for carriers to effectuate the careful planning and skilled execution that are necessary to manage a large-scale network and negotiate entry in competition with an incumbent.

The peril of relying on the FCC's changing standards was realized when, for example, the FCC reversed itself and removed unbundled mass market local switching from the list of required shared elements in 2005. Unbundled mass market local switching was important to certain competitors because it could be combined with other required shared elements (creating what was termed an unbundled network element "platform") so that competitors could, in essence, obtain an entire end-to-end service at below-cost rates. This allowed competitors to focus competitive efforts on the incumbent's most profitable customers and locations while using the incumbent's facilities at rates that were below cost. Numerous competitors adopted the

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Federal Communications Commission, WC Docket No. 03-173, FCC 03-224 (Released: September 15, 2003), (hereafter, *TELRIC NPRM*), ¶ 5; *see also* "This NPRM solicits comment on tentative conclusions and modifications to our current UNE pricing regime that seek to preserve its forward-looking emphasis and its pro-competitive purposes, while at the same time making it more transparent and theoretically sound. Specifically, we propose to simplify TELRIC pricing, while simultaneously improving the accuracy of its pricing signals, by resolving one of the key internal tensions that marks its current application: the assumption that for some purposes rates should reflect a market with widespread facilities-based competition but, for other purposes, rates should reflect a market with a single dominant carrier. We seek comment on an approach that bases UNE prices on a cost inquiry that is more firmly rooted in the real-world attributes of the existing network, rather than the speculative attributes of a purely hypothetical network." (*TELRIC NPRM*, ¶ 4.). The NPRM also discussed unresolved pricing issues related to the network assumptions, cost of capital, depreciation lives, expense factors, non-recurring charges, rate structure, rate deaveraging, rate changes over time, and resale pricing. See *TELRIC NPRM*, pp. 1-2.

[31] It is likely that these contentious issues remain unresolved because, at least in part, of the FCC relenting on certain unbundling requirements. In particular, the elimination of forced sharing of mass market switching discussed above effectively rendered many of the disputes over the pricing methodology moot. It also resulted in a significant shakeup in the industry, as discussed in the next section.

opportunity when the FCC made it available, but the trend reversed when the FCC removed switching from the list of required unbundled elements.[32]

One of the competitors that adopted this business model in a big way was AT&T, which was able to enter the local telephone service market through the unbundled network element platform. When the FCC changed the rules and removed switching from the list of required unbundled elements that strategy collapsed, and the collapse had far-ranging impacts that reshaped the industry. It has been argued that it was the straw that broke AT&T's back, for example, and led to SBC purchasing AT&T for a small fraction of the market value commanded by AT&T only a few years earlier.[33]

VI. Regulators Were Overwhelmed in Contentious Arbitrations

The TCA, and subsequently the FCC, expressed a preference that incumbents and their competitors negotiate the prices of shared elements and resort to arbitrations and regulatory hearings only if negotiations broke down.[34] The naïve expectation that incumbents and competitors would be able to reach agreement via negotiation proved false. In practice, negotiations breaking down was the norm, resulting in difficult, costly, and contentious arbitrations and regulatory proceedings over the prices of the requested elements. Often at the center of these arbitrations and cost proceedings were competing cost models developed

[32] In the three-year period from June 2001 through June 2004 end users served by local competitors over unbundled network elements increased nationwide from 7.6 million to 19.6 million. The FCC removed switching from the list of required unbundled elements in February 2005, and by December 2005 the number of customers served by local competitors using UNEs dropped to 14.5 million, and by the end of 2007 it dropped to 10.6 million. According to the most recent FCC statistics, that number had dwindled to less than 2 million by 2019. Local Telephone Competition: Status as of December 31, 2007, Industry Analysis and Technology Division, Wireline Competition Bureau, Federal Communications Commission, September 2008, Table 3; and Voice Telephone Services: Status as of June 30, 2019, Industry Analysis Division, Office of Economics and Analytics, Federal Communications Commission, April 2021, Table 1.

[33] See Merger of SBC Communications Inc. and AT&T Corp., *Description of the Transaction, Public Interest Showing, and Related Demonstrations,* Filed with the Federal Communications Commission, February 21, 2005; Declaration of John Polumbo, ¶¶ 3-10; and Almar Latour and Shawn Young, "Boards of SBC and AT&T Approve $16 Billion Deal," *The Wall Street Journal,* January, 31, 2005, https://www.wsj.com/articles/SB110711095360640355. After the local service company SBC purchased what remained of AT&T, the combined company changed its name to AT&T to retain the vaunted brand name.

[34] *TCA*, Sec. 252(a) and *First Report and Order*, ¶ 133, "We believe the negotiation/arbitration process pursuant to section 252 is likely to proceed as follows. Initially, the requesting carrier and incumbent LEC will seek to negotiate mutually agreeable rates, terms, and conditions governing the competing carrier's interconnection to the incumbent's network, access to the Federal Communications Commission incumbent's unbundled network elements, or the provision of services at wholesale rates for resale by the requesting carrier.".

specifically for the purpose of estimating the relevant costs of the unbundled network elements at issue. The proceedings were very complex and highly technical, and often lasted for two or three years, as the regulators grappled with competing cost models, expert testimony, and conflicting interpretations of the pricing rules.[35]

Several of my colleagues and I participated in many of these proceedings. I experienced first-hand the cost, time, and effort they entailed for the incumbents, the competitors, and the regulators and regulatory staff.

The first wave of arbitrations was hastily held and often resulted in what later were recognized by commentators as unreasonable prices and sharing obligations. At a time when the industry was struggling to comprehend the TELRIC cost construct as described in the FCC's First Report and Order, incumbents and competitors were presenting voluminous testimony that was often at such a detailed and technical level that it overwhelmed even the industry savvy Commissioners and their staff.

With repeated changes in the FCC's interpretation of the impairment standard and rules for unbundling, the process became a test of stamina. Although establishing sound unbundling rules and rational prices was the main focus of industry experts and regulators for a number of years, the process proved considerably more difficult and resource-intensive than anticipated.

VII. The Forced Sharing Rules Were in Conflict with the Legacy Differential Price Structure for Universal Service, Leading to Cherry-Picking and Undermining Policy Goals

Many of the inefficiencies engendered by the unbundling obligations of the TCA can be traced to the fact that the TCA attempted to encourage competition with the narrow prescription of imposing network sharing obligations, but it lacked a holistic recipe for simultaneously conforming all of the other policy distortions that affect the viability of competition.

Before the TCA, retail and wholesale rates for telecom services were already regulated to achieve policy goals such as universal service (which had led to differential pricing), but these

[35] *TELRIC NPRM*, ¶ 6.

pricing structures were often incompatible with the goals that the TCA sought to promote.[36] The TCA did not take a holistic view of the market by anticipating the effects that the differential pricing structures in place would have on the market once sharing obligations were put in place. A more holistic approach would have entailed either abandoning universal service and its associated distorted pricing structure; or else retaining universal service but requiring an explicit support system rather than the implicit subsidies built into the retail and wholesale prices.

Instead, this disjointed, uncoordinated approach to facilitating a change in the marketplace via new sharing obligations predictably led to highly uneven patterns of competitive entry and to pernicious effects on incumbents. Differential pricing structures attracted competitors to areas where prices were well above costs in order to cherry-pick high revenue, low-cost customers, leaving the low-price and high-cost customers disproportionately with the incumbents. In the words attributed to the famous bank robber Willie Sutton, they targeted the high-revenue or low-cost customers because that's where the money was. But attracting away from the incumbents the very customers who were disproportionately financing the network left incumbents with the least profitable or unprofitable customers, while regulatory constraints on pricing prevented them from increasing rates on those remaining customers to replace the contribution to the network the lost customers were providing.

Requiring unbundling network elements in a manner that ignored differential pricing across geographic areas and customer groups provided arbitrage opportunities that led to inefficient competition and left the incumbents with the weight of funding universal service with fewer and fewer funds to do so. More generally, the failure of the regulators to engage in holistic regulatory reform—recognizing that legacy pricing structures and policy goals were in conflict with their network sharing objectives and market opening provisions, and addressing those factors simultaneously—created an asymmetric playing field rather than competition on the merits.

[36] As noted earlier, universal service was and continues to be a central public policy goal in telecommunications, and achieving this goal for over a half century prior to the *TCA* created pricing that was rife with cross subsidies and other forms of differential pricing. Arbitrage schemes flourish when there is differential retail pricing based on elasticity of demand or on any considerations other than cost, and arbitrage can undermine broader regulatory cost structures and goals (universal service) due to cherry picking.

VIII. Incumbents and Competitors Engaged in Lengthy, Costly Disputes Even Where the Law Provided Powerful Incentives to Cooperate

In its First Report and Order, the FCC ordered the incumbents to make the operational support systems (OSS) (which they use for pre-ordering, ordering, provisioning, maintenance and repair, and billing of unbundled elements) available to competitors on a nondiscriminatory basis by January 1, 1997.[37] The FCC took this step because competitors in their comments noted that incumbents possessed little incentive to do it on their own. In fact, incumbents faced perverse incentives to impede competitors from easily using their networks. For example, barring countervailing regulatory incentives, incumbents had an incentive to delay the handover of a customer to a competitor or to delay the "cutover" of a line to a competitor, the sort of behavior that is predictable, but very difficult to prove.

The TCA anticipated this incentive problem and attempted to build in a solution by providing a path for the major incumbent local exchange carriers to be allowed a new and highly attractive opportunity to compete in the long-distance market. Those local exchange carriers had been precluded from offering long distance service as a condition of the breakup of AT&T in 1984. The breakup, known as the "divestiture" of AT&T, assigned the long-distance business and facilities to the legacy "AT&T," and the local exchange businesses and facilities to seven separate Bell operating companies (the Regional Bell Operating Companies, or RBOCs), each serving a well-defined geographic area. Under the terms of the divestiture, the RBOCs were not permitted to provide long-distance service.[38] Under the TCA, however, an RBOC would be allowed to provide long-distance service *if* the RBOC demonstrated compliance with a "checklist" of items—including the OSS requirements—showing that it was cooperating with the market-opening provisions of the Act.[39]

But even this "carrot" did not have its desired effect; instead, it became its own point of contention. Like many other aspects of the unbundling aspects of the TCA, these requirements

[37] *First Report and Order*, ¶¶ 27, 505, and 516-528.
[38] *Crandall 1991*, pp. 38-39.
[39] These checklist items were provided in Section 271 of the Act, so became known as the "271 provisions." The checklist was in response to the concern that the RBOCs would have an incentive to impede competitors by failing to fully meet their market opening obligations; the incentive built into the *TCA* for the RBOCs to satisfy the checklist was the opportunity to offer long distance service which, at the time, was a deeply attractive prospect indeed.

(and all the other checklist items) were heavily disputed. Competitors (understandably) demanded that new, costly systems be built by the incumbents so that hand-off of customers would not entail significant delays; incumbents (understandably) insisted that competitors or the industry generally, but not incumbents alone, should bear the costs of these very costly new systems. Incumbents also (not surprisingly) pushed back on the demands of competitors for faster and more automated provisioning systems that would make it faster and therefore more attractive for customers to switch providers. Costly, technical, and highly disputatious proceedings regarding the actual performance of the incumbent systems, regarding the proper policy solution to the question of who should bear the costs of these systems, regarding the ongoing monitoring, if any, of these systems, and regarding the other checklist requirements, ensued over years.

The "carrot" of allowing the incumbents to enter the long-distance market was intended to create powerful incentives for incumbent carriers to cooperate with the sharing obligations of the TCA. Yet even with the powerful incentives built into the law for incumbents to cooperate with sharing rules, there were intense conflicts and years of proceedings about whether or not the incumbents were complying with the conditions of the incentives.

IX. Conclusion

Competition in telecommunications was emerging and poised to expand prior to the TCA, and the TCA was an attempt to foster additional competition in a manner that furthered the long held public policy goals of lower prices, higher quality services, and the rapid adoption of new technology. As it unfolded, however, the complex nature of determining which components of incumbents' networks should be shared and establishing a pricing policy for those components proved considerably more difficult, costly, disruptive, and litigious than expected. The repeated corrections and reversals of policy caused instability in the market and, ultimately, vast reallocations of resources. Unbundling was the main focus of many, probably most, regulators and industry experts for the better part of eight years, and yet many of the problems, both anticipated and unforeseen, proved resistant to adequate solutions.

X. About the Author

After receiving a Ph.D. in economics from the University of Chicago in 1985, I was an Assistant Professor of Managerial Economics and Decision Sciences at Northwestern University's J. L. Kellogg Graduate School of Management from 1985 to 1992, and a Visiting Assistant Professor of Managerial Economics and Decision Sciences from 1993-1995, teaching Masters and Ph.D. courses in managerial economics, information economics, the economics and strategy of pricing, and the economics of competitive strategy. From 1987 to 1990 I also held the position of Faculty Research Fellow with the National Bureau of Economic Research. I continued to teach graduate courses on economics and business strategy at Northwestern University in most years between 2000 and 2016 as an Adjunct Associate Professor in the Masters of Science in Communications program. I have published scholarly articles on innovation, competition, incentives, and pricing in several leading academic journals, including the *American Economic Review*, the *RAND Journal of Economics*, and the *Journal of Law, Economics, and Organization*. I am co-author of the economics chapter of the American Bar Association's Practice Guide on Telecommunications and Antitrust (the *Telecom Antitrust Handbook*).

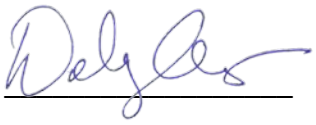
I have testified in several states and submitted affidavits to the Federal Communications Commission regarding economic and antitrust principles of competition in industries undergoing deregulation; measurement of competition and market power in telecommunications markets; the proper interpretation of Long Run Incremental Cost and its role in pricing; the economic interpretation of pricing and costing standards in the Telecommunications Act of 1996; Universal Service; and proper pricing for mutual compensation for call termination. I have testified in a number of states on issues pertaining to broadband markets, broadband deployment, and incentives for broadband investment. I was involved as an expert witness in the years following the passage of the TCA in numerous regulatory proceedings related to implementing the provisions of that law. I have also consulted to carriers in Europe, the Pacific, and Latin America on interconnection and competition issues, and have consulted on issues pertaining to local, long distance, broadband, wireless, telephone numbering, and equipment markets. I have conducted analyses of mergers in many other industries under the U.S. Department of Justice and FTC Merger Guidelines. In addition, I have consulted in other industries regarding potential

anticompetitive effects of bundled pricing and monopoly leveraging, market definition, and entry conditions, among other antitrust issues. My professional qualifications are detailed in my curriculum vitae, which is submitted as Appendix 1.

VERIFICATION

I, Debra J. Aron, declare under penalty of perjury that the foregoing is true and correct and that I am qualified and authorized to file this verified statement and written testimony.

Executed on February 11, 2022.



Debra J. Aron

APPENDIX 1

CRA Charles River Associates

Debra J. Aron

Vice President

PhD, Economics
University of Chicago

BA, Economics
University of California at Los Angeles

Dr. Debra J. Aron is a Vice President in the Competition Practice. Debra applies her expertise in economic and policy matters, including competition and antitrust analysis, intellectual property, class certification, and damages analysis, in both regulatory and litigation disputes. She has provided expert testimony for over 20 years in a variety of high-stakes federal, state, regulatory, and arbitration cases relating to competition and antitrust including market definition, conduct cases, and price fixing damages, intellectual property damages including patents and trade secrets; class actions and class certification including consumer fraud matters and TCPA; pricing; unjust enrichment; and economic cost analyses. She also has conducted competition analyses in several high-profile mergers and macroeconomic analyses of pricing and investment changes. Dr. Aron's practice spans many industries, and she has a specific expertise in telecommunications and technology, including wireless services, wireline services, backbone, RAN, and customer premises equipment, satellite communications, and computer technology.

Publications

"The FCC's Reassigned Numbers Database Won't Help TCPA Class Cert.," *Law360* (September 16, 2021).

"The Economics of 5G Deployment in the "Race" to 5G: The Economic Effects of Adopting New Technology," with Olga Ukhaneva and Chloe Sun, *CRA Insights: The Economics of 5G* (March 2021).

"The Economics of 5G Deployment in the "Race" to 5G: The State of 5G in the US, South Korea, and Other Countries," with Andy Baziliauskas, Olga Ukhaneva, and Chloe Sun, *CRA Insights: The Economics of 5G* (December 2020).

"The Economics of 5G Deployment in the "Race" to 5G: The Role of Open RAN," with Olga Ukhaneva and Chloe Sun, *CRA Insights: The Economics of 5G* (October 2020).

"The Damaging Effects of Large Postal Service Price Increases on Online Retailers, Consumers, and the U.S. Postal Service," with Justin Lenzo, Ph.D., Charles River Associates Whitepaper, September 28, 2020.

"The Economics of 5G Deployment in the 'Race' to 5G: The Role of Massive MIMO," with Olga Ukhaneva and Chloe Sun, *CRA Insights: The Economics of 5G* (August 2020).

"The Economics of 5G Deployment in the 'Race' to 5G: The Role of Mid-Band Spectrum," with Olga Ukhaneva and Chloe Sun, *CRA Insights: The Economics of 5G* (July 2020).

"An Economic Perspective on Balancing Unquantified Harms and Benefits Under the Consumer Welfare Standard," with Steven Tenn, 2019 COLUM. BUS. L. REV. (2019).

"Lessons from the Economic Deregulation of the Airline and Telecommunications Industries," *Infrastructure* 58, no. 2 (Winter 2019).

"An Empirical Analysis of Regulator Mandates on the Pass Through of Switched Access Fees for In-State Long-Distance Telecommunications in the U.S.," with David E. Burnstein, Ana Danies, and Gerry Keith, June 19, 2013. Available at SSRN: http://ssrn.com/abstract=1674082.

Contributing author, ABA SECTION OF ANTITRUST LAW, TELECOM ANTITRUST HANDBOOK, Second Edition, (Chicago: American Bar Association), March 2013.

"The Effects of Legacy Pricing Regulation on Adoption of Broadband Service in the United States," with Allan T. Ingraham, *Review of Network Economics* 11, issue 4, 2012.

"Social Welfare Implications of Liability Rules in Major Environmental Damages Cases," with Francis X. Pampush, Environmental Litigation Committee Newsletter, Fall 2011.

"Regulatory Policy and the Reverse Cellophane Fallacy," with David E. Burnstein, *Journal of Competition Law and Economics* 2010; doi: 10.1093/joclec/nhp033.

"Investment in Next Generation Networks and Wholesale Telecommunications Regulation," with Robert W. Crandall, November 3, 2008. Available at SSRN: http://ssrn.com/abstract=1294910.

"Pricing Principles and Pricing Methodologies for Essential Facilities," May 2008.

Contributing author, ABA SECTION OF ANTITRUST LAW, TELECOM ANTITRUST HANDBOOK, (2005), (Chicago: American Bar Association), 2005.

"The Proper Treatment of Spare Network Capacity in Regulatory Cost Models," with Ana Danies, May 2005. Available at SSRN http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2133365.

"State Commissions Systematically Have Set UNE Prices Below Their Actual Costs," with Frank Pampush and E. Gerry Keith, November 2003. Available at SSRN http://ssrn.com/abstract=3327613.

"Broadband Adoption in the United States: An Empirical Analysis," with David E. Burnstein, in DOWN TO THE WIRE: STUDIES IN THE DIFFUSION AND REGULATION OF TELECOMMUNICATIONS TECHNOLOGIES, Allan Shampine, ed., (Nova Science Publishers, Hauppauge, NY, 2003).

"Developments in the Theory of Vertical Foreclosure as Applied to Regulated Telecommunications Markets" (March 2002), Prepared for Presentation at The American Bar Association Section of Antitrust Law, 50th Annual Spring Meeting.

"Modifications at HHIs for Vertical Supply Relationships" with Wenqing Li and James Langenfeld, White Paper submitted to European Commission, February 2000.

"Economic Theories of Tying and Foreclosure Applied—And Not Applied—in Microsoft," with Steven S. Wildman, *Antitrust* 14, no. 1, 1999, pp.48-52.

"Effecting a Price Squeeze Through Bundled Pricing," with Steven S. Wildman, in COMPETITION, REGULATION, AND CONVERGENCE: CURRENT TRENDS IN TELECOMMUNICATIONS POLICY RESEARCH, Gillett and Vogelsang, eds. (New Jersey: Lawrence Erlbaum Associates, Inc.) 1999, pp. 1-17.

"Worldwide Wait? How the Telecom Act's Unbundling Requirements Slow the Development of the Network Infrastructure," with Ken Dunmore and Frank Pampush, *Industrial and Corporate Change* 7, no. 4, 1998, pp. 615-621.

"The Pricing of Customer Access in Telecommunications," with Steven S. Wildman, *Industrial and Corporate Change* 5, no. 4, 1996, pp. 1029-1047.

"Bonus and Penalty Schemes as Equilibrium Incentive Devices, With Application to Manufacturing Systems," with Pau Olivella, *Journal of Law, Economics, and Organization* 10, Spring 1994, pp. 1-34.

"Diversification as a Strategic Preemptive Weapon," *Journal of Economics and Management Strategy* 2, Spring 1993, pp. 41-70.

"Using the Capital Market as a Monitor: Corporate Spin-offs in an Agency Framework," *RAND Journal of Economics* 22, Winter 1991, pp. 505-518.

"Firm Organization and the Economic Approach to Personnel Management, *American Economic Review* 80, no. 2, May 1990, pp. 23-27.

"The Introduction of New Products," with Edward P. Lazear, *American Economic Review* 80, no. 2, May 1990, pp. 421-426.

"Ability, Moral Hazard, Firm Size, and Diversification," *RAND Journal of Economics* 19, Spring 1988, pp. 72-87.

"Worker Reputation and Productivity Incentives," *Journal of Labor Economics* 5, no. 4, October 1987, part 2, pp. S87-S106.

"The Role of Managerial Ability and Moral Hazard in the Determination of Firm Size, Growth and Diversification," Ph.D. Dissertation, University of Chicago, August 1985.

Presentations

Panelist, "Competition Within the Canadian Telecommunications Landscape," The Conference Board of Canada Virtual Leadership Roundtable, February 2022.

Panelist, Platform Antitrust, “On the Intersection Between Antitrust Enforcement and Other Regulatory Spheres as it Relates to Digital Platforms,” Global Competition Review Live 9th Annual Antitrust Law Leaders Forum, Miami Beach, Florida, February 2020.

“Balancing Unquantified Benefits and Harms Under the Consumer Welfare Standard,” The New York State Bar Association Antitrust Law Section, 2019 William Howard Taft Lecture, Commenter to the remarks of The Honorable Douglas H. Ginsburg, New York, New York, September 2019.

“The Impact on the U.S. Economy of Excluding Huawei from Participation in the U.S. Market for Wireless Network Equipment,” Presentation at the Fiscal Year 2019 National Defense Authorization Act, Section 889, Public Meeting of Department of Defense, General Services Administration, and NASA, Washington, D.C., July 19, 2019.

Moderator, “Your Expert Is Your Friend: How to Effectively Deliver Expert Testimony,” ABA: The Woman Advocate Committee Regional CLE Program: Raising the Bar, Chicago, Illinois, October 2018.

“Lessons from the Deregulation of the Airline and Telecommunications Industries,” ABA Infrastructure and Regulated Industries Section, Dallas, Texas, August 2018.

“Economic Fundamentals: Vertical and Coordinated Effects in Mergers,” ABA Section of Antitrust Law, Fundamentals of Antitrust Economics Series, Chicago, Illinois, July 2018.

Panelist, “Considerations for the Economists’ Analysis in Opt-Out Relative to Class Action Litigation,” ABA 5th Annual Western Regional CLE Program on Class Actions and Mass Torts, San Francisco, California, June 2018.

“Lessons from the Deregulation of the Airline and Telecommunications Industries,” ABA Infrastructure and Regulated Industries Section, Fall Council Meeting, Palm Beach, Florida, October 2017.

“Economic Fundamentals: Vertical and Coordinated Effects in Mergers,” ABA Section of Antitrust Law, Fundamentals of Antitrust Economics Series, Washington, D.C., May 2016.

Panelist, “Economic Fundamentals: Market Power,” ABA Spring Meeting, Washington, D.C., April 2016.

“The Economic Impact of Electricity Price Increases in Puerto Rico,” ABA Section of Public Utility, Communications and Transportation Law, Spring Council Meeting, Naples, Florida, March 2016.

Moderator, “Effective Cross-Examination of the Expert Witness: Practical Tips and Video Clips,” ABA Annual Meeting, Chicago, Illinois, July 2015.

Moderator, “The Science of Persuasion: Practical Insights from Research on Expert Witness Effectiveness and Jury Decision-Making,” ABA Section of Litigation Annual Conference, New Orleans, Louisiana, April 2015.

Panelist, “How to Manage Conversations with Expert Witnesses,” ABA Section of Litigation, Environmental, Mass Torts, & Products Liability Litigation Committees’ Joint CLE Seminar, Avon, Colorado, January 30, 2014.

"The Effects of Legacy Pricing Regulation on Adoption of Broadband Service in the United States," Federal Communications Commission, Washington, D.C., June 11, 2013.

Panelist, "A Primer: Getting the Most Out of Your Experts — Do's and Don'ts in the Use of Expert Witnesses: Learning from the Experts," ABA Section of Litigation Annual Conference, Chicago, Illinois, April 26, 2013.

"An Empirical Analysis of Regulator Mandates on the Pass Through of Switched Access Fees for In-State Long-Distance Telecommunications in the U.S.," with David E. Burnstein, Ana Danies, and Gerry Keith, Wesleyan University, Middletown, Connecticut, March 27, 2013.

"The Effects of Legacy Pricing Regulation on Adoption of Broadband Service in the United States," with Allan Ingraham, The 40th Research Conference on Communication, Information and Internet Policy (TPRC), September 22, 2012.

Panelist, "Two Decades of Daubert: Junk Science Replaced by Junk Rulings?" ABA Section of Litigation Annual Conference, Washington, DC, April 20, 2012.

"The Effects of Legacy Pricing Regulation on Adoption of Broadband Service in the United States," with Allan Ingraham, New America Foundation, workshop on Defining and Measuring Meaningful Broadband Adoption, April 11, 2012, Washington, DC.

"Social Welfare Implications of Liability Rules in Major Environmental Damages Cases," with Francis X. Pampush, American Bar Association Sections of Litigation and Criminal Justice Joint Annual Conference, April 15, 2011, Miami, Florida.

"Consumer Benefits of Intrastate Access Rate Reform in Minnesota," Center for Science, Technology and Public Policy, Humphrey School of Public Affairs, University of Minnesota, January 26, 2011.

"An Empirical Analysis of Regulator Mandates on the Pass Through of Switched Access Fees for In-State Long-Distance Telecommunications in the U.S.," with David E. Burnstein, Ana Danies, and Gerry Keith, The 38th Research Conference on Communication, Information and Internet Policy (Telecommunications Policy Research Conference), October 3, 2010, George Mason University Law School, Arlington, Virginia.

"Pricing Principles and Pricing Methodologies for Essential Facilities," The 36th Research Conference on Communication, Information and Internet Policy (TPRC), September 27, 2008.

"Regulatory Policy and the Reverse Cellophane Fallacy," with David E. Burnstein, 17th Biennial International Telecommunications Society Conference, Montréal, Québec, Canada, June 24-27, 2008.

"The Use of Economic Analysis in 'Industry Expert' Testimony," CLE course, XPRT Forum, March 7, 2008.

Presentations to the New Jersey Board of Public Utilities and to the New Jersey Legislature's Telecommunications Utilities Committee regarding the economic principles for a forward-looking regulatory agenda in light of the facts of competition nationwide and in New Jersey, and the costs of regulation, October – November 2006.

"The Interaction of Regulation with Economics and Financial Analysis in Litigation, Policy, and Strategy Consulting," CLE course, XPRT Forum, October 7, 2006.

"Comments on 'Economic Analysis in FCC Merger Proceedings,'" Conference on Economic Analysis and FCC Decisionmaking, presented by the Federal Communications Bar Association (FCBA) and Stanford Institute for Economic Policy Research (SIEPR), Washington, D.C., March 15, 2006.

"Economic Principles for Consumer Protection Rules," Pri Telecom / Tech Briefing, Santa Clara, California, October 11, 2005.

"The Proper Treatment of Spare Network Capacity in Regulatory Cost Models," Presentation at the Advanced Workshop in Regulation and Competition, Center for Research in Regulated Industries, Skytop, Pennsylvania, May 2005.

"Telecommunications Regulation: What's Obsolete? What Will Become Obsolete?" Presentation at the State and City Telecom Reform Conference, Heartland Institute, Chicago, Illinois, December 2004.

"Trends in Telecommunications Demand & Supply," Presentation at the 46th Annual NARUC Regulatory Studies Program, Michigan State University, August 2004.

"The Economic Costs of Proposed Wireless Regulations in California," Presentation to Commissioners Brown and Kennedy, California Public Utilities Commission, San Francisco, California, April 2004.

"The Economics of UNE Pricing: Presentation to Staff," Ex parte presentation to the staff of the FCC, in FCC WC Docket No. 03-173: Review of the Commission's Rules Regarding the Pricing of Unbundled Network Elements and the Resale of Service by Incumbent Local Exchange Carriers, March 2004.Unbundled Network Elements and the Resale of Service by Incumbent Local Exchange Carriers, March 2004.

"The High Cost of Proposed New Wireless Regulations," Presentation to the Pacific Research Institute conference "Regulating Wireless in California: Bill of Rights... or Wrongs?," San Francisco, California, April 2003.

"The TELRIC Showdown," Panelist, NARUC Staff Subcommittee on Telecommunications, 2002 Annual Convention, Chicago, Illinois, November 2002.

"Economic Principles for Efficient Pricing of Municipal Rights-of-Way," National Association of Telecommunications Officers and Advisors (NATOA), Chicago, Illinois, September 2002.

"Trends in Voice and Broadband Competition in Telecommunications Markets: Markets, Strategies, and Regulation," 82nd Annual Convention of the Indiana Telecommunications Association, Lexington, Kentucky, June 2002.

"Broadband Deployment in the United States," Emerging Opportunities in Broadband Symposium, Northwestern University, Evanston, Illinois, December 2001.

"Local Competition in Illinois," Illinois Telecommunications Symposium, Northwestern University, Evanston, Illinois, December 2000.

"Licensing and Access to Innovations in Telecommunications and Information Services," Telecommunications Policy Research Conference, Alexandria, Virginia, September 2000.

"Effecting a Price Squeeze Through Bundled Pricing," Federal Communications Commission, Washington, D.C., May 1999.

"Competitive and Strategic Use of Optional Calling Plans and Volume Pricing Plans," The Institute for International Research Conference for Competitive Pricing of Telecommunications Services, Chicago, Illinois, July 1998.

"Effecting a Price Squeeze Through Bundled Pricing," Consortium for Research in Telecommunications Policy Conference, University of Michigan, Ann Arbor, Michigan, June 1998.

"The Pricing of Customer Access in Telecommunications," Conference on Public Policy and Corporate Strategy for the Information Economy, Evanston, Illinois, May 1996.

"Diversification as a Strategic Preemptive Weapon," University of Iowa, Iowa City, Iowa, February 1994.

"Diversification as a Strategic Preemptive Weapon, "University of Buffalo, Buffalo, New York, February 1994.

"Diversification as a Strategic Preemptive Weapon," University of Southern California, Los Angeles, California, December 1993.

"Strategic Pricing," Winter Meetings of the Econometric Society, Discussant, Anaheim, California, December 1993.

"Innovation, Imitation, Productive Differentiation, and the Value of Information in New Markets," Michigan State University, Lansing, Michigan, November 1993.

"Diversification as a Strategic Preemptive Weapon," Rutgers University, New Brunswick, New Jersey, November 1993.

"Diversification as a Strategic Preemptive Weapon," University of California at Santa Cruz, Santa Cruz, California, November 1993.

“Diversification as a Strategic Preemptive Weapon,” Graduate School of Business, Stanford University, Stanford, California, November 1993.

“Innovation, Imitation, Productive Differentiation, and the Value of Information in New Markets,” Purdue University, West Lafayette, Indiana, September 1993.

“Innovation, Imitation, Productive Differentiation, and the Value of Information in New Markets,” Summer Meetings of the Econometric Society, Boston University, Boston, Massachusetts, June 1993.

“Innovation, Imitation, Productive Differentiation, and the Value of Information in New Markets,” University of California, Department of Economics, Berkeley, California, May 1993.

“Innovation, Imitation, Productive Differentiation, and the Value of Information in New Markets,” Stanford University, Graduate School of Business, Stanford, California, May 1993.

“Diversification as a Strategic Preemptive Weapon,” Stanford University, Graduate School of Business, Stanford, California, April 1993.

“Innovation, Imitation, Productive Differentiation, and the Value of Information in New Markets,” Hoover Institution, Stanford, California, April 1993.

“Innovation, Imitation, Productive Differentiation, and the Value of Information in New Markets,” University of California, Graduate School of Business, Berkeley, California, February 1993.

“Innovation, Imitation, Productive Differentiation, and the Value of Information in New Markets,” Stanford University, Department of Economics, Stanford, California, February 1993.

“Innovation, Imitation, Productive Differentiation, and the Value of Information in New Markets,” Hoover Institution, Stanford, California, January 1993.

“Pricing Strategies,” Session Discussant, 1992 North American Winter Meeting of The Econometric Society, Anaheim, California, January 1992.

“Diversification as a Strategic Preemptive Weapon,” University of Toronto, Toronto, Canada, November 1991.

“Diversification as a Strategic Preemptive Weapon,” Queen’s University, Kingston, Ontario, Canada, November 1991.

“Bonuses and Penalties as Equilibrium Incentive Devices, with Application to Manufacturing Systems,” University of Chicago, Chicago, Illinois, June 1991.

"The Timing of Entry into New Markets," Summer Meetings of the Econometric Society, University of Pennsylvania, Philadelphia, Pennsylvania, June 1991.

"Innovation, Imitation, Productive Differentiation, and the Value of Information in New Markets," University of Chicago, Chicago, Illinois, April 1991.

"Bonuses and Penalties as Equilibrium Incentive Devices, with Application to Manufacturing Systems," Winter Meetings of the Econometric Society, Washington, D.C., December 1990.

"Corporate Spin-offs in an Agency Framework," University of Washington, Seattle, Washington, October 1990.

"The Timing of Entry Into New Markets," University of British Columbia, Vancouver, British Columbia, October 1990.

"Corporate Spin-offs in an Agency Framework," Texas A&M University, College Station, Texas, April 1990.

"Firm Organization and the Economic Approach to Personnel Management," Winter Meetings of the American Economic Association, New York, New York, December 1989.

"Corporate Spin-offs in an Agency Framework," Western Finance Association Meetings, Seattle, Washington, June 1989.

"Corporate Spin-offs in an Agency Framework," University of Rochester, Rochester, New York, May 1989.

"Corporate Spin-offs in an Agency Framework," North American Summer Meetings of the Econometric Society, Minneapolis, Minnesota, June 1988.

"Competition, Relativism, and Market Choice," North American Summer Meetings of the Econometric Society, Berkeley, California, June 1987.

"Competition, Relativism, and Market Choice," University of Chicago, Chicago, Illinois, April 1987.

"Rate Reform and Competition in Electric Power," Discussant, Conference on Competitive Issues in Electric Power, Northwestern University, Evanston, Illinois, March 1987.

"Worker Reputation and Productivity Incentives," New Economics of Personnel Conference, Arizona State University, Tempe, Arizona, April 1986.

"Ability, Moral Hazard, and Firm Diversification," Various Universities, 1985, 1994, including Yale University, University of Rochester, Stanford University, University of Minnesota, California Institute of Technology, Duke University, Northwestern University, Brown University, Harvard University, University of California - Los Angeles, University of Pennsylvania.

Academic Journal Refereeing

Dr. Aron has served as a referee for The Rand Journal of Economics, the Journal of Political Economy, the Journal of Finance, the American Economic Review, the Quarterly Journal of Economics, the Journal of Industrial Economics, the Journal of Economics and Business, the Journal of Economic Theory, the Journal of Labor Economics, the Review of Industrial Organization, the European Economic Review, the Journal of Economics and Management Strategy, the International Review of Economics and Business, the Quarterly Review of Economics and Business, Management Science, the Journal of Public Economics, the Journal of Institutional and Theoretical Economics, and the National Science Foundation.

Testimony (2011-2021)

Deposition of Debra J. Aron in Jenny Brown, et al. v. DirecTV, LLC, United States District Court Central District of California, Western Division, No. 2:13-cv-01170-DMG-E, June 18, 2021.

Deposition of Debra J. Aron in Robin Breda, et al. v. Cellco Partnership d/b/a Verizon Wireless, United States District Court for the District of Massachusetts, Civil Action No. 1:16-cv-11512-DJC, June 3, 2021.

Deposition of Debra J. Aron in Naomi Gonzales v. Agway Energy Services, LLC, United States District Court for the Northern District of New York, Case No. 5:18-CV-235 (MAD/ATB), October 22, 2020.

Trial Testimony of Debra J. Aron in Sumotext Corp. v. Zoove, Inc. et al., United States District Court, Northern District of California, San Jose Division, Case No. 5:16-cv-01370-BLF-NMCx, March 3, 2020.

Trial Testimony of Debra J. Aron in Motorola Solutions, Inc. et al. v. Hytera Communications Corporation Ltd. et al., United States District Court for the Northern District of Illinois, Eastern Division, Case No. 1:17-cv-01973, February 3-4, 2020.

Hearing Testimony of Debra J. Aron in Order Instituting Rulemaking into the Review of California High Cost Fund-A Program, Before the Public Utilities Commission of the State of California, Rulemaking 11-11-007, January 29-30, 2020.

Prefiled Written Testimony of Debra J. Aron in Order Instituting Rulemaking into the Review of California High Cost Fund-A Program, Before the Public Utilities Commission of the State of California, Rulemaking 11-11-007, November 15, 2019.

Trial Testimony of Debra J. Aron in Hewlett-Packard Co. v. Quanta Storage Inc. et al., United States District Court for the Southern District of Texas, Houston Division, Case No. 4:18-cv-00762, October 21, 2019.

Deposition of Debra J. Aron in Motorola Solutions, Inc. et al. v. Hytera Communications Corporation Ltd. et al., United States District Court for the Northern District of Illinois, Eastern Division, Case No. 1:17-cv-01973, September 20, 2019.

Deposition of Debra J. Aron in Jonathan Coffey et al. v. WCW & Air, Inc. et al., United States District Court, for the Northern District of Florida, Pensacola Division, Case No. 3:17-cv-90-TKW-HTC, September 13, 2019.

Deposition of Debra J. Aron in Sumotext Corp. v. Zoove, Inc. et al., United States District Court, Northern District of California, San Jose Division, Case No. 5:16-cv-01370-BLF-NMCx, August 1, 2019.

Deposition of Debra J. Aron in Waddell Williams, et al. v. Bluestem Brands, Inc., United States District Court, Middle District of Florida, Tampa Division, Case No. 8:17-CV-1971-T-27AAS, September 21, 2018.

Deposition of Debra J. Aron in Robert Hossfeld, et al. v. Compass Bank, N.A., et al., United States District Court, Northern District of Alabama, Southern Division, Case No. 2:16-CV-2017-ACA, September 7, 2018.

Deposition of Debra J. Aron in Ventures Edge legal, PLLC, et al. v. GoDaddy.com, LLC, et al., United States District Court, District of Arizona, Case No. 2:15-cv-02291-GMS, January 30, 2018.

Deposition of Debra J. Aron in Rajesh Verma, et al. v. Memorial Healthcare Group Inc., et al., United States District Court, Middle District of Florida, Jacksonville Division, Case No. 3:16-CV-00427-HLA-JRK, June 27, 2017.

Trial Testimony of Debra J. Aron in T-Mobile USA, Inc. v. Huawei Device, USA, Inc., et al., In the United States District Court for the Western District of Washington at Seattle, Case No. C14-1351-RAJ, May 12, 2017.

Deposition of Debra J. Aron in Re Optical Disk Drive Antitrust Litigation, Hewlett-Packard Company v. Toshiba Corp., et al., United States District Court, Northern District of California, MDL Docket No. 3:10-MD-02143-RS, Case No. 3:13-cv-05370-RS, March 23, 2017.

Deposition of Debra J. Aron in Peerless Network, Inc., et al. v. AT&T Corp., In the United States District Court for the Southern District of New York, Case No. 15 CV 870, February 17, 2017.

Trial Testimony of Debra J. Aron in Thomas H. Krakauer, et al. v. Dish Network, L.L.C., In the United States District Court for the Middle District of North Carolina, Durham Division, Case No. 1:14-CV-333, January 17, 2017.

Deposition of Debra J. Aron in T-Mobile USA, Inc. v. Huawei Device, USA, Inc., et al., In the United States District Court for the Western District of Washington at Seattle, Case No. C14-1351-RAJ, September 29, 2016.

Deposition of Debra J. Aron in Southwestern Bell Telephone Co., et al. v. V247 Telecom, LLC, et al., In the United States District Court for the Northern District of Texas, Dallas Division, Case No. 3:14-CV-01409-M, August 31, 2016.

Hearing Testimony of Dr. Debra J. Aron in Order Instituting Investigation into the State of Competition Among Telecommunications Providers in California, and to Consider and Resolve Questions raised in the Limited Rehearing of Decision 08-09-042, Before the Public Utilities Commission of the State of California, Investigation 15-11-007, July 20, 2016.

Prefiled Written Rebuttal Testimony of Dr. Debra J. Aron in Order Instituting Investigation into the State of Competition Among Telecommunications Providers in California, and to Consider and Resolve Questions raised in the Limited Rehearing of Decision 08-09-042, Before the Public Utilities Commission of the State of California, Investigation 15-11-007, July 15, 2016.

Prefiled Written Testimony of Dr. Debra J. Aron in Order Instituting Investigation into the State of Competition Among Telecommunications Providers in California, and to Consider and Resolve Questions raised in the Limited Rehearing of Decision 08-09-042, Before the Public Utilities Commission of the State of California, Investigation 15-11-007, June 1, 2016 and March 5, 2016.

Deposition of Debra J. Aron in Ramzy Ayyad, et al. v. Sprint Spectrum, L.P., In the Superior Court of the State of California for the County of Alameda, Case No.: RG03-121510, March 29, 2016.

Deposition of Debra J. Aron in Avnet, Inc. and BSP Software, LLC v. Motio, Inc., In the United States District Court for the Northern District of Illinois, Eastern Division, Case No.: 1:12-cv-2100, March 9, 2016.

Deposition of Debra J. Aron in Lena K. Thodos and David Miller, et al. v. Nicor, Inc., et al., In the Circuit Court of Cook County, Illinois County Department, Chancery Division, Case No.: 1:12-cv-2100, February 22, 2016.

Deposition of Debra J. Aron in Henry Espejo, et al. v. Santander Consumer USA, Inc., In the United States District Court for the Northern District of Illinois, Eastern Division, Case No.: 1:11-cv-08987, January 12, 2016.

Deposition of Debra J. Aron in Rachel Johnson, et al., v. Yahoo!, Inc. and Zenaida Calderin, et al. v. Yahoo!, Inc., in the United States District Court for the Northern District of Illinois, Eastern Division, Case Nos.: 14-cv-2028 and 14-cv-2753 and Rafael David Sherman, et al., v. Yahoo!, Inc., In the United States District Court for the Southern District of California, Case No.: 13-CV-00041-GPC- WVG (Combined), June 23, 2015.

Trial Testimony of Debra J. Aron in Salsgiver Communications, Inc., et al., v. Consolidated Communications Holdings, Inc., et al., In the Court of Common Pleas, Allegheny County, Pennsylvania, Case No. No. GD 08-7616, May 2015.

Trial Testimony of Debra J. Aron in Sprint Communications Company L.P. v. Comcast Cable Communications, LLC, et al., In the United States District Court for the District of Delaware, Case No. 1:12-cv-01013-RGA, February 3-4, 2015.

Deposition of Debra J. Aron in Herbert Chen et al. v. Robert Howard-Anderson et al., In the Court of Chancery of the State of Delaware, Case No. C.A. 5878-VCL, December 16, 2014.

Deposition of Debra J. Aron in Sprint Communications Company L.P. v. Comcast Cable Communications, LLC, et al., In the United States District Court for the District of Delaware, Case No. 1:12-cv-01013-RGA, November 20, 2014.

Testimony of Debra J. Aron in Bayer CropScience LP v. Albaugh, Inc., et al., Before the American Arbitration Association, Case No. 16-171-Y-00511-12, October 20-21, 2014.

Trial Testimony of Debra J. Aron in Comcast IP Holdings I, LLC v. Sprint Communications Company L.P., et al., In the United States District Court for the District of Delaware, Case No. 12-205-RGA (CJB), October 9, 2014.

Prefiled Written Reply Testimony of Debra J. Aron in The Utility Reform Network v. Pacific Bell Telephone Company, Before the Public Utilities Commission of the State of California, Case No. 13-12-005, October 3, 2014.

Deposition of Debra J. Aron in Amanda Balschmiter, et al., v. TD Auto Finance, LLC, In the United States District Court, Northern District of Illinois, Eastern Division, Case No. 13cv1186, September 10, 2014.

Prefiled Written Testimony of Debra J. Aron in The Utility Reform Network v. Pacific Bell Telephone Company, Before the Public Utilities Commission of the State of California, Case No. 13-12-005, August 22, 2014.

Deposition of Debra J. Aron in Grant Birchmeier, et al., v. Caribbean Cruise Line, Inc., et al., In the United States District Court, Northern District of Illinois, Eastern Division, Case No. 12 CV 4069, July 19, 2014.

Deposition of Debra J. Aron in Comcast IP Holdings I, LLC v. Sprint Communications Company L.P., et al., United States District Court for the District of Delaware, Case No. 12-205-RGA(CJB), July 11, 2014.

Deposition of Debra J. Aron in In re: Methyl Tertiary Butyl Ether Products Liability Litigation, Commonwealth of Puerto Rico, et al., v. Shell Oil Co., et al., In the United States District Court, Southern District of New York, Case No. 07 Civ. 10470, May 27, 2014.

Depositions of Debra J. Aron in In re: Polyurethane Foam Antitrust Litigation, General Motors, L.L.C. v. Carpenter Co., et al., In the United States District Court for the Northern District of Ohio, Western Division, Case No. 3:12-pf-10027-JZ, April 30, 2014 and September 8, 2014.

Trial Testimony of Debra J. Aron in Seth Warnick, et al., v. Dish Network, L.L.C., In the United States District Court, District of Colorado, Civil Action No. 12-cv-01952-WYD, March 20, 2014.

Deposition of Debra J. Aron in Seth Warnick, et al., v. Dish Network, L.L.C., In the United States District Court, District of Colorado, Civil Action No. 12-cv-01952-WYD, September 25, 2013.

Deposition of Debra J. Aron in In re: Methyl Tertiary Butyl Ether (“MTBE”) Product Liability Litigation, New Jersey Department of Environmental Protection, et al. v. Atlantic Richfield Co., et al., In the United States District Court, Southern District of New York, No. 08 Civ. 312, May 29, 2013.

Prefiled Written Testimony and Reply Testimony of Debra J. Aron in In the Matter of the Petition Filed by ALASCOM, INC. d/b/a AT&T ALASKA to be Relieved of its Carrier of Last Resort Responsibilities in Certain Locations in Southwest Alaska, Before the Regulatory Commission of Alaska, Docket No. U-12-127, April 1, 2013 and January 17, 2013.

Deposition of Debra J. Aron in William Douglas Fulghum, et al., v. Embarq Corporation, et al., In the United States District Court for the District of Kansas, Civil Action No.: 07-CV-2602 (EFM/JPO), November 29, 2011.

Deposition of Debra J. Aron in Southwestern Bell Telephone Company, et al., v. IDT Telecom, Inc., et al., In the United States District Court, Northern District of Texas, Dallas Division, Civil Action No. 3-09-CV-1268-P, November 10, 2011.

Direct and Rebuttal Testimony of Debra J. Aron in the Matter of Petition of Sprint to Reduce Intrastate Switched Access Rates of Incumbent Local Exchange Carriers in North Carolina, Before the North Carolina Utilities Commission, Docket No. P-100, Sub 167, August 18, 2011 and September 27, 2011.

Prefiled Written Testimony and Rebuttal Testimony of Debra J. Aron in the Matter of: An Investigation Into the Intrastate Switched Access Rates of All Kentucky Incumbent and Competitive Local Exchange Carriers, Commonwealth of Kentucky, Before the Public Service Commission, Docket No. 2010-00398, September 30, 2011, and July 8, 2011.

Testimony of Debra J. Aron before the Utilities Committee of the Kansas Legislature regarding the status of competition in telecommunications markets in Kansas, February 2011.

Testimony of Debra J. Aron before the Telecommunications Committee of the Legislature of the state of Washington regarding the consumer benefits and competitive effects of switched access reform, February 2011.

Professional organizations

Member, American Economic Association

Member, Econometric Society

Associate Member, American Bar Association

Past Member, Telecommunications Policy Research Conference Program Committee

Honors and awards

Guthman Research Chair, Kellogg Graduate School of Management, Northwestern University, Summer 1994.

Hoover National Fellowship, Hoover Institution, 1992-1993.

Faculty Research Fellow, National Bureau of Economic Research, 1987-1990.

PepsiCo Research Chair, Northwestern University, 1990.

Kellogg Research Professorship, Northwestern University, 1989.

National Science Foundation Research Grant, 1987-1988.

Buchanan Chair, Kellogg Graduate School of Management, Northwestern University, 1987-1988.

IBM Chair, Kellogg Graduate School of Management, Northwestern University, 1986-1987.

Teaching

Courses taught: Pricing Strategy; Information, Communication, and Competition (economics of strategy and competition); Intermediate Microeconomic Theory; Managerial Economics (microeconomic theory as applied to business strategy and decision making) at the M.B.A. level, The Economics of Information at the Ph.D. level.

Also qualified to teach: graduate Microeconomic Theory; Industrial Organization and Labor Economics; the Economics of Personnel; Public Finance; Project Evaluation; Applied Game Theory.

Professional history

2019–Present	*Vice President*, Charles River Associates, Chicago, IL
2018–2019	*Principal and Senior Managing Director*, Ankura Consulting Group, Chicago, IL
2010-2018	*Principal and Managing Director*, Navigant Economics, Chicago, IL
2000-2016	*Adjunct Associate Professor*, Northwestern University, Evanston, IL
1995-2010	*Managing Director*, LECG, LLC, Evanston, IL
1993-1995	*Visiting Assistant Professor of Managerial Economics*, Northwestern University, Evanston, IL
1985-1992	*Assistant Professor of Managerial Economics*, Northwestern University, Evanston, IL
1992-1993	*National Fellow*, Hoover Institution at Stanford University, Stanford, CA
1983-1984	*Instructor*, University of Chicago Department of Economics, Chicago, IL
1979-1980	*Staff Economist*, Civil Aeronautics Board, Office of Economic Analysis, Washington, D.C.

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Ex Parte No. 711 (Sub-No. 1)

Reciprocal Switching

Verified Statement and

Written Testimony of

Jonathan M. Orszag and Yair Eilat

February 14, 2022

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COMPASS LEXECON

VERIFIED STATEMENT AND WRITTEN TESTIMONY OF JONATHAN M. ORSZAG AND YAIR EILAT

I. INTRODUCTION AND SUMMARY OF CONCLUSIONS

In this section, we describe our qualifications, assignment, and overall conclusions in this matter.

A. QUALIFICATIONS

1. Jonathan M. Orszag

1. Jonathan Orszag is a Senior Managing Director and member of the Executive Committee of Compass Lexecon, LLC, an economic consulting firm. His services have been retained by a variety of public-sector entities and private-sector firms ranging from small businesses to Fortune 500 companies. These engagements have involved a wide array of industries, from entertainment to the transportation and telecommunications sectors. He has provided testimony to the U.S. Congress, U.S. courts, the European Court of First Instance, the Federal Communications Commission, and other domestic and foreign regulatory bodies on a range of issues, including competition policy, industry structure, and fiscal policy.

2. Previously, he served as the Assistant to the U.S. Secretary of Commerce and Director of the Office of Policy and Strategic Planning and as an Economic Policy Advisor on President Clinton's National Economic Council. For his work at the White House, he was presented the Corporation for Enterprise Development's 1999 leadership award for "forging innovative public policies to expand economic opportunity in America." He has taught at both the University of Southern California and UCLA; most recently, Mr. Orszag taught a class on antitrust and merger analysis at UCLA Law School. He received an M.Sc. in economic and social history from Oxford University, which he attended as a Marshall Scholar. He graduated *summa cum laude* in

economics from Princeton University, was elected to Phi Beta Kappa, and was named to the *USA Today* All-USA College Academic Team. In 2004, he was named by the Global Competition Review as one of "the world's 40 brightest young antitrust lawyers and economists" in its "40 under 40" survey. In 2006, the Global Competition Review named Mr. Orszag as one of the world's "Best Young Competition Economists." More recently, in multiple years, he has been named as one of the most highly regarded competition economists in the world by *Who's Who Legal*. Mr. Orszag has testified or consulted on matters of antitrust and competition policy, liability, and damages in many cases covering a range of industries, including construction, entertainment, computer hardware, airlines, pay television, tobacco, medical devices, healthcare, and credit cards. Mr. Orszag's curriculum vitae is attached as Appendix A.

2. **Yair Eilat**

3. Dr. Yair Eilat is a Senior Consultant with Compass Lexecon and has worked for a decade and a half as an economic consultant. He has consulted for many Fortune 500 companies and government agencies, in the US and worldwide, on various antitrust, competition and policy matters. He specializes in applying theoretical modeling and econometric analysis to markets in many industries, such as high-technology, finance, media, energy, telecommunications, and transportation. He submitted expert testimony to several government agencies, including the DOJ, FTC, SEC, and the EC. Dr. Eilat served until recently as the Chief Economist and Deputy Director General of the Israel Antitrust Authority.

4. Dr. Eilat also worked as a researcher at the Harvard Institute for International Development and the Kennedy School of Government at Harvard University, and as an economic advisor to the Economics Committee and State Audit Committee of the Israeli parliament. Dr. Eilat has written policy reports and published in academic journals in the fields

of industrial organization and economic development and has taught at several academic institutes. He holds a PhD in economics from Harvard University and a B.A. in Law and Economics from the Hebrew University, Jerusalem. Yair Eilat's curriculum vitae is attached as Appendix B.

B. ASSIGNMENT

5. We have been asked by counsel for the Association of American Railroads (AAR) to comment, from an economic policy perspective, on the Surface Transportation Board's (Board) *Petition for Rulemaking to Adopt Revised Competitive Switching Rules—Notice of Proposed Rulemaking* (July 27, 2016) and *Reciprocal Switching—Notice of Proposed Hearing* (Dec. 28, 2021). In particular, we have been asked to opine on the question of whether the proposed reciprocal switching rule (the "Proposed Rule") properly addresses an identified market deficiency and whether it is likely to enhance efficiency and benefit the public interest. We understand that proponents of the Proposed Rule believe that it would have the desirable effect of lowering rates on some routes for some shippers.

6. Our overarching conclusion is the following. Under no circumstances should low rates be considered an objective as of themselves. Rather, low rates are the means for achieving other objectives, such as a more efficient rail industry that benefits its shippers. But rates that are too low can be just as harmful as rates that are too high. Genuine competition is the best way for achieving the correct rates that properly balance the near-term benefits to shippers and the public from low rates and the long-term viability of the rail network, to the benefit of shippers and the public.

7. As we explain at length in this report, if it were the case that competition today is failing and some shipping rates today were too high and clearly inefficient, then this should be dealt

with in the most direct way – *i.e.*, direct rate regulation to curb extreme cases of high rates. When it comes to utility regulation, there are really no shortcuts and no magic solutions. A complicated policy like forced switching will at best create the illusion of unleashing competitive forces. In practice, it will be both costly to implement and will only decrease the chances of reaching the correct rates that benefit the industry and its customers.

C. SUMMARY OF CONCLUSIONS

8. Our main conclusions are the following:

- Competition is the main driver of efficient well-functioning markets. However, simply increasing the number of individual rail carriers that could serve a customer should not be considered competition promotion. It may impair the market signals and introduce inefficiencies of various kinds. Lowering shipping rates in the short term should also not be a policy goal as it may have adverse effects on long-term supply.

- A principle that is well accepted in economics is that where adequate competition exists, the public's interest is best served by allowing the competitive conditions of supply and demand to set price and influence investment decisions. In order for regulatory intervention to enhance competition, it must be designed carefully to target an appropriately defined market failure. Otherwise, it may miss the mark and actually curtail competition, to the detriment of efficiency and consumers. The potential pitfalls of regulation are especially problematic in network industries, such as railways. In such an industry, a misplaced effort to benefit one customer can create inefficiencies and result in a general deterioration of service for other customers. The history of the rail industry before the Staggers Act is instructive of the potential effects of excessive regulation in a network industry, even when that regulation is well-intentioned.

- Not every case of substantial market power is an indication of a market failure. Only in cases in which market power is clearly in excess of what is needed for efficient investment incentives, intervention may be warranted. Market power cannot be simply inferred by counting competitors or looking at margins on particular shipments.
- If regulatory intervention is needed because of market power abuse, the proper form of intervention depends on how market power manifests itself. Economic logic dictates that extractive practices – cases in which firms charge too much – are usually best dealt with using direct pricing regulations. If and where those extractive practices are found after applying sound analysis, the Board can act. By contrast, exclusionary practices – cases in which firms use their substantial market power to deny rivals of economies of scale – may, in some cases, be dealt with using forced access solutions. There is no evidence that rail carriers are engaging in exclusion for the purpose of weakening rivals.
- Forced access is very rare in any industry, as the basic principle in any regulatory regime is that firms should not be forced to share their assets with their competitors except in highly unusual circumstances. Forced switching goes one step further than forced access in other contexts, as it not only requires a firm to allow access to its assets, but it also requires the asset owner to physically participate in an ongoing complex operation. Moreover, imposing forced access rules in this case does not "create" competition. Indeed, since the regulator has to stay involved in the process, there are no true competitive forces at play. If such a policy is implemented, the role of the regulator will likely increase compared to its role today.

- Forced switching regulation will also likely be very complicated and costly to implement, and wrongly imposing forced switching may lead to negative consequences that do not exist in a regulated maximum rate regime. These costs are both direct (the costs of implementing the switching and the regulatory costs) and indirect (such as network distortions, depressing investment and imposing safety and environmental costs). As with any new complicated regulation, there is also a risk of unexpected adverse effects.
- Finally, even if shipping rates do go down as a result of the proposed policy, it is far from obvious that a meaningful portion of these savings will be passed on to the shippers' consumers, let alone lead to materially higher demand and to a better use of resources by these consumers. Any savings that are not passed on will simply be a wealth transfer from rail carriers to shippers.

II. PRINCIPLES FOR REGULATORY INTERVENTION

A. INTRODUCTION

9. "Competition" has increasingly become a buzz word in political and policy circles. To be sure, competition should be promoted as it is the main driver of efficient well-functioning markets, which in turn maximize benefits to consumers. However, competition is a nuanced term that is misunderstood by many commentators. For example, one should not simply consider the availability of more options to consumers as evidence of beneficial competition without evaluating the full effects of the policy that created these options on efficiency and consumers.[1] Moreover, lower prices may also not be synonymous with "competition"; that is, in

[1] The economic term ¨efficiency" implies that scarce resources are used in a way that maximizes the benefit to the economy from these resources.

a well-functioning market, higher prices may be necessary to incentivize market participants to invest in ways that benefit consumers.

10. For example, a small town may have only one dentist because it cannot support the presence of another competitive option. It is possible that this dentist will charge higher prices than in larger towns, but that may be the only way it could cover its expenses of building and operating a clinic in a small market. As long as these prices are not so high as to induce the residents of the town to travel to a larger town, patients will gain from the presence of the dentist despite the dentist's higher prices.

11. Thus, in order for regulatory intervention to enhance competition (*i.e.*, benefit consumers), it must be designed carefully to target an appropriately defined market failure. If a regulation is either applied to a situation where there is not an appropriately defined market failure or is designed inadequately, regulation may miss the mark and actually curtail competition, to the detriment of efficiency and consumers.[2] Therefore, a detailed in-depth review is necessary to separate between policies that create beneficial competition and policies that only create the false appearance of competition but may be harmful overall. In this section, we outline some general principles for crafting and implementing such policies.

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[2] As explained in a widely used industrial organization textbook:

> "Unfortunately, the same factors that make market inefficiencies frequently make correcting the inefficiencies difficult. Moreover, not all inefficiencies can be corrected even by optimal government intervention. For example, if the inefficiency stems from limited information, the government may not be able to obtain and disseminate the relevant information cost effectively. That is, the world would be better off with full information, but that is not a viable option."

Dennis W. Carlton and Jeffrey Perloff, *Modern Industrial Organization*, 4th ed., Pearson, 2015, p. 710.

B. IS REGULATION NECESSARY?

12. A principle that is well accepted in economics is that where adequate competition exists, the public's interest is best served by allowing the competitive conditions of supply and demand to set prices and influence investment decisions. Well-functioning market forces help to ensure the most efficient allocation of an economy's resources. Importantly, in an industry in which demand predictions are crucial for planning future capacity, market signals are crucial for such planning and for investment decisions. These market-based signals are also crucial for motivating efficient entry and exit to and from the market.

13. By distorting market signals, regulatory interference with the competitive process can cause systematic problems and harm current and future customers. Therefore, if such interference becomes essential because of an appropriately defined market failure, its design should put substantial weight on the ability of firms the cover their full costs, which is crucial for firms to be able to attract capital and make long-term investments in infrastructure and equipment.[3]

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[3] In the context of another network industry – telecom – Gregory Sidak and Daniel Spulber write:

> "Reducing returns on investment and denying recovery of past investments would cause incumbent [carriers] to reduce or eliminate the construction of transmission and switching facilities needed to supply telecommunications services. That disincentive to investment would halt or slow the growth of existing networks and could reduce expenditures for maintenance and upgrading of transmission technology. … It might be argued that because capital facilities are nonrecoverable or sunk costs, the incumbent [carriers] would continue to operate as long as their earnings equaled or exceeded their operating costs. Could not the incumbents depreciate or 'write off' all nonrecoverable capital costs already incurred without harming the incentives for continued operation? This perspective overlooks the continuing need for maintenance, upgrading, and eventual replacement of capital facilities. If deprived of a return to capital facilities after capital has been sunk in irreversible investments, or if faced with reduced returns to investments already made, any economically rational company will eliminate or reduce similar capital investments in the future."

14. Importantly, one should not equate "competitive process" with "short-term low prices." Low prices are certainly among the main goals of competition: the competitive process curbs firms' ability to charge supra-competitive prices, and this benefits consumers and leads to more efficient markets. But the advantage of well-functioning competitive markets is that they balance between short-term low prices and long-term supply considerations. Long-term supply means both the availability and the quality of the products or services – and is motivated by the ability of firms to earn a competitive return on their investments.

15. If immediate low prices were the only goal, they could be achieved in superficial ways. For example, taxi rates are typically regulated by the municipality in which they operate.[4] If a municipality wanted to lower the regulated taxi rates, it could easily do so. That would benefit taxi users in the short run as taxi drivers will have no choice but to reduce rates. But over time, there would be fewer taxis, as some drivers would exit the market and new ones would not enter. The regulator would then have to choose between substantially raising prices (probably beyond their initial level) in order to reverse the declining supply trend or accept taxi shortages – neither of which is desirable. Therefore, a taxi regulator has to balance short-term and long-term considerations. This is of course difficult to do, and this is exactly where the competition process typically excels. When competition fails and a regulator has to step in and do this

J. Gregory Sidak and Daniel Spulber, "Deregulation and Managed Competition in Network Industries," *Yale Journal on Regulation*, Vol. 15, No. 17 (1998), pp. 117-147 at 124-125.

[4] This is due to information problems and transaction costs: it is still impractical for someone hailing a cab on the street corner to solicit competing taxi bids. Once cab-hailing becomes exclusively digital, regulation of taxi rates may become unnecessary.

balancing, the regulator cannot take a myopic view by making short-run low prices its main goal.[5]

16. The potential pitfalls of regulation are especially problematic in network industries.[6] In such industries, there are numerous interactions to consider. Like in most industries, there are current and future customers that are connected through firms' investment decisions – a customer paying a sub-competitive price today will lower supply for future customers.[7] But in

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[5] For example, a Brookings Institution article concluded about another form of price control:

> "New research examining how rent control affects tenants and housing markets offers insight into how rent control affects markets. While rent control appears to help current tenants in the short run, in the long run it decreases affordability, fuels gentrification, and creates negative spillovers on the surrounding neighborhood.
>
> A substantial body of economic research has used theoretical arguments to highlight the potential negative efficiency consequences to keeping rents below market rates, going back to Friedman and Stigler (1946)."

Rebecca Diamond, "What does economic evidence tell us about the effects of rent control?" Brooking Institute, October 18, 2018. Available at https://www.brookings.edu/research/what-does-economic-evidence-tell-us-about-the-effects-of-rent-control/.

Professor Joseph Stiglitz also warns against the risks of setting rates below their market value:

> "Price ceilings—setting a maximum charge—are always tempting to governments because they seem an easy way to ensure that everyone will be able to afford a particular product. If the price ceiling is effective—that is, it is below the market clearing price—the result is to create shortages at the controlled price. People want to buy more of a good than producers want to sell. Those who can buy at the cheaper price benefit; producers and those unable to buy suffer."

Joseph E. Stiglitz, Carl E. Walsh, "Economics," 4th Edition, W.W. Norton & Company, New York London, 2006, p. 91.

[6] See, *e.g.*, Martin Maegli, Christian Jaag, and Matthias Finger, "Regulatory Governance Costs in Network Industries: Observations in Postal Regulation," Competition and Regulation in Network Industries, Vol. 2, No. 2 (2010), pp. 207-237 at 216 ("An excessive regulation with rigid social, regional or even environmental objectives might prevent the regulated operators from aligning their supply with the effective demand and the consumer needs. This may adversely affect investment activities: regulation should provide innovation and investment incentives in a manner that allows the companies to exploit their investments. As long as the incentives and protective measures are sub-optimal and do not protect investments, there is less innovation and no investment in new technologies in the sector.").

[7] See, *e.g.*, Michal Grajek and Lars Hednrik-Roller, "Regulation and Investment in Network Industries: Evidence from European Telecoms," *Journal of Law and Economics*, Vol. 55

addition, there are also connections among customers using shared assets and jointly covering costs across overlapping and non-overlapping portions of the network. This means that any adjustments to one part of the network will affect customers on other, even seemingly distinct, parts of it. A misplaced effort to benefit one customer (or one customer group) may create inefficiencies and reduce investment that would negatively affect the customer (or customer group) itself. And beyond the immediate customer, such efforts can also create inefficiencies and result in a general deterioration of service for other customers (effects that economists call "negative externalities" because the party that benefits does not internally feel the negative consequences that it causes). Due to the potential substantial negative externalities between customers in network industries, even if customers are rational and well-informed, placing the decision on intervention in their hands could harm other customers and degrade overall efficiency.

17. To conclude, relying on the competitive process should always be the default; even if it is imperfect, it will still often be superior to regulatory intervention. This is especially true in network industries. If the market suffers from a significant well-defined market failure, regulatory intervention may be needed. But such intervention should have in mind efficiency and consumer benefit over the long run, not just short-run low prices. And once a decision is made that regulation should replace market forces, the regulator should attempt to reach these outcomes in the most efficient manner possible.

(February 2012), pp. 189-216 at 189 ("We find access regulation to have a negative effect on both total industry and individual carrier investment.").

C. DIAGNOSING THE COMPETITIVE ISSUE

18. The first step in any regulatory process is therefore diagnosing the market failure that needs to be addressed. For example, if there is an asymmetry in information between firms and consumers that leads to consumer harm, then regulation will typically attempt to ensure consumers are properly informed. If the problem is excessive market power – *i.e.*, firms are able to price substantially above their costs due to a lack of pricing restraints – this may indicate that there is a lack of competition, and intervention to reduce market power may enhance outcomes for consumers.

19. However, not every case of significant market power is an indication of a market failure. Outside of perfectly competitive markets that are mostly just textbook benchmarks, firms almost always possess some degree of market power.[8] In industries with high-fixed costs, market power (in the sense of pricing above variable costs) is actually desirable to some extent, because it is necessary for firms to recoup their investments.[9] Only in cases in which market power is clearly in excess of what is needed for efficient investment incentives, intervention may be warranted.

20. In this regard, it is important to also identify the *source* of the substantial market power. If the source of substantial market power is past investments made or, more generally, competition on the merits, market power should be viewed differently than if it was achieved using anti-competitive means (*e.g.*, excluding rivals) or preferential treatment by regulation. In

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8 See, *e.g.*, Massimo Motta, "Competition Policy: Theory and Practice," Cambridge University Press, 2004, 2004, p. 53.

9 See, *e.g.*, Jeffrey Church and Roger Ware, *Industrial Organization: A Strategic Approach*, Irwin McGraw Hill, 2000, p. 248 ("Entry will … be profitable only if a firm anticipates that it can recover the fixed costs of entry. This requires gross profits to be at least as large as [fixed costs] . Firms will need to capture a minimum market share and markup over marginal cost to cover their fixed costs.").

the absence of observed anticompetitive conduct, substantial market power is much more likely to be an adequate reward for past investments and risks and an incentive for future ones.[10] In the situation where preferential regulatory treatment, say, resulted in market power, there may be little benefit to the economy from substantial market power and it should therefore be viewed with much more suspicion.

21. The next question is how substantial market power manifests itself. Competition economists make the distinction between two categories of potentially abusive uses of substantial market power.[11] One category of effects is extractive practices, which means that the firm in possession of substantial market power "extracts" excessive rents from its customers – typically in the form of high prices (given the quality level of the services provided). There is no fixed definition for excessive rents, but it is generally understood to mean rents that are clearly in excess of what is reasonable given investments and risks taken in the past, and in excess of what is necessary for spurring future welfare-enhancing investments.

22. A second type of substantial market power abuse is exclusionary practices (sometimes referred to as "foreclosure"), which means that a firm uses its substantial market power to weaken its actual or potential competitors, for the purpose of prolonging and further entrenching

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[10] The economics literature has recognized that high and persistent profits, as well as varying profits among firms, can be consistent with competitive markets that perform well for consumers and social welfare. Firms may earn economic profits simply because they are more efficient, innovative, and entrepreneurial than their competitors. Some firms may be particularly adept at recognizing and taking advantage of unexplored market opportunities. Some firms may earn high economic profits as a result of taking on a substantial amount of risk. And some firms may earn high and persistent economic profits from luck – that is, some firms may be or have been in the "right place at the right time." See, *e.g.*, Frank Fisher and JJ McGowan, "On the Misuse of Accounting Rates of Return to Infer Monopoly Profits," *American Economic Review*, Vol. 73, No. 1 (March 1983), pp. 82-97.

[11] See D. W. Carlton and K. Heyer, Extraction vs. Extension: the basis for formulating antitrust policy towards single firm conduct, Competition Policy International 4 (Autumn), pp. 285–305.

its market power.[12] The economic literature identifies various ways in which exclusionary practices could occur.[13] One situation is when a firm (which we will refer to as the "incumbent") controls a "bottleneck asset"[14] and refuses to grant access to that asset to other firms, *even if it is in its own best interest to do so*, just to weaken the other firms as competitors.

23. However, to conclude that an incumbent is in fact weakening potential competition, it is not enough to show that the incumbent denied a competitor the ability to offer their service for a particular opportunity that uses the incumbent's bottleneck asset. After all, owning any asset, by definition, excludes others from using it; that alone cannot be considered "harm to competition." Rather, harming competition means denying access to the asset in order to make rivals overall a weaker competitive force. That requires excluding rivals from *other* opportunities or future opportunities (that is, those *not* involving the bottleneck asset), typically by discouraging them from future investments or denying them economies of scale (including network effects). In the mature rail industry, there is no reason to think that bottleneck assets are being withheld to weaken rivals in this way.

24. As we explain below, the proper remedy for a market failure due to substantial market power depends crucially on the type of the alleged abuse – whether it is extraction or exclusionary.

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12 See, *e.g.*, Dennis W. Carlton and Jeffrey Perloff, *Modern Industrial Organization*, 4th ed., Pearson, 2015, pp. 685-686.

13 See Chiara Fumagalli, Massimo Motta, and Claudio Calcagno, "Exclusionary Practices. The Economics of Monopolisation and Abuse of Dominance." Cambridge University Press, 2017.

14 A bottleneck asset is a link in the production function that is essential to the production process but is controlled by a single firm (or a small number of firms).

25. Importantly, lack of competitive choices should not be considered by itself a form of market failure. At most, it may be one indicator for the existence of substantial market power, though it should be evaluated carefully as we explain in the next section. Theoretically, lack of competitive choices could also reflect that firms with substantial market power previously excluded rivals. But finding such past inference requires a strong factual basis because there are typically far more plausible reasons for lack of competitive choices that are not anti-competitive. Most obviously, when a market does not create enough revenue to support more competitors incurring the entry costs, more competitors should not be expected to enter the market – see, for example, the small town dentist analogy above.[15]

26. As the dentist example shows, the mere lack of sufficient scale in the town to support more than one dentist is not, and should not be confused with a market failure. Accordingly, any misguided attempt to "fix" this problem by adding a second dentist to the small town will be inefficient and will likely fail as the dentists will not be able to cover their expenses. Exit of one of the dentists, and possibly both, will then be inevitable. Without intervention, the worst that could happen is that the price that is charged by the single dentist will be very high and beyond what is justified by that dentist's costs. However, such high prices may not in fact be charged because even the single dentist may face competitive constraints – *e.g.*, the ability of the town

[15] We note for completeness that it is theoretically possible that there may exist very unique circumstances in which a regulator may identify lack of variety in a market as the problem itself. Variety in this case does not mean "number of firms competing" but rather a situation in which variety by itself is highly valued by customers yet, for whatever reasons, it does not arise organically via market forces. However, such situations apply to final customers that may simply differ in their tastes; it is much less relevant for input markets. For example, different customers may prefer different car colors. In contrast, a rail shipper presumably does not care about the color of the locomotive shipping its product but rather cares about lowering its costs and thus maximizing its profits. Therefore, creating variety for the sake of variety – which would very rarely, if ever, warrant regulatory intervention – does not seem relevant for the current proceeding

residents to get treatment elsewhere, the ability of town residents to rely on other services instead (for example, at-home teeth whitening rather than in-office treatments), or simply the risk of attracting a new entrant by charging too much.

27. In much the same way as small-town patients have alternatives to the one dentist, rail carriers also face potential competitive constraints, even when only one rail carrier serves a given customer. As an initial matter, the competitive landscape faced by a rail carrier includes competition from other rail carriers and other modes of transportation services (*e.g.*, trucks, ships, barges, pipelines, etc.). Yet a rail carrier also faces constraints stemming from other alternatives potentially available to a shipper. These include a shipper's ability to produce or rely on a different product as a suitable substitute that does not require the services of the incumbent rail carrier (analogous to the at-home teeth whitener example). These also include a shipper's ability to ship its goods to a different destination using another carrier and/or to obtain the product it needs from a different source using another carrier (analogous to the big town dentist example).

28. And if worst comes to worst – say the dentist charges so much for emergency treatment causing many people with emergency situations to forego necessary treatment – that could be dealt with in the most effective way by capping the rates for such treatments. Rate intervention, of course, should be done carefully and should take into account that charging higher rates for emergency situations is one legitimate and perhaps efficient way that helps the dentist to cover the fixed costs of operating in the market. Without covering these costs, exit will be likely, and this will be detrimental to everyone. But if limiting rates for emergency treatment is desirable, it seems obviously better to simply establish those rates, rather than (for example) require the

dentist to make her office, equipment, and supplies available to a visiting dentist who might offer to perform the treatment for less.

D. CRAFTING A POLICY RESPONSE

29. After the type of market failure and its manifestation have been diagnosed, and if the issue is not already addressed by current regulation, a regulatory solution should be carefully crafted. Since any kind of new regulation entails uncertainty risks due to the potential of unforeseen consequences, new regulations should replace existing ones only if they are more on point to deal with the identified market failure and clearly superior for solving the issue identified.

30. For the reasons we explain below, economic logic dictates that extractive practices – cases in which firms charge too much – are usually best dealt with using direct pricing regulations.[16] By contrast, exclusionary practices – cases in which firms use their substantial market power to deny rivals of economies of scale – may, in some cases, be dealt with using forced access solutions. The logic behind this can be demonstrated in the current context of reciprocal switching, as outlined below.

31. If reciprocal switching is efficient, then there is no reason why it should not be achieved voluntarily – it should be a win-win for all parties involved (the two rail companies and the shipper) who could then, through bargaining, divide the spoils of the efficient switching among themselves. When switching is efficient (after considering all implementation and transaction

[16] See, for example, the OECD explanation on remedies for excessive pricing, which states that, "Since the unlawful conduct concerns the setting of price, the seemingly obvious measure to remedy an excessive price is a price (or corresponding profitability) cap." "Excessive Pricing, OECD, 17 October 2011, p. 56, available at: https://www.oecd.org/competition/abuse/49604207.pdf

costs) and adequate compensation is offered, the only apparent reason why a rail carrier with access to a bottleneck asset will refuse such an arrangement is if it fears that by providing access to that asset through a switching arrangement, its counterpart will gain from the arrangement some competitive advantage on *other* transactions not involving this asset (*i.e.*, in the future or in a different part of the network). Only if that is the case, the incumbent may have an incentive to "foreclose" the potential rival from the efficient transaction, at a certain cost to itself (its forgone share of the efficient arrangement). In such cases of abuse of market power, a forced access solution might be an appropriate policy response (although the particulars of that policy response would require careful examination).

32. However, it should be clear that imposing forced access rules in this case does not "create" competition over the bottleneck asset: since the regulator has to stay involved in the process, there are really no competitive forces at play. The regulator still needs to step in to decide when and how to require switching and how much rail carriers are allowed to charge for it. So this is not a case of unleashing market forces and is possibly quite the opposite: It increases the role of the regulator even beyond the occasional need to engage in rate-setting. It therefore may actually be a step backwards from competitive markets. It should not be confused with the rare cases in which a regulator intervenes on one occasion to change the market structure and then allows firms to compete without further regulatory interference.[17] Rather, forced access in cases of exclusionary conduct is used to *prevent the weakening* of the incumbents' rivals and of competition overall.

[17] For example, one way in which regulators may change market structure is by breaking up companies into smaller ones, which itself is extremely rare because it is very difficult to do in a way that achieves its end goals.

33. But in the rail industry, there is no reason to think that switching in a particular case will benefit the counterpart rail carrier on *different transactions* that do not involve the bottleneck assets. That is, it is not meant to solve a problem of potentially competitive rail carriers lacking scale; large rail carriers in the mature rail industry are generally regarded as having sufficiently large scale to compete effectively. This means that exclusionary intents are unlikely to exist in this industry. Once such intents are ruled out, this implies that if switching does not occur voluntarily, it is most likely inefficient.

34. If switching is inefficient, but there are concerns of excessive market power due to control of a bottleneck, then a much better policy would be to use regulation that would directly prohibit abuses in the form of extreme pricing on routes involving that bottleneck. That would achieve the same goal of curbing substantial market power but in a more direct and transparent way, without the inefficiencies of switching, and without many of the complexities and the potential unintended consequences of introducing a new policy.[18]

35. This example demonstrates why forced access is generally inferior to rate setting in situations of substantial market power that do not involve deliberate attempts by an incumbent to weaken rivals. The only exception would be if there are clearly very low costs associated with forced access – *i.e.*, it does not create inefficiencies and setting the correct regulatory access rates

[18] As noted above, extractive practices can also manifest in the form of abusing market power to provide inadequate service at an otherwise appropriate price. Where such an abuse exists, an appropriate response may be an order designed to improve service. In particular circumstances, it may be that forced switching – from an incumbent providing inadequate service to a rival that will provide adequate service – may be the best available solution. But, like maximum rate regulation, this too would be a direct and transparent policy response in that it recognizes and remedies the abuse of market power by one market participant.

is simpler than rate setting. As we explain below, this is obviously not the case with forced switching.

36. Moreover, if a regulatory framework that serves as a backstop in cases of extreme use of market power is already in place, there is an especially strong case for sticking to the existing framework. In the railroad industry, a well-developed framework exists for exactly that purpose, in the form of maximum rate regulation. Thus, the only so-called advantage of forced switching is creating the appearance of competition, when in fact it is not actual competition at all, because it hinges heavily on regulatory decisions such as the level of access rates.

37. To conclude, if a market failure is identified, the regulatory solution should be tailored to the problem identified. In particular, when the concern is that substantial market power leads to extraction and not to exclusion, rate control could most likely achieve the same goals of curbing excessive market power more cheaply and with much lower risk than forced access. In any case, implementation issues should be given substantial consideration. This includes accounting for direct costs (costs of regulatory procedures and costs of implementation) and indirect costs – such as distortions in service, uncertainty, delays, network disruptions, and of course long-term effects on investments.[19]

38. Consideration should also be given to the question of whether there are winners and losers, not only among rail companies but also among shippers. Regulators should be very cautious about policies that benefit some and harm others as it may distort competition in other

[19] For a discussion of the direct and indirect costs of regulation, see Martin Maegli, Christian Jaag, and Matthias Finger, "Regulatory Governance Costs in Network Industries: Observations in Postal Regulation," Competition and Regulation in Network Industries, Vol. 2, No. 2 (2010), pp. 207-237.

markets. Finally, consideration should be given to the possibility of unforeseen consequences – *i.e.*, the costs of mistakenly applying a wrong policy. This means that a tested approach should generally be given preference over an untested one. As we will further discuss below, the proposed reciprocal switching policy (which is a type of forced access) seems inferior along all these dimensions compared to existing regulations in the rail industry.

III. RELEVANT ATTRIBUTES OF THE RAILROAD INDUSTRY

39. Forced access is very rare in any industry, as the basic principle in any regulatory regime is that firms should not be forced to share their assets with their competitors except in highly unusual circumstances. In important respects, forced switching is more complicated than forced access in other industries, as it not only requires a firm to allow access to its assets, but it also requires the asset owner to physically participate in an ongoing complex operation in which it has not otherwise volunteered to participate. In this section, we briefly discuss a few aspects of the railroad industry that need to be accounted for in the context of assessing the effects of the proposed regulatory policy.

A. RAILROADS AS A NETWORK INDUSTRY

40. As explained by Oliver Wyman, railroads are not a collection of isolated yards that can be reviewed independently, but rather a highly interconnected network.[20] Without careful planning, a change at one location can have consequences in multiple other locations, and changes in multiple locations can lead to compounding effects that lead to the risk of widespread service failures. In the next section, we list several network-related costs and risks that could

[20] Association of American Railroads Opening Comments, EP 711.1, Verified Statement of William J. Rennicke (filed Oct. 26, 2016) ("Rennicke 711.1 Op. V.S.") at 14-16.

follow from the proposed regulatory interventions. They show that a policy that may seemingly affect just an insular location could have much broader service implications, some of which are very hard to predict. This makes setting efficient prices for forced switching extremely complicated, and it also magnifies uncertainty, which depresses the types of investments required by rail carriers.

41. Moreover, the fact that rail transportation is a network industry with different parts of the network strongly affecting one another means that there are substantial negative externalities between shippers. In other words, the fact that a certain shipper is in favor of forced switching does not mean that the arrangement actually serves the public interest by enhancing overall welfare. Even if that shipper is well informed and will only do what is best for itself, other shippers may be harmed as a result, in entirely unforeseen ways.

B. A HISTORICAL PERSPECTIVE

42. The history of the rail industry before the Staggers Rail Act of 1980 ("Staggers Act") is instructive of the potential effects of excessive regulation, even if well-intentioned. Before the Staggers Act, regulation controlled most aspects of this industry. Regulation consisted of rigid price-setting formulas; regulation governing rate increases; minimum level of rates; and mandated service, structure, and operating practices. The excessive regulatory structure led to a deterioration in equipment and systems, frustrated shippers, and eventually led to disinvestment, declining quality, and failed rail carriers. It is well accepted that the long deterioration of rail

infrastructure and service quality was the direct result of years of misguided regulatory intervention.[21]

43. The passage of the Staggers Act and the implementation of deregulatory policies was a game-changer. It allowed market forces to guide railroad pricing and investment decisions whenever possible. It allowed transportation markets to set prices that reflect shippers' values for the service, and it allowed rail carriers the freedom to determine the efficient size and configuration of their networks based on market demand. Deregulation reduced the uncertainty faced by rail carriers about how regulatory interventions might interfere with their operations and gave the rail carriers incentives to make long-range plans and to invest where it was economically sensible to do so given the expected competitive returns over the life of the investment. As a result, rail carriers invested hundreds of billions of dollars in their networks.

[21] For example, the economists William Baumol and Robert Willig, have summarize the impact of the post-1980 deregulation of the railroad industry as follows:

> "The performance of the railroad industry since 1980 provides a vivid illustration of the benefits of regulatory reform. Productivity has leaped upward, rail rates have fallen somewhat in real terms, and the 50-year decline in the railroads' share of traffic has finally come to an end. Returns to capital have risen and investment has responded, arresting the deterioration in railroad capital and service quality. This has been made possible by eliminating many of the destructive regulations that controlled the railroad industry during this century and by reforming the regulations that remain."

Robert D. Willig and William J. Baumol, "Railroad Deregulation: Using Competition as a Guide," *Regulation*, Vol. 11, No. 1 (1987), pp. 28-35.

This reversed the long trend of deterioration in the industry.[22] Deregulation of the railroad industry has also been found to have been a significant factor in improving railroad safety.[23]

44. The risks of excessive regulation are borne out in many other industries. For example, the U.S. airline industry faced overly burdensome regulation into the late 1970s. Studies have shown the widespread benefits that resulted from those deregulatory efforts. A study by two prominent scholars concluded:

> "Airline regulators attempted to assure a stable, growing industry that benefited consumers and the economy. The result was relatively high fares, inefficient operations, and airline earnings volatility. The problems with economic regulation of airlines prompted a pathbreaking shift in 1978, as the United States became the first country to deregulate its domestic airline industry. Fares have declined since deregulation and efficiency has improved, but it is difficult to know what counterfactual with which the current state of the industry should be compared thirty-five years after deregulation. The volatility in industry earnings has continued and average earnings have declined since deregulation…. Still, the continuing upheaval in the industry shows no signs of impeding the flow of investment in airlines or the benefits to consumers…. For most consumers, airline deregulation has been a benefit."[24]

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22 See, *e.g.*, the 2009 Christensen report commissioned by the Board:

> "The U.S. freight railroad industry has undergone a remarkable transformation since 1980 when Congress passed The Staggers Rail Act. In the decades preceding the passage of this seminal act, railroads suffered traffic losses that led to widespread insolvencies. The deregulation of the railroad industry ushered in increased market flexibility, competitive and differential rates for rail service, and a climate open to innovation. In the years following the passage of The Staggers Act, the railroad industry experienced dramatic reductions in costs and increased productivity, which yielded higher returns for carriers and lower inflation-adjusted rates for shippers. Thus both railroads and their customers benefited from regulatory reform."

Christensen Associates, Inc., "*A Study of Competition in the U.S. Freight Railroad Industry and Analysis of Proposals that Might Enhance Competition*," November 2009, p. ES1. Available at https://prod.stb.gov/reports-data/reports-studies/.

23 See Jerry Ellig and Patrick A. McLaughlin, 2016. "The Regulatory Determinants of Railroad Safety," *Review of Industrial Organization*, vol. 49(2), pp. 371-398.

24 Severin Borenstein and Nancy L. Rose, January 2014, "How Airline Markets Work...Or Do They? Regulatory Reform in the Airline Industry,"" in "*Economic Regulation and its Reform: What Have We Learned?,*" University of Chicago Press and National Bureau of Economic Research, Editors: Nancy L. Rose, pp. 63-135.

45. The idea that excessive regulation may create deleterious outcomes is without dispute and it is important that any new regulatory intervention keep such historical evidence as part of the regulator's consideration.

C. EXAMINING MARKET POWER

46. As explained above, a necessary condition for regulation of a market is the identification of a substantial market power problem, *i.e.*, evidence that competition is sub-optimal and leading to inefficient outcomes due to market power abuse. One place economists look for assessing market power is market structure, *i.e.*, the number of firms competing and their market shares.[25] However, market structure can provide only indirect evidence of market power; if not assessed properly, it may be misleading.[26] This is true for several reasons. First, even if there is only a single competitor on a route or segment, it is possible that this market structure reflects competition *for* the market rather than competition *in* the market. That is, it is possible that the costs and revenue levels warrant participation of only a single carrier in a particular transportation market, and rail carriers compete over who will operate in this market by making substantial investments to win over the market. This does not imply a market failure if the rates charged reflect those investments (see dentist example above).

47. Another reason why simply counting railroad competitors on a certain route is insufficient for making policy intervention decisions is that intermodal competition from other forms of transportation (like trucks and barges) may also provide substantial competitive

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[25] See, *e.g.*, Dennis W. Carlton and Jeffrey Perloff, *Modern Industrial Organization*, 4th ed., Pearson, 2015, p. 268.

[26] See, *e.g.*, Jeffrey Church and Roger Ware, *Industrial Organization: A Strategic Approach*, Irwin McGraw Hill, 2000, § 12.1.3.

alternatives, as could shipping options that combine rail and other forms of transportation.[27] Moreover, sometimes shipping along different routes also provides competitive alternatives. Sometimes a shipper may be able to produce or acquire different goods as a suitable substitute that does not require the services of the incumbent rail carrier. For all these reasons, the relevant question for considering competitive regulation is not how many rail carriers are present on a route, but whether those rail carriers have engaged in anticompetitive behavior, *i.e.*, whether they have charged excessive rates or acted anti-competitively to weaken rivals.

48. Another possible indication of a significant market power problem is a direct observation of high prices that do not reflect costs or a reasonable return to investment. Certainly, it is hard to assess when rates are excessive. The existing regulatory regime allows rail carriers to price their services in response to shipper demand and to recover differing amounts of unattributable shared and common costs from different shippers. In high fixed costs network industries such as rail, the ability to use differential pricing is a critical element in investment recovery: this may be the most efficient approach that makes most effective use of competitive market forces. But it also makes it harder to determine when rates are excessive. In particular, it is improper to determine that rates in general are excessive based on observing just a subset of individual rates.

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[27] Economist Massimo Motta explains that in order to identify the closest substitutes for a product, it is necessary to focus on the products that most constrain the pricing of the initial product, rather than merely the products that most closely resemble the initial product:

> "Since market definition is only instrumental to the assessment of market power, the relevant market should not be a set of products which 'resemble' each other on the basis of some characteristics, but rather the set of products (and geographical areas) that exercise some competitive constraint on each other."

Massimo Motta, "Competition Policy: Theory and Practice," 2003, p. 136.

49. Beyond the need to recoup previous investments, high prices and margins may provide a signal that future investments are needed, as well as providing an incentive to make those investments. This is the case, in particular, when an increase in prices is coupled with expanding demand. We are not aware of evidence that rates in the industry have been growing while demand was stagnant or contracting.

50. In any case, a regulatory framework to deal with substantial market power and extractive practices already exists. We next expand on why the proposed forced switching policy is inferior to the existing regulation.

IV. COSTS OF FORCED SWITCHING

A. INTRODUCTION

51. After establishing that the Proposed Rule does not address an identified market failure in the railroad industry that is not already protected against, we expand here on different ways in which the Proposed Rule could be harmful. We conclude that the Proposed Rule may not only be very costly to implement, but wrongly imposing forced switching may lead to negative consequences that do not exist in a regulated maximum rate regime.

52. It is important to understand that the fact that a shipper and/or a rail carrier may ask the incumbent for a switching arrangement is no guarantee against highly inefficient switching – *i.e.*, those cases in which costs substantially outweigh benefits. Since there is much uncertainty about how a dispute over forced switching may be resolved, one rail carrier can use forced switching opportunistically to try to get a beneficial arrangement for itself even if it is bad for the industry as a whole. The same is true on the shipper side: A shipper may benefit from forced access, even if it imposes negative externalities on other carriers, other shippers, and the public as a whole.

There are many sources of such negative externalities: both immediate (increasing congestion, transit time, and overall inefficiencies in the rail network to the detriment of all shippers), and longer term (if the switching rates are artificially set too low, this may lead to lower investments, and more generally, to a misallocation of resources).

53. To be clear, the discussion in this section does not imply that switching is *always* inefficient. As explained above, when it is efficient, voluntary switching will occur naturally and respond to market incentives. It is only forced switching, when it does not respond to a significant market failure, that is likely to lead to inefficient market distortions. As we have explained, we are not aware of a well-defined market failure that is not already accounted for by existing regulation, but which could be addressed by forced switching.

B. DIRECT COSTS

54. Switching increases costs. Indeed, switches are complex and involve direct expenses such as crew time, locomotive time, track time, and fuel usage, as well as technical costs and planning costs.[28] In addition, switching entails safety risks, and indeed the risks associated with switching are relatively greater than those associated with line-haul operations.[29] A rail carrier that will be forced to engage in switching and its workers must be compensated for these costs.

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[28] The fact that switching between carriers is not very common today on routes in which a single railway carrier reaches both the origin and the destination is a testimony to the complexity of this arrangement.

[29] According to data collected by the Federal Railroad Administration for 2019 and 2020 and provided to us by AAR, a labor hour of a rail worker engaging in yard activities (including switching) has more than two and a half times the probability of resulting in a casualty than a single hour of main and branch line activity. For accident rates, the ratio is more than 3.5 to 1. We understand that switching under the Proposed Rule ordinarily would require many different steps and would increase by a non-trivial amount the yard activity hours needed for a shipment. 2/1/2022 Communications with John T. Gray, Senior Vice President – Policy and Economics at the AAR.

Otherwise, this will further increase the likelihood of inefficient switching taking place, because the shipper or rail carrier requesting the switching will not bear the true costs of its request. Moreover, it will certainly depress investments: a rail carrier will not want to invest in developing bottleneck assets if instead of profiting from the asset and recouping its investment, that assets becomes a liability. Determining these costs poses complicated questions that do not arise in the current regulatory regime of a regulated maximum rates.

55. The Board has to choose between two basic approaches: a case-by-case approach or a formulaic approach, each of which has its drawbacks. A case-by-case approach, according to the Proposed Rule, would take into account factors such as "(1) the geography where the proposed switch would occur; (2) the distance between the shipper/receiver and the proposed interchange; (3) the cost of the service; (4) the capacity of the interchange facility; and (5) other case-specific factors." In theory, taking specific factors into account is the right approach if the goal is – as it should be – to mimic what would likely happen in a competitive market (*i.e.*, a market without the identified market failure). All of these factors, and probably others, are needed for deciding whether to order switching, setting the rates appropriately, and establishing operational terms. In practice, however, these factors are fairly vague concepts that are very hard to measure and implement, especially when different decisions on forced switching in different parts of the network are interrelated through network effects. This vagueness will increase the likelihood of disputes during the process, will complicate the procedures, and will introduce even more investment-depressing uncertainty.

56. The alternative, a formulaic approach, may be easier to implement and perhaps more predictable. But because of the complexity of the industry, it will most certainly result in ordering inefficient switching and inappropriate pricing, creating direct distortions. For example,

it will most likely depress differential pricing, which is an important element in the efficient development and maintenance of the network.

57. The statute governing reciprocal switching provides that "[t]he rail carriers entering into [a reciprocal switching] agreement shall establish the conditions and compensation applicable to such agreement, but, if the rail carriers cannot agree upon such conditions and compensation within a reasonable period of time, the Board may establish such conditions and compensation." 49 U.S.C. § 11102(c).

58. When companies negotiate rates under the shadow of a regulatory process that kicks in if negotiations break down, what governs these negotiations is the expected end result if the negotiations reach the regulatory phase. Any uncertainty over the outcome of this regulatory phase will translate into uncertainty during the negotiations, and if both sides have different predictions over the outcome, this may cause negotiations to break down and lead to a costly and lengthy dispute resolution process. The likelihood of both sides having different predictions over the outcome of the dispute resolution process increases with its complexity. It is therefore much *more* likely to happen in switching rate cases (where a number of factors bear on the dispute) than in direct rate regulation (which may be complex, but still involves relatively fewer considerations). In the case of rate regulation, the rail carrier, wanting to avoid such a rate proceeding, will exercise self-restraint, thus avoiding the need to actually use such measures in most cases. In the case of forced switching, since there are more complex factors to consider, the Board is more likely to have to step in and interfere.

59. There are also costs of engaging in a proceeding over switching rates, and the possible delays this could cause due to these potentially lengthy procedures.[30] It is important to understand how complicated it would be for the Board to determine the proper rate for switching. In general, regulators are relatively poorly equipped to make determinations regarding rates, and even more so in the case of access rates. This is not because of limited expertise, but rather because determining the consequences of forced switching is enormously complex, making it hard to efficiently price access to one component of a complex railroad network so as to avoid distorting investment decisions and creating operational inefficiencies. On top of this, the Board would need to factor in direct implementation costs and regulatory costs. Consequently, as complicated as existing maximum rate determinations may be, determining a rate for forced switching that minimizes distortion and inefficiency is very likely *more difficult* than those existing proceedings.

C. INDIRECT COSTS

60. We list here a few sources of indirect costs. Obviously, on top of these, adopting the Proposed Rule may also have negative unintended consequences, as with any new and complex market intervention.

1. Network distortions

61. Oliver Wyman lists a few types of distortions that could occur to railroad networks as a result of forced switching.[31] These include costs to quality (train delays due to congestion and lower railcar utilization); reduced operating efficiency (railcars that are switched have longer trip

[30] The rail carrier providing access will have to be compensated for these costs as well, for the same reason that it has to be compensated for direct switching implementation costs.

[31] See generally Rennicke 711.1 Op. V.S.; see *id.* at 2-4.

times, which reduces car velocity and increases track occupancy); inefficient routing; and increased risk of service failure. According to Oliver Wyman, every event that occurs on the railroad has a probability of being successfully executed. As the number of events increases – such as the multiple events involved in an added switching move – the cumulative probability of all events for a trip being successful would decrease, thus leading to more service failures.[32]

2. Uncertainty that depresses investment

62. Given the complexities in setting rates, the proposed forced switching regime will create uncertainty regarding returns to investment. It is generally understood that all else equal, uncertainty depresses the types of irreversible investments made in the railroad industry.[33] This may compound the direct negative effects on investment incentives if switching rates are set at suboptimal levels.

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[32] One analogy to railroads in this regard is the airline industry. Airlines also operate in a network industry in which knock-on effects are likely: Perturbations in one part of a network can have negative impacts elsewhere. One example is the disruptions caused during last Thanksgiving across large parts of the American Airlines' and Southwest's networks due to weather conditions in Dallas (and exacerbated by Covid-related staff shortages). See https://www.texasmonthly.com/news-politics/american-southwest-airlines-cancellations-pandemic/

[33] For example, Dunne and Mu examine the relationship between uncertainty and irreversible investment in the petroleum refining industry:

> "Using these data, we examine how refiners' investment decisions are influenced by market-level uncertainty. Empirically, a one standard deviation increase in the margin uncertainty measure reduces the probability of investment by 11 per cent under the five-per cent investment threshold (Table I). This finding, along with capital adjustment patterns that are present in the data, appears most consistent with an environment where irreversibility is important. Our results generally conform to the predications that arise from the real-options approach developed by Dixit and Pindyck [1994] where both irreversibility and uncertainty play key roles. In particular, as uncertainty in the refining margin rises, refiners delay their investment decisions."

Dunne, Timothy, and Xiaoyi Mu. "Investment Spikes and Uncertainty in the Petroleum Refining Industry." *Journal of Industrial Economics.* March 2010, 58(1), pp. 190-213.

3. Winners and losers

63. As mentioned above, even if some shippers will benefit from the windfall created by regulation that may inadvertently set switching rates below their competitive values, other shippers will likely lose from distortions created by these rates, especially since this is a network industry. There are many reasons for why there will be losers among shippers: The inability to cover common network costs will depress investment by railroads, and any inefficient shift from other modes of transportation to railroads due to distorted prices may also depress investments in alternative transportation markets. Other shippers will also bear the costs of congestion and network disruptions created by inefficient switching. The existence of winners and losers may have a negative impact on competition in downstream markets and may further contribute to inefficient resource allocation in the economy.

4. Environmental costs

64. While we are not experts in environmental issues, we understand that switching arrangements tend to increase the use of fuel and carbon emissions. Moreover, to the extent that instituting an inefficient regulatory policy will reduce investments in rail and eventually divert traffic to other modes of transportation, this will also tend to increase carbon emissions since it is likely that much of this diversion would occur to trucks, which are significantly less fuel-efficient (and thus more carbon intensive) than rail.[34] There may be another unintended consequence here too: Increased use of trucks will tend to cause highway congestion, which further compounds environmental effects.

[34] According to the European Environment Agency, the average greenhouse gases emissions for rail freight is 24 gCO_2 per km tons, compared to 137 for truck freight and 33 for inland waterways transport. See https://www.eea.europa.eu//publications/rail-and-waterborne-transport.

65. To conclude, implementation of a forced switching regulatory regime will be associated with a host of direct, indirect, and likely unexpected costs. These should be weighed against any positive upside of switching on resource allocation. Such an upside will only exist if, in fact, rates are at supra-competitive levels and those rates have depressed demand beyond its competitive level. But because, as we understand, the Board is proposing not to examine whether rates are in fact above a reasonable maximum, it will not know if forced switching even has any upside.

V. CONCLUSION

66. Except for extreme cases, firms should not be forced to share their assets with their competitors, and even less so to actively take part in complicated arrangements. Forcing them to do so will almost inevitably lead to distortions, especially in cases in which setting the compensation for sharing the assets is complicated and sharing the assets entails complicated logistics. Forced switching may be warranted only in extreme cases in which substantial market power exists and in which a competitor abuses this market power by refusing to do an efficient switch only to weaken its competitor. There is no evidence that these conditions exist in the railroad industry.

67. Simply increasing the number of individual rail carriers that could serve a customer should not be considered competition promotion. It may impair the market signals and introduce inefficiencies of various kinds. Lowering shipping rates in the short term should not in itself be the Board's goal. If there is a concern that rates may be too high on certain segments due to an abuse of market power, a regulatory backstop to deal with such situation already exists in the Board's regulations. There is no reason to think that forced switching regulation will be an

improvement over the situation today – and in both the short run and the long run is likely to harm the customers it seeks to help.

68. Finally, even if it were the case that some current rate levels were supra-competitive (and we have seen no evidence that it is so), and even if the proposed forced switching policy would in fact lower those rates from current anti-competitive levels, it is far from obvious that a meaningful portion of those rate reductions would be passed on to the shippers' consumers or would lead to materially higher demand and to better use of resources by these consumers. Any savings that are not passed on will simply be a wealth transfer from rail carriers to shippers. What would occur depends on the specific demand and cost conditions of each product shipped, which is a complicated fact-intensive question that the Proposed Rule does not suggest the Board would examine.

VERIFICATION

I, Jonathan M. Orszag, declare under penalty of perjury that the foregoing is true and correct and that I am qualified and authorized to file this verified statement and written testimony.

Executed on February 13, 2022.

Jonathan M. Orszag

VERIFICATION

I, Yair Eilat, declare under penalty of perjury that the foregoing is true and correct and that I am qualified and authorized to file this verified statement and written testimony.

Executed on February 13, 2022.

Yair Eilat

Appendix A

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PROFESSIONAL EXPERIENCE:

- **Senior Managing Director**, Compass Lexecon (previously Competition Policy Associates, Inc. ("COMPASS") and before that, Sebago Associates, Inc.), March 2000-Present. Manage economic consulting firm specializing in antitrust, economic policy, and litigation matters. Member of the firm's Executive Committee. Conduct economic and financial analysis on a wide range of complex issues involving mergers, litigation, public policy, and regulations for corporations and public-sector entities. Serve as expert witness in proceedings before U.S. and international courts and administrative agencies and the European Court of First Instance on competition policy issues, including industry structure, vertical relationships, and intellectual property rights.
- **Assistant to the Secretary and Director of the Office of Policy and Strategic Planning,** U.S. Department of Commerce (Washington, D.C.), March 1999-March 2000. Served as the Secretary of Commerce's chief policy adviser. Responsible for coordinating the development and implementation of policy initiatives within the Department. Worked on a wide range of issues, from implementing the steel loan guarantee program to telecommunications and e-commerce issues. Represented the Secretary of Commerce in meetings with other government officials and outside organizations, and testified before Congress on behalf of the Department on budget and Native American economic development issues.
- **Economic Policy Advisor**, National Economic Council, The White House (Washington, D.C.), August 1997-March 1999; Assistant Director, January 1996-November 1996.

Coordinated policy processes on a wide range of issues, from Social Security reform to job training reform, unemployment insurance reform, homeownership and low-income housing issues, the minimum wage, and Individual Development Accounts. Responsible for helping to coordinate the Administration's daily economic message and to promote (and defend) President Clinton's economic record.

- **Economics Teacher,** Phillips Exeter Academy Summer School (Exeter, New Hampshire), June 1997-August 1997. Taught introductory economics at Phillips Exeter Academy Summer School.
- **Economic Consultant,** James Carville (Washington, D.C.), August 1995-January 1996. Helped James Carville, President Clinton's 1992 campaign strategist, research and write his *New York Times* #1 best-selling book, *We're Right, They're Wrong: A Handbook for Spirited Progressives*.
- **Special Assistant to the Chief Economist**, U.S. Department of Labor, (Washington, D.C.), August 1994-August 1995. Served as an economic aide to the Chief Economist (Alan B. Krueger) and the Secretary of Labor (Robert B. Reich).

Volunteer Positions

- **Director of Policy Preparations for Vice Presidential Debate,** Gore-Lieberman Presidential Campaign, September 2000-October 2000. Oversaw policy preparations for Democratic Vice Presidential candidate before his debate with the Republican Vice Presidential candidate.
- **Weekly Commentator,** *Wall Street Journal Online,* September 2004-November 2004. Commented on economic issues during the 2004 presidential campaign. Topics of weekly commentary included jobs, health care, energy, trade, taxes, tort reform, appointments, and fiscal policy.

EDUCATION:

- Oxford University, M.Sc. in Economic and Social History, 1997.
- Princeton University, A.B. *summa cum laude* in Economics, 1996.
- Phillips Exeter Academy, graduate with High Honors, 1991.

HONORS, PROFESSIONAL ASSOCIATIONS, AND APPOINTMENTS:

- Phi Beta Kappa, inducted June 1996.
- Marshall Scholar, 1996.
- *USA Today* All-USA College Academic Team, 1996.
- Corporation for Enterprise Development Leadership Award for "Forging Innovative Public Policies to Expand Economic Opportunity in America," 1999.
- *Who's Who in America*, 2001-Present; Also, *Who's Who in the World*; *Who's Who in Science and Engineering*; *Who's Who in Finance and Business*; and *Who's Who of Emerging Leaders.*
- California Workforce Investment Board, 2000-2003.

- California Governor's Technology Advisory Group, 2000-2003.
- Adjunct Lecturer, University of Southern California (Los Angeles, CA), January 2002-June 2002.
- *Global Competition Review*'s "40 under 40: The World's 40 Brightest Young Antitrust Lawyers and Economists," 2004.
- *Global Competition Review*'s "Best Young Competition Economists," 2006.
- *The International Who's Who of Competition Economists*, 2007-Present.
- LawDay Leading Competition Economics Experts, 2009-Present.
- Expert Guides, Best of the Best USA, 2011-Present.
- Fellow, University of Southern California's Center for Communication Law & Policy, 2007-2015.
- FTI Consulting Inc., Founders Award, 2008.
- Senior Fellow, Center for American Progress, 2009-2016.
- Lecturer, University of California at Los Angeles (UCLA), School of Law, 2018-Present.
- Board of Directors, Sebago Associates, Inc., 2000-2007; Competition Policy Associates, Inc., 2003-2006; The First Tee of Washington, DC, 2005-2011; Ibrix, Inc. (Sold to Hewlett-Packard), 2006-2007; JMP Securities, Inc. (NYSE: JMP) (Sold to Citizens Bank Group), 2011-2021; TGR Foundation (formerly Tiger Woods Foundation), Board of Governors, 2012-Present; Children's Golf Foundation, 2013-2017; Friends of the Global Fight Against AIDS, Tuberculosis, and Malaria, 2013-Present; Board of Governors, The First Tee, 2019-Present.
- Clinton Global Initiative, Member, 2008-2016; Grassroot Soccer, Ambassadors Council, 2010-2019; The First Tee, Trustee, 2013-Present; Good+ Foundation, Fatherhood Leadership Council, 2017-Present.
- Member of the American Economic Association, the Econometric Society, the American Finance Association, and the United States Golf Association.

REPORTS, PAPERS, AND NOTES:

- "The Role of the Circle Principle in Market Definition," with Bryan Keating and Robert Willig, *Antitrust Source*, April 2018.
- "Toward a More Complete Treatment of Efficiencies in Merger Analysis: Lessons from Recent Challenges," with Loren Smith, *Antitrust Source*, October 2016.
- "State Involvement in a Market Economy: Principles to Guide Interventions and a Discussion about Network Industries," in *Antitrust in Emerging and Developing Countries,* edited by Eleanor Fox, Harry First, Nicolas Charbit, and Elisa Ramundo, *Concurrences Review,* 2016.
- "Tax Reform in The Bahamas: An Evaluation of Proposed Options," with David Kamin, Commissioned by the Commonwealth of The Bahamas, May 27, 2014.
- "The Impact of Federal Revenues from Limiting Participation in the FCC 600 MHz Spectrum Auction," with Philip Haile and Maya Meidan, Commissioned by AT&T, October 30, 2013.

- "The Definition of Small Business in the Marketplace Fairness Act of 2013," Commissioned by eBay, Inc., October 8, 2013.
- "The Benefits of Patent Settlements: New Survey Evidence on Factors Affecting Generic Drug Investment," with Bret Dickey, Commissioned by the Generic Pharmaceutical Association, July 23, 2013.
- "The Liftoff of Consumer Benefits from the Broadband Revolution," with Mark Dutz and Robert D. Willig, *Review of Network Economics,* Volume 11, Issue 4, Article 2, 2012.
- "Antitrust Guidelines for Private Purchasers Engaged in Value Purchasing of Health Care," with Tim Muris and Bilal Sayyed, Commissioned by Buying Value, July 2012.
- "The Economic Benefits of Pharmacy Benefit Managers," with Kevin Green, Commissioned by Express Scripts and Medco, December 5, 2011.
- "An Analysis of the Benefits of Allowing Satellite Broadband Providers to Participate Directly in the Proposed CAF Reverse Auctions," with Bryan Keating, Commissioned by ViaSat, Inc., April 18, 2011.
- "A Preliminary Economic Analysis of the Budgetary Effects of the Proposed Restrictions on 'Reverse Payment' Settlements," with Bret Dickey and Robert D. Willig, August 10, 2010.
- "An Economic Assessment of Patent Settlements in the Pharmaceutical Industry," with Bret Dickey and Laura Tyson, Volume 10, Issue 2, *Annals of Health Law*, Winter 2010.
- "An Economic Analysis of Consumer Harm from the Current Retransmission Consent Regime," with Michael Katz and Theresa Sullivan, Commissioned by the National Cable & Telecommunications Association, DIRECTV, and DISH Network, November 12, 2009.
- "Intellectual Property and Innovation: New Evidence on the Relationship Between Patent Protection, Technology Transfer, and Innovation in Developing Countries," with Mark Dutz and Antara Dutta, October 2009.
- "Intellectual Property and Innovation: A Literature Review of the Value of Patent Protection for Developing Countries," with Mark Dutz and Antara Dutta, October 2009.
- "An Economic Perspective on the Antitrust Case Against Intel," with Robert D. Willig and Gilad Levin, October 2009.
- "The Substantial Consumer Benefits of Broadband Connectivity for U.S. Households," with Mark Dutz and Robert D. Willig, July 2009.
- "An Economic Assessment of the Homeowners' Defense Act of 2009," with Doug Fontaine, July 2009.
- "A Preliminary Economic Analysis of FTC Chairman Leibowitz's June 23rd Speech," with Robert D. Willig, June 24, 2009.
- "Assessment of Microsoft's Behaviour in the Browser Market," with Assaf Eilat, Gilad Levin, Andrea Lofaro, and Jan Peter van der Veer, Submitted to the Commission of the European Communities, COMP/C-3/39.530, May 27, 2009.
- "An Economic Perspective on the Microsoft Internet Explorer Tying Case," with Assaf Eilat, Gilad Levin, Andrea Lofaro, and Jan Peter van der Veer, Submitted to the Commission of the European Communities, COMP/C-3/39.530, April 24, 2009.
- "The Empirical Effects of Collegiate Athletics: An Update Based on 2004-2007 Data," with Mark Israel, February 2009.

- "An Econometric Analysis of the Matching Between Football Student Athletes and Colleges," with Yair Eilat, Bryan Keating, and Robert D. Willig, January 2009.
- "An Economic Assessment of Regulating Credit Card Fees and Interest Rates," with Susan H. Manning, October 2007.
- "An Assessment of the Competitive Effects of the SKY-Prime Merger: Lessons from the Recent News Corp.-DIRECTV Merger," with Cristian Santesteban, Submitted to New Zealand Commerce Commission, January 23, 2006.
- "Closing the College Savings Gap," with Peter R. Orszag and Jason Bordoff, November 2005.
- "Putting in Place An Effective Media Player and Media Server Remedy," with Joseph E. Stiglitz, Submitted to the Korean Fair Trade Commission, October 10, 2005.
- "An Economic Analysis of Microsoft's Tying of the Windows Media Player to the Windows Operating System and Its Impact on Consumers, Competition, and Innovation," with Joseph E. Stiglitz, Submitted to the Korean Fair Trade Commission, September 12, 2005.
- "Economic Analyses of Microsoft's Abusive Tie and Its Impact on Consumers, Competition, and Innovation," with Joseph E. Stiglitz and Sangin Park, Submitted to the Korean Fair Trade Commission, September 12, 2005.
- "The Empirical Effects of Division II Intercollegiate Athletics," with Peter R. Orszag, June 2005.
- "An Economic Analysis of Microsoft's Abusive Tie and Its Impact on Consumers, Competition, and Innovation," with Joseph E. Stiglitz and Jason Furman, Submitted to the European Court of First Instance, Case T-201/04 R, May 12, 2005.
- "The Physical Capital Stock Used in College Athletics," with Peter R. Orszag, April 2005.
- "The Empirical Effects of Collegiate Athletic Spending: An Update," with Peter R. Orszag, April 2005.
- "Putting in Place An Effective Media Player Remedy," with Joseph E. Stiglitz, Submitted to the Commission of the European Communities, April 27, 2005.
- "The Empirical Effects of Collegiate Athletic Spending: An Interim Report," with Robert E. Litan and Peter R. Orszag, the National Collegiate Athletic Association and Sebago Associates, Inc., August 2003 (reprinted in *The Business of Sports*, edited by Scott Rosner and Kenneth Shropshire (Jones and Bartlett Publishes, 2004)).
- "Learning and Earning: Working in College," with Peter R. Orszag and Diane M. Whitmore, *Journal of Student Employment*, Volume IX, Number 1, June 2003.
- "The Impact of Asbestos Liabilities on Workers in Bankrupt Firms," with Joseph E. Stiglitz and Peter R. Orszag, *Journal of Bankruptcy Law and Practice*, Volume 12, Issue No. 1, February 2003.
- "The Process of Economic Policy-Making During the Clinton Administration," with Peter R. Orszag and Laura D. Tyson, in *American Economic Policy in the 1990s*, edited by Jeffrey Frankel and Peter R. Orszag (Cambridge, Massachusetts: MIT Press, 2002).
- "The Implications of the New Fannie Mae and Freddie Mac Risk-Based Capital Standard," with Joseph E. Stiglitz and Peter R. Orszag, *Fannie Mae Papers*, Volume I, Issue 2, March 2002 (reprinted in *Housing Matters: Issues in American Housing Policy*).

- "Hispanics and the Current Economic Downturn: Will the Receding Tide Sink Hispanics?" with Alan B. Krueger, Pew Hispanic Center, January 2002.
- "Aging in America: A Policy Perspective," with Jonathan Gruber and Peter R. Orszag, The Pew Charitable Trusts and Sebago Associates, Inc., January 2002.
- "An Economic Analysis of Spectrum Allocation and Advanced Wireless Services," with Martin N. Baily, Peter R. Orszag, and Robert D. Willig, Cellular Telecommunications and Internet Association and Sebago Associates, Inc., October 2001.
- "A New Look at Incentive Effects and Golf Tournaments," in *The Economics of Sports*, edited by Andrew Zimbalist (London: Edward Elgar Publishing, 2001). Original version in *Economics Letters*, 46, March 1994, p. 77-88.
- "Learning and Earning: Working in College," with Peter R. Orszag and Diane M. Whitmore, UPromise, Inc. and Sebago Associates, Inc., August 2001.
- "The Impact of Potential Movie and Television Industry Strikes on the Los Angeles Economy," with Ross C. DeVol, Joel Kotkin, Peter R. Orszag, Robert F. Wescott, and Perry Wong, The Milken Institute and Sebago Associates, Inc., April 19, 2001.
- "Would Raising IRA Contribution Limits Bolster Retirement Security for Lower- and Middle-Income Families?" with Peter R. Orszag, Center on Budget and Policy Priorities, April 2, 2001.
- "Computers in Schools: Domestic and International Perspectives," California Technology, Trade, and Commerce Agency and Sebago Associates, Inc., March 2001.
- "The Impact of Paying for College on Family Finances," with Laura D. Tyson, Joseph E. Stiglitz, and Peter R. Orszag, UPromise, Inc. and Sebago Associates, Inc., November 2000.
- "A Simple Analysis of Discarded Votes by Precinct in Palm Beach," with Peter R. Orszag, Sebago Associates, Inc., November 10, 2000.
- "Analysis of Votes for Buchanan by Precinct within Palm Beach and Broward Counties," with Peter R. Orszag, Sebago Associates, Inc., November 9, 2000.
- "A Statistical Analysis of the Palm Beach Vote," with Peter R. Orszag, Sebago Associates, Inc., November 8, 2000.
- "The Role of Government in a Digital Age," with Joseph E. Stiglitz and Peter R. Orszag, Computer and Communications Industry Association and Sebago Associates, Inc., October 2000.
- "Quantifying the Benefits of More Stringent Aircraft Noise Regulations," with Peter R. Orszag, Northwest Airlines and Sebago Associates, Inc., October 2000.
- "All That Glitters Is Not Gold: The Feldstein-Liebman Analysis of Reforming Social Security with Individual Accounts," with Peter R. Orszag, Center on Budget and Policy Priorities, April 26, 2000.
- "Would Raising IRA Contribution Limits Bolster Retirement Security For Lower- and Middle-Income Families or Is There a Better Way?" with Peter R. Orszag, Center on Budget and Policy Priorities, April 12, 2000.
- "The Economics of the U.S.-China Air Services Decision," with Peter R. Orszag, and Diane M. Whitmore, United Parcel Service and Sebago Associates, Inc., March 2000.

OP-EDS/LETTERS TO THE EDITOR:

- "Hitting Budget Numbers May Be Up for Auction," *Roll Call*, December 19, 2013.
- "Jack Welch Could Help Improve U.S. Jobs Data," with Peter R. Orszag, *Bloomberg,* October 9, 2012.
- "Giving Credit Where Credit Is Due," *The Hill*, December 2, 2011.
- "PBMs Save Us Billions," *The Hill*, November 28, 2011.
- "Drug Patent Settlements," with Robert D. Willig, *New York Times*, July 19, 2010.
- "Homeowners Defense Act Could Lower Insurance Premiums," *Treasure Coast Palm*, September 24, 2009.
- "Katrina Teaches Us To Financially Prepare Today for the Catastrophe of Tomorrow," *San Angelo Standard-Times,* September 23, 2009.
- "A Catastrophe Waiting To Happen," *The Daily Citizen*, September 15, 2009.
- "Broadband: Now A 'Necessity'," *Multichannel News*, August 10, 2009.
- "Forget the Estate Tax: America Needs An Inheritance Tax," *Ideas Primary*, January 23, 2008, available at http://www.ideasprimary.com/?p=442
- "Credit Where It's Due," *Wall Street Journal*, October 25, 2007.
- "Congress Grounds Delivery Competition," Sebago Associates, Inc., April 17, 2003.
- "Paul O'Neill Doesn't Cry for Argentina," Sebago Associates, Inc., August 3, 2001.
- "Do You Recognize The Clinton West Wing in *The West Wing*?" *The Atlantic Monthly* Online, March 2001.

SPEECHES AND PRESENTATIONS:

- "Lessons from the DE&I Battlefield: What Lawyers and Economists Can Learn From Each Other," Panelist at American Bar Association Session, July 8, 2021.
- Keynote, Investment Education Symposium in connection with the Louisana Trustee Education Council (LATEC), New Orleans, Louisiana, February 28, 2019.
- "Challenges in the Negotiation of Remedies in Mergers & Acquisitions," Panelist at IBRAC's 24th Annual International Seminar on Competition Law," Sao Paulo, Brazil, October 24, 2018.
- "Industry Professional Panel," Panelist at Music Industry Research Association, Los Angeles, CA, June 26, 2018.
- "The Amex Decision: Turning the Tables?" Panelist at Concurrences Review and Fordham University School of Law, "Antitrust in the Financial Sector: Hot Issues & Global Perspectives," New York, NY, May 3, 2018.
- "Views from the Trenches: Anthem/Cigna and Aetna/Humana," Panelist at the 66th American Bar Association Section of Antitrust Law Spring Meeting, Washington, DC, April 11, 2018.
- "Consolidation Craze," Moderator at UCLA Law Entertainment Symposium, "Progress is Paramount — Why Hollywood Will Always Matter," Los Angeles, CA, March 24, 2018.

- "Setting the Stage: State Involvement in A Market Economy," Panelist at Concurrences Review and New York University School of Law Conference on "Antitrust in Emerging and Developing Economies: Africa, Brazil, China, India, Mexico…," New York, NY, October 23, 2015.
- "Office Superstores: What Changed in 15 Years?" Panelist on ABA Section of Antitrust Law, Economics and Mergers & Acquisitions Committees, Washington, DC, January 6, 2014.
- "Five Bars: Spectrum Policy and the Future of the Digital Economy," Panelist at Third Way Briefing, House of Representatives, Washington, DC, December 11, 2013.
- "An Economic Perspective on Reverse Payment Settlements in the Pharmaceutical Sector," Speech to the Generic Pharmaceutical Association 2013 Annual Meeting, Orlando, Florida, February 21, 2013.
- "Navigating Our Economic Challenges and the Role of Public Policy," Speech to the South Carolina Manufacturers Alliance Fourth Annual Textile Summit, Spartanburg, South Carolina, January 10, 2013.
- "Upward Price Pressure and Merger Analysis: What Is UPP's Proper Role and How Can UPP Deal With Real-World Issues?" Presentation to Gilbert + Tobin, Sydney, Australia, December 4, 2012.
- "Obama's Second Term: What It Means for the U.S. and World Economies," FTI Consulting, Inc., Brisbane, Australia, December 3, 2012.
- "Merger Substance: How to Conduct a Proper Analysis of a Merger's Competitive Effects, and How to Frame Related Legal Standards?" Panelist at Antitrust in Asia, American Bar Association, New Delhi, India, December 1, 2012
- "Financial Issues in College Sports," Panelist at the Third Annual Sports Law Symposium: What is the Proper Role of Sports in Higher Education?, Institute of Sports Law and Ethics, Santa Clara University, September 6, 2012.
- "Pricing and Bundling of IT Products: Drawing The Line Between Lawful and Unlawful Behaviour," Panelist on GCR Live's Antitrust and Technology 2012, London, England, March 14, 2012.
- "The Role of Economic Evidence in Cartel Enforcement," Speaker on ABA Section of International Law Teleconference, February 28, 2012.
- "Reverse Payment Settlements in the Pharmaceutical Industry," Presentation to the House Energy and Commerce Committee Staff, July 15, 2011.
- "Increased Government Intervention: The Good, The Bad, and the Ugly," Panelist, Association of Management Consulting Firms, New York, NY, December 2, 2010.
- "The Economic Challenges and Trade-Offs Facing the Obama Administration," Remarks to RBS Citizens, Boston, MA, June 8, 2010.
- "Competition Policy As Innovation Policy," Panelist, Computer & Communications Industry Association, Washington DC, October 27, 2009.
- "State of the Market: Regulatory Evolution and Policy," Moderator, Youth, I.N.C. and Piper Jaffray, New York, NY, September 29, 2009.
- "The Empirical Effects of Collegiate Athletics," Presentation to the NCAA Leadership Advisory Board, Detroit, Michigan, April 4, 2009.

- "The Economic Challenges and Trade-Offs Facing the Obama Administration," Remarks to the Junior Capital Group, Proskauer Rose, LLP, New York, NY, February 10, 2009.
- "Managing Communications During Unprecedented Economic Times," Panelist, The California Club, Los Angeles, CA, January 27, 2009.
- Presentation to the Computer & Communications Industry Association's Antitrust Summit on Innovation and Competition Policy in High-Tech Markets, Washington DC, October 24, 2008.
- Presentation to the Center for American Progress Action Fund Session on the "Avoiding the Pitfalls of Credit Card Debt," Washington, DC, February 25, 2008.
- "Distribution Fund Planning and Management: Lessons Learned from the Global Research Analyst Settlement," with Francis McGovern, Presentation to the Securities and Exchange Commission, Washington, DC, January 31, 2006.
- "The Empirical Effects of Division II Intercollegiate Athletics," Presentation to the National Collegiate Athletic Association 2006 Annual Convention, Indianapolis, Indiana, January 8, 2006.
- "Rules of the Game: Defining Antitrust Markets in Cases Involving Sports," Presentation to the Wilmer, Cutler, Pickering, Hale & Dorr Antitrust Lunch, Washington, DC, December 8, 2005.
- "Competition Policy, Antitrust, and The High-Tech Economy," Keynote Address to the Computer & Communications Industry Association TechSummit 2005, Laguna Beach, CA, October 26, 2005.
- "The Empirical Effects of Division II Intercollegiate Athletics," Presentation to the Division II Chancellors and Presidents Summit, Orlando, FL, June 25, 2005.
- "The Empirical Effects of Collegiate Athletic Spending: An Update and Extension," Presentation to the President's Task Force on the Future of Intercollegiate Athletics, Tucson, AZ, June 9-10, 2005.
- "The Empirical Effects of Collegiate Athletic Spending: An Update and Extension," Presentation to the NCAA Division I Board of Directors, Indianapolis, IN, April 28, 2005.
- "An Analysis of Division II Athletic Expenditures: Preliminary Findings," Presentation to the NCAA Division II Board of Directors, Indianapolis, IN, April 28, 2005.
- "An Analysis of Division II Athletic Expenditures: An Overview of Study Design," Presentation to the National Collegiate Athletic Association 2005 Annual Convention, Grapevine, Texas, January 8, 2005.
- "The Empirical Effects of Collegiate Athletic Spending: An Interim Report," Presentation to the National Association of State Universities and Land Grant Colleges Annual Conference, November 17, 2003.
- "The Impact of Asbestos Liabilities on Workers in Bankrupt Firms," *South Texas Law Review,* "Symposium: Asbestos Litigation," Fall 2003.
- "The Impact of Asbestos Liabilities on Workers in Bankrupt Firms," Presentation to the Conference on "Understanding Asbestos Litigation: The Genesis, Scope, and Impact," U.S. Chamber of Commerce, Washington, DC, January 23, 2003.
- "The Process of Economic Policy-Making During the Clinton Administration," Presentation to the Conference on "American Economic Policy in the 1990s," Center for Business and

Government, John F. Kennedy School of Government, and Harvard University, Cambridge, MA, June 29, 2001.

- "The Impact of Paying for College on Family Finances," Presentation to the Conference on "Funding Excellent Schools and Colleges for All Students," National Conference of State Legislatures, Savannah, Georgia, February 17, 2001.
- "China and the Internet," Remarks on Entertainment and the Internet in China at the EMASIA 2000 Forum, The Asia Society, Los Angeles, CA, May 23, 2000.
- "Is It The Star or Just an Extra? The Role Government Plays in a Digital Economy," Remarks on the Regulation of Global Electronic Commerce at the eCommerce and Global Business Forum, The Anderson School at UCLA and the University of Washington Business School, Santa Cruz, CA, May 18, 2000.
- "Lessons Learned from the Emergency Loan Guarantee Programs," Keynote Address at the Government Guaranteed Lending 2000 Conference, Coleman Publishing, Inc., May 4, 2000.
- "Don't Just Think, Believe," Remarks to the Assembly of Phillips Exeter Academy, Exeter, New Hampshire, February 9, 1999.

TESTIMONY BEFORE REGULATORY AGENCIES/CONGRESS:

- *In the Matter of Implementation of Section 621(a)(1) of the Cable Communications Policy Act of 1984 as Amended By the Cable Television Consumer Protection and Competition Act of 1992,* MB Docket No. 05-311, Before the Federal Communications Commission, December 14, 2018.
- "A Response to the Economic Report of Gregory Rosston and Anderzej Skrzypacz, 'Using Auctions and Flexible-Use Licenses to Maximize the Social Benefits From Spectrum,'" with Maya Meidan, Before the Federal Communications Commission, GN Docket No. 14-177, November 9, 2017
- *Review of Commodity, Boxcar, and TOFC/COFC Exemptions,* Docket No. EP 704 (Sub-No 1), Before Surface Transportation Board, with Mark Israel (Verified Statement: July 26, 2016; Reply Verified Statement: August 26, 2016).
- *Division of Insurance Regulation v. Aetna, Inc. and Humana, Inc.*, In the Department of Insurance, Financial Institution, and Professional Registration, State of Missouri, (Case No. 160325191C), (Hearing Testimony: May 16, 2016).
- *In the Matter of AT&T Mobility, LLC v. Iowa Wireless Services, LLC,* in File No. EB-15-MD-007, Before the Federal Communications Commission (Declaration: October 21, 2015; Reply Declaration: February 5, 2016).
- *In the Matter of World Call Interconnect, Inc. v. AT&T Mobility LLC*, in File No. EB-14-MD-011, Before the Federal Communications Commission (Declaration: November 5, 2014).
- Hearing on "Pay-for-Delay Deals: Limiting Competition and Costing Consumers," Testimony to the Senate Judiciary Committee, Subcommittee on Antitrust, Competition Policy, and Consumer Rights, July 23, 2013.
- Hearing on "The Express Scripts/Medco Merger: Cost Savings for Consumers or More Profits for the Middlemen?" Written Testimony to the Senate Judiciary Committee, Subcommittee on Antitrust, Competition Policy, and Consumer Rights, December 6, 2011.

- *In the Matter of Applications of AT&T Inc. and Deutsche Telekom AG For Consent To Assign or Transfer Control Licenses and Authorization,* in WT Docket No. 11-65, with Robert D. Willig and Jay Ezrielev, Submitted to the Federal Communications Commission, Commissioned by AT&T, June 9, 2011.
- "Response to Supplementary Comments of Hubert Horan," Submitted to the Department of Transportation, *Joint Application of Delta Airlines, Inc.; Virgin Blue Airlines PTY LTD; Virgin Blue International Airlines PTY LTD d/b/a V Australia; Pacific Blue Airlines (NZ) LTD; and Pacific Blue Airlines (Aust) PTY LTD*, with Mark Israel, Bryan Keating, and Robert D. Willig, Docket DOT-OST-2009-0155, Commissioned by Delta Air Lines, October 22, 2010.
- "Measuring Consumer Benefits from Antitrust Immunity for Delta Air Lines and Virgin Blue Carriers," Submitted to the Department of Transportation, *Joint Application of Delta Airlines, Inc.; Virgin Blue Airlines PTY LTD; Virgin Blue International Airlines PTY LTD d/b/a V Australia; Pacific Blue Airlines (NZ) LTD; and Pacific Blue Airlines (Aust) PTY LTD*, with Mark Israel, Bryan Keating, and Robert D. Willig, Docket DOT-OST-2009-0155, Commissioned by Delta Air Lines, October 13, 2010.
- *In the Matter of Implementation of Section 224 of the Act; A National Broadband Plan for Our Future,* with Allan Shampine, Submitted to the Federal Communications Commission (WC Docket No. 07-245; GN Docket No. 09-51), Commissioned by the Edison Electric Institute, Declaration Submitted on October 4, 2010; Supplemental Declaration, Submitted on December 14, 2010.
- *In Re: Cable Subscribership Survey For the Collection of Information Pursuant to Section 612(g) of the Communications Act*, with Michael Katz and Theresa Sullivan, Submitted to the Federal Communications Commission (MB Docket No. 07-269), Commissioned by the National Cable & Telecommunications Association, DIRECTV, and DISH Network, December 16, 2009.
- *In The Matter of Applications for the Transfer of Control of Licenses and Authorizations From Centennial Communications Corp. to AT&T*, with Robert D. Willig and J. Loren Poulsen, Submitted to the Federal Communications Commission, Commissioned by AT&T, November 21, 2008.
- *In The Matter of Implementation of the Cable Television Consumer Protection and Competition Act of 1992; Development of Competition and Diversity in Video Programming Distribution: Section 628(c)(5) of the Communications Act; Sunset of Exclusive Contract Prohibition; Review of the Commission's Program Access Rules and Examination of Programming Tying Arrangements,* Filed in Conjunction With Reply Comments Submitted to the Federal Communications Commission (MB Docket No. 07-29; MB Docket No. 07-198), Commissioned by Discovery Communications, Inc., February 12, 2008.
- *In The Matter of Applications for the Transfer of Control of Licenses and Authorizations From Dobson Communications to AT&T*, with Robert D. Willig, Submitted to the Federal Communications Commission, Commissioned by AT&T, July 12, 2007.
- *In The Matter of Satellite Home Viewer Extension and Reauthorization Act of 1994,* with Jay Ezrielev, Submitted to the Library of Congress, Copyright Office (Docket No. RM 2005-07), Commissioned by EchoStar Satellite L.L.C., September 1, 2005.
- *In The Matter of Rainbow DBS Company, LLC, Assignor, and EchoStar Satellite L.L.C., Assignee, Consolidated Application for Consent to Assignment of Space Station and Earth Station Licenses, and related Special Temporary Authorization*, with Simon J. Wilkie,

Submitted to the Federal Communications Commission (IB Docket No. 05-72), Commissioned by EchoStar Satellite L.L.C. and Rainbow DBS Company, LLC, April 12, 2005.

- *In The Matter of Applications for the Transfer of Control of Licenses and Authorizations From Western Wireless Corporation to ALLTEL Corporation*, with Robert D. Willig and Yair Eilat, Submitted to the Federal Communications Commission (WT Docket No. 05-50), Commissioned by ALLTEL Corporation and Western Wireless Corporation, March 29, 2005.
- *In The Matter of A La Carte and Themed Tier Programming and Pricing Options for Programming Distribution on Cable Television and Direct Broadcast Satellite Systems*, with Robert D. Willig and Jay Ezrielev, Filed in Conjunction With Comments Submitted to the Federal Communications Commission (MB Docket No. 04-207), Commissioned by Discovery Communications, Inc., July 15, 2004.
- "An Economic Assessment of the Exclusive Contract Prohibition Between Vertically Integrated Cable Operators and Programmers," with Peter R. Orszag and John M. Gale, Filed in Conjunction With Reply Comments Submitted to the Federal Communications Commission (CS Docket No. 01-290), Commissioned by EchoStar Satellite Corporation and DIRECTV, Inc., January 7, 2002
- Hearing on "The Department of Commerce Fiscal Year 2001 Budget and Its Native American Initiatives," Testimony to the United States Senate Indian Affairs Committee, February 23, 2000.
- Hearing on "Testimony on S. 614: The Indian Tribal Regulatory Reform and Business Development Act," Testimony to the United States Senate Indian Affairs Committee, May 19, 1999.

TESTIMONY IN LITIGATION PROCEEDINGS:

- *In Re: JUUL Labs, Inc., Marketing, Sales Practices, and Products Liability Litigation*, United States District Court, Northern District of California, (Case No. 19-md-02913-WHO), (Expert Report: August 27, 2021; Deposition Testimony: September 22, 2021).
- *Hank Haney and Hank Haney Media, LLC v. PGA Tour, Inc.,* United States District Court for the Southern District of Florida, (Civil Action No. 0:19-CV-63108-RAR), (Rebuttal Expert Report: March 19, 2021; Deposition Testimony: April 12, 2021).
- *Persian Gulf Inc et al. vs. BP West Coast Products, LLC et al and Richard Bartlett et al. v. BP West Coast Products LLC et al.*, United States District Court for the Southern District of California (Case No. 3:15-cv-01749-TWR-AGS; 3:18-cv-01373-TWR-AGS), (Expert Report: December 11, 2020; Deposition Testimony: January 13, 2021).
- *Academy of Allergy & Asthma in Primary Care, and United Biologics, LLC d/b/a United Allergy Services v. Superior Healthplan, Inc., and Centene Corp.,* United States District Court for the Western District of Texas, San Antonio Division, (Civil Action No. 5:17-CV-01122-FB), (Expert Report: September 8, 2020; Reply Expert Report: October 6, 2020; Deposition Testimony: November 18, 2020).
- *In re EpiPen (Epinephrine Injection, USP) Marketing Sales Practices and Antitrust Litigation*, United States District Court for the District of Kansas, (Case No. 17-md-2785-DDC-TJJ), (Expert Report: December 23, 2019; Deposition Testimony: January 23, 2020; Declaration: July 14, 2020).

- *In re Automotive Parts Antitrust Litigation, In re Wire Harness, FCA US LLC v. Yazaki Corp. et al.,* United States District Court, Eastern District of Michigan, Southern Division, (Case No. 2:17-cv-14138-MOB-MKM, Master File No. 12-md-02311), (Expert Report: December 23, 2019; Deposition Testimony: January 10, 2020).
- *In re Determination of Rates and Terms for Sound Recordings (2021-2025) and Making of Ephemeral Copies to Facilitate Those Performances (Web V)*, Before the United States Copyright Royalty Judges, (Docket No.: 19-CRB-0005-WR), (Written Direct Testimony: September 24, 2019; Written Rebuttal Testimony: January 10, 2020; Deposition Testimony: March 5, 2020; Trial Testimony: August 10-13, 2020; August 25, 2020).
- *Matthew Fero et al. v. Excellus Health Plan Inc. et al*, United States District Court, Western District of New York, (Case No. 6:15-cv-06569), (Expert Report: September 13, 2019; Deposition Testimony: October 30, 2019).
- *In re Premera Blue Cross Customer Data Security Breach Litigation,* United States District Court for the District of Oregon (Case No. 3:15-md-2633-SI), (Expert Report: September 19, 2018; Deposition Testimony, October 9, 2018).
- *Rimini Street, Inc. v. Oracle International Corporation and Oracle America, Inc.,* United States District Court for the District of Nevada (Case No. 2:14-CV-01699-LRH-CWH), (Expert Report: May 4, 2018; Rebuttal Report: June 22, 2018; Supplemental Rebuttal Report: July 20, 2018; Deposition Testimony: August 22, 2018; Second Supplemental Rebuttal Report: March 4, 2021).
- *Xaleron Pharmaceuticals, Inc. v. Actavis, Inc. and Allergan, Inc.*, In the Supreme Court of the State of New York, County of New York (Case No. 150587/2016), (Expert Report: December 27, 2017; Deposition Testimony: January 26, 2018).
- *Innovation Ventures, LLC f/d/b/a Living Essentials v. Custom Nutrition Laboratories, LLC and Nutrition Science Laboratories, LLC and Alan Jones*, United States District Court for the Eastern District of Michigan, Southern Division, (Case No. 12-13850), (Rebuttal Expert Report: March 23, 2017; Deposition Testimony: April 5, 2017; Rebuttal Expert Report: December 4, 2020; Deposition Testimony: January 15, 2021).
- *United States of America et al., v. Aetna Inc. and Humana Inc.,* United States District Court for the District of Columbia, (Case: 1:16-cv-01494(JDB)), (Expert Report: October 21, 2016; Expert Reply Report: November 11, 2016; Deposition Testimony: November 23, 2016; Trial Testimony: December 19-20, 2016).
- *In the Matter of Determination of Royalty Rates and Terms for Transmission of Sound Recordings by Satellite Radio and "Preexisting" Subscription Services (SDARS III)*, Before the United States Copyright Royalty Judges (Docket No.: 16-CRB-0001 SR/PSSR (2018-2022), (Written Direct Testimony: October 19, 2016; Deposition Testimony: January 17, 2017 and April 4, 2017; Written Rebuttal Testimony: February 17, 2017; Trial Testimony: April 25-26, 2017).
- *In Re National Collegiate Athletic Association Athletic Grant-In-Aid Cap Antitrust Litigation,* United States District of Court for the Northern District of California, (Case: No. 4:14-md-2541-CW), (Expert Report: August 26, 2016; Deposition Testimony: September 28, 2016).
- *Review of Commodity, Boxcar, and TOFC/COFC Exemptions,* Docket No. EP 704 (Sub-No 1), Before Surface Transportation Board, with Mark Israel (Verified Statement: July 26, 2016; Reply Verified Statement: August 26, 2016).

- *Federal Trade Commission et al., v. Staples, Inc. and Office Depot, Inc.,* United States District Court for the District of Columbia, (Case: 1:15-cv-02115-EGS), (Expert Report: February 29, 2016; Deposition Testimony: March 14, 2016).
- *American Airlines, Inc. v. British Airways PLC; Iberia Lineas Aereas de Espana, and Finnair OYJ,* Before the American Arbitration Association, (Expert Report: December 16, 2015).
- *U.S. Department of Justice v. AB Electrolux; Electrolux North America, Inc.; and General Electric Company*, United States District Court for the District of Columbia, (Case: 1:15-cv-01039-EGS), (Expert Report: September 30, 2015; Rebuttal Report: October 20, 2015; Deposition Testimony: October 28, 2015; Supplemental Report: November 11, 2015; Trial Testimony: December 3-4, 2015).
- *Vijay Singh v. PGA Tour, Inc.,* Supreme Court of the State of New York (Index No. 651659/2013), (Expert Report: June 12, 2015; Deposition Testimony: August 20, 2015).
- *In re: Lightsquared Inc., et al.,* In the United States Bankruptcy Court for the Southern District of New York (Case No. 12-12080 (SCC)), (Expert Report: February 3, 2015; Deposition Testimony: February 23, 2015; Trial Testimony: March 12, 2015).
- *Armando Diaz et al v. San Juan Cable* LLC In The United States District Court for the District of Puerto Rico (Civil Action No: 14-1244-CCC), (Expert Report: December 5, 2014).
- *In re Cablevision Consumer Litigation*, In The United States District Court for the Eastern District of New York (10-CV-4992 (JS) (AKT)) (Expert Report: July 18, 2014; Rebuttal Expert Report: September 11, 2014; Deposition Testimony: October 2, 2014).
- *Orbital Sciences Corporation v. United Launch Alliance, LLC, and RD Amross, LLC,* In the United States District Court for the Eastern District of Virginia (Civil No: 1:13-cv-00753 LMB/JFA), (Expert Report: February 28, 2014).
- *Puerto Rico Telephone Company, Inc. v. San Juan Cable LLC d/b/a OneLink Communications,* In the United States District Court for the District of Puerto Rico (Civil No: 11-2135 (GAG)), (Expert Report: December 11, 2013; Supplemental Report: December 23, 2013; Deposition Testimony: January 10, 2014).
- *Sky Angel U.S., LLC v. Discovery Communications, LLC, et al.* In the United States District Court of Maryland, Southern Division (Civil Action No. 8:13-cv-00031-DKC), (Expert Report: December 6, 2013; Deposition Testimony: January 31, 2014; Trial Testimony: November 23, 2015).
- *Oakley, Inc. vs. Nike, Inc. and Rory McIlroy*; In the United States District Court for the Central District of California (Case No. SACV12-02138 JVS-MLG), (Expert Report: November 26, 2013).
- *In re: Electronic Books Antitrust Litigation; The State of Texas, et al., v Penguin Group (USA), Inc., et al.*, In the United States District Court for the Southern District of New York (No. 11-md-02293 (DLC) and No. 12-cv-03394 (DLC)), (Declaration: November 15, 2013; Deposition Testimony: December 7, 2013; Sur-Reply Declaration: January 21, 2014).
- *Federal Trade Commission v. Actavis, Inc., et al.*, Signatory, Brief of Antitrust Economists as *Amici Curiae* before the Supreme Court, No. 12-416, February 28, 2013.
- *VOOM HD Holding LLC v. EchoStar Satellite LLC*, In the Supreme Court of the State of New York, County of New York (Index No. 600292/08), (Expert Report: December 4, 2009; Deposition Testimony: March 5, 2010; Supplemental Expert Report: August 10, 2012;

Supplemental Deposition Testimony: September 14, 2012; Jury Trial Testimony: October 11-12, 2012).

- *Hewlett-Packard Company v. Oracle Corporation*, In the Superior Court of the State of California, County of Santa Clara (Case No 1-11-CV-203163), (Expert Report: March 26, 2012; Rebuttal Report: April 9, 2012; Deposition Testimony: April 19, 2012; Supplemental Expert Report: December 10, 2012; Supplemental Deposition Testimony: February 5, 2013; Trial Testimony: March 18, 2013; Updates to Supplemental Expert Report: November 30, 2015; Supplemental Rebuttal Report: March 15, 2016; Supplemental Deposition Testimony: March 24, 2016, April 20, 2016; Jury Trial Testimony: June 20-21, 2016, June 28, 2016; Declaration: August 1, 2016).
- *In The Matter of Game Show Network, LLC v. Cablevision Systems Corporation*, in File No. CSR-8529-P, Before the Federal Communications Commission (Expert Report: December 12, 2011; Reply Declaration: February 9, 2012; Expert Report: December 14, 2012; Deposition Testimony: February 7, 2013, March 12, 2015; Direct Testimony: March 12, 2013; Supplemental Direct Testimony: March 19, 2013; Rebuttal Report: December 15, 2014; Complete Direct Testimony: June 1, 2015; Trial Testimony: July 20, 2015).
- *In The Matter of The Tennis Channel v. Comcast Cable Communications, LLC*, in File No. CSR-8258-P, Before the Federal Communications Commission (Declaration: February 11, 2010; Reply Declaration: April 13, 2010; Expert Report: February 25, 2011; Deposition Testimony: March 8, 2011; Written Direct Testimony: April 15, 2011; Rebuttal Declaration: April 26, 2011; Courtroom Testimony: April 27, 2011; Supplemental Deposition Testimony: May 1, 2011; Supplemental Rebuttal Declaration, May 12, 2011).
- *Caroline Behrend, et al. vs. Comcast Corporation, et al.*, In the United States District Court for the Eastern District of Pennsylvania (Civil Action No. 03-6604), (Declaration: August 21, 2009; Deposition: September 29, 2009).
- *In The Matter of TCR Sports Broadcasting Holding, LLP d/b/a Mid-Atlantic Sports Network v. Comcast Corporation*, in MB Docket No. 08-214, File No. CSR-8001-P, Before the Federal Communications Commission (Declaration with Jay Ezrielev: July 31, 2008; Expert Report: March 19, 2009; Deposition Testimony: April 23, 2009; Courtroom Testimony: May 26, 2009; Reply Declaration: June 1, 2009).
- *In The Matter of NFL Enterprises LLC v. Comcast Cable Communications, LLC*, MB Docket No. 08-214, File No. CSR-7876-P, Before the Federal Communications Commission (Declaration with Jay Ezrielev: June 20, 2008; Expert Report: March 13, 2009; Deposition Testimony: April 1, 2009; Written Direct Testimony: April 6, 2009; Courtroom Testimony: April 16, 2009).
- *In Re: Intel Corp. Microprocessor Antitrust Litigation; Phil Paul et al v. Intel Corporation*, In the United States District Court for the District of Delaware (MDL Docket No. 05-1717 (JJF) and C.A. No. 05-485 (JJF), (Declaration: August 10, 2007; Declaration: April 23, 2007).
- *Microsoft Corporation v. Commission of the European Communities*, European Court of First Instance, Case T-201/04 R, April 24-25, 2006.

Appendix B

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EDUCATION

Ph.D., Economics: Harvard University, Cambridge, MA Completion: 2002

- Fields of specialization: Industrial Organization, Economic Development
- Awarded a full tuition and stipend scholarship

B.A., Law and in Economics: Hebrew University, Jerusalem, Israel Completion: 1996

- Rector's Prize (awarded each year to the top two students in the Faculty), Faculty of Social Sciences: 1992/3
- Dean's List, Faculty of Law: 1992/3, 1993/4

PROFESSIONAL EXPERIENCE

Compass Lexecon February 2021 – Present

Senior Consultant

Independent Consultant, Ramot Menashe, Israel February 2020 – February 2021

Israel Antitrust Authority, Jerusalem, Israel January 2016 – February 2020

Chief Economist and Head of Economics Department

In charge of all the economic work at the Authority and on advising the Director General on all matters.

- Oversaw a group of 35 economists responsible for market studies, policy analysis, merger and conduct evaluation, litigation expert testimony, and competition advocacy
- Since mid 2017, served as the *Acting Director General* on matters without a permanent Director General
- Served on intra-governmental committees

Compass Lexecon, Oakland, CA, USA 2002– 2015

Senior Vice President

- Provided economic consulting on antitrust, regulatory, and competition policy matters to dozens of Fortune 500, international companies and the U.S. government in various industries including high tech, telecoms, transportation, entertainment and consumer products
- Managed many projects that required analysis of firms' strategic business practices, as well as the use of advanced theoretical and empirical economics tools and vast datasets
- Submitted written testimony and presented research results to the U.S. Department of Justice and Federal Trade Commission regarding the competitive effects of several large proposed mergers
- Retained by the U.S. Securities and Exchange Commission to author a distribution plan for the Con Agra security plan settlement

Harvard Institute for International Development, Cambridge, MA 1999 – 2001

Researcher

- Worked as a development economics researcher during Ph.D. studies
- Co-authored several published papers with economists Jeffrey Sachs and Clifford Zinnes

The Israel Democracy Institute, Jerusalem, Israel 1996 – 1997

Israeli parliament intern

- Economic intern at the Knesset's Economics Committee and State Audit Committee through the Institute's Knesset internship program

Various academic institutes

- Teaching positions at Harvard University, Hebrew University and Tel Aviv College of Management Academic Studies

RESEARCH AND PUBLICATIONS

See https://eilatyair.wixsite.com/home/papers

MISCELLANEOUS

- Citizenship: USA, Israel, Italy
- Languages: English, Hebrew

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB Ex Parte No. 711 (Sub-No. 1)

Reciprocal Switching

Verified Statement and

Written Testimony of

Robert Shapiro and Luke Stuttgen

February 14, 2022

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Verified Statement and Written Testimony of Robert Shapiro and Luke Stuttgen Regarding Analysis of Proposals to Revise the Regulation of Reciprocal Switching

I. Background and Qualifications

This statement is prepared by Robert Shapiro and Luke Stuttgen.

Robert Shapiro is the chairman of Sonecon, LLC, which provides economic analysis and advice to U.S. and foreign government officials, business executives, and leaders of non-governmental organizations. Dr. Shapiro has advised Presidents Bill Clinton and Barack Obama, Vice President Albert Gore, Jr., British Prime Minister Tony Blair and Foreign Secretary David Miliband, Secretary of State Hillary Clinton, Treasury Secretaries Robert Rubin and Timothy Geithner, and other senior members of the Clinton, Obama and Trump administrations and the U.S. Congress. Before founding Sonecon, Dr. Shapiro was the U.S. Under Secretary of Commerce for Economic Affairs in the administration of President Bill Clinton. Prior to that, he was co-founder and Vice President of the Progressive Policy Institute and the Legislative Director and Economic Counsel to Senator Daniel Patrick Moynihan. Dr. Shapiro also served as the principal economic advisor to Bill Clinton in his 1991-1992 presidential campaign, senior economic adviser to Hillary Clinton in her 2015-2016 campaign, and economic-policy adviser to the campaigns of Joseph Biden, Barack Obama, John Kerry and Albert Gore, Jr. Dr. Shapiro holds a Ph.D. and M.A. from Harvard University, a M.Sc. from the London School of Economics and Political Science, and an A.B. from the University of Chicago.

Luke Stuttgen is an associate of Sonecon specializing in labor and health economics. He served as a Staff Economist at the White House Council of Economic Advisors during the Biden and Trump administrations where he conducted economic analysis of labor, health, and trade policy. He holds a B.S. degree in Mathematics and Mathematical Economics from the University of Wisconsin-Madison, a M.A. in International Economic Policymaking from the Paris School of International Affairs, and a M.Sc. in International Political Economy from the London School of Economics and Political Science.

Our qualifications are set forth in more detail as Exhibit A.

II. Introduction

The decision by the Surface Transportation Board (STB) to consider new regulations for mandated reciprocal switching by Class I railroads raises significant issues about the effects of the proposed regulation on industry investment and the relevance of railroad profitability in making policy. Reciprocal switching occurs when a shipper with access to one freight railroad wants access to a competing railroad's track, equipment, and facilities for transport between two points generally served by only one competing railroad. That access exists today under negotiated agreements. Shippers also can use other modes of transport or other rail routes that avoid the single-service points. The primary issue raised by advocates of the proposed forced switching rules is the market prices they have to pay: Shippers ask the STB to use the power of government to force railroads to charge them less for access to single-service points.

The proposed regulation poses a serious threat to sustainable future investment in the rail network. After decades of investments by Class I railroads to modernize their equipment, facilities, and operations, the proposed regulation would discourage future investments in several

ways. First, the regulation would reduce investment by creating uncertainty about the expected returns from future investments and ongoing expenditures. This effect initially occurs when a government body considers a regulation that will affect an industry's revenues—that industry's cost of capital rises as investors delay and demand better terms in response to greater risk. This effect would be sustained if the STB approves the regulation, since uncertainty will persist around the rules that will determine when to apply the regulation and around how the rules will be applied in each case.

If adopted, the proposed rule also will lead to less investment by Class I railroads by directly reducing the rate of return on equipment, facilities, and operations subject to the regulation. With the ICC/STB's approval, railroads have long used "Ramsey pricing," under which prices vary by location based on how much shippers are willing to pay. Railroads estimate those prices before undertaking investments to determine whether they will recoup their capital and operating costs, including those in single-service facilities, and whether the investment will be profitable given the prices that shippers pay across their entire networks. Forced access under the proposed regulation would reduce those returns, eroding railroad company incentives to invest in the upkeep and repair of existing assets and more generally in expanding and improving their infrastructure. By reducing returns, it also could affect service quality at regulated switching locations, harming both shippers and the public.

Moreover, a leading justification offered by proponents of new reciprocal switching regulation—the revenue adequacy levels of the railroad industry—provides no sound basis for their position. Setting aside the particulars of the STB's rules for determining revenue adequacy for regulatory purposes, the financial concept of revenue adequacy, as we will discuss below, is defined by reference to the ratio or difference between a company's rate of return (ROI) and the industry's cost of capital (COC).

The proposed regulation would reduce the revenues (and thus revenue adequacy) of railroads affected by it. Moreover, this would occur as freight trucking creates daunting challenges for railroads to maintain their profitability in coming years apart from new regulation. The trucking industry has entered a period of consolidation and broad adoption of new technologies that will intensify competitive pressures on railroad revenues and their revenue adequacy. Climate change also will increase those pressures by imposing greater burdens on railroads, since railroads fund their own infrastructure while taxpayers pay to build, maintain, and repair the roads, highways, and bridges that comprise most of the trucking industry's infrastructure.

Finally, if profitability or revenue adequacy were a legitimate basis for transferring funds through regulation, shippers should be required to pay *more*, since their revenue adequacy far outpaces Class I railroads: The return on investment over the cost of capital by Class I railroads was less than 30 percent in 2019 and less than 40 percent in 2020, compared to 130 percent or more for major shipper industries.

Railroad companies and shippers engage in voluntary switching today when it makes economic sense for both parties to do so. The proposed regulation would force railroads to engage in switching activities that make no economic sense for them and have no general economic basis, impairing the revenues, investment, and ongoing operations of U.S. railroads

III. The Impact of the Proposed Regulation on Investment

The levels of investment in railroad infrastructure since 1980 are a major success story for deregulation and commerce in the United States—a success now threatened by the proposed reregulation. Using World Bank data, the Federal Railroad Administration concluded in 2013 that the U.S. freight railroad system was "the safest, most efficient and cost effective" in the world.[1] That achievement is built on sustained efforts by railroad companies to raise their rates of return and attract the capital that has produced sustained, high level of private investment. From 1980 to 2020, railroads invested nearly $740 billion, the equivalent of more than 40 percent of the industry's revenues, to build and maintain locomotives, tracks, tunnels, bridges, stations, switches, and other equipment and facilities.[2] Railroads continue to devote almost 20 percent of their annual revenues to capital expenditures, compared to about 4 percent for manufacturing.[3]

The strong investment record of Class I railroads has enabled the industry to upgrade operations and technologies in ways that support lower costs and prices. By one contemporaneous estimate, investments in new equipment, facilities, and operations from 1983 to 1997 enabled railroads to reduce their costs by 25 percent to 30 percent.[4] This investment record and continued strong investments since 1997 rest on the incentives and the discretion over rates that the industry gained from deregulation. Before the Railroad Revitalization and Regulatory Reform Act of 1976 and the Staggers Act in 1980, the ROI for investors in the railroad industry was 1.2 percent, returns that could not cover the cost of capital.[5] Deregulation and the investments that followed resulted in much higher returns, ranging from 7.2 to 14.4 percent across Class I railroads in 2020.

The proposed rule would seriously dampen railroad investment going forward in three distinct ways. First, the prospects of reregulation and the process of determining when and how to apply the new regulation will increase uncertainty about the returns on investments in the equipment and facilities that would be affected by adverse rulings under the regulation. Second, every adverse ruling would directly reduce the return on investments in equipment, facilities, and operations subject to the regulation's mandated access, reducing incentives to invest in those affected factors. Third, the reduction in revenues resulting from the mandated rates would reduce funds available for investment, raising the industry's cost of capital and lowering its returns on investment.

The Impact of Regulatory Uncertainty

Uncertainty discourages investors by increasing the risks associated with their returns, and the proposed regulation here introduces such uncertainties in several ways that will reduce overall railroad investment. While new rules for forced switching at single-service locations are under consideration, investors cannot know how that process will affect the revenues and returns of railroad companies. Extensive economic studies have shown that under such circumstances, investors delay their decisions, demand better terms, or shift their investments to companies

[1] Stewart (2013).
[2] Association of American Railroads (2021-B).
[3] U.S. Census Bureau (2021).
[4] Bitzan and Keeler (2003).
[5] Government Accountability Office (1990).

whose expected rates of return can be estimated more reliably.[6] As a result, this aspect of uncertainty increases the railroad industry's cost of capital and thereby dampens investment.

Further, if the STB approves such forced-access regulation, uncertainty about the precise rules for determining when the new regulation will be applied will remain for a considerable period, extending the adverse impact of uncertainty on the industry's cost of capital and associated investment. And once those rules are issued, the new process will introduce ongoing uncertainties about how the rules will be applied case by case and the level of the mandated rates for transport through particular single-service locations case by case. These uncertainties will produce continuing upward pressure on the cost of capital for Class I railroads and ongoing downward pressure on investment levels.

Potential investors in Class I railroads also may be discouraged by the STB's willingness to proceed with regulation on the grounds that some Class I railroads have reached acceptable levels of revenue adequacy. A majority of Class I railroads have begun to earn their cost of capital (based on the STB's measurements) only in the past decade, following three decades of modernization, consolidation, and sustained high levels of investment. Even so, only an average of half of Class I railroads were revenue adequate under the STB's annual findings in any given year from 2011 to 2019, and revenue adequacy in one year is far from an indication of long-term financial health or a guarantee of revenue adequacy in the following year. In this context, a decision by the STB to knowingly depress rail revenues by imposing forced access could impair the confidence by investors that, going forward, the new regulation will allow railroads to maintain revenue adequacy and generate profits that justify continued investment.

The Impact of Lower Returns on Investments Related to Regulated Access

The proposed rule also would directly reduce investment by depressing the returns on the equipment, facilities, and operations subject to forced or mandated access. Unlike its competitors in the freight trucking industry, railroads pay for their own infrastructure. When a railroad considers expanding or upgrading its network—for example, by building new track, switches, and facilities for currently underserved locations—it determines whether the expected additional revenues from the new investments will exceed the substantial fixed costs and capital costs, plus additional variable costs such as maintaining track and servicing and operating locomotives. The prices that so-called "captive shippers" pay to access single-serve facilities are higher, because railroads have to recoup the costs to build and maintain facilities that service a small group of shippers. As in any market, such pricing is ultimately based on what shippers are willing to pay, given that "captive" shippers can choose alternative routes that avoid single-serve locations.

The prices that prospective shippers are prepared to pay for access to the transport reflect their "elasticity of demand." Economists call this "Ramsey pricing," and the STB (as the ICC) has supported its use since 1985.[7] Before undertaking substantial capital expenditures, railroads estimate those prices based on their experience, market research, and negotiations. In this way, they can better assess the potential revenues from the investment and compare those

[6] Hassett and Shapiro (2015).
[7] McCullough (2015).

revenues to the up-front capital costs to estimate how long it will take for the investment to generate returns that justify those capital costs.

Forced access under the proposed regulation would reduce those revenues by mandating lower prices for shippers using facilities served by a limited number of railroads, which explains why shipper organizations have pressed fervently for this reregulation. However, such savings for shippers might not be permanent, because railroads that cannot rely on recouping the costs of those investments will have no incentive to build and maintain such facilities. The proposed regulation also would discourage railroads from building into an existing facility since a railroad would be able to use its competitors' tracks. Moreover, the ROI of railroads would decline over time, eroding the incentives and capacity of railroads to expand their networks and improve their infrastructure at a time when railroad congestion is increasing.

The extent of the likely damage from such rate reregulation will depend on the access-pricing regime and adjudicating process adopted. The recent history of price regulation—including the serious ongoing problems that economists and the STB have faced trying to determine market dominance and maximum pricing—provides no grounds for confidence that new, top-down pricing rules will account for the nuanced permutations of railroad pricing and their allocations of fixed and variable costs.

The Impact of Lower Railroad Revenues Mandated by Regulation

The proposed rule would adversely affect revenues across the railroad industry, directly reducing incentives for investment and the associated quality of service. In testimony to the STB, CSX estimated that for a given single shipment, the proposed regulation could add an extra 300 miles and lengthen transport time by three days.[8] More generally, the congestion and inefficient use of resources that likely would arise from forced access at lower prices would slow railroad operations, eroding profits and the industry's ability to compete with freight trucking. These effects also could lead to higher prices for shippers that require expedited transport. While we cannot determine the precise extent of such reduced efficiency and higher prices beforehand, forced switching clearly would tend to increase costs and reduce service quality.

There also is no basis for claims that mandating reciprocal switching would increase rail utilization, compared to its competitors. Railroad companies engage in voluntary switching activities when it makes economic sense for them to do so and forced switching would not contribute to their financial viability. Rail carriers currently experiencing strong profits may be able to absorb losses from forced switching without raising other prices. But the reduced profits would still impair investment and so erode future productivity gains, which in turn would lead to higher prices over a longer term. Therefore, we should expect that over time, the proposed regulation would increase the use of routes rendered unprofitable by that regulation, and the adverse effects on revenues and investment would ultimately result in less rail utilization and higher prices.

IV. Earnings and Regulation

Economists have long found that regulations based on the earnings of a company and industry create perverse incentives that produce unwanted results harming consumers as well as

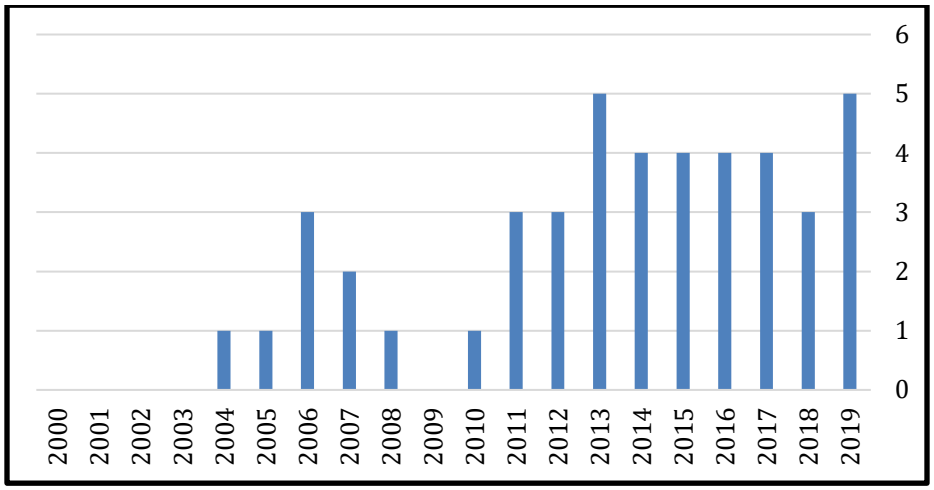
[8] Brown (2014).

the company and industry. Such regulation erodes incentives to invest in new technologies and other innovations that can raise earnings or reduce costs, leaving the industry with less efficient technologies and operations that result in higher prices for consumers.[9] By limiting earnings in certain areas, such regulation also creates incentives to raise prices in unregulated areas. As noted earlier, it also creates incentives to reduce both investments and ongoing expenditures in regulated areas, further harming consumers by degrading service quality.[10] And since earnings change from year to year, a price-related policy keyed to earnings can lead to greater price volatility in both regulated and unregulated operations.

As the STB considers the proposed regulation here, its evaluation of the financial condition of the railroad industry for these purposes also should take full account of the historical context and likely future developments in intermodal competition. A snapshot of the rail industry's current financial status is insufficient grounds for new regulation that will directly affect its revenues going forward and alter the terms of competition in the freight transport sector. To ensure that the rail industry is revenue adequate over the long term, so its ROI equals or exceeds its COC over a long term, that ROI must be allowed to fluctuate above as well as below its COC. If regulation penalizes the industry for a ROI that moves above the COC, investments in freight rail will never be an attractive proposition, and the cost of capital for railroads will rise.

The STB reports the revenue adequacy for each Class I railroad on an annual basis using certain regulatory methods. Under those methods, from passage of the Staggers Act in 1980 to 2003, Class I railroads were deemed to be revenue adequate less than seven percent of the time;[11] and from 2004 to 2012, an average of less than two of seven Class I railroads met this threshold in any given year (Figure 1 below). From 2013 to 2019, an average of just over four of the seven Class I railroads were deemed revenue adequate in any given year.

Figure 1: Number of Class I Railroad Deemed Revenue Adequate, 2000–2019



The Staggers Act includes the explicit goal of ensuring that carriers generate adequate revenue to provide a "safe and efficient rail system," and the relative improvement in this revenue

[9] Mayo and Sappington (2016).
[10] *Ibid.;* Trebing (1980).
[11] Rosenberg and Strafford (2014).

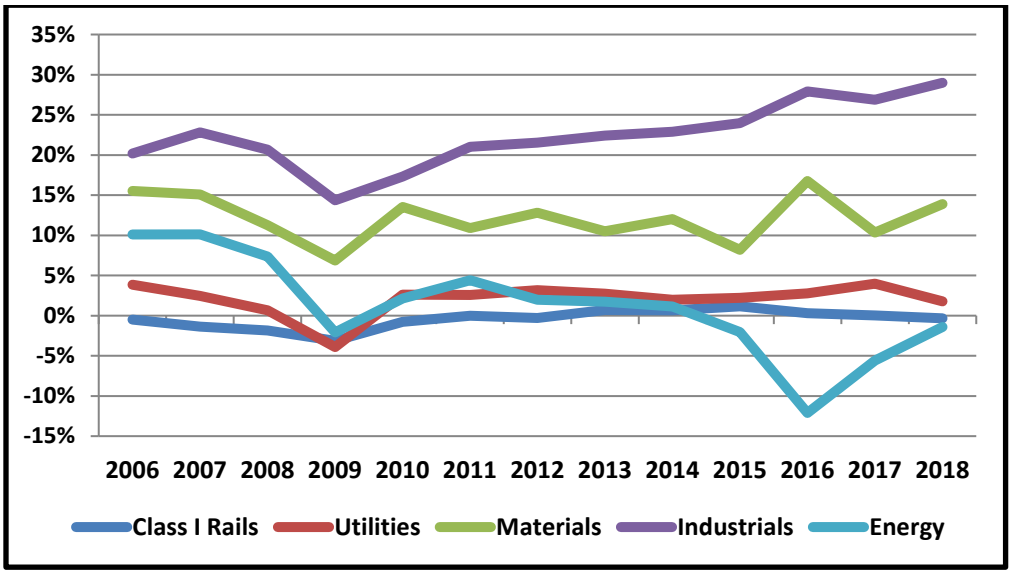
adequacy measure indicates the STB's success implementing the Act and the success of the industry's investment strategies and operations. The proposed rule change would put those improvements at risk.

The Revenue Adequacy of Shippers and Other Industries.

Advocates from shipper industries have asserted that revenue adequacy somehow justifies forced switching regulation.[12] When properly measured, revenue adequacy may be a reasonable measure of the industry's economic condition; but so long as reasonable profits are an acceptable goal, revenue adequacy cannot provide a reasonable basis for regulation. The advocates' logic also is self-defeating, since the new regulation would dampen railroad returns on investment, increasing their cost of capital and thereby reducing their revenue adequacy. Moreover, applying the same standard to the shipper industries advocating the proposed change provides evidence against mandated switching as the revenue adequacy of most shipper industries already far outpaces Class I railroads.

Figure 2, below, presents the median returns on invested capital minus the average cost of capital for Class I railroads and major shipper industries from 2006 to 2018.[13] This analysis shows, first, how recently railroads' ROI (as measured by the STB) exceeded their COC on an industry-wide basis—and only in some years and by narrow margins. The analysis also shows that while five of seven Class I railroads were revenue adequate under the STB's annual measurement in 2020 with returns on invested capital of 7.20 percent to 14.44 percent, the revenue adequacy of the shipper industries has consistently been substantially greater, including private utilities whose rates are regulated by state agencies. The exception was the energy sector since 2015, a sector with highly volatile revenues resulting from strong external shocks that depressed its revenue adequacy.

Figure 2: Median ROI–COC for Five Major Sectors of the S&P 500, 2006–2018



[12] Shipper Coalition for Railroad Competition (2017).
[13] Murphy and Zmijewski (2019).

In 2020, the average ROI of railroads weighted by revenues was just under 11 percent and their average cost of capital as determined by the STB was 7.89 percent. The result was a return on investment of less than 40 percent above the cost of capital or barely 3 percent. However, the effects of the pandemic made 2020 a very non-standard year, and the same calculation for 2019 results in a return on investment for Class I railroads of less than 30 percent above the cost of capital. By contrast, the return on investment of eight major shipper industries—aerospace and defense, electrical equipment, pharmaceuticals, biotech, air freight, and logistics, metals and mining, chemicals, and energy equipment services—was some 130 percent or more above their cost of capital.

Similarly, focusing on the median revenue adequacy of S&P 500 companies across 10 sectors plus the overall S&P 500 in 2016, 2017, and 2018 shows that by this metric, railroads were barely revenue adequate in two of the three years and revenue inadequate in the third year (see Table 1 below). As a result, Class I railroads trailed badly behind the overall S&P 500 and eight of its nine other sectors—again, excepting only energy. Overall, approximately 90 percent of firms in the S&P 500 were revenue adequate each year. Compared to the large private firms in most sectors, railroads have continued to struggle to attract investment, suggesting that the STB should not only reject any steps that would discourage private investment in railroads but consider instead measures that would encourage such investment.

Table 1: Median ROI–COC for 10 Sectors of the S&P 500, 2016, 2017 and 2018

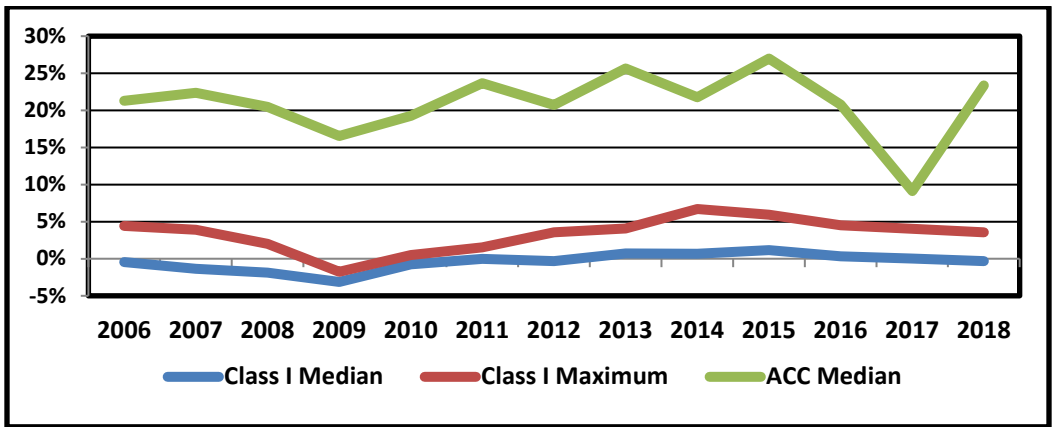
Sector	2016	2017	2018
Communication Services	70.0%	63.5%	93.5%
Information Technology	56.9%	48.1%	58.6%
Health Care	47.4%	38.0%	49.2%
Consumer Staples	36.0%	37.1%	40.0%
Industrials	27.9%	26.9%	29.0%
S&P 500	**21.9%**	**19.8%**	**28.6%**
Consumer Discretionary	14.3%	11.1%	14.0%
Materials	16.8%	10.4%	13.9%
Utilities	2.8%	4.0%	1.8%
Class I Railroads	**0.3%**	**0.01%**	**-0.3%**
Energy	-12.1%	-5.6%	-1.4%

The proposed regulation would only increase the existing disparity by reducing what shippers pay railroads to ship their goods. The result also would be a net negative for employment since railroad investments generally create more jobs. The American Chemistry Council (ACC), for example, is a shipper group advocating the proposed rules. ACC companies are not only more revenue adequate than the Class I railroad with the highest current returns; their median revenue adequacy exceeded the maximum annual revenue adequacy achieved by any Class I railroad by 15 to 20 percentage points every year except 2017 (Figure 3 below).[14] ACC companies also produce half the jobs per-dollar of revenues as Class I railroads.[15] Further, 84 percent of rail industry jobs are union positions with compensation 64 percent higher than the national

[14] Pociask and Sigaud (2021).
[15] *Ibid.*

average.[16] Railroad workers also are disproportionately veterans, and the labor rights of all railroad workers are protected by the Railway Labor Act. New rules that would shift revenues from railroads to shippers would not only reduce overall investment; they also would impair job creation and union membership.

Figure 3: Revenue Adequacy of Railroads vs. ACC Companies, 2006–2018



New Challenges Facing Railroads: Technological Advances in Freight Trucking

The case that the earnings of some Class I railroads justify the proposed rule change also fails to consider the larger context of intermodal competition. In many markets and places, railroads compete directly with truck carriers, with trucks offering greater flexibility and speed but at higher prices than rail. Looking ahead, several developments are likely to favor trucking over railroads, including the positive impact on trucking's costs from the downward trend of energy prices (notwithstanding recent spikes), recent technological developments, and challenges posed by climate change. In this context, the proposed rule would only further aggravate the pressures on railroad revenues, their earnings, and investment.

The trucking industry's two primary costs are fuel and labor. In 2011, those two factors accounted for about 70 percent of all industry costs.[17] Since 2011, labor costs have remained relatively steady and energy costs have declined substantially. From 2016 to 2019, the average marginal fuel costs per-mile for trucking averaged $0.385 per-mile compared to an average of $0.645 per-mile in 2012 and 2013.[18] In addition, larger fleets have improved the industry's bargaining power with its fuel suppliers, and advances in trucking technology have improved the fuel efficiency of newer trucks.[19] Both of these trends are likely to continue.

Trucking companies also have begun to purchase the first generation of electric trucks with per-mile fuel costs of about one-third less than conventional diesel fuel.[20] While the initial fixed costs of the new vehicles are an obstacle to their broad adoption, projected improvements in battery and green energy technologies should further reduce those costs, especially if Congress

[16] Association of American Railroads (2021-A).
[17] American Transportation Research Institute (2020).
[18] Kapadia (2021).
[19] *Ibid.*
[20] Hirsch (2020).

approves current proposals to subsidize the electrification of trucking fleets. Advances in self or autonomous driving technologies also pose a threat to rail's competitiveness with trucking, since more than 40 percent of trucking industry costs are labor-related. If self-driving trucks reduce the industry's labor costs over the next decade, along with trucking's declining fuel costs, the industry's enhanced competitive position could significantly impair the revenue adequacy of Class I railroads.

Other technological advances disproportionately supporting trucking's competition with railroads include the prospects for trucking to enhance its efficiency by applying digitization and data analytics based on information from electric logging devices (ELDs).[21] Digitization and new online and app-based software enable trucking companies to match truckers, carriers, and shippers more efficiently, reducing overhead and logistics costs. These and other new management technologies also can help these carriers to better understand their fleets' needs and reduce losses associated with underutilizing their resources. As the regulatory requirements for ELDs continue to phase in, trucking companies will gain much finer-grained control over their operations, further enhancing the competitiveness of freight trucking.

Given these favorable technological developments for trucking, railroads will have to substantially increase their investments in their networks and technologies to remain competitive.[22] In this context, the fact that some railroads have been revenue adequate under the STB's annual measurements in some recent years is a foundation to help freight rail survive that should not be impaired by new regulation.

New Challenges Facing Railroads: Consolidation in Freight Trucking

One factor that has supported the economic viability of Class I railroads, the industry's consolidation, may soon be matched by freight trucking and so also threaten rail revenues and investment. Much of the industry's productivity gains since passage of the Staggers Act depended on increased economies of scope and scale arising from consolidation.[23] Consolidation has enabled the industry to reduce operational costs, improve quality, and take advantage of substantial network effects, including larger track networks that reach more stations centralization of logistics, and other network efficiencies. Bitzan and Wilson (2007), for example, estimate that rail mergers and acquisitions from 1983 to 2003 reduced industry costs by 11.4 percent.[24]

With seven Class I railroads operating today, the potential for additional benefits from consolidation is more limited for railroads than for freight trucking. In trucking, industry observers have noted a wave of large new acquisitions by major trucking firms since the mid-2010s.[25] This trend has accelerated during the pandemic, with numerous major acquisitions by large trucking companies that enable them to integrate vertically, reduce fixed expenses, expand their fleets, and acquire new technologies.[26] Beyond those benefits, consolidation in trucking can reduce the number of required truckloads by increasing the volume of freight per-trip. Such consolidation

[21] Kearney (2021).
[22] Cotey (2012).
[23] Agricultural Marketing Service (2014).
[24] Bitzan and Wilson (2007).
[25] Miller (2018).
[26] Wolf (2020), Clevenger (2021), and Schultz (2021).

also reduces costs for fuel, wages, and logistics, and decreases damages to freight in transmit, trucking emissions, and congestion at truck loading facilities.[27]

The number of small carriers—outfits with six or fewer trucks—also jumped by 69 percent from 2012 to 2018 according to the Federal Motor Carrier Safety Administration (FMCSA). Department of Transportation data suggest that the number of independent truckers has increased further during the pandemic as demand for local deliveries of e-commerce and other online orders has risen and new software has lowered the cost of entering the trucking spot market.[28] Long-haul trucking companies are responding to these developments by acquiring smaller short-haul carriers and expanding services to cover more varying length of transport.[29]

While short-haul trucking complements freight rail, long-haul trucking is a competitor or substitute. The trucking industry's continuing opportunities for consolidation, rationalization, and adoption of new technologies will likely enhance its competitiveness with freight rail by offering more vertically integrated services and lower overhead costs. Since comparable opportunities are considerably less available for freight rail, it faces serious challenges to maintain its revenues and associated investment—without the additional burden of the proposed regulation.

New Challenges Facing Railroads: Climate Change

The increased incidence of severe weather events associated with climate change also poses long-term challenges for railroads relative to trucking. First, the flexibility of trucking and the extensive networks of roads and highways gives the industry opportunities to avoid disruptive weather events on a per-trip basis unavailable to rail. In addition, trucking companies do not bear costs for infrastructure maintenance comparable to railroads. As a result, climate change poses greater operational, strategic, and financial challenges for railroads in the two industries' competition.

The operational challenges include increased track buckling from high temperatures[30] and increased frequency and severity of weather events that disrupt freight rail service and therefore dictate additional investments in climate-related resiliency and maintenance. Such disruptions will include delays, the need for significant re-routings, and halts in service.[31] While severe weather also can disrupt and delay truck transport, trucking companies have much greater ability to re-route their transports.[32] The logistics of freight truck rerouting in emergencies also are more straightforward, since trucks can use other public roads while railroads must carefully consider any rerouting based on the limited range of tracks.

Improving the resilience of the nation's transport infrastructure to climate changes and repairing and maintaining that infrastructure following bouts of severe weather, will require substantial additional investments. Railroads will bear the cost of those investments in tracks, switches, and facilities since they own their infrastructure. However, the freight trucking industry

[27] Point-to-Point (2020).
[28] Cassidy (2021).
[29] Miller (2018).
[30] Chinowsky, Helman, Gulati, Neumann and Martinish (2017).
[31] Rossetti (2003).
[32] Ashe (2019).

can rely on taxpayers to fund the investments to strengthen, repair, and maintain the roads, highways, and bridges that comprise much of their infrastructure.

To be sure, climate change poses substantial challenges to the long-term viability of freight trucking, since extreme weather events that reduce road and highway resiliency increase the marginal cost of transporting by truck.[33] The trucking industry also has substantially higher emissions per ton-mile than railroads, exacerbating the risks of climate change, and little incentive to invest in climate-resilient infrastructure. As railroads face the need to invest significant shares of their revenues in more efficient and climate-resilient rail transport infrastructure, regulations that weaken their competitive viability would be destructive both environmentally and economically.

V. Conclusions

From our perspective as economists, the choice facing the STB is clear. The U.S. freight industry is among the most efficient in the world, based on decades of intense investment following deregulation. The proposed regulations for forced access advocated by shipper industries would impair that achievement: They would directly discourage continued strong investment by Class I railroads by reducing their revenues, depressing their returns on equipment and facilities subject to the new regulation, and introducing serious uncertainties for investors about railroads' future rates of return. The result could be substantially less investment and consequently less efficient freight rail networks, declining service, and ultimately higher prices for consumers.

A primary basis for the shippers' case that the government should require railroads to charge shippers less for access to single-service locations is that railroads have adequate revenues because the returns on their investments exceed their cost of capital. By this logic, every successful company providing unique services could be subject to government-directed pricing. Moreover, regulation would reduce the industry's revenues and investments. In addition, the revenue adequacy of the shipper industries pressing for the new price regulation far exceeds that of any Class I railroad—so by the shippers' logic, they should pay more for the access—and the proposed regulation would only increase that disparity by shifting revenues from railroads to shippers.

The proposed regulation also would threaten railroad investment and revenue adequacy by reducing the industry's ability to undertake the investments required to compete in the future with freight trucking. In coming years, trucking's competitive position is likely to improve substantially based on the industry's adoption of new technologies, its opportunities for greater consolidation, and its advantages in responding to climate change, compared to freight rail.

It is our economic judgment that the proposed regulation could significantly impair future revenues and investments by major freight rail companies, degrading the nation's freight transport infrastructure and ultimately harming American consumers.

[33] Meye Flood, Keller, Lennon, McVoy and Dorney (2014).

References

Agricultural Market Service (2014). "Railroad Concentration, Market Shares, and Rates." U.S. Department of Agriculture. February 2014. https://www.ams.usda.gov/sites/default/files/media/Railroad%20Concentration%2C%20Market%20Shares%2C%20and%20Rates.pdf.

American Transportation Research Institute (2020). "An Analysis of the Operational Costs of Trucking: 2020 Update." November 2020. https://truckingresearch.org/wp-content/uploads/2020/11/ATRI-Operational-Costs-of-Trucking-2020.pdf

Ash, Ari (2019). "Softening US truck market resets battle for domestic freight." Journal of Commerce online. Truckload Freight. May 8, 2019. https://www.joc.com/trucking-logistics/truckload-freight/softening-us-truck-market-resets-battle-domestic-freight_20190508.html

Association of American Railroads (2021-A). "Railroad Jobs: A Highly Skilled & Compensated Workforce." https://www.aar.org/issue/railroad-jobs/#!

_____ (2021-B). "Railroad 101." Freight Railroads Fact Sheet. https://www.aar.org/wp-content/uploads/2020/08/AAR-Railroad-101-Freight-Railroads-Fact-Sheet.pdf

Bitzan, John and Theodore Keeler (2003). "Productivity Growth and Some of Its Determinants in the Deregulated U.S. Railroad Industry." *Southern Economic Journal.* Vol 70, No. 2 Oct 2003. https://www.jstor.org/stable/3648967.

Bitzan, John and Wesley Wilson (2007). "Industry costs and consolidation: efficiency gains and mergers in the U.S. railroad industry." *Review of Industrial Organization*. Vol 30, No. 2 March 2007. https://www.jstor.org/stable/41799324.

Brown, Cressie (2014). Testimony to Surface Transportation Board "Petition for rulemaking to adopt revised competitive switching rules." March 26, 2014. https://www.stb.gov/wp-content/uploads/Transcript-2014-03-26.pdf.

Cassidy, William (2021). "Record number of new US trucking firms on the books, but not new capacity." *The Journal of Commerce online*. July 14, 2021. https://www.joc.com/trucking-logistics/truckload-freight/record-number-new-us-trucking-firms-books-not-new-capacity_20210714.html.

Chinowsky, Paul, Jacob Helman, Sahil Gulati, James Neumann and Jeremy Martinich (2017). "Impacts of cliamte change on operation of the US rail network." *Transport Policy*. Vol 75. March 2019. https://www.sciencedirect.com/science/article/pii/S0967070X16308198

Clevenger, Seth (2021). "How Consolidation is Reshaping Trucking's Technology Sector." Transport Topics. February 19, 2021. https://www.ttnews.com/articles/how-consolidation-reshaping-truckings-technology-sector

Cotey, Angela (2012). "As diesel costs rise, railroads turn to technology, training and procurement strategies to reduce fuel consumption." Progressive Railroading.

https://www.progressiverailroading.com/mechanical/article/As-diesel-costs-rise-railroads-turn-to-technology-training-and-procurement-strategies-to-reduce-fuel-consumption--29413.

Government Accountability Office (1990). "Railroad Regulation: Economic and Financial Impacts of the Staggers Rail Act of 1980." Report to Congressional Requesters. https://www.gao.gov/assets/rced-90-80.pdf.

Hassett, Kevin and Robert Shapiro (2015). "Regulation and Investment: A Note on Policy Evaluation under Uncertainty, With an Application to FCC Title II Regulation of the Internet." Georgetown University Center for Business and Public Policy. July 2015. https://cbpp.georgetown.edu/publications/publications-policy-papers/

Hirsch, Jerry (2020). "Economics of Electric Trucks Remain an Adoption Challenge." Trucks.com. December 14, 2020. https://www.trucks.com/2020/12/14/economics-of-electric-trucks/

Kapadia, Shefali (2021). "Trucking operational costs in 6 charts." Transport Dive. January 4, 2021. https://www.transportdive.com/news/trucking-operational-costs-atri-driver-truck-trailer-fuel-insurance/591974/

Kearney (2021). "Annual State of Logistics Report: Change of plans." Council of Supply Chain Professionals. https://epages.gopenske.com/rs/004-RHK-737/images/State-of-Logistics-2021-Change-of-plans.pdf.

McCullough, Gerard (2015). "Constrained Market Pricing and Revenue Adequacy: Regulatory Implications for Shippers and Class I U.S. Freight Railroads." Transportation Research Board. The National Academies of Science, Engineering and Medicine. https://trid.trb.org/view/1375681.

Meyer, Michael, Michael Flood, Justin Lennon, Mary McVoy, and Chris Dorney. (2014). "Strategic Issues Facing Transportation Volume 2: Climate Change, Extreme Weather Events, and the Highway System: Practitioner's Guide and Research Report." National Cooperative Highway Research Program. NCHRP Report 750.
https://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_750v2.pdf.

Miller, Matt ()2018). "Trucking Consolidation." *American Journal of Transportation*. September 10, 2018. https://www.ajot.com/premium/ajot-trucking-consolidation.

Murphy, Kevin and Mark Zmijewski (2019). Testimony to Surface Transportation Board. November 26, 2019.

Pociask, Steve and Liam Sigaud (2021). "Veering Off the Rails: How the Recent Push to Reregulate Railroads Threatens Consumer Welfare." Center for Citizen research. American Consumer Institute. October 21, 2021. https://www.theamericanconsumer.org/wp-content/uploads/2021/10/Final-Reciprocal-Switching.pdf.

Point-to-Point (2020). "Freight Consolidation: The Benefits and Drawbacks." Averitt Express. February 27, 2020. https://blog.averittexpress.com/freight-consolidation-benefits-and-drawbacks.

Rosenberg, Robert and Time Strafford (2017). "Determining Revenues Adequate to Maintain and Improve Service and Capacity." Association of Transportation Law Professionals Fall Forum. November 10, 2014.
https://www.sloverandloftus.com/images/pdf/ATLP%20Fall%20Forum%20PPT%20II%20(RDR6695).pdf.

Rossetti, Michael (2003). "Potential Impacts of Climate Change on Railroads." United States Department of Transportation. www.transportation.gov/sites/dot.gov/files/docs/rossetti_CC_Impact_Railroads.pdf.

Schultz, John (2021). "Mergers, acquisitions running at fast pace in booming trucking market." Logistics Management. August 9, 2021. https://www.logisticsmgmt.com/article/mergers_acquisitions_running_at_fast_pace_in_booming_trucking_market.

Shipper Coalition for Railroad Competition (2017). "Reciprocal Switching: Reply Comments Before the Surface Transportation Board." Docket No. EP 711 (Sub-No. 1). January 13, 2017. http://www.nitl.org/wp-content/uploads/2017/01/EP-711-1-Reply-Comments-Shipper-Coalition-jan-13-2017.pdf.

Stewart, Richard (2013). "Freight Rail Economic Development." Minnesota Department of Transportation and Minnesota Department of Employment and Economic Development. November 2013. http://www.dot.state.mn.us/ofrw/fred/PDF/final.pdf

Trebing, Harry (1980). "Structural Change and Regulatory Reform in the Utilities Industries" *The American Economic Review.* Vol. 70, No. 2. May, 1980. https://www.jstor.org/stable/1815503.

U.S. Census Bureau (2021). "2021 Capital Spending report: U.S. Capital Spending Patterns 2010-2019." March 24, 2021. https://www.census.gov/library/publications/2020/econ/2021-csr.html

Wolf, Connor (2020). "COVID Drives Trucking Industry Consolidation." Transport Topics. December 16, 2020. https://www.ttnews.com/articles/covid-drives-trucking-industry-consolidation.

VERIFICATION

I, Robert J. Shapiro, declare under penalty of perjury that the foregoing is true and correct and that I am qualified and authorized to file this verified statement and written testimony.

Executed on February 12, 2022.

Robert J. Shapiro

VERIFICATION

I, Luke Stuttgen, declare under penalty of perjury that the foregoing is true and correct and that I am qualified and authorized to file this verified statement and written testimony.

Executed on February 13, 2022.

Luke Stuttgen

EXHIBIT

About the Authors and Curricula Vitae

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Dr. Robert J. Shapiro is the chairman of Sonecon, LLC, a firm in Washington D.C. that provides economic analysis and advice to U.S. and foreign government officials, business executives, and leaders of non-governmental organizations. He is also a Fellow of the Georgetown University Center for Business and Public Policy, a board director of Overstock.com, and an advisory board member of Cote Capital and Civil Rights Defenders. Dr. Shapiro has advised Presidents Bill Clinton and Barack Obama, Vice President Albert Gore, Jr., British Prime Minister Tony Blair and Foreign Secretary David Miliband, Secretary of State Hillary Clinton, Treasury Secretaries Robert Rubin and Timothy Geithner, and other senior members of the Clinton, Obama and Trump administrations and the U.S. Congress. Dr. Shapiro and Sonecon also have provided analysis and advice to companies including AT&T, Exelon, ExxonMobil, Fujitsu, Gilead Sciences, Google, Nasdaq, and UPS, as well as many NGOs including the International Monetary Fund, the Brookings Institution, the Center for American Progress, and the U.S. Chamber of Commerce. Before founding Sonecon, Dr. Shapiro was the U.S. Under Secretary of Commerce for Economic Affairs. Prior to that, he was co-founder and Vice President of the Progressive Policy Institute and the Legislative Director and Economic Counsel to Senator Daniel Patrick Moynihan. He also served as the principal economic advisor to Bill Clinton in his 1991-1992 presidential campaign, senior economic adviser to Hillary Clinton in her 2015-2016 campaign, and economic-policy adviser to the campaigns of Joseph Biden, Barack Obama, John Kerry and Albert Gore, Jr. He holds a Ph.D. and M.A. from Harvard University, a M.Sc. from the London School of Economics and Political Science, and an A.B. from the University of Chicago.

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U.S. UNDER SECRETARY OF COMMERCE FOR ECONOMIC AFFAIRS 1998-2001
U.S. Government *Washington, D.C.*

Oversaw the operations and policies of the Census Bureau, including the 2000 Decennial Census, the Bureau of Economic Analysis and the Office of the Under Secretary, entailing managing more than 50 executives with 10,000 employees and a $4.5 billion budget. Chief economic advisor for the Commerce Department and Commerce Secretary's representative to White House task forces. Also, directed the Clinton Administration's efforts to assess the economic and social impact of information technologies and e-commerce.

CO-FOUNDER AND VICE PRESIDENT 1989-1998
Progressive Policy Institute *Washington, D.C.*

Managed major operations and strategic planning for a Washington public-policy organization and oversaw development of its economic analyses and policy positions. Extensive publications.

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Directed economic analysis and policy development for Washington public policy foundation. Also, raised funds and developed economic-policy positions. Extensive publications.

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SENIOR ADVISOR, GORE FOR PRESIDENT AND GORE-LIEBERMAN CAMPAIGN	2001
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Economic and Public Policy Studies, 2002-2021:

- The U.S. Postal Service's Increased Focus on Parcel Deliveries and The Impact on Universal Mail Delivery and the Economy. September 2021.

- The Impact of a National Program of Free Tuition at Public Community Colleges and Free Tuition for Most Students at Public Four-Year Colleges and Universities on College Enrollments, Graduations, and the Economy. January 2021.

- The Impact of the Roofing Industry on the American Economy. July 2020.

- The Best Way to Promote Universal Healthcare Coverage: Create a Public Option to Enroll in The Federal Employees' Health Benefits Program. November 2019.

- The Impact of Electronic Cigarettes on Cigarette Smoking by Americans and Its Health and Economic Implications. July 2019.

- Who Owns Americans' Personal Information and What Is It Worth? March 2019.

- Why Americans Distrust and Fear Immigrants. March 2019.

- Changes in the Educational, Racial and Ethnic Composition of U.S. Employment, January 2008 to August 2018, and the Debate over Diversity in the U.S. Economy. January 2019.

- Taking Root: The Growth of America's New Creative Economy. February 2019.

- Declaration of Robert J. Shapiro before the Postal Regulatory Commission In the Matter of Institutional Cost Contribution Requirement for Competitive Products. Docket No. RM2017-1. April 2018.

- Unlocking the Gates: America's New Creative Economy. February 2018.

- The Politics of Widening Income Inequality in the United States, 1977 to 2014. October 2017.

- The Value of the Medicare Part D Program for its Beneficiaries and the Medicare System. December 2016.

- Earnings of Kaplan University Graduates: How Their Earnings Compare to Counterparts Who Did Not Pursue Higher Degrees, Graduates of Public and Private Not-for-Profit Institutions in Five States, and Graduates Nationwide . August 2016.
- The Impact of Broadband and Related Information and Communications Technologies on the American Economy. May 2016.
- How the United States Postal Service Uses Its Monopoly Revenues and Special Privileges to Cross Subsidize Its Competitive Operations. February 2016.
- A Strategy to Promote Affordable Housing for All Americans by Recapitalizing Fannie Mae and Freddie Mac. November 2015.
- The Impact of Intellectual Property Protections on Research and Development in India and on the Growth and Wages of Key Indian Industries. November 2015.
- How the U.S. Postal Service Uses Its Monopoly Revenues and Special Privileges to Subsidize Its Competitive Operations. October 2015.
- Regulation and Investment: A Note on Policy Evaluation under Uncertainty, With an Application to FCC Title II Regulation of the Internet. July 2015.
- The Revenue and Economic Effects of the Paul-Boxer Plan to Encourage the Repatriation of Foreign-Source Earnings by U.S. Multinational Corporations. July 2015.
- The Basis and Extent of the Monopoly Rights and Subsidies Claimed by the United States Postal Service. March 2015.
- Income growth and decline under recent U.S. presidents and the new challenge to restore broad economic prosperity. March 2015.
- The Impact of Title II Regulation of Internet Providers on Their Capital Investments November 2014.
- Unnecessary Injury: The Economic Costs of Imposing New Global Capital Requirements on Large U.S. Property and Casualty Insurers. November 2014.
- Who Owns America's Oil and Natural Gas Companies: A 2014 Update. October 2014.
- The U.S. Software Industry as an Engine for Economic Growth and Employment September 2014.
- To Reclaim Prosperity, Puerto Rico Should Adapt Ireland's Model for Modernization and Focus on Attracting Investors from Around the World. September 2014.

- How India Can Attract More Foreign Direct Investment, Create Jobs, and Increase GDP: The Benefits of Respecting the Intellectual Property Rights of Foreign Pharmaceutical Producers. January 2014.

- The Economic Benefits of New York City's Public-School Reforms, 2002-2013. December 2013.

- The Importance of International Standards in Managing Defaults in Islamic Finance: Saudi Arabia and the Saad Group's Sukuk Default. May 2013.

- The Economic Implications of Restricting Spectrum Purchases in the Incentive Auctions. April 2013.

- Anatomy of a Special Tax Break and The Case for Broad Corporate Tax Reform March 2013.

- The Impact of Oil and Natural Gas Company Holdings on College and University Endowments. December 2012.

- Diabetes Research and the Public Good: Federal Support for Research on Type 1 Diabetes. November 2012.

- The Financial Hazards and Risks Entailed in Extending Unlimited Federal Guarantees for Deposits in Transaction Accounts. October 2012.

- Wage and Salary Growth in the United States: Average Americans Made Steady Progress for Two Generations, Until the Last Decade. October 2012.

- Political Contributions and Their Effect on Shareholders. June 2012.

- The Benefits of Reducing Violent Crime. June 2012.

- The Employment Effects of Advances in Internet and Wireless Technology: Evaluating the Transitions from 2G to 3G and from 3G to 4G. January 2012.

- Who Owns America's Oil and Natural Gas Companies. October 2011.

- The Economic Impact of U.S. Trade Sanctions on Imports of Paper Products. September 2011.

- What Ideas Are Worth: The Value of Intellectual Capital and Intangible Assets in the American Economy. September 2011.

- The Contributions of Information and Communication Technologies to American Growth, Productivity, Jobs and Prosperity. September 2011.

- The Revenue Implications of Temporary Tax Relief for Repatriated Foreign Earnings: An Analysis of the Joint Tax Committee's Revenue Estimates. September 2011.

- The Financial Contribution of Oil and Natural Gas Company Investments to Major Public Pension Plans in Seventeen States for Fiscal Years 2005 – 2009. June 2011.

-
- The Impact of Immigration and Immigration Reform on the Wages of American Workers. May 10, 2011.

- The Financial Contribution of Oil and Natural Gas Company Investments to Major Public Pension Plans in Four States, 2005 – 2009. April 2011.

- Foreign Direct Investments in Developing Nations. April 2011.

- Report on Taxpayer Costs for Higher Education. September 2010.

- A New Analysis of Broadband Adoption Rates by Minority Households. June 2010.

- The Employment Effects of Awarding Major U.S. Defense Contracts to U.S.-Based Firms, Compared to Foreign-Based Multinational Firms: An Economic Case Study of the Competition to Produce the KC-X Refueling Tanker. March 2010.

- The Costs of "Charging It" in America: Assessing the Economic Impact of Interchange Fees for Credit Card and Debit Card Transactions. February 2010.

- Towards Universal Broadband: Flexible Broadband Pricing and the Digital Divide August 2009.

- The Economic Benefits of Provisions Allowing U.S. Multinational Companies to Defer U.S. Corporate Tax on their Foreign Earnings and the Costs to the U.S. Economy of Repealing Deferral. June 2009.

- The Impact of a Pre-Borrow Requirement for Short Sales on Failures-to-Deliver and Market Liquidity. May 2009.

- The Benefits to U.S. Taxpayers from an Open Market Buyback of Treasury Inflation-Protected Securities. March 2009.

- Economic Modernization in Mongolia: The Impact of Tax and Regulatory Policies on the Mining Sector. January 2009.

- Using What We Have to Stimulate the Economy: The Benefits of Temporary Tax Relief for U.S. Corporations to Repatriate Profits Earned by Foreign Subsidiaries. January 2009.

- The Impact of Private Equity Acquisitions and Operations on Capital Spending, Sales, Productivity, and Employment. January 2009.

- The Social and Economic Value of Private and Community Foundations. December 2008.

- The Role of Private Equity in US Capital Markets. October 2008.

- The Effects of Proposed Hurricane Legislation. August 2008.

- Addressing Climate Change Without Impairing the U.S. Economy: The Economics and Environmental Science of Combining a Carbon-Based Tax and Tax Relief. June 2008.

- The Economic Implications of Patent Reform: The Deficiencies and Costs of Proposals Regarding the Apportionment of Damages, Post-Grant Opposition, and Inequitable Conduct. February 2008.

- Generic Biological Treatments and the Associated Cost Savings. February 2008.

- American Jobs and the Impact of Private Equity Transactions. January 2008.

- The Distribution of Ownership of U.S. Oil and Natural Gas Companies. September 2007.

- The Economic Effects of Intellectual Property-Intensive Manufacturing in the United States. August 2007.

- The Impact of Authorized Generic Pharmaceuticals on the Introduction of Other Generic Pharmaceuticals. May 2007.

- Reducing Barriers to Investment in Fiber Connections and Advanced Broadband Services for American Households. February 2007.

- Addressing the Risks of Climate Change: The Environmental Effectiveness and Economic Efficiency of Emission Caps and Tradable Permits, Compared to Carbon Taxes. February 2007.

- Discredited: The Impact of Argentina's Sovereign Debt Default and Debt Restructuring on US Taxpayers and Investors. October 2006.

- Maintaining Contact: The Provision of International Long-Distance Service for Low-Income Immigrants in the United States. November 2006.

- Creating Broad Access to New Communications Technologies. April 2006.

- The Economic Impact of a Windfall Profits Tax On Federal, State and Local Public Employee Pension Funds. February 2006.

- The Economic Impact of a Windfall Profits Tax for Savers and Shareholders. November 2005.

- The Future of Security Exchanges. October 2005.

- Assessing the Economic Impact of Proposed Asbestos Legislation: A Reconsideration of the Evidence. July 2005.

- The Economic Value of Intellectual Property. July 2005.

- Healthy Returns: The Economic Impact of Public Investment in Transportation. May 2005.
- Conserving Energy and Preserving the Environment: The Role of Public Transportation. July 2002.

Law Review Article, 2006:

"Naked Short Selling: How Exposed Are Investors?" with James Christian and John-Paul Whalen, *Houston Law Review*, Vol. 43, No. 4, Winter 2006.

Submissions to the Securities and Exchange Commission, 2003-2008:

"Comments on Proposed Naked Short Selling Anti-Fraud Rule, 10b-21," May 12, 2008

"Comments on Proposed Amendments to Regulation SHO," September 14, 2006.

"Comments on Proposed Regulation SHO," December 24, 2003.

Books and Chapters in Books, 1997-2022:

- "The Role of Innovation and Intellectual Property in Economic Competition," in *Rethinking Competitiveness*, Kevin A. Hasset, ed., The AEI Press, 2012.

- "Individualism and America's Historic Wariness of Ideology and the Welfare State," in *Politics and Ideology*, Kurt Almqvist and Alexander Linklater, eds., Axel and Margaret Ax:son Johnson Foundation, 2012.

- "Resisting globalisation is a losing strategy," in *Priorities for a new political economy: Memos to the left,* Progressive Governance. Oslo, 2011

- "Explaining America's Economic Preeminence, in *On the Idea of America*, Kurt Almqvist and Alexander Linklater, eds., Axel and Margaret Ax:son Johnson Foundation, 2010.

- "Democracy in America," in *What is the West?* Kurt Almqvist and Alexander Linklater, eds., Axel and Margaret Ax:son Johnson Foundation, 2008.

- "The Future of Work: A Global Perspective from America." in *Visions of the Future*, Kurt Aklmqvist, ed., Axel and Margaret Ax:son Johnson Foundation, 2001.

- *Futurecast: How, Superpowers, Population and Globalization Will Change the Way You Live and Work,* St Martins Press, New York, 2008 (Also issued by other publishers in eight other countries and six other languages.)

- *Globaphobia: Confronting Fears about Open Trade*, with Gary Burtless, Robert Lawrence and Robert Litan, Brookings Institution Press, Washington, DC: 1998

- "The Global Context for Technology and Trade," in *Science and Technology Policy Yearbook,* 2000, Albert H. Teich, *et. al*., eds, American Association for the Advancement of Science, 2000.

- "Government's Role Promoting Growth," in *How Do We Grow Faster*, U.S. Chamber of Commerce, 1997.

- "A New Deal on Social Security," in *Building the Bridge: 10 Big Ideas to Transform America,* Will Marshall, ed., Rowman & Littlefield, Publishers, Lanham, Md.: 1997.

- "Restoring Upward Mobility in a Knowledge Based Economy," in *Building the Bridge: 10 Big Ideas to Transform America,* Will Marshall, ed., Rowman & Littlefield, Publishers, Lanham, Md.: 1997.

Articles, Journals, Magazines and Newspapers, 2000-2015:

- "Bloomberg's Real Economic Impact," *The Daily Beast,* December 19, 2013.

- "The Current State of Democracy in America," *Axcess*, Stockholm Sweden, November 2013.

- "The Cost of Dysfunction," *The Daily Beast,* October 16, 2013.

- "Who's Threatening the Economy," *The Daily Beast,* September 5, 2013.

- "America's Idea Economy," *The Daily Beast,* August 2, 2013.

- "Are Robots Killing Job Growth?" *The Daily Beast,* July 19, 2013.

- "U.S. Rocks at Globalization," *The Daily Beast,* June 8, 2013.

- "A Nation of Immigrants?" *The Daily Beast,* May 18, 2013.

- "The Economic Growth Mess," *The Daily Beast,* April 27, 2013.

- "Ditch Austerity Budget," *The Daily Beast,* April 10, 2013.
- "Cyprus Crisis Still Threatening," *The Daily Beast,* April 1, 2013.
- "Cancel the Sequester," *The Daily Beast,* March 1, 2013.
- "The Role of Innovation in Economic Growth, and Why Its Impact Is Limited in Many Places," *Analyse Financiere*, January/February/March 2013.
- "Weak job creation has become the norm," *The Washington Post,* February 13, 2013.
- Dangerous Debt-Ceiling Drama," *The Daily Beast,* January 9, 2013.
- "Markets like D.C. Deals," *The Daily Beast,* January 3, 2013.
- "Rewriting economic history against Obama" *The Washington Post*, August 16, 2012.
- "American Strength," In *American Review: Global Perspectives on US Affairs,* United States Studies Centre, University of Sydney, Vol. 1., No. 1. November 2009.
- "Big Isn't Beautiful," *Democracy, a Journal of Ideas*, Issue 14, Fall 2009.
- "The Next Globalization," *Democracy, a Journal of Ideas*, Issue 10, Fall 2008.
- "Politicians Should Look Abroad for the Source of Our Energy Woes," *U.S. News & World Report,* September 10, 2008.
- "How Europe Sows Misery in Africa," with Kevin Hassett, *The Washington Post,* June 22, 2003.
- "Size Matters," *Washington Monthly*, December 2002.
- "Nest Eggs, Over Easy," in *Washington Mon*thly, November 2001

Economic Studies, Department of Commerce, 1998-2000:

- Introduction and Editor, "Falling Through the Net: Toward Digital Inclusion: A Report on Americans' Access to Technology Tools," U.S. Department of Commerce, October 2000.
- Introduction and Editor, "Digital Economy 2000," U.S. Department of Commerce, June 2000.
- Introduction and Editor, "The Economics of Y2K and the Impact on the United States," U.S. Department of Commerce, November 17, 1999.

- Introduction and Editor, "The Emerging Digital Economy II," U.S. Department of Commerce, June 1999.

Public Policy Study, Progressive Foundation, 1997

Cut and Invest to Grow: How to Expand Public Investment While Reducing the Deficit, Policy Report No. 26, Progressive Foundation, Washington, D.C.: July 1997.

Academic Journal Articles, 1997:

"Knowledge and Wealth: The Role of Innovation and Human Capital in Economic Growth," *University of Chicago Policy Review,* Vol 1, No. 2, 1997.

"Building a Conceptual Baseline for Corporate Tax Reform," *National Tax Journal*, No. 3, 1997.

Articles as Contributing Editor to *Blueprint Magazine*, 2001-2005*:*

- "Tax Reform or Bust," *Blueprint Magazine*, May 31, 2005
- "Give Him an "F", *Blueprint Magazine*, May 7, 2004.
- "Bush: Grow Slowly and Carry a Big Debt," *Blueprint Magazine*, March 25, 2002.
- "Reducing the Payroll Tax Burden." *Blueprint Magazine*, April 25, 2001.
- "Fairness Matters." *Blueprint Magazine,* April 25, 2001.

Columns as Contributing Editor of *Slate*, 2002-2003:

- "Will the Tax Cut Work? Here's how we'll know if it does," June 10, 2003
- "Spin Cycle, Why has the business cycle gone topsy-turvy?", April 15, 2003.
- "Al-Qaeda and the GDP, How much would terrorism damage the U.S. economy? Less than you'd expect," February 28, 2003.
- "Fantasy Economics, Why economists are obsessed with online role-playing games," February 4, 2003.
- "Ants vs. Grasshoppers, Why the Bush administration should encourage business investment," December 26, 2002.
- "The Cost of Toppling Saddam, Will an Iraq war hurt the economy?" October 02, 2002.
- "The Options Problem, It started with Adam Smith, not Bernie Ebbers," July 31, 2002

- "War Bucks, Will the Iraq conflict cause the dollar to collapse?,"http://www.slate.com/?id=2077581&qp=27236 March 26, 2003

- "Deflation Nation, Could falling prices send the U.S. into a Japanese-style recession?" September 10, 2002.

- "The IT Split: Why Japan's tech industry bombed while America's boomed," August 21, 2002.

- "What Is the Mother of Invention? Why the American economy is so innovative," October 18, 2002.

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Professional Background

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Education

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Selected Publications and Technical Reports

“The Many Ways Americans Work and The Costs of Treating Independent Contractors as Employees” **Sonecon** (with Robert Shapiro). Forthcoming.

"The Effects of Earlier Medicaid Expansions: A Literature Review" **Council of Economic Advisers Issue Brief.** (Contributor). June 2021.

“Supporting Labor Supply in the American Jobs Plan and the American Families Plan” **Council of Economic Advisers Blog Post.** (Contributor). May 2021.

“Innovation, Investment, and Inclusion: Accelerating the Energy Transition and Creating Good Jobs” **Council of Economic Advisers Issue Brief.** (Contributor). April 2021.

"Advancing the Quality and Efficiency of America's Healthcare System" in **Economic Report of the President Together with The Annual Report of the Council of Economic Advisers**. (Contributor). Council of Economic Advisors. January 2021.

“Increasing the Number of Kidney Transplants to Treat End Stage Renal Disease.” **Council of Economic Advisers Issue Brief.** (Contributor). January 2021.

“Evaluating the Effects of the Economic Response to COVID-19” **Council of Economic Advisers Issue Brief.** (Contributor). August 2020.

"Internally Displaced People and their Access to Healthcare in the Metropolis: The Case of Bogota" UNESCO Inclusivity Lab, **Human Development Research Initiative** (with Giorgia Davidovic and Simren Herm-Singh). January 2018.

BEFORE THE SURFACE TRANSPORTATION BOARD

300049

STB Ex Parte No. 761

HEARING ON REVENUE ADEQUACY

STB Ex Parte No. 722

RAILROAD REVENUE ADEQUACY

ENTERED
Office of Proceedings
November 26, 2019
Part of
Public Record

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November 26, 2019

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I. SUMMARY

The Board's focus on improving its rate reasonableness procedures is commendable, and the Association of American Railroads ("AAR") supports efforts to enhance the Board's existing tools for detecting market dominance and assessing the reasonableness of rates within its jurisdiction. AAR has proposed a number of improvements to the Three-Benchmark test, and it would support further efforts by the Board to improve its SAC and Simplified SAC tools and explore ways to promote alternative dispute resolution.

But the evidence is overwhelming that rate regulation predicated on "revenue adequacy" is not the answer to any problem. In the first place, such regulation is inconsistent with the economic reality that virtually every U.S. industry earns returns in excess of its cost of capital. To use a railroad's achievement of this common level of profitability as grounds for triggering massive economic consequences is utterly unjustified as a matter of economic policy and inconsistent with the Board's governing statute. While AAR appreciates the good faith efforts of the Rate Reform Task Force (herein "Task Force" or "RRTF") to develop a suite of regulatory reform ideas, its recommendation to use revenue adequacy as a means of system-wide rate of return regulation flies in the face of the Board's own studies of its rate reasonableness options,[1] ignores the strong critiques of this use of revenue adequacy by independent observers like the Transportation Research Board, [2] and fails to engage at all with the detailed

[1] INTERVISTAS, SURFACE TRANSPORTATION BOARD, AN EXAMINATION OF THE STB'S APPROACH TO FREIGHT RAIL RATE REGULATION AND OPTIONS FOR SIMPLIFICATION, PROJECT FY 14-SB-157 (Sept. 14, 2016) ("InterVISTAS Report") (noting the SAC test "has stood the test of time as a maximum rate reasonableness methodology").

[2] NATIONAL ACADEMIES OF SCIENCES, ENGINEERING & MEDICINE, TRANSPORTATION RESEARCH BOARD, MODERNIZING FREIGHT RAIL REGULATION, at 28, 100, 101, 125 (2015) ("MFRR Report") (dismissing the idea of a revenue adequacy constraint as "anachronistic," "misguided," "lack[ing] an economic foundation," and "at odds with the deregulatory thrust of the Staggers Rail Act reforms").

evidence that AAR and several of its member railroads submitted in prior proceedings (most recently Ex Parte 722). It is fair to say that no federal agency is contemplating such a massive step backwards into discredited 1970s-era rate-of-return regulation.

AAR recognizes that the Board has been lobbied by certain shipper interests to develop a revenue adequacy rate mechanism as a one-size-fits-all alternative to the Board's existing SAC, Simplified SAC, and Three Benchmark methodologies. But capitulating to this idea is misguided for multiple reasons.

First, the attainment of revenue adequacy is not a signal of market failure that justifies STB intervention. Revenue adequacy results from many pro-competitive reasons and thus does not mean that railroads are acting improperly or abusing market power. In fact, revenue adequacy is a sign of good health—it results from innovation, wise investments, and increased productivity—all the results of market forces in competitive environments. This truth is confirmed by the fact that other well-functioning industries routinely earn accounting returns on investment higher than their cost of capital. Indeed, almost all U.S. industries earn accounting returns above the cost of capital. So the supposed "problem" evidenced by a railroad's revenue adequacy that some say justifies a regulatory crackdown actually occurs across the board in every industry. Revenue adequacy, thus, is a widespread, normal, and expected outcome in the economy—not a sign of market power abuse that warrants regulatory action. As Professor Kalt has previously observed, there is "no way in which one can look at accounting rates of return and infer anything about relative economic profitability or, a fortiori, about the presence or absence of monopoly profits."[3]

[3] Opening Comments of The Association of American Railroads, EP 722, Verified Statement of Joseph P. Kalt, at 36 (filed Sep. 5, 2014) ("The infirmities of using accounting profitability and rates of return to infer market power or above-competitive returns, particularly for capital industries like railroading with long-lived equipment, are well known.")

Second, the STB has no authority to regulate system-wide earnings, either directly or indirectly. Earnings regulation is a discredited utility-style approach to regulation that Congress deliberately abandoned with the Staggers Act. The STB must as well. "Congress deliberately chose to move away from a public utility model of regulation for the railroad industry."[4] Rather, "in enacting the Staggers Act, Congress concluded that unnecessarily burdensome and rigid utility-style regulation have prevented the railroads from responding to changing market conditions, as other businesses could, and taking actions that could help them to recover their costs and earn adequate revenues. The Staggers Act was intended to loosen this tight regulatory grip…."[5] Any form of revenue adequacy constraint is effectively rate of return regulation that Congress has not authorized.[6]

Third, the agency's measurement of revenue adequacy is laden with measurement errors. The Board's current annual determinations do not measure return on investment against the current value of assets, which is the real metric that investors in competitive markets consider. And the Board's annual findings are further distorted because it removes accumulated deferred taxes from the investment base.

Fourth, rate freezes like those proposed in the Task Force's "Rate Increase Constraint" have a dreadful track record. In the 1970s, our nation experimented with price freezes, with poor results. Artificial restrictions on prices distort the marketplace,

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[4] *Western Coal Traffic League – Petition for Declaratory Order*, STB Docket No. FD 35506, 15-17 (served July 25, 2013). *See also Groome & Associates, Inc. v. Greenville Cty. Economic Develop. Corp.*, STB Docket No. 42087, at 12 (served July 27, 2005) ("Congress directed [in the Staggers Act] that railroads be treated more like ordinary businesses than like public utilities.").

[5] *Study of Interstate Commerce Commission Regulatory Responsibilities Pursuant to Section 201(a) of the Trucking Industry Regulatory Reform Act of 1994*, 1994 MCC LEXIS 104, *275-76 (1994).

[6] *Ark. Power & Light Co. – Petition to Institute Rulemaking Proceeding – Implementation of Long-Cannon Amendment to the Staggers Rail Act*, Docket No. 38754, 365 I.C.C. 983, 989 (1982) ("The Commission does not regulate the overall rate of return for railroads."); *see* Verified Statement of Joseph P. Kalt ("Kalt V.S.") ¶¶ 14, 87-89, 102.

creating shortages and preventing ordinary market signals from functioning. The results were predicable: long lines, the inability of markets to adjust prices to meter demand, shortages in some geographic areas and surpluses in others, a reduction in innovation and investments, and thankfully the eventual abandonment of this intrusive interference with markets. As the Nobel Prize-winning economist Milton Friedman bluntly put it: "We economists don't know much, but we do know how to create a shortage. If you want to create a shortage of tomatoes, for example, just pass a law that retailers can't sell tomatoes for more than two cents per pound. Instantly you'll have a tomato shortage."[7] Having lived through this failed experiment, Congress in 1980 *expressly* told the ICC that it could *not* impose system-wide rate freezes on a carrier who attained revenue adequacy by expressly authorizing revenue adequate railroads to raise rates beyond inflation without any presumption of unlawfulness. *See* 49 U.S.C. § 10707a (1982). Given the context of the statutory scheme and its legislative history, a carrier's reward for achieving the goal of revenue adequacy cannot be a system-wide rate freeze.

Fifth, the Board does not have the statutory authority to revoke long-haul protections bestowed on the railroad industry for a century, whether or not a carrier is revenue adequate. The purpose of the Bottleneck Rule is not to help railroads achieve revenue adequacy but to maximize railroad efficiency by ensuring that a railroad—a business firm operating a network—can choose its own routes and rates absent abuse of market power.[8] Thus, it makes no sense that this protection would be taken away merely because a railroad becomes revenue adequate. A revenue adequate railroad still needs to optimize its network. Indeed, removing bottleneck protections would result in operational chaos, congestion, market distortions, and other ills we know result from system-wide rate of return regulation. In any event, the Bottleneck Rule is "mandated

[7] "*Controls blamed for U.S. energy woes*," Los Angeles Times, Feb. 13, 1977.

[8] 49 U.S.C. §§ 10701(c), 10705(a)(2).

by the law."[9] As the Board recognized, the Bottleneck Rule is based on "statutory provisions [that] protect[] each railroad's right to determine, at the outset, which reasonable through routes it will use to respond to requests for service."[10] Any attempt to reverse or suspend this rule for revenue-adequate railroads would be unlawful.

Finally, there is no way to tie a metric of system-wide financial health to the reasonableness of an individual rate. It is impossible. The reasonableness of a particular rate rests, at its foundation, on the services and facilities the railroad uses to serve that customer. What a carrier earns on competitive traffic a thousand miles away is irrelevant. As the D.C. Circuit correctly observed, a test of "system-wide revenue need" provides "no guidance" on the rates a customer should be charged for the particular facilities and services it uses.[11] Seeking to design a new tool to regulate individual rates based on the system-wide revenue needs of a carrier should be abandoned.

AAR's comments are supported by the written testimony of Professor Joseph P. Kalt of Harvard University's Kennedy School of Government, who analyzes whether the revenue adequacy-related ideas from the Task Force are consistent with principles of sound economics and proper public policy. Professor Kalt explains that any proposal that bases regulatory action on a system-wide measure of "revenue adequacy" is a move away from the basic economic principles in the Staggers framework.[12] A system-wide "revenue adequacy" constraint is inherently a blunt tool that cannot tell the difference between "revenue adequacy" that is the result of successful and efficient pro-competitive behavior and "revenue adequacy" that may be the result of market power over certain portions of a carrier's operations. Identifying rates that are unreasonably

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[9] *Central Power & Light Co. v. S. Pac. Transp. Co.*, STB Docket No. 41242, 1 S.T.B. 1059, 1073 n.21 (served Dec. 31, 1996) ("*Bottleneck I*") ("Our decision is, in our view, mandated by the law.").

[10] *Bottleneck I*, at 1065.

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

[12] Kalt V.S. ¶¶ 126-38.

high as the result of market power invariably requires consideration of the particular markets and traffic at issue, in the way that the Board's existing SAC and Simplified SAC methodologies are designed to do. A return to old-style regulation in which generalized rate constraints are applied to limit earnings to an "adequate" level would distort incentives and lead to reduced efficiency, higher costs, and deteriorated service quality.[13] Professor Kalt urges the Board to abandon this concept and instead to consider smart simplification of its existing procedures to develop rate reasonableness measures that are both accessible to all shippers and grounded in sound economics.[14]

Section II of these Comments summarize the core reasons why the Board should abandon the revenue adequacy constraint once and for all. Improved financial health is not evidence of any specific exercise of market power that could justify regulatory intervention in any particular case. Indeed, all well-functioning U.S. industries regularly earn accounting returns on investment in excess of their cost of capital. And Congress plainly did not give the Board authority to regulate system-wide railroad revenues or turn the clock back to discredited utility-style rate-of-return regulation.

Section III addresses the suggested definition of long-term revenue adequacy. The proposed time period is arbitrary and unsupported by substantial evidence. Moreover, measurement errors in the annual revenue adequacy determinations, such as the use of book value and the treatment of deferred taxes, make the Board's measure of revenue adequacy arbitrary, a poor lens for determining long-term revenue adequacy, and an even worse tool for regulating railroad rates or routes.

Section IV discusses the concept of a Rate Increase Constraint ("RIC") and explains why it would be both unlawful and terrible public policy. Nothing in the statutory scheme authorizes the Board to move away from an individual case-by-case

[13] *Id.* at ¶ 14.

[14] *Id.* at ¶¶ 139-47.

analysis of rate reasonableness to system-wide rate freezes that would slowly drive railroad rates (and earnings) down to revenue inadequacy. Indeed, RIC would carry all the negative consequences of rate freezes, would create multiple cross-subsidies, and would perversely create incentives for inefficiencies. RIC also features extraordinary regulatory lag that could leave system-wide rate constraints in place years after railroads become revenue *inadequate*.

Section V shows that the idea of reversing the Bottleneck Rule for revenue adequate railroads is unlawful. A bottleneck carrier's right to its long haul is not a policy choice by the Board that it has the discretion to reverse. It is a statutory command that the Board may not override unless it meets specific statutory criteria—none of which are satisfied by a mere showing of system-wide revenue adequacy. Moreover, allowing shippers free rein to override railroads' route-setting prerogative would create severe operational disruptions and would adversely affect rail infrastructure investment.

Section VI concludes by emphasizing that the Board has other paths forward to address its concerns about its current rate procedures. The Board can improve access to rate relief in small shipper and small value cases by further streamlining its Three Benchmark approach, and it could consider additional streamlining of the SAC and Simplified SAC approach to create an improved methodology for larger cases.

II. THE STB SHOULD ABANDON THE REVENUE ADEQUACY CONSTRAINT.

To inform its decision-making, the Board should "identify the problem that it intends to address (including, where applicable, the failures of private markets or public institutions that warrant new agency action) as well as assess the significance of that problem."[15] If there is a problem to be solved through regulation, it should identify

[15] Exec. Order No. 12866, 58 Fed. Reg. 51735 §§ 1(b)(1) and 6(a)(3)(B)(i) (Sep. 30, 1993).

a range of *lawful* solutions with a Regulatory Impact Analysis (RIA).[16] Only if the agency identifies a problem Congress intended to be solved through lawful regulation should the agency turn to the benefits and costs of alternatives.

A thorough RIA would conclude that the agency should discard its revenue adequacy constraint. First and foremost, earning revenues beyond revenue adequacy is not a "problem" to be solved through federal regulations. Second, regulating the earnings of a company is an antiquated and discredited type of regulation with crippling flaws that has driven governments worldwide to abandon this kind of oppressive government control. Third, Congress plainly did not grant the Board authority to impose this fallen form of regulation on the freight rail industry. The so-called Revenue Adequacy Constraint—announced by the ICC in 1985, only to lie dormant for the next three decades and never applied to the railroad industry—is unnecessary, unlawful, and ill-advised. It should be discarded.

A. Earning over revenue adequacy is a fulfillment of Congress's purpose, not a problem to be solved.

The recent improving financial health of some of the major railroads is not a cause for regulatory concern for three reasons. First, revenue adequacy, even rightly measured, does not indicate any specific exercise of market power. Second, the financial health of the rail sector is not a cause for concern but an encouraging development as it represents fulfillment of the Congressional goal of restoring the financial wellbeing of railroads. Other well-functioning competitive industries *routinely* earn accounting measures of ROIs above the cost of capital. The same opportunity is necessary for a sustainable national freight railroad industry, which must compete for capital with other unregulated companies in the national economy.

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[16] *Id.* at § 6(a)(3)(C)(iii).; U.S. OFFICE OF MGMT. & BUDGET, CIRCULAR A-4, REGULATORY ANALYSIS (2003), *available at* https://obamawhitehouse.archives.gov/omb/circulars_a004_a-4/.

Third, there is no evidence or reason to suspect that the improving financial health of the industry has resulted from the inappropriate exercise of market power, as shown by the STB's own independent study of the freight rail industry. Improved financial performance in the rail sector has been driven by the pro-competitive forces unleashed by the Staggers Act that have allowed railroads to pursue and achieve innovation and efficiencies.

1. Revenue adequacy, even rightly measured, does not demonstrate any specific exercise of market power.

Even if one assumes that the Board had well calibrated tools to accurately identify when a railroad became revenue adequate (which, as Section III explains, it does not), there is no basis for the Board to assume that achievement of system-wide revenue adequacy is due to any particular exercise of market power. As Professor Kalt explains, "[e]ven if a railroad is found to be revenue 'over-adequate' – that is, earning revenues for a period of time greater than a long-term, replacement cost revenue adequacy calculation of adequate revenues – it does not necessarily follow that the railroad is exercising market power and has been charging above-competitive rates."[17]

One reason that returns over the cost of capital do not equate to above-competitive rates is that firms in competitive markets are strongly incentivized to—and are often able to—out-earn their cost of capital through investment and productivity improvements. As Professor Kalt explains, in competitive markets, "[f]irms seek to achieve economic returns that not just equal but exceed their cost of capital," as "the prospect of successfully out-earning one's cost of capital drives innovation and investment."[18] For this reason, "[i]t is sound economic policy to maintain incentives for

[17] Kalt V.S. ¶ 55.

[18] *Id.* ¶¶ 60-61.

railroads to try to earn returns *in excess of* their cost of capital."[19] In other words, the prospect of earning returns higher than the cost of capital drives innovation and productivity improvements that the Board should be encouraging. That is pro-competitive and a development to be celebrated and encouraged.

2. Improved financial health from innovation, efficiencies, and the growth of competitive markets is not a market failure.

A crippling flaw in treating revenue adequacy as a problem to cure with aggressive federal regulation is illustrated by focusing on the causes of the improved financial performance of railroads in recent years. The facts are overwhelmingly clear that improving railroad financial health (including revenue adequacy as currently measured by the Board) is not a cause for concern because it is due to pro-competitive reasons. In other words, the improved financial health of the railroad industry is a win-win situation—railroads, shippers, and the public all benefit when railroads are free to set rates and determine traffic routing in response to market forces.

Preliminarily, it is important to realize that the vast majority of rail traffic is subject to effective competition and therefore not subject to regulation.[20] This undermines any unsupported claim from trade groups that revenue adequacy is so problematic that firm-wide earnings regulation is needed. When such a large portion of rail traffic is competitive, there is no need for any regulation at all with regard to such traffic, regardless of railroad revenue adequacy. And for the small slice of traffic that lacks effective competition, the Board already has the tools it needs (and that Congress endorsed) to protect those shippers from any abuse of market power.

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[19] *Id.* ¶ 61 (emphasis added).

[20] More than 67% of the carloads reported in the Board's 2017 Expanded Commodity Revenue Stratification Report had a revenue-to-variable cost ratio below 180% and were therefore excluded from Board rate regulation because the statute conclusively presumes that such traffic is competitive. STB, 2017 Expanded Commodity Revenue Stratification Report, *available at* https://prod.stb.gov/reports-data/economic-data/commodity-revenue-stratification-reports/.

Professor Kalt explains that "[i]mprovements in ROI that move a carrier into 'revenue adequate' territory may be driven by these types of positive net present value, pro-competitive investments and behavior -- cost reductions, productivity improvements, and innovation to serve existing markets better or expand to new markets."[21] So,

> [r]ather than an indication of anticompetitive conduct, a movement into a state of even properly-measured 'revenue adequacy' may represent the signal to expand capacity in the face of competition. In the case of an innovation in operations that lowers costs (and raises income), the reduced costs act as a signal to attract additional business that previously was met by competitors or that was not previously viable at the higher cost levels. The presence of positive net present value investment opportunities—for example, to debottleneck or expand terminals or loading facilities—represent signals for procompetitive expansion of capacity or improvements in service. Indeed, absent the opportunity and expectation to earn above the COC on these investments, such pro-competitive actions and investments would not be undertaken.[22]

Indeed, "on average, sound financial management implies that the expected return on investment will *exceed* the cost of capital, even for firms without market power."[23]

Likewise, Professor Kalt has previously explained that the improved financial performance of railroads in recent years is attributable in large measure to efforts by the railroads to improve the profitability of competitive traffic, not to exploitation of potentially market dominant traffic.[24] Dr. Kalt's analysis shows that over the period 2008-2012, an increasing share of railroad contribution in excess of variable cost was earned on traffic that is conclusively presumed to be competitive—*i.e.*, traffic with an R/VC ratio less than 180%. An increased contribution share from competitive traffic is

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[21] Kalt V.S. ¶ 75.

[22] *Id.* ¶ 76.

[23] *Id.* ¶ 73.

[24] Opening Comments of The Association of American Railroads, EP 722, Verified Statement of Joseph P. Kalt, at 36-37 (filed Sep. 5, 2014).

inconsistent with the notion that railroads have achieved improved financial results by pricing potentially market dominant traffic at excessive levels.

Professor Kalt noted that any concern that the improved financial health of railroads might "increase[] the risk that shippers could be forced to pay unreasonably high rates" is "unfounded" based on "evidence from extensive, rigorous research."[25] Professor Kalt explained that "[t]he increasing dynamism of U.S. industry—with greater capital mobility, easier logistics of sourcing, greater integration into the global economy, etc.—has increased the forces of geographic and product competition for many types of traffic."[26] Relatedly, intermodal competition in the railroad industry "has been effective and growing, with rail and trucks competing vigorously for traffic," and "[r]ailroad intermodal traffic volumes have quadrupled since the Staggers Act, and now represent the Class I railroads' single largest traffic group."[27]

With regard to railroad rates in this new era of increasingly revenue adequate railroads, Professor Kalt explained that "[b]y the early to mid-2000s, productivity gains peaked and plateaued (as they had to at some point) and average rail rates showed upward movement for the first time in two decades. It is common in the media and political arenas (albeit, not among scholars) to hear claims that the latter, at least, has been the result of reduced rail-to-rail competition putatively attributable to … [various] rationalizations that have taken place under the Staggers Act. ... [Yet,] numerous academic studies of the rail industry have concluded that competition in the rail industry has not been eroded … in the post-Staggers Act era. By implication, this means that improved railroad financial performance has not been achieved by exercising a greater level of railroad market power."[28] Professor Macher joins Professor Kalt in

[25] *Id.* at 16-17.

[26] *Id.* at 18.

[27] *Id.* at 17 (footnote omitted).

[28] *Id.* at 18-20 (footnote omitted).

making the point that the "foundation of such a policy [using revenue adequacy to constrain rates] also errs in presuming that the source of returns in excess of adequate levels is differential pricing of dominant routes, when, in fact, … such profits may arise from a variety of sources. This prospect creates the potential for regulation to substantially misalign incentives in the industry."[29]

The extensive and independent study by the Christensen Associates commissioned by the STB ("Christensen Report") showed that the improved financial health of the rail industry was due to pro-competitive behavior, not problematic abuse of market power.[30] In particular, the Christensen Report debunked the notion that any further regulation is necessary to offset the increased earnings of railroads, as no problematic abuse was detected to correlate with increased earnings. In fact, the economic recovery of the rail industry under the policies set forth in the Staggers Act was actually accompanied by a multi-decade *decline* in the inflation-adjusted rates that shippers pay for rail service.[31]

Moreover, the upward movement in rail rates in the years immediately following the recent recession were not abuses of market power but, rather, the logical response to market conditions, including significant growth in demand, higher operating expenses, a slowing in the pace of productivity gains in the rail industry, and changes in the trucking market (*e.g.*, driver shortages, higher fuel prices, highway congestion).[32]

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[29] Macher, et al., *Revenue Adequacy: The Good, the Bad and the Ugly*, 41 Transp. L.J. 85, 123 (2014).

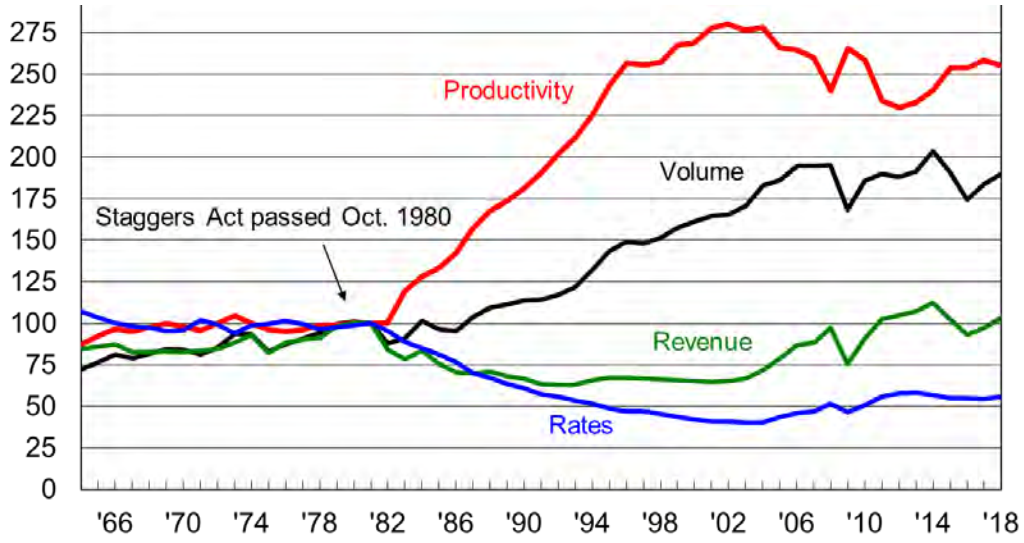
[30] *See* Laurits R. Christensen Associates, Inc., *A Study of Competition in the U.S. Freight Railroad Industry and Analysis of Proposals that Might Enhance Competition, Executive Summary of Revised Final Report* (2009) ("*2009 Christensen Report*"); Laurits R. Christensen Associates, Inc., *A Study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

[31] *See 2010 Christensen Report* at 3-25-26.

[32] *Id*.

Professor Kalt likewise notes that "[i]t is difficult to find other examples of regulatory success that rival that of the Staggers Act and its implementation by the ICC and the Board," and much of the improvement in railroad financial health "has been passed through to shippers in the form of lower rates for transportation and a high-quality, more efficient, and cost-effective network,"[33] as shown in Figure 1.

Figure 1
RAIL RATES, PRODUCTIVITY, VOLUMES & REVENUE: 1964-2018
(1981=100)



"Rates" are inflation-adjusted revenue per ton-mile. "Volume" is ton-miles. "Productivity" is revenue ton-miles per constant dollar operating expense. Source: AAR

Professor Kalt explains that the performance reflected in Figure 1 does not, as some worry, "signal[] a diminution of competition that is borne by shippers," but rather, "numerous academic studies of the rail industry have concluded that competition in the rai industry has not been eroded" and "improved railroad financial performance has not been achieved by exercising a greater level of railroad market power."[34]

Similarly, the Christensen Associates concluded that both railroads and their customers benefitted from the deregulatory policies of the Staggers Act: "[F]ollowing the passage of The Staggers Act, the railroad industry experienced dramatic reductions

[33] Kalt V.S. ¶ 26 (footnote omitted).

[34] *Id.* ¶¶ 27-28.

in costs and increased productivity, which yielded higher returns for carriers and lower inflation-adjusted rates for shippers."[35] Even more powerful, the Christensen Associates concluded that "[t]he recent increases in revenue per ton-mile appear to be largely the result of increases in fixed and marginal costs—related to increases in the railroad industry's input prices and diminishing productivity growth—and not due to an increased exercise of market power."[36] This report commissioned by the STB is the most recent empirical study of the industry and provides no support for concluding that "revenue adequacy" is a problem to be solved by federal regulation.

3. Well-functioning U.S. industries routinely earn accounting measures of ROI well above the cost of capital.

Not only do the facts indicate that revenue adequacy in the railroad industry is not a problem to fix, this same conclusion can be reached by comparing the performance of the freight rail industry against other well-functioning industries. In sum, virtually all companies in America earn accounting measures of ROI substantially above the cost of capital, over a sustained period of time.

The evidence from other industries is overwhelming. Professor Kalt explains that "firms earning returns on investment in excess of the cost of capital for extended periods is a common and expected occurrence even in industries that are highly competitive."[37] In fact, "[r]ecent research confirms that levels of 'revenue adequacy' and 'revenue over-adequacy', as measured by ROI/COC, are not unusual at all in the economy," and "the ratio of ROI to COC typically can be well over one in industries widely and properly regarded as competitive."[38] As shown in Figure 2 below, the

[35] *2009 Christensen Report* at ES-1.

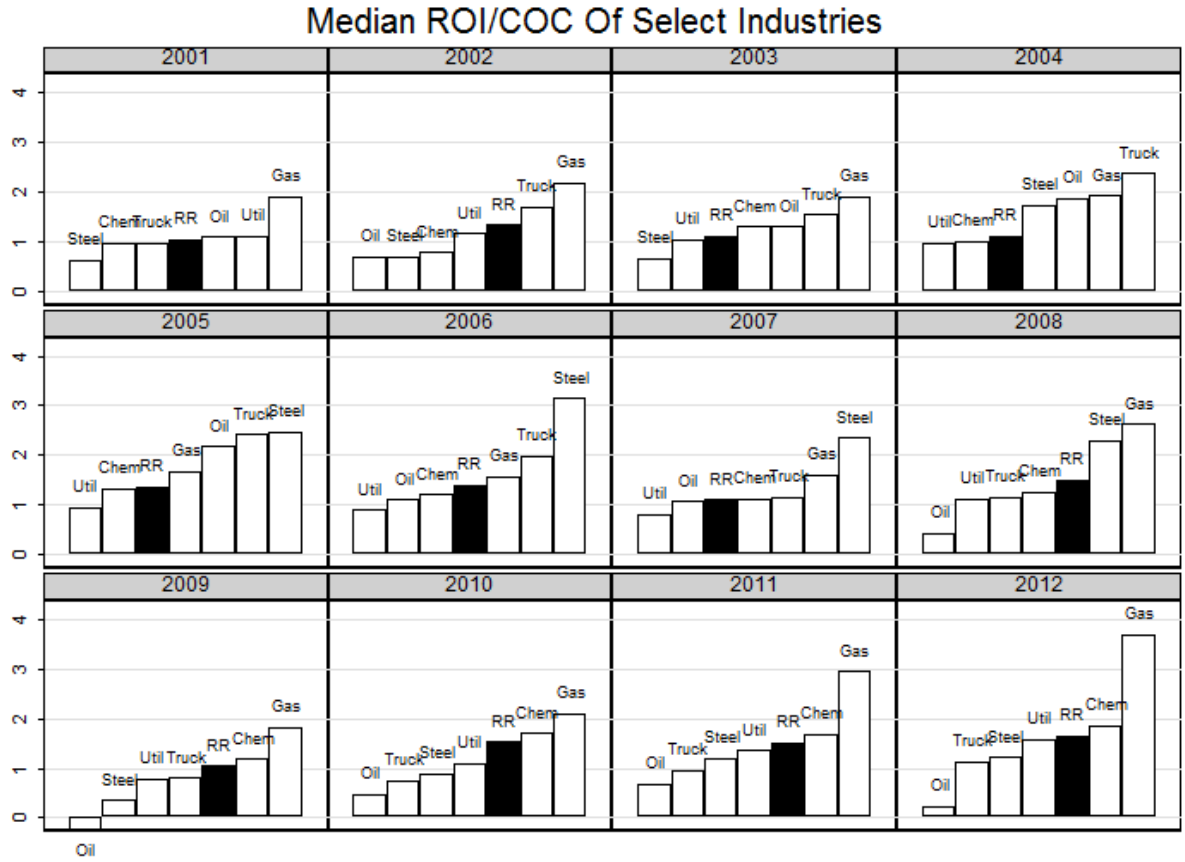
[36] *2009 Christensen Report* at ES-38; *see also 2010 Christensen Report* at 4-13, 5-20, 6-3, 6-17.

[37] Kalt V.S. ¶ 74.

[38] *Id.* ¶ 78.

railroad industry's performance has been wholly consistent with other comparable industries—not in any way inappropriate or suggesting abuses of market power.[39]

Figure 2



Source: Macher, *et al.*, 41 Transp. L.J. at Figure 3.

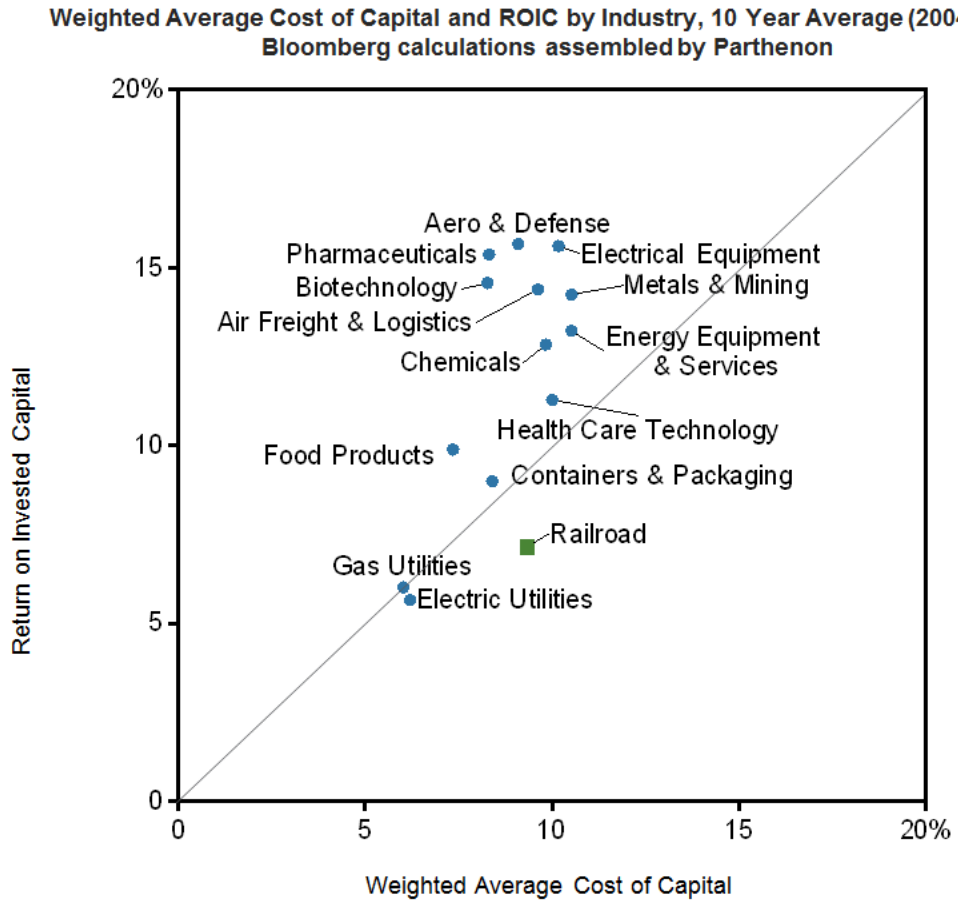
Professor Kalt explains that various research confirms that "[f]irms operating in highly competitive segments of the economy can realize revenue adequacy metrics above and below unity."[40] For example, Figure 3 below shows research "based on longer-term (10-year) averages, [found that] industry-weighted ROIs were greater than weighted-average COCs for industries with comparable COC rates."[41]

[39] *Id.* ¶ 79.

[40] *Id.* ¶ 83 (quoting Macher *et al.*, 41 Transp. L.J. at 110).

[41] *Id.* ¶ 84 (footnote omitted).

Figure 3



Note: Bloomberg calculations are a total annual invested capital weighted average of S&P 500 companies within the industry during 2014
Source: Parthenon using Bloomberg data

Similarly, a McKinsey study of the performance of 3,000 non-financial companies over the period 2007-2011 found similar results. The firms in the top two quintiles all had ROI > COC, and the firms in the top quintile substantially so. The majority of the firms in the middle range clustered around revenue adequacy (ROI = COC), both above and below.[42] The authors also observed that "Low turns are the hallmark of the bottom

[42] Chris Bradley, Angus Dawson & Sven Smit, *"The strategic yardstick you can't afford to ignore,"* MCKINSEY QUARTERLY, Oct. 2013 (herein "McKinsey Study"), *available at* https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/the-strategic-yardstick-you-cant-afford-to-ignore. The McKinsey Study looks at firms and industry based on a measure of "Economic Profit." Economic Profit equals ROI minus COC

quintile, which includes capital-intensive industries, such as airlines, electric utilities, and railroads."[43] Increased returns over the cost of capital create a virtuous cycle of increased investment. The authors observed that top-quintile companies (earning returns substantially above the ROIC) attract "a disproportionate share of investment" and invested "2.6 times more fresh capital than bottom-quintile businesses did over the subsequent decade."[44]

Professor Kalt concludes: "If revenue adequacy is based on ROI being greater or equal to COC (even measured over longer time horizons), revenue adequacy is a widespread, normal and expected outcome in the economy. Revenue adequacy and over-adequacy based on long-term comparisons of ROI to COC do not indicate exercises of above-competitive rail rates resulting from exercises of market power."[45]

The reasons so many American industries earn an accounting return substantially above the cost of capital are numerous. For one, CEOs and CFOs typically invest in a portfolio of projects at any given time. When deciding whether to invest in particular projects, they will use "hurdle rates" somewhat above the firm's cost of capital to gauge whether an investment is worth the risk. Senior management does not approve investments unless they are expected to generate a return at least as high as the hurdle rate. The approved investments, therefore, will have expected returns above the firm's cost of capital and often significantly above the cost of capital. As a result, if the risk and return assessments underlying the investment decisions are accurate—and successful firms strive to make rational decisions based on the most accurate assessments possible—the portfolio of approved projects will produce overall firm

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times capital invested. Thus, a firm with zero Economic Profit would have ROI equal to COC. Positive Economic Profit is equivalent to being revenue over-adequate. Kalt V.S. ¶ 88.

[43] McKinsey Study at 3. By "asset turn," the authors are describing the capacity to extract revenue from a given quantity of capital assets.

[44] *Id.* at 5.

[45] Kalt V.S. ¶ 87.

returns that substantially exceed the firm's cost of capital. Such returns above the cost of capital are exactly what Dr. Brinner observes in the real world.[46]

Professor Kalt echoed Dr. Brinner: "Competitive markets are dynamic, and successful competitive firms often earn above long-run equilibrium rate of returns. Firms seek to achieve economic returns that not just equal but exceed their cost of capital. As technology changes and markets shift, firms that are particularly adept at taking advantage of these changes reap economic returns in excess of their capital costs. "Firms that are particularly adept at staying ahead of the curve … can sustain rates of return in excess of their costs of capital. . . ."[47] In fact, in competitive markets, "the prospect of successfully out-earning one's cost of capital drives innovation and investment. As in other industries, competitive revenue adequacy is necessary to provide incentives for railroads to invest in efficient capacity expansion and system replenishment, to pursue cost saving innovations, and to respond to the opportunities presented by emerging market developments. It is sound economic policy to maintain incentives for railroads to try to earn returns in excess of their cost of capital."[48]

A second reason firms earn returns substantially over their cost of capital flows from the use of *accounting* measurements of ROI. "The infirmities of using accounting profitability and rates of return to infer market power or above-competitive returns, particularly for capital industries like railroading with long-lived equipment, are well known. As starkly summarized by the classic treatment of the issue, 'there is no way in which one can look at accounting rates of return and infer anything about relative economic profitability or, a fortiori, about the presence or absence of monopoly

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[46] *See* Opening Comments of The Association of American Railroads, EP 722, Verified Statement of Roger Brinner, Exhibit 2 (filed Sep. 5, 2014).

[47] Opening Comments of The Association of American Railroads, EP 722, Verified Statement of Joseph P. Kalt, at 33 (filed Sep. 5, 2014).

[48] *Id.* at 33-34.

profits.'"[49] Notable economists caution against the use of accounting rather than economic measures of financial health. "If book depreciation and economic depreciation are different (they are rarely the same), then the book profitability measures will be wrong; that is, they will not measure true profitability."[50] And "[p]rice regulation based on such misguided conclusions would likely make it more difficult for railroads to attract and retain capital investment on account of not being able to realize economically required rates of return."[51]

In sum, the Board should not view revenue adequacy as a problem that needs to be corrected. Virtually all American companies in well-functioning markets earn an accounting return above the cost of capital. There is no basis to treat the freight rail industry differently in this regard than its unregulated competitors and unregulated customers.

B. Congress plainly did not grant the STB authority to constrain firm-wide earnings.

Nothing in the Board's governing statute gives it the authority to impose an earnings constraint on the freight rail industry. Statutory authority to regulate rates is limited to the reasonableness of individual rates on individual movements. The only statutory references to firm-wide earnings relate to the Board's duty to promote firm-wide financial health, defined in detail and referenced in short hand as revenue adequacy. "Congress ... does not alter the fundamental details of a regulatory scheme in vague terms or ancillary provisions—it does not, one might say, hide elephants in mouseholes." *Whitman v. Am. Trucking Assoc.*, 531 U.S. 457, 468 (2001).

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[49] *Id.* at 32 (footnote omitted).

[50] RICHARD BREALEY, STEWART MYERS & FRANKLIN ALLEN, PRINCIPLES OF CORPORATE FINANCE 317 (8th ed. 2005).

[51] Opening Comments of Opening Comments of Norfolk Southern Railway Company, EP 722, Verified Statement of Bradford Cornell, at 18 (filed Sep. 5, 2014).

Earnings regulation is a controlling form of regulatory intervention that Congress would not have hidden in vague terms. If Congress wanted the ICC and STB to treat revenue adequacy as a problem to be solved by earnings regulations, it would have said so. Here, Congress made clear revenue adequacy was its overarching goal, to save the industry from excessive federal regulation. Congress did not first direct the ICC to promote revenue adequacy only expecting, once achieved, for the ICC to transform the goal into a problem and adopt regulations to curtail the very outcome Congress directed the agency to foster.

1. Regulating based on firm-wide earnings is an antiquated and discredited form of regulation.

It is essentially undisputed that "old-style" earnings regulation—meaning any constraint based on system-wide earnings—is a form of regulation that is now discredited and rejected. As Professor Kalt explains that in their economic essence, the Task Force's idea to use measures of firm-wide rates of return in excess of a firm's cost of capital to trigger limitations on rates and overall revenues "entail a regulatory framework commonly referred to as 'old-style' rate-of-return regulation."[52] But this kind of regulation is "old-style" because "it has been largely abandoned in at least developed countries because of its many distortions and inefficiencies.[53]

Professor Sappington explained how rate of return regulations like a system-wide revenue adequacy constraint are antiquated and have been rejected worldwide by regulators because "regulators are well aware of the many drawbacks to stringent earnings regulation" and have "recognized [that] … stringent earnings regulation has the potential to seriously impede industry performance."[54] This is because, "a policy

[52] Kalt V.S. ¶ 14.

[53] *Id. See also* Kalt V.S. ¶¶ 126-138.

[54] Opening Comments of Norfolk Southern Railway Company, EP 722, Verified Statement of David Sappington, at 7, 10 (filed Sep. 5, 2014).

that limits a supplier to normal earnings – regardless of its performance – provides the supplier with little or no incentive to excel in the marketplace. In particular, stringent earnings regulation provides no incentive for the regulated firm to engage in the challenging, costly processes of discovering more efficient means of operation and identifying and fulfilling the needs and desires of consumers."[55] The "trend away from stringent earnings regulation in many industries reflects an important principle that is relevant in all industries, including the U.S. freight railroad industry. The principle is that all parties – suppliers and customers alike – can gain when the prospect of *extra-normal* earnings is employed to motivate regulated suppliers to deliver exceptional performance in the marketplace."[56] "Indeed, the prospect of extra-normal earnings is precisely what drives producers in competitive markets to innovate and serve the best interests of consumers."[57]

Professor Macher said it most directly: "were regulators to utilize the revenue adequacy provisions of the Staggers Act to constrain rates with the purpose of limiting railroads' profitability to be only equal to the industry cost of capital, profound economic incongruities and problems would arise."[58] One of those problems would be legal, described as "a knife-edge turning point between the clear Congressional mandate for regulators to 'assist' carriers in achieving adequate revenue levels and a regulatory policy to ensure that railroads are unable to earn anything more than exactly this level," which "appears to be directly contrary to the aim of the Staggers Act…"[59] From an economic perspective, "such a policy ignores the economic reality that the vast majority of rail traffic faces competition with other railroads, other transportation

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[55] *Id.* at 4.

[56] *Id.* at 3 (emphasis added).

[57] *Id.* at 4.

[58] Macher *et al*., 41 Transp. L.J. at 122.

[59] *Id.* at 122-23.

service alternatives, and other geographic and product alternatives."[60] Macher continues:

> [M]arket-based allocation drives firms to reduce costs, innovate, and more generally, better serve the U.S. economy. Firms do not undertake these activities for altruistic reasons but for the pursuit of economic profits in excess of the firm's cost of capital. Regulatory policies that restrict firms to only earn the industry cost of capital effectively eliminate profit motives that drive innovative, cost-reducing and value-enhancing activities.[61]

Professor Macher explains that using revenue adequacy as a constraint on railroad earnings or rates "creates the potential for regulation to substantially misalign incentives in the industry"—in other words, "creates perverse incentives" in which railroads would "avoid … efficiency enhancements" and "slow-roll[]" innovations, to the detriment of society.[62] Finally, Professor Macher explains that "such a policy is neither targeted nor free of regulatory costs. That is, the regulatory tool of profit-based regulation applies a 'dull axe' of firm-wide profit-triggered regulation to a far more specific issue of residual market power abuses on specific shipments. Apart from the perverse incentives created by such a policy, this profit-based regulation has proven to be sufficiently costly in a variety of industries to warrant substantial movement away from this tool over the past quarter century."[63]

2. <u>The STB has no authority to impose a utility-style constraint on system-wide revenues.</u>

Given the known flaws with old-style earnings regulation, "Congress deliberately chose to move away from a public utility model of regulation for the

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[60] *Id.* at 123.

[61] *Id.*

[62] *Id.* at 123-24.

[63] *Id.* at 123-24 (emphasis added).

railroad industry"[64]—including with regard to the concept of revenue adequacy. From the 4R Act[65] to the Staggers Act[66] to ICCTA,[67] the concept of revenue adequacy consistently has been a *goal* of railroad financial health Congress has expressly charged the agency to actively support.[68] Nowhere in the statutory scheme—either explicitly or implicitly—does Congress suggest or contemplate any type of regulatory action that would cap railroad revenues or rates once railroads become long-term revenue adequate. The statutory scheme does authorize the Board to regulate railroad rates and routes in well-defined circumstances—when there is an abuse of market power. This makes sense in light of the overarching policy goals Congress articulated in the Staggers Act of maximizing competition and minimizing regulation except in instances of market failure.[69]

Indeed, the rate reasonableness provisions of the statute do not state that the Board may declare a rate to be unreasonable based on the amount of revenue that a railroad earns on a firm-wide basis. To the contrary, the statute expressly requires that, in order for the Board to prescribe an alternative rate, the Board must make a finding as

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[64] *Western Coal Traffic League – Petition for Declaratory Order*, STB Docket No. FD 35506, 15-17 (served July 25, 2013).

[65] Railroad Revitalization and Regulatory Reform Act of 1976, Pub. L. No. 94-210, 90 Stat. 31 (1976) ("4R Act").

[66] Staggers Rail Act of 1980, Pub. L. No. 96-448, 94 Stat. 1895 (1980) ("Staggers Act").

[67] ICC Termination Act of 1995, Pub. L. No. 104-88, 109 Stat. 803 (1995) ("ICCTA").

[68] *See* 49 U.S.C. § 15(a)(4) (1976) (4R Act directing the Commission to "make an adequate and *continuing effort to assist … carriers in attaining" adequate revenues*); H.R. Rep. No. 96-1430, at 80 (1980), *as reprinted in* 1980 U.S.C.C.A.N. 4110, 4111 (regarding the Staggers Act, stating that its purposes was "freedom from unnecessary regulation" and to provide "the opportunity for railroads to obtain adequate earnings to restore, *maintain and improve* their physical facilities while achieving the financial stability of the national rail system" (emphasis added)); *see also* 49 U.S.C. § 10704(a)(2), (4) (1982).

[69] 49 U.S.C. 10101(1) ("[I]t is the policy of the United States Government … to allow, to the maximum extent possible, competition and the demand for services to establish reasonable rates for transportation by rail[,[… [and] to minimize the need for Federal regulatory control over the rail transportation system…").

to an *individual* rate and situation, requiring a fact-specific inquiry to determine if the particular challenged rate is unreasonable.[70] The statute likewise requires a "full hearing," and only after conducting the hearing is the Board authorized to take regulatory action.[71] The notion that a rate could be deemed unreasonable based on the carrier's overall financial condition without any consideration of the specifics of the challenged rate itself is contrary to the entire scheme of rate regulation set up under the statute.

The rate regulation regime and the competitive access rules set up by Congress are limited by statute to *individual* instances of market power abuse (or anticompetitive conduct). For example, the maximum rate scheme of Staggers and ICCTA requires the Board to focus both its market dominance and rate reasonableness inquiries on the specific "transportation to which a rate applies."[72] Section 10701(d)(1) requires the Board to make a finding of market dominance with regard to "the transportation to which a *particular rate* applies" and sets forth factors that are specific to traffic particular to the rate at issue.[73] Likewise, section 10707(a) defines "market dominance" as "an absence of effective competition from other rail carriers or modes of transportation for the transportation to which *a rate* applies," and describes a rate reasonableness challenge as a challenge to "*a rate* for transportation by a rail carrier providing transportation subject to the jurisdiction of the Board."[74]

Accordingly, the statutory scheme of rate regulation administered by the Board is a far cry from traditional utility-style rate of return regulation. Indeed, it has long been recognized that railroads could not survive under traditional rate of return

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[70] *See* 49 U.S.C. § 10704.

[71] *Id.*

[72] 49 U.S.C. §§ 10701(d)(1), 10707(a).

[73] 49 U.S.C. § 10701(d)(1) (emphasis added).

[74] 49 U.S.C. § 10707(a) (emphasis added).

regulation, where the overall revenues earned by a firm are regulated to ensure a reasonable level of profits on the regulated business. Even before the Staggers Act, the ICC did not apply public-utility style rate of return regulation to assess the reasonableness of rates. As the Third Circuit noted in addressing shippers' challenges to the ICC's adoption of CMP in *Coal Rates Guidelines*, prior to the 4R and Staggers Acts, "[r]ailroad rate regulation was not like traditional public utility rate regulation because of the ICC's inability to guarantee that the carrier obtained business." *Consolidated Rail Corp. v. United States*, 812 F.2d 1444, 1453 (3d Cir. 1987); *see Bessemer & Lake Erie v. ICC*, 691 F.2d 1104, 1113-14 (3d Cir. 1982) ("Railroad regulation by the ICC[] is not … classic public utility regulation. For the most part railroads operate in a competitive environment. It is true that under the 4R and Staggers Acts they are subject to regulation of rates for market dominant traffic. They are not, however, assured of a compensable rate of return even on the investment required to serve that traffic.").

Nowhere does the statute authorize the Board to take any kind of active role in limiting railroad earnings or rates absent a rate reasonableness challenge (or under the competitive access rules with regard to routes). In fact, Congress contemplated only a single substantive consequence for attaining revenue adequacy. In the Staggers Act, Congress included a provision that set forth three "zones" of rate flexibility, which the ICC could not suspend or investigate on its own initiative. *See* 49 U.S.C. § 10707a. The first zone was for inflationary increases and was available to all carriers. The second zone was a further 6% increase over inflation until 1984, again available to all carriers. The third zone was 4% increase over inflation after 1984, but only for revenue inadequate carriers.

Importantly, the statute made it clear that rate increases exceeding the amounts authorized by the three zones of rate flexibility could not be presumed unreasonable. *See* 49 U.S.C. § 10707a(g) (1982). Congress therefore plainly contemplated that revenue adequate carriers would be allowed to become more revenue adequate, when it

authorized those carriers to raise rates 6% above inflation. It did not outlaw earning returns above the revenue adequacy threshold; rather, Congress subjected those rate increases to individual rate reasonableness challenges brought by shippers under the agency's prevailing rate reasonableness standards. (The zones of rate flexibility were removed by Congress in ICCTA as superfluous in light of the removal of STB authority to suspend or investigate rates on its own initiative.) The only consequence in the Staggers Act for attaining revenue adequacy was thus the inability to take advantage of the third zone of rate flexibility. The absence of any other regulatory consequences tied to attaining revenue adequacy is powerful evidence that Congress intended no such additional consequences.

In sum, evidence of congressional commitment to a market-based framework is pervasive in the statutory provisions. For example, the national rail policy expressed in the statute repeatedly emphasizes the importance of allowing market forces to function without pervasive regulatory intervention: "[C]ompetition and the demand for services" are to govern rates "to the maximum extent possible." 49 U.S.C. § 10101(1). The regulatory regime is required to "minimize the need for Federal regulatory control over the rail transportation system." *Id.* § 10101(2). Regulating system-wide earnings in any fashion is the polar opposite of "minimizing" Federal regulatory control; there is no kind of regulatory control more controlling and stifling than traditional utility-style earnings constraints.

3. The legislative history of Staggers and 4R Act confirms that Congress did not envision any constraint on system-wide revenues.

The idea of twisting the revenue adequacy goal into a constraint on railroad earnings is unsupported not only by the statutory text but also the history of the Staggers Act (and the 4R Act before it). The statutory goal of revenue adequacy first appeared in the 4R Act, which was a response to the financial erosion of the railroad

industry and widespread concern that the railroad industry would not survive without a fundamental change to the regulatory scheme. The 4R Act was essentially deregulatory and allowed railroads to act more as competitive firms with greater commercial freedom to act in response to market forces. *See* 49 U.S.C. § 15a(4) (1976). As Congress explained:

> It is the purpose of the Congress in this Act to provide the means to rehabilitate and maintain the physical facilities, improve the operations and structure, and restore the financial stability of the railways system of the United States, and to promote the revitalization of such railway system, so that this mode of transportation will remain viable in the private sector of the economy and will be able to provide energy-efficient, ecologically compatible transportation services with greater efficiency, effectiveness, and economy….[75]

The revenue adequacy provisions in the 4R Act were central to Congress's objective to promote the financial health of the railroad industry. The 4R Act specified that a revenue adequate railroad would be one with revenues sufficient to "(a) provide a flow of net income plus depreciation adequate to support prudent capital outlays, assure the repayment of a reasonable level of debt, permit the raising of needed equity capital, and cover the effects of inflation, and (b) ensure retention and attraction of capital in amounts adequate to provide a sound transportation system in the United States."[76] Moreover, the 4R Act directed the agency to "make an adequate and *continuing* effort to assist … carriers in attaining [revenue adequacy.]"[77]

Four years later, unhappy that the ICC was not doing enough to promote revenue adequacy, Congress went further to reinforce its deregulatory stance with

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[75] 45 U.S.C. § 801(a) (1976).

[76] 49 C.F.R. § 15(a)(4) (1976).

[77] 49 C.F.R. § 15(a)(4) (1976) (emphasis added).

regard to the railroad industry and enacted the Staggers Act.[78] In the Staggers Act, Congress reiterated the ideal and goal of long-term revenue adequacy, expressing that its purpose was "freedom from unnecessary regulation" and "the opportunity for railroads to obtain adequate earnings to restore, maintain and improve their physical facilities while achieving the financial stability of the national rail system."[79] Nowhere in the Staggers Act is there any authorization for the Board to begin regulating railroad rates, earnings, or routes based on achievement of firm-wide revenue adequacy.

The underlying through-line in the 4R Act, Staggers Act, and ICCTA was to replace regulation with market forces so that freight railroads would be free to adapt and respond to market conditions using competitive market practices. Congress correctly anticipated that embracing sound regulation that relied on normal market forces would give freight railroads a reasonable opportunity to become financially sound.[80] Along with the carefully crafted provisions allowing for rate reasonableness challenges and competitive access rules, shippers would be, at the same time, adequately protected from any instances of abuse of market power.

4. Agency and federal court precedent confirm that Congress did not intend the agency to regulate system-wide revenues.

Plentiful agency and judicial precedent supports the proposition that Congress never intended the agency to treat revenue adequacy as a problem needing a regulatory solution, but, rather, revenue adequacy is the *minimum* level of financial soundness for

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[78] *See* H.R. Rep. No. 96-1035, at 54 (1980), *as reprinted in* 1980 U.S.C.C.A.N. 3978, 3999 ("[p]revious admonitions by the Congress that the Commission assist carriers in earning adequate revenue levels . . . have not achieved their goals.").

[79] H.R. Rep. No. 96-1430, at 80 (1980), *as reprinted in* 1980 U.S.C.C.A.N. 4110, 4111; *see* 49 U.S.C. § 10704(a)(2), (4) (1982).

[80] *See* Opening Comments of The Association of American Railroads, EP 722, Verified Statement of Emil H. Frankel, at 5-6 (filed Sep. 5, 2014); Opening Comments of The Association of American Railroads, EP 722, Verified Statement of Joseph P. Kalt, at 3, 6-16 (filed Sep. 5, 2014).

the railroad industry. For example, in 1979, the ICC explained that its study of railroad revenue adequacy "was designed to compute a *minimum* adequate revenue level for the Nation's class I railroads; the methodology … is not necessarily appropriate for the determination of the maximum fair revenue issues involved in individual rate proceedings."[81] Likewise, in 1981, when the ICC adopted the current standard for its annual revenue adequacy measurement, the ICC properly concluded that earning a rate of return equal to its cost of capital was "the *minimum* necessary to attract and maintain capital in the railroad, or any other, industry …. If a firm is unable to earn the cost of capital, investors will be unwilling to supply capital to it."[82]

The Third Circuit similarly made it clear that the revenue adequacy provisions in the statute were not intended as a limitation on revenues. *Bessemer*, 691 F.2d at 1110-12. The Third Circuit explained that earning an ROI equal to the cost of capital is "widely agreed to be the minimum necessary to attract and maintain capital in the railroad, or any other, industry." *Id.* at 1110. Moreover, the Third Circuit accepted the ICC's view that the revenue adequacy provisions in the statute are "addressed to the *opportunity* to attain revenue levels which would reverse the long decline in the railroad industry. The

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[81] Ex Parte No. 353, *Adequacy of Railroad Revenue – 1978 Determination*, 362 I.C.C. 199, 201 (1979) (emphasis in original); *see also Standards for Railroad Revenue Adequacy*, 364 I.C.C. 803, 810 (1981) ("The *minimum* rate of return that will allow railroads to obtain investment funds is the cost of capital.") (emphasis added) ("*Standards I*"); *Railroad Revenue Adequacy – 1988 Determination*, 6 I.C.C.2d 933, 940 (1990) ("[W]e use the current cost of capital standard, which represents the *minimum* return necessary to attract and maintain capital in the railroad, or any other, industry.") (emphasis added); *Procedures to Calculate Interest Rates*, 9 I.C.C.2d 528, 532-33 (1993) ("[A]ny industry, including the railroad industry, must earn a rate of return *at least* equal to its own cost of capital in order to remain viable over the long run.") (emphasis added); *see also* Ex Parte No. 347 (Sub-No. 1), *Coal Rate Guidelines, Nationwide—Notice of Proposed Rulemaking*, slip op. at 7 (served Feb. 8, 1983) ("[R]ailroads can obtain funds for investment only by offering rates of return comparable to other investment opportunities. Investments earning less than the cost of capital will not be able to retain existing funding or obtain new funding, because investors could invest available funds elsewhere at a higher rate of return.")

[82] *Standards I*, 364 I.C.C. at 809 (emphasis added).

specific objectives listed in section 205 [the revenue adequacy definition] *should not in [the ICC's] view be read as limitations on revenue . . . .*" *Id.* at 1112 (emphasis in original).[83]

And more recently, the D.C. Circuit confirmed that system-wide revenue needs provide "no guidance" as to the reasonableness of a particular rate. *BNSF Ry. Co. v. Surface Transp. Bd.*, 453 F.3d 473, 481 (D.C. Cir 2006).[84] For the appeal of the *Xcel* decision, the Board argued that system-wide revenue adequacy metrics were irrelevant to the reasonableness of a particular rate. The D.C. Circuit agreed:

> As the Board points out, the RSAM figure merely provides a test of "system-wide revenue need" and therefore "provides no guidance on the rates Xcel should be charged for the particular facilities and services Xcel uses." In contrast, the Board has "consistently affirmed that CMP, with its SAC constraint, is the preferred and most accurate procedure available for determining the reasonableness of rates in markets where the rail carrier enjoys market dominance."[85]

If revenue inadequacy cannot protect a carrier against a SAC determination of unreasonableness, a railroad should not be punished if the rate is lawful under that SAC test, but the carrier is revenue adequate on a system-wide basis.

In a similar vein, this agency has recognized that "Congress directed [in the Staggers Act] that railroads be treated more like ordinary businesses than like public utilities." *Groome & Associates, Inc. v. Greenville Cty. Economic Develop. Corp.*, STB Docket No. 42087, at 12 (served July 27, 2005). It follows that a public utility style of rate of return regulation is not appropriate for the railroad industry.[86] Indeed, shortly after the

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[83] The court further noted that the shippers "ignore[] the distinction in the statute between revenue adequacy proceedings and rate reasonableness proceedings." *Bessemer*, 691 F.2d at 1113.

[84] This was the appeal of *Pub. Serv. Co. of Col. d/b/a Xcel Energy v. BNSF*, STB Docket No. 42057 (STB served June 8, 2004), *modified on reconsideration, Pub. Serv. Co. of Col. d/b/a Xcel Energy v. BNSF*, STB Docket No. 42057 (STB served Jan. 19, 2005) ("*Xcel*").

[85] *BNSF Ry. Co. v. Surface Transp. Bd.*, 453 F.3d 473, 481 (2006) (citation omitted).

[86] *See, e.g.*, *Study of Interstate Commerce Commission Regulatory Responsibilities Pursuant to Section 201(a) of the Trucking Industry Regulatory Reform Act of 1994*, 1994 MCC LEXIS 104, *275-76 (1994)

Staggers Act was passed, the ICC correctly explained that "*[t]he Commission does not regulate the overall rate of return for railroads*. Carriers retain the benefits derived from increased efficiency and market share." *Ark. Power & Light Co. – Petition to Institute Rulemaking Proceeding – Implementation of Long-Cannon Amendment to the Staggers Rail Act*, Docket No. 38754, 365 I.C.C. 983, 989 (1982) (emphasis added).

C. The STB should reject the "Revenue Adequacy Constraint" in *Coal Rate Guidelines* because it violates the statute, sound economics, and agency precedent.

With the passage of the Staggers Act, therefore, three facts were clear: (1) the ICC was not to regulate the overall rate of return for railroads; (2) earning returns on investment equal to the industry cost of capital was the *minimum* goal for railroad revenue levels;[87] and (3) Congress had deliberately moved away from a burdensome public utility model of regulation for the railroad industry. Yet in 1985, the ICC announced the creation of the revenue adequacy constraint with the unsupported proclamation that the "revenue adequacy standard represents a reasonable level of profitability for a healthy carrier. It fairly rewards the rail company's investors and assures shippers that the carrier will be able to meet their service needs for the long term. Carriers do not need greater revenues than this standard permits, and we believe that, in a regulated setting, they are not entitled to any higher revenues. Therefore, the logical first constraint on a carrier's pricing is that its rates not be designed to earn

("In enacting the Staggers Act, Congress concluded that unnecessarily burdensome and rigid utility-style regulation have prevented the railroads from responding to changing market conditions, as other businesses could, and taking actions that could help them to recover their costs and earn adequate revenues. The Staggers Act was intended to loosen this tight regulatory grip….").

[87] Professor Kalt explains that at the time the ICC defined "revenue adequacy" as earning a return on investment ("ROI") at least equal to the industry cost of capital ("COC"), "there was very little rigorous economic analysis of whether such a measure was a robust and meaningful basis for guiding policymakers' regulatory decisions and frameworks" due to the "state of the rail industry at the time this metric was developed." Kalt V.S. ¶¶ 36-37.

greater revenues than needed to achieve and maintain this 'revenue adequacy' level." *Coal Rate Guidelines, Nationwide*, 1 I.C.C.2d 520, 535 (1985). This declaration by the ICC came out of the blue and was untethered from the statute, prior precedent,[88] sound economic concepts, or the support of commentators, including shippers and the U.S. Department of Transportation.

Indeed, the surprising statement cannot be squared with the ICC's Notice of Proposed Rulemaking (NPRM) in that very proceeding. The NPRM reflected the view that attainment of revenue adequacy could be the occasion for heightened scrutiny of rail rates challenged by shippers, but that revenue adequacy was not a rate reasonableness standard.[89] In others words the ICC was simply proposing to look carefully at *individual rates* if it observed accounting ROIs substantially above the cost of capital over a long period of time. Specifically, the ICC explained that "[o]ur regulatory task is to determine the reasonableness of only those rates which are set in an essentially non-competitive market environment. We must develop a means to assure that the rate assessed on this traffic properly reflects the high demand for the service, but is not set at an unreasonably high or 'monopoly' level."[90] The ICC therefore expressed a concern over individual rates charged by revenue adequate railroads only if it witnessed a consistent pattern of returns "substantially" in excess of a carrier's revenue needs.[91]

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[88] *See, e.g.*, Ex Parte No. 347 (Sub-No. 1), *Coal Rate Guidelines, Nationwide—Notice of Proposed Rulemaking*, slip op. at 16 (served Feb. 8, 1983) ("[W]here a consistent pattern of returns substantially in excess of [a] carrier's revenue needs has been established, we would, *upon complaint*, consider the reasonableness of rates on *captive* coal traffic and prescribe lower rates in *appropriate circumstances*." (emphasis added)); *id.* at 15 ("[O]nce revenue adequacy is achieved, we must scrutinize the rates more closely … [H]owever, this does not mean that further rate increases on captive coal traffic would be unreasonable *per se* once a carrier attains revenue adequacy.").

[89] *Id.* slip op. at 14-15.

[90] *Id.*, slip op. at 9 (note omitted).

[91] *Id.*, slip op. at 16 ("[W]here a consistent pattern of returns substantially in excess of a carrier's revenue needs has been established, we would, upon complaint, consider the reasonableness of rates on captive coal traffic and prescribe lower rates in appropriate circumstances.").

Indeed, the parties that commented in *Coal Rate Guidelines* generally supported the view expressed in the NPRM that revenue adequacy was not intended to be a firm-wide constraint on revenues but rather should be used only as a basis for taking a harder look at the reasonableness of a particular rate. Notably, the Department of Transportation ("DOT") submitted extensive comments on the ICC's proposed rule. On the issue of the role of revenue adequacy, DOT agreed with the idea of applying closer scrutiny to rates after the ICC determines a railroad is earning adequate revenues, but it expressly stated that it did "not advocate limiting railroads to the revenue adequacy level, by requiring rate reductions or new rates that hold total earnings at the level established as the minimum required to sustain operations."[92] DOT explained that such an inflexible approach "would require regulatory intervention beyond that envisioned or *even authorized* by the Staggers Act."[93]

In other words, the NPRM in 1983 set forth sound legal and economic ideas that were contradicted in the final revenue adequacy constraint described in *Coal Rate Guidelines*. There is no reason for the Board to now implement such a faulty, contradictory, unsupported concept that has never been applied to the rail industry.

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In sum, the STB should reject the misguided notion that system-wide revenue adequacy is a problem that demands a regulatory solution. A firm-wide constraint on revenues is not consistent with the statute, precedent, or sound regulatory policy. The diminished investment and distorted commercial actions caused by earnings regulation will lead unavoidably to a gradual reduction in the scope and robustness of the rail network over time and a decline in the quality of rail service. Indeed, the 2015 report, Modernizing Freight Rail Regulation (MFRR), published by the TRB, dismissed the idea

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

[93] *Id*. at 34 (emphasis added).

of a revenue adequacy constraint as "anachronistic," "misguided," "lack[ing] an economic foundation," and "at odds with the deregulatory thrust of the Staggers Rail Act reforms."[94]

The AAR agrees. Congress plainly did not intend for the ICC to twist the stated goal of the Staggers Act—to transform a failing industry into one that is revenue adequate—into an unauthorized directive to treat the attainment of that goal as a green light for heavy-handed earnings constraints. As the TRB put it, such regulation "has never been used to regulate railroads and would be at odds with the Staggers Rail Act, a central policy of which is to minimize the need for federal regulatory control."[95] The STB should end the misperception created by the ICC that the agency can or would adopt regulations to curtail firm-wide earnings, and should forsake the concept of a "Revenue Adequacy Constraint" as ill-advised and unauthorized.

III. THE SUGGESTED DEFINITION OF LONG-TERM REVENUE ADEQUACY IS ARBITRARY AND DISTORTED BY MEASUREMENT ERRORS.

A. The definition of long-term revenue adequacy is arbitrary.

The Task Force suggests a possible definition of long-term revenue adequacy for the purpose of "rate relief … under the revenue adequacy constraint announced in *Coal Rate Guidelines*."[96] The Task Force acknowledged that the one-year snapshot used for the Board's annual revenue adequacy determination is not sufficient to determine long-term revenue adequacy.[97] Instead, the Task Force suggests that "the Board measure long-term revenue adequacy over the length of an entire business cycle," which it specifically defines as "the shortest period of time, not less than five years, that includes

[94] MFRR Report at 28, 100, 101, 125.

[95] *Id.*

[96] RRTF Report at 33.

[97] *Id.*

both a year in which a recession began and a year that follows a year in which a recession began."[98]

The Task Force's suggestion, while on the right track in recognizing that financial health must be looked at over an appropriate time period, is inherently arbitrary and is not based on sound economic principles.[99] Specifically, the time period is an unexplained departure from *Major Issues*, where the Board found that a 10-year period was needed to cover a business cycle.[100]

"Given fluctuations in demand and the long-life of rail assets," explains Professor Kalt, the Task Force's suggestion "is likely to be too short to reflect the economic circumstances relevant to the decisions to continue to invest capital or withdraw capital from the industry" because "the five-year period is likely to lead to jumps in measured revenue adequacy that are not reflective of the current, or forward-looking condition of the rail industry."[101] Professor Kalt instead recommends a *minimum* of ten years, inclusive of a full recession, in conjunction with a replacement-cost standard for asset valuation, discussed more in the next section.[102]

Moreover, the appropriate time period for determining long-term revenue adequacy should be tailored to fit the purpose for which the Board is using the finding. Professor Kalt explains that "some flexibility is required for interpreting and applying the results of any long-term revenue adequacy calculation. Depending on the purpose to which the revenue adequacy measure is to be put, a demonstration that the current and near-term economic circumstances have changed substantially from that indicated

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[98] *Id.*

[99] Kalt V.S. ¶¶ 48-54.

[100] *Major Issues in Rail Rate Cases*, STB Ex Parte No. 657 (Sub-No. 1), at 62-66 (served Oct. 30, 2006) ("*Major Issues*").

[101] Kalt V.S. ¶ 53.

[102] *Id.*

by the long-term measure may be required."[103] For example, if used solely to monitor the health of the industry, as the statute prescribes, the Board could rely on a fixed 10-year period, which should be sufficient to cover an average business cycle. However, if the Board had the authority to use the long-term revenue adequacy determination as a basis for rate regulation, which it does not, a fixed 10-year period, much less the potentially short time period suggested by the Task Force, would be insufficient.

Here the agency need not determine what longer time period would be appropriate for purposes of rate regulation. Professor Kalt explains that it is "clear that blunt accounting-based ROI measures, even if measured over the long-term, do not provide regulators with sufficient information to determine whether improvements are being driven by purely accounting conventions, by pro-competitive behavior (that is desirable and requires no regulatory intervention), or by exercise of market power somewhere in a carrier's system (which could warrant a regulatory response)."[104] In other words, even a long-term revenue adequate measurement will not provide a basis for the targeted rate regulation appropriate for the railroad industry.

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[103] *Id.* ¶ 54 ("For example, sudden large and sustained shifts in demand, due to, for example, recession, changes in coal or crude-by-rail or other competitive forces due to technological change—such as widespread adoption of autonomous trucking, could make the long-term revenue adequacy a misleading measure of current and near-term conditions. Then, too, vacillations in the interest rate policies of the Federal Reserve can directly affect the cost of capital in the revenue adequacy calculation, and indirectly – albeit, powerfully – affect macroeconomic movements in the economy. To the extent the revenue adequacy measure serves as a trigger for more intrusive regulation, rather than a gauge of the financial status of the industry, then I recommend that the applicability of a finding of long-term revenue adequacy be rebuttable based on substantial changes in conditions relative to the calculation period.").

[104] *Id.* ¶ 77.

B. The Board's method of calculating revenue adequacy results in a distorted and inaccurate picture of railroad revenue adequacy.

If the STB is going to make data-driven decisions, then the data supporting those decisions must be as accurate as possible. Here, the Board's method of calculating revenue adequacy is laden with measurement errors that result in a distorted and inaccurate picture of railroad revenue adequacy. The data problems are twofold: the use of book values and the treatment of deferred taxes.

The Board currently calculates railroad ROI for purposes of determining revenue adequacy by using the book value of railroad assets, rather than replacement value. This is despite the fact that both the ICC and the Board have repeatedly acknowledged that the preferred way to value the assets of a firm for purposes of assessing the adequacy of the firm's revenues is the replacement cost of the assets.[105] As Professor Kalt has explained, *accounting* rates of return are not probative of whether a railroad is actually earning an *economic* rate of return that exceeds its cost of capital, much less any kind of anticompetitive conduct or exercise of market power as a source of returns in excess of the cost of capital.[106] Especially with the kind of durable and long-lived capital found in the rail industry, non-economic accounting measures of depreciated original book costs readily yield economically nonsensical conclusions as to the adequacy of

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[105] *Standards I*, 364 I.C.C. at 820 ("While we perceive some difficulty in implementing a replacement cost valuation method, we believe that it is conceptually the best method available."); *Standards for Railroad Revenue Adequacy*, 3 I.C.C.2d 261, 277 (1986) ("*Standards II*") ("While current cost accounting [*i.e.*, current replacement cost of assets] is theoretically preferable to original cost valuation, it cannot be practically implemented in a manner that we can be confident would produce accurate and reliable results.").

[106] Opening Comments of The Association of American Railroads, EP 722, Verified Statement of Joseph P. Kalt, at 4, 30-31 (filed Sep. 5, 2014); *see* F. Fisher & J. McGowan, *On the Misuses of Accounting Rates of Return to Infer Monopoly Profits*, 73 AM. ECON. REVIEW 82, 90 (1983) ("[T]here is no way in which one can look at accounting rates of return and infer anything about relative economic profitability or, a fortiori, about the presence or absence of monopoly profits"); Kalt V.S. ¶ 39 ("It is important to note that even properly conceived measures of revenue adequacy do not provide sufficient evidence on which to base a finding of anticompetitive conduct or the exercise of market power.").

revenues and returns. For example, using book value overstates railroad ROIs (and thus revenue adequacy).[107] Professor Kalt has also explained that the Board's difficulty in using current replacement cost as a measure "cannot justify the use of economically incoherent rates of return on depreciated historical book value to determine whether a railroad is realizing 'excess revenues.'"[108]

Another problematic measurement error relates to the Board's treatment of deferred taxes. The ICC's treatment of deferred taxes has swayed back and forth.[109] The Commission eventually settled on the so-called "Utility Method," where accumulated deferred taxes are excluded from the investment base.[110] Even though the D.C. Circuit, reviewing the ICC's decision, believed that the Utility Method created a powerful disincentive for investment in the railroad industry, it felt compelled to reject the railroads' challenge due to the deferential scope of its review.[111]

Excluding deferred taxes from the investment base makes no economic sense. Because deferred taxes are a source of funds that railroads use to invest in its assets, *i.e.*, a source of capital that may be reinvested, it makes sense to treat deferred taxes as any other source of capital rather than remove it from the investment base. A group of

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[107] Opening Comments of The Association of American Railroads, EP 722, Verified Statement Roger Brinner, at 14-26 (filed Sep. 5, 2014). As Dr. Brinner explains, book value is based on the historic cost of assets carried on a firm's books as opposed to the current cost of assets.

[108] Opening Comments of The Association of American Railroads, EP 722, Verified Statement of Joseph P. Kalt, at 31 (filed Sep. 5, 2014); *see also* Kalt V.S. ¶¶ 34-47

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

[110] *See Standards II*, at 271.

[111] *Consolidated Rail Corp. v. United States*, 855 F.2d 78 (D.C. Cir. 1988); *see id.* at 90 ("Given the competition between the railroads and unregulated firms for capital, the railroads are substantially disadvantaged by being deprived of the opportunity to earn a return on the funds in comparison to the unregulated firms, and therefore the incentive to all investors, including the railroads, is to invest in the unregulated firms where the advantage of the 'double benefit' is retained.").

leading economists urged the ICC back in 1985 to take this very stance and measure revenue adequacy as "a rate of return equal to the current cost of capital on the replacement value of all rail assets that are required to meet the demands for railroad service, *regardless of the source of funds used in investing in those assets*."[112] The appropriate standard does not therefore depend on the source of the funds used to make investments. Whether the source is debt financing, equity financing, returns from existing traffic, or tax benefits bestowed by Congress, the standard (according to some of the world's most prominent economists) should be the same: a rate of return equal to the current cost of capital on the replacement value of all rail assets required to meet the demand for railroad service.

Professor Kalt concurs. He explains that the Board's current practice "in effect assumes that investors expect no return on assets 'financed' by deferred taxes. But such an assumption provides no incentive to the investors to keep those assets deployed in the rail industry. They have the incentive to, and would be better off, re-deploying that capital in industries where they could earn their cost of capital. It is therefore rational that investors do expect to earn a return on deferred taxes and such expectations are reflected in the market-based determinations of the cost of equity used by the STB. Therefore, the STB's exclusion of deferred taxes overstates the attractiveness of railroad industry investments."[113]

Moreover, the Board's treatment of deferred taxes creates worrisome practical problems. As the Board experienced in 2017, changes to corporate taxes rates can produce ridiculous measurements of financial health. If the Board had not wisely acted, its 2017 figures would have suggested a one-year phantom surge in railroad profitability, as the net operating incomes would be inflated to reflect the change in

[112] Opening Comments of Norfolk Southern Railway Company, EP 722, Attachment A (Economists' Statement in Support of Staggers Act (Feb. 25, 1985) (emphasis added).

[113] Kalt V.S. ¶ 68.

accumulated deferred taxes. This is unlikely to be the last time the Board will have to manually adjust its ROI calculation. While the corporate tax rate was stable for years, one can anticipate the rate changing in future administrations, leaving the Board's revenue adequacy measurement at the mercy of changes in future corporate tax rates. The agency's manual adjustment of the ROI calculation went largely unchallenged and unnoticed *this time*. It will not be so easy next time, if the ROI calculations are tied to meaningful changes in rate regulation.

These measurement errors should be addressed by the Board. However, even if the Board fixes these measurement errors, revenue adequacy cannot be used as a basis to impose a rate freeze or earnings cap on the freight rail industry.

IV. THE CONCEPT OF A "RATE INCREASE CONSTRAINT" IS UNLAWFUL AND FLAWED.

The Task Force proposes a "rate increase constraint (RIC) applicable to carriers that are long-term revenue adequate."[114] Under RIC, "[f]or shippers whose rates exceed the RIC, carriers would be forbidden from raising non-contract, non-exempt rates by more than the rate of inflation (as measured by RCAF-U)."[115] The RIC "threshold level would vary based on the category of transportation …, and would rise and fall each year as the carrier's revenue above the long-term revenue adequacy threshold rises or falls."[116] The first step in identifying the RIC is to determine the "average annual real surplus," that "would then be allocated to a defined set of commodity-service characteristic combinations based on that category's share of total revenues with R/VCs exceeding 180%."[117] Finally, after "allocating the average annual real surplus among the

[114] RRTF Report at 36.

[115] *Id.*

[116] *Id.* at 36-37.

[117] *Id.* at 37.

various categories," a "process similar to the Maximum Markup Methodology" would be applied, "reducing each category's R/VC ratio until … the surplus assigned to that category" is exhausted.[118] "The resulting figures, calculated for each category, would be the RIC level."[119] The Task Force concluded that this "constraint would only be enforced: (a) on complaint, (b) if the railroad is found to be market dominant, and (c) if the issue movement is non-exempt and non-contract."[120]

A. The RIC concept is unlawful.

The governing statute does not permit the Board to impose rate freezes based on system-wide earnings. The Board must make a fact-specific finding that the *individual* rate at issue is unreasonable. This is not only the law—it makes sense, because "the source of returns in excess of adequate levels … may arise from a variety of sources," not only "differential pricing of dominant routes."[121]

Furthermore, the requirement in the statute that rates must be challenged individually is a specific implementation of Congress's intent that shippers be protected from actual, proven abuses of market power, while railroads are otherwise free to set rates in response to market forces.[122] In contrast, RIC presumes rates to be unlawful and subject to STB-prescribed constraints without looking at the particular characteristics of the movement in question, including facilities used to handle the issue traffic. It fails to address the many reasons a railroad may be charging a certain rate to a certain customer for a certain shipment—all of which is taken together and considered in a rate

[118] *Id.*

[119] *Id.*

[120] *Id.* (footnote omitted).

[121] Macher *et al.*, 41 Transp. L.J., at 123.

[122] *See* 49 U.S.C. §§ 10701(c), 10704, 10705(a)(2), 10707.

reasonableness case. The RIC does away with all of this in favor of an imprecise blunt stick that has no correlation to any problematic activity by railroads.

Perhaps most compelling, as previously noted, Congress expressly addressed rate increases in the Staggers Act. Congress created a specific "zone" of rate flexibility to permit carrier to raise rates to cover inflation. *But rate increases outside these zones by revenue adequate carriers could not be presumed unreasonable. See* 49 U.S.C. § 10707a(g) (1982). Congress created this provision "as a procedural mechanism for carriers to change rates without undue regulatory interference. The Conferees believe that the best regulator is the marketplace, and the forces of competition will restrain railroad rates more effectively than federal regulation." H.R. REPORT NO. 96-1430, at 93 (1980) (Conf. Rep.) Accordingly, Congress was emphatic that the ICC could not infer a rate was unreasonable simply because it exceeded an inflationary increase, even for revenue adequate carriers. *Id.* at 94 ("The Conference substitute states unequivocally that a rate increase beyond the zone establishes no presumption of market dominance or reasonableness.").

While the zones of rate flexibility were removed in ICCTA, there is no evidence Congress intended to permit the STB to create zones of rate freezes prohibited under the Staggers Act. Congress explained that "obsolete or unnecessary ICC regulatory functions would be repealed," and ICCTA "significantly reduces regulation of surface transportation industries in this country." S. REP. NO. 104-176, at 1-2 (1995). Congress therefore sorted "through the panoply of laws currently administered by the ICC and repeal[ed] or modernize[d] those that ha[d] become outdated." *Id.* at 2. With regard to the zone of rate flexibility, it was removed "because it has outlived its usefulness." *Id.* at 32. Overall, ICCTA "continue[d] the deregulation theme of the past 15 years by providing further regulatory reductions in the surface transportation industries" and "preserve[d] the careful balance put in place by the 4R Act and the Staggers Act that led to a dramatic revitalization of the rail industry…." *Id.* at 5, 6.

The RIC concept would resurrect the first zone of rate flexibility from Staggers, but with an unlawful twist. It would permit a carrier to raise its rate to cover inflation, subject to a shipper challenge under other rate reasonableness methodologies. So too did Congress in 1980. *See* 49 U.S.C. § 10707a(b). RIC would then go further. It would prohibit any increase above that inflationary level for any rate that exceeded the RIC threshold. But Congress's prior directive not to presume unlawful rate increases by revenue adequate carriers is an insurmountable obstacle to the RIC concept.

Finally, the ICC well understood the evils of rate freezes, having lived through the failed national experiment. It observed that to achieve revenue adequacy, "maximum rates on market dominant traffic, in general, should be permitted to increase to the extent necessary for a carrier to achieve revenue adequacy. . . . [H]owever, this does not mean that further rate increases on captive coal traffic would be unreasonable *per se* once a carrier attains revenue adequacy."[123] "Such an approach," the ICC explained, "would be economically unsound, as it would create disincentives to optimal marketing pricing."[124] Moreover, "[a] rigidly applied revenue adequacy constraint would have many practical problems."[125] RIC would resurrect precisely the kind of rate freeze the ICC concluded would be "economically unsound," would create "disincentives to optimal market pricing," and would raise "many practical problems."

B. Rate freezes are poor public policy that would result in a myriad of negative consequences.

The negative consequences that would result from the RIC abound. First, the RIC would bring with it all of the traditional problems associated with a rate freeze, including distorting market signals by preventing timely price adjustments based upon

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[123] Ex Parte No. 347 (Sub-No. 1), *Coal Rate Guidelines, Nationwide—Notice of Proposed Rulemaking*, slip op. at 15 (served Feb. 8, 1983).

[124] *Id.*, slip op. at 19.

[125] *Id.*

consumer demand. Shortages would result since the rail industry would be prevented from anticipating changing market demands. Professor Kalt points out that the effects of RIC would include, among others, "disincentives to engage in cost-minimizing behavior," "[p]erverse incentives for pricing 'competitive' traffic," and "[i]ncentives to reduce quality of service or to focus investments or activities for service on those traffic segments that are not constrained by RIC."[126]

Prices are vital to the efficient allocation of resources toward the satisfaction of consumers' needs. As Professor Kalt explains, "[t]hey are the critical signals which impact choices of product and service offerings and which determine the nature and level of capital investment and ownership structures."[127] Rising prices are the market's way of signaling unsatisfied demand and inducing additional investment in a given sector. RIC will "prevent prices from adjusting beyond a government-set price and therefore send distorted signals to the market, hiding the unmet demand and failing to induce investment that would benefit consumers."[128]

For proof of these bedrock economic principles, the Board can examine the natural gas and gasoline price control policies of the 1970s and post-war rent control in New York City for the distortive and destructive effects of price regulation that fails to mimic competitive outcomes. As Professor Kalt reminds us, "[g]asoline lines and shortages of natural gas in periods of peak demand (i.e., the dead of winter) were the direct products of Nixon-era and subsequent price controls that purportedly were intended to protect consumers by trying to override the workings of competitive market supply and demand. The associated political disasters they created ultimately forced

[126] Kalt V.S. ¶ 103.

[127] *Id.* ¶ 93.

[128] *Id.*

their abandonment."[129] There is no need for the STB to recreate those economic and political disasters.

Second, the RIC would violate the agency's longstanding policy that it will not create unfair cross-subsidies by regulatory action (*i.e.*, a customer should pay for the facilities it uses and not shift those costs to another customer).[130] A cross-subsidy is particularly likely for movements on lower density portions of revenue adequate railroads. Shippers benefiting from such moves should be contributing to the joint fixed costs of the assets they utilize. Yet the RIC would unfairly constrain such shippers' rates at inflation-based increases, pushing the cost of such movements to other shippers that should not have to bear those costs.

The cross-subsidies will result not only due to the particularities of density, but also from distorting inter-temporal effects. The RIC in 2020 would be a function of revenues earned on traffic from years earlier. An increase in chemical rates today may be found unlawful based on the level of revenue from coal traffic from a decade ago. As a result, the rate freezes will create cross-subsidies across time.

For example, a railroad that was revenue adequate in all of the years except for the current year could have a rate freeze applied in a year when the railroad is not in fact revenue adequate. In this way, at the very time at which a railroad needs additional revenues to cover its costs, it could be subject to a rate freeze because in prior years it experienced a surplus. That outcome would make no sense.

Third, the RIC will result in perverse incentives that will inspire inefficiencies and bloat. For example, if a railroad knows it is subject to a rate freeze on a large amount of traffic on a particular route, the incentive to invest or make improvements to

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[129] *Id.* ¶ 94.

[130] *See Otter Tail Power Co. v. BNSF Railway Co.*, STB Docket No. NOR 42071 (served Jan. 27, 2006), *aff'd*, 484 F.3d 959 (8th Cir. 2007); *PPL Montana, LLC v. Burlington Northern & Santa Fe Railway*, 6 S.T.B. 286 (2003), *aff'd*, 437 F.3d 1240 (D.C. Cir. 2006).

that route will be low because the railroad will have no ability to recoup those costs from the very shippers who use those services. Further, if a railroad is getting close to revenue adequacy, it then has incentives to build-up its asset base with inefficient, rather than innovative, assets. This is contrary to the public good. Professor Kalt explains how RIC will distort service and investment decisions.[131]

Fourth, it is likely that shippers will demand that the RIC be applied to tariff rates coming off expired contracts. If the RIC were applied to limit tariff rates coming off contracts, such a policy would powerfully deter both railroads and shippers from entering into contracts.[132]

Each one of the foregoing consequences is inimical to the intent of Congress. The RIC is an intrusive regulatory stick that would unnecessarily limit railroad earnings where no actual problem of market power abuse has been shown to exist.[133] This is directly contrary to Congress's intent that the Board maximize the freedom of railroads to respond to market forces and minimize regulatory interference except when necessary to protect shippers from individual instances of market power abuse.[134]

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[131] Kalt V.S. ¶¶ 131-132.

[132] The Board has recognized that contract rates often differ from tariff rates as a result of market conditions. *E.I. du Pont de Nemours* & Co. *v. Norfolk Southern Ry. Co.* , STB Docket No. NOR 42125, at 57 n.3 (served Mar. 24, 2014) ("In my view, it is difficult to treat contract rates and tariff rates as apples-to-apples comparisons because contract rates are often lower for a variety of reasons, including volume commitments.") (Chairman Elliott, concurring); *see also U.S. Magnesium, L.L.C. v. Union Pac. R.R.* Co., STB Docket No. 42114, at 18 (served Jan. 28, 2010) ("UP observed, and the Board agrees, that contract rates can in some instances be lower than tariff rates for a number of reasons (for instance, shippers in certain settings could negotiate indemnity or volume assurances with the carrier in exchange for a better rate).").

[133] Any system-wide rate cap or rate freeze triggered by earnings that might be proposed in this proceeding will likewise come with these harmful effects.

[134] 49 U.S.C. § 10101.

C. Other practical problems with the RIC concept.

1. Regulatory lag.

The RIC will introduce extraordinary regulatory lag in the calculation of the rate freeze and would compromise railroads' right and ability to set prices in response to market forces. The Board's annual cost of capital and revenue adequacy findings occur 10 months after the close of the year. The calculation of the RIC caps for 2020, for example, would not be published *until nearly the end of 2021*. No railroad would have any idea where the rate constraint was for a given commodity in 2020, when it must publish its tariff rates and serve its customers; it would only find out a year and a half later if its pricing violated the RIC constraint. If it guessed too low, it could never seek reimbursement without violating the prohibition against retroactive ratemaking; and if it guessed too high it may be subject to rate reparations from the agency. And even if we assume the RIC will eventually relax if a railroad plunges back into revenue inadequacy, the calculated effects of relaxation would not be revealed until many months after the railroad has lapsed into revenue inadequacy, thereby forcing the railroad to endure an extended period of sub-compensatory revenues.

2. The RIC will tie rate freezes to earnings from unregulated traffic.

The majority of freight rail traffic is unregulated, either because it is exempt, under contract, or moves at rates below 180% of variable cost. National policy should encourage the growth of those unregulated markets. It is manifestly in the national interest for the American freight rail system to increase its market share over other transportation modes, divert goods from the highway to a safer and more environmentally friendly mode of transportation, and generally to innovate and take risks to expand those highly competitive businesses.

The RIC concept will rebuke those entrepreneurial efforts. As the railroad industry improves its service offering and expands these unregulated markets, it is

rewarded with expanded rate freezes on other lines of business. Incentives matter. Binding together the scope of rate freezes to unregulated markets will discourage innovation at the precise moment in history when the agency should be encouraging the industry to improve further its service to these unregulated sectors as other traditional industries decline. No other unregulated American business is burdened by this kind of asymmetric regulation, and Congress plainly instructed the agency to keep its hands out of these unregulated transportation markets. The RIC concept cannot be reconciled with that congressional mandate.

3. The RIC will artificially encourage customers to shift traffic and will likely be transformed into a firm rate cap.

The RIC was designed to avoid the known financial consequences of old-school utility-style earnings regulation. The Task Force attempts to assure the public that while "there is some possibility [the RIC] could be viewed as a rate cap, with attendant consequences, no money would be rebated to shippers, and shippers currently paying beyond the level identified would not have their rates reduced."[135] Regrettably, the Task Force is likely too optimistic.

First, AAR anticipates that certain stakeholders will advocate that the RIC apply as a cap for new business/movements. If so, the "rate freezes" in RIC will quickly become hard "rate caps." Every railroad loses a substantial portion of its business every year, for a host of reasons, and continually has to work hard to replace that business. However, for new business, the RIC may be transformed into a firm rate cap, with rates for new customers constrained at RIC levels and the "limit on rate increases" applying to only *existing* customers.

Second, RIC will encourage customers to shift traffic to different lanes governed by a rate cap. Many customers have geographic options for the transportation of their

[135] RRTF Report at 36.

goods and services. RIC would distort the marketplace, creating artificial benefits to shippers for certain (new or existing) lanes where RIC is a perpetual rate cap, versus those existing lanes where RIC simply limits future rate increases. With that artificial distortion of the marketplace, it is inevitable that some customers will shift business away from lanes where RIC only limits rate increases to those where RIC is a firm cap.

Third, the asymmetry of RIC will systematically drive down the rate structure of a carrier over time and curtail system-wide revenues. Market forces ebb and flow. When market forces push transportation rates lower, the railroads will respond accordingly. But when market forces would result in larger rate increases than permitted by RIC, the railroads will be unable to fully respond. This asymmetry will result in below market rates and transform the rate freeze into a rate cap over time.

The RIC concept that the Task Force designed to avoid the crippling features of strict earnings regulation will likely evolve into the precise form of utility-style earnings regulation that Congress forbade. The question is simply how quickly the RIC will march a railroad to its ruin.

4. The RIC may not "relax" if a carrier becomes less revenue adequate, as claimed by the Task Force.

The staff report also holds forth the promise that RIC is a "robust," responsive remedy: "[A]s they prove effective (as a railroad is moved closer to the break-even point), they automatically loosen. . . . By contrast, should the constraints prove too weak, and a railroad continues to earn rising profits even though it is long-term revenue adequate, the constraints tighten further."[136] Again, the Task Force may be overly optimistic. It is plainly the case that if the RIC drives a railroad into revenue inadequacy, which could take many years, the RIC will lift automatically. But what happens to the RIC in the interim? Contrary to all logic, if the RIC collapses earnings

[136] RRTF Report at 36.

towards revenue inadequacy, the RIC constraint may tighten, not loosen. This result is counterintuitive, but it flows from two facts. First, the RIC would use the average surplus over time to calculate the RIC in a given year. Second, as the Board's Maximum Markup Methodology would be used to determine the RIC, lower R/VC ratios will ensure lower RIC caps.

Consider the following hypothetical, where a railroad (that has been found to be long-term revenue adequate) has a traffic group containing five movements with R/VC ratios>180%, each with a variable cost of $1,000. The RIC cap is calculated at 235% to exhaust the assumed "average surplus" of $300. Then, in year 12, assume that due to competitive market forces, the railroad lowers all its rates by 4%, moving it closer to the so-called "break even point." The Task Force predicts the RIC will relax. The opposite occurs. Because (1) the impact of the lower revenues in year 12 is diluted, as the surplus is a function of a multi-year analysis, and (2) there has been a downward shift in the entire rate distribution, so the RIC falls from 235% to 226%—even to eliminate a surplus that is lower than the prior year's.

Table 1—RIC Illustration

	Year 11 R/VC	Year 11 RIC	Year 12 R/VC	Year 12 RIC
Move #1	250%	**235%**	240%	**226%**
Move #2	245%	**235%**	235%	**226%**
Move #3	240%	**235%**	230%	**226%**
Move #4	235%	235%	225%	226%
Move #5	230%	235%	220%	226%

Indeed, under the RIC, a railroad could become bankrupt in year 12, and the RIC would still automatically impose a rate freeze on the distressed carrier.

V. THE BOARD MAY NOT REVERSE THE BOTTLENECK RULE FOR REVENUE ADEQUATE RAILROADS OR OTHERWISE.

The Task Force also recommends that the Board "[s]uspend the bottleneck protections for rates of revenue adequate carriers,"[137] by "reversing the Bottleneck decisions as to revenue-adequate carriers."[138] A "bottleneck" occurs when more than one railroad could be involved in a specific move, but either the origin or destination is exclusively served by one railroad. The portion of the move that is served by only one railroad is called the "bottleneck." According to the Task Force, shippers should be permitted to compel a revenue adequate railroad to quote a bottleneck segment rate to/from a shipper-designated "feasible interchange point with a second carrier" and then challenge the reasonableness of that segment-specific rate.[139] The purpose of overriding the Bottleneck Rule is to reduce rates on movements that involve a bottleneck segment through the artificial creation of so-called "competition" over non-bottleneck segments of through movements and the intervention of the Board in reasonableness challenges to those forced rates for bottleneck segments.

The Board's governing statute and controlling Supreme Court precedent prohibit the Board from giving shippers such control over railroad rate- and route-setting. The Board recognized these legal constraints when it adopted the Bottleneck Rule. The substance of and rationale for the Bottleneck Rule were set out in the Board's rulings in two related decisions referred to as *Bottleneck I* and *Bottleneck II*.[140] In the *Bottleneck* cases, the Board consolidated three cases in which shippers sought to force a rail carrier to quote a "local" rate for a bottleneck segment of a through movement so

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[137] RRTF Report at 13.

[138] *Id.* at 41.

[139] RRTF Report at 13.

[140] *Central Power & Light Co. v. S. Pac. Transp. Co.*, STB Docket No. 41242, 1 S.T.B. 1059 (served Dec. 31, 1996) ("*Bottleneck I*"); *Central Power & Light Co. v. S. Pac. Transp. Co.*, STB Dockets No. 41242, 41295, 2 S.T.B. 235 (served Apr. 30, 1997) ("*Bottleneck II*").

that the reasonableness of just the bottleneck rate, as opposed to the through rate established by the carrier, could be challenged. The Board concluded it did not have the authority to require railroads to quote such bottleneck rates.

First, the Board recognized that a carrier's rate-setting prerogative is guaranteed by statute, 49 U.S.C. §10701(c).[141] Second, the Board concluded that a carrier has the statutory power and discretion to determine which interchange (and therefore which through route) it will use in responding to a request for service.[142] Third, the Board concluded that a new through route, and therefore a new interchange, can be prescribed only to address particular competitive harms, and not simply to create new routes on demand.[143] Finally, the Board reaffirmed the principle of *Great Northern Railway v. Sullivan,* 294 U.S. 458 (1935) ("*Great Northern*") that "shippers must challenge the reasonableness of the entire rate from origin to destination, and may not challenge the bottleneck segment separately."[144]

The Task Force mistakenly claims that the Bottleneck Rule is based on policy judgments that the Board could reverse in the interest of "promot[ing] competition."[145] This is wrong. As the Board itself recognized, the Bottleneck Rule is grounded on the Board's governing statute and binding Supreme Court precedent: "Our decision is, in our view, mandated by the law."[146] The Board expressly concluded that "giving shippers the rate control that they sought would not withstand legal scrutiny, as it would defeat a railroad's right to determine, at the outset, the rates that it will use to

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[141] *Bottleneck I*, 1 S.T.B. at 1064.

[142] *Id.*

[143] *Id.*

[144] *Bottleneck II*, 2 S.T.B at 238.

[145] RRTF Report at 40.

[146] *Bottleneck I,* 1 S.T.B. at 1073 n.21.

respond to requests for through service."[147] As the Board recognized, the Bottleneck Rule is based on "statutory provisions [that] protect[] each railroad's right to determine, at the outset, which reasonable through routes it will use to respond to requests for service."[148]

Any attempt to reverse or suspend the Bottleneck Rule as the Task Force recommends would be unlawful. Reversal of the Bottleneck Rule could only occur by an act of Congress. Accordingly, any subsequent consideration of the proposed "Bottleneck Changes" in this proceeding would be a waste of the Board's resources.

A. Binding Supreme Court precedent establishes that the agency may not entertain a challenge to the rate for a segment of a through movement.

The Task Force's objective in advocating suspension of the Bottleneck Rule for revenue adequate railroads is to enable shippers to pursue lower rates through rate reasonableness challenges brought against currently non-existent local rates on segments of through routes. This objective was unlawful and hence unachievable well before the Board articulated its Bottleneck Rule in the late 1990s. The Supreme Court has held consistently for nearly a century that shippers are entitled to challenge only the level of a through rate, not the level of rates for segments of a through movement. In 1925, the Supreme Court rejected the argument of a rail carrier participating in a multi-carrier movement that the level of individual rate factors should be addressed by the agency separately from the level of the through rate. *See Louisville & Nashville R.R. Co. v. Sloss-Sheffield Steel & Iron Co.*, 269 U.S. 217 (1925) ("*Sloss-Sheffield*"). The Court concluded that the proper challenge was to the entire rate from origin to destination. As the Court explained:

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[147] *Bottleneck II*, 2 S.T.B. at 237.

[148] *Bottleneck I*, at 1065.

> The shipper's only interest is that the joint rate be reasonable as a whole. It may be unreasonable although each of the factors of which it is constructed is reasonable. It may be reasonable although some of the factors, or of the divisions of the participants, were unreasonable.

Id. at 234.

Ten years later, the Supreme Court affirmed the *Sloss-Sheffield* holding in *Great Northern*. *Great Northern* involved combination rates (the sum of two proportional rates) on shipments of lignite from Canada to points in the United States. The shipments moved on a through bill of lading issued by Canadian Pacific from Alberta to the international boundary and from there over Great Northern to points in North Dakota. In a rate challenge brought by shippers, the ICC found that Great Northern's proportional rates were unreasonable, but made no finding as to the reasonableness of the combination through rates.

The Court reversed the ICC, finding its approach to be inconsistent with the Interstate Commerce Act and with *Sloss-Sheffield*:

> [T]he Great Northern proportional [rate] cannot be applied save as it is a part of the through rate. There was a single charge which, though based on the combination rate, was precisely the same in amount as if the rate had been jointly made. As shown by our decision in [*Sloss-Sheffield*,] the division among connecting carriers of charges based on joint rates -those involved in that case were constructed out of existing proportionals - is of no concern of the shipper. The proportionals here involved are but parts of a through rate and cannot be distinguished from divisions of a joint rate. The shipper's only interest is that the charge shall be reasonable as a whole.

Great Northern, 294 U.S. at 463 (citations omitted).

Since *Sloss-Sheffield* and *Great Northern*, through the enactment of Staggers and ICCTA, the Supreme Court, federal courts of appeals, the ICC, and the Board have repeatedly affirmed the rule that shippers must challenge the rate for the entire through movement, and may not challenge rate factors for individual segments of a through movement. This principle is "long standing," *Canada Packers, Ltd. v. Atchison, T & S.F.*

Ry. Co., 385 U.S. 182, 183 (1966), and a "venerable principle of railroad rate regulation," *Union Pac. R.R. Co. v. STB*, 202 F.3d 337, 339 (D.C. Cir. 2000). It has repeatedly been followed by the ICC and the Board.[149]

The Board and the courts have recognized a limited exception to this rule in cases involving transportation contracts. *See, e.g., Union Pac. R.R. Co. v. STB*, 202 F.3d 337, 344 (D.C. Cir. 2000). When a shipper has a contract for a portion of the through movement, it may limit a rate reasonableness challenge to the rates for the non-contract portion of the movement. This limited exception is based on an explicit statutory provision, 49 U.S.C. § 10709(c)(1), which excludes contract rates from the Board's jurisdiction.[150] By contrast, there is nothing in the governing statute that allows an over-ride of the *Great Northern* rule in the case of revenue adequate carriers.

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[149] *See, e.g., MidAmerican Energy Co. v. STB*, 169 F.3d 1099, 1106 (8th Cir. 1999) (*Great Northern* held "that a shipper may not recover damages based upon the carrier's portion of a rate if the carrier chooses to offer only a joint rate with another carrier, unless the entire joint rate is unreasonable"); *W. Res., Inc. v. STB*, 109 F.3d 782, 789 (D.C. Cir. 1997) ("Shippers …, if charged under a joint or proportional rate, must challenge the rate for the entire through movement; they cannot challenge individual segments); *United States v. ICC*, 198 F.2d 958, 974 (D.C. Cir. 1952) ("[*Great Northern*] held that the shipper could not complain of the division of the charges among the participating carriers, and ... remarked that 'The shipper's only interest is that the charge shall be reasonable as a whole"'); *Ariz. Elec. Power Coop., Inc. v. Burlington N & Santa Fe Ry.*, STB Docket No. 42058, Decision (served Mar. 15, 2005) ("*AEPCO v. BNSF*"), *available at* 2005 WL 638319, at *8 & n.18 ("Both Supreme Court and agency precedent require that, whether examining joint rates or proportional rates, we must address the reasonableness of the through rate as a whole, rather than the reasonableness of the component parts of the through rate….").

[150] *See, e.g., Union Pac. R.R. Co. v. STB*, 202 F.3d 337, 344 (D.C. Cir. 2000) (noting that the Board's exception for contract traffic in the *Bottleneck* decisions was "born … of the Board's separate *statutory obligation* to protect a bottleneck railroad's 'long haul' where it can provide origin-to-destination service, see 49 U.S.C. § 10705(a)(2)" (emphasis added)); *id.* ("The Board offers a lengthy and well-reasoned explanation of the intersection of the *conflicting mandates of its contractual and long-haul provisions*, .. and we think it resolved the tension between these mandates in a reasonable fashion.").

B. A bottleneck carrier has a statutory right to its long haul where it can provide origin-to-destination service.

The Task Force idea would allow shippers to force railroads with bottleneck segments to short-haul themselves via new, unwanted interchanges with other railroads. This approach would violate another long-standing statutory right of carriers on which the Bottleneck Rule is based, namely a railroad's right to its long haul. The Board itself acknowledged in the *Bottleneck* decisions that the protections of a carrier's long haul have been in place since at least the early 1900s, long before Congress had anything to say on the subject of revenue adequacy:

> The routing protections provided to rail carriers by section 10705 are longstanding and, as we explained, confer on each railroad the initial discretion to choose the routes it will use to respond to requests for service. … In particular, the right of a rail carrier not to be short-hauled, 49 U.S.C. 10705(a)(2), originated in the Mann-Elkins Act of 1910, Pub. L. No. 218, 36 Stat. 539, 552 (1910), and protects a railroad, at the outset, from … 'hav[ing] to carry over its lines traffic originating on, or destined to, another line when the entire carriage could as well have taken place on its own line.' Chicago, M., S.P. & P. R.R. v. United States, 366 U.S. 745, 750-51 (1961).

Bottleneck II at 241.

The statutory protection of a railroad's long haul, set out in the current statute at 49 U.S.C. § 10705(a)(2), is based on multiple U.S. Supreme Court opinions that have acknowledged for over a century a carrier's rate- and route-setting prerogative. For example, the Supreme Court explained in the early 1900s that if a "reasonable and satisfactory through route already existed," as chosen by the carrier, "the Commission had no power" to establish a through route or joint rate. *ICC v. N. Pac. Ry. Co.*, 216 U.S. 538, 544 (1910). Indeed, the Court emphasized that "[i]t cannot be said that there is no such route [merely] because the public would prefer two. The condition in the statute is

not to be trifled away. Except in case of a need such as the statute implies, the injustice [of the agency imposing through routes] … is not permitted by law." *Id.* at 545. [151]

A little over a decade later, the Supreme Court explicitly recognized the right of a carrier to its long haul, with no mention of financial health or revenue adequacy as an exception to this right: "The act does not give the Commission authority to establish all the through routes it may deem necessary or desirable in the public interest. The general language of paragraph (3) is limited by paragraph (4). The latter lays down the rule that, subject to specified exceptions, a carrier may not be compelled to participate in a through route which does not include substantially its entire line lying between the termini of the route. The purpose is to protect the long haul routes of carriers." *United States v. Mo. Pac. R.R. Co.*, 278 U.S. 269, 276-77 (1929).[152]

Into the mid-1900s, the Supreme Court continued to recognize in the applicable statute an explicit and continuing limitation on the agency's power to short haul a carrier (again, without regard to revenue adequacy): "This authority [to prescribe a through route] is restricted against short hauling … by § 15(4) which provides that the

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[151] *See also S. Pac. Co. v. ICC*, 219 U.S. 433, 452 (1911) (recognizing railroads' "authority to fix just and reasonable rates"); *id.* at 443 (Commission has no authority to "set aside a just and reasonable rate lawfully fixed by a railroad whenever the Commission deemed that it would be equitable to shippers…" and to do so would be an "abnormal and extraordinary power … which, if … obtained, would open a vast field for the exercise of discretion, to the destruction of rights of private property in railroads, and would in effect assert public ownership without any of the responsibilities which ownership would imply."); *United States v. Ill. Cent. R.R. Co.*, 263 U.S. 515, 522 (1924) ("[a] carrier is entitled to initiate rates and, in this connection, to adopt such policy of rate-making as to it seems wise." (citing *ICC v. Chi. Great W. Ry.*, 209 U.S. 108, 118-19 (1908); *S. Pac. Co. v. ICC*, 219 U.S. 433 (1911); *ICC v. Louisville & Nashville R.R. Co.*, 227 U.S. 88, 92 (1913)).

[152] *See also R.R. Co. v. United States*, 323 U.S. 588, 590-91 (1945) ("The Commission's authority to grant relief [regarding through routes] is bottomed on s 15(3) and (4) of the Interstate Commerce Act, as amended. The subsection first mentioned authorizes the Commission, when it deems it to be 'necessary or desirable in the public interest' to establish through routes and joint rates. The succeeding subsection is a limitation on the Commission's power, derived in part from earlier enactments, prohibiting the Commission from requiring a line-haul carrier to short-haul itself as a participant in a prescribed through route.").

Commission 'shall not * * * require any carrier by railroad * * * to embrace in such route substantially less than the entire length of its railroad and of any intermediate railroad operated in conjunction and under a common management or control therewith, which lies between the termini of such proposed through route." *Chicago, Milwaukee, St. Paul & Pac. R. Co. v. United States*, 366 U.S. 745, 749-50 (1961). And even into the 2000s, federal courts have explained the now obvious point that, regardless of a carrier's revenue adequacy, the Board is subject to a "separate statutory obligation to protect a bottleneck railroad's 'long haul' where it can provide origin-to-destination service, *see* 49 U.S.C. § 10705(a)(2)…." *Union Pac. R.R. Co. v. STB*, 202 F.3d 337, 344 (D.C. Cir. 2000).

C. The Staggers Act sought to reinforce railroads' rate- and route-setting prerogative.

Railroads' long-haul rights, as well as *Great Northern*, precede the Staggers Act. The rate- and route-setting prerogative embodied in this prior precedent was fully consistent with Congress's intent in the Staggers Act to allow market forces to govern railroads' commercial decisions to the maximum extent possible. In fact, one of Congress's objectives in the Staggers Act was to give railroads even greater control over rate- and route-setting decisions so that market forces rather than regulatory mandates would govern railroad commercial decisions.

One of the first major agency actions after the Staggers Act was the elimination of the so-called DT&I conditions that required merging railroads to keep open existing junctions and gateways and to allow shippers to route traffic over routes and gateways of their choice. The ICC determined that the DT&I conditions were incompatible with Congress' intent that markets, not regulation, should govern railroads' commercial decisions: "[The Staggers Act] has emphasized the need for rail carriers to have

flexibility to make individual ratemaking and routing choices."[153] The ICC concluded that the DT&I conditions "prevent[ed] market forces from efficiently allocating railroad resources."[154]

Shortly after eliminating the DT&I conditions, the ICC adopted the current competitive access rules.[155] Under those rules, the ICC and now the Board will override a railroad's routing decisions only to address situations where a carrier abuses its market power by extracting unreasonable terms or by rendering inadequate service. The competitive access rules were upheld in *Baltimore Gas & Electric Co. v. United States*, 817 F.2d 108, 110 (D.C. Cir. 1987) ("*Baltimore Gas & Electric*"). The restrictions in the competitive access rules on regulatory override of railroad routing decisions were again upheld in the subsequent *Midtec* case, where the ICC reiterated that overriding a railroad's routing prerogative through a grant of terminal access or reciprocal switching simply to satisfy "a desire for the service of a second carrier" was not consistent with the statute.[156] On appeal, shippers again argued that terminal access and reciprocal switching "were intended by the Congress to increase interrail competition in order 'to offset the very substantial rate advantages given the railroads' under other provisions of the Staggers Act." *Midtec*, 857 F.2d at 1505. The court emphatically rejected this reading of the statute:

> If the Commission were authorized ... to prescribe reciprocal switching or terminal trackage whenever such an order could enhance competition between rail carriers, it could radically restructure the railroad industry. *We have not found even the slightest indication that Congress intended the*

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[153] *Traffic Protective Conditions*, 366 I.C.C. 112, 119 (1982) ("*Conditions*"), *aff'd in relevant part sub nom., Detroit, T. & 1 R.R. Co. v. United States*, 725 F.2d 47 (6th Cir. 1984) (reversing portion of the decision making revocation of the conditions retroactive).

[154] *Id*. at 130.

[155] *See Intramodal Rail Competition*, 1 I.C.C. 2d 822 (1985).

[156] *See Midtec Paper Corp. v. Chicago & N. W. Transp. Co.*, 3 I.C.C. 2d 171, 174 (1986), *affirmed sub nom., Midtec Paper Corp. v. United States*, 857 F.2d 1487 (D.C. Cir. 1988) ("*Midtec*").

Commission in this way to conform the industry more closely to a model of perfect competition.

Id. at 1507 (emphasis added). As the court observed, "competition policy is not a matter of regulators handicapping would-be competitors in order to create an evenly matched contest." *Id*. at 1503.

In the *Bottleneck* decisions, the Board confirmed the ICC's and the courts' reading of Congress' intent in Staggers regarding forced routing through regulatory fiat. As the Board stated, "Congress chose not to provide for the open routing that shippers seek here. To the contrary ... Congress retained and strengthened the specific statutory provisions allowing carriers to select their routes and to protect their long hauls." *Bottleneck I,* at 1067.

D. The statute does not give the Board the broad authority to over-ride railroads' rate- and route-setting prerogative as contemplated by the Task Force.

While providing no vehicle for open routing, the governing statute does provide limited tools that the Board can use to override a railroad's rate- and route-setting prerogatives. Specifically, § 11102(a) provides limited authority to order terminal access; § 11102(c) provides limited authority to order reciprocal switching; and § 10705(a) provides limited authority to prescribe a through route, including, under defined criteria, a route that requires a rail carrier to short-haul itself. These statutory tools cannot be used to override railroads' rate- and route-setting prerogatives on movements involving bottleneck segments simply because a carrier is revenue adequate. They are available only to address particular competitive failures. The statute does not give the Board anything remotely akin to a competitive access revenue adequacy remedy or tool.

1. The Board's prescriptive authority is subject to the competitive access rules which are addressed to particular abuses of market power.

As explained previously, the ICC adopted the current competitive access rules, 49 C.F.R. § 1144.2, shortly after the Staggers Act. Those rules provide that the Board may order reciprocal switching or prescribe a through route only to address situations where a carrier abuses its market power by extracting unreasonable terms or by rendering inadequate service. As economists have already explained in EP 722, merely being "revenue adequate" as defined by the Board does not correlate at all with any kind of anticompetitive conduct or service inadequacy.[157] As Professor Kalt explains, "[t]he Task Force bottleneck proposal does not attempt to focus on shippers and traffic that are the subject of the exercise of market power" and "the effects of this proposal promise to be economically rather arbitrary."[158]

Under the competitive access rules, the Board can override a railroad's routing prerogative only to address a particular competitive harm. As the ICC stated in its *Midtec* decision, "we think it correct to view the Staggers changes as directed to situations where some competitive failure occurs."[159] In its brief to the D.C. Circuit in the *Midtec* case, the ICC explained that the "central philosophy of the Staggers Act" is that "regulation should be reserved for situations where it is needed to protect against abuses"[160] and regulatory "intrusion into carrier operations and pricing practices in the

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[157] *See, e.g.*, Opening Comments of The Association of American Railroads, EP 722, Verified Statement of Joseph P. Kalt, at 29-30 (filed Sep. 5, 2014); Opening Comments of The Association of American Railroads, EP 722, Verified Statement of Roger Brinner, at 18,26 (filed Sep. 5, 2014); *see also* Macher, *et al.*, 41 Transp. L.J. at 123-24.

[158] Kalt V.S. ¶ 105.

[159] *Midtec Paper Corp. v. Chicago & Nw. Transp. Co.*, 3 I.C.C.2d 171, 174 (1986)("*Midtec II*"), *aff'd*, *Midtec Paper Corp. v. United States*, 857 F.2d 1487 (D.C. Cir. 1988).

[160] Joint Brief for Respondents Interstate Commerce Commission and United States of America, *Midtec Paper Corp. v. ICC*, Docket No. 87-1032, at 25 (D.C. Cir., filed Mar. 14, 1988) ("ICC *Midtec* Brief").

absence of some real or threatened abuse simply cannot be squared with a fair reading of the rail transportation policy."[161]

2. The circumstances under which a railroad can be ordered to short-haul itself have nothing to do with revenue adequacy.

Section 10705(a) sets forth specific circumstances under which a carrier may be required to short-haul itself: (1) when required under sections 10741 [*i.e.*, no unreasonable discrimination], 10742 [*i.e.*, regarding interchange obligations], or 11102 [*i.e.*, regarding the use of terminal facilities]; (2) when the long haul results in an "unreasonably long" route "when compared with a practicable alternative through route that could be established"; or (3) when "the Board decides that the proposed through route is needed to provide adequate, *and* more efficient or economic, transportation."[162] None of these circumstances has anything to do with revenue adequacy. It would be patently inconsistent with the language of the statute to require a railroad to abandon its route-setting prerogative and short-haul itself simply because it has earned revenues on a firm-wide basis sufficient to meet the Board's current revenue adequacy standard.

The Board has summarized the criteria in section 10705(a) as follows: "As a general matter, a railroad has a right to rationalize its system and to provide service over its most efficient routes," though "the Board may exercise its authority under section 10705 to order a carrier to open another route if a party demonstrates that the bottleneck railroad has exploited its market power by (1) providing inadequate service over its lines or (2) foreclosing more efficient service over another carrier's line."[163] In other words, what is required by § 10705(a) is an individual showing that an individual

[161] *Id.* at 18 n.12.

[162] 49 U.S.C. § 10705(a) (emphasis added).

[163] *Entergy Ark., Inc. v. Union Pac. R.R. Co.*, STB Docket No. 42104, at 7 (STB served June 26, 2009).

carrier exploited its market power by inadequate service or by insisting on such an unreasonable through route that a shipper may use a more efficient route—a showing that is fact-sensitive and has nothing to do with merely being revenue adequate.[164]

The language in section 10705(a)(2)(C) regarding the need to provide "adequate, and more efficient or economic transportation" also has nothing to do with revenue adequacy. The inquiry into the adequacy and efficiency or economics of a particular movement "is necessarily fact-specific."[165] "[T]o establish that a foreclosed route is 'more efficient' under 10705" would require the Board to "consider all relevant factors," which would include "those listed in 49 CFR 1144.2(a)(1)…."[166]

Moreover, the legislative history of section 10705(a) confirms that the language regarding adequate and efficient or economic transportation does not relate to revenue adequacy, but rather, regards a fact-specific analysis of a particular route and takes into account the railroad's need for operating efficiency and economy (not just shippers' desires for a more favorable rate).[167] The federal district court analyzing the legislative history of section 10705(a) explained:

> Under the construction which we give to clause (b), even if the shipper is able to prove that the proposed new route would give him more efficient or more economic transportation—better (as for example quicker) or cheaper service — since, by the express language of paragraph (3) of Section 15, the Commission may never establish a through route unless 'deemed by it to be necessary or desirable in the public interest,' we have no doubt but that this language, fairly interpreted, must be taken to include also considerations of railroad operating efficiency and economy, which, in a given case, may control over considerations in the shipper's favor.[168]

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[164] *See id.* at 8.

[165] *Id.*

[166] *Id.*

[167] *See, e.g.*, *Pa. R. Co. v. United States*, 54 F. Supp. 381, 387-90 (D. Md. 1944) (discussing legislative history of meaning of section 15(4), now 10705(a)(2)(C)).

[168] *Id.* at 390.

3. The public interest standard underlying the Board's prescriptive authority limits Board action to remedy particular harms.

The STB's prescriptive authority under the other access-related statutory provisions—§ 11101(a) (terminal access) and § 11101(c) (reciprocal switching)—must be exercised in the "public interest."[169] But the agency has long understood the "public interest" in such regulatory intervention to be triggered by a compelling need for intervention, not a mere desire to advance a regulatory objective. As the ICC explained, the "public interest" means "more than a mere desire on the part of shippers or other interested parties for something that would be convenient or desirable for them." *Jamestown, N.Y., Chamber of Commerce v. Jamestown, Westfield & N.W.R.R. Co.*, 195 I.C.C. 289, 292 (1933). "[S]ome actual necessity or some compelling reason must first be shown before we can find such action in the public interest." *Id*. Where the original rail carrier is providing good freight rail service, the "desirability, but not the necessity, of the additional operation of a joint terminal freight station" is not sufficient to show that the public interest requires such joint terminal access. *Id.*

The ICC followed *Jamestown* in the decades that followed and continued to require "a complainant seeking terminal trackage rights to demonstrate 'some actual necessity or compelling reason' for such relief." *Midtec Paper Co*., 857 F.2d at 1502; *see also Cent. States Enters., Inc. v. ICC*, 780 F.2d 664, 677-78 (7th Cir. 1985) (citing "pre-Staggers Act cases" that are "joint use cases that describe the public interest standard in terms" similar to the "compelling need" test articulated in *Jamestown*). The achievement of revenue adequacy clearly does not satisfy the "actual necessity" or "compelling reason" standard for a Board over-ride of a railroad's route-setting prerogative.

[169] 49 U.S.C. § 10705(a)(1).

4. The Eighth Circuit's decision in *MidAmerican* upheld the Bottleneck Rule and did not suggest that the Board had authority to expand access remedies.

The Eighth Circuit upheld the Bottleneck Rule in *MidAmerican Energy Co. v. STB,* 169 F.3d 1099 (8th Cir. 1999) ("*MidAmerican*"). But the Task Force suggests that since the Eighth Circuit found the Bottleneck Rule to be based on a "permissible" reading of the statute, a different reading of the statute reaching a very different conclusion—*i.e.*, that the Board can override railroad rate- and route-setting prerogative without any showing of competitive harm—might also be "permissible."[170] The statutory language and its consistent application do not permit such a loose interpretation of *MidAmerican*.

In fact, the Eighth Circuit never suggested that a different reading of the statutory provisions on railroads' rate- and route-setting prerogatives would be "permissible." To the contrary, the decision acknowledged the statutory foundation for the Bottleneck Rule, including 49 U.S.C. § 10701(c) (railroad discretion as to how to satisfy its duty to provide rates and services) and 49 U.S.C. § 10705(a) (protecting a railroad's long haul). *MidAmerican* 169 F.3d at 1106. The decision further recognized that "nothing in the Act requires carriers to establish routes over all possible interchanges," *Id.* (citing *Routing Restrictions*, 296 I.C.C. at 774), and that the "Board may order a carrier to provide service over a shorter haul than it wishes only if the Board first makes specific findings under the Act." *Id*. And in upholding the Bottleneck Rule, the Eighth Circuit did not question the view of Chairman Morgan, who explained that "[t]he Board has not provided for 'open access,' but existing law does not permit that sort of remedy. The law directs the Board to promote competition, but not to governmentally force it simply upon demand …." *Bottleneck II* at 249 (Chairman Morgan, commenting).

[170] *See* RRTF Report at 40.

E. Allowing shippers to over-ride railroads' route-setting prerogative would create serious operational disruptions.

The Board does not have the legal authority under the existing statute to reverse the Bottleneck Rule and allow expanded access to the lines of revenue adequate railroads. Even if the Board had such authority, it would be extraordinarily unwise to exercise it in the manner contemplated by the Task Force.

Professor Kalt explains, "[p]ermitting shippers to specify interchange locations harkens back to the pre-Staggers era of open routings."[171] The inefficiency in terms of managing a rail network is obvious. "The elimination of forced open routings, and railroads' ability to manage their rail networks efficiently was one of the major factors leading to the initial explosion in productivity and rate reductions following the passage of the Staggers Act."[172] With the incentives created by the proposed bottleneck changes, "the shipper need not consider the effect of the potential routing on the cost of operating the rail network, the impact of the routing on service levels and frequency available to other shippers, or the ability of the railroad to deploy and operate its capital efficiently."[173]

Professor Kalt also notes that, "[u]nder reasonable assumptions regarding the demand for rail services, it only takes a small increase in costs to offset the efficiency benefits of even a significant reduction in the price mark-up. As such, although the Task Force proposal would transfer revenue from certain railroads to bottleneck shippers, the induced cost increases arising from these changes may well exceed any efficiency gain from the price reductions."[174] Indeed, "[f]orced access … would not constitute

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[171] Kalt V.S. ¶ 106.

[172] *Id.*

[173] *Id.* ¶ 107.

[174] *Id.* ¶ 109 (footnote omitted).

implementation of a policy of mimicking competition. Competitive market forces would not generate a system of open access railroads. . . ."[175]

It has been "well-documented" that "running a railroad requires *business judgment* on matters ranging from who will make investment in shared facilities, to which cars and trains need to get through a congested yard or network segment most quickly, to who will pay for quality improvements on a shared network."[176] The experience outside the U.S. where regulators have tried to employ various forms of forced, shipper directed, access is that rail access regimes have been plagued by conflicts between the myopic interests of individual users and the shared interest in overall network efficiency.[177]

AAR and its members also presented extensive testimony in EP 711 and EP 711 (Sub-No.1) explaining the importance of a railroad's rate and route-setting prerogative to a well-functioning rail network. AAR's witness William Rennicke explained in EP 711 that much of the dramatic improvement in rail service since Staggers is directly attributable to the reduction of interchanges and switching that resulted from giving railroads greater control over routing decisions.[178] As he explained, rail productivity has increased dramatically as railroads have been able to move more traffic over a network of high-density lines with fewer inputs and work events per shipment. A key feature of that rationalization process was the elimination of unnecessary interchanges with other railroads and the accompanying reduction in switching and car handling activity.[179]

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[175] *Id.* ¶ 110.

[176] *Id.* ¶ 111.

[177] *Id.* ¶ 116.

[178] *See* Opening Comments of the Association of American Railroads, EP 711, Verified Statement of William J. Rennicke, at 6-23 (filed March 1, 2013) ("Rennicke 711 Op. V.S.").

[179] *Id. See also*, Opening Comments of the Association of American Railroads, EP 711 (Sub-No. 1), Verified Statement of William J. Rennicke, at 6-7 (filed Oct. 26, 2016).

AAR's members also described the benefits of giving railroads increased control over routing decisions and the increased use of single-line service. CSX described its extensive use of "run through" trains in interline movements and its ability, through control of routing, to improve the efficiency of yard operations.[180] Union Pacific explained that it achieved broad single-line efficiencies by systematically eliminating interchanges, developing train plans and car blocking plans so traffic could bypass yards, and removing or downsizing yards that were no longer needed.[181]

AAR and its members also described the adverse consequences of giving shippers greater control over the routing of traffic. The basic problem is that individual shippers, if given control over routing, have the incentive to advance their own parochial interests, not the interests of the network as a whole or the interests of network efficiency. Therefore, allowing shippers to control how railroads provide the requested transportation service inevitably would introduce inefficiencies and potentially serious service breakdowns across the network.

The comments of AAR and its members were in the context of a proposed change to the Board's approach to prescribed reciprocal switching under § 11101(c). But the potential scope of the Task Force's idea is more extensive than the reciprocal switching proposals that were the subject of EP 711 and EP 711 (Sub-No. 1). Reversing the Bottleneck Rule would potentially allow shippers to demand new routes and interchanges whenever a bottleneck exists. This type of control could have disastrous consequences.

Mr. Rennicke explained in his testimony in EP 711 that giving shippers the ability to mandate an otherwise unnecessary interchange would undermine all of the factors that allowed railroads to achieve improvements in rail transportation service

[180] Opening Comments of CSX Transportation, Inc., EP 711, at 27-33 (filed March 1, 2013).

[181] Opening Comments and Evidence of Union Pacific Railroad Company, EP 711 (Sub-No. 1), at 10-18 (filed Oct. 26, 2016).

over the past three decades.[182] He described in detail what must occur to implement new switching activity and the broad range of circumstances under which a new interchange might be required.[183] As Mr. Rennicke explained, a simple and straightforward handoff of traffic between two railroads in or near urban areas, where most reciprocal switching takes place, is rare. Each new interchange scenario would raise challenges, complications, and costs unique to the specific circumstances at issue. The additional time necessary to perform an interchange would create delays that can lead to congestion in areas where traffic density is high. The new switches would consume capacity in yards, creating further risk of congestion. Mr. Rennicke provided several examples demonstrating how mandated switching at the request of a shipper would degrade yard efficiency. The loss of control over routing decisions would severely impact railroads' ability to manage their yard operations efficiently.

AAR's members also submitted extensive testimony on the adverse operating impacts of allowing shippers to dictate how traffic moves. CSXT's Chief Operating Officer, Cindy Sanborn, explained that involuntary switching would require increased car handlings, disrupt network planning, and reduce predictability of traffic.[184] Norfolk Southern explained that through increased car handling, involuntary switching would decrease shipment velocity and reduce line-haul miles per day.[185] Norfolk Southern's Assistant Vice President, Transportation Network, Jeffrey Sliger, explained how giving shippers the ability to demand new traffic patterns and new interchanges would undermine service planning efforts.[186]

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[182] Rennicke, 711 Op. V.S. at 40-41.

[183] *Id*. at 41-90.

[184] Opening Comments of CSX Transportation, Inc., EP 711 (Sub-No. 1), Verified Statement of Cindy M. Sanborn, at 8-17 (filed 26, 2016).

[185] Comments of Norfolk Southern Railway Company, EP 711, at 71-79 (filed March 1, 2013).

[186] Opening Comments of Norfolk Southern Railway Company, EP 711 (Sub-No. 1), Verified Statement of Jeffrey H. Sliger, at 2-6 (filed Oct. 26, 2016).

Kansas City Southern's Assistant Vice President, International Network Planning, Gregory Walling, explained how a forced switching regime requiring railroads to short-haul themselves "would undo decades of railroad industry operational and infrastructure modifications that were accomplished to make interline rail operations more efficient and less capital intensive."[187] He illustrated the operational concerns with an example of involuntary switching at Sallisaw, Oklahoma.[188] Union Pacific's Executive Vice President – Operations, Lance Fritz, explained that involuntary switching "would make [their] entire network less efficient because traffic would be diverted from the most efficient routes, reducing densities on those routes and thus unraveling the efficiencies that Union Pacific has built over decades."[189]

F. Reversal of the Bottleneck Rule would adversely affect rail infrastructure investment.

As the Board is well aware, rail infrastructure is funded through private investment by individual railroads. The rail network requires vast amounts of capital each year to maintain and replace track and facilities and to improve and expand the network. Reversal of the Bottleneck Rule would adversely affect railroads' spending on rail infrastructure in two basic ways.

First, it would reduce the revenues that are available to railroads to make infrastructure investments. The purpose and effect of reversing the Bottleneck Rule are to reduce revenues earned by railroads deemed to be revenue adequate by allowing shippers to force railroads to quote segment rates and then to challenge the segment

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[187] Opening Comments and Evidence of the Kansas City Southern Railway Company, EP 711, Verified Statement of Gregory Walling, at 53 (filed March 1, 2013).

[188] *Id*. at 54-60.

[189] Opening Comments and Evidence of Union Pacific Railroad Company, EP 711, Verified Statement of Lance M. Fritz, at 24 (filed Mar. 1, 2013).

rates in rate reasonableness proceedings. Shippers clearly expect that such use of the Board's rate reasonableness methodologies would result in significant rate reductions. The revenues available to invest in rail infrastructure would be further reduced by the added costs imposed by new and unnecessary interchanges and reduced efficiency. Less operating revenue would inevitably result in lower spending on infrastructure.

Infrastructure spending would also likely decline due to the uncertainties created by a change in regulation that would give shippers control over the routing of traffic. AAR's members explained in detail in EP 711 and EP 711 (Sub-No.1) how a loss of control over the routing of traffic would discourage infrastructure investment. CSX's Chairman and CEO, Michael Ward, explained that giving shippers control over switching decisions would create uncertainties about future volume and capacity needs at particular locations, undermining the planning and forecasting that must take place to justify particular investments.[190] Norfolk Southern's Vice President of Strategic Planning, John H. Friedman, explained that giving shippers the ability to control traffic routing through forced switching could "forc[e] NS to further downsize its network in order to compensate for the heightened regulatory risk and uncertainty related to the potential for changing traffic flows and traffic volumes."[191] And Union Pacific's Vice President, Financial Planning and Analysis, Jon Panzer, explained how the uncertainty created by giving shippers the ability to mandate switching would affect the assessment of expected return from an investment that is critical to making investment decisions. He explained that forced switching would decrease the number of potential projects for

[190] Opening Comments of CSX Transportation, Inc., EP 711 (Sub-No. 1), Verified Statement of Michael J. Ward, at 10-15 (filed Oct. 26, 2016).

[191] Opening Comments of Norfolk Southern Railway Company, EP 711 (Sub-No. 1), Verified Statement of John H. Friedman, at 10 (filed Oct. 26, 2016).

which the expected ROI justifies investment, and as a result, fewer projects would be funded.[192]

The expectation of AAR's members that increased uncertainty caused by forced switching would lead to reduced infrastructure investment is supported by the academic literature on access regimes. Norfolk Southern's witness in EP 711 (Sub-No.1), Professor Grajek, predicted a "material reduction in long-term investment" if mandated switching were imposed on railroads.[193] His conclusions were supported by his extensive empirical research into the European Union's telecommunications industry, where he found enormous losses in net investment as a result of access regulations imposed on that industry. Union Pacific's witness, Professor Wright, similarly explained how the uncertainty created by the prospect of forced switching would raise costs and discourage investments, particularly in industries with large, sunk costs like the railroad industry.[194]

G. Any change to the Bottleneck Rule would have to be made by Congress.

Any change in the Bottleneck Rule would therefore require Congressional action for three reason. First, as discussed above it is premised on long-standing Supreme Court precedent and current statutory provisions.

Second, railroads have relied on the agency's precedent, which limits shippers' ability to dictate traffic movements, in making extensive rail investments that have produced today's efficient rail network. The Conrail Transaction is a prominent

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[192] Opening Comments and Evidence of Union Pacific Railroad Company, EP 711 (Sub-No. 1), Verified Statement of Jon T. Panzer, at 7-10 (filed Oct. 26, 2016).

[193] Opening Statement of Norfolk Southern Railway Company, EP 711 (Sub-No. 1), Verified Statement of Michal Grajek, at 3 (filed Oct. 26, 2016).

[194] Opening Comments and Evidence of Union Pacific Railroad Company, EP 711 (Sub-No. 1), Verified Statement of Joshua D. Wright, at 25-26 (filed Oct. 26, 2016).

example of industry reliance upon these policies. As Norfolk Southern's former Chairman and CEO, David R. Goode, explained:

> [T]he Conrail Transaction was fundamentally premised on Norfolk Southern's assumption that it would retain the continued ability to provide single-line service. Operating under this assumption, Norfolk Southern secured one of the largest debt financing arrangements, at the time, for the transaction and made substantial capital investments throughout its network, both with full confidence that the expense of such financing and investments would be recouped from the revenue growth as a result of the improved service product, expanded market access, increased operating efficiency, and enhanced competitiveness enabled by more single-line hauls.[195]

Union Pacific similarly testified that its merger integration efforts over several years proceeded based on the assumption that the STB would protect a railroad's route- and rate-setting prerogative.[196] As Union Pacific explained, beginning in 1982, Union Pacific reconfigured six railroads to develop a rail network that maximizes single-line service and expedites customer shipments. Union Pacific would not have proceeded with the consolidations that created its current system had it been subject at the time to forced switching rules that would have undermined its ability to realize single-line efficiencies and provide single-line service. Any reversal of longstanding policy that "does not take account of legitimate reliance on prior interpretation[s]" is "arbitrary, capricious [or] an abuse of discretion." *Smiley v. Citibank (S.D.)*, 517 U.S. 735, 742 (1996) (internal citations omitted).

Third, Congress repeatedly has rejected proposed legislation that would have set aside the Bottleneck Rule. Over the past twenty years, at least 18 bills have been introduced in the House or Senate that would relax the competitive access standards

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[195] Opening Comments of Norfolk Southern Railway Company, EP 711 (Sub-No. 1), Verified Statement of David R. Goode, at 20 (filed Oct. 26, 2016).

[196] Opening Comments and Evidence of Union Pacific Railroad Company, EP 711 (Sub-No. 1), at 14-18 (filed Oct. 26, 2016).

and make it easier for shippers to obtain an order to force reciprocal switching or terminal access.[197] Not one of those 18 bills passed either house of Congress. Nor did Congress direct the Board to change its long-standing competitive access rule when it reauthorized the agency.

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[197] *See, e.g.*, (1) Rail Shipper Fairness Act of 2015, S. 853, 114th Cong., § 3 (2015) (requiring rail carriers to quote rates between any interchange points of two or more carriers and requiring competitive switching in terminal areas or within 100 miles of an interchange unless infeasible or unsafe); (2) Surface Transportation Board Reauthorization Act of 2011, S. 158, 112th Cong., § 302 (2011) (overturning *Midtec,* establishing when STB should provide terminal access, and create a pricing mechanism); (3) Surface Transportation Board Reauthorization Act of 2009, S. 2889, 111th Cong., § 302 (2009) (same as S. 158); (4) Railroad Competition and Service Improvement Act of 2007, S. 953, 110th Cong., § 104 (2007) (requiring, rather than authorizing, STB to order reciprocal switching); (5) Railroad Competition and Service Improvement Act of 2007, H.R. 2125, 110th Cong., § 104 (2007) (same); (6) Railroad Competition Improvement and Reauthorization Act of 2005, H.R. 2047, 109th Cong., § 5 (reversing *Midtec* by prohibiting Board from requiring evidence of anticompetitive conduct as condition to ordering reciprocal switching); (7) Railroad Competition Act of 2006, S. 2921, 109th Cong., § 104 (2006) (reversing *Midtec* by amending statute to read "the Board shall not require evidence of anticompetitive conduct by a rail carrier from which access is sought" as condition to terminal access or reciprocal switching); (8) Railroad Competition Act of 2005, S. 919, 109th Cong., § 102 (2005) (prohibiting Board from requiring evidence of anticompetitive conduct as pre-condition to ordering terminal access or reciprocal switching); (9) Railroad Competition Act of 2003, H.R. 2924, 108th Cong., § 5 (2003) (abrogating *Midtec* by prohibiting Board from requiring evidence of anticompetitive conduct as pre-condition to ordering terminal access or reciprocal switching); (10) Railroad Competition Act of 2003, S. 919, 108th Cong., § 5 (2003) (same); (11) Surface Transportation Board Reform Act of 2003, H.R. 2192, 108th Cong., § 104 (2003) (overturning *Midtec*); (12) Railroad Competition Act of 2001, S. 1103, 107th Cong., § 103 (2001) (abrogating *Midtec* by providing that, in considering requests for reciprocal switching or terminal access, STB "may not require evidence of anticompetitive conduct by a rail carrier from whom access is sought"); (13) Surface Transportation Board Reform Act of 2001, H.R. 141, 107th Cong., § 104 (2001) (same); (14) Railroad Competition and Service Improvement Act of 1999, H.R. 2784, 106th Cong., § 7 (1999) (overturning *Midtec* by prohibiting STB from requiring evidence of anticompetitive conduct as condition to ordering terminal trackage rights or reciprocal switching); (15) Railroad Competition and Service Improvement Act of 1999, S. 621, 106th Cong., § 7 (1999) (same); (16) Surface Transportation Board Reauthorization Act of 1999, H.R. 3163, 106th Cong. § 6 (1999) (same); (17) Surface Transportation Board Reform Act of 1999, H.R. 3446, 106th Cong., § 104 (1999) (to same effect); and (18) Surface Transportation Board Modernization Act, H.R. 3398, 106th Cong., § 12 (1999) (overturning *Midtec* by changing the standards for terminal access and reciprocal switching and altering the procedure for Board action).

As the Supreme Court explained, "once an agency's statutory construction has been 'fully brought to the attention of the public and Congress,' and the latter has not sought to alter that interpretation although it has amended the statute in other respects, then presumably the legislative intent has been correctly discerned." *United States v. Rutherford*, 442 U.S. 544, 554, n.10 (1979); *see also United States v. Riverside Bayview Homes, Inc.*, 474 U.S. 121, 137 (1985) (congressional refusal to overrule agency construction of legislation is "evidence of the reasonableness of that construction, particularly where the administrative construction has been brought to Congress' attention through legislation specifically designed to supplant it"); *Blau v. Lehman*, 368 U.S. 403, 413 (1962) ("Congress is the proper agency to change an interpretation of the Act unbroken since its passage, if the change is to be made.").

VI. THE STB SHOULD IMPROVE EXISTING RATE REGULATION TOOLS.

As explained above, the removal of burdensome and overbearing regulatory constraints by Congress in the Staggers Act contributed significantly to improving the quality and efficiency of rail service and the financial health of the railroad industry. All industry stakeholders have benefited from these improvements, which have come about because market forces have been allowed to direct railroads' commercial and financial decisions. There is no reason to believe that any abuse of market power caused the general turnaround in the rail industry over the last several decades, and there has been no overarching competitive failure that the Board must address through fundamental changes in regulatory standards.

Nevertheless, it is appropriate for the Board to look for ways to improve its regulatory standards and procedures. The economic principles that have governed rate regulation since Staggers remain valid and must continue to be followed.[198] However, the Board can improve the implementation of those economic principles to ensure that

[198] *See* Kalt V.S. ¶¶ 20-30, 111-13.

shippers will have access to rate relief if a railroad abuses its market power.[199] The Board has already begun investigating ways to improve its existing rate reasonableness tools, and the Board should continue focusing on these efforts while staying within the bounds of these sound economic principles.

A. The Board's existing regulatory tools continue to be the proper framework for regulating rates.

In response to the improving financial health of the railroad industry, Congress called upon the Board in Section 15 of the Surface Transportation Board Reauthorization Act of 2015, Pub. L. No. 114-110, 129 Stat. 2228, to conduct a study of existing rate reasonableness methodologies and to investigate whether alternative methodologies are available that are "consistent with sound economic principles." The Board commissioned InterVISTAS Consulting LLC to conduct the study, and InterVISTAS issued its report in September 2016.[200]

InterVISTAS concluded that the SAC test "has stood the test of time as a maximum rate reasonableness methodology," although the Report recognized that the complexity of SAC procedures limited its practical availability in some cases.[201] However, the Report noted that in recognition of the complexity of the Full SAC methodology, the Board has developed two simplified alternatives to SAC – the Simplified SAC methodology and the Three-Benchmark methodology – and that "shippers can achieve similar results to Full SAC under these less-costly alternatives."[202] Moreover, InterVISTAS explained that it had examined several

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[199] *Id.* ¶¶ 126-34.

[200] InterVISTAS, Surface Transportation Board, An Examination of the STB's Approach to Freight Rail Rate Regulation and Options for Simplification, Project FY 14-SB-157 (Sept. 14, 2016) ("InterVISTAS Report").

[201] InterVISTAS Report, Exec. Summary at xviii.

[202] *Id.*

alternative methodologies used in other countries and by other regulatory agencies and found that none of those approaches was a valid alternative to CMP and the basic procedures—SAC, S-SAC, and Three-Benchmark—developed to implement CMP.[203]

Similarly, Professor Kalt explains that "the foundational principles upon which current regulation rests—that competition should be relied on whenever possible and that regulation should mimic competitive outcomes as closely as possible—remain central to the continued success of the rail industry and must remain central to any policy decisions regarding revenue adequacy."[204] Professor Kalt also notes that SAC and its progeny properly embrace the three foundational regulatory principles that emerged from the objectives of Staggers: "(1) where competition is adequate, give railroads the flexibility to set their own rates, terms, conditions and service offerings so that they can better tailor their service to customers and the economy's needs; (2) maintain regulatory constraints on rates paid by shippers, but *only* where it can be shown that a railroad is market dominant (i.e., not constrained by effective competition) through a qualitative finding as to the lack of effective competitive alternatives and a quantitative finding that the rate exceeds 180% of the railroad's variable costs of service to a shipper; and (3) where a railroad's rates for particular traffic were elevated above the 180% of variable cost threshold as the result of demonstrable market dominance, establish regulated rates which mimic the rates competition would set (if it could) via application of the principles of Constrained Market Pricing (CMP)."[205]

Professor Sappington concurs that the use of CMP principles in SAC and its prodigy "approximat[e] the discipline competition would impose on railroads" and

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[203] *Id.* at 132.

[204] Kalt V.S. ¶ 33.

[205] *Id.* ¶23.

"appropriately restricts … regulation to the prices railroads charge to shippers that are deemed to lack effective competition."[206]

In short, various economic experts, including the Board's own economic consultants, have confirmed the validity of the existing economic framework for regulating rail rates under the current statute and the need for any refinements to rate regulation standards to be made within that economic framework.

B. The Board can improve access to rate relief in small shipper and small value cases through further streamlining of the Three-Benchmark approach.

In 2007, the Board adopted the current Three-Benchmark methodology—under which the reasonableness of a challenged rate is determined by examining that rate in relation to three benchmark figures—as a simplified alternative to SAC and S-SAC that nevertheless retained a foundation in CMP. *Simplified Standards for Rail Rate Cases*, EP 646 (Sub-No. 1) (STB served Sept. 5, 2007). The InterVISTAS Report examined the Three Benchmark methodology and concluded that each of the three elements of the methodology is linked to the economic principles underlying CMP and thus preserves the need to permit Ramsey-based pricing while protecting shippers from unreasonably high rates. *See* InterVISTAS Report at 47 -51. InterVISTAS expressed concern that additional simplification of the Three-Benchmark methodology, as well as the Simplified SAC approach, "risks moving the approaches further away from bedrock CMP principles." Report at xvii. However, the Board has continued to explore further simplification of the Three-Benchmark approach in Docket No. EP 665 (Sub-No. 1), and AAR believes that this exploration should continue.

Despite the concerns raised in AAR's comments in Docket No. EP 665 (Sub-No. 2) regarding the specific proposals in the ANPRM, AAR believes there is substantial

[206] Opening Comments of Norfolk Southern Railway Company, EP 722, Verified Statement of David Sappington, at 5 (filed Sept. 5, 2014).

merit in the concept of a procedure for very small cases based on the Three Benchmark methodology that would meet the Board's stated goal of ensuring that small shippers have access to the rate reasonableness process at an appropriate cost. As AAR noted in its October 21, 2019 letter to the Board members in Docket No. EP 755, the AAR's members are prepared to support a rate reasonableness process that incorporates a few basic principles:

- a comparison group approach improved by bright-line criteria;
- streamlined case administration measures;
- a reasonable, summary screening for market dominance similar to the Board's proposal in Market Dominance Streamlined Approach, Docket No. EP 756 (STB served Sept. 12, 2019), with the improvements offered by the AAR and individual members in that docket;
- measures to address the current limitations of the waybill sampling approach; and
- screening criteria that ensure small shippers have the use of this new, more accessible process.

C. The Board should also consider further streamlining of the SAC and Simplified-SAC methodology.

The Board should also focus on further refining the SAC and Simplified-SAC methodologies for larger cases. For example, the recommendation of the Task Force to use streamlined evidence on road property investment in S-SAC is conceptually on the right path by exploring simplifications to an economically sound methodology. Professor Kalt also suggests some additional measures that could be considered for further refinement of the SAC methodology.[207] In particular, Professor Kalt recommends standardizing certain "decisions on recurring issues that arise in most or all cases, but don't depend on the specific SARR, and could be applied going forward to

[207] Kalt V.S. ¶¶ 139-47.

future case," such as treatment of equity flotation and real estate acquisition costs, choice of inflation indices, treatment of taxes and bonus depreciation, and calculation issues related to DCF (*e.g.*, amortization of debt, terminal value, etc.).[208] Second, "various categories of costs … could be standardized, subject to rebuttable presumptions depending on the specific details of a case," such as G&A costs, construction costs, and ancillary facilities.[209] Third, "the use of third-party experts (paid by the parties …) on areas outside the STB's expertise (e.g. real estate valuation) could provide guidance to the Board" and limit the proceeding before the Board in various ways.[210] Fourth, the "establishment of rules and standards for the determination of traffic groups and cross-over traffic could limit the extent of the disputes over the SARR."[211] Fifth, technical conferences could also assist in resolving disputes in a more efficient manner.

Simplified SAC is another tool the Board could effectively improve. Simplified-SAC relies on the same CMP principles as Full-SAC, except for the efficiency dimension of CMP as discussed below. It also shares many elements of the Full-SAC process, although in a far simplified approach. Like Full SAC, the Simplified SAC methodology seeks to simulate rates that would exist in a contestable market, *i.e.*, a market in which the potential entry of a new rail carrier would keep rates at competitive levels. It is based on the principle that a railroad should have the freedom to set rates based on market conditions and perceived demand for service while ensuring that a challenged rate is not so high as to subsidize other traffic. The Simplified SAC methodology therefore ensures that the rates charged by a rail carrier to a group of shippers that share facilities cover the full cost of those facilities. But it protects shippers with high

[208] *Id.* ¶ 143.

[209] *Id.* ¶ 144.

[210] *Id.* ¶ 145.

[211] *Id.* ¶ 146.

demand for rail transportation from being forced to pay rates that cover the cost of other shippers' facilities. In this way, the Simplified SAC methodology addresses potential abuse of market power by ensuring that high demand shippers pay no more than necessary to cover the full cost of the service they receive. Through the internal cross-subsidy test developed in *PPL Montana, LLC v. Burlington Northern & Santa Fe Railway*, NOR 42054 (STB served Aug. 20, 2002) and *Otter Tail Power Co. v. BNSF Ry.*, NOR 42058, slip op. at 11-13 (STB served Jan. 27, 2006), the Simplified SAC test also prevents rates from being prescribed at levels that will require other shippers to cover the cost of the complaining shipper's service.

The Simplified SAC methodology accomplishes these important economic objectives through procedures that are much simpler and more straightforward than those required in a Full SAC analysis. Complainants do not need to design a hypothetical stand-alone railroad from scratch, which is a leading cause of the complexity of Full SAC analyses. This feature of Full SAC is intended to detect and remove inefficiencies in the defendant railroad's operations, but since Staggers, railroads have been able to streamline their networks and operations so that this feature is not as important as it was when the SAC test was developed. In fact, much of the complexity of Full SAC analyses is due to the complainants' frequent attempts to use this design feature of Full SAC to posit unrealistic and infeasible rail systems. Instead, Simplified-SAC assumes that the existing rail carrier has already sought to optimize the efficiency of its network and operations, and the Simplified SAC analysis therefore uses the existing facilities and operations to represent the design and operations of the hypothetical entrant. This aspect of Simplified SAC substantially reduces the cost and time to litigate a case as compared to Full-SAC. It eliminates the need for a complex operating plan and expert testimony and modeling on the feasibility of alternative operating plans.

There has not been a completed Simplified SAC analysis since the Board adopted the methodology, although the InterVISTAS Report noted that at least five cases were identified for potential use of the methodology but settled before the Board applied Simplified-SAC.[212] The lack of any completed Simplified-SAC analysis does not indicate that the methodology is flawed or inappropriate. Indeed, because the methodology is relatively straightforward, it is much easier to predict the results of a Simplified-SAC analysis than the results of a Full SAC analysis. Predictable standards promote private sector resolution of rate disputes before they reach the Board. The Board should pursue refinement of the existing approaches with a focus on small cases and not abandon the economic principles that have guided regulation since Staggers.

VII. CONCLUSION

AAR appreciates the opportunity to comment on the revenue adequacy constraint and some of the ideas described in the Task Force report. However, revenue adequacy is not a problem in need of a regulatory solution. Recent improvements in financial health are attributable to efficiency, innovation, and growth of competitive markets like intermodal traffic. Indeed, most U.S. industries routinely earn an accounting return substantially above the cost of capital. There is no reason to deny the freight railroad industry the same financial opportunities as its unregulated competitors or customers.

In any event, Congress gave the agency no authority to impose an earnings constraint, revoke bottleneck protections and long-haul rights, or resurrect Nixon-era price freezes simply because a carrier has achieved revenue adequacy, however defined. Congress plainly did not intend the prize for carrier innovation, improved

[212] *See* InterVISTAS Report at 57 (citing *William Olefins v. GTC* (NOR 42098); *BP Amoco v. Norfolk Southern* (NOR 42093); *Shell Chemical v. Norfolk Southern* (NOR 41670); *U.S. Magnesium v. Union Pacific* (NOR 42115); and *U.S. Magnesium v. Union Pacific* (NOR 42116)).

efficiency, and creation of new competitive markets to be a return to overbearing federal regulatory control.

Respectfully submitted,

/s/ Raymond Atkins

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November 26, 2019

BEFORE THE
SURFACE TRANSPORTATION BOARD

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HEARING ON RAILROAD REVENUE ADEQUACY

Docket No. EP 722

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WRITTEN TESTIMONY OF

JOSEPH P. KALT, PH.D.

NOVEMBER 26, 2019

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I. INTRODUCTION

A. WITNESS INTRODUCTION

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

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

3. I am also a senior economist with Compass Lexecon, an economics consulting firm specializing in the analysis of competition, among other areas of economics. I hold B.A., M.A., and Ph.D. degrees in economics.

4. Throughout my career, I have engaged in extensive research, teaching, and consulting on the economics of regulated markets, as well as on competition economics and policy more generally. In addition to my university teaching, I have taught on such topics in programs for working journalists, state legislators, federal administrative law judges, and business and non-profit sector leaders. Over the last 30 years, I have testified on numerous occasions before state, federal, and international courts, tribunals and commissions, as well as before the U.S. Senate and the U.S. House of Representatives, regarding the economics and policy of competition and regulated industries.

5. With regard to the railroad sector, I have provided expert testimony before the Surface Transportation Board ("STB" or "the Board") and various other federal and international tribunals on a wide range of matters, including major rail mergers, rate making and rate regulation

exemptions, competitive access policy, and a number of antitrust matters. I have also been invited on multiple occasions to provide education on the basic economics of the railroad sector and its regulation to STB members, congressional staff, and federal administrative law judges.

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

B. BACKGROUND

7. In January 2018, the Surface Transportation Board created the Rate Reform Task Force ("RRTF" or "the Task Force") and tasked it with "recommend[ing] improvements to the existing rate review processes and…propos[ing] new rate review methodologies that are more attuned to the realities of the current transportation world."[1] The Task Force submitted a report in April 2019. That report commented on multiple topics related to railroad regulation and included recommendations related to modifying the definition and application of "revenue adequacy." In this proceeding, the Board is focused specifically on analyzing and evaluating the Task Force's recommendations related to revenue adequacy and has asked for comment on those recommendations in the following areas:[2]

- **Definition of Revenue Adequacy**: The Task Force recommends that the Board create a new measure of ***long-term*** revenue adequacy that compares the average return on investment ("ROI") of an individual carrier over an entire business cycle to the rail industry average cost of capital ("COC") over that same business cycle.[3]
- **Rate Increase Constraint**: The Task Force recommends "considering a rate increase constraint for long-term revenue-adequate carriers, which would identify a point beyond which further application of differential pricing would be unwarranted."[4]

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1 Rate Reform Task Force, "Report to the Surface Transportation Board," April 25, 2019 (hereinafter "Rate Reform Report") at p. 1.

2 Surface Transportation Board, "Notice." Docket No. EP 761 (Hearing on Revenue Adequacy) and Docket No. EP 722 (Railroad Revenue Adequacy), decided September 12, 2019 (hereinafter "STB Notice") at pp. 2-3.

3 The RRTF proposes to define an entire business cycle as "the shortest period of time, not less than five years, that includes both a year in which a recession began and a year that follows a year in which a recession began" using the National Bureau of Economic Research official designation of recession dates to identify study periods. (Rate Reform Report at p. 33.)

4 STB Notice at pp. 2-3.

- **Bottleneck Changes**: The RRTF suggests eliminating so-called bottleneck protections for carriers found to be long-term revenue adequate.[5]
- **Simplified Stand-Alone Cost ("Simplified-SAC") Changes:** The RRTF proposes reinstating the simplified Road Property Investment ("RPI") analysis – i.e., using cost averages and formulas from prior SAC cases to calculate RPI – in Simplified-SAC cases for long-term revenue adequate carriers.[6]

C. ASSIGNMENT AND STATEMENT OVERVIEW

8. I have been asked by the Association of American Railroads to analyze the foregoing proposals put forth by the Board and the Task Force, and to assess whether those proposals are consistent with principles of sound economics and proper public policy. I have also been asked to provide my own recommendations for developing an economically sound measure of "revenue adequacy" and to assess whether (and how) such an economically sound measure of revenue adequacy should be incorporated into the regulatory process.

9. The remainder of this report is organized as follows. In Section II, I present a summary of my main conclusions. In Section III, I review the principles of sound regulation that have formed the foundation of successful rail regulation and that must remain central to the analysis of the recommendations being evaluated in this proceeding. In Section IV, I discuss economically sound measures of revenue adequacy and analyze the definition of long-term revenue adequacy under consideration by the Board. In Section V, I evaluate the economics of the proposed measure of long-run revenue adequacy and explain its shortcomings. In Section VI, I address why the Rate Increase Constraint and bottleneck proposals of the Task Force are inappropriate regulatory responses to long-term revenue adequacy. Section VII analyzes the economic implications of the Task Force recommendations. Finally, in Section VIII, I offer alternative recommendations aimed at improving the ability of the Board to ferret out otherwise unaddressed pockets of market power resulting in above-competitive pricing that may exist in the rail network and to regulate effectively maximum rates in such circumstances.

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[5] A "bottleneck" occurs when more than one railroad could be involved in a specific move, but either the origin or destination is exclusively served by one railroad. The portion of the move that is served by only one railroad is called the "bottleneck." Currently, carriers cannot be forced to route traffic over the non-bottleneck portion of the move unless a shipper obtains a contract for the non-bottleneck portion of the move. For a more detailed description see Rate Reform Report at pp. 39-41.

[6] STB Notice at pp. 2-3.

II. SUMMARY OF CONCLUSIONS

10. Based on my analysis of the proposals put forth by the Board and the Rate Reform Task Force, as well as my experience studying the economic impacts of regulation, generally, and of regulation in the rail industry, specifically, I find that the recommendations related to defining "long-term revenue adequacy" are not based on sound economic principles and calculations. The proposed measures of revenue adequacy are simply not capable of detecting actual over-adequate economic returns – i.e., returns that are truly in excess of a railroad's actual cost of capital – and are not capable of attributing any such putative excess returns to above-competitive pricing as a result of exercises of market power by a subject railroad. I find further that the Task Force's proposals to utilize putative determinations of returns in excess of revenue adequacy to trigger broad-based tightening of regulatory constraints on a railroad's rates, revenues, and earnings would constitute a misguided return to "old-style" rate-of-return regulation that is now discredited for its long history of distorting investment, operations, service quality, and pricing – all to the detriment of the public's interest in a dynamic and efficient transportation system and national economy.

11. Although it is necessary and prudent to review policy periodically, the continued success of the rail industry depends critically on continuing to develop policies that are grounded in sound economic principles. The economic justification for regulating prices (rates) in an industry such as railroading is found in basic principles which demonstrate that the exercise of market power – elevating prices above the levels that competition would set if competitive forces were potent enough to do so – is contrary to the public interest in a healthy and efficient economy. Straightforwardly, these principles mean that competition should be allowed to work where it is viable; and where competition is otherwise thwarted by exercises of market power that sets rates above-competitive levels, remedial rate regulation should seek to mimic competitive outcomes to the maximum extent possible. Proper evaluation of the recommendations highlighted by the Board for consideration in this proceeding must occur within this context.

12. The central principle of "mimic competition" is deeply embedded in the Board's post-Staggers Act regulatory framework of Constrained Market Pricing (CMP) and its Stand-Alone Cost (SAC) test of rate reasonableness for traffic where railroads have been shown to possess market power (dominance). Indeed, this framework is at the heart of the remarkable success of

federal rail policy in restoring railroads over the last 40 years to being valuable and critical components of the nation's transportation system. But because railroad networks inherently rest on long-lived capital facilities that, once put in place, are effectively "sunk" and incapable of readily fleeing the industry if and when economic or policy conditions turn uneconomic, they are sitting ducks for opportunistic machinations of policy by self-interested parties who see advantage in turning regulation in their private favor even at the expense of the long-run health of a carrier's network and the many others who depend on that network: Individual users of the network can privately benefit from uneconomic and distortive rate policies without, themselves, bearing the costs in the short- or long-run of deviating from the "mimic competition" principle. Accordingly, sound rail regulation properly concerns itself with promoting market-grounded rate regulation standards and ensuring that policy focuses on sustaining adequate revenues for carriers.

13. The Task Force's proposals at issue in this proceeding do not treat "revenue adequacy" as a policy admonition aimed at protecting against opportunistic threats to the economic health and sustainability of long-lived investments in the nation's railroad networks. Instead, the subject proposals would treat "revenue adequacy" as a *trigger* for imposing broad-based restrictions on a putatively revenue-adequate railroad's rates. The Task Force proposes multiple means of doing this, including using "revenue adequacy" to trigger the direct capping of rates and the indirect erosion of rates via structural changes (in particular, the elimination of so-called "bottleneck" protections). The Task Force also recommends changes to the Board's current Simplified-SAC methodology, apparently as a means to make it less expensive for shippers to obtain rate relief.

14. The use of putative findings of returns in excess of revenue adequacy (what we can call revenue "over-adequacy") as triggers for tighter regulation of railroad rates would be grossly unsound policy. This conclusion follows directly from several compelling considerations:

- First, the proposed revenue adequacy "trigger" rests on accounting measurement with known and egregious flaws. The measure of revenue adequacy endorsed by the Task Force would be based on the accounting rate of return of a railroad (based on the value of its depreciated book (accounting) capital investment) relative to its market cost of capital. There is no serious disagreement among scholars in the field that the proffered accounting rates of return are not capable of providing useful information on a firm's actual returns in the marketplace or on whether a firm's revenues are sufficient to yield investors actual economic returns that are at least equal to those investors' costs of committing capital to the firm. Accounting rates of return based on historical, depreciated book values of investment are inherently distorted by such factors as

differences between accounting depreciation and actual economic depreciation and useful lives of capital assets, as well as changes in economic conditions that readily affect the market value of capital assets over their lives.

- Second, the putative regulations would be triggered by normal and healthy events. Quantitative research finds that returns in excess of revenue adequacy ("over-adequacy") on an accounting basis are, in fact, the norm across industry after industry. Competitive markets are dynamic, and successful competitive firms often earn above long-run equilibrium rates of return, and firms rationally seek to achieve economic returns that are not just equal to, but exceed, their cost of capital. As technology changes and markets shift, firms that are particularly adept at taking advantage of these changes reap economic returns in excess of their capital costs. Such returns can be sustained over time by firms that are particularly adept at staying ahead of the curve when it comes to anticipating technology, shifts in traffic mix, changing shipper needs, and the like. In fact, this prospect is arguably the central driver of investment. The implication for us here is that, as a general matter, a finding that an industry – such as railroading – is revenue "over-adequate" on an accounting basis provides no indication of the relative health of that industry in terms of its ability to compete for the capital of investors who can commit their capital to other sectors. Nor does such a finding provide reliable information regarding the presence, location, or strength of any above-competitive pricing on a carrier's system.

- Third, the proposed measure of economic value upon which determinations of purported revenue adequacy would be based is not the true economic value of a railroad's assets – i.e., the actual value upon which investors must expect to earn at least the cost of capital if a firm is to be properly judged as revenue adequate. There is no serious disagreement among scholars of the field that economically coherent measurement of revenue adequacy (i.e., assessment of whether a firm's revenues are sufficient to yield investors actual economic returns that are at least equal to those investors' costs of committing capital to the firm) must be based on the *replacement cost* (current market value) of the capital assets that investors have committed to the firm. In fact, this economic reality is implicitly recognized and embedded in the Board's SAC tests, which are designed to determine what level of revenue is adequate in the case of specific traffic on sub-sections of a carrier's system.

- Fourth, measures of overall railroad revenue adequacy, even if made more reliable, are not capable of detecting an abuse of market power that has raised rates above competitive levels. This is a key point. Whether revenue adequacy is measured coherently or incoherently, measures of returns in excess of revenue adequacy are fundamentally incapable of attributing "excess" revenues and returns to the problem that sound regulation should address – i.e., a railroad's exercise of market power so as to raise rates above competitive levels somewhere on its system. Under both true economic "over-

adequacy" and flawed accounting "over-adequacy," the exercise of otherwise unchecked market power (and associated above-competitive rates) somewhere on a railroad's system is but one among many possible sources of putatively excess returns. These possible sources range from artifacts of accounting rules, to vacillations in economic conditions relevant to a carrier's performance, to the success of carrier-specific investments or operational innovations. Moreover, pockets of market power are inherently the product of attributes of specific service to specific customers for specific carriage. Accordingly, under policy guided by the "mimic competition" principle, there is no substitute for analyzing the reasonableness of a challenged rate at that level of specificity.

- The Task Force's proposals *presume* that revenue "over-adequacy" (according to the accounting measure of "adequacy") is the product of the exercise of market power that has raised rates and revenues above competitive (i.e., reasonable) levels . Thus, the Task Force sees returns in excess of revenue adequacy as properly triggering additional restraints on a carriers' rate-setting freedom. Not only is the Task Force's underlying presumption wholly unjustified for the reasons summarized above, but the resulting proposals for rate restraint beyond those imposed by the Board's CMP-SAC framework portend a step backward to older, discredited regulatory strategies.

- Fifth, the Task Force is resurrecting an "old-style" and discredited approach to regulation. In their economic essence, the Task Force's proposals (i.e., using measures of overall firm-wide revenues and concomitant firm-wide rates of return in excess of a firm's cost of capital to trigger limitations on rates and overall revenues) entail a regulatory framework commonly referred to as "old-style" rate-of-return regulation. Such regulation is "old-style" in the sense that it has been largely abandoned in at least developed countries because of its many distortions and inefficiencies. In particular:

    - Using putative findings of revenue adequacy to trigger tightened constraints on a firm's revenues and pricing freedom stifles innovation. This is because cost-reducing and/or quality-improving efforts that might otherwise raise revenues are rewarded with rate constraints. For similar reasons, pricing in even competitive markets can be distorted when price increases in those markets, driven by competitive market forces, push a railroad toward or past measured revenue adequacy. Under such conditions, carriers would have incentives to hold *competitive prices* at artificially low and below-competitive levels, and the proposed 'Rate Increase Constraint' ("RIC") will have thereby produced cross-subsidization of shippers in such markets. In addition, directly limiting a firm's pricing freedom so as to push revenues and the associated rate of return toward the regulator's measure of "adequate" (as under the Task Force's proposed RIC) gives firms distorted incentives to "pad" or "gold-plate" their capital asset base, since

increasing capital intensity and raising the asset base raises the level of allowable rates and revenues and reverses or avoids a determination of revenue adequacy.

- Structural changes (such as the Task Force's proposed elimination of bottleneck protection for putatively revenue adequate carriers) aimed at taking revenues away from a revenue "over-adequate" railroad portend disruption and inefficiencies across the rail network. The Task Force's bottleneck recommendation would give shippers the power to direct interchanges at bottlenecks on affected railroads' systems. As documented experience around the world has demonstrated, because a shipper rationally concerns itself with its specific traffic and transport needs rather than with conditions across a carrier's entire network, this produces operational and even investment distortions on complicated, non-linear networks subject to capacity constraints and congestion – i.e., on railroads like the U.S carriers.
- The Task Force's proposal to employ determinations of returns in excess of revenue adequacy as triggers for simplifications to the Board's SAC tests is on a better path, but the agency must tread carefully. Tying any meaningful change in regulation to an individual carrier's "revenue adequacy" would inevitably create incentives for carriers to avoid such "triggering" by making investment, operational, and/or pricing decisions of the distorted and inefficient forms described above.
- This is not to say that the Board should not be continuously looking for ways to improve its ability to ferret out pockets of unchecked market power and concomitant above-competitive pricing and streamline its rate regulation processes. What is needed is *smart simplification* which focuses on those goals, rather than on pulling back the overall revenues of supposedly revenue "over-adequate" railroads simply because they are putatively revenue "over-adequate" and *not* because the regulatory process has actually detected pockets of market power being exercised and elevating prices above competitive levels somewhere in a carrier's system. In Section VIII below, I present recommendations for smart simplification.

III. PRINCIPLES OF SOUND REGULATION

A. DESIGNING ECONOMICALLY RATIONAL RAIL REGULATION

15. The fundamental economic rationale for regulating rates and services in the railroad industry (really, in any industry) is the prospect of a rail carrier exercising market power and elevating rates above competitive levels.[7] Such concerns arise because railroading is ***generally*** subject to both barriers to entry arising because railroading is a *network* industry characterized by substantial economies of scope and scale, as well as extremely long-lived capital assets with large

[7] 49 U.S.C. § 10101.

fixed, common (i.e., shared across traffic) and sunk costs. The former can make it inefficient for multiple systems to serve certain locations, and the latter limits the ability of new entrant railroads to contest for certain traffic carried by an incumbent. Yet, ***specific*** rail service (i.e., particular routes, commodities, and/or shippers) is often subject to very potent competition from other railroads, other modes of freight transportation, or alternative geographic sourcing and location decisions available to shippers across wide swaths of their systems.

16. The combination of these two factors – the large fixed and common sunk costs across the network with long-lived capital in conjunction with varying competition across routes, commodities and shippers – makes designing economically rational rail regulation a challenge. Sound regulatory policy must recognize – and balance – both of these fundamental economic characteristics of the industry. Because all parts of a network are ultimately interconnected with all other parts of the network – and because different users of the network find themselves in highly diverse competitive and other market circumstances – it is challenging to structure economically coherent and sustainable regulation that allows competition to work where possible, but that also protects shippers against the exercise of market power and concomitant above-competitive rates where such protection is called for.

17. When policy makers leaned too heavily on system-wide, top-down rate regulation – rules that made it impossible for railroads to meet individual shipper demands, negotiate rates through private contracts with their shippers, or compete on price and service quality with other modes of transportation – the results were predictable.[8] Rate bureaus established rates that reflected "average markups" over the railroads' variable costs of service and those rates were applied to all shippers that used a specific traffic lane or shipped a specific commodity. However, rates based on these types of averages fail to account for the fact that shippers value services in very different ways and, therefore, are willing to pay very different rates. The result is that bureau-established rates were very attractive to some shippers and very unattractive to others. Shippers whose regulated rates were much less attractive than the rates offered by competing transportation

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

alternatives abandoned the railroads. Rail volumes began to shift toward the high-cost traffic that obtained a relatively good deal under the pre-Staggers rates (i.e., rates below the true cost of providing service). Left with a shrinking traffic base of largely bulky or high-cost shipments generating revenues significantly below total costs, railroads could not generate revenue adequate to cover operating costs and finance necessary long-term capital investments.

18. With much of the railroads' traffic subject to competition from other railroads, other modes of transportation, or other competitive forces (e.g., geographic and product competition), successful regulatory policy *requires* allowing railroads to price dynamically in response to changes in competitive factors. In this environment, broad-scale, top-down price regulation inevitably impedes efficient investment, operations and pricing applicable to large numbers of customers.

19. The important lesson from past railroad experience is that rate regulation must be targeted. Regulation that uses blunt instruments to impose rate constraints across wide swaths of traffic without first considering whether that traffic is subject to competitive constraints will introduce distortions that will, over the long run, contribute to the deterioration of the industry. Such policies are undoubtedly contrary to the overall public's interest in a healthy national economy.

B. ECONOMICALLY SOUND REGULATION IS THE KEY TO SUSTAINING A STABLE RAIL INDUSTRY

20. The response to the deteriorating and increasingly inoperable national rail network was the Staggers Rail Act of 1980. The overriding objective of the Staggers Act was to establish an economically rational regulatory framework that would help restore the industry to sustainable health, encourage system rationalization, and spur increased and sustainable investment while providing regulatory oversight for shippers who *truly* were subject to abuses of market power.

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

the railroad's variable costs of service to a shipper; and (3) where a railroad's rates for particular traffic were elevated above the 180% of variable cost threshold as the result of demonstrable market dominance, establish regulated rates which mimic the rates competition would set (if it could) via application of the principles of Constrained Market Pricing.

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

- Direct competition by one or more other railroads operating in the vicinity of the shipper;
- Potential competition offered by competing rail build-in (or build-out) option(s);
- Access to a competing rail carrier via a transload option;
- A shipper's ability to shift its purchases or production from (or to) a range of geographic regions that provide different rail transportation options (referred to as "geographic competition");
- A shipper's ability to use substitute products with different rail transportation alternatives (often referred to as "product competition"); and
- Intermodal competition from other modes of transportation (i.e., trucks, barges or pipelines).

23. If a shipper has no access to *any* of these forms of competition, the Staggers Act recognized that constraints on pricing freedom were warranted to protect these truly "captive" shippers. However, in designing a regulatory system that would offer this protection, the Stagger's Act also recognized that the economics of a network industry operating with high and shared fixed costs across markets of diverse competitive conditions require that railroads engage in *differential* pricing. Traffic subject to competition can be driven toward incremental cost which provides little or no contribution to the large shared and common costs of maintaining the rail network. That is, with competition faced by railroads for certain traffic unavoidably limiting the contributions which such traffic can make to recovery of the very high fixed costs of the shared network, other traffic

necessarily must provide greater contribution – in accord with the higher value that shippers place on rail service.

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

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

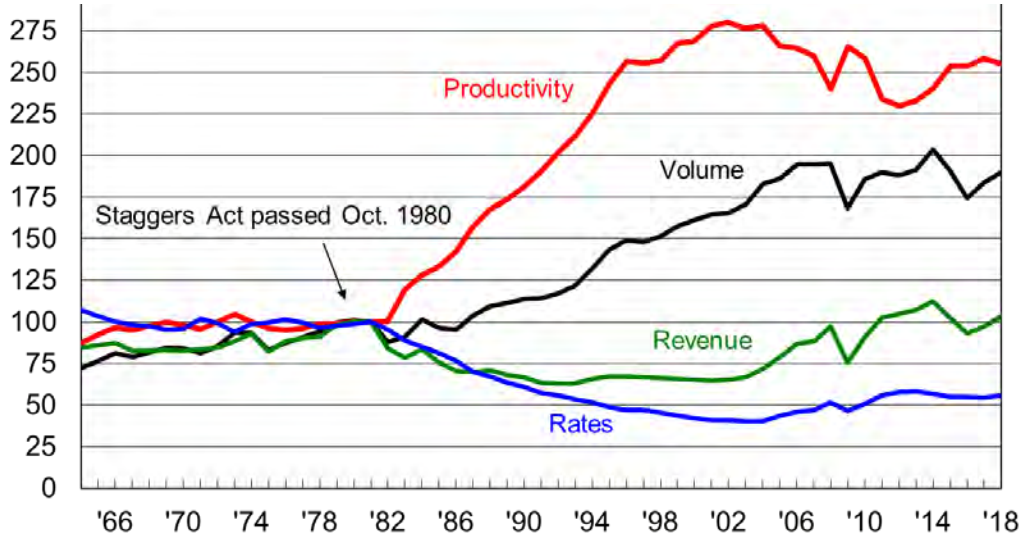
C. THE SUCCESS OF STAGGERS

26. It is difficult to find other examples of regulatory success that rival that of the Staggers Act and its implementation by the ICC and the Board.[9] Railroads have generated striking improvement

[9] For a summary, see Macher, Jeffrey T, John W. Mayo and Lee F Pinkowitz, "Revenue Adequacy: The Good, the Bad, and the Ugly," *Transportation Law Journal*, vol. 41 no. 2, 85-127 (2014) (hereinafter "Macher *et al.*") at §I. See, also, United States Senate, "Interstate Commerce Commission Sunset Act of 1995, report of the Committee on Commerce, Science, and Transportation," Washington, DC, 104-176 (1995) at p. 3 ("The Staggers Act is considered the most successful rail transportation legislation ever produced, resulting in restoration of financial health to the rail industry.").

across a range of performance metrics, including dramatically lower costs, improved productivity, and increases in private capital spending and investment. Much of the improvement has been passed through to shippers in the form of lower rates for transportation and a high-quality, more efficient, and cost-effective network.[10] This can be seen in Figure 1, which shows the changes in several measures of industry performance following passage of the Staggers Act.

Figure 1
RAIL RATES, PRODUCTIVITY, VOLUMES & REVENUE: 1964-2018
(1981=100)



"Rates" are inflation-adjusted revenue per ton-mile. "Volume" is ton-miles. "Productivity" is revenue ton-miles per constant dollar operating expense. Source: AAR

27. Some have worried that the performance reflected in Figure 1 indicates that the pendulum has swung too far: that while the consolidations and rationalizations have allowed railroads to improve performance dramatically, perhaps that improvement also signals a diminution of competition that is borne by shippers and that warrants changes in the regulatory approach to the industry.

28. While this is an important question, numerous academic studies of the rail industry have concluded that competition in the rail industry has not been eroded. By implication, this means

[10] Bitzan, John D., and Theodore E. Keeler, "The Evolution of U.S. Rail Freight Pricing in the Post-Deregulation Era: Revenues Versus Marginal Costs for Five Commodity Types," *Transportation*, vol. 41 no. 2 (2014) (hereinafter "Bitzan and Keeler"). See also Mayo, John W. and David E. M. Sappington, "Regulation in a 'Deregulated' Industry: Railroads in the Post-Staggers Era," *Review of Industrial Organization* vol. 49, 203-227 (2016) (hereinafter "Mayo and Sappington").

that improved railroad financial performance has not been achieved by exercising a greater level of railroad market power.[11] A comprehensive study concluded that, relative to a benchmark of pre-Staggers era ownership structures and policies:

> "[The] takeover waves have led to efficiency gains by decreasing the marginal costs, and this was translated into lower prices and an increase in the consumer surplus. Finally, the takeovers have led to a reallocation of assets from the less efficient firms to the most efficient firms, which improved the quality of the freight services provided."[12]

29. In other words, the Staggers framework's focus on relying on competition where possible, and mimicking competitive outcomes where regulation is necessary, is directly related to the improved industry performance that we see in Figure 1. That framework has not resulted in an overall increase in the exercise of market power by railroads. However, the Board has increasingly expressed concern about the cost to shippers of access to regulatory protections at a time of improved service and solid financial performance by the nation's railroads. In particular, the Board's current interest in how the revenue adequacy standard should be interpreted and what role revenue adequacy should play – if any – in regulating rail rates, raises issues that are complex from both an economic and a policy perspective.

D. THE ROLE OF REVENUE ADEQUACY

30. The concept of 'adequate revenue' was first incorporated into statute in the 1976 Railroad Revitalization and Regulatory Reform Act ("4R Act"). That law required that rail regulators develop "reasonable standards and procedures for the establishment of revenue levels

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[11] See, for example, Laurits R. Christensen Associates, Inc., "Analysis of Competition, Capacity, and Service Quality," Final Report vol. 2 (November 2008); Laurits R. Christensen Associates, Inc., "Analysis of Competition, Capacity, and Service Quality," Revised Final Report vol. 2 (November 2009). See also, Pittman, Russell, "Railway Mergers and Railway Alliances: Competition Issues and Lessons for Other Network Industries," *Competition and Regulation in Network Industries* vol. 10, 259-278 (2009); Coublucq, Daniel, "Demand Estimation with Selection Bias: A Dynamic Game Approach with an Application to the U.S. Railroad Industry," Düsseldorf Institute for Competition Economics Discussion Paper, no. 94 (2013) (hereinafter "Coublucq"); Ivaldi, Marc and Gerard McCullough, "Railroad Pricing and Revenue-to-Cost Margins in the Post-Staggers Era," *Railroad Economics* vol. 20, 153–78 (2007); Ivaldi, Marc and Gerard McCullough, "Welfare Tradeoffs in U.S. Rail Mergers," Toulouse School of Economics Working Paper, 10-196 (September 2010).

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

adequate…to cover total operating expenses, including depreciation and obsolescence, plus a fair, reasonable, and economic profit or return (or both) on capital employed in the business."[13] The concept remained in ensuing legislation and remains a central tenet of rail regulation, with the Board directed to:

> "[M]aintain and revise as necessary standards and procedures for establishing revenue levels for rail carriers providing transportation subject to its jurisdiction under this part that are adequate, under honest, economical, and efficient management, for the infrastructure and investment needed to meet the present and future demand for rail services and to cover total operating expenses, including depreciation and obsolescence, plus a reasonable and economic profit or return (or both) on capital employed in the business."[14]

31. It is notable that none of the legislation that references 'adequate revenues' specifically defines the term. Nor does any legislation identify any specific regulatory actions that should follow a finding of revenue adequacy. Indeed, there is no indication that the concept of 'adequate revenues' was intended as any type of ceiling on rail rates or that it was intended to be used as a trigger for constraining railroad earnings. Nevertheless, to carry out their mandate, the ICC determined that individual railroads that earned a return on investment ("ROI") equal to or greater than the cost of capital ("COC") for the rail industry as a whole would be considered to be earning 'adequate revenue' as specified in statute.[15]

32. Given the state of the rail industry at the time this metric was developed, there was very little rigorous economic analysis of whether such a measure was a robust and meaningful basis for guiding policymakers' regulatory decisions and frameworks. However, as some carriers have increasingly been found to be "revenue adequate" based on the annual ROI standard, carriers, shippers and regulators have become more focused on the regulatory implications of achieving "revenue adequacy". Those questions are at the heart of the RRTF's recommendations related to revenue adequacy.

33. We turn to examining these issues now, but note here that the foundational principles upon which current regulation rests—that competition should be relied on whenever possible and that

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[13] See Macher *et al*., referencing the Railroad Revitalization and Regulatory Reform Act § 205, 90 Stat. 41 at p. 92.

[14] 49 U.S.C. § 10704 (a)(2).

[15] See, Macher *et al*. at p. 97.

regulation should mimic competitive outcomes as closely as possible when actual competition is absent due to substantial barriers to entry—remain central to the continued success of the rail industry and must remain central to any policy decisions regarding revenue adequacy. This means that if the concept of revenue adequacy is going to be used to determine specific regulatory action it must be defined and calculated based on sound economic principles. Further, any policy measures stemming from a finding of revenue adequacy must be designed in a way that impose regulation only in instances where it can be demonstrated that rates have been elevated to above-competitive levels by the exercise of market power.

IV. ECONOMICALLY SOUND MEASUREMENT OF ADEQUATE REVENUES

A. APPROPRIATE MEASUREMENT OF REVENUE ADEQUACY

34. Revenue adequacy can be understood in terms of competitive market principles. Under competition, adequate revenues would encompass costs of efficient operations, return on the current value of invested capital, and the cost of replacing capital consumed in providing services. It is important to note that even properly conceived measures of revenue adequacy do not provide sufficient evidence on which to base a finding of above-competitive pricing resulting from the exercise of market power. While one source of true revenue "over-adequacy" (i.e., real economic returns in excess of the real economic cost of capital) can be the exercise of market power, the exercise of market power is but one of numerous potential sources of revenue "over-adequacy". Consequently, the most that a finding of revenue "over-adequacy" can justify is the need for further, competent and targeted investigation of the sources of such a finding.

35. The basic tools for isolating the exercise of market power which results in above-competitive rates as an actual source of revenue "over-adequacy" are already in the Board's toolbox. Sound policy should not use revenue "over-adequacy" to trigger, blind to the realities of competitive conditions across affected traffic, rate constraints intended to prevent the exercise of market power. Sound policy should focus on improving the Board's tools for ferreting out market power that may be raising rates above competitive levels, but that have thus far gone undetected and unchallenged

36. The economic principles of competitive markets that so deeply – and appropriately – inform the Board's regulatory framework point directly to using a *replacement cost* standard when

assessing revenue adequacy. Such a standard recognizes that under competitive market conditions a revenue adequate railroad would earn a rate of return that reflects the *current* value of the railroad's productive assets, and that current productive value under competitive conditions is the replacement cost of those assets. Indeed, in the initial proceedings that established the revenue adequacy method, the ICC recognized that valuing railroad assets at replacement cost was both economically rational and consistent with the competitive market standard that current rail rate regulation is built around.[16]

37. Measures of revenue adequacy that are based on calculated rates of return earned on the depreciated book (i.e., accounting) value of assets are grossly inconsistent with sound "mimic competition" regulation. Setting aside the well-known problems of the nominal measurement of capital and depreciation with long-lived assets in the presence of even modest inflation that are highlighted in basic economics and business textbooks,[17] a benchmark based on earnings relative to the return on depreciated historical (original cost) book value bears no relationship to competitive market outcomes.[18] Alternatively stated, the successful entrant in a contestable market would have to cover all of its operating and capital costs, and those costs would be the current costs of providing all of the system's services. These include *the cost of keeping capital in the industry rather than selling that capital and redeploying the resulting value in alternative investments elsewhere in the economy*. The older, original costs that the incumbent bore at some point in the past are simply irrelevant to pricing in the marketplace.[19]

38. Although the assets of an incumbent railroad have a depreciated book value and fewer years of useful life than the assets of a newly-built railroad, the rates an existing railroad can charge

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[16] See Verified Statement of Joseph P. Kalt and John C. Klick filed in support of "Petition of the Association of American Railroads to Institute a Rulemaking Proceeding to Adopt A Replacement Cost Methodology to Determine Railroad Revenue Adequacy," before the Surface Transportation Board, filed May 1, 2008 (hereinafter "Kalt/Klick Replacement Cost VS") at pp. 2-3 (original cite omitted).

[17] See, for example, Granof, Michael H., Philip W. Bell, and Bruce R. Neumann, *Accounting for Managers and Investors,* 2nd ed., Prentice-Hall, 1993 (hereinafter "Granof, *et al*.") at pp. 361-363.

[18] The biases and inaccuracies of "judging profitability by accounting measures" are clear and pervasive. These biases do not wash out in the long run. As a result, the comparison of net ROI (based on book values) to the cost of capital is an unreliable measure of economic profitability even in the long-run. These "textbook problems fundamentally stem from the use of historical cost and book depreciation and the concomitant failure to account for the current value (i.e., replacement cost) of long-lived assets." See, for example, Brealey, Richard A., Stewart C. Myers, and Franklin Allen, *Principles of Corporate Finance*, 11th ed., New York: McGraw-Hill/Irwin, 2011 (hereinafter "Brealey *et al*.") at pp. 307-312.

[19] Granof, *et al.* at pp. 361-365.

(and thus the revenue an existing railroad can generate) in a competitive market are dictated by the rates that are necessary to support the purchase of new rail assets. If rates fall below the level necessary to support new investment, the replacement of existing assets is discouraged and supply will fall. In a competitive market, rates will increase to the level at which investment in new assets will be encouraged, and competitive rates will settle at the level at which new supply can just cover its costs, and existing suppliers will capture these rates as well. If rates are not allowed to increase to levels that support the cost of new investment (i.e., to levels that support the cost of replacing assets) capacity is not replaced and the industry will fall into disrepair – a cycle the rail industry is all too familiar with.

39. The prices of services generated by older, depreciated assets and sold in competitive markets are not set by competitive forces at a level which yields a rate of return on the depreciated value of historical assets that is commensurate with the cost of capital. Instead, competitive markets set the prices of services produced from older assets in competition with comparable services supplied to the market by the newer assets the market calls forth in order to bring overall supply and demand into balance.

40. An analogy is helpful here.[20] Consider the owner of an older apartment building in a healthy, competitive market of thousands of competitor apartment buildings that must continue to add apartment capacity and/or replace capacity in order to keep up with demand. Suppose the older apartment building is fully depreciated according to standard accounting practices; and, for simplicity, assume the owner has no variable costs when she rents out a building. Under a depreciated book value measure of revenue adequacy, if the owner of the older apartment realizes rents of any amount that exceed *zero,* she realizes an infinite rate of return on her investment (she putatively has no capital invested any more) and is grossly revenue *over*-adequate. But clearly, competitive market forces do not push her rents to zero: The market sets her rents at the level commensurate with the level of rents needed to attract and keep enough supply in the market to meet the overall market demand.

41. Nor does the apartment owner have zero capital in the industry: The value of her building – i.e., the capital she has at stake in the industry – is the discounted value of the (competitive) rents

[20] See, also, Reply Verified Statement of Roger Brinner, PhD, Docket No. EP722, November 4, 2014 at pp. 5-6.

the market will yield her over the remaining life of her building. This is the value of the capital she has invested in the industry. The owner bears the cost – economists say "opportunity cost" – of keeping and renting out her apartment building instead of selling it for the discounted value of expected rental revenues over its remaining life (i.e., its current market value) and redeploying the value of the building in the form of investment in some other sector of the economy.

42. An economically rational owner of such an apartment building would sell and get out of the apartment rental business if she cannot earn a rate of return on the current market value (the replacement cost) of her building that is commensurate with the return she could realize by investing that value in other sectors of the economy with comparable risk. This rate of return is the owner's cost of capital. The revenues generated for the apartment building when the owner can charge competitive market rents will be just *adequate* to cover this cost of capital. This is because competitive market apartment rents settle at the level which allows the market to keep existing and newly entering investors – all of whom face the opportunity cost of putting their investments in other sectors of the economy with comparable risk – in the apartment business so as to have enough supply available in the market to satisfy consumers' overall demand for rental units.

43. Applied to the rail freight industry and presuming that policy seeks a definition of "revenue adequacy" that is consistent with the public's interest in regulation which promotes the health and efficiency of the nation's economy, these basic economics tell us that the concept of "revenue adequacy" must be understood with reference to the overriding public interest in competitive market outcomes. That is, with sound regulation guided by the standard of enabling competitive market outcomes through regulatory freedom where competition is potent and mimicking competitive outcomes where it is not, it follows that the revenues which would be generated by competitive market outcomes across a railroad's network are the competitive market's determination of adequate revenues for a firm whose performance satisfies the public's interest in a healthy national economy. Competitively determined revenues provide the firm with the incentive to chase business it can efficiently serve, and the cash flow that justifies investments in that pursuit.

44. Sustained revenues in excess of the competitive standard would be subject to limitation via the entry and pricing of rivals in a competitive setting. Conversely, inadequate revenues would be

elevated by competitive markets as rising demand in a generally growing economy pull them upward to the point at which new entrants would begin to appear and constrain them. In short, adequate revenues from the perspective of the public interest are the revenues a railroad would earn in equilibrium over the long term if it were compelled by competition to charge no more and no less than competitive rates on all of its movements.

45. The implication for revenue adequacy under a rail regulatory regime founded on the public interest principle that railroads should be able to charge rates consistent with competition is that the value of older, existing assets is derivable from the net present value of their remaining years generating competitive rates. Although existing, older assets have fewer years of useful life left, they generate the same annual revenues (when properly maintained) as do new assets in each year they are in service. Therefore, we can calculate the annual revenues an existing railroad would need to earn in any given year by asking what prices a competitive market would set. As the very underpinnings of the Board's SAC methodology teach, a competitive rail market would be free of any barriers to entry, and it would set prices at the level just sufficient to cover the costs of entrants plus a competitive rate of return on those entrants' capital (i.e., their cost of capital). This – the Board's SAC test – is a replacement cost standard.[21] That is, competitive rail markets, if they could operate as such, would set rail rates at the level needed to just cover the cost of replacing an incumbent's service with a service by a new, stand-alone railroad.

46. This, of course, is familiar territory for the Board: *Adequate* overall revenues for a railroad in a regulatory framework which sets prices through unregulated market forces where competition is potent and mimics competitive prices where competition is not potent are the revenues that would, at a minimum, cover the costs (including the cost of capital) of a System-Wide Stand-Alone Railroad – a SW-SARR – which could efficiently reproduce the service of an actual railroad were the industry subject to free entry by competitors. As recent economic research puts it:

> "[I]t is significant to note that the stand-alone cost test can validly be applied to the traffic of large groups of shippers that could, in concept, approach the totality of a carrier's operations, or its operations within one of its regions. Such a test would compare the shippers' total expenditures for their services, which are essentially the

[21] Mayo, John W. and Robert D. Willig, "Economic Foundations of 21st Century Freight Rail Rate Regulation," Macher, Jeffrey T. and John W. Mayo, eds., *U.S. Freight Rail Economics: Are We on the Right Track?,* Routledge, New York (2019), accessed at VitalSource Bookshelf, Chapter 2 (hereinafter "Mayo and Willig") at p. 50.

> total revenues of the carrier, to the total costs of an efficient hypothetical entrant providing those services. This is a test of the profitability of that entrant, and not a test of the profitability of the actual carrier based on its expended costs and booked capital stock. Here, the notion of a regulatory constraint based on "revenue adequacy" is properly interpreted as whether actual prices generate more than adequate revenues to cover the stand-alone costs of the analyzed services, no matter how extensive they are."[22]

47. I have previously set out a framework for implementation of a system-wide SAC test of revenue adequacy, grounded in the "mimic competition" framework;[23] and others have demonstrated that quite reasonable simplifying assumptions of the character already reflected in the Board's Simplified-SAC methodology make such a test procedurally feasible.[24] Here, however, let us consider the implications for rate regulation of even a properly conceived and implemented standard of "revenue adequacy". At least two dimensions of this issue warrant particular consideration. The first concerns the time period over which revenue adequacy should be considered, and the second concerns whether a finding of even properly measured revenue "over-adequacy" would provide a reliable guide for regulation aimed at ferreting out and limiting the exercise of market power that raises rates above the CMP "mimic" competition standard.

B. "REVENUE ADEQUACY" IS A LONG-RUN CONCEPT, AND ITS RELEVANCE IS FORWARD-LOOKING

48. From the perspective of sustaining the health of an industry whose long-lived and sunk capital make it a potential target for self-interested parties seeking to use regulation for their private benefit, revenue adequacy must be employed as a fundamentally long-term and forward-looking concept. Revenues adequate to support "the infrastructure and investment needed to meet the present and future demand" inherently reflect the amount and timing of expected revenues over the life of the investments. At a minimum, in competitive markets these revenues must reflect the costs of replacing the capital services currently being provided. From the perspective of the

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22 Mayo and Willig at p. 50.

23 Verified Statement of Joseph P. Kalt, Docket No. 722, September 5, 2014 (hereinafter "Kalt VS") and Reply Verified Statement of Joseph P. Kalt, Docket No. 722, November 4, 2014. See, also, Kalt/Klick Replacement Cost VS.

24 Verified Statement of Michael R. Baranowski, *Petition of the Association of American Railroads to Institute a Rulemaking to Adopt a Replacement Cost Methodology to Determine Railroad Revenue Adequacy*, Surface Transportation Board, May 1, 2008.

investor considering committing the resources needed to sustain and/or expand the capital required to provide rail service, the stream of expected current *and future* returns must equal or exceed the value of the current capital that would be committed.

49. The period of commitment of capital in the rail industry is especially long and significant.[25] Railroads are among the most capital intensive of industries. And the capital used by railroads is among the most long-lived among various industrial and transportation sectors with which railroads compete for capital.[26] As such, from an investor's perspective, the issue of revenue adequacy depends on the aggregate level and pattern of revenue earned over the life of the assets.

50. While under competition firms expect when investing to be at least revenue adequate in aggregate over the life of their investments, in any given year revenues can readily deviate from adequate levels as a result of shorter-term changes in demand, macroeconomic conditions, and competitive forces. With the need to sink capital for long periods in the rail industry, however, the investor can accept some periods of revenue below adequate levels if revenue above adequate levels can be expected to be earned in other periods. As such, a single-year snapshot of whether a railroad is revenue adequate, even under the appropriate replacement cost standard, can provide a misleading view into the financial well-being of a railroad.

51. An economically coherent measure of revenue adequacy for railroads requires revenue information currently available, and thus the determination of revenue adequacy of a railroad is inherently backward-looking with respect to the actual performance and revenues earned by the railroad. The Task Force and the Board are properly focused on the importance of measuring revenue adequacy over the course of (at least) an entire business cycle. It would not be proper to conclude that a single year in which net operating income exceeded the annual SAC revenue requirement is itself indicative of actual revenue "over-adequacy" since the long lives of rail equipment mean that revenue adequacy is inherently a long-term notion. Much less would a single

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[25] Verified Statement of Roger Brinner, Docket No. 722, September 5, 2014 (hereinafter "Brinner VS") at pp. 18-20.

[26] For use in calculating gross domestic product and the national income accounts, the Bureau of Economic Analysis uses economic lifetimes of 28 years for railroad equipment, 38 years for replacement track, and 54 years for other railroad structures. No other industrial industry or activity has longer-lived structures, and only electrical transmission and distribution has longer-lived equipment. *BEA Depreciation Estimates, Service Lives, and Declining Balance Rates.* U.S. Department of Commerce, Bureau of Economic Analysis, at https://apps.bea.gov/scb/account_articles/national/0597niw/tablea.htm.

year of putative "over-adequacy" indicate supra-competitive pricing that should trigger more regulatory intervention.

52. While a full business cycle captures some of the temporal variation in demand for rail services, other significant changes need not follow the business cycle. For example, swings in demand for coal transportation or crude-by-rail can have significant effects on rail revenue and profitability that may be unrelated to the business cycle. More significantly, rail assets tend to be very long-lived, so a business cycle will typically capture only a small portion of the returns over the life of these investments.

53. Given fluctuations in demand and the long-life of rail assets, the Task Force's recommendation of "the shortest period of time, not less than five years, that includes both a year in which a recession began and a year that follows a year in which a recession began" is likely to be too short to reflect the economic circumstances relevant to the decisions to continue to invest or withdraw capital from the industry. It is important to be sure to include the "bust" portions of boom-and-bust swings in rail freight demand, as the Task Force recommendations do, but the five-year period is likely to lead to jumps in measured revenue adequacy that are not reflective of the current or forward-looking condition of the rail industry. As such, a minimum of ten years would be consistent with the Board's ten-year Discounted Cash Flow (DCF) analysis in Stand-Alone Cost analyses. With inclusion of a full recession and recovery cycle in revenue adequacy calculations, such calculations would appropriately approximate a long-term concept of revenue adequacy. This recommendation reflects a tradeoff between the long lives of rail assets and the need to use more current information in evaluating the economic circumstances of the rail industry. In conjunction with a replacement-cost standard, this period is likely to provide a reliable and stable measure of the long-term revenue adequacy of the rail industry.

54. In addition, some flexibility is required for interpreting and applying the results of any long-term revenue adequacy calculation. Depending on the purpose to which the revenue adequacy measure is to be put, a demonstration that the current and near-term economic circumstances have changed substantially from those indicated by the long-term measure may be required. For example, sudden large and sustained shifts in demand, due to, for example, recession, changes in coal or crude-by-rail or other competitive forces due to technological change—such as widespread adoption of autonomous trucking, could make the long-term revenue

adequacy a misleading measure of current and near-term conditions. Then, too, vacillations in the interest rate policies of the Federal Reserve can directly affect the cost of capital in the revenue adequacy calculation, and indirectly – albeit, powerfully – affect macroeconomic movements in the economy. To the extent the revenue adequacy measure serves as a trigger for more intrusive regulation, rather than a gauge of the financial status of the industry, then I recommend that the applicability of a finding of long-term revenue adequacy be rebuttable based on substantial changes in conditions relative to the calculation period.

C. MEASURED "REVENUE ADEQUACY" DOES NOT DEMONSTRATE THAT ANY SPECIFIC RATES HAVE BEEN ELEVATED ABOVE COMPETITIVE LEVELS BY THE EXERCISE OF MARKET POWER

55. There are important limitations on the conclusions that can be drawn from a practical implementation of an appropriately designed measure of revenue adequacy. Even if a railroad is found to be revenue "over-adequate" – that is, earning revenues for a period of time greater than a long-term, replacement-cost revenue adequacy calculation of adequate revenues – it does not necessarily follow that the railroad is exercising market power and has been charging above-competitive rates.

56. A finding that a railroad is earning an "excessive" rate of return (relative to its current cost of capital) is not a demonstration that the firm is thereby earning supra-competitive profits through the any exercises of market power that have resulted in supra-competitive rates. When revenue adequacy is measured based upon depreciated accounting costs, this principle is clear from the example above of the older apartment building in an otherwise competitive apartment rental market. The nearly fully depreciated apartment building would show "excess returns" on its depreciated original book cost of capital regardless of whether the rents charged (over some range) were at, above, or below the competitive market's rental rates.

57. The infirmities of using accounting profitability and rates of return to infer that market power has raised prices and resulted in above-competitive returns, particularly for capital industries like railroading with long-lived equipment, are well-known. As starkly summarized by the classic treatment of the issue, "there is no way in which one can look at accounting rates of

return and infer anything about relative economic profitability or, a fortiori, about the presence or absence of monopoly profits."[27]

58. Even if revenue adequacy were properly measured, a finding that rates of return were in "excess" of an incumbent firm's cost of capital on a system-wide basis would not necessarily indicate an abuse of market power. The appropriate revenue adequacy benchmark mimics what are long-run equilibrium competitive returns and revenues. With even a sound replacement cost measure of revenue adequacy, the practicalities of measurement would entail time horizons differing from the useful economic lives of key railroad assets, as well as *ex* post assessment.

59. Even with relatively stable competitive market conditions, one would expect to see returns at certain points in time that would be above or below the long-run equilibrium, because of fluctuations in demand and cost conditions around the long-run equilibrium. Thus, observed returns for a railroad in excess of the long-run equilibrium competitive level for some period, even if properly measured, would not be a demonstration that the railroad is in fact earning supra-competitive returns on its investments, much less that the returns it has been earning have been elevated by abuses of market power which have resulted in above-competitive rates. The ICC recognized that attempting to limit returns so as not to exceed the competitive benchmark return would, in fact, deprive railroads of the ability to realize a competitive return on its investments. This type of rate "cap" would preclude railroads from obtaining overall adequate long-term revenues as the railroads would bear the burden of shortfalls around long-run returns without the compensatory upside benefits.[28]

60. Competitive markets are dynamic, and successful competitive firms often earn above long-run equilibrium rates of return. Firms seek to achieve economic returns that do not just equal but exceed their cost of capital. As technology changes and markets shift, firms that are particularly adept at taking advantage of these changes reap economic returns in excess of their capital costs. Firms that are particularly adept at staying ahead of the curve when it comes to anticipating

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[27] Fisher, Franklin M., and John J. McGowan, "On the Misuse of Accounting Rates of Return to Infer Monopoly Profits," *American Economic Review*, vol. 73 no. 1, 82-97 (1983) (hereinafter "Fisher and McGowan") at p. 90.

[28] Standards for Railroad Revenue Adequacy, Ex Parte No. 393, 364 I.C.C. 803, March 26, 1981. See also, Verified Statement of David Sappington, Docket No. 722, September 5, 2014 (hereinafter "Sappington VS").

technology, shifts in traffic mix, changing shipper needs, etc., can sustain rates of return in excess of their costs of capital and ahead of the returns and revenue required by a static SW-SARR.

61. In competitive markets, the prospect of successfully out-earning one's cost of capital drives innovation and investment. As in other industries, competitive revenue adequacy is necessary to provide incentives for railroads to invest in efficient capacity expansion and system replenishment, to pursue cost-saving innovations, and to respond to the opportunities presented by emerging market developments. Moreover, in real-world competitive markets, an incumbent firm which is particularly efficient in its operations, its ability to anticipate customer needs, and/or its implementation of technologic innovations will have its overall revenues constrained and set by such competition. Even so, such firms will nevertheless realize what economics refers to as "efficiency rents," which leave it with rates of return on its capital investment at particular times (including periods during which revenue adequacy might be measured) which exceed its cost of capital. It is sound economic policy to maintain incentives for railroads to try to earn returns in excess of their cost of capital. Accordingly, "revenue adequacy" is appropriately a long-term and forward-looking concept.

62. As I discuss in more detail below in addressing the Task Force recommendations, calculations based on accounting costs and ROI-to-COC comparisons, rather than replacement/stand-alone cost principles, will frequently find business enterprises earning above-adequate revenues in the absence of an exercise of market power. As we have seen, accounting-based measures are fundamentally inappropriate and unreliable methods for identifying either true revenue adequacy in a mimic-competition regulatory regime or the exercise of market power in pricing. Moreover, as I have noted, in practice, firms with advantages in cost, technology, brand reputation, and management can sustain above-normal accounting profits for extended periods of time that reflect this firm-specific advantages and efficiencies.

63. More fundamentally, in a capital-intensive, multi-product network industry like rail, where most of the diverse traffic served is subject to effective competition, the issue of the existence and extent of specific prices inconsistent with the CMP competitive benchmark does not require that the railroad overall be revenue over-adequate. The imposition of regulatory pricing restrictions based on a finding of revenue adequacy – without any further investigation as to the sources of the revenue adequacy and without any demonstration that the actual exercise of market power has

raised rates above competitive levels for specific traffic – would be unjustified and inconsistent with sound policy. However, because market power is one potential source of above-competitive pricing and underlying revenue over-adequacy, if a railroad turned out to be truly revenue over-adequate under an economically coherent, long-run, replacement cost measure of revenue adequacy, it would be important for shippers and regulators to have viable tools available to investigate the source of such "over-adequacy." Indeed, even if a carrier were not revenue adequate, such tools would be important to have. I offer recommendations for some such tools in Section VIII, but in the following two sections I turn to the analyzing the specific proposals identified by the Board.

V. THE PROPOSED LONG-RUN REVENUE ADEQUACY METRIC IS NOT BASED ON SOUND ECONOMIC PRINCIPLES AND IS NOT A RELIABLE INDICATOR OF MARKET POWER THAT HAS RAISED RATES ABOVE COMPETITIVE LEVELS

64. The Board seeks comment on the Task Force proposal to assess long-term revenue adequacy by comparing the average ROI (calculated based on depreciated book accounting costs) of an individual carrier over an entire business cycle to the rail industry average COC over that same business cycle.[29] Per the Task Force recommendation, carriers whose long-term ROI exceed the industry long-term COC over the historical period would be deemed revenue adequate. A finding of long-term revenue adequacy would then be interpreted by the Board as evidence of above-competitive rates resulting from the exercise of market power by a carrier and as an indicator that regulatory intervention is warranted.

65. This proposal is fundamentally flawed for several important reasons. In this section, I focus on identifying the flaws in the proposed calculation and demonstrate that the ROI approach – based as it is on accounting, rather than true economic, costs – is an unreliable method for identifying above-competitive pricing resulting from market power and associated anticompetitive practices. In the next section, I address the proposed regulatory interventions that the Board is considering.

[29] The RRTF proposes to define an entire business cycle as "the shortest period of time, not less than five years, that includes both a year in which a recession began and a year that follows a year in which a recession began" using the National Bureau of Economic Research official designation of recession dates to identify study periods. (Rate Reform Report at p. 33.)

A. A REVENUE ADEQUACY MEASURE BASED ON ACCOUNTING RETURNS ON INVESTMENT CANNOT RELIABLY IDENTIFY REVENUE ADEQUACY

66. In light of the economics discussed above in connection with the example of a fully depreciated apartment building that still has actual economic value, it hardly requires reiteration that revenue adequacy measures based on accounting returns on investment cannot reliably identify actual revenue adequacy. Defining and measuring revenue adequacy based on quantification of accounting measures of the depreciated, historical book value of assets are conceptually misguided and, ultimately, contrary to the public's interest in competitive market outcomes and regulation which yields or mimics those outcomes.

67. In practice, there are at least two major problems with use of accounting values to infer economic returns. First, the depreciated book value of the assets based on historical investment costs likely grossly understates the current competitive market value or replacement cost of these assets. Historical book accounting does not adjust for the effect of inflation on the value of long-lived capital goods. And railroad assets are especially long-lived. The price of rail equipment, parts, and construction twenty, thirty (or more) years ago can be a fraction of the current competitive market value. For example, while the remaining life of a 25-year-old railcar will be less than a new one, the competitive value the market places on the use of that railcar is influenced by the current cost of providing additional, new railcar capacity. The effect of asset price inflation is not reflected in the measure of assets on which returns are calculated. This has been shown to have a very large impact on estimated rates of return in the rail industry.[30]

68. Second, under the Board's current annual determination of "revenue adequacy", the size of a railroad's asset base on which returns are required is reduced by the accounting measure of deferred taxes. Deferred taxes represent the accumulated difference in taxes calculated under tax versus book accounting rules. For railroads, this difference arises primarily from differences between book and tax depreciation and the amounts are large: the asset base "financed" by deferred taxes in 2018 exceeded $41 billion, or more than a quarter the investment base used by the Board in determining revenue adequacy.[31] To the extent railroads continue to invest at the

[30] Brinner VS at pp. 18-20.

[31] Surface Transportation Board, Docket No. EP 552 (Sub-No. 23) Railroad Revenue Adequacy—2018 Determination, decided September 4, 2019.

same level, this cumulative difference is effectively deferred long term. Current practice in effect assumes that investors expect no return on assets "financed" by deferred taxes. But such an assumption provides no incentive to the investors to keep those assets deployed in the rail industry. They have the incentive to, and would be better off, re-deploying that capital in industries where they could earn their cost of capital. It is therefore rational that investors expect to earn a return on deferred taxes, and such expectations are reflected in the market-based determinations of the cost of equity used by the STB. Therefore, the STB's exclusion of deferred taxes overstates the attractiveness of railroad industry investments.

69. Under the economically appropriate replacement cost/system-wide standalone cost approach, the appropriate concept for economic depreciation is the change in the net present value of the future earnings stream from the asset. As I previously showed, a replacement cost revenue adequacy evaluation can be done by comparing a modified net railway operating income ("NROI") to the required revenue under replacement cost or by comparing the rate of return based on the modified NROI to the capital costs.[32] Similarly, NROI can be modified by accounting for the economic depreciation associated with the asset as well as the associated change in net present value associated with the tax shields provided by the asset. Consistent with the use of economic depreciation based on change in the net present value of the asset associated with replacement cost, actual cash flows for taxes, rather than the "book" taxes and elimination of the reduction in net investment by deferred taxes provides a more economically consistent measure of NROI.

B. A Revenue Adequacy Measure Based on Accounting Returns on Investment and Cost of Capital Cannot Demonstrate Non-Competitive Pricing

70. The exercise of market power and concomitant above-competitive rates somewhere in a railroad's system is hardly the only reason why accounting-based measures of revenue adequacy can imply real economic returns in excess of the real economic cost of capital (i.e., "over-adequacy"). Thus, revenue adequacy calculated on the RRTF's proposed measures cannot identify above-competitive rail rates and fail to provide any coherent rationale for using findings of putative revenue "over-adequacy" as triggers for rate constraints of the type being considered by the Board. The ROI component of the proposed revenue adequacy metric can readily deviate substantially

[32] Kalt/Klick Replacement Cost VS at pp. 22-23.

and persistently from economically meaningful measures of economic income; and, as discussed above, can do so for any number of reasons.

71. Accounting ROI is calculated as the NROI divided by net book investment—net railroad assets less deferred taxes. Both of these measures utilize information on historical book values and accounting measures of taxes, rather than economic measures arising from replacement costs. Net investment is calculated based on net depreciated historical book value (an accounting measure equal to original historical cost less accumulated depreciation on that historical cost) rather than the current replacement cost of a railroad's productive assets (an economic measure). Net investment also excludes deferred taxes, an accounting device to reconcile actual taxes with 'book' taxes.[33] Similarly, NROI generally uses straight-line depreciation based on historical cost and associated book tax deductions. Neither the NROI or net investment is consistent with economically appropriate measures of income and investment based on replacement costs.

72. Much like in our apartment house example above, under the ROI method, it is possible to generate extremely high rates of return in situations where a railroad's assets are substantially or fully depreciated. Any positive income on an asset base that is nearly or fully depreciated will generate the appearance of very high rates of return, unrelated to the competitive conditions in the industry. It bears repeating, that "there is no way in which one can look at accounting rates of return and infer anything about relative economic profitability or, a fortiori, about the presence or absence of monopoly profits."[34]

C. SOUND INVESTMENT POLICY IN COMPETITIVE MARKETS IMPLIES THAT THE AVERAGE INVESTMENT HAS AN ROI GREATER THAN THE COC

73. In general, the optimal investment rule for firms is to invest in projects that have a positive expected net present value – the expected cash flow, discounted at the appropriate risk-adjusted rate, is greater than zero. "Given that the goal of financial management is to increase share value, our discussion in this section leads us to the *net present value rule*: An investment should be

[33] In general, the primary component of deferred taxes –the accumulated difference between taxes actually paid and taxes assumed to be paid under book accounting treatment – arises from differences between depreciation schedules used for calculating actual taxes and for accounting purposes.

[34] Fisher and McGowan at p. 90.

accepted if the net present value is positive and rejected if it is negative."[35] This investment rule demonstrates that value is created by investing in projects in which the return exceeds, not merely equals, the cost of capital. Equivalently, the expected economic return on investment is greater than the cost of capital. Indeed, failing to invest in positive net present value projects – ROI greater than COC – implies that no value has been created from investment activity. Thus, on average, sound financial management implies that the expected return on investment will *exceed* the cost of capital, even for firms without market power.

74. Investors and managers seek out positive net present value investments in order to create value and exploit inframarginal investment opportunities.[36] This occurs in competitive industries as companies take advantage of firm-specific competitive advantages arising from the position in the market and firm capabilities. In long-run equilibrium, competition tends to drive down such positive returns in excess of COC. However, industries are rarely in long-run equilibrium and a combination of firm strategy and comparative advantages, along with changing market circumstances provide opportunities for positive net present value (ROI > COC) investments. For example, the rapid development of new oil fields and limited pipeline capacity provide opportunities for railroads to utilize their existing strategic advantages (in terms of the existing rail transportation network) and ongoing investment in capacity to serve new markets. Similarly, some firms are able to identify and maintain strategies and comparative advantages relative to their competitors that provide for ongoing positive investment returns.[37]. As shown below, firms earning returns on investment in excess of the cost of capital for extended periods is a common and expected occurrence even in industries that are highly competitive.

75. Improvements in ROI that move a carrier into "revenue adequate" territory may be driven by these types of positive net present value, pro-competitive investments and behavior -- cost reductions, productivity improvements, and innovation to serve existing markets better or expand to new markets. For example, a change in operations that reduces the cost of providing rail service

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[35] Ross, Stephen A, Randolph W. Westerfield and Bradford D. Jordan, *Essentials of Corporate Finance*, 5th ed., McGraw-Hill Irwin, 2007 at p. 228.

[36] Brealey *et al*. at Chapter 11.

[37] Brealey *et al*. at Chapter 11.

on competitive traffic that is not matched by competitors will provide additional income that raises ROI, possibly to a level that would now make the railroad "revenue adequate".

76. Rather than an indication of anticompetitive conduct, a movement into a state of even properly-measured "revenue adequacy" may represent the signal to expand capacity in the face of competition. In the case of an innovation in operations that lowers costs (and raises income), the reduced costs act as a signal to attract additional business that previously was met by competitors or that was not previously viable at the higher cost levels. The presence of positive net present value investment opportunities—for example, to debottleneck or expand terminals or loading facilities—represents signals for pro-competitive expansion of capacity or improvements in service. Indeed, absent the opportunity and expectation to earn above the COC on these investments, such pro-competitive actions and investments would not be undertaken.

77. These issues make it clear that blunt accounting-based ROI measures, even if measured over the long-term, do not provide regulators with sufficient information to determine whether improvements are being driven by purely accounting conventions, by pro-competitive behavior (which is desirable and requires no regulatory intervention), or by above-competitive rail rates resulting from exercises of market power somewhere in a carrier's system (which could warrant a regulatory response).

D. EARNING RETURNS ON INVESTMENT THAT EXCEED COST OF CAPITAL IS A NORMAL AND EXPECTED OUTCOME IN COMPETITIVE INDUSTRIES

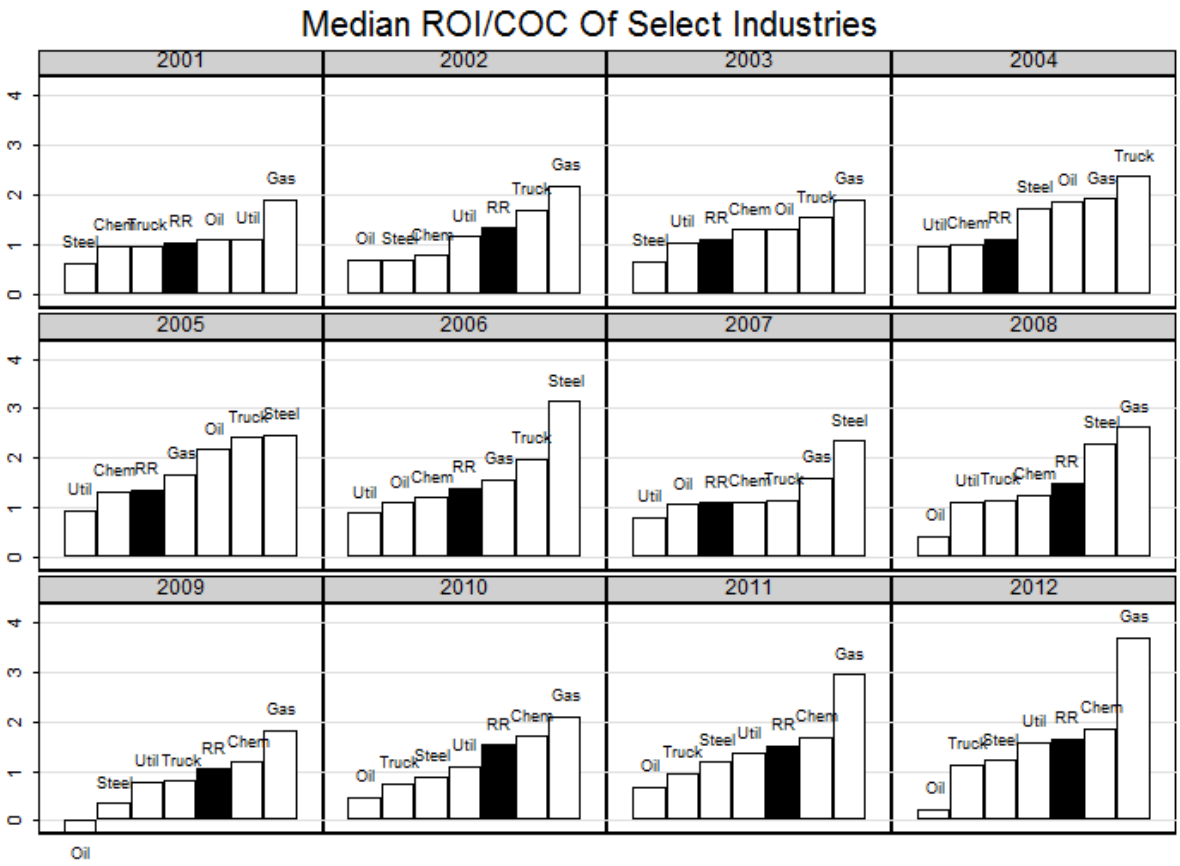
78. Recent research confirms that levels of "revenue adequacy" and "revenue over-adequacy," as measured by ROI/COC, are not unusual at all in the economy. Indeed, the ratio of ROI to COC typically can be well over one in industries widely and properly regarded as competitive. Such results are consistent with the analysis above on the economics of investment and capital allocation.

79. For example, Macher, *et al*. compare annual Class I railroad ROI/COC ratios to the ROI/COC ratios of a group of "comparable" industries (as defined by the General Accounting Office).[38] Their results, reproduced in Figure 2 below, show that the railroad industry's

[38] The GAO conducted a study of railroad revenues and alternative methods to measure railroad revenue adequacy in 1986. As part of that study, the GAO identified a group of "comparable" industries that included: trucking, electrical utilities, natural gas, pipelines, steel, industrial chemicals and synthetics, and oil and gas.

performance has been wholly consistent with other comparable industries. The authors find that "while generally improving over 2001-2012, rail industry revenue adequacy ratios are otherwise indistinguishable relative to the comparison set."[39]

Figure 2



Source: Macher, *et al.* at Figure 3.

80. Macher, *et al*. also compare railroad revenue adequacy measures (ROI/COC ratios) to a wider set of 1,720 industrial, publicly-traded, non-financial firms in the U.S. The authors report findings that are relevant here:

- Across all firms in their study, median revenue adequacy measures (i.e., ROI/COC) are greater than 1, indicating that "median firms across industries routinely and typically realize "revenue adequacy;"[40]

[39] Macher *et al.* at p. 108.

[40] Macher *et al*. at p. 109.

- They also find that "realized revenue adequacy values across Class I railroads…fall well within the 25th-75th percentile range every year against the comparison set…and are in no sense outliers." [41]
- Finally, they conclude that "if the revenue adequacy of the rail industry is put into the larger perspective of revenue adequacy relative to the broader set of firms operating in the U.S. economy over the past dozen years, there is little to distinguish its performance."[42]

81. From this, Macher *et. al.* conclude that "the analysis provides no support for the proposition that rail industry's revenue adequacy realizations are unusual or excessive."[43] This analysis also rejects the view that "revenue adequacy" (based on ROI/COC ratios) demonstrates the exercise of market power or above-competitive pricing.

82. In another analysis, Macher, *et al*. compare Class I revenue adequacy measures to the same measures for "specific well-known firms operating in four different and highly competitive markets: Coca-Cola…, Ford…, Johnson & Johnson…, and Walmart."[44] The analysis demonstrates that the ROI/COC ratios for Coca-Cola and Johnson & Johnson are "significantly above unity" and are "extremely high" relative to the "revenue adequacy" standard (i.e., ROI/COC = 1) and to measures of railroad ROI/COC.[45] Yet these extremely high measures of revenue adequacy "are of no immediate public policy concern."[46]

83. In the same analysis, Macher, *et al*. found that Walmart was "revenue adequate" for all twelve years they examined, with ratios that ranged from 1.07-1.66.[47] At the same time, Ford fluctuated above and below the threshold, with "adequate" revenue in some years and "inadequate"

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41 Macher *et al*. at p. 109.

42 Macher *et al*. at p. 109.

43 Macher *et al*. at p. 109.

44 Macher *et al*. at p. 110.

45 Macher *et al*. at p. 110.

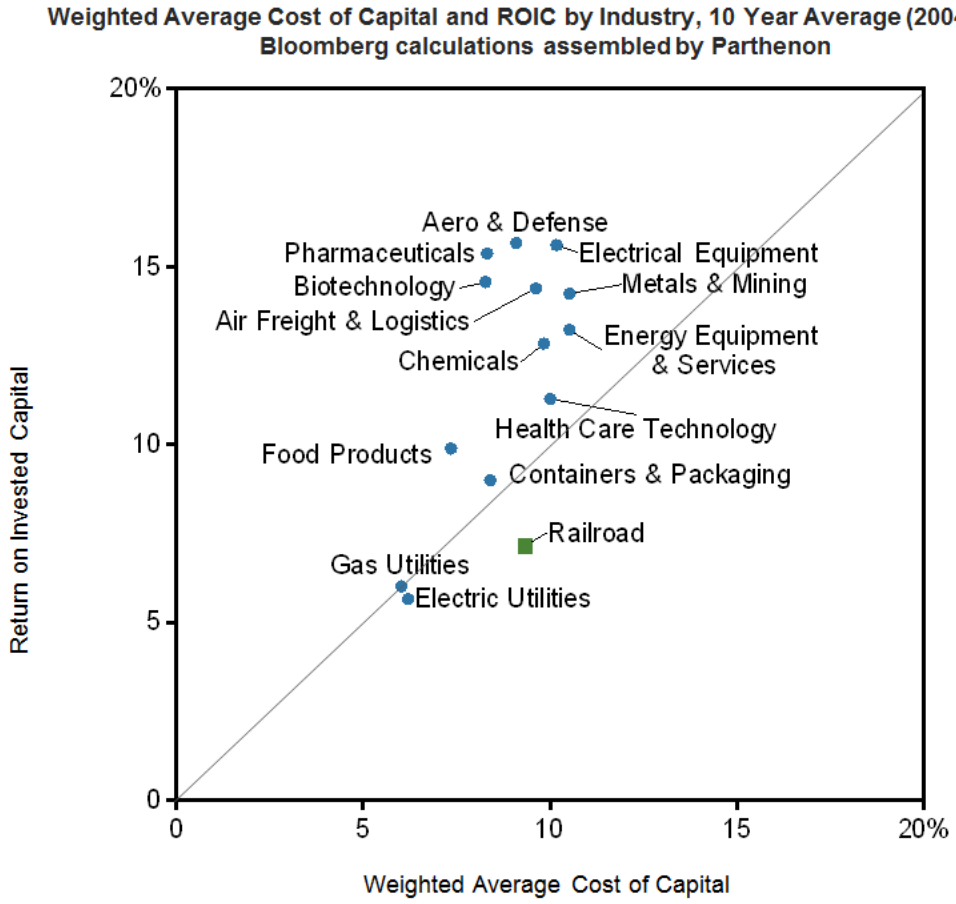
46 Macher *et al*. at p. 110.

47 Clearly a long-term measure of revenue adequacy (based on ROI and COC) would show that Walmart is highly revenue adequate.

revenues in others. As summarized by the authors, "[F]irms operating in highly competitive segments of the economy can realize revenue adequacy metrics above and below unity."[48]

84. Previous research confirms these results. For example, in previous reports on revenue adequacy, using somewhat different data and methods, and based on longer-term (10-year) averages, the industry weighted-average ROIs were greater than weighted-average COCs for industries with comparable COC rates.[49] (See Figure 3.)

Figure 3



Note: Bloomberg calculations are a total annual invested capital weighted average of S&P 500 companies within the industry during 2014
Source: Parthenon using Bloomberg data

Source: Brinner VS at Exhibit 2.

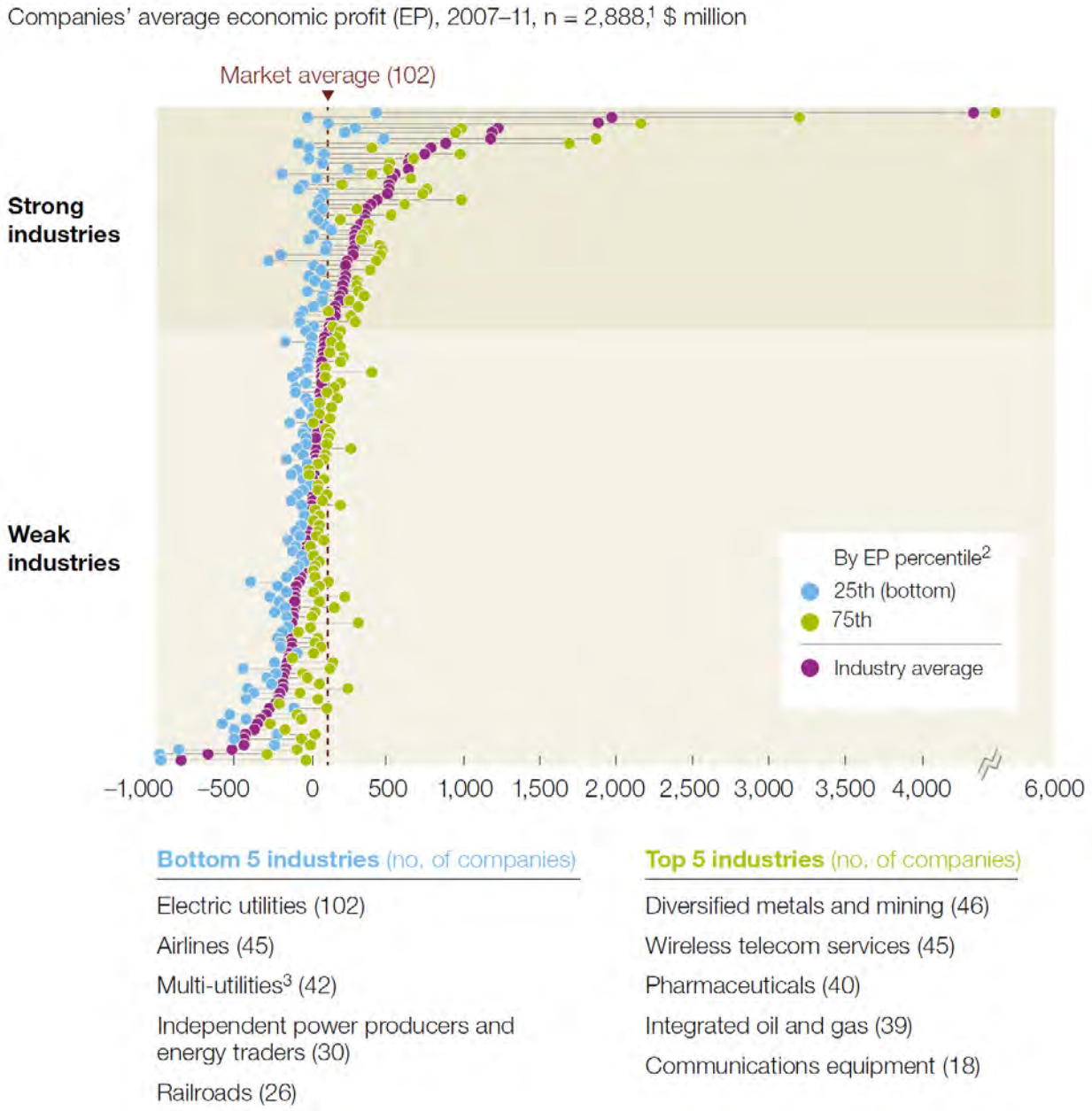
[48] Macher *et al*. at p. 110.

[49] See Brinner VS at p. 13.

85. Using a complementary methodology, a McKinsey study looking at the performance of 3,000 non-financial companies over the period 2007-2011 found similar results.[50] The firms in the top two quintiles all had ROI > COC, and the firms in the top quintile substantially so. As shown in Figure 4, the distribution of firms' profitability is fundamentally "bell-shaped" around putative revenue "adequacy" (ROI = COC) with large numbers of industries and individual firms spread over the range. (See Figure 4.) Indeed, the "market average" in this study finds the average company across many industries typically to be more than "revenue adequate" over the five-year period.

[50] Bradley, Chris, Angus Dawson, and Sven Smit, "The strategic yardstick you can't afford to ignore," *McKinsey Quarterly* (October 2013) (hereinafter "Bradley *et al."*). This study looks at firms and industry based on a measure of "Economic Profit." Economic Profit equals ROI minus COC times capital invested. Brealey *et al*. at p. 306. Thus, a firm with zero Economic Profit would have ROI equal to COC. Positive Economic Profit is equivalent to being revenue over-adequate.

Figure 4
Distribution of Company Profit with Industry



Source: Bradley *et al*. at Figure 7.
Note: Economic Profit equal zero corresponds to ROI equal COC.

86. While the high-performing firms tended to regress toward the average over longer periods (up to 14 years in the study), these differences persisted. Overall, the authors find that, on average, industry explained 40% of the differences in outcomes versus 60% for individual company

effects.[51] Moreover, increased returns over the cost of capital also creates a virtuous cycle of increased investment. The authors observe that top-quintile companies (earning returns substantially above the ROIC) attract "a disproportionate share of investment" and invested "2.6 times more fresh capital than bottom-quintile businesses did over the subsequent decade."[52] In short, this approach confirms that long-term revenue adequacy and over-adequacy are widespread in the economy and not indicative of the exercise of market power.

87. The evidence is overwhelming. If revenue adequacy is based on ROI being greater or equal to COC (even measured over longer time horizons), revenue adequacy is a widespread, normal and expected outcome in the economy. Revenue adequacy and over-adequacy based on long-term comparisons of ROI to COC do not indicate the existence of above-competitive rail rates resulting from exercises of market power.

VI. USING REVENUE ADEQUACY AS A TRIGGER FOR GENERALIZED RATE CONSTRAINTS IS INCONSISTENT WITH SOUND "MIMIC COMPETTITION" REGULATORY POLICY

88. Beyond questions of the proper use and interpretation of measures of revenue adequacy, the Board also seeks comments on several policy recommendations that the Task Force included in their report. These include the recommendations that: (a) long-term revenue adequate railroads be subjected to a Rate Increase Constraint, (b) bottleneck protections be suspended for long-term revenue adequate railroads; and (c) simplifications to the Simplified-SAC process be reinstated for long-term revenue adequate railroads.

89. While it is important to consider the regulatory implications of a finding of revenue adequacy, it is essential that those actions remain consistent with economic principles underlying sound price regulation of multi-product firms operating in an industry with extensive competition over so much of their systems, but potentially with pockets of market power in that system. The proposals by the Task Force that are currently under consideration by the Board do not meet this standard. Indeed, they are directly contrary to the findings of prior economic research, which concludes that:

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[51] Bradley *et al*. at p. 10.

[52] Bradley *et al*. at p. 5.

> "If the STB were to explicitly allow the revenue adequacy concept to evolve from a primarily information-producing role into an active and ongoing regulatory constraint, it would represent a significant expansion of rail industry regulation. However, the linking of regulatory constraints to observed accounting profit measures, such as those captured in the revenue adequacy metric, lacks economic foundations."[53]

90. At their core, the various recommendations would all place constraints on overall railroad rates, revenues and earnings without undertaking the necessary steps to investigate whether purported "over-adequacy" is the result of above-competitive pricing resulting from otherwise unchecked exercises of market power somewhere in a carrier's system. Nor would such constraints be limited to such instances. As a result, the recommendations portend downward pressure on otherwise competitive rates and distortions to investment and operating efficiency. Wholesale restricting, capping or otherwise limiting rates that have not been found to be above-competitive levels under CMP principles on the basis of a railroad's overall revenue "over-adequacy" would represent a return to distortive, old-style earnings regulation that was so long applied unproductively to franchise public utilities. This is economically inconsistent with Congress' prescriptions that: "In regulating the railroad industry, it is the policy of the United States Government … to allow, to the maximum extent possible, competition and the demand for services to establish reasonable rates for transportation by rail";[54] and that unless a carrier's rate is determined to be the product of market dominance, the carrier "may establish any rate for transportation or other service provided by the rail carrier."[55]

A. BASIC ECONOMICS

91. Basic economics tell us why price regulation that does not mimic competition has disastrous consequences for both producers and consumers:

> "[W]hen government adopts a price control…[it] forces all, or a large percentage, of transactions to take place at that price instead of the equilibrium price set through the interaction between supply and demand. Since supply and demand shift constantly in response to tastes and costs, but the government price will change only after a lengthy

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53 Macher *et al*. at p. 121.

54 49 U.S.C. § 10101.

55 49 U.S.C. § 10701(c). See further discussion in Sappington VS at pp. 5-7.

political process, the government price will effectively never be an equilibrium price. This means that the government price will be either too high or too low.[56]

92. Noble Prize-winning economist Milton Friedman put it more bluntly:

> "We economists don't know much, but we do know how to create a shortage. If you want to create a shortage of tomatoes, for example, just pass a law that retailers can't sell tomatoes for more than two cents per pound. Instantly you'll have a tomato shortage. It's the same with oil or gas.[57]

93. Prices are vital to the efficient allocation of resources toward the satisfaction of consumers' needs. They are the critical signals which impact choices of product and service offerings and which determine the nature and level of capital investment and ownership structures. *Price regulation that fails to mimic competitive pricing distorts these signals and, in turn, distorts firms' decisions about how to structure service offerings and where to direct their capital resources.* Rising prices are the market's way of signaling unsatisfied demand and inducing additional investment in a given sector. Price caps prevent prices from adjusting beyond a government-set price and therefore send distorted signals to the market, hiding the unmet demand and failing to induce investment that would benefit consumers.[58] In the real world of politics and regulation, such price regulation also tends to discourage price reductions that would otherwise be dictated from time to time by market conditions because the bluntness of regulation often means roadblocks to restoring prices to higher levels when market conditions dictate.

94. Beyond economic principles, we need not look too far back in our own actual regulatory history—only to, say, the natural gas and gasoline price control policies of the 1970s and post-war rent control in New York City—to see the distortive and destructive effects of price regulation that fails to mimic competitive outcomes. Gasoline lines and shortages of natural gas in periods of peak demand (i.e., the dead of winter) were the direct products of Nixon-era and subsequent price controls that purportedly were intended to protect consumers by trying to override the workings of

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[56] Scott Morton, Fiona M., "The Problem of Price Controls," *Regulation* vol. 24, no. 1 (2001).

[57] "Controls blamed for U.S. energy woes," *Los Angeles Times*, February 13, 1977.

[58] Scott Morton, Fiona M., "The Problem of Price Controls," *Regulation*, vol. 24, no. 1 (2001).

competitive market supply and demand.[59] The associated political disasters they created ultimately forced their abandonment. In the case of rent controls, trying to regulate thousands of competitors contributed hugely to the creation of slums and haves and have-nots, as controls drove investment out of the rent-controlled areas and channeled the vast bulk of investment into competitive, but unregulated, sectors of the marketplace.[60] And then, of course, there is the history of rate bureau-imposed rail price controls in the pre-Staggers era. The disasters created for shippers, ultimate consumers and railroads, alike, by that experience need not be recounted further here.[61]

95. In short, adoption of a regime of maximum rate and/or revenue caps that moves away from identifying and regulating rates only when rates on specific traffic are demonstrated to be in excess of "mimic competition" CMP levels threatens the public interest. While the long lives of railroad assets might disguise the deleterious effects and permit reasonable service for a time (just as rent controls on long-lived residential capital do not immediately show up as deteriorating quality), the long-run interests of the public in an efficient freight transportation sector and a healthy national economy can only be harmed.

B. A FINDING OF FIRM-WIDE REVENUE ADEQUACY DOES NOT IDENTIFY *WHERE*, OR EVEN *THAT,* MARKET POWER HAS RAISED RATES ABOVE COMPETITIVE LEVELS

96. As discussed at length above, market power being exercised by a railroad somewhere within its network is but one possible reason a carrier might be found to be revenue "over-adequate" on an overall firm-wide basis. This holds whether "adequacy" is measured on an accounting book value basis or on an economically sound replacement cost basis. But even if market power were one cause for measured revenue "over-adequacy" of a particular railroad, a determination of firm-wide "over-adequacy" would provide no basis for determining what particular rates for what particular shippers on what particular traffic exceed competitive (i.e., CMP) levels.

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

[60] Jenkins, Blair, "Rent Control: Do Economists Agree?" *Econ Journal Watch,* vol. 6 no. 1, 73-112 (2009).

[61] See Kalt VS at pp. 8-10 for a summary.

97. Railroads are very capital intensive with long-lived sunk capital and large shared and common costs. They serve a myriad of routes and commodities that are often subject to competition from a variety of different sources. As a result, differential pricing is absolutely necessary: prices above raw incremental costs for some material amount of traffic are necessary to cover the network's shared and common costs and retain and attract capital. These economic factors are unchanged by whether the railroad as a whole is revenue adequate or not. As a result, a railroad need not be revenue adequate in order to exercise market power and thereby raise rates to specific customers for their shipments on specific routes on which it is dominant. Indeed, the Board has found on multiple occasions that the exercise of market power has resulted in above-competitive rates on certain traffic for railroads that were not revenue adequate.[62]

98. Even if it were the case that revenue over-adequacy implied that there was somewhere an exercise of market power causing rates to be above competitive, CMP levels, the inability of firm-level revenue adequacy to identify which traffic is affected renders it insufficient for triggering automatic changes in pricing or regulatory treatment within a system in which policy properly allows, "to the maximum extent possible, competition and the demand for services to establish reasonable rates for transportation by rail"; that requires a demonstration of market dominance; that adheres to CMP "mimic competition" principles for assessing the reasonableness of carrier-established rates; and that otherwise permits a carrier to "establish any rate for transportation or other service provided by the rail carrier."[63]

99. Given the nature of rail economics, economically sound policy dictates that it remains necessary that price regulation or adjustment only be applied where it has been demonstrated (1) that there has been an exercise of market power with respect to specific traffic and (2) that the rates are in excess of the appropriate "mimic competition" benchmark. As explained below, the type of broadly targeted and bluntly applied regulatory triggers and responses tied to a finding of purported overall, long-term revenue adequacy proposed by the Task Force do not reflect sound policy and would result in deleterious outcomes for shippers and the future of rail service.

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[62] See "Rail Rate Cases at the STB," February 26, 2019, accessed at https://www.stb.gov/stb/industry/Rate_Cases.htm.

[63] 49 U.S.C. § 10101 and 49 U.S.C. § 10701(c).

C. RRTF PROPOSALS: USING REVENUE ADEQUACY TO 'TRIGGER DIRECT, FIRM-WIDE RATE, REVENUE, AND EARNINGS CONSTRAINTS

100. The Task Force goes beyond concern over the effectiveness of the Board's current regulatory tools and policies as checks on and remedies for market dominance. It entertains the imposition of a Rate Increase Constraint (RIC) potentially applicable to all non-exempt, non-contract traffic of a revenue over-adequate railroad. This effectively imposes: 1) a price cap on new rates for traffic categories with average revenue to variable cost ratio (R/VC) greater than 180% based on the amount of the railroad's "net surplus" and the revenue obtained above the 180% R/VC threshold; and 2) increases in prices for existing shipments in the above-180% R/VC range would be limited to inflation. The proposed RIC would be enforced upon complaint and a perfunctory and formulaic, albeit putatively rebuttable, finding of market dominance.[64]

101. The RIC rate caps would result in arbitrary rates across traffic groups, within traffic groups, and across time. The choice of "traffic groups" is arbitrary—whether commodities are grouped together (or split), whether the mileage splits are established at 500-mile increments, etc. The RRTF acknowledges that they "might need to add additional categories, particularly with respect to specific commodities, to ensure an appropriate amount of precision."[65]

102. In addition, as the examples provided by the Task Force show, the RIC would effectively turn the 180% R/VC level established in the Staggers Act into a real (i.e., inflation-adjusted) rate cap for a wide variety of traffic. For the traffic categories selected and reported by the Task Force for the two western railroads, seven of the sixteen categories listed across the two railroads have rates capped at 180% of R/VC.[66]

103. In short, the RIC has the characteristics of a binding, real (i.e., inflation-adjusted), cost-based rate cap. Moreover, and importantly in terms of its implications for incentives and efficiency in the rail industry, the RIC would employ rate-of-return measured *revenue adequacy* as the trigger for greater limitations on railroad rates, revenues and earnings. This embodies the essence of now-discredited "old-style" rate-of-return regulation with the attendant inefficiencies and distortions of

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64 Rate Reform Report at p. 53.

65 Rate Reform Report at p. 37, fn. 38.

66 Rate Reform Report at p. 38.

such regulation. As I discuss in greater detail in Section VII below, these undesirable effects include:

- Long-recognized disincentives to engage in cost-minimizing behavior that are generated by RIC-type tying of constraints of prices, revenues and/or earnings to measures of overall revenue adequacy.[67]
- Perverse incentives for pricing "competitive" traffic.
- Incentives to reduce quality of service or to focus investments or activities for service on those traffic segments that are not constrained by RIC.
- Disincentives for efficient use of capital.
- Incentives for wasteful capital investment or under-investment.

D. RRTF PROPOSALS: USING REVENUE ADEQUACY TO TRIGGER INDIRECT, STRUCTURAL RATE, REVENUE, AND EARNINGS CONSTRAINTS

104. The Board also seeks comment on the Task Force recommendation that calls for eliminating bottleneck protections. The recommendation would require revenue adequate railroads, at shippers' requests, to quote rates to interchange locations specified by shippers. These rates for the separate segments of the shipment would be subject to protest by shippers and ratemaking proceedings. Absent the existing bottleneck protections under the Task Force proposal, it appears that potential interline shippers would be free to select a junction location for their traffic, and railroads would be required to provide separate rates between origin-to-junction and junction-to-destination segments. The shipper would be free to choose a junction such that the rate on one segment would be set by direct intramodal competition between carriers. On the other bottleneck segment, the shipper could challenge the bottleneck rate and obtain a rate on that segment consistent with SAC or Simplified-SAC rate for the bottleneck segment only. This would permit shippers to obtain a reduction in the total rate for the movement from origin to destination even when the previous through rate had been consistent with market pricing principles.

105. The Task Force's bottleneck proposal does not attempt to focus on shippers and traffic that are the subject of the exercise of market power by the railroad which is resulting in unregulated

[67] See, for example, Averch, Harvey and Leland Johnson, "Behavior of the Firm Under Regulatory Constraint," *American Economic Review*, vol. 52 no. 5, 1052-1069 (1962); Wellisz, Stanislaw H., "Regulation of Natural Gas Pipeline Companies: An Economic Analysis," *Journal of Political Economy*, vol. 71 no. 1, 30-43 (1963); and Baumol, William J and Alvin K. Klevorick, "Input Choices and Rate-of-Return Regulation: An Overview of the Discussion," *Bell Journal of Economics and Management Science*, 162-190 (Autumn 1970).

rates which are inconsistent with competitive market principles. As a result, the effects of this proposal promise to be economically rather arbitrary. The advantage to a favored shipper of this proposal is that it could can seek to apply the Board's maximum rate-setting process to a segment of the total movement in order to obtain rate reductions for the cost of the full move, where the application of the maximum rate-setting process on the whole move would not likely have found the existing rate to be excessive. The effect is to reduce the portion of the common costs borne by this favored shipper in excess of incremental costs, even though absent the change in the bottleneck provision, the share of common costs borne are consistent with CMP principles. The result is cross-subsidization. That is, rates elsewhere in the system that contribute to revenue "over-adequacy" end up reducing other rates below the level that competition would set.

106. Permitting shippers to specify interchange locations harkens back to the pre-Staggers era of open routings. In the pre-Staggers era, railroads maintained "open routings" in which there could be dozens or more alternative routings (and interchanges) from origin to destination, with corresponding similar rates across them.[68] Shippers could effectively select among these routings. The inefficiency in terms of managing a rail network is obvious. The elimination of forced open routings, and railroads' ability to manage their rail networks efficiently was one of the major factors leading to the initial explosion in productivity and rate reductions following the passage of the Staggers Act.

107. The proposal now imposes shippers' choices on railroads' efforts to manage efficiently a complex transportation network. Under the proposal, each bottleneck shipper would have the incentive to select a junction over which it believed it could obtain the most favorable resulting combined rate based on the characteristics of the bottleneck segment for purposes of the STB's rate reasonableness tests and on the potential rate available on the competitive segment. With these incentives, the shipper need not consider the effect of the potential routing on the cost of operating the rail network, the impact of the routing on service levels and frequency available to other shippers, or the ability of the railroad to deploy and operate its capital efficiently.

108. For example, the shipper could have the incentive to select a high-density bottleneck route, as the additional traffic sharing the common assets may reduce the rate that could be charged under

[68] See, for example, Baltimore Gas & Electric Co. v. United States, 817 F.2d 108, 110 (D.C. Cir. 1987).

the SAC or Simplified-SAC. Additional traffic over that route, however, may increase congestion, worsen service quality to other shippers, and reduce other revenue available to the railroad as service quality declines. Beyond the deleterious effects and distortions of regulation intended to reduce railroad revenue in response to being found revenue adequate, this proposal directly implicates the efficiency of operating the rail network.

109. Under reasonable assumptions regarding the demand for rail services, it only takes a small increase in costs to offset the efficiency benefits of even a significant reduction in the price mark-up.[69] As such, although the Task Force proposal would transfer revenue from certain railroads to bottleneck shippers, the induced cost increases arising from these changes may well exceed any efficiency gain from the price reductions.

110. In fact, the railroad industry has proven to be especially poorly suited to so-called "access regulation". At the core of the problem is that there are economic reasons why business firms exist and not everything can be coordinated through arm's-length markets. Forced access, for example, would not constitute implementation of a policy of mimicking competition. Competitive market forces would not generate a system of open access railroads, and no SARR in a contestable market would be expected to enter as a non-integrated facilities company merely charging independent rolling stock carriage companies for the use of the SARR's infrastructure.

111. For reasons that have been well-documented, running a railroad requires *business judgment* on matters ranging from who will make investment in shared facilities, to which cars and trains need to get through a congested yard or network segment most quickly, to who will pay for quality improvements on a shared network.[70] While it might seem that promoting competition could be achieved by forcing the structural dis-integration of rail firms and the networks they operate, the "mimic competition" principle points in the opposite direction. Competitive forces operating on the challenges of coordinating operations across myriad, non-fungible traffic movements and the needs for investment in long-lived and shared capital efficiently push the integration of infrastructure and rolling stock activities into a common integrated railroad firm, rather than

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[69] Gómez-Ibáñez, José A., "Open Access to Infrastructure Networks: The Experience of Railroads," *Review of Industrial Organization*, vol.49, 311–345 (2016) at pp. 314-316.

[70] Verified Statement of William J Rennicke, STB Ex Parte 711, March 1, 2013 (hereinafter "Rennicke VS").

leaving those challenges and needs to a mélange of transactions among arm's-length parties with readily conflicting interests.[71]

112. The Task Force's proposal would transfer significant control of key operating decisions from railroad decisionmakers concerned with the operation of their overall networks to shippers concerned with their specific traffic. The Task Force proposes changes to the Board's long-standing bottleneck policies in order to impose price and revenue constraints on purportedly now "robust[ly]"[72] revenue adequate railroads. Specifically, in the words of the Task Force, "*shippers* could be allowed to direct their [e.g., through] carrier to deliver their cars to a feasible interchange point with a second carrier…"[73]

113. Such a transfer of decision-making away from the owners and operators of a network to the *users* of that network is a recipe for gross inefficiency: The former have direct financial incentives to concern themselves with the network-wide effects of individual investment and operating decisions. These include decisions as to whether or not to engage in interchange on otherwise through traffic that might have adverse ripple effects on operations and investment needs elsewhere across the system. In the language of economics, the owners and operators of a network can and do internalize disruptive "network externalities" (i.e., spillover affects when operations and/or investment at one part of the system affect operations and/or investment elsewhere on the system).

114. Carriers, shippers and the Board are well familiar with such "ripple" effects, as when news headlines describe the episodes when "Container Congestion [at ports] Ripples to US Interior".[74] Particularly on highly non-linear and complicated multi-node "web" networks with non-fungible shipments and constrained capacity, such events may not be 100% preventable, but owner-

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[71] See, for example, Candell, Amy B. and Joseph P. Kalt, "Open Access for Railroads? Implications for a Non-Hub Congestible Network Industry," Advanced Workshop in Regulation and Competition, Center for Research in Regulated Industries (May 2000); Gómez-Ibáñez, José A. and Dines De Rus (eds.), *Competition in the Railway Industry: A Comparative International Analysis*, Edward Elgar Publishing, Inc, Northampton, MA. (2006) (hereinafter "Gómez-Ibáñez and De Rus"); Gómez-Ibáñez, José A., "Open Access to Infrastructure Networks: The Experience of Railroads," *Review of Industrial Organization*, vol.49, 311–345 (2016) at pp. 314-316.

[72] Rate Reform Report at p. 41.

[73] Rate Reform Report at p. 13.

[74] Ashe, Ari, *JOC.com*, January 18, 2019, accessed November 21, 2019 at https://www.joc.com/rail-intermodal/class-i-railroads/union-pacific-railroad/container-congestion-ripples-us-interior_20190118.html.

operators of the network have strong incentives and are in the best position to minimize their occurrence and the costs and disruption they create.

115. A user of rail service, on the other hand, has neither the forceful incentives or business tools that the carrier has for taking into account the effects that, as the Task Force would have it, would arise under its proposal to have shippers "direct their carrier to deliver their cars to a feasible interchange point with a second carrier"[75] on the Class I "web" railroads which are notably subject to congestion and over which one user's shipments are not fungible with the shipments of myriad other user's. The Task Force's proposal would affirmatively invite individual shippers to impose network externalities on other shippers. Economically, this would be a form of cross-subsidization – i.e., imposing costs on other shippers using the network in order to enable a particular shipper to benefit from lower rates.

116. Indeed, the experience outside the U.S. where regulators have tried to employ various forms of forced, shipper-directed, or open access is that rail access regimes have been plagued by conflicts between the understandably myopic specific-transaction-level interests of individual users, on the one hand, and the shared interests of all shippers in overall network efficiency. The consequences in Australia, Europe and North America have been very costly when rail networks are – as in the U.S. – characterized by or susceptible to such factors as carrier/user interfaces which are technically complex,[76] the network is subject to capacity constraints and congestion, and access users are heterogeneous.[77] In such contexts, access regimes have ended up manifesting themselves in not only operational inefficiencies that are spread as externalities across network users, but also congestion and underinvestment in needed infrastructure as both rationally self-interested carriers and shippers have incentives to hold out and hope that other carriers or shippers will bear the risk and cost of needed system improvements.[78]

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75 Rate Reform Report at p. 13.

76 As in the case of the highly non-linear networks of US carriers. See Rennicke VS.

77 Gómez-Ibáñez, José A., "Open Access to Infrastructure Networks: The Experience of Railroads," *Review of Industrial Organization*, vol.49, 311–345 (2016) at pp. 314-316.

78 Gómez-Ibáñez and De Rus and Gómez-Ibáñez, José A., "Open Access to Infrastructure Networks: The Experience of Railroads," *Review of Industrial Organization*, vol.49, 311–345 (2016) at pp. 314-316.

E. MODIFICATIONS TO SIMPLIFIED-SAC

117. In addition to its access and RIC proposals, the Task Force also calls for modifications to Full SAC and Simplified-SAC. In the case of Simplified-SAC, this includes the use of a standardized Road Property Investment (RPI) in rate cases brought against a long-term revenue adequate carrier.

118. As I discuss in more detail in Section VIII below, streamlining and standardizing the regulatory process to reduce the cost and time required to adjudicate rates is a laudable goal, particularly for a railroad that is found to be long-term revenue adequate under a proper standard. Any such simplifications would need to ensure that simplifications minimize the need to make arbitrary stand-alone allocations of costs that would give shippers opportunity for unjustified rate relief based on errors and arbitrary deviations from competition-mimicking decisions.

119. Given that the Board has previously rejected the proposed simplification to RPI for large rate cases because of concerns about the rolling-average RPI simplification and its ability to identify costs accurately, simply re-instating the RPI simplification is not without risk. Regardless, it may be a useful approach to streamline the process that may be able to identify maximum rates under appropriate competitive principles without bias. What is needed is *smart simplification*. I turn to this in Section VIII below.

VII. ECONOMIC IMPLICATIONS OF THE TASK FORCE RECOMMENDATIONS

A. ISSUES OF TIMING AND REGULATORY LAG

120. The Task Force's proposals imply substantial changes and potential instability in rates, even for potentially benefitted shippers. For example, under RIC, annual updating of the historical review period and calculation of "net surplus" and changes in the distribution of traffic across groups would change the relevant rate caps for shippers, perhaps substantially. These discontinuities would likely be exacerbated as the proposed "look back" period jumps in response to business cycle changes. (For example, the RRTF reports that over 2007 to 2008 the "Average Return on Investment" jumped by an average of 1.40 percentage points and almost 2 percentage points or more for three of the seven railroads examined.)[79]

[79] Rate Reform Report at p. 35.

121. The adoption of a regulatory regime that applies non-market or arbitrary principles for ratemaking in one regime ("revenue adequacy") and market-based principles otherwise, will result in unstable and arbitrary outcomes. If a revenue-adequate railroad falls back into revenue inadequacy, does this invalidate rates that have been determined under RIC or the bottleneck changes? If not, then what is the economic benefit of a revenue-inadequate railroad's rates being set at levels inconsistent with the market principles applicable to railroad economics?

122. The directional effect of the Task Force proposals is to eliminate revenue above the level of purported long-term rate adequacy. To the extent that the bottleneck provision and the proposed RIC -result in even more substantial rate reductions, this could serve to drive rates below annual (and eventually long-term) revenue adequacy. It would appear that if a railroad were to swing between being long-term revenue adequate and being revenue inadequate, then the proposed additional regulatory measures would no longer apply. In that case, the rate caps under RIC would apparently no longer apply, as would bottleneck rates created while the carrier was revenue inadequate; it is unclear whether rates established under the RIC that would not be found unreasonable under Full SAC would remain in place. If this were not the case, then the proposals would be imposing limitations on revenue-inadequate railroads inconsistent with market principles and the policies of the Staggers Act.

123. In the same vein, the RIC rate freeze[80] (subject to inflation) would create a distortionary distinction between "new" and "existing" traffic. The proposal appears to limit rates on "new" traffic to the proposed threshold ratios of rates to URCS variable costs based on broad and arbitrary categorizations. This distinction inevitably provides perverse incentives for inefficient and unproductive economic decisions, not just by railroads but by shippers as well. For example, a large buyer of grain that sources grain from a variety of elevators would have the incentive to choose among them, not on the basis of prices determined in the marketplace, but as a result of arbitrary regulatory fiat. The grain buyer could decide, based on existing rates and thresholds imposed on various arbitrary categories (e.g., wheat moving less than 500 miles, moving between 500 and 1000 miles, etc.) to quit shipping from its existing supplying elevators and to source grain from elevators that it had previously not been using. By doing so, the purchaser may be able to generate "new" traffic subject to more attractive, albeit arbitrary, rate caps. This type of strategic

[80] Economically, limiting rates to changes in inflation *freezes* rates in real, inflation-adjusted dollar terms.

decision-making by purchasers in response to regulator-imposed rate caps is an unproductive diversion of resources that would harm existing suppliers and the economy.

124. The need to conduct reviews of revenue adequacy based on actual data means that such reviews must inherently be backward-looking. The inherent regulatory lag in the process implies that the proposals will frequently be out of step with the conditions facing the rail industry. As a result, the RIC rate freeze on real (i.e., inflation-adjusted) rates[81] and the proposed triggering of bottleneck access would invariably impose arbitrary rate reductions and freezes at times when the railroads are struggling to earn adequate returns. For example, if the RIC schema and/or bottleneck proposal had been in place during the Great Recession of 2008-09 because a railroad had been declared to be "revenue adequate" in the period leading up to the Great Recession, the resulting RIC rate caps and revenue erosion in 2009 for a railroad such as Norfolk Southern (NS) would have been focused on returning NS's "net surplus" to shippers right at a time when NS was, even absent the Task Force's revenue-reducing provisions in effect, in severe "net deficit" under the ROI-COC revenue adequacy measure.

125. The foregoing is not isolated to situations such as the Great Recession. Regulatory lag is endemic to the use of revenue adequacy as a trigger for rate constraints of any form. The annual revenue adequacy determination is released in the fall of the following year (e.g., released in fall of 2019 covering calendar year 2018). The most recent annual revenue adequacy finding (released in September 2019 covering calendar year 2018) found that neither BNSF nor NS were revenue adequate in 2018 (under the current book accounting measure). Yet, the Task Force proposal's revenue-reducing rate caps and bottleneck provisions would have been applicable to those two railroads during 2018 (based on a determination of long-term revenue adequacy in the fall of 2017 using 2016 as the final year of the test period).[82] The Task Force's proposals would have the effect of suppressing rail revenue broadly and arbitrarily and driving these two railroads further into revenue inadequacy. The broad-based changes in rate regulation proposed by the Task Force would necessarily result in regulatory lags and rigidity that would be markedly inappropriate for an industry like railroads, where most of traffic is subject to dynamic competitive forces and

[81] See fn.80 above.

[82] Rate Reform Report at Table 4.

railroads must adjust in real-time to changes in those forces if they are to stay viable as transportation options for the nation's economy.

B. THE TASK FORCE RECOMMENDATIONS ARE A BACKWARD STEP TOWARD DISCREDITED "OLD-STYLE" UTILITY REGULATION

126. The RRTF proposals employ a finding of putative firm-wide revenue adequacy to trigger tighter constraints on a rail carrier's rates, revenues and earnings. As such, the proposals represent recommendations for a return to a discredited form of utility-style ratemaking based on accounting rates of return. Specifically, the Task Force proposals represent a form of rate-of-return or earnings regulation: The proposals are intended to limit or reduce rates and revenues as long as the rail carrier is at or above the ROI/COC "revenue adequacy" threshold with little or no focus on whether specific rates are inconsistent with competitive market principles.

127. The old-style regulatory approach embraced by the Task Force has been most commonly applied in situations in which the enterprise has been granted a government franchise monopoly as a public utility — a situation not at all applicable to the railroad industry. The documented problems of such regulation have been summarized in independent research:

> "The advent of competition in areas previously reserved for the franchised [public utility] monopoly has made the administration of rate-of-return regulation more contentious than ever….Briefly, rate-of-return regulation gives the firm incentives to misreport cost allocations, choose an inefficient technology (in some cases), undertake cost-reducing innovation in an inefficient way, underproduce in a noncore market, price below marginal cost in a competitive market which happens to be included in the set of core markets regulated by an aggregate rate-of-return constraint, and view diversification decisions inefficiently."[83]

128. The pejorative tenor of economists' labeling revenue adequacy regulation—which triggers the tightening of regulatory constraints based on firm-wide measures of rate of return—as "old-style" is intentional on the profession's part. Experience with such regulation has wholly discredited it. It is particularly ill-suited to the U.S. rail industry, in which carriers are not protected from competition by grants of exclusive public utility franchises and such huge portions of their business face potent competition.

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[83] Braeutigam, Ronald R., & Panzar, John C, "Diversification Incentives Under 'Price-Based' and 'Cost-Based' Regulation," *RAND Journal of Economics*, vol. 20 no. 3, 373-391 . (1989) at p. 390.

129. The sources of the debilitating consequences of old-style rate-of-return regulation are well-known. The drawbacks of earnings regulation include: ''(1) limited incentives for innovation and cost reduction; (2) over-capitalization; (3) high costs of regulation; (4) excessive risks imposed on customers; (5) cost shifting; (6) inappropriate levels of diversification and innovation; (7) inefficient choice of operating technology; and (8) insufficient pricing flexibility in the presence of competitive pressures.''[84] These drawbacks pervade the Task Force proposals as these proposals trigger regulation to limit or reduce revenues and rates based on whether aggregate accounting returns exceed some threshold.

130. The Task Force recommendations portend the introduction and magnification of these problems in the rail sector. The RRTF proposals would use putative "revenue adequacy" as indicated by a railroad's measured rate-of-return to trigger constraints on railroads' rates and revenues. As a consequence, pro-competitive actions railroads could take to reduce costs or improve service on the vast portion of its services that are subject to competition would result in government-imposed limitations in rates and revenues – thereby directly distorting and discouraging such actions.

131. For example, under the RIC, in cases of traffic with R/VC<180% or other non-market dominant traffic, rate increases taken in order to match changes by competitors would result in increased "net surplus" for a railroad and lower RIC caps. As such, this would reduce the incentive to price in line with competition. Such disincentives for competitive pricing would further discourage outlays and efforts to expand or improve service for this traffic in response to changing market conditions. In so doing, the RIC proposal portends distortion of one of the key elements undergirding the Staggers framework's remarkable success in restoring railroads' capacities to contribute to the modern, dynamic economy of the nation – i.e., their ability to respond to ever-changing conditions in markets where their very survival depends on their responses to competitive forces.

132. Similarly, using revenue adequacy to trigger tighter rate constraints would create incentives to reduce quality of service or to focus investments or activities for service on those traffic

[84] Mayo and Sappington at p. 215, citing Sappington, David E. M., "Price Regulation," in M. E. Cave, S. K. Majumdar, & I. Vogelsang (eds.), *Handbook of Telecommunications* Economics, Elsevier, Amsterdam, vol. I, 225–293 (2002). See, also, fn. 67 above.

segments that are not constrained by regulation in order to pay for the cost of the additional value created. For example, a RIC-constrained railroad would have little incentive to engage in value-creating investments or activities that would improve service — that is, investments or activities that increase shippers' willingness to pay for the improved service in excess of the cost of making those improvements. As a result, the RIC cap could prevent the railroad from obtaining incremental revenue sufficient to sustain these value-creating investments or other activities that would benefit shippers.

133. Investment decisions, too, would be distorted by the Task Force's proposals. Capital investments expand "net investment" (i.e., the capital base) upon which ROI is calculated and, under the Task Force's proposals, would thereby serve to reduce the likelihood of a railroad being found to be "revenue adequate". The result would be well-understood distortion of incentives. Specifically, at any given level of operations, incentives would be artificially tilted toward excessive capital-intensity, where instead, making operational changes or using less capital-intensive technologies that would be less costly and more efficient. The result is known in regulatory economics and practice as a bias toward "gold-plating" of capital investments.

134. As innumerable public utility commissions learned under old-style regulation in which rate constraints were triggered by the regulators' measures of revenue adequacy, "gold-plating" of investments under earnings-based regulation is wasteful and all-too-common.[85] The problem has typically pushed regulators into adopting additional layers of regulation to ensure that regulated firms' investments are "prudent" and/or "used and useful". In so doing, the distortions to incentives engendered by old-style regulation pull regulators to move ever more deeply into the role of central planners who find it necessary to constrain the ability of the firms they regulate to make those firms' own adaptive investment and operational decisions.

135. No such regulatory trajectory, policies and proceedings are required when competition can be relied on to set rates, and in the case of the rail industry, pockets of market power are subject to market-based principles of the type developed and employed by the Board for railroad ratemaking under the Staggers regime (e.g., CMP and SAC principles). Indeed, the well-documented success of modern market-based regulation is not confined to the railroad industry. Numerous studies have

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[85] See, for example, Doyle, Chris, "Regulating Firms with Monopoly Power" in Sugden, Roger, ed., *Industrial Economic Regulation: A Framework and Exploration,* Routledge, London (1993) at p. 118.

shown that moving from earnings-based, rate-of-return regulation, which has traditionally been applied in electric utilities, telecommunications, energy, railroads (before Staggers) and other industries, has led to reductions in costs, improvements in service, and greater innovation and flexibility in pricing, product and services.[86] Re-creating the link between accounting costs and future revenue for railroads reflected in the Task Force proposals is a move backward in time and in the wrong policy direction.

136. Finally, depending on the frequency and severity of impositions of rate constraints that would be triggered under the Task Force's proposals, adoption of those proposals could well end up putting the industry in a position not unlike the pre-Staggers world by making capital investment simply uneconomic. This would occur if the loosening effect of increasing one's capital base (e.g., through "gold-plating") is not sufficient to keep expected rates of return to levels over the life of investments which at least cover their costs of capital. Under those circumstances, investment would be uneconomic, and particularly so if system-expanding investments to attract new business or into new technologies are relatively riskier than the average operations of a railroad.[87] Under such circumstances, the RRTF schemas would create potentially strong incentives for overall under-investment and thereby hold back the efficiency and aggregate size of rail operations.

137. This prospect is raised by the fact that the proposed revenue limitations triggered by accounting earnings are asymmetric in that they would serve to suppress returns when the rail industry accounting performance is good but provide no mechanism for recovering foregone revenues when times are bad. In essence, the RRTF proposals would have the effect of taking the "tops" off of earnings cycles, but leave carriers fully exposed to the "troughs" in earnings.

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[86] See, for example, fn. 9 above; Sappington VS (and citations therein); Sappington, David E. M. and Dennis L. Weisman, "Price cap regulation: what have we learned from 25 years of experience in the telecommunications industry?," *Journal of Regulatory Economics* vol. 38, 227-257 (2010); Paul Joskow, "Regulation of Natural Monopoly," *Handbook of Law and Economics*, Polinsky, A.M. and S. Shavell, eds., Elsevier (2007) at Chapter 16; and Paul L. Joskow, "Incentive Regulation in Theory and Practice: Electricity Distribution and Transmission Networks," *Economic Regulation and Its Reform: What Have We Learned?*, Rose, Nancy L., ed., University of Chicago Press (2014).

[87] That is, if the project-specific risks result in the cost of capital of system-expanding investments to attract new business or into new technologies which are higher than the firm-wide cost of capital (representing a firm-wide averaging of risks) employed in a triggering revenue adequacy test.

138. Most rail service is not subject to rate regulation by the Board and those rates are subject to competitive forces. There is no mechanism in the marketplace, existing regulation, or the RRTF proposals that *ensures* that railroads will remain revenue adequate over the life of the investment. Indeed, it is unlikely in light of the long post-Staggers experience with railroads' exposure to market forces that any such mechanism is possible. But what can be said is that the Task Force's proposals create the real prospect of biasing long-term returns toward revenue *in*adequacy. Such a bias toward inadequate returns would be a powerful deterrent in sustaining the large on-going investments required for an efficient and progressive railroad industry.

VIII. RECOMMENDATIONS FOR IMPROVEMENTS TO THE SYSTEM

139. As an initial matter, were a railroad found to be truly revenue over-adequate under proper application of a replacement-cost test, it is not unreasonable for the Board to be concerned about the sources of that over-adequacy. If such over-recovery were shown to be caused by exercises of market power that have resulted in above-competitive rates somewhere in carrier's system, it is logical that the Board would be concerned as to why its existing tools have been insufficient to ferret out and remedy instances of market dominance and concomitant above-competitive pricing that may contribute to coherently-calculated revenue over-adequacy. But sound policy is properly concerned with the efficiency and effectiveness of the Board's regulatory processes and practices for regulating market dominance that results in above-competitive rates and revenues, regardless of whether or not a carrier is revenue adequate. We consider a number of improvements in this regard below.

140. Rather than using putative determinations of revenue adequacy to replace the economic principles reified in the SAC process with arbitrary and distortive price restraints (such as the RIC approach), sound policy should continuously seek to respond to instances of market power with policies that are consistent with the principles of limiting rail rates to competitive levels, and doing so with efficient and effective practices and procedures. In practice, we believe this means establishing an effective regulatory process that can be accessed realistically by all shippers. This includes improving the effectiveness of the Board's SAC framework by making SAC proceedings quicker and less expensive and introducing smart simplification and aggressive streamlining to the SAC and Simplified-SAC processes.

141. The Board has long recognized the importance of establishing rules and standards in SAC proceedings that improve the efficiency of the regulatory process. Over the years, the Board has established various rules that successfully eliminated many areas of dispute typically seen in SAC cases. Continuing this work to simplify and streamline proceedings involving revenue-adequate railroads will address the Board's concerns with respect to providing access to all shippers and will allow the Board to maintain regulation that is consistent with the fundamental economic characteristics of the industry.

142. A variety of changes and decisions related to development of SAC rates could streamline and reduce costs without significantly diminishing their accuracy or consistency with market principles. The process could be streamlined if the number of disputed issues could be reduced, so attention is focused on matters of economic significance to the case at issue.

143. Certain changes could take the form of once-and-for all decisions on recurring issues that arise in most or all cases, but don't depend on the specific SARR, and could be applied going forward to future cases. Examples of such topics include:

- Treatment of equity flotation costs
- Treatment of real estate acquisition costs
- Choice of inflation indices
- Treatment of taxes and bonus depreciation.
- Calculation issues related to the DCF, e.g., amortization of debt, terminal value, etc.

144. There are also various categories of costs that could be standardized, subject to rebuttable presumptions depending on the specific details of a case. Establishing these types of guidelines will mitigate the need for parties to present extensive evidence and re-litigate recurring issues. Examples of elements that may benefit from some level of smart simplification through standardization include:

- G&A costs
- Various construction costs, such as ties, earthworks, ballast, rail, etc.
- Ancillary facilities

145. Further, the use of third-party experts (paid by the parties and to whom the relevant evidence is provided) on areas outside the STB's expertise (e.g. real estate valuation) could provide guidance to the Board. One benefit of this approach is that it would allow the Board to establish

common parameters for all parties to work with in developing the SARR, thus limiting the volume of evidence presented by the parties before the Board and limiting the range of decisions the Board must issue.

146. A major source of disputes results from the choice of traffic groups, cross-over traffic, and operating plans. The establishment of rules and standards for the determination of traffic groups and cross-over traffic could limit the extent of the disputes over the SARR. Based on the traffic groups, established standards for operating plans could eliminate the need for separate Railroad Traffic Controller demonstrations. To the extent disputes remain, the use of technical conferences can be used and requiring the two sides can be required to each provide results based on the same specified assumptions, so that areas of dispute and their effect on rates can be isolated.

147. It is a useful and important exercise for the Board to consider how to improve the regulatory process. But care must be taken to avoid throwing the baby out with the bath water. The core principles of relying on competition to the maximum extent possible, and using regulation to mimic competitive market results in those instances where competition is demonstrably thwarted by exercises of market power, are as sound now as they were in 1980, and they have produced a long record of success in enabling railroads to play important roles in supporting the nation's economy.

I declare under penalty of perjury that the foregoing is true and correct.

Joseph P. Kalt
November 26, 2019

APPENDIX A

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PUBLICATIONS AND RESEARCH: BOOKS AND MONOGRAPHS

Universities and Indian Country: Case Studies in Tribal-Driven Research (with Dennis Norman), University of Arizona Press, April 2015.

On Improving Tribal-Corporate Relations in the Mining Sector: Strategies for Both Sides of the Table (with Saleem Ali, Sarah Krakoff, Miriam Jorgensen and Anthony McInnis), The Harvard Project on American Indian Economic Development, Harvard University, Cambridge, MA, May 2014.

Constitutional Design (with Jessie M. Mosqueda and C. Falan Yinug), The Native Nations Institute for Leadership, Management and Policy, *Guides for Indigenous Governance*, March 2013.

The State of the Native Nations: Conditions under U.S. Policies of Self-Determination (a principal author, with The Harvard Project on American Indian Economic Development), Oxford University Press, 2008.

American Indians on Reservations: A Databook of Socioeconomic Change Between the 1990 and 2000 Censuses (with Jonathan B. Taylor), The Harvard Project on American Indian Economic Development, January 2005.

Annotated Bibliography: The Social and Economic Impacts of Indian and Other Gaming (with Leigh Gardner and Katherine A. Spilde), The Harvard Project on American Indian Economic Development, January 2005.

The Context and Meaning of Family Strengthening in Indian America: A Report to the Annie E. Casey Foundation by The Harvard Project on American Indian Economic Development (with Amy Besaw, Andrew Lee, Jasmin Sethi, Julie Boatright Wilson, Marie Zemler), The Annie E. Casey Foundation, Baltimore, Maryland, August 2004.

New Horizons in Natural Gas Deregulation, ed. (with Jerry Ellig) and co-author of two chapters, Greenwood Press, 1995.

What Can Tribes Do? Strategies and Institutions in American Indian Economic Development, ed. (with Stephen Cornell), University of California, 1992.

National Parks for the 21st Century: The Vail Agenda, editor and primary author of the Report of the Steering Committee, National Park Foundation, Chelsea Green Publishing Co., 1992.

Cases in Microeconomics (with Jose A. Gomez-Ibanez), Prentice Hall, 1990.

Drawing the Line on Natural Gas Regulation, ed. (with F. C. Schuller) and author of two chapters, Greenwood-Praeger Press/Quorum Books, 1987.

The FACS/Ford Study of Economic and Business Journalism (with James T. Hamilton), Foundation for American Communications and the Ford Foundation, 1987.

The Economics and Politics of Oil Price Regulation: Federal Policy in the Post-Embargo Era, MIT Press, 1981; paperback edition, 1983.

Petroleum Price Regulation: Should We Decontrol? (with Kenneth J. Arrow), American Enterprise Institute, 1979.

PUBLICATIONS AND RESEARCH: ARTICLES

"Climate Proposals Have No Effect on Shareholder Returns. My Research Proves It", Commentary for http://fortune.com, June 5, 2018.

"Economic Impact of the *Hualapai* Water Rights Settlement and Proposed Diamond Creek Pipeline", Report Prepared for the Hualapai Nation, July 16, 2017.

"From Tribal *Members* to Tribal *Citizens*" (with Stephen Cornell), in N. Hill, ed., *Blood Quantum and the Future of Native Nations*, Fulcrum Publishing, forthcoming 2016.

"American Indian Self-Determination: The Political Economy of A Successful Policy" (Co-Author with Stephen Cornell), Paper for American Academy of Sciences International Workshop on Minority Groups: U.S. and China, American Academy of Arts and Sciences, Tufts University, June 25-27, 2010.

"Is There Only One Cultural Path to Development? Sustainable Heterogeneity Among Contemporary American Indian Nations" (with Stephen Cornell and Miriam Jorgensen), Conference in Honor of Samuel Huntington, Cultural Change Institute, The Fletcher School, Tufts University, October 2008.

"The U.S. Energy Outlook: Will It Go from Bad to Worse?" in *The Issues Inside the Fishbowl*, FTI Consulting, April 2008.

"Two Approaches to the Development of Native Nations: One Works, the Other Doesn't" (with Stephen Cornell), in M. Jorgensen, ed., *Rebuilding Native Nations: Strategies for Governance and Development,* University of Arizona Press, 2007.

"Development, Governance, Culture: What Are They and What Do They Have to Do with Rebuilding Native Nations?" (with Manley A. Begay, Jr., Stephen Cornell, and Miriam Jorgensen), in M. Jorgensen, ed., *Rebuilding Native Nations: Strategies for Governance and Development,* University of Arizona Press, 2007.

"The Role of Constitutions in Native Nation Building: Laying a Firm Foundation," in M. Jorgensen, ed., *Rebuilding Native Nations: Strategies for Governance and Development,* University of Arizona Press, 2007.

"Seizing the Future: Why Some Native Nations Do and Others Don't" (with Stephen Cornell, Miriam Jorgensen and Katherine Spilde), in M. Jorgensen, ed., *Rebuilding Native Nations: Strategies for Governance and Development,* University of Arizona Press, 2007.

"Competition & Regulation, Part III: Tensions Evolve between Regulation and Competition" (with Charles Augustine and Joseph Cavicchi), in *Electric Light and Power*, www.elp.com, January/February 2006, pp. 24-25.

"Constitutional Rule and the Effective Governance of Native Nations," in Eric D. Lemont, ed., *Contemporary American Indian Constitutionalism and the Rebuilding of Native Nations,* University of Texas Press, 2006.

"Gradualism in Retail Restructuring" (with Charles Augustine and Joseph Cavicchi) in *Electric Light and Power*, www.elp.com, September/October 2005, pp. 26-30.

"Competition & Regulation in the Power Industry: Can the Two Coexist?" (with Charles Augustine and Joseph Cavicchi) in *Electric Light and Power*, www.elp.com, July/August 2005, pp. 28-31.

"Establishing a Tribal Development Corporation," *Forum on Establishing a Tribally Owned Development Corporation*, the United States Senate Committee on Indian Affairs, July 20, 2004.

"Economics, Law, and Politics: What Will Drive Energy's Future," in *Proceedings of the 50th Annual Institute of the Rocky Mountain Mineral Law Foundation*, vol. 50, p. 1-1 (2004), December 2005.

"Myths and Realities of Tribal Sovereignty: The Law and Economics of Indian Self-Rule" (with J. Singer), *Joint Occasional Papers in Native Affairs*, The Harvard Project on American Indian Economic Development, John F. Kennedy School of Government, Harvard University, January 2004.

"Partisan Misperceptions and Conflict Escalation: Survey Evidence from a Tribal/Local Government Conflict" (with Keith Allred and Kessely Hong), in *Third-Party Intervention eJournal*, November 2003.

"Roundtable: Recent Developments in Section 2" (with Aaron Edlin, A. Douglas Melamed, and Gary L. Roberts), *Antitrust Magazine,* vol. 18, No. 1, Fall 2003.

The First Nations Governance Act: Implications of Research Findings from the United States and Canada (with Stephen Cornell and Miriam Jorgensen), Report to the British Columbia Assembly of First Nations, July 2002.

"Public Policy Analysis of Indian Gaming in Massachusetts" (with Kenneth Grant and Jonathan B. Taylor), Faculty Research Working Paper Series #RWP02-019, John F. Kennedy School of Government, Harvard University, May 13, 2002.

"Means-Testing Indian Governments: Taxing What Works" (with Jonathan Taylor), in Richard C. Monk, ed., *Taking Sides: Race and Ethnicity*, McGraw-Hill/Dushkin, 2001.

"Where's the Glue? Institutional and Cultural Foundations of American Indian Economic Development" (with Stephen Cornell), *The Journal of Socio-Economics*, vol. 29, 2000.

"Open Access for Railroads? Implications for a Non-Hub, Congestible Network Industry" (with Amy B. Candell), Advanced Workshop in Regulation and Competition, Center for Research in Regulated Industries, May 2000 (unpublished working paper).

"What Tribes Can Do: An Interview with Joseph P. Kalt," *American Indian Report*, March 1999.

"Sovereignty and Nation-Building: The Development Challenge in Indian Country Today" (with Stephen Cornell), *The American Indian Culture and Research Journal*, vol. 22, no. 3, February 1999.

"Making Research Count in Indian Country: The Harvard Project on American Indian Economic Development" (with Manley A. Begay, Jr., and Stephen Cornell), *Journal of Public Service and Outreach*, vol. 3, no. 1, Spring 1998.

"Successful Economic Development and Heterogeneity of Governmental Form on American Indian Reservations" (with Stephen Cornell), in Merilee S. Grindle, ed., *Getting Good Government: Capacity Building in the Public Sector of Developing Countries*, Harvard University Press, 1997.

"Cultural Evolution and Constitutional Public Choice: Institutional Diversity and Economic Performance on American Indian Reservations" (with Stephen Cornell), Faculty Research Working Paper Series, John F. Kennedy School of Government, January 1995; reprinted in John Lott, ed., *Uncertainty and Economic Evolution: Essays in Honor of Armen A. Alchian*, Routledge Press, 1997.

"Regulatory Reform and the Economics of Contract Confidentiality: The Example of Natural Gas Pipelines" (with A. B. Jaffe, S. T. Jones, and F. A. Felder), *Regulation*, 1996, No. 1.

"Precedent and Legal Argument in U.S. Trade Policy: Do They Matter to the Political Economy of the Lumber Dispute?" in *The Political Economy of American Trade Policy*, Anne O. Krueger, ed., University of Chicago Press, 1996.

"Do Precedent and Legal Argument Matter in the Lumber CVD Cases?" in *The Political Economy of Trade Protection*, Anne O. Krueger, ed., University of Chicago Press, 1996.

"Introduction: The New World of Gas Regulation" (with Jerry Ellig), J. Ellig and J. P. Kalt, eds., *New Directions in Natural Gas Deregulation*, Greenwood Press, 1995.

"Incentive Regulation for Natural Gas Pipelines" (with Adam B. Jaffe), in J. Ellig and J. P. Kalt, eds., *New Directions in Natural Gas Deregulation*, Greenwood Press, 1995.

"Where Does Economic Development Really Come From? Constitutional Rule Among the Modern Sioux and Apache" (with Stephen Cornell), *Economic Inquiry*, Western Economic Association International, vol. XXXIII, July 1995, pp. 402-426.

"Insight on Oversight" (with Adam B. Jaffe), *Public Utilities Fortnightly*, April 1995.

"The Redefinition of Property Rights in American Indian Reservations: A Comparative Analysis of Native American Economic Development" (with Stephen Cornell), L. H. Legters and F. J. Lyden, eds., *American Indian Policy: Self-Governance and Economic Development*, Greenwood Press, 1994.

"Reloading the Dice: Improving the Chances for Economic Development on American Indian Reservations" (with Stephen Cornell), in J. P. Kalt and S. Cornell, eds., *What Can Tribes Do? Strategies and Institutions in American Indian Economic Development*, University of California, 1992, pp. 1-59.

"Culture and Institutions as Public Goods: American Indian Economic Development as a Problem of Collective Action" (with Stephen Cornell), in Terry L. Anderson, ed., *Property Rights and Indian Economies*, Rowman and Littlefield, 1992.

"Comment on Pierce," *Research in Law and Economics*, vol. 13, 1991, pp. 57-61.

"Pathways from Poverty: Economic Development and Institution-Building on American Indian Reservations" (with Stephen Cornell), *American Indian Culture and Research Journal*, 1990.

"The Apparent Ideological Behavior of Legislators: On-the-Job Consumption or Just a Residual?" (with Mark A. Zupan), *Journal of Law and Economics* 33 (April 1990), pp. 103-32.

"How Natural Is Monopoly? The Case of Bypass in Natural Gas Distribution Markets" (with Harry G. Broadman), *Yale Journal on Regulation*, Summer 1989.

"Culture and Institutions as Collective Goods: Issues in the Modeling of Economic Development on American Indian Reservations" (with Stephen Cornell), *Project Report*, Harvard Project on American Indian Economic Development, June 1989.

"Public Choice, Culture and American Indian Economic Development" (with Stephen E. Cornell), *Project Report*, Harvard Project on American Indian Economic Development, July 1988.

"The Political Economy of Protectionism: Tariffs and Retaliation in the Timber Industry," in R. Baldwin, ed., *Trade Policy Issues and Empirical Analysis*, University of Chicago Press, 1988.

"The Impact of Domestic Environmental Regulatory Policy on U.S. International Competitiveness," *International Competitiveness*, A.M. Spence and H.A. Hazard, eds., Ballinger Publishing Co., 1988.

"Re-Establishing the Regulatory Bargain in the Electric Utility Industry," *Discussion Paper Series*, Energy and Environmental Policy Center, Kennedy School of Government, March 1987, published as Appendix V in *Final Report of the Boston Edison Review Panel*, W. Hogan, B. Cherry and D. Foy, March 1987.

"Natural Gas Policy in Turmoil" (with Frank C. Schuller), in J. P. Kalt and F. C. Schuller, eds., *Drawing the Line on Natural Gas Regulation: The Harvard Study on the Future of Natural Gas Policy*, Greenwood-Praeger Press/Quorum Books, 1987.

"Market Power and Possibilities for Competition," in J. P. Kalt and F. C. Schuller, eds., *Drawing the Line on Natural Gas Regulation: The Harvard Study on the Future of Natural Gas Policy*, Greenwood-Praeger Press/Quorum Books, 1987.

"The Political Economy of Coal Regulation: The Power of the Underground Coal Industry," in R. Rogowsky and B. Yandle, eds., *The Political Economy of Regulation*, Federal Trade Commission, GPO, 1986, and in *Regulation and Competitive Strategy*, University Press of America, 1989.

"Exhaustible Resource Price Policy, International Trade, and Intertemporal Welfare," February 1986 (revised June 1988), *Journal of Environmental Economics and Management*, 1989.

"Regional Effects of Energy Price Decontrol: The Roles of Interregional Trade, Stockholding, and Microeconomic Incidence" (with Robert A. Leone), *Rand Journal of Economics*, Summer 1986.

"A Framework for Diagnosing the Regional Impacts of Energy Price Policies: An Application to Natural Gas Deregulation" (with Susan Bender and Henry Lee), *Resources and Energy Journal*, March 1986.

"Intertemporal Consumer Surplus in Lagged-Adjustment Demand Models" (with Michael G. Baumann), *Energy Economics Journal*, January 1986.

"A Note on Nonrenewable Resource Extraction Under Discontinuous Price Policy" (with Anthony L. Otten), *Journal of Environmental Economics and Management*, December 1985.

"Capture and Ideology in the Economic Theory of Politics" (with Mark A. Zupan), American Economic Review, June 1984; republished in *The Behavioral Study of Political Ideology and Public Policy Formation*, Carl Grafton and Anne Permaloff, eds., University Press of America, Inc., 2005, pp. 63-103; republished in *The Political Economy of Regulation*, Thomas P. Lyons, ed., Edgar Elger Publishing, 2007, chapter 9.

"A Comment on 'The Congressional-Bureaucratic System: A Principal Agent Perspective,'" *Public Choice*, Martinus Nijhoff Publishers, Dordrecht, The Netherlands, vol. 44, 1984, pp. 193-95.

"The Creation, Growth and Entrenchment of Special Interests in Oil Price Policy," in *Political Economy of Deregulation*, Roger G. Noll and Bruce M. Owen, eds., American Enterprise Institute, 1983.

"The Costs and Benefits of Federal Regulation of Coal Strip Mining," *Natural Resources Journal*, October 1983.

"Oil and Ideology US Senate," *The Energy Journal*, April 1982.

"Public Goods and the Theory of Government," *The Cato Journal*, Fall 1981.

"The Role of Governmental Incentives in Energy Production" (with Robert S. Stillman), *Annual Review of Energy*, vol. 5, Annual Reviews Inc., 1980, pp. 1-32.

"Why Oil Prices Should be Decontrolled" (with Kenneth J. Arrow), *Regulation*, September/October 1979, pp. 13-17.

"Technological Change and Factor Substitution US, 1929-67," *International Economic Review*, Spring/Summer 1977.

"The Capital Shortage: Concept and Measurement" (with George M. von Furstenberg), *The Journal of Economics and Business*, Spring/Summer 1977, pp. 198-210.

"Problems of Stabilization in an Inflationary Environment: Discussion of Three Papers," *1975 Proceedings of the Business and Economic Statistics Section: American Statistical Association Annual Meetings*, pp. 20-22.

RESEARCH REPORTS

Political, Social, and Environmental Shareholder Resolutions: Do They Create or Destroy Shareholder Value? (co-author L. Adel Turki, PhD, with Kenneth W. Grant, Todd D. Kendall, PhD and David Molin, PhD), Executive Summary, April 27, 2018.

Economists' Amici Brief to the United States Supreme Court (In re: Long-Term Contracts for Energy Markets, No. 14-614, 14-623; with Cavicchi, A. Joseph, *et al*.), January 19, 2016.

The Mining of Crow Nation Coal: Economic Impact on the Crow Reservation, Big Horn County, and Montana, Report Prepared for the Crow Nation by Prof. Joseph P. Kalt, The Harvard Project on American Indian Economic Development, February 4, 2014.

Tucson's New Prosperity: Capitalizing on the Sun Corridor, A Sun Corridor Legacy Program Concept Paper Prepared by the Sonoran Institute (with Dan Hunting and Luther Propst), Draft, The Sonoran Institute, Tucson Arizona, May 25, 2010.

Economists' Amici Brief to the United States Supreme Court (In re: Long-Term Contracts for Energy Markets, No.08-674; with Blaydon, Colin C., *et al.*), July 14, 2009.

Economic and Public Policy Analysis of the Proposed Western Navajo-Hopi Lake Powell Water Pipeline: *Prepared for the Hopi Nation*, March 19, 2008.

Economists' Amici Brief to the United States Supreme Court (In re: Long-Term Electric Power Contracts, Nos. 06-1457, 06-1462; with Baumol, Wm. J, *et al.*), November 28, 2007.

"The Links Between Air Quality Policies, Electric Power and Natural Gas Markets, and Macroeconomic Impacts: *Clear Skies Versus The Clean Air Planning Act*" (with Charles Augustine and Stephen Makowka), A Policy Analysis Study by Lexecon, an FTI Consulting Company, March 2004.

Alaska Native Self-Government and Service Delivery: What Works? (with Stephen Cornell), Report to the Alaskan Federation of Natives, The Harvard Project on American Indian Economic Development, John F. Kennedy School of Government, Harvard University, August 2003.

The Costs, Benefits, and Public Policy Merits of the Proposed Western Navajo-Hopi Lake Powell Pipeline (with Jonathan B. Taylor and Kenneth W. Grant II), December 22, 1999.

"A Public Policy Evaluation of the Arizona State Land Department's Treatment of the Island Lands Trust Properties at Lake Havasu City" (with Jonathan B. Taylor and Matthew S. Hellman), August 16, 1999.

"Reserve-Based Economic Development: Impacts and Consequences for Caldwell Land Claims" (with Kenneth W. Grant, Eric C. Henson, and Manley A. Begay, Jr.), August 10, 1999.

"Policy Recommendations for the Indonesian Petrochemical Industry" (with Robert Lawrence, Henry Lee, Sri Mulyani and LPEM, and DeWitt & Company), March 1, 1999.

"American Indian Gaming Policy and Its Socio-Economic Effects: A Report to the National Gambling Impact Study Commission" (with Stephen Cornell, Matthew Krepps, and Jonathan Taylor), July 31, 1998.

"Public Interest Assessment of the Proposed BLM/Del Webb Land Exchange in Nevada," report submitted to the U.S. Department of the Interior on behalf of Del Webb Conservation Holding Corporation, June 25, 1996.

"Politics Versus Policy in the Restructuring Debate," The Economics Resource Group, Inc., funded by Northeast Utilities System Companies, June 1995.

"Indexing Natural Gas Pipeline Rates" (with Amy B. Candell, Sheila M. Lyons, Stephen D. Makowka, and Steven R. Peterson), The Economics Resource Group, Inc., April 1995.

"An Economic Analysis of Electricity Industry Restructuring in New England" (with Adam B. Jaffe), The Economics Resource Group, Inc., funded by Northeast Utilities System Companies, April 1995.

"Oversight of Regulated Utilities' Fuel Supply Contracts: Achieving Maximum Benefit from Competitive Natural Gas and Emission Allowance Markets" (with Adam B. Jaffe), The Economics Resource Group, Inc., funded by Enron Gas Services Corporation, April 1993.

"Incentives and Taxes: Improving the Proposed BTU Tax and Fostering Competition in Electric Power Generation," Harvard University and The Economics Resource Group, Inc., March 10, 1993.

"An Assessment of the Impact of the PT Chandra Asri Petrochemical Project on Indonesia's Economy" (with Henry Lee, Dr. Robert Lawrence, Dr. Ronald M. Whitefield, and Bradley Blesie), The Economics Resource Group, Inc., December 1991.

"The Federal Energy Regulatory Commission's Proposed Policy Statement on Gas Inventory Charges (PL 89-1-000)" (with Charles J. Cicchetti and William W. Hogan), *Discussion Paper Series*, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, July 1989.

"The Redesign of Rate Structures and Capacity Auctioning in the Natural Gas Pipeline Industry," *Discussion Paper Series*, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, June 1988.

"A Review of the Adequacy of Electric Power Generating Capacity US , 1985-93 and 1993-Beyond" (with James T. Hamilton and Henry Lee), *Discussion Paper Series*, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, June 1986.

"Energy Issues in Thailand: An Analysis of the Organizational and Analytical Needs of the Thailand Development Research Institute," Harvard Institute for International Development, March 1986.

"Old Gas Decontrol, FERC's Block Billing for Pipelines, and the Winners and Losers in Natural Gas Policy," prepared for the Natural Gas Supply Association (NGSA), December 1985.

"Natural Gas Decontrol, Oil Tariffs, and Price Controls: An Intertemporal Comparison," Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, April 1985.

"Market Structure, Vertical Integration, and Long-Term Contracts in the (Partially) Deregulated Natural Gas Industry," *Discussion Paper Series*, Harvard Institute of Economic Research, Harvard University, April 1985.

"Can a Consuming Region Win under Gas Decontrol?: A Model of Income Accrual, Trade, and Stockholding" (with Robert A. Leone), *Discussion Paper Series*, Energy and

Environmental Policy Center, John F. Kennedy School of Government, Harvard University, February 1984.

"Natural Gas Decontrol: A Northwest Industrial Perspective" (with Susan Bender and Henry Lee), *Discussion Paper Series*, John F. Kennedy School of Government, Harvard University, November 1983.

"Natural Gas Decontrol: A Northeast Industrial Perspective" (with Henry Lee and Robert A. Leone), *Discussion Paper Series*, John F. Kennedy School of Government, Harvard University, October 1982.

"Television Industry Self-Regulation: Protecting Children from Competition in Broadcasting" (with George J. Holder), Harvard Institute of Economic Research, Discussion Paper No. 896, April 1982.

"The Use of Political Pressure as a Policy Tool During the 1979 Oil Supply Crisis" (with Stephen Erfle and John Pound), *Discussion Paper Series*, John F. Kennedy School of Government, Harvard University, April 1981.

"Problems of Minority Fuel Oil Dealers" (with Henry Lee), *Discussion Paper Series*, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, April 1981.

OTHER PUBLICATIONS AND LEGISLATIVE TESTIMONY

Political, Social, and Environmental Shareholder Resolutions: Do They Create or Destroy Shareholder Value? (co-author L. Adel Turki, PhD, with Kenneth W. Grant, Todd D. Kendall, PhD and David Molin, PhD), Executive Summary, June, 2018.

Statement to U. S. Senate Committee on Indian Affairs, *Hearing on S. 664, Navajo Utah Water Rights Settlement Act of 2017 and S. 1770 Hualapai Tribe Water Rights Settlement Act of 2017*, December 6, 2017.

"Trade Corridor Planning Merits Community Input," (with Robin Shamback and Kurt Wadlington), in *Arizona Daily Star*, The Editorial Page, August 30, 2013, p. A17.

"Tucson must not become bottom feeder underneath Phoenix's sprawl machine," *Arizona Daily Star*, Opinion, May 28, 2010.

Statement to U.S. House of Representatives Committee on Appropriations, Subcommittee on Interior, Environment, and Related Agencies, *The State of Indian America*, March 13, 2007.

"Political Windfall", Review & Outlook editorial, *The Wall Street Journal Opinion,* November 2, 2005.

Statement to U.S. Senate Committee on Indian Affairs, *Lessons in Economic Development*, Hearings Regarding International Lessons in Economic Development, September 12, 2002

(hearings cancelled September 11, 2002); published in U.S. Senate Committee on Indian Affairs, F*orum on Establishing a Tribally Owned Development Corporation*, July 20, 2004.

"Institution Building: Organizing for Effective Management" in *Building Native Nations: Environment, Natural Resources, and Governance*, ed. by Stephanie Carroll Rainie, Udall Center for Studies in Public Policy, The University of Arizona, 2003.

Statement to U.S. House of Representatives Committee on Government Reform, Subcommittee for Energy Policy, Natural Resources and Regulatory Affairs, Hearings Regarding Natural Gas Capacity, Infrastructure Constraints, and Promotion of Healthy Natural Gas Markets, Especially in California, October 16, 2001.

Statement to U.S. Senate Committee on Indian Affairs, *Harvard University Native American Program*, Hearings Regarding Native American Program Initiatives at the College and University Level (with Dr. Ken Pepion), June 21, 2001.

Statement to U.S. Senate Committee on Indian Affairs*, Impact of Federal Development Initiatives in Indian Country,* Hearing Regarding S.2052, of September 27, 2000.

Foreword to *Impossible to Fail*, J.Y. Jones, Hillsboro Press, 1999.

Statement to U.S. House of Representatives, Subcommittee on Energy and Mineral Resources, *Federal Oil Royalty Valuation* (HB 3334), Hearing of May 21, 1998.

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

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

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

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

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

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

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

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

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

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

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

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

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

SELECTED PRESENTATIONS

Keynote Address upon the Inauguration of Dr. Mark A. Zupan, Fourteenth President of Alfred University, October 22, 2016.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKSHOPS PRESENTED

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

TEACHING

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

OTHER PROFESSIONAL ACTIVITIES

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

President's Council of Economic Advisors, Navajo Nation, 2016-present

National Advisory Board, National Institute for Civil Discourse, 2016-present (Working Board, 2011-2015)

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

Board of Directors, Sonoran Institute, 2008-present (Vice-Chair, 2014-2016)

Investment Committee, Women's Foundation of Southern Arizona, 2015-present

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

National Advisory Board, Big Sky Institute, Montana State University, 2007-2011

Board of Trustees, The Communications Institute, 2003-2014

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

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

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

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

Editorial Board, *Economic Inquiry*, 1988-2002

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

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

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

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

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

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

Research Advisory Committee, American Enterprise Institute, 1979-1985

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

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

SELECTED HONORS AND AWARDS

Honorary Doctorate, Alfred University, October 2016

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

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

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

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

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

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

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

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

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

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

EXPERT TESTIMONY

Tau Power B.V. and Altai Power LLp

ICC Case No. 23431/MHM Between Tau Power B.V. and Altai Power LLP vs. The Republic of Kazakhstan, On Behalf of Claimants, Expert Report (with Stephen Makowka), March 4, 2019, Second Expert Report (with Stephen Makowka), June 3, 2019.

Sanum Investments Limited and Lao Holdings, N.V.

In an Arbitration Under the Rules of the Singapore International Arbitration Centre. SIAC Arbitration No. 414 of 2017 (ARB414/17/QW). Between Sanum Investments Limited and Lao Holdings N.V., Claimants and San Marco Capital Partners, LLC, Kelly Gass, and The Government of the Lao People's Democratic Republic, Respondents. Expert Report of Joseph P. Kalt and Eric Henson, March 29, 2019.

Lao Holdings N.V. and Sanum Investments Limited

ICSID Case No. ARB(AF)/16/2 Between Lao Holdings N.V., Claimant and Lao People's Democratic Republic, Respondent, and ICSID Case No. ADHOC/17/1 Between Sanum Investments Limited, Claimant and Lao People's Democratic Republic, Respondent, Witness Statement (with Eric C. Henson), September 1, 2017; Second Expert Witness Statement, November 28, 2018.

Tulalip Tribes and The Consolidated Borough of Quil Ceda Village

United States District Court Western District Court, Western District of Washington at Seattle, The Tulalip Tribes and The Consolidated Borough of Quil Ceda Village, Plaintiffs, and The United States of America, Plaintiff Intervenor, v. The State of Washington, Washington State Governor Jay Inslee, Washington State Department of Revenue Director, Vikki Smith, Snohomish County, Snohomish County Treasurer Kirke Sievers, and Snohomish County Assessor Linda Hjelle, Defendants, Expert Report, April 17, 2017; Rebuttal Expert Report, May 30, 2017; Deposition, July 14, 2017; Oral Testimony, May 17, 2018; Rebuttal Testimony, May 23, 2018.

Spring Creek Coal LLC

ONRR Case No. 12.00736.001, *Value of Spring Creek Coal for Payment of Federal Royalty January 1, 2008 to December 31, 2011*, Expert Report (with Eric C. Henson), April 7, 2017.

Lao Holdings N.V. and Sanum Investments Limited

ICSID Case No. ARB(AF)/12/6 *Between Lao Holdings N.V., Claimant and the Government of The Lao People's Democratic Republic, Respondent,* and PCA Case No. 2013-13 *Between Sanum Investments Limited, Claimant and the Government of The Lao People's Democratic Republic, Respondent,* Witness Statement, March 15, 2017.

Government of British Columbia and the Government of Canada

An Analysis of Certain Economic Issues Relating to Petitioner's Claims About the Operation of Stumpage and Log Markets in British Columbia, Expert Witness Statement, March 13, 2017; Expert Witness Report, April 6, 2017.

Government of Canada

Economic Analysis of Remuneration for Canadian Crown Timber: Are In-Jurisdiction Benchmarks Distorted by Crown Stumpage?, Expert Witness Statement, March 10, 2017.

Lao Holding N.V., Sanum Investments Limited

SIAC Case No. ARB/143/14/MV *Between the Government of The Lao People's Democratic Republic, Claimant and Lao Holdings N.V., Sanum Investments Limited, Respondents,* Witness Statement, October 14, 2016; Supplemental Witness Statement, December 2, 2016.

ONEOK, Inc., et al.

United States District Court for the District of Nevada, In Re Western States Wholesale Natural Gas Antitrust Litigation, MDL No. 1566, Expert Report, September 12, 2016; Rebuttal Declaration, November 3, 2016; Deposition, February 21, 2017.

Trans Bay Cable LLC

Before the Federal Energy Regulatory Commission, Docket No. ER16-2632-000, Prepared Direct Testimony, September 20, 2016.

Total Gas & Power North America, Inc.

Answer in Opposition to Order to Show Cause and Notice of Proposed Penalty, Total Gas & Power North America, Inc., Total S. A., Total Gas & Power, Ltd., Aaron Hall, and Therese Tran f/k/a Nguyen, FERC Docket No. IN12-17-000, Affidavit, July 12, 2016.

NextEra Energy Resources, LLC

Petition for Approval of Gas Infrastructure Contracts with Algonquin Gas Transmission Co. for the Access Northeast Project, Commonwealth of Massachusetts, Department of Public Utilities, DPU 16-05, Surrebuttal Testimony (with A. Joseph Cavicchi), July 18, 2016.

Petition for Approval of Gas Infrastructure Contracts with Algonquin Gas Transmission Co. for the Access Northeast Project, Commonwealth of Massachusetts, Department of Public Utilities, DPU 15-181, Direct Testimony, June 13, 2016 (with A. Joseph Cavicchi); Surrebuttal Testimony (with A. Joseph Cavicchi), July 12, 2016.

SolarCity Corporation

United States District Court for the District of Arizona between: SolarCity Corporation, Plaintiff, versus Salt River Project Agricultural Improvement and Power District, Defendant; Civil No. 2:15-cv-00374-DLR, Expert Report, June 1, 2016; Rebuttal Report, August 1, 2016; Deposition August 30, 2016.

Sanum Investments Limited

Sanum Investments Limited, Claimant, v. ST Group Co., Ltd., Sithat Xaysoulivong, S.T. Vegas Co., Ltd., S.T. Vegas Enterprise Ltd, Xaya Construction Co., Ltd. and Xaysana Xaysoulivong, Respondents, Singapore International Arbitration Center, Witness Statement (with Steven R. Peterson and Eric C. Henson), April 20, 2016; Oral Testimony, June 16-17, 2016.

Southern Company and AGL Resources Inc.
Before the New Jersey Board of Public Utilities, In the Matter of the Merger of the Southern Company and AGL Resources Inc., BPU Docket No. GM15101196, Rebuttal Testimony, April 8, 2016.

Citizen Potawatomi Nation
American Arbitration Association, Commercial Arbitration, AAA Case No. 01-15-0003-3452 between: Citizen Potawatomi Nation, A federally recognized Indian Tribe, Claimant, v. The State of Oklahoma, Respondent, Expert Report, January 15, 2016; Oral Testimony, February 16, 2016.

Global Gaming Philippines LLC and GGAM Netherlands B.V.
In the Matter of an Arbitration under the Rules of the United Nations Commission on International Trade Law (2010) between: Global Gaming Philippines, LLC and GGAM Netherlands B.V. (Claimants), versus Bloomberry Resorts and Hotels Inc., and Sureste Properties, Inc., (Respondents), Expert Report, June 15, 2015; Supplemental Export Report, May 15, 2017; Oral Testimony, May 29, 2018.

American International Group, Inc., Claimants and AIG Capital Corporation
International Chamber of Commerce, In the Matter of an Arbitration under the Rules of Arbitration, ICC Case No. 20025/RD (c.20026/RD), between (1) American International Group, Inc. and AIG Capital Corporation, Claimants, and (2) Huaxia Life Insurance Co., Ltd., and Jumbo Acquisition Limited, Respondents, Expert Report, February 6, 2015; Oral Testimony, March 30, 2015.

PJM Power Providers Group and the Electric Power Supply Association
Before the Public Utilities Commission of Ohio, In the Matter of the Application of Ohio Edison Company, The Cleveland Electric Illuminating Company and The Toledo Edison Company for Authority to Provide for a Standard Service Offer Pursuant to R.C. 4928.143 in the Form of an Electric Security Plan, Case No. 14-1297-EL-SSO, Expert Report, December 22, 2014; Deposition, February 2, 2015; Supplemental Testimony, May 11, 2015; Deposition, July 30, 2015; Oral Testimony, October 14, 2015; Second Supplemental Testimony, December 30, 2015; Deposition, January 16, 2016; Rehearing Testimony, June 22, 2016; Oral Testimony, July 15, 2016.

Gunnison Energy Corporation, SG Interests I, Ltd., and SG Interests VII, Ltd.
In the United States District Court for the District of Colorado, Buccaneer Energy (USA) Inc., Plaintiff, v. Gunnison Energy Corporation, SG Interests I, Ltd., and SG Interests VII, Ltd., Defendants, Expert Report, December 22, 2014.

American Association of Railroads
Before the Surface Transportation Board, In re Railroad Revenue Adequacy Docket No. EP 722, Verified Statement, September 5, 2014; Reply Statement, November 4, 2014; Oral Testimony, July 22, 2015.

Future Foam, Inc.

In the United States District Court for the Northern District of Ohio, Western Division, MDL No. 2196, In re: Polyurethane Foam Antitrust Litigation, Expert Report, May 15, 2014; Deposition, June 9-10, 2014.

Burlington Resources Oil & Gas Company

*In the State of New Mexico, County of Santa Fe, First Judicial District Court, Docket No. D-0101-CV-2003-02309, Phillis Ideal, Jose E. and Clara Gomez Living Trust, and J. Fidel Candelaria v. Burlington Resources Oil & Gas Company, Successor in Interest to Burlington Resource Oil and Gas Company,*Expert Report, March 5, 2014; Deposition, March 11, 2014; Affidavit, March 31, 2014.

TTX Company

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

Apple Inc.

In the United States District Court for the Southern District of New York, Docket No. 11-md-02293 (DLC) ECF Case, In Re: Electronic Books Antitrust Litigation v. Apple Inc., Declaration, November 15, 2013; Deposition, December 4, 2013; Sur-Reply Declaration, January 21, 2014.

Lao Holdings, N.V.

Lao Holdings, N.V., Claimant, v. The Government of the Lao People's Democratic Republic, Respondent, ICSID Case No. ARB/(AF)12/6, Witness Statement, July 22, 2013; Witness Statement, October 1, 2013; Rebuttal Witness Statement, May 9, 2014.

Tri-State Generation and Transmission Association, Inc.

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

United Parcel Service Company

In the United States District Court for the Central District of California, Western Division, AFMS, LLC v. United Parcel Service Company and FedEx Corporation, Expert Report, February 8, 2013.

BNSF Railway Company, CSX Transportation, Inc., Norfolk Southern Railway Company, and Union Pacific Railroad Company

United States District Court for the District of Columbia, In Re: Rail Freight Fuel Surcharge Antitrust Litigation, MDL No. 1869, All Direct Purchaser Cases, Expert Report, January 22, 2013; Deposition, May 28, 2013; Declaration, March 31, 2014; Deposition, May 7, 2014; Sur-Reply Declaration, July 21, 2014; Deposition, August 8, 2014; Oral Testimony, September 29, 2016.

Equilon Enterprises, LLC, Motiva Enterprises LLC, Shell Oil Company, Shell Oil Products Company LLC, and Shell Trading (US) Company

In the United States District Court for the Southern District of New York, Case No. 08 Civ. 00312 (SAS), New Jersey Department of Environmental Protection, et al., Plaintiffs, against Atlantic Richfield Company, et al., Defendants, Expert Report, November 15, 2012; Deposition, May 14, 2013.

The Hershey Company

In the United States District Court for the Middle District of Pennsylvania, In Re: Chocolate Confectionary Antitrust Litigation: MDL Docket No. 1935 (Civil Action No. 1:08-MDL-1935), Expert Report, August 3, 2012; Deposition, August 20, 2012; Declaration, November 5, 2012; Expert Report, May 31, 2013; Deposition, June 20, 2013; Supplemental Expert Report, September 16, 2013.

Atlantic Richfield Company

In the United District Court for the Western District of Pennsylvania, Classes of Plaintiffs v. Babcock & Wilcox Power Generation Group, Inc., et al., Defendants, Civil Action No. 2:10-cv-00368-RCM, et al., Deposition, May 4, 2012; Expert Report, February 28, 2013; Deposition, June 12, 2013; Expert Report, February 9, 2015 (filed February 26, 2015).

Perenco Ecuador Ltd.

International Centre for Settlement of Investment Disputes: In The Arbitration Under The Convention on The Settlement of Investment Disputes Between States and Nationals of Other States and The Treaty Between The Republic of France and The Republic of Ecuador Concerning The Encouragement and Reciprocal Protection of Investment; Perenco Ecuador Limited, Claimant v. The Republic of Ecuador, Respondent, ICSID Case No. ARB/08/6, Statement, April 12, 2012; Supplemental Statement, November 7, 2012; Oral Testimony, November 15, 2012; Expert Report, December 19, 2014; Fourth Expert Report, July 24, 2015; Oral Testimony, November 13, 2015.

Electronic Arts, Inc.

In the United States District Court for the Northern District of California, Geoffrey Pecover and Andrew Owens, on behalf of themselves and all others similarly situated, Plaintiffs, v. Electronic Arts Inc., a Delaware Corporation, Defendant: Case No. 08-cv-02820 CW, Expert Report, March 8, 2012; Reply Report, April 12, 2012.

The PPL Companies, The Calpine Companies, Exelon Generation Company, NAEA Ocean Peaking Power, and The PSEG Companies

In the United States District Court for the District of New Jersey. PPL EnergyPlus et al., Plaintiffs, v. Lee A. Solomon et al., Defendants. Case 2:11-cv-00745-PGS-ES, Declaration, February 6, 2012.

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

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

Motiva Enterprises LLC, Shell Oil Company, and TMR Company

In the State of New Hampshire Superior Court, Case No. 03-C-550, State of New Hampshire, Plaintiff, against Hess Corporation et al., Defendants, Expert Report, October 17, 2011; Deposition, December 6, 2011.

BP Exploration (America) Inc.

In the Superior Court for the State of Alaska at Anchorage, The State of Alaska, Plaintiff, v. BP Exploration (Alaska) Inc., a Delaware Corporation, Defendant, IN Case No. 3AN-09-6181 CI, Expert Report (with W. David Montgomery), September 30, 2011; Deposition, January 18, 2012; Supplemental Expert Report, March 15, 2012; Oral Testimony, June 13, 2012.

Mobil Oil Corporation

In the Twenty-Sixth Judicial District, District Court, Stevens County, Kansas, Willie Jean Farrar, et al. Plaintiffs, vs. Mobil Oil Corporation, Defendant, Affidavit, September 14, 2011; Expert Report, March 23, 2012; Affidavit, June 1, 2012.

In the United States District Court, for the District of Kansas, Jimmie Hershey, on behalf of himself and all others similarly situated, Plaintiffs, v. ExxonMobil Oil Corporation, Defendant, Affidavit, June 1, 2012.

Intercontinental Terminals Company, LLC

In the District Court, Harris County, Texas, 133rd District; Cause No. 2010-66657; Port Terminal Railroad Association, Plaintiff, vs. Intercontinental Terminals Company, LLC, Vopak North American, Inc., and Vopak Terminal Deer Park, Inc., Defendants, vs. Mitsui & Col. USA, Inc., Third-Party Defendant; Expert Report, September 2, 2011.

Motiva Enterprises, LLC

In the Circuit Court of the Eleventh Judicial Circuit in and for Miami-Dade County, Florida, Bay Point Oil Corp., et al, Plaintiffs, vs. Motiva Enterprises, LLC, Defendant, Case No. 03-03572, and *Hollywood Hills Service Center, Inc., et al, Plaintiffs, vs. Motiva Enterprises, LLC, Defendant, Case No. 04-13857 CA (30),* Declaration, July 15, 2011; Affidavit, May 25, 2012.

Kaiser-Francis Oil Company

In the United States District Court for the Western District of Oklahoma, J.C. Hill, et al., Plaintiffs, v. Kaiser-Francis Oil Company, Defendant, Case No. CIV-09-07-R, Affidavit, June 7, 2011; Expert Report, December 2, 2011; Supplemental Expert Report, August 13, 2012; Affidavit, October 19, 2012; Affidavit, November 7, 2012.

Progress Energy and Duke Energy

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

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

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

United States Soccer Federation Inc. and Major League Soccer LLC

In the United States District Court, Northern District of Illinois Eastern Division, Champions World LLC, Plaintiff, v. United States Soccer Federation Inc. and Major League Soccer LLC, Defendants, Case No. 06-CV-5724, Expert Report, May 13, 2011; Deposition, September 22-23, 2011.

The AES Corporation, Tau Power B.V.

At the International Centre for Settlement of Investment Disputes, Case No ARB/10/16, The AES Corporation, Tau Power B.V. and The Republic of Kazakhstan, Expert Report of Joseph P. Kalt and Howard N. Rosen (FTI Consulting Inc.), April 28, 2011; Rebuttal Expert Report of Joseph P. Kalt and Howard N. Rosen (FTI Consulting Inc.), March 30, 2012; Supplemental Expert Report of Joseph P. Kalt, August 6, 2012; Oral Testimony, September 14, 2012; Expert Report of Joseph P. Kalt and Howard N. Rosen (FTI Consulting Inc.), November 2, 2012; Oral Testimony, February 6-7, 2013.

Dairy Farmers of America, Inc. and Dairy Marketing Services, LLC

In the US District Court for the District of Vermont, Alice H. Allen and Laurence E. Allen d/b/a/ Al-Lens Farm et al, Plaintiffs, v. Dairy Farmers of America Inc., Dairy Marketing Services, LLC, and Dean Foods Company, Defendants, Docket No. 5:09-cv-00230-cr, Expert Report, April 5, 2011; Declaration, April 12, 2011; Deposition, May 6, 2011; Reply Report, July 6, 2011; Expert Report, December 16, 2011; Deposition, February 14, 2012; Expert Report, May 11, 2012; Reply Report, July 26, 2013.

Devon Energy Corporation, BP America Production, and Conoco Phillips Co.

In the First Judicial District Court, State of New Mexico, County of Santa Fe, Phillis Ideal and Collins Partners, Ltd., a Texas Limited Partnership, Plaintiffs, v. BP America Production Company, Defendant, Case No.: D-0101-CV-2003-02310, Affidavit, June 27, 2011; Expert Report, October 22, 2012; Deposition, August 28, 2014; Affidavit, November 14, 2014.

In the First Judicial District Court, State of New Mexico, County of Santa Fe, F. Ferrell Davis, Plaintiff, v. Devon Energy Corporation, et al., Defendants, No. D-0101-CV-200301590, Affidavit, March 30, 2011; Affidavit, June 26, 2011; Expert Report, July 6, 2012; Deposition, August 6, 2012; Affidavit, October 22, 2012.

In the First Judicial District Court, State of New Mexico, County of Santa Fe, Smith Family, LLC, Plaintiff, v. ConocoPhillips Company, Defendant, No. D-0101-CV-200302311, Affidavit, May 18, 2012; Affidavit, August 24, 2012.

ICM Assurance Ltd. and Nexen Inc.

In the Matter of the Arbitration Pursuant to the UK Arbitration Act 1996 Between ICM Assurance Ltd. And Nexen Inc., Claimants, v. Oil Insurance Limited, Respondent, Expert Report, December 17, 2010.

Atlantic Richfield Company

In the US District Court for the Eastern District of Wisconsin, Glenn Burton, Jr., v. American Cyanamid Co., et al. Case No. 07-CV-0303; Ravon Owens v. ABC Insurance, et al. Case No. 07-C0-441; and Cesar Sifuentes v. American Cyanamid Company et al., Case No. 10-CV-0075, Deposition of Joseph P. Kalt, December 20, 2016; Deposition, June 8, 2017.

Superior Court for the State of California, County of Santa Clara, Case No. 1-00-CV-788657, the People of the State of California v. Atlantic Richfield Company, et al., Deposition, September 26, 2011; Deposition, December 19, 2012.

In the US District Court for the Eastern District of Wisconsin, Glenn Burton, Jr., Plaintiff, Case No. 07-CV-0303, vs. American Cyanamid Co., et al., Defendants; and in the State of Wisconsin Circuit Court: County of Milwaukee, Yasmin Clark, Minor, by her guardian ad litem, Susan M. Gramling, Plaintiff, Case No. 06-CV-012653, v. American Cyanamid Co., et al., Defendants, Telephonic Deposition of Joseph P. Kalt, September 28, 2010.

State of Wisconsin Circuit Court, Milwaukee County, No. 99-CV-6411, Steven Thomas v Atlantic Richfield Co., et al., Deposition, April 5-6, 2006; Affidavit, April 27, 2007; Videotaped Deposition, May 3, 2007.

Superior Court of the State of Rhode Island, No. 99-5226, State of Rhode Island, Attorney General v Lead Industries Association, Inc., et al., Deposition, May 11-12, 2005; Deposition, August 18-19, 2005.

New England Power Generators Association

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

PPL Corporation and E.ON U.S. LLC

Before the Federal Energy Regulatory Commission, In re Docket No. EC10-__-000, Application for Approval Pursuant to Section 203 of the Federal Power Act, Volume

1 of 3; Affidavit filed with Joseph Cavicchi, June 28, 2010.

BNSF Railway Company

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

Cypress Semiconductor Corporation

In the US District Court for the Northern District of California Oakland Division, In re SRAM Antitrust Litigation, MDL No. 1819, Expert Report, May 4, 2010; Deposition, June 8, 2010.

Dean Foods Company, et al.

In the US District Court for the Eastern District of Tennessee Greenville Division, Sweetwater Valley Farm, Inc., et al., Plaintiffs, vs. Dean Foods Company, et al., Defendants, MDL No. 1899, Expert Report, May 3, 2010; Deposition, June 23-24, 2010; Expert Report, August 12, 2011.

In the US District Court for the Eastern District of Tennessee Greenville Division, Sweetwater Valley Farm, Inc., et al., No. 2:07-cv-208, Plaintiffs, vs. Dean Foods Company, et al., Defendants, Case No. 2:08-MD-01000, Declaration, March 30, 2011; Supplemental Declaration, March 15, 2012.

In the US District Court for the Eastern District of Tennessee Greenville Division, Food Lion, LLC, et al., Plaintiffs, vs. Dean Foods Company, et al., Defendants, Case No. 2:07-CV-188, Expert Report, May 3, 2010; Deposition, June 11, 2010; Declaration, April 16, 2015; Oral Testimony, June 23-24, 2015; Deposition, July 20, 2015.

McKesson Corporation

In the US District Court for the District of Massachusetts, San Francisco Health Plan individually and on behalf of the State of California, et al., Plaintiffs v McKesson Corporation, Defendant in C.A. No. 1:08-cv-10843-PBS; Responsive Expert Report, September 19, 2011.

In the US District Court for the District of Massachusetts, the State of Connecticut v. McKesson Corporation in Civil Action No. 08-10900-PBS, Responsive Expert Report, April 14, 2010.

In the US District Court for the District of Massachusetts, New England Carpenters Health Benefits Fund, et al. v First Databank, Inc. and McKesson Corporation, No. 05-11148-PBS, Report, January 28, 2008; Rebuttal Report, October 1, 2008.

CITGO Petroleum Corporation

In the United States District Court, Northern District of Oklahoma, in Re: Stephenson Oil Company, on behalf of itself and all others similarly situated, Plaintiff, vs. CITGO Petroleum Corporation, Defendant, Case No. 08-CV-380-TCK-TLW, Expert Report, November 20, 2009; Oral Testimony, February 25, 2010.

Confederated Tribes of the Chehalis Reservation

In the United States District, Western District of Washington at Tacoma, in Re: Confederated Tribes of the Chehalis Reservation, Plaintiffs, v. Thurston County Board of Equalization, Defendants, Civil Action No. C08 5562, Expert Report, October 15, 2009; Deposition, December 4, 2009.

Rio Tinto

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

North West Shelf Gas Party Ltd.

In the Matter of the Commercial Arbitration Act and an Arbitration Between Woodside Energy Ltd. and Others, Sellers, and Alinta Sales Party Ltd., Buyer, Statement and Expert Report on Behalf of the Sellers, July 3, 2009; Oral Testimony, August 26-27, 2009.

Gunnison Energy Corporation, SG Interests I, Ltd., and SG Interests VII, Ltd.

In the United States District Court for the District of Colorado In re: Riviera Drilling & Exploration Company, Plaintiff, v. Gunnison Energy Corporation, SG Interests I, Ltd., and SG Interests VII, Ltd., Defendants, Civil Action No. 08-cv-02486-REB-CBS, Expert Report, June 24, 2009; Expert Rebuttal Report, August 24, 2009; Deposition, October 20, 2009.

Gannett Company, Inc. *et al.*

In the United States District Court for the District of Arizona, State of Arizona ex rel. Terry Goddard, Attorney General, Plaintiff, v. Gannett Company, Inc.; Citizen Publishing Company; Lee Enterprises, Inc.; Star Publishing Company; and TNI Partners, Defendants, Affidavit, May 18, 2009.

Hyundai Heavy Industries Co., Ltd., *at al*.

International Chamber of Commerce, Court of Arbitration Case No. 15521/JEM/CYK, Hyundai Heavy Industries Co., Ltd., et al., Claimants v. International Petroleum Investment Company, et al., Respondents, Witness Statement, February 20, 2009; Oral Testimony, May 27, 2009.

Shell Oil Company; Shell Oil Products Company; Shell Trading (US) Company, LLC; Shell Enterprises, LLC; Motiva Enterprises, LLC; and TMR Company

In the United States District Court for the Southern District of New York, MDL No. 1358, Case No. 04-CV-3417 (SAS), In re: Methyl Tertiary Butyl Ether ("MTBE"), City of New York, Plaintiff v Amerada Hess Corporation, et al., Defendants, Expert Report, February 13, 2009; Supplemental Expert Report, March 30, 2009.

City of Los Angeles, California, *et al.*

US District Court, District of Columbia, Federal Maritime Commission v. City of Los Angeles, California, et al. Civil Action No. 1:08-cv-010895-RJL, Declaration, November 26, 2008.

PPL Companies

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

Federal Government of Canada

London Court of International Arbitration, In the Matter of Arbitration No. 111790 (Softwood Lumber Agreement), The United States of America v. Canada, Expert Witness Report of Joseph P. Kalt, November 9, 2011; Rebuttal Expert Report, Ex. R-151, February 3, 2012; Oral Testimony, March 6, 2012.

London Court of International Arbitration, In the Matter of Arbitration No. 81010 (Softwood Lumber Agreement), The United States of America v. Canada, Expert Witness Statement of Joseph P. Kalt, February 20, 2009; Rebuttal Expert Witness Report, May 8, 2009; Second Rebuttal Expert Witness Report, July 7, 2009; Oral Testimony, July 22-23, 2009; Expert Report (with Robert H. Topel), June 22, 2010.

London Court of International Arbitration, In the Matter of Arbitration No. 91312 (Softwood Lumber Agreement), The United States of America v. Canada, Expert Witness Statement of Joseph P. Kalt and David Reishus, May 12, 2009; June 11, 2009.

London Court of International Arbitration, In the Matter of Arbitration No. 7941 (Softwood Lumber Agreement), The United States of America v. Canada, Statement (with D. Reishus) June 29, 2008; Rebuttal Statement (with David Reishus), August 11, 2008; Oral Testimony, September 22-23, 2008.

ExxonMobil Corporation; *et al.*

US District Court, District of Columbia, Cause No. 1:04CV00940, City of Moundridge, Kansas et al. v ExxonMobil Corporation, et al., Affidavit, January 11, 2006; Report, June 5, 2008.

City of Las Cruces, New Mexico

State of New Mexico, et al. Plaintiffs, v. City of Las Cruces, New Mexico, and Dona Ana Mutual Domestic Water Consumers Association, Defendants, No. CV-06-1289, Declaration, May 16, 2008.

Association of American Railroads

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

Chevron USA, Inc., *et al.*

US District Court, Eastern District of Texas, Texarkana Division, United States of America ex rel. Harrold E. (Gene) Wright v Chevron USA, Inc., et al., No. 5:03cv264, Reports, April 1, 2008 (Unocal, Mobil), April 11, 2008 (Mobil); Depositions, April 14, 20-21, 2008.

Infineon Technologies AG

US District Court, Northern District of California, Dynamic Random Access Memory (DRAM) Antitrust Litigation (*Dockets No. 06-cv-1665, 07-cv-1200, 07-cv-1207, 07-cv-1212, 07-cv-1381*), Report, March 7, 2008; Deposition, April 26, 2008.

Exxon Mobil Corporation

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

Tyco Healthcare Group L.P. and Mallinckrodt Inc.

US District Court, Central District of California, Western Division, Allied Orthopedic Appliances, Inc., et al. v Tyco Healthcare Group L.P. and Mallinckrodt Inc., No. V-05-6419-MFP (AJWx), Report, February 1, 2008; Deposition, March 4, 2008.

P3 Group

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

Tractebel Energy Marketing, Inc.

Tractebel Energy Marketing, Inc. v AEP Power Marketing, Inc., et al., Nos. 03 CV 6731, 03 CV 6770, Report, January 21, 2008.

Cabot Corporation

US District Court, District of Massachusetts, AVX Corporation and AVX Limited v Cabot Corporation, C.A. No. 04 CV 10467 RGS, Report, January 15, 2008; Deposition, March 12, 2008.

Columbia Gas Transmission Corporation, *et al.*

US District Court, Southern District of West Virginia, Stand Energy Corp., et al. v Columbia Gas Transmission Corp., et al., No. 2:04-0867, Report, December 18, 2007; *Civil Action Nos. 2:04-0868 through 0874*, Videotaped Deposition, February 7, 2008; *Civil Action No. 2:04-0867*, Expert Report, September 30, 2008.

Nissan North America, Inc.

US District Court, District of Maine, MDL Docket No. 03-md-1532, ALL CASES, In Re: New Motor Vehicles Canadian Export Antitrust Litigation, Report, October 26, 2007; Deposition, December 13, 2007.

Energy Transfer Partners, L.P.

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

Equilon Enterprises LLC, *et al.*

US District Court, Eastern District of Missouri, Eastern Division, Daniels Self, et al. v Equilon Enterprises LLC, et al., Cause No. 4 00CV0193 TIA, Report, September 4, 2007; Deposition, September 22, 2007.

Occidental Petroleum Corporation

Arbitration under the Convention on the Settlement of Investment Disputes Between States and Nationals of Other States and the Treaty Between the United States of America and the Republic of Ecuador Concerning the Encouragement and Reciprocal Protection of Investment, ICSID No. ARB/06/11, Report, September 17, 2007; Rebuttal Witness Statement, June 12, 2009; Oral Testimony, November 7, 2009; Joint Expert Report with Daniel Johnston, April 11, 2011; Supplemental Joint Expert Report with Daniel Johnston, June 10, 2011; Second Supplemental Joint Expert Report with Daniel Johnston, June 24, 2011.

The Hanwha Companies, ORIX Corporation, and Macquarie Life Limited

International Court of Arbitration of the International Chamber of Commerce, Korea Deposit Insurance Corporation v Hanwha Companies, ORIX Corporation, and Macquarie Life Limited, ICC No. 14501/JB/JEM/EBS (c. 14502/JB/JEM/EBS), Report, July 13, 2007; Reply Report, September 7, 2007.

New Times Media LLC, *et al.*

Supreme Court of the State of California, In and For the County of San Francisco, Unlimited Jurisdiction, Bay Guardian Company, Inc. v New Times Media LLC, et al., No.: 04-435584, Report, June 27, 2007; Declaration, June 28, 2007; Deposition, December 18, 2007; Oral Testimony, February 14, 2008.

American Electric Power Service Corporation, *et al.*

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

Western Refining, Inc.

US District Court, Federal Trade Commission v Western Refining, Inc., et al., No. 1:07-CV-00352-JB-ACT, Report, May 2, 2007; Deposition, May 6, 2007; Oral Testimony, May 11, 2007.

Equilon Enterprises LLC dba Shell Oil Products US, *et al.*

US District Court, Central District of California, Southern Division, No. SACV-04-10370 JVS (JTLx), Report, November 20, 2006; Rebuttal Report, December 22, 2006; Declarations, February 12, 2007, February 15, 2007, March 12, 2007, March 26, 2007; Addendum to Rebuttal Report, March 26, 2007; Oral Testimony, June 20, 2007.

Qualcomm, Inc., *et al.*

US District Court, Eastern District of Texas, Tyler Division, Golden Bridge Technology Inc., Plaintiffs v. Nokia, Inc. et al., Defendants, Civil Action No. 6:06-cv-163 LED, Report, November 7, 2006; Deposition, December 8, 2006.

ExxonMobil Corporation

ExxonMobil Royalty Settlement Agreement Reopener: Direct Cost Reopener, Report, July 31, 2006; Rebuttal Report, September 13, 2006.

ExxonMobil Corporation

Internal Revenue Service, Reports, June 29, 2006, December 15, 2006 (with D. Reishus).

Individual Defendants

US District Court, Southern District of Texas, Civil Action No. H-05-0332; U.S. Commodity Futures Trading Commission v Denette Johnson, Report, June 14, 2006; Oral Testimony, August 30, 2006; Affidavit, April 20, 2007; Affidavit, May 23, 2007; Oral Testimony, January 11, 2008.

BP America Production Company, et al.

State of New Mexico, County of Santa Fe First Judicial District, No. D-0101-CV-200001620, Laura Dichter, et al. v BP America Production Company, et al., Affidavit, February 8, 2006; Report, March 23, 2007.

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

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

BP America Production Company F/K/A Amoco Production Company, et al.

District Court of Kleberg County, Texas, Camp Gilliam v BP America Production Company F/K/A Amoco Prod. Co., et al., Cause No. 03-445-D; Report, November 18, 2005; Oral/Video Deposition, January 10, 2006.

General Motors Corporation, et al.

US District Court, District of Maine, MDL Docket No. 03-md-1532, ALL CASES, In Re: New Motor Vehicles Canadian Export Antitrust Litigation, Report, September 30, 2005; Deposition, December 6, 2005; Report, December 1, 2006.

OXY USA, Inc.

Eighth Judicial District Court, State of New Mexico, County of Union, No. 04-24 CV, Heimann, et al. v Oxy USA, Inc., Report, July 13, 2005.

US Bancorp

Superior Court of Los Angeles County, Central District, State of California, No. BC 285 134, Auerbach Acquisition Associates, Inc. v Greg Daily et al., Deposition, June 21, 2005.

PPL Corporation

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

SBC Communications, Inc.

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

General Electric and Bechtel (Dabhol)

Arbitration Under an Agreement Between the Government of the Republic of Mauritius and the Government of the Republic of India for the Promotion and Protection of Investments and Under the Citral Rules, Capital India Power Mauritius I and Energy Enterprises (Mauritius) Company (Claimants) and the Government of the Republic of India (Respondent), Report (with D. Newbery and T. Lumsden), May 23, 2005.

Hamersley Iron/Rio Tinto

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

Duke Energy LNG Services, Inc.

Arbitration under the uncitral rules. L'Enterprise Nationale pour la Recherche, la Production, le Transport, la Transformation et al Commercialisation des Hydrocarbons, and Sonatrading (Amsterdam) B.V., Claimants; and Duke Energy LNG Services, Inc., Report, April 22, 2005**;** Second Report, November 11, 2005; Oral Testimony, February 16, 2006.

American Association of Railroads

Surface Transportation Board, Ex Parte 657, Rail Rate Challenges Under the Stand-Alone Cost Methodology, Statement, April 30, 2005; Oral Statement, April 26, 2005; Statement, May 1, 2006; Reply Statement, May 31, 2006; Rebuttal Statement, June 30, 2006.

BNSF Railway Company

Surface Transportation Board, STB Docket No. 42088, Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v BNSF Railway Company,

Statement, April 19, 2005; Reply Statement, July 20, 2005; Rebuttal Statement, September 30, 2005.

Community of Awas Tingni

Inter-American Court of Human Rights, Mayagna (Sumo) Indigenous Community of Awas Tingni Against the Republic of Nicaragua, Report (with M. Begay), April 15, 2005.

PPL Corporation

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

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

Sovereign Risk Insurance Limited

American Arbitration Association, ZC Specialty Insurance Company v Sovereign Risk Insurance Limited, No. 50 T 153 0055203, Report, March 10, 2005; Suppl. Report, April 11, 2005.

ExxonMobil Corporation

State of Alaska v. ExxonMobil; JAMS (Joint Arbitration & Mediation Services) Ref. No. 1220032196; ExxonMobil Royalty Settlement Agreement Reopener: Destination Value, Report, March 4, 2005; Rebuttal Report, March 24, 2005; Oral Testimony, April 7, 2005.

PPL Montana, LLC

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

T-Mobile

Superior Court of the State of California, County of Alameda, No. 4332, Cell Phone Termination Fee Cases, Affidavit, January 17, 2005, Declaration, November 6, 2008.

Shell Oil Company, Texaco Refining and Marketing Inc., Equilon Enterprises LLC

US District Court, Central District of California, No. SACV- 03-565-JVS (JTLx), Andre Van Der Valk, et al. v Shell Oil Company, et al., Report, October 8, 2004; Rebuttal Report, November 8, 2004; Deposition, December 13, 2004; Second Rebuttal Report, April 4, 2005.

Shell Oil Products Company, LLC, Shell Oil Company, and Motiva Enterprises, LLC
US District Court, District of Massachusetts, Mac's Shell Service, Inc., et al. v Shell Oil Products Company, LLC, et al., No. 01-CV-11300-RWZ, Report, July 6, 2004; Deposition, July 29, 2004; Oral Testimony, November 30-December 1, 2004; Declaration Re: Expert Testimony of Brian S. Gorin, October 14, 2008; Declaration Re: Expert Testimony of Richard J. Olsen, October 14, 2008.

Equilon Pipeline Company
US District Court, Western District of Washington at Seattle, No. C01-1310L, Olympic Pipeline Co. v Equilon Pipeline Co., LLC, et al., Report, June 18, 2004; Deposition, June 29-30, 2004; Suppl. Report, October 27, 2004.

ExxonMobil Corporation
District Court of Monroe County, Alabama, Aline Moye, et al. v ExxonMobil Corporation, et al., CV-98-20, Report, June 15, 2004.

CSX Transportation Inc.
US District Court, Northern District of Florida, Tallahassee Division, No. 4:03CV169-RH, CSX Transportation, Inc. v Department of Revenue of the State of Florida, et al., Report, May 14, 2004; Deposition, August 5, 2004.

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

British Columbia Lumber Trade Council and the Province of British Columbia
U.S. Dept. of Commerce, International Trade Administration, Certain Softwood Lumber Products from Canada (C-122-839), Reports, December 12, 2001, January 16, 2002, March 15, 2004 (with D. Reishus), March 16, 2004 (with D. Reishus), April 15, 2004 (with D. Reishus.), September 15, 2004 (With D. Reishus), February 28, 2005 (with D. Reishus), March 15, 2005, December 5, 2005 (with D. Reishus), December 5, 2005 (with D. Reishus).

CSX Transportation, Inc.
US District Court, Northern District of Georgia, No. 1:02-CV-2634CAP, CSX Transportation, Inc. v State Board of Equalization of the State of Georgia, *et al.,* Report, April 15, 2004; Deposition, September 24, 2004; Oral Testimony, May 16, 2005.

El Paso Natural Gas Company and Burlington Resources Oil & Gas Company
District Court of Washita County State of Oklahoma, Nations Bank, N.A., et al. v El Paso Natural Gas Company and Burlington Resources Oil & Gas Company, No. CJ-97-68, Report, March 30, 2004; Deposition, April 27, 2004; Suppl. Report, August 16, 2005; Oral Testimony, November 2, 2005.

Chevron U.S.A. Inc.

District Court, 17th Judicial District, Parish of LaFourche, LA, Chevron U.S.A. Inc. v State of Louisiana, et al., Report, November 21, 2003; Suppl. Report, January 9, 2004; Oral Testimony, March 16, 2004.

Arizona Competitive Power Alliance

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

Shell Oil Company

Court of Common Pleas, Cuyahoga County, Ohio, Donald J. Casserlie, et al. v *Shell Oil Company, et al.*, Report, January 30, 2004.

Shell Oil Company, *et al.*

District Court, County of Montezuma, State of Colorado, Celeste C. Grynberg, et al. v Shell Oil Company, et al., Affidavit, June 12, 2003; Report, June 20, 2003; Suppl. Report, August 15, 2003; Deposition, December 2, 2003; Affidavits, January 6, 2004; Affidavit, January 22, 2004; Oral Testimony, October 14, 2004.

Motiva Enterprises, LLC, *et al.*

Superior Court of Connecticut, Complex Litigation Docket at Waterbury, Wyatt Energy, Inc. v Motiva Enterprises, LLC, et al., Report, November 20, 2003; Deposition, December 18-19, 2003; Suppl. Report, August 20, 2008; Oral Testimony, June 15-16, 2009.

SDDS, Inc.

Circuit Court, Sixth Judicial District, SDDS, Inc. v State of South Dakota, Affidavit, December 23, 2002; Affidavit, January 17, 2003; Report, February 24, 2003; Report, April 25, 2003; Deposition, May 13, 2003; Oral Testimony, July 2, 2003, July 11, 2003; Oral Rebuttal Testimony, July 17, 2003; Affidavit, October 22, 2003.

Shell Western E & P Inc., Shell Gas Trading Company, and Shell Oil Company

US District Court, 112th Judicial District, Crockett County, TX, Minnie S. Hobbs Estate, et al. v Shell Western E & P Inc., et al., Report, August 28, 2002; Deposition, December 14, 2002; Suppl. Report, August 1, 2003; Affidavit, August 20, 2003; Oral Testimony, October 7, 2003.

The Burlington Northern & Santa Fe Railway Company

US District Court, Northern District of California, San Francisco Division, Truck-Rail Handling, Inc. and Quality Transport, Inc. v The Burlington Northern & Santa Fe Railway Company, Report, August 18, 2003; Suppl. Report, September 22, 2003; Deposition, September 25, 2003.

Dex Holdings, LLC

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

Amerada Hess Corporation

First Judicial District, State of New Mexico, County of Santa Fe, Patrick H. Lyons, Commissioner of Public Lands of the State of New Mexico, Trustee v Amerada Hess Corporation, Report, September 21, 2001; Deposition, November 7, 2001; Suppl. Report, January 31, 2002; Second Suppl. Report, April 7, 2003; Deposition, May 8, 2003.

Oxy USA, Inc.

Twenty-Sixth Judicial District, District Court, Stevens County, Kansas, Civil Department, Opal Littell, et al., v Oxy USA, Inc., Report, October 7, 2002; Rebuttal Report, October 29, 2002; Oral Testimony, April 7, 2003.

El Paso Merchant Energy, L.P.

Energy Regulatory Commission, et al., v Sellers of Long-Term Contracts to the California Department of Water Resources, Sellers of Energy and Capacity Under Long-Term Contracts with the California Department of Water Resources, Testimony, October 17, 2002; Rebuttal Testimony, November 14, 2002; Deposition, November 24, 2002; Oral Testimony, December 10, 2002; Prepared Reply Testimony, March 20, 2003.

Joint Complainant Sellers of Jet Fuel

US Court of Federal Claims, Department of Defense Jet Fuel Contract Litigation, declarations in various individual cases, December 2002-2007.

El Paso Merchant Energy, L.P.

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

Powerex Corp.

American Arbitration Assoc., International Commercial Arbitration Between Powerex Corp. and Alcan Inc., Report, November 20, 2002; Oral Testimony, December 12, 2002.

Mardi Gras Transportation System Inc.

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

The Burlington Northern & Santa Fe Railway Company

US District Court, Western District of Texas, Austin Division, South Orient Railroad Company, Ltd. v The Burlington Northern & Santa Fe Railway Company and Union Pacific Railway Company, Report, October 30, 2002; Deposition, November 15, 2002.

Texaco Inc., *et al.*

District Court, 19th Judicial District, Parish of East Baton Rouge, LA, State of Louisiana and Secretary of the Department of Revenue and Taxation, et al. v Texaco Inc., et al., Report, November 11, 2002.

Ticketmaster Corporation

US District Court, Central District of California, Tickets.com, Inc. v Ticketmaster Corporation and Ticketmaster-Online Citysearch, Inc., Rebuttal Report, November 8, 2002; Deposition, November 20, 2002.

ExxonMobil Corporation

US Department of the Interior, Board of Land Appeals, Request for Value Determination Regarding the Arm's-Length Nature of a Gas Sales Contract, Affidavit, October 8, 2002.

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

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

Conoco Inc. and Phillips Petroleum Company

US District Court, Northern District of Oklahoma, Transeuro Amertrans Worldwide Moving and Relocations Limited v Conoco Inc. and Phillips Petroleum Company, Affidavit, August 21, 2002; Oral Testimony, September 17, 2002.

Amoco Production Company

District Court, La Plata County, Colorado, Richard Parry, et al. v Amoco Production Company, Report, May 1, 2002; Oral Testimony, August 29, 2002.

Conoco Inc., Amoco Production Company, and Amoco Energy Trading Corp.

US District Court, District of New Mexico, Elliott Industries Limited Partnership v Conoco Inc., et al., Report, July 1, 2002; Affidavit, July 6, 2002; Deposition, August 13, 2002.

CFM International, Inc.

US District Court, Central District of California, Western Division, Aviation Upgrade Technologies, Inc. v The Boeing Company, et al., Report, June 28, 2002.

Elkem Metals Company and CC Metals & Alloys, Inc.

US International Trade Commission, Ferrosilicon from Brazil, China, Kazakhstan, Russia, Ukraine, and Venezuela, Remand Proceedings, Affidavit, May 23, 2002; Oral Testimony, June 6, 2002.

Chevron U.S.A., Conoco, and Murphy Exploration & Production Company

US Court of Federal Claims, Chevron U.S.A., Inc.; Conoco Inc.; and Murphy Exploration & Production Company v United States of America, Report, May 1, 2002.

El Paso Merchant Energy, L.P.

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

Surrebuttal Testimony, June 19, 2001; Rebuttal Testimony, March 11, 2002; Oral Testimony, March 26-27, 2002.

American Quarter Horse Association

251st District Court, Potter County, Texas, Kay Floyd, et al. v American Quarter Horse Association, Affidavit, October 30, 2001; Report, February 1, 2002.

Amoco Production Company, *et al.*

First Judicial District, State of New Mexico, County of Santa Fe, Ray Powell, Commissioner of Public Lands of the State of New Mexico, Trustee v Amoco Production Company, Amerada Hess Corporation, Shell Western E&P, Inc., and Shell Land & Energy Co, Report, September 21, 2001; Deposition, November 7, 2001; Suppl. Report, January 31, 2002.

Shell Oil Company

Montana Sixteenth Judicial District Court, Fallon County, Fidelity Oil Company v Shell Western E & P, Inc., and Shell Oil Company, Report, September 7, 2001.

Anne E. Meyer and Mary E. Hauf, et al. v Shell Western E & P, Inc., and Shell Oil Company. Rebuttal Report, September 7, 2001.

Fran Fox Trust, et al. v *Shell Western E & P, Inc., and Shell Oil Company*. Rebuttal Report, September 7, 2001.

Marvel Lowrance and S-W Company v *Shell Western E & P, Inc., and Shell Oil Company*. Rebuttal Report, September 7, 2001.

Bass Enterprises Production Company

Bass Enterprises Production Company, et al. v United States of America, Assessment of Bass Enterprises Production Company's and Enron Oil and Gas Company's Economic Losses Arising from the Temporary Taking of Oil and Gas Lease, Report, March 19, 1999; Deposition, May 13, 1999; Oral Testimony, October 24-25, 2000; Suppl. Report, June 11, 2001; Deposition, June 30, 2001; Oral Testimony, July 23-24, 2001.

Tosco Corporation

US District Court, District of Hawaii, Carl L. Anzai, Attorney General, for the State of Hawaii, As Parens Patriae for the Natural Persons Residing in Hawaii, and on Behalf of the State of Hawaii, its Political Subdivisions and Governmental Agencies, v Chevron Corporation, et al., Report, October 23, 2000; Deposition, January 8-9, 2001; Suppl. Report, April 16, 2001; Deposition, April 24, 2001.

Shell Oil Company, *et al.*

US District Court, District of Colorado, United States Government and CO2 Claims Coalition, LLC, v Shell Oil Company and Shell Western E&P, Inc., Mobil Producing Texas and New Mexico, Inc., and Cortez Pipeline Company, Report, November 23, 1998; Deposition, January 11-12, 1999; Affidavit, January 21, 1999; Suppl. Report, April 30, 1999; Second Suppl. Report, March 30, 2001.

American Airlines

The United States Department of Justice v AMR Corporation, Report, October 11, 2000; Deposition, October 31-November 1, 2000; Suppl. Report, November 16, 2000; Revised Suppl. and Rebuttal Report, December 4, 2000; Deposition, December 14-15, 2000; Declaration, January 5, 2001; Declaration, March 14, 2001.

Teléfonos de Mexico

US District Court, Western District of Texas, San Antonio Division, Access Telecom, Inc. v MCI Telecommunications Corp., MCI International, Inc., SBC Communications, Inc., SBC International, Inc., SBC International Latin America, Inc., and Teléfonos de Mexico, Report, January 22, 2001; Suppl. Report, February 14, 2001; Deposition, February 22, 2001.

Exxon Corporation

Allapattah Services, Inc., et al. v Exxon Corporation, U.S. District Court, Southern District of Florida, Affidavit, November 25, 1996; Report, January 22, 1997; Deposition, September 22 and November 11, 1998; Report, April 15, 1999; Deposition, May 3-4, 1999; Affidavit, May 16, 1999; Affidavit, June 6, 1999; Deposition, July 12, 1999; Daubert Testimony, July 15-17, 1999; Oral Testimony, August 24-25, 1999; Oral Testimony, February 6, 7, 8, 12, 2001.

Burlington Northern Santa Fe

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

Compaq Computer Corporation

US District Court, Eastern District of Texas, Beaumont Division, Charles Thurmond, Hal LaPray, Tracy D. Wilson, Jr., and Alisha Seale Owens v Compaq Computer Corporation. Opinion, December 15, 2000; Deposition, January 4, 2001.

Phillips Petroleum Company, *et al.*

District Court of Fort Bend, Texas, 268th Judicial District, Kathryn Aylor Bowden, et al. v Phillips Petroleum Company, et al., Deposition, August 1, 2000; Oral Testimony, September 8, 2000.

Exxon Corporation, Shell Oil Company, and Union Oil Company of California

US District Court, Eastern District of Texas, Lufkin Division, J. Benjamin Johnson, Jr., and John M. Martineck, Relators, on Behalf of the United States of America, v Shell Oil Company, et al., Reports, June 16, 2000; Deposition (Shell Oil Co.), August 8-11, 2000.

Union Oil Company of California and Shell Oil Company

Review of the Federal Royalties Owed on Crude Oil Produced from Federal Leases in California, Report, June 30, 1997; Suppl. Report, July 28, 2000.

Government of Canada

Arbitration Under Chapter Eleven of the North American Free Trade Agreement: Between Pope & Talbot, Inc., and The Government of Canada, Affidavit, March 27, 2000; Second Affidavit, April 17, 2000; Oral Testimony, May 2, 2000.

Exxon Company, U.S.A.

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

Crow Indian Tribe

Rose v Adams, Crow Tribal Court, Montana. Report Concerning the Crow Tribe Resort Tax (with D. Reishus), November 27, 1996; Testimony, January 23, 1997; Surrebuttal Report (with D. Reishus), February 25, 1997; Report (with D. Reishus), March 31, 2000.

BP Amoco, PLC, and Atlantic Richfield Company

US District Court, Northern District of California, San Francisco Division, Federal Trade Commission v BP Amoco, PLC and Atlantic Richfield Company, Report, March 1, 2000; Deposition, March 7, 2000.

Williams Production Company *et al.*

First Judicial District, County of Santa Fe, State of New Mexico, *San Juan 1990-A, L.P., K&W Gas Partners, et al. v Williams Production Company and John Doe,* Affidavits, August 29, 1997 and February 7, 2000.

Te Ohu Kai Moana (Treaty of Waitangi Fisheries Commission)

High Court of New Zealand, Auckland Registry, between Te Waka Hi Ika O Te Arawa and Anor, et al., Affidavit, February 4, 2000.

American Petroleum Institute

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

Amoco Production Company and Amoco Energy Trading Corporation

First Judicial District Court, County of Santa Fe, State of New Mexico, The Florance Limited Company, et al. v Amoco Production Co., et al., Report, December 15, 1999; Deposition, January 11-12, 2000.

Reliant Technologies, Inc.

U.S. District Court, Northern District of California/Oakland Division, Reliant Technologies, Inc. v Laser Industries, Ltd., and Sharplan Lasers, Inc., Report, October 15, 1999; Deposition, December 2-3, 1999.

El Paso Natural Gas Company

District Court of Dallas County, Texas, Transamerican Natural Gas Corporation v El Paso Natural Gas Company, et al., Report, September 24, 1999; Deposition, September 28, 1999; Affidavit, November 19, 1999.

Rockwell International Corporation and Rockwell Collins, Inc.

US District Court, District of Arizona, Universal Avionics Systems Corporation v Rockwell International Corporation, et al., Report, September 15, 1998; Second Report, November 18, 1998; Supplement to Report, July 30, 1999; Supplement Amended Second Report, July 30, 1999; Deposition, September 22-23, 1999.

Exxon Corporation

Superior Court, State of California, Los Angeles, the People of the State of California, City of Long Beach, et al. v Exxon Corporation, et al. Deposition, May 11-12, 19, 1999; Oral Testimony, July 22-23, 26-29, 1999.

Texaco, Inc.

US District Court, Middle District of Louisiana, *Long, et al. v Texaco, Inc., et al.,* Report (with K. Grant), August 14, 1998; Deposition, October 2-3, 1998 [6th *Judicial District Court, Parish of Iberia, State of Louisiana*, *John M. Duhe, Jr., et al. v Texaco Inc., et al.,* Oral Testimony, March 2, 1999; *United District Court, Western District of Louisiana, Texaco Inc., et al. v Duhe, et al.,* Report (with K. Grant), June 30, 1999.

AIMCOR, American Alloys, Inc., *et al.*

US International Trade Commission, Ferrosilicon from Brazil, China, Kazakhstan, Russia, Ukraine, and Venezuela, Oral Testimony, April 13, 1999.

Elkem Metals Company, L.P.

In Re Industrial Silicon Antitrust Litigation and Related Cases, US District Court, Western District of Pennsylvania, Report, January 9, 1998; Deposition, February 5-6, 1998.

US District Court, Western District of Pennsylvania, Bethlehem Steel Corporation v Elkem Metals Company, L.P., and Elkem ASA, Report, December 9, 1998; Deposition, March 26-27, 1999.

El Paso Energy Corporation and El Paso Tennessee Pipeline Co.

EPEC Gas Latin America, Inc. and EPEC Baja California Corporation v Intratec S.A. de C.V., et al. v El Paso Energy Corp., et al., Report, March 26, 1999.

Government of Canada

Arbitration Panel Convened Pursuant to Article V of the Softwood Lumber Agreement Between The Government of Canada and The Government of the United States of America, Canada-United States Softwood Lumber Agreement: British Columbia's June 1, 1998 Stumpage Reduction, Report, March 12, 1999.

Rockwell International Corporation and Rockwell Collins, Inc.

US District Court, District of Arizona, Universal Avionics Systems Corporation v Rockwell International Corporation, et al., Report, September 15, 1998; Second Report, November 18, 1998; Supplement to Report, July 30, 1999; Supplement Amended Second Report, July 30, 1999; Deposition, September 22-23, 1999.

American Alloys, Inc., Globe Metallurgical, Inc. and Minerais U.S. Inc.
In re Industrial Silicon Antitrust Litigation: Civil No. 95-2104, US District Court, Western District of Pennsylvania. Oral Testimony, November 2, 1998.

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

Group of Oil Company Defendants
US District Court, Southern District of Texas, Corpus Christi Division, Lease Oil Antitrust Litigation No. II, MDL No. 1206, Deposition, September 28, October 15, 1998; Affidavit, October 8, 1998.

American Alloys, Inc., *et al.*
US District Court, Western District of Pennsylvania, Industrial Silicon Antitrust Litigation, No. 95-2104, Testimony, September 14, 1998.

North West Shelf Gas Project
Arbitration Between Western Power Corporation and Woodside Petroleum Development Pty. Ltd. (ACN 006 325 631), et al. First Statement, May 6, 1998; Second Statement, May 15, 1998; Third Statement, July 22, 1998; Oral Testimony, July 22-28, 1998.

TransCanada Gas Services Limited
US District Court, District of Montana, Paladin Associates, Inc., et al. v Montana Power Company, et al., Report, November 19, 1997; Rebuttal Report, December 22, 1997; Deposition, January, 1998; Affidavit May 19, 1998.

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

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

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

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

Exxon Corporation and Affiliated Companies
US Tax Court, Exxon Corporation and Affiliated Companies v Commissioner of Internal Revenue, Rebuttal Report, February 19, 1998.

Exxon Company

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

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

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

Group of Energy Company Defendants

US District Court, District of New Mexico, Doris Feerer, et al. v Amoco Production Company. et al., Report, May 5, 1997; Suppl. Report, July 14, 1997; Deposition, December 4-5, 1997.

Phillips Petroleum Company

US District Court, Canyon Oil & Gas Co. v Phillips Petroleum Company, Report (with K. Grant), September 30, 1997.

Pro Se Testimony

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

Pennsylvania Power & Light Company

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

Exxon Corporation

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

Honeywell, Inc.

Litton Systems, Inc. v Honeywell Inc., US District Court, Central District of California, No. CV-90-0093 MR., Preliminary Report, March 7, 1997.

In the matter of Litton Systems, Inc., v. Honeywell Inc., before the United States District Court, Central District of California, Case No. CV90-4823 MRP (EX), Report on Assessment of Litton's Antitrust Damages, August 3, 1998; Deposition, August 24-August 26, 1998; Oral Testimony, December 2-4, 1998.

Public Service Company of New Hampshire

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

Group of Oil Company Defendants

Fifth Judicial District Court, County of Chaves, State of New Mexico, Carl Engwall, et al. v Amerada Hess Corp., et al., Deposition, November 1-2, December 6, 1996; Oral Testimony, January 16-17, 1997.

District Court of Seminole County, State of Oklahoma, Laura Kershaw, et al. v Amoco Production Co., et al., Deposition, November 5, December 6, 1996.

Fond du Lac Band of Chippewa Indians

US District Court, District of Minnesota, Fourth Division, Fond du Lac Band of Chippewa Indians, et al. v Arne Carlson, et al., Report, December 4, 1996; Suppl. Report, December 20, 1996.

Northeast Utilities

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

Pro Se Testimony

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

Burlington Northern Railroad Company

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

Pennzoil Company

Lazy Oil Co., et al. v Witco Corporation, et al., Report, January 29, 1996; Deposition, March 1996.

Yavapai-Prescott Indian Tribe

Yavapai-Prescott Indian Tribe v Harold Scott (Director of Revenue, State of Arizona), et al. Declaration, June 27, 1995; Second Declaration, August 10, 1995.

Northeast Utilities

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

State of Michigan

Court of Claims, State of Michigan, Carnagel Oil Associates, et al. v State of Michigan, The Department of Natural Resources, et al; Miller Brothers, et al. v State of Michigan, The Department of Natural Resources, et al., Deposition, May 30, 1995.

Burlington Northern Railroad Company

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

Northern Natural Gas Pipeline Co.

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

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

Atlantic Richfield Corp., Exxon U.S.A., Inc., and British Petroleum, Inc.
Superior Court, State of Alaska, First Judicial District at Juneau, ANS Royalty Litigation. Report, June 6, 1994; Deposition, October 1994.

Esso Standard Oil Company (Puerto Rico)
US District Court, Puerto Rico, Esso Standard Oil Company (Puerto Rico), et al. v Department of Consumer Affairs, Commonwealth of Puerto Rico, Deposition, April, 1994; Testimony, July-August, 1994; Testimony, August 1989, April, May 1990.

Governments of British Columbia and Canada
US Department of Commerce, International Trade Administration, Certain Softwood Products from Canada, Report for the First Administrative Review, Statement, April 12, 1994.

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

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

ARCO Pipe Line Company, Four Corners Pipe Line Co. and ARCO Transportation Alaska, Inc.
Federal Energy Regulatory Commission, Market-Based Ratemaking for Oil Pipelines, Comments in Response to Notice of Inquiry, Statement, January 1994.

Exxon
U.S. Bankruptcy Court, Claims Quantification Proceedings, In Re: Columbia Gas Transmission Corporation, Testimony, July 1993, October 1993.

El Paso Natural Gas Company
El Paso Natural Gas Company v Windward Energy & Marketing, et al., Report, August 1993, Affidavit, September 4, 1993.

SAGASCO Holdings Ltd.
Federal Court of Australia, Santos Ltd. Acquisition of SAGASCO Holdings Ltd., Testimony, August 1993.

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

Gulf Central Pipeline Company

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

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

White Mountain Apache Tribe

US Fish and Wildlife Service, U.S. Department of the Interior, Proposed Endangered Species Act Designation of Critical Habitat for Salix Arizonica (Arizona Willow) on the Fort Apache Indian Reservation, Statement, April 1993.

General Chemical Corporation

US Department of the Interior, Bureau of Land Management, Proposed Increase in Royalty Rates on Soda Ash, Statements, February 1993.

Association of American Railroads

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

Coalition of Petroleum Refiners

US Department of Energy, Office of Hearings and Appeals, The Citronelle Exception Relief, Statement, July 1992; Testimony, October 1992, November 1992, December 1992; Testimony, March and July, 1989.

Exxon

State of California, et al. v Standard Oil Co. of California, et al., Deposition, October 1992.

Burlington Northern Railroad Company

American Arbitration Association, Arbitration between Wisconsin Power & Light Company and Burlington Northern Railroad Company and Soo Line Railroad Company, Testimony, August, September 1992.

Atlantic Richfield Company

Don Van Vranken, et al. v Atlantic Richfield Company. Deposition, February 1992; Testimony, August 1992.

National Council on Compensation Insurance `

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

Governments of British Columbia and Canada

International Trade Administration, U.S. Department of Commerce, Certain Softwood Lumber Products from Canada, Statement, February, March, April 1992; Testimony, April 1992, May 1992.

British Petroleum and Exxon Corporation
Superior Court, State of Alaska, First Judicial District at Juneau, ANS Royalty Litigation, State of Alaska, et al. v Amerada Hess, et al., Report, April 1991; Deposition, June, September 1991; Suppl. Report, April 1992.

Transcontinental Gas Pipe Line Corporation
United States of America Federal Energy Regulatory Commission, Testimony, March 1992.

Atlantic Richfield Company
Greater Rockford Energy and Technology, et al. v Shell Oil Company, et al., Deposition, December 1991.

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

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

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

Liberty Mutual Insurance Company
Minnesota Workers' Compensation Insurance Antitrust Litigation, Deposition, November 1990.

Misle Bus and Equipment Company
United States of America v Misle Bus and Equipment Company, Oral Testimony, September 1990.

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

Amoco Production Company
The Kansas Power and Light Company, et al. v Amoco Production Company, et al., Deposition, March 1990 through June 1990.

Santa Fe Industries
Texas Utilities Company and Chaco Energy Company v Santa Fe Industries, Inc., et al. Deposition, November 1988, March, July 1989.

Arizona Public Service
Utah International v Arizona Public Service, et al., an arbitration proceeding, June 1989.

Atlantic Richfield Company

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

El Paso Natural Gas

Doyle Hartman v Burlington Northern, Inc., El Paso Natural Gas Co., et al., Deposition, October 1988.

Honeywell Inc.

MidAmerican Long Distance Company v Honeywell, Inc., Deposition, August 1988.

Exxon

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

Natural Gas Pipeline Company of America

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

Mojave Pipeline Company

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

Exxon

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

Villa Banfi

L. Knife & Sons v Villa Banfi, Testimony, February, March 1987.

Cities Service Corp.

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

Exxon

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

Mobil Oil Corporation

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

Bethlehem Steel Corporation

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

Natural Gas Supply Association

Federal Energy Regulatory Commission, Request for Suppl. Comments Re: FERC Order No. 436 and Related Proposed Rulemakings, *Old Gas Decontrol, FERC's Block*

Billing for Pipelines, and the Winners and Losers in Natural Gas Policy, Statement, February 25, 1986.

Group of Oil Refiners

Office of Hearings and Appeals, MDL-378 Stripper Well Exemption Litigation, Testimony, July, September 1984.

Dorchester Gas Corp.

Office of Hearings and Appeals, U.S. Department of Energy v Dorchester Gas Corporation, Testimony, January 1984.

BEFORE THE SURFACE TRANSPORTATION BOARD

STB Ex Parte No. 761

HEARING ON REVENUE ADEQUACY

STB Ex Parte No. 722

RAILROAD REVENUE ADEQUACY

SUPPLEMENTAL COMMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS

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February 13, 2020

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INTRODUCTION

The Association of American Railroads (AAR) welcomes the opportunity to supplement its initial comments and testimony from the December hearing. The discourse at that hearing was wide-ranging and informative. We believe the hearing made clear that using system-wide financial health as a trigger for forced competitive access or Nixon-era limits on rate increases has no support in sound economics or the law.

Our goal in these supplemental comments is not to reiterate points made in our written testimony or hearing testimony. Rather, AAR focuses on three topics raised by the members at the hearing. In **Section I,** we provide further analysis of the statutory framework for revenue adequacy, including a closer look at the language in the statute referencing "economic profit or return (or both)" and the relevant rail transportation policy (RTP) factors. In particular, we address the question of whether the Board's governing statute authorizes utility-style rate regulation with the goal of driving system-wide earnings towards the cost of capital. As demonstrated below, the statute plainly does not support that kind of earnings regulation.

In **Section II**, we address the flawed econometric model that the American Chemistry Council ("ACC") presented at the hearing, which would use *average* competitive rates and system-wide financial health to set the *maximum* lawful rate. ACC's proposal is rife with practical, economic, and legal flaws. As Professor Kalt and Dr. Reishus explain in their attached Verified Statement, the ACC proposal "represents a return to the pre-Staggers principles of ratemaking" where, "[i]n place of groups of rates determined by rate bureaus, the proposal would use a mathematical equation as its 'rate bureau[.]' . . . The[] commodity-based maximum rates would consider no information about specific customer demands, service levels, or costs. This proposal represents a large backwards step away from modern, flexible and innovative,

customer-based rail service and pricing."[1] ACC's proposal is an apt illustration of a point that AAR explained in detail in its Opening Comments, and that Professor Kalt and Dr. Reishus explain in their Verified Statement: any kind of revenue adequacy constraint should be abandoned, because "[a] finding of 'revenue adequacy'—*even if* properly measured using replacement cost—cannot identify which, if any, rates are above competitive levels."[2] Moreover, when revenue adequacy is used to trigger rate regulation, in whatever form, the well-known distortions of earnings regulation come into play. This is precisely the case with regard to ACC's proposal, which is a type of discredited earnings regulation.[3]

In **Section III**, we offer a lawful and sound path forward. The hearing revealed the members' concerns that existing methods may not provide an adequate forum for small customers to challenge individual rates. AAR offers two interrelated options.

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[1] Verified Statement of Prof. Joseph P. Kalt & David Reishus, PhD ("Kalt & Reishus V.S.") ¶ 40. AAR is also attaching the verified statement of Professor Robert Willig, submitted in the prior hearing on revenue adequacy. *See* EP 722, Reply Comments of the Association of American Railroads, Reply Verified Statement of Prof. Robert Willig ("Willig Reply V.S.") (Nov. 4, 2014). Professor Willig rebuts the flawed testimony of Professor Faulhaber, which ACC attached to its initial written comments in this proceeding, recycling the testimony from the joint shipper submission in EP 722. *See* Ex Parte Nos. 761 & 722, Written Testimony of the American Chemistry Council (Nov. 26, 2019) (attaching as Exhibit 1, Verified Statement of Gerald R. Faulhaber, Reply of Concerned Shipper Ass'ns, *Railroad Revenue Adequacy*, EP 722 (Nov. 4, 2014)). We offer the Willig Reply V.S. simply to remind the STB of the robust economic support for its Stand-Alone Cost test.

[2] Kalt & Reishus V.S. ¶ 56; *see Blue Cross & Blue Shield United of Wis. v. Marshfield Clinic*, 65 F.3d 1406, 1412 (7th Cir. 1995) ("[I]t is always treacherous to try to infer monopoly power from a high rate of return. … [N]ot only do measured rates of return reflect accounting conventions more than they do real profits (or losses), as an economist would understand these terms, … but there is not even a good economic theory that associates monopoly power with a high rate of return." (internal citations omitted); *In re Implementation of Section 6002(B) of the Omnibus Budget Reconciliation Act of 1993*, 28 FCC Rcd. 3700, 3888, ¶ 284 (Mar. 21, 2013) ("[A]ccounting-based indicators of profitability are not estimates of economic profit, and neither accounting nor economic profits are considered reliable estimators of market power." (internal footnotes omitted)).

[3] Kalt & Reishus V.S. ¶¶ 23-40.

First, the STB should improve its existing tools by exploring ways to streamline and improve the SAC, Simplified-SAC, and Three-Benchmark tests. Professor Kalt has offered some smart simplifications for the SAC test, and the industry has offered ways to improve the Three-Benchmark approach. Second, the STB should investigate how to encourage parties to make greater use of the *voluntary* arbitration program Congress created. AAR believes that features of that program—particularly the lack of confidentiality and the selection of arbitrators—has deterred its use. AAR urges the STB to explore whether changes to the program could encourage use of the arbitration program.

I. THE STATUTE DOES NOT AUTHORIZE RATE REGULATION BASED ON A RAILROAD'S OVERALL EARNINGS.

At the December 2019 hearing, several questions were raised about the proper interpretation of the statutory provisions relating to revenue adequacy and rate regulation. As AAR explained at the hearing and as further discussed below, it is clear both on the face of the statute and from the context of Congress's objectives that Congress did not intend to establish or permit a regime of rate regulation that constrains rates based on the level of a railroad's overall earnings. AAR reiterates its request that the Board formally abandon the use of a revenue adequacy constraint, which is not supported by the statute and has never been applied in a rail rate case.

A. The Statutory Scheme Does Not Authorize the Use of a Revenue Adequacy Constraint to Regulate Rates.

The Board's interpretation of the statutory provisions pertinent to revenue adequacy must begin with two well-known canons of statutory construction:

(1) statutory language must be given its plain meaning,[4] and (2) statutory provisions must be read consistent with the whole text of the statute, including its stated objectives and context.[5] Under both canons, the governing statute does not authorize the Board to employ a revenue adequacy constraint to regulate rail rates.

1. The plain meaning of the statute does not support a revenue adequacy constraint.

The plain meaning canon precludes a statutory interpretation that seeks to find hidden meaning in plain language or that seeks to draw implausible inferences from straightforward statutory language.[6] Here, the plain language of the Interstate Commerce Act precludes the use of revenue adequacy as the basis for constraining rail rates or revenues.

Two statutory provisions speak directly to the proper use of revenue adequacy in the current regulatory scheme. Section 10701(d)(2) states that in considering the reasonableness of a rate, the Board must "recogniz[e] the policy of this part that rail

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[4] *See Estate of Cowart v. Nicklos Drilling Co.*, 505 U.S. 469, 475 (1992) ("In a statutory construction case, the beginning point must be the language of the statute, and when a statute speaks with clarity to an issue[,] judicial inquiry into the statute's meaning, in all but the most extraordinary circumstance, is finished."); *see also Pub. Empl. Retirement Sys. of Ohio v. Betts*, 492 U.S. 158, 171 (1989) ("[N]o deference is due to agency interpretations at odds with the plain language of the statute itself. Even contemporaneous and longstanding agency interpretations must fall to the extent they conflict with statutory language.").

[5] *See Gundy v. United States*, 139 S. Ct. 2116, 2126 (2019) ("This Court has long refused to construe words 'in a vacuum,' …. [as] '[i]t is a fundamental canon of statutory construction that the words of a statute must be read in their context and with a view to their place in the overall statutory scheme.'" (internal citations omitted)); *Robinson v. Shell Oil Co.*, 519 U.S. 337, 341 (1997) ("[S]tatutory language is determined by reference to the language itself, the specific context in which that language is used, and the broader context of the statute as a whole.").

[6] *See City of Farmington, N.M. v. FERC*, 820 F.2d 1308, 1315 (D.C. Cir. 1987) ("'Where the language is plain and admits of no more than one meaning[,] the duty of interpretation does not arise . . . .'" (quoting *Caminetti v. United States*, 242 U.S. 470, 485 (1917)) (rejecting the government's interpretation of a statutory provision, explaining that the government "abandon[ed] the literal statutory language").

carriers shall earn adequate revenues." Section 10704 similarly states that the "Board shall make an adequate and continuing effort to assist those carriers in attaining revenue levels prescribed under this paragraph." The plain language of these provisions instructs the Board to "assist" railroads in achieving revenue adequacy, not to cap revenues, or more aggressively regulate rates, once railroads achieve a prescribed level of financial health. Indeed, there is not a single statutory provision that identifies revenue adequacy as a basis for constraining firm-wide earnings or regulating the level of individual rail rates.

2. The statute, read as a whole, does not support a revenue adequacy constraint.

Under the whole-text canon of statutory construction, courts "do not . . . construe statutory phrases in isolation; [they] read statutes as a whole," including the context and purposes of the statute.[7] The 4R Act,[8] in which the concept of revenue adequacy was introduced, was designed and structured to reduce the ICC's over-regulation of railroads and to restore railroads' financial health by giving them more flexibility in rate setting.[9] Four years later, the Staggers Act[10] reinforced the deregulatory efforts initiated in the 4R Act, and, specifically with regard to revenue adequacy, the Staggers Act

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[7] *United States v. Morton*, 467 U.S. 822, 828-34 (1984); *see Gundy v. United States*, 139 S. Ct. 2116 (2019) ("'[R]easonable statutory interpretation must account for both the specific context in which ... language is used and the broader context of the statute as a whole' …. And beyond context and structure, the Court often looks to 'history [and] purpose' to divine the meaning of language." (internal citations omitted)); *United States v. Morton*, 467 U.S. 822, 828 (1984); *see also Freeman v. Quicken Loans, Inc.*, 566 U.S. 624, 632 (2012) (rejecting an interpretation of a statutory provision that would undercut the purpose of the statute by imposing liability on "the very class for whose benefit [the statute] was enacted").

[8] Railroad Revitalization and Regulatory Reform Act of 1976 ("4R Act"), Pub. L. No. 94-210, 90 Stat. 31.

[9] *See infra* note 11.

[10] Staggers Rail Act of 1980 ("Staggers" or "Staggers Act"), Pub. L. No. 96-448, 94 Stat. 1895.

changes were intended to clarify the ICC's duty to assist railroads in earning adequate revenues.[11] Neither statute provided the ICC with new regulatory tools for regulating the overall earnings of railroads. To the contrary, both statutes were designed to allow railroads to improve their financial health via deregulation.[12] Within this broader statutory context, the affirmative goal of revenue adequacy cannot plausibly be read as a limit on railroad earnings; rather, it is a directive from Congress to the agency to assist railroads in achieving financial health.

Even if the plain language of the statute and its wider context were ambiguous (and they are not), the legislative history demonstrates Congress's acute concern over the dismal financial condition of the rail industry and the over-regulation by the ICC that had contributed to that financial condition.[13] The legislative history of the 4R Act and the Staggers Act shows that revenue adequacy was intended as an affirmative goal, not a rate constraint, and that the statutes' overarching objective was to make railroads financially viable by deregulating.[14] For example, the legislative history contains numerous references to Congress's understanding of revenue adequacy as an affirmative objective:

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[11] *See W. Coal Traffic League v. United States*, 719 F.2d 772, 774-75, 777 (5th Cir. 1983) (explaining that "through enactment of the [4R Act], Congress sought to reduce regulatory restraints on railroad pricing decisions" and that Congress in 1980 enacted "a second major deregulation statute, the Staggers Act[,]" "[i]n an effort to hasten railroad rate deregulation").

[12] *Id.*

[13] *See Milavetz, Gallop & Milavetz, P.A. v. United States*, 559 U.S. 229, 236 n.3 (2010) ("Although reliance on legislative history is unnecessary in light of the statute's unambiguous language, we note the support that record provides for the Government's reading.").

[14] *See supra* note 11.

- "The Committee believes that it is important for the [ICC] to determine expeditiously adequate revenue levels for the carriers and to assist carriers in attaining such levels …."[15]

- "It is the purpose of the Congress in [the 4R Act] to provide the means to rehabilitate and maintain the physical facilities, improve the operations and structure, and restore the financial stability of the railway system of the United States, and to promote the revitalization of such railway system, so that this mode of transportation will remain viable in the private sector of the economy and will be able to provide energy-efficient, ecologically compatible transportation services with greater efficiency, effectiveness, and economy …."[16]

- "Almost all agree that something further must be done to improve the financial health of the nation's railroads or the industry will continue to falter with the likely alternative being only an increasingly heavy burden on the consumer and taxpayer. To the extent it remains desirable to continue private sector ownership of this nation's rail industry the need for this legislation is obvious and accepted. The goal is to allow for the restoration of the rail industry to vigorous and profitable growth."[17]

- "Previous admonitions by the Congress that the Commission assist carriers in earning adequate revenue levels . . . have not achieved their goals."[18]

- Revenue adequacy relates to "the opportunity for railroads to obtain adequate earnings to restore, maintain and improve their physical facilities while achieving the financial stability of the national rail system."[19]

- The ICC "is given the mandate to place greater emphasis on the need for carriers to have adequate revenue levels."[20]

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[15] S. Rep. No. 94-499, at 52 (1975), *as reprinted in* 1976 U.S.C.C.A.N. 14, 52.

[16] 45 U.S.C. § 801(a) (1976).

[17] S. Rep. No. 96-470, at 6 (1979).

[18] H.R. Rep. No. 96-1035, at 54 (1980), *as reprinted in* 1980 U.S.C.C.A.N. 3978, 3999 (internal citations omitted).

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

[20] *Id., as reprinted in* 1980 U.S.C.C.A.N. 4110, 4112.

Nothing in the legislative history suggests that Congress intended revenue adequacy to function as a cap on earnings or a rate constraint. In other words, the term "adequate" does not represent a ceiling but, rather, a goal.

3. Both federal court and agency precedent have recognized revenue adequacy as an affirmative objective.

The ICC recognized when it first implemented the revenue adequacy provisions that those provisions were intended to assist railroads to achieve revenue adequacy and were not a basis for a new rate constraint.[21] As explained by the Third Circuit in upholding the ICC's adoption of standards for defining and measuring revenue adequacy, the revenue adequacy provisions in the statute are "addressed to the opportunity to attain revenue levels which would reverse the long decline in the railroad industry. The specific objectives listed in section 205 [the revenue adequacy definition] *should not in* [*the ICC's*] *view be read as limitations on revenue . . . .*"[22]

Courts and the ICC/STB have repeatedly recognized that the 4R Act and the Staggers Act were not designed to create new regulatory limits on railroad rates and revenues but just the opposite—to enable railroads to function more like other firms in the national economy. *See, e.g., Groome & Assocs., Inc. v. Greenville Cty. Econ. Dev. Corp.*, FD 42087, at 12 (STB served July 27, 2005) ("Congress directed [in the Staggers Act] that railroads be treated more like ordinary businesses than like public utilities."); *Burlington N. R.R. Co. v. Pub. Util. Comm'n of Tex.*, 812 F.2d 231, 235 (5th Cir. 1987) (recognizing the intent of the Staggers Act was to take a step toward "treat[ing] the rail industry as any other unregulated industry"). Commercial firms are not subject to earnings regulation,

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[21] *See* AAR Opening Comments at 30-32. The ICC's creation of the revenue adequacy constraint in 1985 was inconsistent with earlier and later agency and federal court precedent and should be abandoned. *See id.* at 30-35.

[22] *Bessemer & Lake Erie R.R Co. v. ICC*, 691 F.2d 1104, 1112 (3d Cir. 1982) (emphasis added).

and there is no basis in the statute or legislative history to conclude that Congress wanted to subject railroads to such onerous and distorting regulatory constraints—particularly when Congress's goal was to support and ensure the financial health of the industry.[23]

B. Textual Analysis of the Relevant Statutory Provisions Shows that Revenue Adequacy Was Not Intended as a Constraint on Rates.

There are two statutory provisions and two statements of Rail Transportation Policy that refer directly or indirectly to revenue adequacy. These provisions indicate that revenue adequacy is to be used as a measure of the financial health of the industry, monitoring the *agency's* progress in meeting Congress's goal of industry wellbeing. Likewise, none of these provisions treats revenue adequacy as a constraint on rates.

1. Section 10704(a)(2)

The statutory provision that explicitly sets out the revenue adequacy principle and standard is 49 U.S.C. § 10704(a)(2):

> The Board shall maintain and revise as necessary standards and procedures for establishing revenue levels for rail carriers providing transportation subject to its jurisdiction under this part that are adequate, under honest,

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[23] As discussed at the hearing, there is no legal basis for concluding that the revenue adequacy constraint has been ratified or otherwise approved by Congress. This is because there is no indication at all that Congress was aware of the obscure and never applied "revenue adequacy constraint" created in *Coal Rate Guidelines* when it reenacted the relevant legislation, much less "evidence of *express* approval[,]" as required. *Beverly Enters., Inc. v. Herman*, 119 F. Supp. 2d 1, 9 (D.D.C. 2000) (emphasis added); *see id.* ("[I]n order to construe congressional reenactment of a statute as an adoption of an agency interpretation thereunder, there must be a showing that Congress was aware of, and expressly approved of, the prior agency position. *See General Am. Transp. Corp. v. I.C.C.*, 872 F.2d 1048, 1053 (D.C.Cir.1989) … [A]ssuming Congress was even aware of the [agency's] construction, there is simply no evidence of express approval. … [And] '[i]t is at best treacherous to find in congressional silence alone the adoption of a controlling rule of law….'" (quoting *Girouard v. United States*, 328 U.S. 61, 69 (1946)); *Isaacs v. Bowen*, 865 F.2d 468, 473 (2d Cir. 1989) ("[T]he doctrine applies when Congress indicates not only an awareness of the administrative view, but also takes an affirmative step to ratify it.").

> economical, and efficient management, for the infrastructure and investment needed to meet the present and future demand for rail services and to cover total operating expenses, including depreciation and obsolescence, plus a reasonable and economic profit or return (or both) on capital employed in the business. The Board shall make an adequate and continuing effort to assist those carriers in attaining revenue levels prescribed under this paragraph. Revenue levels established under this paragraph should—
>
> (A) provide a flow of net income plus depreciation adequate to support prudent capital outlays, assure the repayment of a reasonable level of debt, permit the raising of needed equity capital, and cover the effects of inflation; and
>
> (B) attract and retain capital in amounts adequate to provide a sound transportation system in the United States.

As noted previously, this provision calls for affirmative action to promote adequate revenues for every carrier. "Adequate" means "equal to, proportionate to, or fully sufficient for a specified or implied requirement."[24] Section 10704(a)(2) defines that specific requirement as revenues that are sufficient to: i) allow for infrastructure and investment needed to meet present and future demand for rail services; ii) cover total operating expenses, including depreciation; and iii) provide for "a reasonable and economic profit or return (or both) on capital employed in the business." The provision goes on to require that the Board make an "adequate and continuing effort to assist… carriers in attaining revenue levels" in accordance with this prescribed definition. 49 U.S.C. § 10704(a)(2). In other words, the statute calls for the Board to assist carriers in earning not up to their cost of capital, but rather revenue levels described by Section 10704(a)(2), which describes revenue *above and beyond* the cost of capital. As further explained in the next section, the specific words used in this provision have a plain

[24] 1 WEBSTER'S THIRD NEW INT'L DICTIONARY 25 (1976).

meaning that must be given effect. And that plain meaning unambiguously establishes that revenue adequacy is a floor, not a ceiling.

a. "reasonable and economic" profit or return

First, section 10704(a)(2) plainly states that in order for a carrier's revenues to be considered adequate, those revenues must be sufficient to not only cover infrastructure costs and operating expenses, but also to earn a profit. The level of profit required is specifically defined as "a reasonable and economic profit or return." 49 U.S.C. § 10704(a)(2). The word "economic" used as a modifier of "profit or return" has a plain meaning. First, it is widely understood that an "economic" profit or return is different from an "accounting" profit or return.[25] Unlike an "accounting" profit, which is based on the historical book value of assets, an "economic" profit must be based on a replacement cost assessment of asset values. As the Eleventh Circuit has explained:

> Accounting profits differ from economic profits in several important ways . . . . [A]ccounting profits exceed economic profits. Thus, the perfectly competitive firm in equilibrium earns zero economic profits though its normal returns are reflected in positive accounting profits. Hence, substantial accounting profits—say, 20 percent—may be consistent with trivial or zero economic profit and thus do not necessarily indicate any market power.[26]

Thus, because the STB's revenue adequacy calculations are based on "accounting" profits, the STB's calculations necessarily overstate a railroad's "economic" profitability.

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[25] *See In re Coca-Cola Co.*, 117 F.T.C. 795, 950 n.93 (1994) ("Economic profit accounts for the opportunity costs of all the assets that a firm uses in its business, while accounting profit reflects a firm's explicit historical expenditures.").

[26] *Bailey v. Allgas, Inc.*, 284 F.3d 1237, 1252 n.21 (11th Cir. 2002); *see In re Coca-Cola Co.*, 117 F.T.C. at 950 n.93 (1994) ("For purposes of antitrust analysis, 'economic profit,' rather than 'accounting profit,' is the appropriate measure of firm performance.").

Likewise, section 10704(a)(2)'s revenue adequacy definition requires a greater level of profitability than that currently reflected by the STB's annual calculations.

This distinction between economic and accounting profit is widely acknowledged by economists as well:

- "The two concepts of profit differ because total cost, in the economist's definition, includes the opportunity cost of any capital, labor, or other inputs supplied by the owner of the firm. Thus, if a small business earns just enough to pay the owner the fees (say, $35,000 per year) that her labor and capital could have earned if they had been sold to others, economists say she is earning zero *economic* profit. In contrast, most accountants will say her profit is $35,000."[27]

- "In the calculation of the implicit rental rate of capital used to determine long-run economic profits, capital assets should be valued at **replacement cost**, which is the long-run cost of buying a comparable-quality asset."[28]

With regard to the term, "economic … return," the Antitrust Division of the Justice Department has recognized that accounting returns do not reflect "true economic rates of return":

> High accounting profits do not necessarily reflect the exercise of monopoly power. In particular, cost measures are normally available only from reports prepared in conformity with accounting conventions, but economics and accounting have significantly different notions of cost. Accounting figures seldom reflect the firm's true economic cost of producing its goods and services, and accounting rates of return will often differ from true economic rates of return. For example, determining if a firm is earning an economic profit requires accounting properly for depreciation and the economic replacement cost of the assets the firm is

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[27] WILLIAM J. BAUMOL & ALAN S. BLINDER, ECONOMICS—PRINCIPLES AND POLICY 108 (6th ed. 1994) (emphasis in original).

[28] DENNIS W. CARLTON & JEFFREY M. PERLOFF, MODERN INDUSTRIAL ORGANIZATION 247 (4th ed. 2005) (emphasis in original).

> using to generate its income. Yet the information reported by accountants frequently is not designed to measure and accurately reflect those costs.[29]

Because the Board assesses revenue adequacy using "accounting" profits/returns based on the book value of a carrier's assets, the Board's revenue adequacy calculations say nothing about the level of "economic" profit or return the STB is supposed to assist railroads in earning.

Second, the term "reasonable and economic profit or return (or both)" means a profit or return (or both) *above* the cost of capital, not *equal* to the cost of capital (as the Board currently measures revenue adequacy).[30] For example, in *Bailey v. Allgas, Inc.*, the Eleventh Circuit explained that "[e]conomists regard capital's opportunity cost as a cost and define *economic profit* as the return to investors *above and beyond* what is necessary to induce them to invest." 284 F.3d 1237, 1252 n.21 (11th Cir. 2002). Likewise, the Transportation Research Board has stated that "zero economic profits" means "break even."[31] Zero profit—*i.e.*, a break-even earning of no more than the cost of capital—is

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[29] U.S. Dep't of Justice, *Competition and Monopoly: Single-Firm Conduct under Section 2 of the Sherman Act*, Chapter 2 (IV)(A) (2008) (internal citations omitted); *see id.* at 29 (contrasting accounting return with economic return: "[A]vailable estimates of a firm's capital costs, an important input into calculating a firm's profitability, are generally based on accounting rules that do not account for the riskiness of the investment. If the investment, at the time it was made, was quite risky, a very high accounting rate of return may reflect a modest economic return. More generally, when all relevant economic costs are properly accounted for, what may at first seem to be a supracompetitive return may be no more than a competitive one (or vice versa).").

[30] As noted above, section 10704(a)(2) defines adequate revenues as those sufficient to: i) allow for infrastructure and investment needed to meet present and future demand for rail services; ii) cover total operating expenses, including depreciation; and iii) provide for "a reasonable and economic profit or return (or both) on capital employed in the business." STB's current revenue adequacy measurement fails to effectively reflect these three requirements.

[31] National Academies of Sciences, Engineering, and Medicine 2015. *Modernizing Freight Rail Regulation*. Washington, DC: The National Academies Press. https://doi.org/10.17226/21759, at 125.

not a profit; it is, by definition, the absence of profit.[32] The reference to a "reasonable" economic profit or return naturally implies some positive amount of profit.

Economic literature is in accord: "Economic profit . . . is the amount a firm earns *over and above* the payments for all inputs, including the interest payments for the capital it uses and the opportunity cost of any capital provided by the owners of the firm."[33] Accordingly, the Board's determination that a railroad is "revenue adequate" when its accounting ROI equals the COC—and the unsupported statements in *Guidelines*, which suggested a revenue adequacy constraint would be triggered if accounting ROI equals the COC—are inconsistent with the requirements of 10704(a)(2). Such an interpretation reflects no economic profit to the railroad at all, much less a "reasonable" amount as required by statute, while simultaneously overstating a railroad's actual "economic" profits or returns.

b. "attract and retain capital"

Subsections 10704(a)(2)(A) and (B) further explain that adequate revenue levels must "permit the raising of needed equity capital" and "attract and retain capital in amounts adequate to provide a sound transportation system." A cap on rail earnings at the cost of capital would put railroads at a permanent disadvantage relative to other firms in the economy competing for capital, which is the exact opposite of Congress's goal in the 4R Act and Staggers Act. As demonstrated at the hearing by the panel of economists sponsored by UP, NS, and CN, if the Board's methods for calculating return on invested capital and railroad industry cost of capital were applied to other firms in the S&P 500, the median S&P 500 firm would have an ROI well above its cost of

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[32] *Id.*

[33] WILLIAM J. BAUMOL & ALAN S. BLINDER, ECONOMICS—PRINCIPLES AND POLICY 412 (11th ed. 2009) (emphasis in original, and some emphasis omitted).

capital.[34] If railroads were constrained to earn no more than their cost of capital, they would not be able to compete fairly or equally for capital investment, as envisioned by the statutory revenue adequacy definition.

2. Section 10701(d)(2)

A second statutory provision, section 10701, sets forth standards for, *inter alia*, rate reasonableness cases. As noted previously, section 10701(d)(2) instructs the Board to consider "the policy of this part that rail carriers shall earn adequate revenues" in determining maximum reasonable rates. Once again, the statute sets out an affirmative obligation to promote revenue adequacy, not a restraint on rates or an independent basis for regulating rates. It would turn section 10701(d)(2) on its head to read that provision as stating "that rail carriers shall earn [*no more than*] adequate revenues," which is the assumption underlying the revenue adequacy constraint in *Guidelines*. Section 10701(d)(2) also sets out specific factors the Board must consider when determining maximum reasonable rates—the so-called Long-Cannon factors. While certain of the Long-Cannon factors suggest limitations on a railroad's application of differential pricing, none of the factors contains any reference to revenue adequacy, let alone any implication that rates should be capped when a railroad achieves revenue adequacy. To the contrary, Congress *expressly limited* STB's discretion to apply the Long-Cannon factors, instructing that the Board give them "due consideration" while "recognizing … that rail carriers *shall earn adequate revenues*" in accordance with the definitional requirements of section 10704(a)(2). 49 U.S.C. § 10701(d)(2) (emphasis added).

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[34] Ex Parte Nos. 761 & 722, Written Testimony of Professor Kevin Murphy, Ph.D., and Professor Mark Zmijewski, Ph.D., on behalf of Union Pacific Railroad Company, Norfolk Southern Railway Company, and CN (Nov. 26, 2019).

3. Rail Transportation Policy Factors

The RTP factors, contained in 49 U.S.C. § 10101, are not independent sources of regulatory authority but rather express the policies that are to guide the STB's exercise of authority granted elsewhere in the statute.[35] In other words, the general provisions in § 10101 cannot trump the specific provisions dealing with rate reasonableness.[36] Nevertheless, the RTP factors reinforce the point that revenue adequacy is a goal to strive for, not a constraint on rates.

The legislative history of the Staggers Act explains the overall thrust of the (then) new RTPs. In reference to the RTPs, the conference report on the Staggers Act explains:

> Consistent with the new rail transportation policy of this Act, the Conferees intend that competition be recognized as the best control on the ability of railroads to raise rates. The purpose of this legislation is to reverse the decline of the railroad industry, which has been caused, in part, by excessive government regulation. The Conferees believe that by allowing the forces of the marketplace to regulate railroad rates wherever possible the financial health of the railroad industry will be improved and will benefit all parts of the economy, including shippers, consumers, and rail employees.[37]

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[35] *See CSX Transp., Inc. – Abandonment Exemption – in LaPorte, Porter, & Starke Ctys., Ind.*, AB 55 (Sub-No. 643X) et al., slip op. at 6 (STB served May 31, 2017) ("[T]he RTP does not create an independent basis for Board action in the absence of a violation of a substantive provision in the Interstate Commerce Act.") (citations omitted).

[36] *See Perez-Guzman v. Lynch*, 835 F.3d 1066, 1075 (9th Cir. 2016) (the "canon [of *generalia specialibus non derogant—i.e.*, "the specific governs the general"] provides that a 'narrow, precise, and specific' statutory provision is not overridden by another provision 'covering a more generalized spectrum' of issues. *Radzanower v. Touche Ross & Co.*, 426 U.S. 148, 153–54, 96 S.Ct. 1989, 48 L.Ed.2d 540 (1976). When two statutes come into conflict, courts assume Congress intended specific provisions to prevail over more general ones, *see Fourco Glass Co. v. Transmirra Prods. Corp.*, 353 U.S. 222, 228–29, 77 S.Ct. 787, 1 L.Ed.2d 786 (1957), the assumption being that the more specific of two conflicting provisions 'comes closer to addressing the very problem posed by the case at hand and is thus more deserving of credence,' Antonin Scalia & Bryan A. Garner, *Reading Law: The Interpretation of Legal Texts* 183 (2012).").

[37] H.R. Rep. No. 96-1430, at 89 (1980), *as reprinted in* 1980 U.S.C.C.A.N. 4110, 4120-21.

Another report states that "[t]his new section [section 10101] directs the Commission to encourage primary reliance on the marketplace rather than regulation, to limit regulation of railroads to those areas where there is an absence of effective competition and to permit rates which provide revenues necessary to maintain the rail system and to attract capital."[38]

In addition to the overall policy favoring deregulation, a return of railroads to financial health, and reliance on market forces rather than regulation to set rates, the specific RTP factors relating to revenue adequacy are consistent with the statutory provisions discussed above that treat revenue adequacy as an affirmative objective and not a constraint on rates.

a. RTP (3)

RTP(3) contains the one express instruction on revenue adequacy in the RTPs. RTP(3) directs the Board to "promote a safe and efficient rail transportation system by allowing rail carriers to earn adequate revenues."[39] RTP(3) does not provide the slightest suggestion that rail rates should be capped once financial viability is achieved.

b. RTP (6)

RTP(6) contains an indirect reference to revenue adequacy, stating that it is Congress's policy "to maintain reasonable rates where there is an absence of effective competition and where rail rates provide revenues which exceed the amount necessary to maintain the rail system and to attract capital."[40] There were several questions at the hearing about the meaning of RTP(6) and its relevance to rate regulation.

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

[39] 49 U.S.C. § 10101(3).

[40] 49 U.S.C. § 10101(6).

On its face, RTP(6) expresses nothing more than Congress's desire that the agency enforce the provisions of the statute that govern rate reasonableness challenges, already discussed above. In other words, RTP(6) does not grant the Board authority above and beyond what the statute authorizes elsewhere. And the text of RTP(6) accords with this. The plain reading of RTP(6) is that rates must be "reasonable" when, in the context of market power, rates "provide revenues which exceed the amount necessary to maintain the rail system and to attract capital."[41] RTP(6) does not say that rates must be "capped" when they exceed the amount necessary to maintain the rail system and to attract capital (to say nothing about a reasonable and economic profit or return), only that the rates must be "reasonable."

Importantly, a "reasonable rate[]" is not defined in RTP(6). Rate reasonableness principles are set out elsewhere in the statute, particularly in section 10701. But nowhere in section 10701 or elsewhere in the statute is a "reasonable" rate defined by reference to the level of firm-wide earnings or revenue adequacy. In fact, as discussed above, section 10701(d)(2), which identifies general rate reasonableness principles, does so with an express instruction that STB recognize the mandatory, affirmative goal of revenue adequacy, not utilize that concept to somehow constrain railroad revenues.

In assessing the reasonableness of a particular rate, the STB does consider the revenues generated by the challenged rate to determine whether the rate reflects an abuse of market power. But there is no connection between overall revenue levels earned by a rail carrier and the particular economic circumstances of the movement at issue in a rate reasonableness case. This analysis is consistent with RTP(6) and the rest of the statute, which must be read as a whole.[42] While railroads must charge reasonable

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[41] 49 U.S.C. § 10101(6).

[42] As a further example, RTP(6) cannot be read to negate section 10704(a)(2)'s definitional requirement that revenue adequate railroads earn a "reasonable and economic profit or return." *See supra* note *36*.

rates, as envisioned by RTP(6), RTP(6) does not state or suggest that the reasonableness of a particular rate can be determined *based on* the level of a railroad's overall earnings.

c. RTP (12)

RTP(12) was also discussed at the hearing, but it has nothing to do with revenue adequacy or the level of a rail carrier's firm-wide earnings.[43] Rather, it relates to "undue concentrations of market power." The existence and exercise of market power can only be assessed by analyzing particular markets. Firm-wide revenues do not say anything about the existence or exercise of market power in particular markets.[44]

C. The Statute Supports AAR's Request that the Board Abandon the Revenue Adequacy Constraint in *Guidelines*.

In its November 26, 2019 comments and again at the December 2019 hearing, AAR urged the Board to abandon the revenue adequacy constraint that is set out in *Guidelines*. The constraint has never been applied to railroads, and as written, its possible application is obscure. Even if it were supported by the statute, the revenue adequacy constraint created in *Guidelines* in the 1980s is simply out of date—modern-day economics have established that revenue adequacy is completely irrelevant to whether a rate is "unreasonable" (or anticompetitive).[45] An agency created for its expertise should reject a discredited basis for rate regulation.

Consistent with AAR's request that the Board abandon the revenue adequacy constraint, the statutory analysis above demonstrates that the revenue adequacy constraint in *Guidelines* is unsupported by the statute and rests on a mistaken

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[43] *See* 49 U.S.C. § 10101(12).

[44] Kalt & Reishus V.S. ¶ 56.

[45] *Id.* ¶¶ 53, 56.

understanding of the statutory provisions related to revenue adequacy. For several reasons, the implementation of the revenue adequacy constraint would not be lawful.

First, the statutory scheme and the individual statutory provisions relating to revenue adequacy make it clear that revenue adequacy is an affirmative goal, not a constraint on the level of railroad earnings. The Board is directed to assist railroads in achieving financial viability, not to use financial health as the basis for establishing a new regime of more aggressive rate regulation.

Second, revenue adequacy is a floor, not a ceiling. Revenue adequacy is defined to include a "reasonable and economic profit or return,"[46] which cannot reasonably be interpreted to mean a break-even financial state where railroads, unlike other firms in the economy, are limited to earning no more than their cost of capital. Unlike public utilities, which are often held to earnings equal to their cost of capital, railroads are not guaranteed any level of earnings. And because railroads operate in continuously changing markets that sometimes result in profits and other times in losses, capping railroads' earnings at their cost of capital would prevent railroads from recouping profits needed to offset instances of losses, thus dooming the rail industry to long-term revenue inadequacy—precisely the opposite of the statutory objective.

Third, the revenue adequacy provisions of the statute are part of a larger, deliberate statutory scheme for minimizing regulatory intervention into railroad rate-setting. When Congress instructed the ICC/STB to assist railroads to achieve revenue adequacy, Congress was not creating a new regulatory tool that would allow the ICC/STB to engage in earnings regulation that was already coming into broad

[46] 49 U.S.C. § 10704(a)(2).

disrepute among economists and regulators. On the contrary, it was urging the agency to ease off on rate regulation.[47]

Finally, nothing in the statute supports a rate regulation standard that allows the Board to constrain rates on individual movements based on the overall level of revenues earned by the railroad. As AAR explained in its November 26, 2019 comments, system-wide financial health, even if properly measured, has no bearing on the reasonableness of an individual rate.[48]

II. THE BOARD SHOULD REJECT ACC'S PROPOSAL.

ACC's proposal is not smart simplification because it is neither smart nor simple.[49] It is not smart because the proposed Benchmark Model is internally flawed. It is not capable of predicting actual competitive rates that any shipper would be likely to pay today.[50] Nor can the model reflect current marketplace conditions—"the model cannot account for the specific individualized marketplace influences on prices that demonstrably result in a wide distribution of rail rates . . . ."[51] And because ACC's proposal uses revenue adequacy as a trigger as well as a measure for restricting rate levels, the Benchmark Model is a form of earnings regulation, with all the associated distortions and inefficiencies, including discouraging investment, innovation, and

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[47] "Previous admonitions by the Congress that the Commission assist carriers in earning adequate revenue levels have not achieved their goals. As a result, the Committee is establishing a more straight forward mandate. This is a clear directive to ensure financially sound railroads, and the Commission is not to misuse the term "reasonable" to circumvent this directive." H. Rep. No. 1035, 96th Cong., 2d Sess. at 54 (May 16, 1980).

[48] Ex Parte Nos. 761 & 722, Comments of the Association of American Railroads, at 9–10 (Nov. 26, 2019) ("AAR Opening Comments").

[49] Kalt & Reishus V.S. ¶¶ 73-96.

[50] *Id.* ¶ 9; *see id.* ¶¶ 42-51.

[51] *Id.* ¶ 76.

efficiency.[52] ACC's proposal is also not simple—it is a complicated statistical and econometric model that is likely to be highly contentious and require expert econometricians to debate questions of regression specification, both substantive and technical.[53]

Moreover, ACC's proposal is unlawful. It fails to satisfy the statutory requirements because it does not conduct an individualized analysis of the challenged rate. It is also an abrupt departure from agency precedent in that it is an unrestricted comparison approach based on an average of competitive rates, which has been rejected by the STB and federal courts. Finally, the Benchmark Method produces absurd results that would lead shippers to prefer the hand of the regulator to the hand of competition, which is contrary to the de-regulatory thrust of the statutory scheme.

A. ACC's proposal is flawed.

Professor Kalt and Dr. Reishus explain in detail why the Benchmark Model proposed by ACC is deeply flawed as a matter of sound economic policy. The flaws are described in greater detail in the attached verified statement, but some of the highlights are as follows.

ACC is mimicking the wrong type of competition. The Benchmark Model "applies the wrong set of principles to mimic competition":[54] "In an industry like railroading with massive economies of scale and scope and huge sunk costs, differential pricing is consistent with competitive principles. On the other hand, while rail rates equal to short-run marginal cost can result when and where there are direct head-to-head alternatives for *specific* traffic, applying such rates for *all* traffic will not generate

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[52] *Id.* ¶¶ 5, 23-40.

[53] *Id.* ¶ 10; *see* ¶¶ 73-96.

[54] *Id.* ¶ 6.

revenue sufficient to sustain the railroad enterprise."[55] Accordingly, the "appropriate competitive principles" are not head-to-head competition that prices at marginal cost but, rather, "*contestability*," which is competition to be the single serving railroad.[56] In other words, the Benchmark Model cannot actually do what it claims to do—predict either "'competitive' rates that any shipper would be likely to pay today under proper principles," or predict "'supra-competitive' [rates] … above the level implied by contestability."[57]

The proposal is earnings regulation. The Benchmark Model proposed by the ACC has key characteristics of "old-style" regulation. At the simplest level, "old-style" rate-of-return (*i.e.*, earnings) regulation means any constraint based on system-wide earnings.[58] This is precisely what ACC proposes. The Benchmark Model does not even apply unless the carrier earns a certain level of system-wide earnings. As Professor Kalt and Dr. Reishus explain, "the rate caps [of the Benchmark Model] are triggered by a putative finding of revenue adequacy,"[59] which of course "cannot identify if a railroad is realizing supra-competitive levels of earnings in either the short- or long-run."[60] In any event, because the "*trigger* for the imposition of rate regulation under the ACC approach would still be a finding of revenue over-adequacy, . . . carriers would face incentives to avoid tripping the trigger by, for example, undertaking efficiency and quality improvements that portend increases in revenue and earnings. . . . [T]hese are

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[55] *Id.* ¶ 7.

[56] *Id.* ¶ 6.

[57] *Id.* ¶¶ 7, 9.

[58] *See* AAR Opening Comments, Kalt V.S. at 14.

[59] Kalt & Reishus V.S. ¶ 5.

[60] *Id.* ¶ 56.

the same distortionary incentives that full earnings-based rate regulation has so rampantly produced in other sectors."[61]

Moreover, the Benchmark Model is designed to "eliminate railroad earnings deemed to be above"[62] a certain level (depending on the CT level), and it tightens like a ratchet as a revenue-adequate carrier earns higher returns (from lawful rates charged to competitive traffic).[63] Professor Kalt and Dr. Reishus explain that "the more the calculated ROI exceeds the COC (without the CT cap), the more restrictive would be the CT rate caps."[64] Worse, "[d]espite the claim to the contrary, there is nothing in the CT proposal 'to maintain the long-term revenue adequacy' of the rail carriers," meaning that "there is nothing in the proposal that provides a mechanism by which railroads pushed to just-revenue-adequate levels by the ACC approach, but that subsequently fall below revenue adequate level, are guaranteed revenue to make up these revenue shortfalls, . . . [which] could well happen as a result of, for example, changes in economic and market conditions arising during the period of rate capping."[65]

Professor Kalt and Dr. Reishus explain, "[t]he limitations on overall revenues imposed by the proposed Benchmark and CT Methodology would be triggered by a finding of overall revenue adequacy and calculated in a manner to restrict aggregate revenues based on rates of return by applying restrictive caps to individual rates. . . . As such, this *is* rate-of-return regulation. . . . [T]he proposal has the characteristics of, and suffers the same failings as, other earnings-based rate regulation."[66] It is

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[61] *Id.* ¶ 95.

[62] *Id.* ¶ 24.

[63] *Id.* ¶¶ 23-33.

[64] *Id.* ¶ 32.

[65] *Id.* ¶ 33 (internal footnote omitted).

[66] *Id.* ¶ 35 (internal footnote omitted).

characteristics like these that would incentivize carriers to avoid the "stick" of the Benchmark Model by some artificial behavior, such as underpricing, wasteful investment, or underinvestment that would keep their ROI from equaling or exceeding the COC, which is directly contrary to the goals of Congress in enacting the 4R Act and the Staggers Act.

The ACC proposal suffers from an asymmetry problem. As briefly mentioned above, nothing in the ACC proposal would prevent railroads subject to the proposal's rate restrictions from falling into revenue inadequacy *while subject to the proposal's restrictions* in response to changing economic and market conditions.[67] "[R]ailroads are obviously subject to swings in economic conditions common to competitive industries," and "[u]nlike true public utilities, with protected franchise monopolies over inelastically demanded services . . ., there is no mechanism by which a railroad's revenues could be guaranteed to remain at 'revenue adequate' levels."[68] Yet, the ACC proposal lacks any mechanism for going back and replenishing revenues held to inadequate levels by the combination of CT rate restrictions and weak economic conditions.[69] "This kind of asymmetric earnings regulation—rate caps when times are good but no floor when times are bad—poses additional risks and disincentives for ongoing investments" and "discourages innovations with uncertain outcomes: potential upside profits achieved through reduced costs or increased service quality would be limited by the rate caps, yet losses would be borne fully by the railroad."[70]

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[67] *Id.* ¶ 33.

[68] *Id.* ¶ 34.

[69] *Id.* ¶¶ 33-34.

[70] *Id.* ¶ 34.

The model would suffer from debilitating regulatory lag. "[T]he Benchmark model leads to inflexible pricing based on *past* rail rates."[71] In particular, "[g]iven the backward-looking nature of any statistically-determined estimate, these benchmark rates would, at best, reflect market conditions that were in effect years earlier."[72] The Benchmark Model "lacks meaningful marketplace information on costs, service, customer characteristics, and marketplace alternatives available to customers that determine individual rates[, and] [t]he limited information it does have relies on rates in effect as long as ten years ago."[73] Despite the fact that the "purpose of the model is to establish the 'competitive' rate that would be applicable to individual shippers, the model cannot actually identify the 'competitive' rates that any shipper would be likely to pay today under proper principles of competition."[74]

The proposal is not smart simplification. ACC's approach is outrageously complicated, forcing the Board to delve into complex statistical and econometric modeling that will resist standardization or simplicity.[75] Parties would be forced to retain econometricians to debate "questions of regression specification—which variables are to be included and in what form, should they be interacted differently for different commodities, how does one account for changes in costs over time that may affect different traffic differentially, etc."[76] "Related to these are problems of omitted variable bias, collinearity, use of specification tests for inclusion or not of variables,

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[71] *Id.* ¶ 38.

[72] *Id.*

[73] *Id.* ¶ 9.

[74] *Id.*

[75] *See id.* ¶¶ 10, 73-96.

[76] *Id.* ¶ 91.

goodness of fit, and the ability to evaluate the predictive ability of the model."[77] "Numerous other technical issues arise in the choice of estimation and statistical testing (e.g., adjustments for heteroskedasticity, clustering, geographic correlation, etc.)."[78] This is not simplification, smart or otherwise.

These and other flaws identified by Professor Kalt and Dr. Reishus should be sufficient to disqualify this benchmarking approach as a viable methodology for determining rate reasonableness for the freight rail industry.

B. ACC's proposal is unlawful.

To the extent the STB needs more reasons, ACC's proposal fails to satisfy the statutory requirements, would be an abrupt departure from agency and federal court precedent, and produces absurd results. Each is an independent reason to discard this concept.

1. <u>ACC's model does not perform an individualized analysis of the challenged rate.</u>

The statutory scheme requires a detailed analysis of not only market dominance, but of whether a challenged rate is in fact unreasonable *in light of the market particularities* of the movement in question.[79] In particular, 49 U.S.C. § 10704(a)(1) requires a "full hearing" to examine an individual challenged rate, and that hearing must include, *inter alia*, the "due consideration [of] – (A) the amount of traffic which is transported at revenues which do not contribute to going concern value and the efforts made to minimize such traffic; (B) the amount of traffic which contributes only

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[77] *Id.*

[78] *Id.*

[79] AAR Opening Comments, at 24-25 (citing 49 U.S.C. §§ 10701 and 10704); 49 U.S.C. § 10707(c) ("[A] finding of market dominance does not establish a presumption that the proposed rate exceeds a reasonable maximum.").

marginally to fixed costs and the extent to which, if any, rates on such traffic can be changed to maximize the revenues from such traffic; and (C) the carrier's mix of rail traffic to determine whether one commodity is paying an unreasonable share of the carrier's overall revenues…." 49 U.S.C. § 10701(d)(2).

Section 10707 ties up the bow: "When the Board finds … that a rail carrier … has market dominance over the transportation to which the rate applies, it may then determine that rate to be unreasonable *if it exceeds a reasonable maximum for that transportation*[, and] a finding of market dominance does not establish a presumption that the proposed rate exceeds a reasonable maximum." 49 U.S.C. § 10707(c) (emphasis added). In other words, the Board can find a rate is unreasonable only if it analyzes whether the challenged rate exceeds a reasonable *maximum* (not an average) for the *specific traffic to which the rate applies*. This analysis necessarily requires taking into account the market particularities of the movement at issue—otherwise, there is no way to determine a "reasonable maximum" rate "for the specific traffic to which the rate applies."[80] *Id.*

A "benchmark" approach like the one proposed by the ACC cannot meet these statutory requirements. This is because the Benchmark Model *cannot* determine whether the challenged rate is appropriate in light of the market particularities of the movement to which it applies.[81] Rather, under the Benchmark Model, a challenged rate is presumably unlawful merely because it happens to be above an *average* of competitive rates with some arbitrary similarities. As Professor Kalt and Dr. Reishus explain, the Benchmark Model "is an elaborate form of averaging, portending the imposition of homogenizing rate restrictions which would *push rates to average levels*

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[80] Note, the RTP factors in 49 U.S.C. § 10101 must conform to this statutory scheme—not the other way around. *See supra* note 36.

[81] Kalt & Reishus V.S. ¶¶ 7, 9, 51-56.

without proper, or even coherent, consideration of the actual economic circumstances—including competitive circumstances—that actually drive dynamic competitive pricing in the rail industry."[82] This fails to satisfy the statutory requirement that the Board determine a reasonable *maximum* rate according to the market realities for the movement at issue, not the *average* of competitive rates plus some arbitrary multiplier.

The "Competitive Threshold" (CT) does not solve this problem. The CT multiplier is simply an arbitrary point at which a rate above the average is deemed too high—*not* because of the market particularities of the movement at issue, but because the carrier is to whatever extent revenue adequate. This is not authorized by the statute. As Section II explains in detail, nowhere in the statute is the Board given authority to use mere revenue adequacy, rather than the particularities of the movement, to determine if a rate is unreasonable. Said in a different way, the CT (regardless of the number) fails to do what the statute requires: analyze whether the challenged rate is justified in light of the market particularities for the movement to which the rate applies. Combining an arbitrary average threshold with an arbitrary CT factor fails to meet this requirement.

2. ACC's model is a comparison approach based on an average of competitive rates that has been rejected by the STB and Federal Courts.

ACC's proposal is nothing more than a complicated way to judge the reasonableness of a challenged rate based on the average of rates from movements that have more competitive transportation options. It is a wolf wrapped in econometric clothing.

But the Board has repeatedly rejected using a comparison group approach that improperly pulls from competitive traffic. *See, e.g.*, EP 646-1, *Simplified Standards for Rail*

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[82] *Id.* ¶ 92 (emphasis added).

Rate Cases, slip op. at 17 ("As such, the comparison group should consist of only captive traffic over which the carrier has market power. The rates available to traffic with competitive alternatives would provide little evidence on the degree of permissible demand-based differential pricing needed to provide a reasonable return on the investment."); *US Magnesium, LLC v. Union Pac. R.R. Co.*, Docket No. 42114, at *5 (STB served Jan. 28, 2010) ("The comparison group should consist of only captive traffic over which the carrier has market power, as the rates available to traffic with competitive alternatives would provide little evidence of the degree of permissible demand-based differential pricing needed to provide a reasonable return on the investment."); *E.I. Dupont de Nemours & Co. v. CSX Transp., Inc.*, Docket No. 42099 (STB served June 30, 2008) ("The comparison group should consist of only captive traffic over which the carrier has market power, as the rates available to traffic with competitive alternatives would provide little evidence on the degree of permissible demand-based differential pricing needed to provide a reasonable return on the investment."); *see also* EP 646-1, *Simplified Standards for Rail Rate Cases*, slip op. at 80-82 (explaining that the proposal to include "traffic priced below 180% R/VC level" in the comparison group was erroneous and would not be adopted); *US Magnesium, LLC v. Union Pac. R.R. Co.*, Docket No. 42114, at *5 (STB served Jan. 28, 2010) ("[N]o movements priced below the 180% R/VC level may be included in the comparison group"); *S-W R.R. Car Parts Co. v. Mo. Pac. R.R. Co.*, Docket No. 40073, at *5-*7 (STB decided Dec. 1, 1988) (rejecting an argument that traffic with R/VC ratios below 180 should be included in the comparison group and noting, "[i]t would be entirely inappropriate to judge SWRC's rates by comparison to a group of rates that includes traffic statutorily defined as not captive (R/VC less than 180 percent) during the complaint period"); *E.I. Dupont de Nemours & Co. v. CSX Transp., Inc.*, Docket No. 42099 (STB served June 30, 2008) ("[N]o movements priced below the 180% R/VC level may be included in the comparison group."). Despite this mountain of clear precedent undermining its proposal, the ACC has not even acknowledged these

cases, let alone offered a reasoned basis for the STB to depart from agency precedent—precedent that is recent, repeated, and well-reasoned.

Moreover, the D.C. Circuit sharply criticized an approach to rate regulation similar to that proposed by the ACC. In *Burlington N. R.R. Co. v. ICC*, 985 F.2d 589 (D.C .Cir. 1993) ("*McCarty Farms*"), the D.C. Circuit scrutinized a very similar comparison approach and honed in immediately on the "fundamental conceptual problem" with using an R/VC comparison approach: "If the formula is employed regularly and repeatedly, it will reduce rates to the lowest R/VC used in the comparison group."[83] The court reasoned that "it is hard to discern any principle behind the choice of benchmark traffic."[84] In particular, the court noticed that because there was a discrepancy between the rates actually charged and the rates of the benchmark traffic, "it seems most probable that the transportation and demand characteristics of the two groups are in fact different."[85] The D.C. Circuit further reasoned with regard to this type of "benchmarking" method, that "if a profit-maximizing railroad charges more for the issue traffic than for the benchmark traffic, that would seem to represent a judgment—by the party with the greatest interest in making it correctly—that the issue traffic either costs more to transport or has a less elastic demand."[86]

The same can be said for the ACC proposal, which suffers from the same conceptual problems that troubled the D.C. Circuit. All railroads, revenue adequate or not, are in the best position to determine the appropriate price for a service in light of the market particularities of the movement. As Professor Kalt and Dr. Reishus explain: the core premise of the Benchmark Model—that competitive conditions actually found

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[83] *McCarty Farms*, 985 F.2d at 597.

[84] *Id.*

[85] *Id.* (emphasis added).

[86] *Id.* (emphasis added).

on some traffic can tell us the rates that competition would set on other traffic—is in direct contradiction to the underlying economics of competition pertinent to an industry with massive economies of scale and scope such as the rail freight transportation industry.[87] An approach like the Benchmark Model improperly interferes with a railroad's right to determine the appropriate price for its services.[88] This is because the Benchmark Model does not pinpoint whether a rate is in fact unreasonable given the *actual* market forces in play for the movement.[89] As the D.C. Circuit explained, comparison approaches (like the R/VC method or the Benchmark Model) "do not intelligibly define" exploitation of captive shippers, unlike CMP methods, which are "well designed" to determine that.[90]

3. ACC's proposal will produce absurd results.

Finally, the ACC approach of setting the maximum lawful rate based on the average of competitive movements (even if adjusted for revenue adequacy with a CT threshold) would produce absurd results in two key respects.

First, the model itself will label roughly half of all the "competitive" rates as unreasonably high—plainly an absurd outcome. As discussed above, the Benchmark Model is just a complicated way of calculating an average.[91] In particular, the Benchmark Model determines the average rate charged to customers who have

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[87] Kalt & Reishus V.S. ¶¶ 7, 41-51.

[88] *See* 49 U.S.C. § 10701(c) ("a rail carrier providing transportation subject to the jurisdiction of the Board under this part may establish any rate for transportation or other service provided by the rail carrier").

[89] Kalt & Reishus V.S. ¶¶ 7, 41-51.

[90] *McCarty Farms*, 985 F.2d at 598.

[91] Kalt & Reishus V.S. ¶ 92.

competitive options, as defined by the model, over a certain period of time (in the past).[92] This average figure is deemed the "competitive" or "benchmark" rate.

But herein lies the problem with the use of averages. By necessity under the model, *roughly half* of the rates taken into account (*i.e.*, rates where customers have competitive choices) will fall *above* the average (middle) line.[93] This means that those rates suddenly become "potentially non-competitive" rates simply by virtue of being above the average line. In other words, as Professor Kalt and Dr. Reishus explain: "rates on *roughly half* of competitive traffic will [necessarily] be above whatever line the Benchmark Model identifies as the 'competitive rate'; [yet,] this benchmark rate line derived from purportedly 'competitive' traffic becomes the prevailing rate for purportedly 'non-competitive' traffic."[94] This means that if, as ACC suggested, the CT is set at 1, then "roughly *half* of the 'competitive traffic' would be found to be paying rates above the rate cap imposed on 'non-competitive' traffic, and the average rate actually paid by 'non-competitive' traffic subject to the cap could well turn out to be *below* the average rate paid by 'competitive' traffic," which is "wholly inconsistent with reasonable rate regulation or competitive principles applicable to the railroad industry."[95] This is ridiculous. The Board should disqualify any model that uses hundreds of thousands of competitive rates as an input, but then labels half those rates as unreasonably high—such a model is neither reliable nor realistic.

This leads to a separate and additional absurdity: Under the Benchmark Model, regulated traffic would get a better deal than the majority of "competitive traffic," which necessarily will have rates above the maximum lawful rate. As Professor Kalt

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[92] *Id.* ¶¶ 38, 58-72.

[93] *Id.* ¶¶ 8, 64.

[94] *Id.* ¶ 8 (emphasis added).

[95] *Id.* ¶ 8 (emphasis added).

and Dr. Reishus explain: "Based on the example in Table 4 of Dr. Caves' statement, which applies a CT factor of 1.0 to BNSF and UP, rate caps generated by the Benchmark Methodology . . . would be *less than* what roughly half of comparable *competitive* traffic would be paying. This is a not an artifact of the illustration but a central feature of the Benchmark Methodology."[96] Congress clearly did not intend that the STB should embrace a rate setting methodology where customers would prefer the visible hand of regulators to the invisible hand of competition.[97]

III. THE BOARD SHOULD WIDEN ACCESS FOR SMALL SHIPPERS TO RATE RELIEF BY EXPLORING VOLUNTARY ARBITRATION.

At the hearing, there was some discussion of the Board's alternative dispute resolution procedures. AAR urges the Board to explore why no stakeholder – railroad or shipper—has opted into the voluntary arbitration program for rate disputes. While disputes over maximum lawful rates were not historically eligible for voluntary arbitration under any agency program, Congress expanded the STB's voluntary arbitration program to include rate disputes, and the Board has established revised rules to reflect this change.[98] The lack of popularity of the voluntary arbitration program may be attributed, in part, to several deterring features of the program that likely keep railroads, shippers, or both away.

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[96] *Id.* ¶ 64.

[97] *See* H.R. Rep. No. 96-1430, at 89 (1980), *as reprinted in* 1980 U.S.C.C.A.N. 4110, 4120-21 ("The purpose of this legislation is to reverse the decline of the railroad industry, which has been caused, in part, by excessive government regulation. The Conferees believe that by allowing the forces of the marketplace to regulate railroad rates wherever possible the financial health of the railroad industry will be improved and will benefit all parts of the economy"); *see also, supra* Section I.B.3.

[98] Surface Transportation Board Reauthorization Act of 2015 § 13, *codified at* 49 U.S.C. § 11708; EP 730, *Revisions to Arbitration Procedures*, Decision (STB served Sept. 30, 2016).

First, the program is not confidential. Although the decisions are non-precedential,[99] the STB nonetheless requires the publication of the decisions on its website, with confidential information redacted. This is a major departure from common expectations that arbitration is private and confidential. Ensuring confidentiality for the arbitration program would significantly lower the risk of agreeing to arbitrate because, whichever side wins, the other side does not have to worry about a damaging public result that they will have limited ability to appeal.

Second, the arbitrator pool for the arbitration program is much too limited. The STB requires participants in an arbitration to select arbitrators from a limited pool of arbitrators unless *all* parties opt out of the Board's list.[100] There is no reason why a railroad should not be permitted, when it opts into the arbitration program, to expand the list to include other experienced neutral arbitrators. The current rules do not permit that departure.

Third, the issue of market dominance, which can still be costly for litigants, must first be determined by the Board before parties can be referred to an arbitration panel. This guarantees a more lengthy and costly process than is necessary and that might even exceed the time and cost of bringing a rate challenge before the STB under one of the simplified approaches. If the parties could include the issue of market dominance in the arbitration process, money and time could be saved, and parties may be more likely to opt into the arbitration program.

Finally, under current rules, the Board will police against the improper disaggregation of large disputes into many small cases on only a case-by-case basis. For

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[99] 49 U.S.C. § 11708(d)(5).

[100] In other words, once parties have agreed to the voluntary arbitration program, there is no option to opt out of the Board's list of arbitrators so long as at least one party sees the Board's pool as favorable. Thus, if a railroad opts into the arbitration program, it cannot unilaterally choose to use arbitrators outside of the Board's list.

example, the Board cautioned shippers that they cannot take a large case that is suitable for a Simplified-SAC presentation and try to break it apart into dozens of Three-Benchmark cases. EP No. 646-1, *Simplified Standards for Rail Rate Cases*, Decision, at 32-33 (STB served Sept. 5, 2007). However, over objections from the rail industry and at the shippers' request, the STB elected not to create any mechanical protections and instead rely on a case-by-case analysis. *Id.* This remains problematic, as a railroad that agrees to voluntarily arbitrate smaller disputes will have no protections against a customer's disaggregation of claims because the individual arbitrator would have no standards to enable him or her to police that kind of behavior.

The Board should explore how to improve its voluntary arbitration program, particularly in light of the deterring aspects, above. This is an additional type of "smart simplification" that AAR and Professor Kalt advocated for in AAR's initial EP 761 Comments.[101]

CONCLUSION

For the reasons herein, the Board should abandon the revenue adequacy constraint altogether, reject ACC's proposal, and instead explore improvements to its voluntary arbitration program.

[101] AAR Opening Comments, at 6; *Id.*, Kalt V.S., at ¶¶ 14, 139-47.

Respectfully submitted,

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February 13, 2020

Verified Statement of Joseph Kalt and David Reishus

Before the Surface Transportation Board

Docket No. EP 761

Hearing on Railroad Revenue Adequacy

RESPONSE TO THE "BENCHMARK METHODOLOGY" PROPOSAL SUBMITTED BY THE AMERICAN CHEMISTRY COUNCIL

Verified Statement of

Prof. Joseph P. Kalt and David Reishus, PhD

February 13, 2020

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I. INTRODUCTION

A. WITNESS INTRODUCTIONS

1. **Joseph P. Kalt, PhD:** I am the Ford Foundation Professor (Emeritus) of International Political Economy at the John F. Kennedy School of Government at Harvard University and a senior economist with Compass Lexecon, an economics consulting firm specializing in the analysis of competition, among other areas of economics. I hold B.A., M.A., and Ph.D. degrees in economics. I submitted a Verified Statement in this proceeding on behalf of The Association of American Railroads,[1] and provided companion oral testimony before the Surface Transportation Board ("the Board") on December 12, 2019. My curriculum vita, which lists my prior testimony as an expert, my publications, and my other professional activities, was attached to my prior Verified Statement.

2. **David Reishus, PhD:** I am an Executive Vice President at Compass Lexecon, an economics consulting firm and division of FTI Consulting, Inc. I received a B.A. degree in economics from Northwestern University, and M.A. and Ph.D. degrees in economics from Harvard University. In my professional career, I have focused on microeconomic issues with emphasis on issues of taxation, regulation (including natural resource, energy, transportation and international trade), and antitrust policy. Most of my work has been in the context of natural resource, energy, electricity, and regulated transportation industries. Beginning in 1995, I have studied and provided economic consulting services relating to the economics of rail freight regulation and related contractual and organizational issues. As part of this work, I have previously provided expert testimony before the Board on an array of economic matters, including rail competition, mergers, trackage rights, and access. My curriculum vita is attached as Appendix A to this statement.

3. The opinions expressed herein are our own, and do not necessarily represent those of our employers or their other employees.

[1] Written Testimony of Joseph P. Kalt, Ph.D., November 26, 2019 (hereinafter "Kalt VS (2019)") attached to Comments of the Association of American Railroads, STB Ex Parte No. 761 Hearing on Revenue Adequacy, STB Ex Parte No. 722 Railroad Revenue Adequacy, November 26, 2019.

B. ASSIGNMENT

4. We have been asked by the Association of American Railroads ("AAR") to analyze the Benchmark Model and Methodology proposal of the American Chemistry Council ("ACC") for rail ratemaking. This proposal is described in the Verified Statement of Kevin W. Caves, Ph.D., filed on behalf of the American Chemistry Council; Dr. Caves also presented this proposal at the December 12, 2019 hearing.[2]

II. SUMMARY OF CONCLUSIONS

5. The proposed "Benchmark Model" and the Competitive Threshold-determined rate caps are a form of earnings-based rate regulation, with all the flaws and failings such an approach brings to the railroad industry. As presented by Dr. Caves, the rate caps are triggered by a putative finding of revenue adequacy based on historical book values. The stringency of the resulting revenue caps depends on the level of company-wide revenue "over-adequacy". While the cap applicable to any individual shipment is derived from the Benchmark Model, the level of revenue restriction is based on railroad-wide earnings. Thus, the serious and well-recognized distortions of earnings-based regulation – including deleterious incentives for, and impacts on, cost-minimizing behavior, service quality, innovation, investment, and responsiveness to changing market circumstances of such earnings-based regulation, especially when based on historical book valuation – would result under ACC's proposal.

6. The proposal applies the wrong set of principles to mimic competition. The appropriate competitive principles are ones of *contestability*—competition to be the serving railroad—and these are the principles embedded in the Constrained Market Pricing approach of the Board. These principles result in prices that reflect the demands, service levels, and costs of serving *specific* traffic, rather than assuming (as Dr. Caves does) that shipments of the same commodity, length, and size would have the same rates regardless of location on the system, service quality, and customer needs. The Benchmark Model's approach of setting rates on all traffic based on rates

[2] Verified Statement of Kevin W. Caves, PhD on Behalf of The American Chemistry Council, STB Docket No. EP 755 Final Offer Rate Review and STB Docket No. EP 761 Hearing on Revenue Adequacy, November 12, 2019 (hereinafter "Caves VS") attached to the Written Testimony of the American Chemistry Council, STB Docket No. EP 761 Hearing on Revenue Adequacy, STB Docket No. EP 722 Railroad Revenue Adequacy November 26, 2019 (hereinafter "ACC Filing").

for traffic which has direct rail or intermodal alternatives violates these principles and fails to mimic competition relevant to the railroad industry.

7. The Benchmark Model's approach to ratemaking is flawed at its core. In an industry like railroading with massive economies of scale and scope and huge sunk costs, differential pricing is consistent with competitive principles. On the other hand, while rail rates equal to short-run marginal cost can result when and where there are direct head-to-head alternatives for *specific* traffic, applying such rates for *all* traffic will not generate revenue sufficient to sustain the railroad enterprise. Moreover, the Benchmark Model cannot identify which, or even if any, rates are "supra-competitive"—i.e., above the level implied by contestability. To do so requires looking at railroad returns on a replacement cost basis, and at revenues and costs relating to specific groups of traffic. The proposed Benchmark Model methodology does none of this.

8. Although not explicit, the Benchmark Model methodology bases its rate caps on the *average* of competitive rates. Statistical regression performed on the purportedly "competitive" traffic is an exercise in line-fitting. As such, rates on roughly half of competitive traffic will be above whatever line the Benchmark Model identifies as the "competitive rate"; this benchmark rate line derived from purportedly "competitive" traffic becomes the prevailing rate for purportedly "non-competitive" traffic. Dr. Caves includes a Competitive Threshold multiplier to adjust the proposed rate caps based on the fitted benchmark rate regression line. In fact, in some of his demonstrations of the proposal, the rate caps on purportedly "non-competitive" shipments are set equal to the "benchmark" rate. In this case, rates for "non-competitive" traffic would be capped at the *average* of the rates on corresponding "competitive" traffic. As a result, roughly half of the "competitive traffic" would be found to be paying rates above the rate cap imposed on "non-competitive" traffic, and the average rate actually paid by "non-competitive" traffic subject to the cap could well turn out to be below the average rate paid by "competitive" traffic. The proposal and such absurd outcomes are wholly inconsistent with reasonable rate regulation or competitive principles applicable to the railroad industry.

9. The Benchmark Model methodology does not represent smart simplification of rail rate regulation. As it fails to apply the appropriate principles for mimicking competition, it represents a move away from smart rate regulation. The Benchmark Model lacks meaningful marketplace information on costs, service, customer characteristics, and marketplace alternatives available to

customers that determine individual rates. The limited information it does have relies on rates in effect as long as ten years ago. Given that the purpose of the model is to establish the "competitive" rate that would be applicable to individual shippers, the model cannot actually identify the "competitive" rates that any shipper would be likely to pay today under proper principles of competition. The model also introduces a rash of complexities that would be likely to vex railroads, shippers, and the Board for years. For example, the model identifies traffic eligible for rate relief based on a myriad of arbitrary decisions and mechanical criteria for separating "competitive" from purportedly "non-competitive" traffic. As Dr. Caves' own results reveal, even very modest differences in these criteria can result in more than three-fold differences in the amount of "non-competitive" traffic potentially eligible for rate relief.

10. Establishing reliable universal criteria applicable to all traffic for separating "competitive" from "non-competitive" traffic is not simple and would inevitably be highly contentious. For example, purely as a result of the mathematics of statistical regression, roughly half of all shipments categorized into the purportedly "competitive" shipments used to estimate the benchmark regression line would have rates that lie *above* the that line – i.e., these "competitive" rates are above the benchmark of competitive rates. Under ACC's logic, these shipments would have rates higher than what the Benchmark Model says competition would allow. They would nevertheless be ineligible for ACC's system of rate relief as the CT is determined by, and the rate caps applied to, the separate putatively "non-competitive" traffic. For this reason, customers with shipments categorized as "competitive" but having rates above the benchmark of competitive rates could be expected to argue vigorously that the Benchmark Model, itself, finds their rates to be above competitive levels and that the criteria that results in their pertinent shipments being labeled "competitive" are invalid. Such scenarios threaten to introduce intolerable instability in the proposed process for dividing "competitive" from "non-competitive" shipments: Moving more "competitive" traffic to the "non-competitive" side of the traffic dividing line would necessitate recalculation of the Benchmark model, which would then ratchet the benchmark line downward. This would lower the benchmark "competitive" rate relative to the rates paid by the remaining "competitive" traffic, portending more challenges of putatively "competitive" shipments with rates above the competitive benchmark being challenged as too high to be competitive; and so on. Similar issues arise in establishing the applicable Competitive Threshold and in determining the appropriate data coverage, variables, specification and estimation methods to be used by the

statistical model in calculating with the benchmark "competitive rate" applicable to "non-competitive" traffic.

III. SUMMARY OF THE "BENCHMARK MODEL"

A. MODEL OVERVIEW

11. Testifying on behalf of the ACC, Dr. Caves proposes the Board develop a "Benchmark Model" in the form of a statistical regression equation that would be used to "determine maximum reasonable rates for revenue adequate railroads." The proposed Benchmark Model would create a "Competitive Threshold," defined by Dr. Caves as "the maximum ratio by which captive rates would be permitted to exceed competitive rates while still satisfying the regulatory requirements of railroad revenue adequacy."[3]

12. The methodology proposed by Dr. Caves proceeds in four steps.

- Select a "benchmark group" of putatively "competitive" movements.[4]
- Develop an econometric (i.e., statistical) regression model (the "Benchmark Model") using Waybill Sample data for the "competitive" movements that 'fits' a regression line for the revenue-per-ton-mile rates on the benchmark group's shipments to an equation containing various shipment characteristics.[5]
- Use the Benchmark Model's fitted regression line to predict the revenue-per-ton-mile rates for "potentially non-competitive" traffic – i.e., traffic that was not included in the benchmark group of competitive traffic. The actual rates for the "potentially non-competitive" traffic are compared to the predicted values from the econometric model to purportedly "identify movements with abnormally high rates."[6]

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3 Caves VS at p. 3.

4 Caves VS at p. 12.

5 Caves VS at p. 20.

6 Caves VS at p. 24.

- For Revenue Adequate carriers, use the "Benchmark Method" to determine a "Competitive Threshold" that establishes the level of rate relief that "captive shippers" should receive.[7]

B. DATA

13. Dr. Caves' model relies primarily on data available from the Surface Transportation Board's Carload Waybill Sample ("CWS"). Dr. Caves also uses the Centralized Station Master databases ("CSM"), Port Series data from the U.S. Army Corps of Engineers, and railroad network geographic information system ("GIS") data in his analysis.[8]

14. Dr. Caves uses the CWS to identify certain shipment characteristics. The characteristics include: revenue; weight (tons); the deregulation flag; distance; shipment size (in carloads); number of railroads; car ownership (i.e., private car flag); commodity code ("STCC"); hazardous material dummy variable; Rule 11 dummy variables; and year.

15. Dr. Caves uses the CSM and GIS data in conjunction with information in the CWS data to determine what he calls "potentially competitive rail alternatives."[9] He uses the Port Series and GIS data in conjunction with the CWS data to identify what he calls "potentially competitive water-based alternatives."[10]

C. "COMPETITIVE" TRAFFIC GROUP

16. The first step in Dr. Caves' Benchmark Model is to define a sample of movements from the CWS that he deems to be "competitive." A move is included in the putatively "competitive" sample if it meets any one of the following criteria:

- It is a "deregulated (exempt)" shipment.[11] While not explicitly stated, it appears that "exempt shipments" in the model are based only on commodity exemptions, and traffic

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7 Caves VS at p. 29.

8 Caves VS at pp. 9-12.

9 Cave VS at p. 12.

10 Cave VS at p. 12.

11 Caves VS at p. 12

moving under equipment (i.e., TOFC/COFC) exemptions are not "competitive" under this criterion.[12]

- It is subject to rail competition. Dr. Caves considers a move rail-competitive if at least one Class I railroad operated within five miles of the origin, provided the *same* railroad also operated within five miles of the destination.[13] Dr. Caves also considers various alternative definitions of "benchmark groups" that allow the distance between Class I railroads to differ by as much as 50 miles.[14]

- It is subject to water-based competition. Water-based competitive rail traffic is defined as having at least one port on the same waterway within five miles of both the origin and the destination.[15] Dr. Caves considers various alternative definitions of "benchmark groups" that allow the distance to ports to increase to as much as 50 miles.[16]

- It is subject to truck competition. Truck competitive movements are defined as movements that are shorter than 200 miles and consist of fewer than five carloads.[17]

17. Dr. Caves' criteria for placing deregulated traffic in the "competitive sample" does not explicitly include traffic with revenue less than or equal to 180% of variable cost or traffic moving under contract – traffic not subject to rate regulation. Unless covered by the screens defined above, this traffic is excluded from the "competitive" sample and is part of the "potentially non-competitive" traffic subject to rate-setting under Dr. Caves' "Competitive Threshold".

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[12] Caves VS at pp. 12-13. Note that none of the shipments in the Commodity Group, "Miscellaneous Mixed Shipments" (i.e., 2-digit STCC 46) are treated as exempt by Dr. Caves. Caves VS, Table 2B, at pp. 17-19. Intermodal traffic is commonly waybilled in this commodity group and this commodity group is among the largest category moved.

[13] Caves VS at p. 13.

[14] Caves VS at p. 21.

[15] Caves VS at p. 13.

[16] Caves VS at p. 21.

[17] Caves VS at p. 13.

D. MODEL SPECIFICATION

18. Dr. Caves uses what he deems to be his "competitive sample" of moves identified from the CWS to estimate an econometric (i.e., statistical) regression model that is designed to predict the natural logarithm of revenue-per-ton-mile (the dependent variable) based on "shipment characteristics" (the independent variables).[18] The independent variables consist of:[19]

- logarithm of distance (miles),
- logarithm of number of carloads,
- a "dummy variable" if a private railcar or not,
- a "dummy variable" if a hazardous material,
- "dummy variables" for Rule 11 movements,
- the number of railroads on a move; and
- "fixed effects"[20] for commodities (at the 5-digit STCC level), and
- "fixed effects" by commodity, year, and railroad to try to control for the effect of the masking of contract revenues in the CWS used.

19. Applying the estimated coefficients from the above regression, Dr. Caves uses his limited information on shipment characteristics—haul length, carloads, number of railroads, the "dummy variables", and the "fixed effects"—for the designated "potentially non-competitive" moves (i.e., the moves not included in the "competitive sample") to predict the logarithm of the "competitive" revenue-per-ton-mile rates for the "potentially non-competitive traffic."[21] Dr. Caves' basic idea is that these predicted rates for what he calls "potentially non-competitive" movements are what he

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[18] Caves VS at pp. 20-22.

[19] Caves VS at pp. 20-23.

[20] Fixed effects in this context are variables that are constant across moves; these variables, such as year of the move and commodity moved, do not change over time. They have fixed effects; in other words, any impact they have on a move's rate is the same across all moves having the same year or commodity. A regression with "fixed effects" imposes single average effects of, e.g., year and commodity on the rates for all moves having the same year and commodity. "Dummy variables" are similar in that they estimate the average effect of some variable, e.g., hazardous material or not, over all movements.

[21] Caves VS at pp. 24-25.

believes such movements would have received if they had been "competitive" (according to Dr. Caves' definitions of "potentially non-competitive" and "competitive"). The resulting predicted "competitive" rates are roughly the "average" rates observed for "competitive traffic" having the same model-included characteristics (i.e., the characteristics of the variables he has selected for inclusion in the model).[22] As we explain below, this ambitious attempt is conceptually misguided in its understanding of the nature of competition in an industry such as railroading, and it utterly fails as a statistical technique for identifying individual rates that competition would generate for any given movement of a customer.

E. THE LINK TO REVENUE ADEQUACY: THE SO-CALLED "COMPETITIVE THRESHOLD"

20. Dr. Caves advises the Board to "implement a Benchmark-based rate standard by allowing captive rates to exceed competitive rates by a predetermined Competitive Threshold."[23] The so-called Competitive Threshold would be determined by the STB based on an analysis of revenue adequacy.

21. Dr. Caves' application of his model first calculates the reduction in each putatively "revenue adequate" railroad's revenue necessary to set the Return on Investment ("ROI"), based on the accounting measure of net historic (book) invested capital, equal to the Cost of Capital ("COC") over some period.[24] For each railroad that has an ROI in excess of COC for the period, he examines the rates and revenues from the purportedly "non-competitive" traffic. He then calculates the "Minimum Viable Competitive Threshold", which is defined as the lowest value of the threshold that, combined with the benchmark rates for the purportedly "non-competitive"

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[22] As we explain below when addressing the econometric issues, the process of fitting a regression "line" to the scatter of points estimates the conditional expectation of the variable of interest (i.e., the rail rate)—the average rate given the explanatory values.

[23] Caves VS, Table 5, at p. 29.

[24] Caves VS, Table 5, at pp. 33 and 35. As previously demonstrated, use of accounting measures of net historic (book) invested capital in determinations of revenue adequacy is professionally discredited in finance and economics, and would represent a return to experientially discredited and now widely abandoned regulatory standards. See Kalt VS (2019).

traffic, would reduce overall historical railroad revenue and earnings such that ROI would not fall below COC for the historical period.[25]

22. This Competitive Threshold (CT) is a multiplier to be applied to the predicted "competitive" revenue-per-ton-mile rates from the statistical regression model for all "potentially non-competitive" movements. A CT of 1.0, for example, implies that rates on the "potentially non-competitive" movements are capped at a level equal to the predicted rate from the econometric model.[26] These calculations determine the maximum rate for each of the "potentially non-competitive" movements and is intended to reduce revenue and earnings to each railroad up to the amount calculated above.

IV. THE PROPOSED BENCHMARK AND CT METHODOLOGY FUNCTIONS AS AN EARNINGS-BASED REVENUE CAP WITH ALL THE ASSOCIATED DISTORTIONS AND INEFFICIENCIES

23. The proposed Benchmark Model and CT Methodology is, at its core, *earnings regulation*. It would utilize putative findings of over-adequate earnings to trigger caps on individual shipments' rates and thereby pull down overall system-wide revenues and earnings relative to what they otherwise would be. Specifically, the application of the Benchmark Methodology is tied to a determination of revenue (over-) adequacy: "The level of CT would be selected based on an analysis of revenue adequacy."[27] As explained by the ACC, Dr. Caves has intentionally designed the CT "to determine the degree of differential pricing above the predicted competitive benchmark rate that is necessary to maintain the long-term revenue adequacy of the defendant rail carrier."[28] In short, the proposed CT Methodology is clearly designed to trigger caps on rates for certain shipments, and thereby to reduce the revenues and attendant earnings, of railroads found to

[25] Caves VS at p.32. Dr. Caves does not allow the CT to go below 1.0. This ensures that the rate caps are not less than his benchmark rates.

[26] Caves VS at p.33.

[27] Caves VS at p. 29.

[28] ACC Filing at p. 4.

otherwise have revenues and earnings that yield "excess" accounting rates of return on investment (ROI).[29]

24. Dr. Caves' presentation of the Benchmark and CT Methodology makes it clear that the proposal is a form of regulation under which putative findings of over-adequate aggregate earnings trigger restraints on certain rates so as to limit overall aggregate revenue and earnings to putatively adequate levels. In the illustrations in Tables 5 and 6 of his Verified Statement, Dr. Caves determines a CT value for each of the three railroads that, based on his calculations, were "revenue adequate." For these railroads, the illustration sets the CT at a level to cap affected rates to the extent necessary to eliminate railroad earnings deemed to be above the revenue adequate level (with a minimum CT level of 1.0).

25. Consistent with Dr. Caves' illustrations, Figure 1 below provides a simple illustration of the relationships between revenue adequacy, revenue limitations, and rate caps in the Benchmark Model. In Figure 1 and for purposes of exposition, the subject railroad is assumed to serve only four shipments, all with the same commodity, length of haul, and other limited shipment characteristics included in the Benchmark Model regression. Without any loss of basic concepts, this assumption eliminates the need to convert between rates and revenues and allows us to avoid the complexities that arise from the statistical modelling and estimation; we address those complications below.

26. In Figure 1, two shipments are purportedly "competitive" and have the same $700 rate (with corresponding revenue to the railroad); and two shipments are purportedly "non-competitive" with rates (and revenue to the railroad) of $1,050 each. In this example, the Benchmark Model would identify the benchmark price as the average of the "competitive" rate ($700 in bold in the Figure). In the illustration, the purportedly "non-competitive" rates are on average higher than "competitive" rates, in this example by 50%. The resulting total revenue of the railroad is $3,500.

[29] The ACC proposal fully embraces the wholly discredited historical book accounting approach to measuring and using "revenue adequacy." For review and discussion of the reasons for the professional rejection of the approach, see, e.g., Kalt VS (2019) and Written Testimony of Professor Kevin Murphy, Ph.D., and Professor Mark Zmijewski, Ph.D., On Behalf of Union Pacific Railroad Company, Norfolk Southern Railway Company, and CN STB Ex Parte No. 761 Hearing on Revenue Adequacy, STB Ex Parte No. 722 Railroad Revenue Adequacy, November 26, 2019 (hereinafter "Murphy and Zmijewski (2019)").

Figure 1

Illustrating the Benchmark Model:
An Example Railroad with Four Shipments

	Uncapped Rates		Benchmark Model	
Shipment	**Rate**	**Average**	**Rate**	**Rate Cap**
			"Competitive"	
1	$700	**$700**	$700	--
2	$700		$700	
			"Non-Competitive"	
3	$1,050	$1,050	$900	**$900**
4	$1,050		$900	
Total Revenue	**$3,500**		**$3,200**	
			CT	***1.29***
	Target "Revenue Adequate" Minimum Revenue		$3,200	

27. Based on a separate revenue adequacy analysis of the railroad's historical ROI and COC, the proposal determines the railroad's revenue required to have ROI just equal to the COC. If in the example in Figure 1 the railroad were not found to be "revenue adequate" (i.e., ROI $\leq$ COC) then the rate caps would not be in effect. If instead, the railroad were found to be "revenue adequate" (ROI > COC), then rate caps would be triggered for specific shipments upon a demonstration of railroad market dominance vis-à-vis those shipments. In this case, assume the minimum revenue necessary for the railroad to be "revenue adequate" is calculated to be $3,200. Rate caps for purportedly "non-competitive" traffic would then target pushing aggregate revenues down to $3,200.

28. The right-hand side of Figure 1 shows how this rate cap would apply to a "revenue adequate" railroad. Consistent with Dr. Caves' illustrations, in this case, the CT would be set to eliminate total railroad revenue and earnings in excess of the minimum "revenue adequate" revenue level ($3,200). In our example, the railroad is earning $300 above this level (revenue of $3,500 minus $3,200). Under the proposal, the CT is set at the level that eliminates $300 of revenue from the "non-competitive" group of shippers. This would require applying a rate cap of

$900 to the two "non-competitive" shipments currently paying $1,050 each (2 shipments times ($1,050 - $900 = $150) equals $300, the targeted revenue reduction.) The CT follows immediately from the targeted revenue and the corresponding required rate cap to meet that reduction; it is the ratio of the targeted rates ($900) divided by the benchmark rate ($700) for a value of 1.29. Thus, the CT is the element that converts the targeted revenue reduction to be extracted from the "non-competitive" traffic into the applicable rate cap.

29. Note that if the minimum revenue necessary for the railroad to just be "revenue adequate" were lower for any reason, then the targeted revenue restrictions and rate caps would be more stringent. If the railroad engaged in efficient, cost-reducing activities and operations that would cause its ROI to be higher at any given revenue level, this would reduce the "target" revenue for the railroad and cause the rate caps to be more stringent (i.e., lower). If the "revenue adequate" target revenue in in Figure 1, for example, were $3,000 rather than $3,200 due to efficiency enhancements, then an additional $200 of revenue would be targeted to be removed from the "non-competitive" traffic. The rate caps in Figure 1 would then need to be set at $800 instead of $900, and the CT would be 1.14 ($800/$700).

30. A similar increased stringency in the rate caps would follow if revenue from "competitive" traffic went higher, perhaps as a result of service improvements that benefitted affected customers and increased their relative willingness to pay. If all else were the same in Figure 1, except that "competitive" rates were $750 (instead of $700) and thus revenue to the railroad were $100 higher than in the Figure, then revenue from "non-competitive" traffic would need to be reduced by that same $100. The resulting applicable rate cap would need to be $850 (instead of $900). The corresponding CT would be 1.13 ($850/$750). Of course, in the process, any incentive to provide customers with improved service would be dampened or eliminated altogether.

31. As shown by this simple example, the structure of the Benchmark Model results in rate caps that are triggered by earnings levels. And the restrictiveness of the proposed rate caps varies based on the railroad's overall revenue and earnings from its aggregate traffic. This restrictiveness of the rate caps does not depend on whether the railroad is "revenue adequate" as a result of cost-reducing efficiencies, improved service quality to "competitive" shippers, or, potentially, as a result of rates to some (unidentified) shippers which really are above the "mimic competition" contestable levels.

32. Consistent with the example of Figure 1, and as shown by Dr. Caves and explained by the ACC, the CT revenue cap is set so that the historic book accounting-based earnings ROI would be equal to the COC. All else equal (and as is apparent from our example in Figure 1 and Dr. Caves' illustrations), the more the calculated ROI exceeds the COC (without the CT cap), the more restrictive would be the resulting CT rate caps.[30]

33. Despite the claim to the contrary, there is nothing in the CT proposal "to maintain the long-term revenue adequacy"[31] of the rail carriers. For railroads found to have been revenue *over* adequate over some test period in the past based on the backward-looking measure of "adequacy", the CT proposal is designed to push revenues down to the just-revenue-adequate level (as currently measured).[32] The proposal threatens ultimately to drive revenue below adequate levels (as currently measured) because there is nothing in the proposal that provides a mechanism by which railroads pushed to just-revenue-adequate levels by the ACC approach, but that subsequently fall below revenue adequate level, are guaranteed revenue to make up these revenue shortfalls. This could well happen as a result of, for example, changes in economic and market conditions arising during the period of rate capping. The CT approach provides for no mechanism for real-time rate *uncapping* by which a railroad pushed into revenue inadequacy could recoup the revenue foregone in such a "down" period once and if times improve. And, to be sure, for revenue *inadequate carriers, nothing in the proposal would help them to become revenue adequate.* As indicated by Dr. Caves: "The remaining railroads are not revenue adequate, so the CT is not applicable to them."[33] (As we discuss below, notwithstanding this proffer of assurance, the mere prospect of revenue-limiting rate caps would distort the incentives and behavior of even currently non-revenue adequate carriers.)

34. As Dr. Caves recognizes, most of rail traffic is competitive. Moreover, railroads are obviously subject to swings in economic conditions common to competitive industries. Unlike true public utilities, with protected franchise monopolies over inelastically demanded services

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[30] Even if the CT were not chosen mechanically so that historical revenues were at the exact minimum "revenue adequate" level, any relationship between historical earnings and the existence of the CT caps (due to a finding of revenue adequacy) or the stringency of the threshold based on some evaluation of past earnings and revenues leads to the disincentives and inefficiencies of earnings-based rate regulation.

[31] ACC Filing at p. 17.

[32] Subject the statutory limitation on rate setting and not setting rate caps *below* the benchmark level.

[33] Caves VS at p. 34.

(e.g., municipal water service or, in an earlier era, electric power companies), there is no mechanism by which a railroad's revenues could be guaranteed to remain at "revenue adequate" levels. This kind of asymmetric earnings regulation—rate caps when times are good but no floor when times are bad—poses additional risks and disincentives for ongoing investments. Likewise, it discourages innovations with uncertain outcomes: potential upside profits achieved through reduced costs or increased service quality would be limited by the rate caps, yet losses would be borne fully by the railroad.

35. Dr. Caves also claims that "implementing the CT is not equivalent to implementing rate-of-return regulation."[34] He bases this on the proposition that some "non-competitive" shippers may not be statutorily eligible for rate relief due either to having rates less than 180% of variable cost or failing to sustain a claim of rail market dominance.[35] This overlooks the fact that the limitations on overall revenues imposed by the proposed Benchmark and CT Methodology would be triggered by a finding of overall revenue adequacy and calculated in a manner to restrict aggregate revenues based on rates of return by applying restrictive caps to individual rates. The triggering of CT rate caps and (as shown in his illustration) the stringency of those CT rate caps turn directly on the degree of historical revenue over-adequacy, which in turn is determined by the *aggregate* earnings and rates of return realized by the railroad. As such, this *is* rate-of-return regulation. It uses putatively excess ROI to trigger rate restrictions and adjust the stringency of rate caps so as to push aggregate revenue, earnings, and rates of return down to purportedly adequate levels.[36] As such, the proposal has the characteristics of, and suffers the same failings as, other earnings-based rate regulation.[37]

36. The Benchmark Methodology earnings-based rate caps portend all of the distortions associated with that type of outdated regulation that Prof. Kalt discussed in his prior Verified Statement.[38] We will not repeat them all here, but as previously summarized, the deficiencies of

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[34] Caves VS at p. 29.

[35] Caves VS at p. 30.

[36] The proposal puts a floor of 1.0 on the CT, which may become binding before revenues are at the "adequate" level.

[37] See Kalt VS (2019) for extensive discussion of these failings.

[38] See, esp., Kalt VS (2019) at pp. 38-48. See also the discussion of Prof. Sappington, Regulatory Policy Design in the U.S. Railroad Industry, attached to Written Testimony of Norfolk Southern Railway Company, STB Docket

earnings-based regulation include: ‘‘(1) limited incentives for innovation and cost reduction; (2) over-capitalization; (3) high costs of regulation; (4) excessive risks imposed on customers; (5) cost shifting; (6) inappropriate levels of diversification and innovation; (7) inefficient choice of operating technology; and (8) insufficient pricing flexibility in the presence of competitive pressures.”[39]

37. From among the numerous distortions and inefficiencies that the proposed earnings-based rate cap creates, here we highlight two which are particularly relevant to the Benchmark Methodology. First, the level of the CT, if applied, depends on the overall earnings—i.e., revenues less *costs*—of the subject railroad. Tying future revenues to past costs, as the proposal does, would substantially weaken railroads' incentives to engage in investments and management efforts to reduce costs and improve efficiency. This is true regardless of whether otherwise efficient and cost-saving investments and activities would impact traffic categorized as “competitive” or “potentially non-competitive”, as the earnings threshold does not distinguish whether costs and revenues arise from “competitive” or “non-competitive” traffic. As history has borne out in the railroad and many other industries, these types of disincentives and impediments to providing efficient, quality service matter immensely.

38. Second, the Benchmark model leads to inflexible pricing based on *past* rail rates. The Benchmark Model calculates a single benchmark “competitive” rate for all shipments for a commodity, with adjustments only for carloads, distance, and four other characteristics of the shipment.[40] As discussed in more detail below, this statistically-determined benchmark rate essentially reflects a form of an “average” of rates designated as “competitive”, with different “averages” for different commodities. This benchmark rate would apply to all railroads and movements regardless of location—a shipment of coal from Appalachia to Baltimore would have the same benchmark rate as one from the Powder River Basin to Kansas (with the same adjustment

No. EP 761, Hearing on Revenue Adequacy and Docket No. EP 722, Railroad Revenue Adequacy, November 26, 2019 (hereinafter “Sappington (2019)”).

[39] Mayo, John W. and David E. M. Sappington, “Regulation in a ‘Deregulated’ Industry: Railroads in the Post-Staggers Era,” Review of Industrial Organization vol. 49, 203-227 (2016) (hereinafter, “Mayo and Sappington (2016)”) at p. 215, citing Sappington, David E. M., “Price Regulation,” in M. E. Cave, S. K. Majumdar, & I. Vogelsang (eds.), *Handbook of Telecommunications Economics*, Elsevier, Amsterdam, vol. I, 225–293 (2002).

[40] These are number of railroads involved in the shipment, whether a private car is used, whether it is a hazardous material (or not), and if (and where) there is a Rule 11 movement. Caves VS at p. 23.

for any difference in the length of haul that is applicable to traffic for all commodities).[41] Given the backward-looking nature of any statistically-determined estimate, these benchmark rates would, at best, reflect market conditions that were in effect years earlier.

39. Under the proposal, once a "potentially non-competitive" shipper demonstrates that it is subject to market dominance, that shipper would be eligible to have its rates capped at the specified benchmark rate times the CT applicable to its carrier.[42] But these rate caps would apply to all shipments, regardless of service level, location, costs, economic and competitive conditions, and customer demands. A shipment of a commodity on some high-cost, low-density line would be charged the same rate as a shipment on a lower-cost, higher-density line. As the demonstration of market dominance excludes factors such as geographic and product competition that vary across customers and time as economic conditions vary, these rate caps necessarily fail to respond to differences across customers or changes in market conditions. This inflexibility provides incentives to re-allocate resources (inefficiently) in ways that would reduce service quality on capped rates in order to capture additional revenue on uncapped rates. This would be a form of cross-subsidization.

40. The Benchmark Model and its corresponding rate inflexibility is a move away from sound principles of rail regulation and the competitive principles appropriate to the railroad industry. In many respects, the proposal represents a return to the pre-Staggers principles of ratemaking. In place of groups of rates determined by rate bureaus, the proposal would use a mathematical equation as its "rate bureau": The same CT per-ton-mile rate cap for all (purportedly non-competitive) movements of a given commodity on a railroad would be determined by a mathematical equation (with differences only for length of haul, shipment size, and specific limited factors related to the number of carriers if an interline move). These commodity-based maximum rates would consider no information about specific customer demands, service levels, or costs. This proposal represents a large backwards step away from modern, flexible and innovative, customer-based rail service and pricing.

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[41] As discussed below, the Benchmark Model includes approximately 10,0000 variables, by railroad, year, and commodity, to account for the masking. Caves VS at p. 21 and 23. Presumably, no such railroad-specific variables would be included in a model based on actual revenue, as the revenue would not be masked.

[42] The rates would also need to be subject to STB rate-making authority—i.e., non-exempt traffic, not moving under contract, found to be market dominant, and rates limited to no less than 180% of variable cost.

V. THE BENCHMARK METHODOLOGY IS INCONSISTENT WITH COMPETITIVE PRINCIPLES PROPERLY APPLICABLE TO THE RAILROAD INDUSTRY

41. As set out by Dr. Caves, the Benchmark Model is "used to predict the rates that would be expected to prevail under competitive conditions" for the purportedly non-competitive traffic.[43] The proposal caps rates on putatively "non-competitive" traffic on a revenue adequate railroad based on a common CT multiplier (equal to as low as 1.0) of the estimated prevailing "competitive" rate for that traffic. According to Dr. Caves: "Railroads that earn rates of return in excess of the cost of capital are subject to rate regulation [under the proposal] only to the extent that these excess returns are the result of charging supracompetitive prices to captive shippers."[44] This attempt to identify "supracompetitive" rates and mimic competition for "non-competitive" traffic fails to capture the competitive principles and realities *relevant to the rail industry.* (Indeed, as we show in Section VI below, much of Dr. Caves' *competitive* traffic would pay rates that the Benchmark Methodology would find to be considered "supra-competitive" (i.e., excessively high) when paid by "non-competitive" traffic.)

A. COMPETITIVE PRINCIPLES APPLICABLE TO THE RAILROAD INDUSTRY

42. The appropriate *mimic competition* principles for railroads would not generally result in "non-competitive traffic" with rates capped at the average of otherwise comparable "competitive" traffic,[45] nor would we expect the traffic to match the average for competitive traffic. Instead, we would expect differential pricing, based on customer characteristics (including access to realistic alternatives that affect the elasticities of customers' demands) to contribute to differential recovery across movements of the costs of a carrier's common and shared assets.

43. Railroads are characterized by substantial fixed and common costs with enormous economies of scale and scope. In any sector, sufficient economies of scale relative to the size of market demand can make it most efficient—and hence in the public interest—to have one large firm serve the entire volume of market demand rather than trying to satisfy that demand with any combination of smaller, higher cost firms. Similarly, sufficient economies of scope relative to the

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[43] Caves VS at p. 7.

[44] Caves VS at p.

[45] For extended discussion of the competitive principles applicable to the railroad industry, see Kalt VS (2019).

demands for various levels of service can make it most efficient to have a wide range of differentiated products across a wide range of differentiated customers provided by a single large firm rather than any combination of smaller firms.

44. Much, but not all, of the traffic served by the railroads are subject to competition from other railroads and other modes of transportation (trucks, pipelines, and water transportation), as well as product and geographic competition. Rates on traffic that is subject to direct competitive forces (e.g., due to trucks, other railroads, or geographic competition) tend toward the service-quality-adjusted, short-run marginal cost of the next-best competitive alternative (e.g., trucks or an alternative railroad) for *that* traffic. With large economies of scale and scope, if all rates were set at these levels, the resulting revenue would be unable to justify keeping investments in the rail industry, and the rail network could not be sustained. As a result, differential pricing with prices above short-run marginal costs for some traffic, and in some cases perhaps substantially above, is necessary for the sustained operation of the railroads.

45. The kind of competition applicable to an industry characterized by substantial economies of scale and/or scope—known as "contestability" (i.e., where competition takes the form of a contest to see who will be the supplier) —generates differential pricing. Particularly in the presence of large economies of scope (where one railroad can most efficiently combine the shipments of myriad kinds of freight from myriad customers across a far-flung network with differential traffic density on the many segments of the network), differential pricing represents the outcome of competition through contestability whereby rates would vary based on differences in variable costs specific to the portion of the network used, shipper demands, line density, and the rental costs (as determined by replacement costs) for the shared assets used to serve different groups of customers. In industries—like railroading—where such contests are inhibited by barriers to entry and/or exit created by the prevalence of sunk costs and/or regulatory structures, the applicable "mimic competition" principle of sound regulation appropriately simulates this form of competitive pricing.[46]

46. The rail industry's very large economies of scale and scope dictate that it would be grossly wasteful to have multiple railroads serving large swaths of the nation's geography. For much of

[46] See Kalt VS (2019).

the country, doing that would entail hugely expensive duplication of facilities where a single system can readily handle available traffic. Under these fundamental economic characteristics, effective mimicking of competition entails contestability—i.e., setting regulated rates at the levels that competition to be the winner among multiple potential suppliers would set if such competition was not blocked by barriers to entry and/or exit. Under contestability for an industry such as railroads, competitively mimicked and sustainable rates for *all* traffic are not equal to the rates for *some* traffic on which direct competition drives rates toward short-run marginal cost. Rather, rates consistent with competitive outcomes means that *some* portion of a carrier's traffic pay rates above those paid by other traffic (i.e., other traffic which can avail itself of direct alternatives to the service provided by the railroad). These differences in rates are limited by the differences in costs of competing for the ability to serve different groups of customers under different circumstances and costs.

47. Under such conditions, what competition produces as competitive prices for a particular customer is certainly *not* some average statistical amalgam of rates paid by other customers who do have multiple suppliers from which to choose. Instead, *competition* produces prices for solely-served customers that vary with those customers' individual circumstances and demands. That is, *competition* produces rates that would not be expected to be the same for all shippers of the same commodity even after adjusting for the shipment characteristics identified by Dr. Caves. The Board's SAC framework accords with these basic economics of contestable markets. The ACC's proposal does not.[47]

48. The Board's current—and appropriate—framework for rate regulation recognizes that competition limits the degree of differential pricing experienced by affected shippers based on principles of contestability. The rates and revenues those shippers pay are just those necessary to sustain that portion of the network used by those shippers. Rates for those shippers are

[47] An alternative to competitive market principles is "second-best" Ramsey pricing—in which the markup over marginal costs varies traffic based on individual customers' willingness-to-pay and their responsiveness to price—and total revenue collected reflects that needed to sustain the rail network. The CT Methodology, with a single "markup" over competitive rates for all customers (not *costs*) is in no way an approximation to Ramsey pricing. It is widely recognized that Ramsey pricing is informationally impossible in the railroad industry, given the need to have customer-specific information on rail demand that varies over time for vast numbers of customers. See, Intervistas Consulting Inc., Project No. FY14-STB-157, *Surface Transportation Board: An Examination of the STB's Approach to Freight Rail Rate Regulation and Options for Simplification*, *Final Report,* 2016 at pp. 21-28.

appropriately capped, based on the 'mimic competition' principle, at the cost at which a would-be alternative contesting railroad would provide those services. This is the competitive foundation of contestability that underlies the SAC framework. Under this principle, the *competitive* per-ton-mile rate (the concept endorsed and employed—albeit, improperly—by Dr. Caves) would vary for proper competitive reasons based on the costs of sustaining the portions of the network and costs of providing services used by different shippers with different direct alternative options. For a given commodity and even after controlling for length of haul and shipment size, *competitive* per-ton-mile rates properly vary, for example, between shippers utilizing costly but low-density portions of the network and shippers on lower-cost, high-density parts of the system.

49. Nothing about these competitive principles implies that the per-ton-mile rate for a commodity should be the same across shippers (even after controlling for length of haul and shipment size). Higher rates determined under these principles are not "supra-competitive" under the appropriate competitive standard for the rail industry. Rates for shippers subject to some form of marketplace competition and for shippers only subject to contestable competition will all have rates based on the specific characteristics of the shipment (and the economic environment) in which the shipment occurs. These include costs, service, congestion, demand, and competitive factors far beyond those identified by Dr. Caves. The imposition of rates (or rate caps) without accounting for these specific shipment-specific factors is not capable of mimicking competition.

50. The ACC's version of 'mimic competition' is inconsistent with the foregoing basic principles of sound rail rate regulation. The Benchmark/CT Methodology appears to assume that competitive market principles would result in all "non-competitive" traffic for a commodity paying the same rate per-ton-mile, with adjustments common to all commodities only for length of haul, size of shipment, and measures related to the extent of interlining. There is no plausible view of competition that would fail to recognize that characteristics of customers' demands, costs, service quality, geography, and density of traffic on utilized lines are attributes that vary across shipments and locations. Indeed, as discussed more below, purportedly "competitive" traffic under Dr. Caves' criteria will have large variation in rates across customers and routes, based on shipment- and customer-specific marketplace factors. Rates customers pay under even the type of competition envisioned by Dr. Caves are not some standard, fixed rate. The proffered methodology ignores this reality of the rail industry and is not capable of incorporating such price variation.

51. The intent of the Benchmark Methodology is to identify the rates for all traffic as though each movement were subject to direct, head-to-head competitors. As we explain below, the model fails to achieve that intent. It cannot identify the appropriate factors that determine individual rail rates even where there is direct, head-to-head competition; and it embraces the wrong concept of competition for sound regulation for an industry with economies of scale and scope as large as those found in freight railroading.

B. THE USE OF MEASURES OF "REVENUE ADEQUACY" BASED ON HISTORICAL COSTS TO TRIGGER THE PROPOSED RATE CAPS IS INCONSISTENT WITH COMPETITIVE PRINCIPLES

52. In violation of the principles of *competitive* differential pricing, but used nevertheless for purposes of establishing rate caps for all purportedly non-competitive traffic, the Benchmark/CT Methodology applies a single mark-up percentage to the benchmark rates. As shown in Dr. Caves' examples and our example in Figure 1, the CT mark-up is tied to a measure of revenue adequacy based on historical book accounting. We have explained above and previously how distortions and incentives for inefficient behavior arise from tying rate caps to historical earning levels.[48] Historical accounting-based rate-of-return regulation provides no sound basis to trigger an attempt to impose "competitive" outcomes by applying earnings regulation or rates caps.

53. A finding of revenue adequacy based on historical book measures of invested capital cannot identify if and on what traffic rates may be above those implied by proper competitive market principles. As Prof. Kalt (and Profs. Murphy and Zmijewski) have shown, ROI (measured using historical book accounting) in excess of the COC is an expected and widespread outcome of firms operating in competitive industries, even over long, multi-year periods.[49] A finding of ROI in excess of COC based on such measures is not a reliable indicator of whether *any* prices are above appropriate competitive levels.

54. As Prof. Kalt has previously explained, the proper measure for whether a railroad (or other business enterprise) is earning above long-run competitive levels turns on valuing the assets of the company at replacement cost, not historical book value.[50] It is the current value of replacing the

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[48] See also Kalt VS (2019) at pp. 38-48.

[49] See Kalt VS (2019) at pp. 32-38; Murphy and Zmijewski (2019).

[50] Kalt VS (2019) at pp. 16-23.

assets used, and the return earned on that value, which determine whether the firm is earning economic and, perhaps, supra-competitive economic profits. Under the appropriate contestability standard, the return on the replacement value of employed assets determines whether revenues are at a level necessary to sustain the enterprise.

55. Indeed, it is the expectation of earning returns on *replacement* cost at or above the cost of capital that would signal to a potential competitor the potential for economic profits and that this is a business in which it might be worth risking an investment.[51] Due to large sunk costs and high costs of entry and exit, this type of entry does not occur in railroads.[52] But it is the expected return on replacement costs that provides the appropriate benchmark for identifying the long-run competitive return. Of course, in practice, returns in any year may fluctuate around those levels; for example, due to booms and busts in the economy. Thus, even under a replacement cost standard, it is necessary to look at returns over a longer period to establish whether returns are consistent with competitive outcomes.

56. These principles are embedded in the existing CMP approach of the Board. Under CMP, rates for a given portion of a carrier's traffic are compared to the rates necessary to sustain a competitive level of return on a replacement cost basis (as represented by the SAC of a would-be competitive entrant). Consistent with competitive principles, such SAC rates are considered on a going-forward basis. Indeed, the contrast with the SAC framework highlights the deep flaws in the ACC proposal's attempt to mimic competition:

- The trigger for applying the Benchmark Methodology turns on the use of historical book accounting for invested capital rather than replacement cost for identifying when and if ROI is above the COC. Such an approach cannot identify if a railroad is realizing supra-competitive levels of earnings in either the short- or the long-run.
- A finding of "revenue adequacy"—*even if* properly measured using replacement cost—cannot identify which, if any, rates are above competitive levels. Absent such a demonstration, the use of a CT mark-up over the benchmark rates to establish rate caps

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[51] See Carlton, Dennis W., and Jeffrey M. Perloff, *Modern Industrial Organization,* 4th ed., New York: HarperCollins College Publishers, 2004 at pp. 247-248.

[52] With large sunk investment by an incumbent, a new entrant risks being stuck in a market with two competitors when that market can only support one firm as a result of the economies of scale and scope relative to market size. Sunk costs – a barrier to *exit* – thus act as a barrier to *entry* and hence contestable entry in practice.

regardless of customer characteristics, demand, and costs of service of any specific "non-competitive" traffic is unjustified and not consistent with principles of competition.

- Moreover, as application of the SAC framework has shown, there can be pockets of above-competitive rates even on a railroad that is not earning, in the aggregate, its COC on either a replacement cost or historical book value basis. There is no underlying connection between rates capped by contestable competition and the proposed Benchmark Methodology.

VI. THE BENCHMARK MODEL RESULTS IN INCONSISTENT TREATMENT OF COMPETITIVE AND NON-COMPETITIVE TRAFFIC AND RATES

57. The Benchmark Model is an econometric regression of rail rates on a handful of variables related to the physical characteristics of the move (i.e., length of haul, volume, private car, etc.), along with hundreds of commodity fixed effects codes and roughly 10,000 fixed effects based on a combination of year, railroad, and commodity (used by Dr. Caves with the intent of adjusting for the effects of masking of revenue in the CWS). We discuss the limitations and pitfalls of the regression approach below. First, however, it is important to understand the conceptual failings inherent in using a statistically-determined "prevailing" competitive price as the basis for capping rates on individual movements.

58. As explained by Dr. Caves, statistical regression is an exercise in fitting lines through points.[53] Regression is a commonly used technique for analyzing data and identifying patterns and statistical relationships among data.[54] It uses variation in explanatory ("independent") variables to "explain" the variation in some "dependent" variable. In the case of the Benchmark Model, the dependent variable is rail rates (measured as the logarithm of revenue per-ton-mile), and the data to be "fit" by the regression consist of the constructed "competitive" sample of rail rates. Regression as used here is a method of estimating coefficients that permits the determination of the mean (i.e., the "average") of the dependent variable (i.e., the logarithm of rail rates), conditional on the values of the independent variables (length of haul, the "dummy" variables, etc.).

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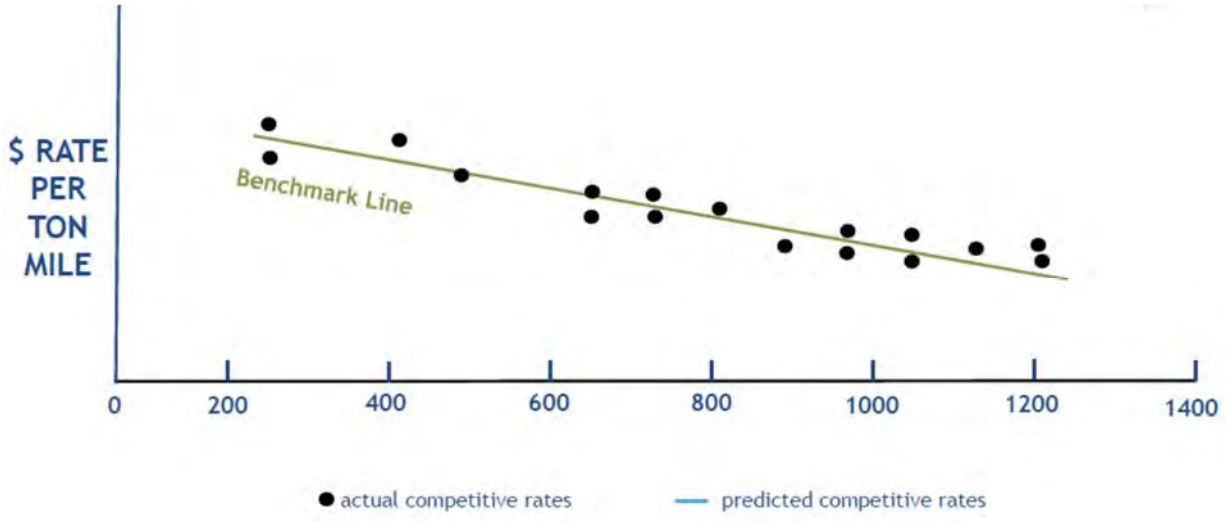
[53] Caves VS at pp. 7-8.

[54] See, for example, William Greene, *Econometric Analysis*, 7th ed. (2012) (hereinafter "Greene") at p. 12.

59. Figure 2 below is an illustration of this "line-fitting" exercise presented by Dr. Caves at the December 12 hearing. Figure 2 displays illustrative data for putatively "competitive" traffic, consisting of rates (as the dependent variable needing to be explained) and lengths of haul (as the explanatory independent variable), along with the regression line that best "fits" the data in the sense of showing how length of haul can most closely predict rates. In the illustration, rates go down by a certain amount as length of haul increases in equal increments. While the illustration shows the relationship between rates and one independent variable, length of haul, the Benchmark Model as presented by Dr. Caves has thousands of variables that are being considered simultaneously. While this increases the complexity of calculation and eliminates the ability to draw a simple graph, the basic concept of line fitting still holds.

Figure 2

Dr. Caves' Illustration of Fitting the Benchmark Model



Source: Dr. Caves Presentation, EP 761 Hearing, December 12, 2019.

60. In the above illustration, the "data" on shipment rates lie above and below the line, indicating that the "predicted" benchmark line of "competitive" rates per ton mile based on length of haul is sometimes below and sometimes above the data on rates per ton mile designated as "competitive" and utilized to fit the benchmark line. This is a required property of regression, as the regression mathematically minimizes the vertical distance (squared) between the observed data and the fitted line. As a result, the line of predicted rates will always run between actual rates that

have been designated as "competitive", with some predicted rates being below and some being above the levels of those actual rates. Typically, roughly half of the data will be above the predicted line and half will be below. And if the model is well specified (meaning it does a good job of capturing the underlying economic relationships that account for the actual rates in the data), this property is likely to be true even as one looks at sub-groups of data (say, for example, only single-line chemical traffic with lengths of haul between 500 and 1000 miles, etc.).[55] Indeed, as the Benchmark Model includes fixed effects for each 5-digit commodity, the model attempts to adjust for average differences in rates across commodities.

61. We have recreated Dr. Caves' "illustration" of the line fitting exercise consistent with the limited information and model results reported by Dr. Caves. (See Figure 3 below.) We conservatively calibrated the illustration so that it matches Dr. Caves' estimated relationship between rates per-ton-mile and length of haul (both in logarithms) and his reported measure of how well the regression fits.[56] Figure 3 shows the results of this exercise. Dr. Caves' underlying regression is linear in the logarithms of rates and length of haul. In order to discuss this in terms of the relevant variable—the level, rather than the logarithm, of rail rates—we transform the regression results in logarithms back into terms of rates in dollars. This results in a fitted "line" that bends.

62. Figure 3 illustrates how the Benchmark regression model works, consistent with the information reported by Dr. Caves. The illustrative, purportedly "competitive" shipment rates

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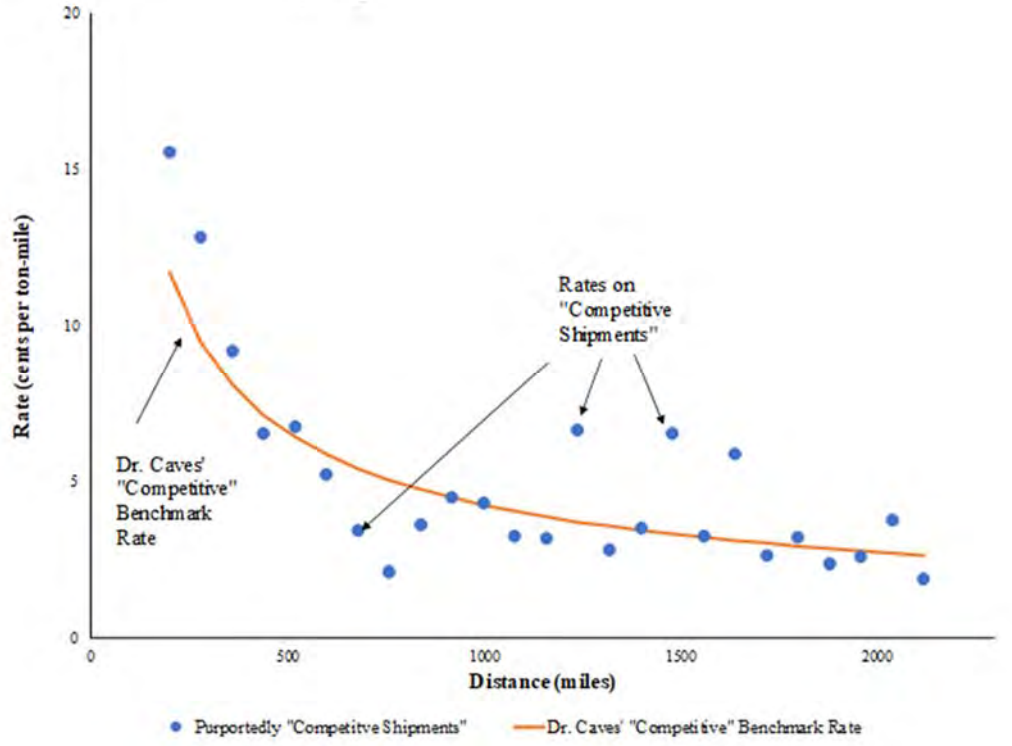
[55] See, for example, David F. Hendry and Bent Nielsen, *Econometric Modeling* (2007), at p. 168.

[56] We created 25 data points where there was an underlying linear relationship between the logarithm of rates and length of haul, and then added a random normal variable for the unexplained "error" to create illustrative data consistent with the basics of the Benchmark Model. The fitted regression line in Figure 2 has a slope of -.63, consistent with Dr. Caves estimate, and it has a slightly better "fit" than for the Benchmark Model, an R-Square of .587 v. .572, meaning that the illustrated data is slightly "closer" to the line than if there were a higher R square. As the average length of haul for a Class 1 Railroad in 2018 was over 1000 miles in 2018, we allowed the length of haul to range evenly between 200 and 2120 miles. (See https://www.bts.gov/content/average-length-haul-domestic-freight-and-passenger-modes-metric.) We drew a random set of normal "error" terms for each illustrative observation and adjusted the underlying linear relationship and variance of the errors to approximately match the estimates for the coefficient on length of haul and R-square reported by Dr. Caves. Obviously different draws of the random unexplained "error" variable would result in a different scatter of "competitive shipment" points.

scatter above and below the fitted line.[57] As such, the fitted line mathematically "averages" the information from the data.[58] In the specific illustration of Figure 3, rates for 13 of the 25 "competitive movements" exceed "the rates that would be expected to prevail under competitive conditions" as determined by the Benchmark Model. This is a built-in feature of the Benchmark Model—*roughly half* of the actual competitive rates exceed the rates that are *expected* under the Benchmark Model and which are the basis for setting rates on purportedly non-competitive traffic.

Figure 3

Illustration of Fitting Benchmark Model
Matching Reported Coefficient and Goodness of Fit



Note: Because the model is estimated in logarithms, but the results are graphed in terms of the *level* of rates, the fitted "line" curves.

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[57] The level of the rate in Figure 3 is not calibrated to any particular value, as we did not have the average rate in the masked CWS. The *relative* differences between the "actual" data points and the line, however, are consistent with the reported data.

[58] Under least squares linear regression, the line minimizes the square of the deviation of the actual and predicted variable – in this case, the logarithm of the rate per ton-mile. We abstract from the additional statistical complexities required to determine predicted rate *levels*—the variable we care about—as a result of converting from logarithms to levels. See, e.g., James Stock and Mark Watson, *Introduction to Econometrics*, 2nd ed. (2007) (hereinafter "Stock and Watson") at pp. 274-275.

63. The illustrative data in Figure 3 roughly correspond to the reported goodness of fit of the regression. The goodness of fit measure, called "R-Squared", tells us how much of the variation in the rates per ton-mile for the "competitive" group the Benchmark Model explains—the answer is less than 60%.[59] On one hand, some of the variation in observed rates arises from the Board's masking process. This lowers the R-Squared measure of explanatory power. On the other hand, Dr. Caves includes roughly 10,000 separate fixed effects variables that would not normally be included in a Benchmark Model. Inclusion of these variables may offset some (or all) of the effects of masking, as well as explain some of the variation in rail rates across time, commodity, and railroad that the model may not otherwise explain—thus tending to raise the explanatory power.[60]

64. As seen in Figure 3, roughly half of the "competitive" traffic has rates higher than the benchmark rate that would apply to comparable (as determined by the limited variables included in the regression) "non-competitive" traffic. Based on the example in Table 4 of Dr. Caves' statement, which applies a CT factor of 1.0 to BNSF and UP, rate caps generated by the Benchmark Methodology on purportedly "non-competitive" traffic would be *less than* what roughly half of comparable *competitive* traffic would be paying. This is a not an artifact of the illustration but a central feature of the Benchmark Methodology.

65. The limited ability of the Benchmark Model to explain competitive rates can lead to large differences between the benchmark rate and the rates actually paid by competitive traffic. Based on the Figure 3 illustration calibrated to the reported Benchmark Model results in Dr. Caves' Verified Statement, the average mark-up over the prevailing competitive benchmark rate for competitive traffic with rates above that benchmark is 30%. In the same example, over 10% of the competitive moves have rates more than 75% above the benchmark level.[61] Thus, even with

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[59] Caves VS at pp. 21-22.

[60] As a mathematical property, the inclusion of additional variables into a regression cannot decrease and almost always increase the amount of variation that the regression "explains," regardless of whether these variables have any underlying economic or statistical significance or improve the quality of prediction when applied to another sample of data (e.g., the purportedly "non-competitive" traffic.)

[61] The specific results stated here depend on the illustration that was drawn randomly but are intended to roughly match the results reported by Dr. Caves. More robust values would require analysis of the underlying data and model, but the similar principle would be expected to be found.

the CT set at levels greater than the benchmark rate, rates for some traffic designated as "competitive" would be above the rate caps imposed on "non-competitive" traffic.[62]

66. In addition, like competitive traffic, purportedly "non-competitive" traffic almost certainly has a range of rates both above and below the benchmark rate implied by the model. According to Dr. Caves, 73.9% of the non-competitive traffic in his data has rates at 150% or below of the benchmark rate.[63] Although not reported, it is also almost certain that there are substantial volumes of "non-competitive" traffic in his data with rates below the supposed prevailing competitive rate. Thus, it follows that the imposition of a binding rate cap on all "non-competitive" traffic at the rates from the Benchmark Model would drive *average* rates on non-competitive traffic below the *average* for purportedly comparable competitive traffic.[64] Nothing in the ACC approach model would provide railroads the ability to raise "non-competitive" rates already below the cap in response to the imposition of the cap, and so the average must be lower. Even with a CT greater than 1.0 (so that the rate caps are some arbitrary multiple of the benchmark rates), it is inevitable that the average for non-competitive traffic potentially subject to the cap would be less than the rate cap. At the same time, some of the purportedly competitive traffic, perhaps substantial volumes, would in any case have rates in excess of that paid on average by non-competitive traffic.

67. Building on the example used earlier in Figure 1, we can illustrate how the application of the Benchmark/CT Methodology can result in these types of untenable results. Figure 4 below replicates the illustration in Figure 1 of the Benchmark Model applied to a railroad with four shipments. The information is the same as before, with the purportedly "competitive" and "non-competitive" shipments having the same average rates and revenue. In Figure 4, however, we allow a $200 variation above and below the average for both groups. In this example, some "competitive" traffic has rates higher than some matching "non-competitive" traffic. This would inevitably happen under the Benchmark Model.

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[62] Although these results are one example based on the limited information on masked revenue provided by Dr. Caves, actual rail rates among shippers for even narrowly drawn traffic lanes and commodities subject to direct competition vary significantly due to customer preferences, customer-specific marketplace options, service differences and other economic factors.

[63] Caves VS at p.27.

[64] Other limitations on rate-setting authority—the 180% R/VC threshold, no authority over contract rates, and need for a market dominance showing—may prevent the imposition of binding rate caps at the Benchmark level for some traffic.

Figure 4

The Benchmark Model:
An Example Railroad with Individual Rates

	Uncapped Rates		Benchmark Model	
Shipment	**Rate**	**Average**	**Rate**	**Rate Cap**
			"Competitive"	
1	$500	**$700**	$500	--
2	$900		$900	
			"Non-Competitive"	
3	$850	$1,050	$850	**$950**
4	$1,250		$950	
Total Revenue	**$3,500**		**$3,200**	
			CT	***1.36***
	Target "Revenue Adequate" Minimum Revenue		$3,200	

68. As before, in order to eliminate the $300 of purportedly excess revenue (the difference between the railroad's uncapped revenue and the target), the CT would be set so as to reduce revenues generated by putatively "non-competitive" rates by $300. A rate cap of $950 would apply (implying a CT of 1.35, $950/$700), and the rate cap would be binding on only one of the "non-competitive" shippers. The other "non-competitive" shipment has rates below the cap (albeit, rates could still readily be above the 180% of variable cost threshold and subject to market dominance). However, if the target revenue reduction were greater, perhaps as a result of more efficient railroad operations, the results become more extreme. Some of the illustrations of Dr. Caves result in a CT of 1.0.[65] A CT of 1.0, in the example in Figure 4, would imply a rate cap of $700 applicable to the "non-competitive" traffic, leaving one of the two competitive shippers with a rate $200 above the rate cap. As explained above, this result is a necessary outcome of the Benchmark Model.

[65] Caves VS at p. 33.

69. With more shipments, the observed range of rates would be larger, and it would be inevitable that some "non-competitive" rates would turn out to be less than the benchmark rate for comparable (according to the regression's included variables) "competitive" traffic. In Figure 4, this would occur if Shipment 3 had a rate of $650. The resulting rate cap could then drive the average of "non-competitive" rates *below* the competitive level specified by the model. This is economically incoherent.

70. The application of Dr. Caves' type of mechanical statistical benchmarking for ratemaking necessarily results in the sort of perverse results described above. The underlying economic problem is that the Benchmark Model applicable to all rail traffic is incapable of capturing the forces of supply and demand affecting individual shippers' and shipments' rail rates. The model contains "fixed effects" by commodity that have the effect of adjusting the predicted benchmark rate toward the average rate for that commodity, such that the benchmark rate for "non-competitive" traffic for a commodity simply reflects the average rate paid by so-called "competitive" traffic for that commodity. The model also contains other factors that obviously influence rates—length of haul, interline costs, private versus carrier-owned cars, etc. The interactions of these factors vary across time, location, and customer, and the model cannot capture the effects of such customer- and traffic-specific factors on rates.

71. As is well known, a variety of direct competitive factors—such as geographic and product competition—influence rates. Yet, these factors are wholly absent from the Benchmark Model. Similarly, service quality and other cost factors influence rates in a manner not captured by the model. Rates paid by sophisticated customers moving similar or same commodities over the same highly competitive routes can vary substantially and reflects differences in customer-specific choices, service quality, and outcomes. Looking across time and across location, even within the same commodity, further expands the range of marketplace attributes that determine prices. Virtually none of this is or can be captured by the Benchmark Model.

72. The variation in rates unexplained by the Model is not some insignificant noise in the data. Instead, it represents the real outcomes of marketplace forces that are not captured by the Model. A reasonable application of an attempt to mimic competition would need to address and incorporate these differences, not "average" over them—as the Benchmark Model does—in a manner that ignores the economic factors relevant to efficient rail service and pricing.

VII. THE BENCHMARK/CT METHODOLOGY IS NOT A MOVE TOWARD SMART SIMPLIFICATION

73. Dr. Caves' Benchmark/CT Methodology appears simple on its face: run a regression, choose a CT, and impose rate caps. The proposal, however, does not represent smart simplification for addressing rail rate regulation. It is not smart in that it creates arbitrary distinctions and burdens railroads and shippers with an array of harmful inflexibilities, disincentives, and inefficiencies, some of which have been highlighted above. And it is not simple, as it creates a range of complexities and disputes that are unlikely to find any simple, consistent, and stable solution.

A. METHODOLOGICAL FLAWS AND ISSUES

74. The proposal suffers from the fundamental problem of not addressing the relevant concept of rail regulation—i.e., contestability; and from the irresolvable problem of imposing system-wide revenue constraints on railroads, particularly when based on accounting ROI-COC comparisons. But the proposal is rife with other methodological difficulties and flaws, as well. We discuss these briefly below.

1. Data Issues and Timing

75. Dr. Caves' methodology requires a large sample of waybills in order to apply his Benchmark Model. In his proposal, he has utilized CWS data spanning eight years from 2006-2013. Even with more up-to-date data, the model would require several years of waybills to generate enough data for any potential application. The 2018 Public Use Waybill Sample became available in December 2019. Assuming the confidential waybill sample became available at a similar time, the data would need to be incorporated into the modelling exercise, the results verified and approved. The implication is that updated benchmark rates applicable to 2020 or 2021 would be based on rail rates in effect ten years ago, from 2011 through 2018, assuming eight years of data would continue to be used.

76. While Dr. Caves' Model is proffered as a demonstration of the proposed methodology, even with non-masked data the methodology would inevitably and inherently require the use of *historical* rail rates for predicting *current* "competitive" rates. There is nothing in the structure of the proposed Benchmark Model that can address changing cost factors, economic forces, and marketplace conditions over time and across commodities to yield benchmarks coherently applicable to future rates. Indeed, Dr. Caves hints that the non-masked model may include

"dummy variables" that account for average differences in rates across years and railroad.[66] But this method cannot determine the appropriate average value for the *current* year from historical data. As we've explained, the model cannot account for the specific individualized marketplace influences on prices that demonstrably result in a wide distribution of rail rates for what the model would treat as comparable traffic.

77. Consider, for example, the case of coal, one of the largest rail commodities and one that Dr. Caves has identified as being 70% non-competitive.[67] As natural gas and renewables displace coal for electric generation, rail shipments of coal have declined substantially, by roughly a third from 2011. Economic and environmental pressures are only likely to continue this trend.[68] A leading competitive factor in the current economy constraining rail rates for coal is product competition. With this form of competition, some coal customers can turn to different fuels or products—natural gas, renewables, or purchased power—to satisfy their needs for electric generation as an alternative to purchasing and transporting coal. This competitive factor continues to change over time and varies across customers and locations; rates from 2011 are not a reliable basis by which to set system-wide rate caps for coal traffic in 2021 and beyond. Nothing in the model can identify the marketplace effects of the changing and differential competition from natural gas and renewables, or identify the effects of future environmental policies that vary across states and regions.

78. One can readily identify similar large swings in economic conditions for other commodities in response to industry, competitive (e.g., pipeline completions), and commodity sector changes such as the phenomena of crude-by-rail and "frac sand". More broadly, procyclical changes in economic conditions can lead to substantial swings in overall rail traffic, revenue, and rates such that rates based on history and as captured in the Benchmark Model make poor guides, or "benchmarks", for current conditions.

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66 Caves VS at p. 21, fn. 30.

67 Caves VS at p. 15.

68 See AAR, *Railroads and Coal,* May 2019. https://www.aar.org/wp-content/uploads/2018/05/AAR-Railroads-Coal.pdf

2. The "Competitive" and "Potentially Non-Competitive" Groups

79. The choice of how to divide traffic into a "competitive" group and a "non-competitive" group is fundamental to the Benchmark Model. The "competitive" traffic becomes the source of data for estimating the model, but this traffic is then not part of the "non-competitive" traffic that is presumably eligible to have rates capped. The size and composition of the non-competitive traffic group also affects the magnitude of the potential CT that would be used to eliminate past earnings above the historical, book accounting-based revenue adequacy measure. The larger the volume of non-competitive traffic, the greater the aggregate reduction in revenue that results from the application of a rate cap at any CT level.

80. Dr. Caves has presented no evidence or analysis to support the metrics he uses to identify his "competitive sample." Each represents fertile ground for endless dispute. For example:

- Dr. Caves' definition of rail "competition" does not appear to include interline competition. Dr. Caves considers a move subject to potential rail competition only if the *same* Class I railroad is within a certain number of miles of the origin and destination.[69]
- Dr. Caves definition of rail "competition" does not account in any way for product and geographic competition. Such competition cannot be dismissed on grounds of expediency without introducing what statisticians refer to as "specification" or "left-out variable" bias (i.e., bias introduced by trying to explain the level of competitive rail rates with a model that does not account for the *economically* relevant forces of competition in the industry).
- Dr. Caves presents no analysis supporting his assertion that 200 miles and fewer than five carloads are the limits of truck competition, nor has he demonstrated that the limits of truck competition are uniform across commodities.
- It appears that Dr. Caves does not consider TOFC/COFC traffic within the context of exempt or truck competitive, and such traffic would be competitive or non-competitive based on other criteria.

81. In addition to being too narrow, the criteria defining the "Competitive Set" excludes analysis of product and geographic competition entirely (apart from commodities already found to be exempt), as well as build-in/build-out threats. Product and geographic competition have been recognized by the ICC and the Board as essential sources of competition for many rail movements.

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[69] Caves VS at p. 13.

More importantly, both common sense and technical economics recognize the roles of product and geographic competition.

- A shipper may have the ability to shift production to a different area and access alternative transportation options, or access different destinations for the sale of a more-or-less fungible product (geographic competition). That competition will discipline rates but is not reflected in any of Dr. Caves' criteria.
- A shipper may be able to use multiple products in its business. If a shipper can use a substitute product (product competition) that offers different transportation alternatives, that competition will discipline rates but is not reflected in Dr. Caves' criteria. Indeed, the declining demand for coal transportation in the face of on-going product competition demonstrates the force of this factor.

82. Arbitrary alternatives for the rules for dividing traffic into the "competitive" and "potentially non-competitive" categories result in large differences in the traffic that are deemed "potentially non-competitive" and in the potential economic effect of the proposal on shippers and carriers. As indicated by Dr. Caves, 76% of the traffic is "competitive" under his preferred screen, with 24% "potentially non-competitive."[70] If the number of observations in the "competitive" traffic (the measure reported by Dr. Caves) correspond to traffic percentages, then moving from the narrowest to the broadest definition in Dr. Caves' Table 3 results in a "competitive" traffic going from 76.2% of all movements to 93.4% of movements being "competitive".[71] "Potentially non-competitive" traffic correspondingly drops from 23.8% to 6.6% of all traffic. This represents a more than three-fold change in the traffic that would be potentially subject to the imposition of price thresholds. Were a railroad found to be revenue adequate under the proposal, these differences in the size and composition of the "non-competitive" group would lead to large differences in the amount of revenue that could be potentially capped. This would necessarily lead to large differences in the corresponding CTs required to claw back a given targeted level of revenue, as well as in the resulting magnitude and distribution of the effect of any rate cap obtained by different shippers.

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[70] Caves VS at Table 2A. This refers to the unweighted traffic; the traffic weighted by the expansion factor is 80%.

[71] Caves VS at Table 3. If the number of waybill observations corresponds to the unweighted traffic, then, per Dr. Caves, the number of waybills included in column BG1 represents 76.2% of the sample, and thus the number of waybills in column BG9 would represent over 93% of the sample.

83. The metrics used to identify "competitive" and "non-competitive" traffic would likely be the subject of intense debate among the interested parties in any given case. Dr. Caves identified certain "screens" subject to alternative specifications. We highlighted certain competitive factors ignored by these screens. The questions of what screens should be used, whether the same screen should apply to all commodities, and which commodities should be included under which definition of which screen are likely to be the subject of intense disagreement and enormous complexity. Is the same distance to an alternative railroad the appropriate measure of "competitive" when applied to shippers of grain, miscellaneous mixed freight, or toxic inhalant chemicals? The proposed screens currently adopt the existing commodity (but not equipment) exemptions. The need to identify and justify reliable screens for distinguishing "competitive" and "non-competitive" traffic risks turning this proposal into a vast exemption-style proceeding. Moreover, in order to then implement the Benchmark Model, such a proceeding would have to arrive at non-arbitrary, broad-brush, mechanically-applicable criteria for distinguishing competitive from non-competitive conditions across different commodities shipped by rail.

84. Given that shippers obtain no benefit from this proposal by being included in the "competitive" sample, there would also likely be great pressure to substantially restrict the criteria for being included in the "competitive" sample and to, instead, expand the "non-competitive" group. Regardless of how the traffic is split between competitive and non-competitive, it would almost certainly be the case, as explained above and if the model is working as intended, that approximately half of the competitive shipments would have rates above the benchmark rate. Some or all of those "competitive" shippers could find themselves in the position of paying rates in excess of rates capped under this proposal. The need to maintain the separate treatment of the "competitive" and "non-competitive" groups, however, is core to the logic of the Benchmark Methodology, and failure to establish and maintain that divide would render the concept of a "benchmark" meaningless.

85. The conflict between "competitive" and "non-competitive" shippers would also likely play out in ways that lead to instability and ongoing ratcheting of benchmarks and rates. If the assignment into the "competitive" sample does not prevent a shipper from exercising statutory rights to seek rate relief, then any "competitive" shipper that can satisfy the tests for market dominance could be eligible for rate relief under the Benchmark/CT Methodology. Shippers designated as being in the "competitive" group, but with rates above the benchmark, and especially

with rates well above the benchmark, would have the incentive to make such a showing and take advantage of the relief permitted. But in such cases, it is wholly inconsistent to include such shipments in the purportedly "competitive" data sample that determines the competitive benchmark rates. Eliminating those shipments from the "competitive" group would require re-running the model and result in lower benchmark rates. This loop of "competitive" traffic seeking relief, leaving the "competitive" data sample, re-running the model, and ratcheting benchmark rates lower could readily continue until either multiple rounds of proceedings exhaust the traffic that could plausibly argue for market dominance, or all rates are at the 180% R/VC threshold.

3. Model Specification

86. Despite the large number (850) of "fixed effects" (individual variables intended to capture differences in the average value across different classifications) for commodity type (and 10,000 additional fixed effects included solely for the purpose of controlling for the masking of the Waybill sample), the statistical model includes very little of the economic and competitive factors that actually affect rail rates. The variables, apart from the commodity shipped, that Dr. Caves uses to attempt to "explain" differences in rates consist of: haul distance, number of carloads, number of railroads, and a few dummy variables used to identify *average* effects of the use of private cars, presence of hazardous material, and whether a rate relates to a Rule 11 move.

87. The statistical regression assumes that all traffic responds to the few identified factors (i.e., distance, carloads, etc.) in the same manner across all traffic and time. There is nothing in the regression to account for variation in rates across different traffic due to differences in cost factors (apart from commodity and the handful of items mentioned above), service quality, congestion, reliability, or timeliness that affect railroads' costs and shippers' willingness to pay. Moreover, variation in the force of competition (effectiveness and cost of competing modes or intra-modal costs) across traffic in different circumstances within the designated "competitive" data sample is completely ignored.

88. Even within the limited range of factors considered in Dr. Caves' regression, the statistical model embodies a variety of assumptions that are unlikely to hold universally. For example, the number of carloads and distance of a move are assumed to have the same effect on intermodal as on coal traffic.

89. Likewise, there is nothing in Dr. Caves' framework that identifies how any of these factors differ over time—the regression assumes all real (i.e., inflation-adjusted) rates[72] respond to these factors identically from 2006 to the present, and there is nothing in the model to account for how competitive rail rates actually respond to changes in costs or the prices of competitive alternatives across time.

90. The fact that more than 40% of the variation in the real rate per ton-mile is left unexplained by Dr. Caves' statistical regression demonstrates that the regression model does not reliably capture the determinants of competitive prices. Dr. Caves correctly makes the point that a model can generate reliable results even if a substantial amount of the variation is unexplained—but this conclusion depends on an understanding of reliable *for what purpose*. If knowing the *average* effect of length of haul on rates is the purpose of the statistical analysis, we may be able to get a reliable measure of that average effect from a well-specified model with large unexplained variation in the regression. If, however, we are interested in predicting competitive, benchmark rates applicable to *individual* shipments, rather than average rates over a large group of shipments, then the model's inability to explain individual rates with any precision makes that model unusable for that intended purpose.[73] As the results of the Benchmark Model are intended to be used to cap rates on individual shipments, the Benchmark/CT Methodology requires accurate and reliable estimates of rates to the individual shipper, which it does not and cannot provide.

91. This discussion identifies just some elements of the technical economic and statistical thicket of issues that would need to be thrashed out and decided.[74] We've discussed the threshold problem of characterizing traffic as competitive or non-competitive for purposes of determining the data on which the statistical model could be run. Additional economic statistical issues include questions of regression specification—which variables are to be included and in what form, should they be interacted differently for different commodities, how does one account for changes in costs

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[72] Where nominal rail rates are adjusted to real rates by the *consumer* price index. This implicitly assumes that all rail rates will trend at the rate of consumer prices.

[73] Assuming an otherwise well-specified model, this difference is the difference in the confidence in the estimate of the effect of length of haul and the prediction error applicable to any individual rate. Greene at pp. 80-87. In the case of rail rates derived from the Benchmark Model, the unexplained prediction error includes the effects of precisely those factors that actually determine individual rates, but that are excluded from the model.

[74] See, for example, Greene at Chap. 5 and 352-354; Stock and Watson at Ch. 9; and Jeffrey Wooldridge, *Econometric Analysis of Cross Section and Panel Data* (2002) at pp.328-331.

over time that may affect different traffic differentially, etc. Related to these are problems of omitted variable bias, collinearity, use of specification tests for inclusion or not of variables, goodness of fit, and the ability to evaluate the predictive ability of the model. Numerous other technical issues arise in the choice of estimation and statistical testing (e.g., adjustments for heteroskedasticity, clustering, geographic correlation, etc.). As decisions on these issues would affect the resulting model and its output, the resolution of these issues is likely to affect different shippers differently. These types of concerns would likely be of significance to various interested parties; the issues and their resolution are far from simple.

92. All the foregoing issues drive home the point that the use of a "black box" statistical regression as ***the*** basis for setting myriad rail rates would generate open-ended, contentious, and intense dispute. At its core, the statistical Benchmark Model is an elaborate form of averaging, portending the imposition of homogenizing rate restrictions which would push rates to average levels without proper, or even coherent, consideration of the actual economic circumstances—including competitive circumstances—that actually drive dynamic competitive pricing in the rail industry.

B. THE BENCHMARK/CT METHODOLOGY'S RATE CAPS

93. The use of the Benchmark Methodology and CT-based rate caps suffers from arbitrariness and failings of the same type as the Rail Rate Reform Task Force's RIC proposal, but with much greater force and potential for distortion. (See Kalt VS (2019) and Section IV above on the extensively documented distortive effects of earnings-based rate regulation.) Like similar proposals, the ACC proposal deviates from the mimic competition principle relevant for railroads that calls for some degree of differential pricing along the lines discussed above and previously identified by Prof. Kalt.[75] It does not qualify as *smart* simplification.

94. In addition to the distortions introduced by earnings-based rate regulations, the application of the CT rate caps would eliminate the incentive for railroads to maintain or improve service quality for traffic on which the CT reduces rates. A reduction in service quality would be borne by the shipper and the corresponding cost savings would be gained by the railroad. As long as service quality is above the minimum level necessary to retain the customers' traffic at the *capped*

[75] Kalt VS (2019) at pp. 8-12.

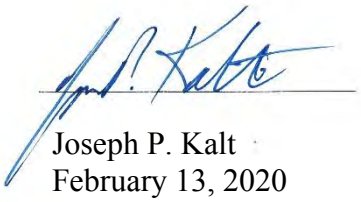
rates, the railroad has no incentive to maintain or improve service quality. Instead, it has the incentive to try to effectively transfer as much of the costs of the service on to shippers.

95. Dr. Caves suggests that the Board need not necessarily set the CT at the level that would eliminate revenue in excess of the calculated revenue adequacy level. This does not eliminate the distortions and harms of rate cap regulation that triggers rate tightening based on a seller's levels of earnings and revenue. The *trigger* for the imposition of rate regulation under the ACC approach would still be a finding of revenue over-adequacy. As a result, carriers would face incentives to avoid tripping the trigger by, for example, undertaking efficiency and quality improvements that portend increases in revenues and earnings. As previously documented, these are the same distortionary incentives that full earnings-based rate regulation has so rampantly produced in other sectors.[76]

96. Similarly, were the Board to select some arbitrary level for the CT, potentially affected shippers (and railroads) would have the strong incentive to litigate and pressure the Board to tighten (or loosen) any arbitrarily selected CT. The balance of these pressures would likely turn on the financial performance and earnings of the railroads. Moreover, while the use of a historical-cost revenue adequacy measure to impose widespread rate regulation is inconsistent with appropriate mimic competition principles, the use of an arbitrarily chosen CT in the Benchmark/CT Methodology is equally inconsistent. The proposed approach, with any chosen CT level and with its inability to capture the economic factors that actually determine rail rates in the real world, would leave rate regulation untethered from any valid competitive principle. Such an approach would be the opposite of a principled and smart simplification of the rail regulatory process.

[76] See, for example, Kalt VS (2019) at, esp., pp. 38-48; Mayo and Sappington (2016); and Sappington (2019).

I declare under penalty of perjury that the foregoing is true and correct.



Joseph P. Kalt
February 13, 2020

I declare under penalty of perjury that the foregoing is true and correct.

David Reishus
February 13, 2020

APPENDIX A

CURRICULUM VITAE

David Reishus

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PROFESSIONAL EXPERIENCE

Compass Lexecon
Boston, MA
Executive Vice President, April 2013 – present
Senior Vice President/Senior Managing Director, July 1999 – March 2013

The Economics Resource Group, Inc., Cambridge, MA
President, 1993 – June 1999
Senior Economist, 1990 – 1993

Provides economic analysis and advice on issues of regulation, antitrust, taxation and applied microeconomics to a variety of clients. Develops, manages, and oversees economic analyses for clients and other principals. Responsible for the management and operations of the company.

U.S. Congress, Joint Committee on Taxation, Washington, DC
Economist, 1987 – 1990

Provided economic analysis and development of legislative tax proposals. Responsibilities included corporate and foreign taxation and proposals related to low-income taxpayers, child care, and health issues.

Harvard University, Cambridge, MA
Instructor, 1986 – 1987

Leader of senior thesis tutorial for industrial organization and finance topics. Previously taught Introductory Economics.

Information Resources, Inc., Chicago, IL
Consultant, 1979 – 1980

EDUCATION

Harvard University, Cambridge, MA
Ph.D. in Economics, 1988
Dissertation: "Empirical Essays on the Economics of Taxation and the Firm"
M.A. in Economics, 1983

Northwestern University, Chicago, IL
B.A. in Economics, 1979

TESTIMONY AND OTHER REPORTS

Government of British Columbia and Government of Canada
Before the International Trade Administration, Department of Commerce, *Countervailing Duty Investigation of Certain Softwood Lumber Products From Canada (C-122-858), First Administrative Review. Response to Petitioner's Submission of August 12, 2019.* Expert Witness Statement, August 26, 2019.

Government of British Columbia and Government of Canada
Before the International Trade Administration, Department of Commerce, *Countervailing Duty Investigation of Certain Softwood Lumber Products From Canada (C-122-858), First Administrative Review. Economic Analysis of British Columbia Log Export Permitting Process, Stumpage and Log Markets.* Expert Witness Statement, July 15, 2019.

Government of Canada
Before the International Trade Administration, Department of Commerce, *In the Matter of Certain Softwood Lumber Products from Canada (A-122-857). Economic Analysis Regarding Claims of Particular Market Situation for Canadian Softwood Lumber By-Products.* Expert Witness Statement, July 20, 2017.

Association of Oil Pipe Lines
Before the Federal Energy Regulatory Commission. Docket No. RM17-1-000 Revisions to Indexing Policies and Page 700 of FERC Form No. 6. Declaration, January 19, 2017.

BNSF Railway Company
Before the Surface Transportation Board. Finance Docket No. 32760 (Sub-No. 46) BNSF Railway Company -- Terminal Trackage Rights --Kansas City Southern Railway Company and Union Pacific Railroad Company. Verified Statement, October 23, 2015.

Association of American Railroads

Petition of the Association of American Railroads to Institute a Rulemaking Proceeding to Reintroduce Indirect Competition as a Factor Considered in Market Dominance Determinations for Coal Transported to Utility Generation Facilities; Surface Transportation Board Ex Parte No. 717. Verified Statement, November 14, 2012.

Modis

In the United States District Court for the District of Columbia, Case 1:09-cv-01051-RWR, Modis, Inc. v. Infotran Systems, Inc. and Tien H. Tran v. Modis Inc. and Timothy W. Martin. Expert Report, October 18, 2010. Deposition testimony December 7, 2011.

Government of Canada

In the Matter of Arbitration No. 91312, Canada v. The United States of America. Expert Witness Statement of Joseph P. Kalt and David Reishus, May 12, 2009.

Government of Canada

In the Matter of Arbitration No. 7941, The United States of America v. Canada. Expert Witness Statement, June 29, 2008. Rebuttal Expert Witness Statement, August 11, 2008. (With Joseph Kalt).

Government of Canada

In the Matter of an Arbitration Under Chapter Eleven of the North American Free Trade Agreement Between Merrill & Ring Forestry, L.P. and The Government Of Canada. Expert Report, May 9, 2008. Supplemental Expert Affidavit, March 19, 2009. Oral testimony, May 21, 2009.

Dynegy

In the Circuit Court of Colbert County, State of Alabama, NO. CV-2003-142JMH, Nelson Brothers, LLC v. Cherokee Nitrogen v. Dynegy Marketing & Trade; Dynegy Inc. Expert Report, August 22, 2007.

Independent Energy Producers Association of California

Before the Federal Energy Regulatory Commission, Docket No. R.06-02-013, Long-Term Procurement Plans, Prepared Testimony of the Independent Energy Producers Association; Prepared Testimony of David Reishus and Joseph Cavicchi on behalf of the IEPA, March 2, 2007.

First Energy

Before the Pennsylvania Public Utility Commission, Petition of Metropolitan Edison Company for Approval of a Rate Transition Plan (Metropolitan Edison Company Docket No. R-00061366) and Petition of Pennsylvania Electric Company for

Approval of a Rate Transition Plan (Pennsylvania Electric Company Docket No. R-00061367), Direct Testimony of David A. Reishus, April 10, 2006.

ExpressTrak LLC

In the United States District Court For the District of Columbia, Case No. 02- CV-1773, National Railroad Passenger Corporation v. ExpressTrak, L.L.C., Expert Report, Dated January 3, 2006; revised April 7, 2006. Deposition testimony, March 24 and April 26, 2006.

British Columbia Lumber Trade Council and the Province of British Columbia

Before the International Trade Administration, Department of Commerce, *In the Matter of Certain Softwood Lumber Products from Canada (C-122-839)*. *Statement for the First Administrative Review, March 15, 2004 (with Joseph Kalt); Response to Price Impact of Canadian Log Restraints, March 16, 2004 (with Joseph Kalt); Response to Coalition Submission on Pass-Through Issues, April 15, 2004 (with Joseph Kalt); Economics of Arm's-Length Transactions and Subsidy Pass-Through, September 15, 2004 (with Joseph Kalt); Economic Analysis of the Vancouver Log Market, February 28, 2005 (with Joseph Kalt); Comment on the Economic Implications of the Annual Allowable Cut, December 5, 2005 (with Joseph Kalt); Update to Economic Analysis of the Vancouver Log Market, December 5, 2005 (with Joseph Kalt)*. Reports filed from March 15, 2004 to December 5, 2005.

Multiple Associations of Energy Producers

Before the Public Utilities Commission of the State of California, Rulemakings R.04-04-025 – R.04-04-003, "Prepared Rebuttal Testimony," October 28, 2005 (with A. Joseph Cavicchi). Oral testimony, January 23 and 24, 2006.

PPL Corporation

United States of America, Before the Federal Energy Regulatory Commission, Docket No. ER05-1416-000, "Affidavit of A. Joseph Cavicchi, Joseph P. Kalt, Ph.D., and David A. Reishus, Ph.D. on Behalf of the PPL Parties," October 19, 2005.

The Burlington Northern and Santa Fe Railway Company

Before the Surface Transportation Board, Finance Docket No. 34342, Kansas City Southern -- Control -- The Kansas City Southern Railway Company, Gateway Eastern Railway Company, and The Texas Mexican Railway Company. Verified Statement, June 3, 2003; Verified Statement, August 4, 2003; Reply Verified Statement, August 29, 2003.

Dynegy Inc.

United States of America, Before the Federal Energy Regulatory Commission, San Diego Gas & Electric Company v. Sellers of Energy and Ancillary Services, Investigation of Practices of the California ISO and PX; Pub. Utils. Comm'n of the State of California v. Sellers of Long-Term Contracts. Prepared Rebuttal Testimony (with Patrick Wang), March 20, 2003.

Duke Energy Trading and Marketing LLC

United States of America, Before the Federal Energy Regulatory Commission, San Diego Gas & Electric Company v. Sellers of Energy and Ancillary Services into Markets Operated by the California Independent System Operator and the California Power Exchange; Investigation of Practices of the California Independent System Operator and the California Power Exchange. Prepared Rebuttal Testimony (with Patrick Wang), March 20, 2003.

Dynegy Inc.; Duke Energy Services LLC; Mirant Americas, Inc.; Reliant Energy; Williams Energy Marketing and Trading Co.

United States of America, Before the Federal Energy Regulatory Commission, San Diego Gas & Electric Company v. Sellers of Energy and Ancillary Services into Markets Operated by the California Independent System Operator and the California Power Exchange; Investigation of Practices of the California Independent System Operator and the California Power Exchange. Affidavit (with Patrick Wang), October 15, 2002 (revised November 12, 2002).

Association of American Railroads

Review of Rail Access and Competition Issues, Before the Surface Transportation Board, Ex Parte No. 575. Joint Verified Statement (with Joseph Kalt), March 26, 1998.

Crow Tribe of Indians

Report Concerning the Crow Tribe Resort Tax (with Joseph P. Kalt), November 27, 1996; *Surrebuttal Report Concerning the Crow Tribe Resort Tax* (with Joseph P. Kalt), February 25, 1997; and *Report Concerning the Crow Tribe Resort Tax* (with Joseph P. Kalt), March 31, 2000.

Sithe Energies

Economic Impact on New York State of the Sithe Plan, Chapter IV of *Energizing New York: The Sithe Plan*, December 8, 1995.

Massachusetts Department of Environmental Protection

Use of an Economic Test for Distinguishing Legitimate Recycling Activities, July 1993.

SELECTED OTHER CONSULTING EXPERIENCE

Government of Canada

Assisted in developing presentations, responses and submissions before WTO dispute settlement panel regarding countervailing duties.

Major Coal Producers
Analyzed end-market competitive alternatives and pricing behaviors.

Management Company
Analyzed lost profits and other damages arising from contractual dispute in Asian gaming.

Large Integrated Electric Utility
Analyzed cost and rate impacts related to shut down of nuclear plant.

International Oil Company
Analyzed cost structure for major deepwater crude oil exploration and production investment.

Independent Transmission Company
Analyzed risk and financial investment incentives for stand-alone transmission project.

Large Solar Power Provider
Assisted in data analysis of market operations and outcomes.

Merchant Power Generator
Analyzed economic, regulatory and financial issues related to proposed new pipeline investment and novel regulatory regime.

Supermajor Oil Company
Assist in analysis of competition and proposed conditions related to divestiture of regional midstream petroleum product assets.

Electric and Gas Utility Holding Companies
Analyzed potential competitive issues arising from multiple mergers between large electric, gas utility, and interstate gas pipeline companies for use before Federal competition authorities and state regulatory agencies.

Major Regional Hospital
Performed statistical analysis of patient waiting-times and follow-up.

Petroleum Products Pipeline
Analyzed business and regulatory options for large interstate petroleum products pipeline subject to market-based and regulated tariffs.

Dean Foods
Analyzed claims of price fixing and statistical model of antitrust damages for use in class certification.

Group of Class 1 Railroads

Analyzed claims of competitive harm and the development and use of econometric models for pricing, damages and class certification in the context of alleged price-fixing.

Government of Canada

In context of international arbitration under the U.S. Canada Softwood Lumber Agreement, analyzed pricing patterns, effects of risk and government development and timber pricing policies in multiple provinces on the North American lumber markets, Developed dynamic economic models of production and trade capable of determining appropriate export measure adjustments.

Major Energy Traders

Assisted in analyses of claims of market manipulation in physical and financial energy markets.

U.S. Generation Companies

Advise on methods for performing merger analysis and analysis of competitive effects of proposed divestitures.

Western Refining

Analyzed effect of a contested proposed merger involving southwestern refining, wholesale, and marketing operations

AT&T

Analyzed competitive issues in the long-distance telephone market in the context of a class-action price-fixing suit.

Pacific Lumber/Scotia Pacific

Assisted in analysis and projections involving redwood product markets for business valuation in bankruptcy.

TAPS Carriers

Assisted in development of ratemaking analyses for oil pipeline rates.

General Electric & Bechtel

Analyzed derivation of cost of equity, discount factor, and method for contract damages and expropriation of Dabhol power plant in the context of I.C.C. arbitration.

Class 1 Railroad

Analyzed potential competitive harm of vertical rail merger and possible remedies before the Canadian Competition Bureau.

Multinational Oil Companies

Analyzed alternative approaches for identifying, measuring and managing price and fiscal risks in long-term contracts in connection with multiple billion-dollar-plus projects in in Africa and Middle East.

Frontier Oil Corporation

Analyzed application of discount factors and method in damages arising from a failed merger.

Amoco

Analyzed marketability and market value of natural gas for purposes of class-action royalty valuation.

Class 1 Railroad

Analyzed claims of vertical market foreclosure and anticompetitive conduct in rail transportation.

Supermajor Oil Company

Performed functional analysis of sources of global value creation for international tax treatment.

Government of Canada

Assisted in analysis of changes in forestry practices and stumpage charges in the context of international trade agreements.

Exxon Corporation and Affiliated Companies

Performed analysis of design and effect of U.K. oil and gas tax system.

CSX Corporation and CSX Transportation, Inc.

Analyzed historical evidence of rail consolidations and the impact of the proposed Conrail transaction on Eastern coal shippers. Evaluated competitive requirements of proposed conditions on the transaction.

Group of Major Oil Companies

Developed and analyzed a database of crude oil purchases for analyzing issues of crude oil valuation at the wellhead in the context of multiple class action litigations.

Koch Pipeline

Assisted in developing product and market definitions relating oil pipeline antitrust allegations.

British Petroleum

Performed economic analysis of alternative organizational forms for operating petroleum assets. Developed advanced financial tools for valuing decision alternatives and contingent assets.

Exxon

Performed economic analysis of certain fuel used and cost allocations among the Prudhoe Bay Unit owners for a royalty dispute with the State of Alaska.

Burlington Northern Railroad/Santa Fe Railroad

Analyzed competitive impacts of proposed railroad merger for use before the Interstate Commerce Commission.

PSI/CINergy

Adapted economic model of regional economy and performed analysis of the economic impact of alternative merger scenarios for a public utility.

El Paso Natural Gas Company

Performed economic analysis of markets and competition for an open-access natural gas pipeline for use in an antitrust case.

Better Home Heat Council, Inc.

Performed economic analysis of a local gas utility's conservation programs effect on consumer fuel-switching decisions and public policy impact for use before the Massachusetts Department of Public Utilities.

Association of American Railroads

Analyzed the impact of market conditions for the exemption of rail transportation of export corn and soybeans from Interstate Commerce Commission regulation.

ARCO Pipe Line Company

Evaluation of market power of petroleum products pipeline in consideration of light-handed regulation for use before the Federal Energy Regulatory Commission.

BP/America

Assisted in the design and implementation of crude oil valuation analyses for royalty litigation.

Williams Natural Gas Pipeline Co.

Prepared pricing analysis of natural gas purchase contracts, performed calculation of damages, and analyzed economic submissions for use in antitrust case.

El Paso Corporation

Various projects including strategic analysis of market opportunities to enhance value of the pipeline and analysis of market competition in gathering and long-distance gas transportation.

Government of British Columbia

Assisted in evaluation of impact of Canadian log export regulations on U.S. and Pacific Rim log and wood products trade and industry.

Atlantic Richfield Company

Provided economic analysis of market structure and conduct for the distribution of motor fuels for use in an antitrust case.

Burlington-Northern Railroad

Assisted in evaluating market impacts of innovative railroad grain car service rate and reservation policy for use before the Interstate Commerce Commission.

National Cattleman's Association

Researched and wrote report analyzing the welfare and environmental effects of domestic U.S. beef production with particular concern about appropriate policy responses.

PUBLICATIONS AND RESEARCH

"Corporate Reorganizations: Tax Treatment of Corporate Mergers, Acquisitions, and Reorganizations," *The Encyclopedia of Taxation and Tax Policy, 2nd ed*., The Urban Institute Press, 2006. (Revised and updated.)

"Corporate Reorganizations: Tax Treatment of Corporate Mergers, Acquisitions, and Reorganizations," *The Encyclopedia of Taxation and Tax Policy*, The Urban Institute Press, 1999.

"Outside Directorships, the Reputation of Managers, and Corporate Performance" (with S. Kaplan), *Journal of Financial Economics*, Vol. 27, No. 2, September 1990.

"Financing Child Care: Who Will Pay for the Kids?," *National Tax Journal*, Vol. XLII, No. 3, September, 1989.

"The Effects of Taxation on the Merger Decision" (with A. Auerbach), in A. Auerbach, ed., *Corporate Takeovers: Causes and Consequences*, University of Chicago Press, 1988.

"Taxes and the Merger Decision" (with A. Auerbach), in J. Coffee, L. Lowenstein, and S. Rose-Ackerman, eds., *Knights, Raiders and Targets*, Oxford University Press, 1988.

"The Impact of Taxation on Mergers and Acquisitions" (with A. Auerbach), in A. Auerbach, ed., *Mergers and Acquisitions*, University of Chicago Press, 1988.

OTHER PROFESSIONAL ACTIVITIES

Presentations to National Bureau of Economic Research, Federal Reserve Bank of Cleveland, Federal Reserve Bank of New York, Harvard University, Tax Economists Forum, National Tax Association, Western Economic Association, The Institute for Energy Law of The Center for American and International Law.

Memberships in National Tax Association, American Economic Association.

Referee for *Quarterly Journal of Economics, Journal of Law and Economics.*

HONORS AND AWARDS

National Science Foundation Fellowship, 1981-1985.
International Foundation of Employee Benefit Plans, Graduate Research Fellowship, 1984.
Phi Beta Kappa, 1979.

Reply Verified Statement of
Robert Willig

Before the
Surface Transportation Board

RAILROAD REVENUE ADEQUACY
Docket No. EP 722

Reply Verified Statement of

Robert Willig

Professor of Economics and Public Affairs

Princeton University

On behalf of the Association of American Railroads

November 4, 2014

I. Introduction and Statement Overview

Witness Introduction

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

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

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

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

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

Purpose and Summary of Findings

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

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

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

[2] Faulhaber V.S. p. 11.

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

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

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

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

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

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

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

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

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

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

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

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

> The "stand-alone cost" to any given shipper (or shipper group) is the cost of service [to] that shipper alone, as if it were isolated from the railroads' other customers. It represents that level at which the shipper could provide the service itself. No shipper would reasonably agree to pay more to a railroad for transportation than it would cost to produce in isolation itself, or more than it would cost a competitor of the railroad to provide the service to it. Thus, the stand-alone cost serves as a surrogate for competition: it enforces a competitive standard on rail rates in the absence of any real competitive alternative.
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> * * *
>
> Because the stand-alone cost represents the cost of obtaining service from another source (i.e. reproducing the service capability), the cost of facilities must be based on replacement cost, or the current cost of producing equipment or plant with equivalent capabilities.[6]

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

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

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

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

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

> To prevent abuse of any monopoly power, there is no need to regulate prices that are no higher than those which could prevail under effective competition. Where competition is effective, no railroad will be able to charge any shipper rates in excess of the minimum cost (including the capital costs) that would be incurred currently to provide the service in isolation. The reason for this constraint is simple: in a market subject to effective active or potential competition, any railroad charging in excess of that amount would invite entry into the market by a firm willing to charge no more than is necessary just to cover that level of costs. Since the stand-alone cost is the minimum current cost of providing a service in isolation, the stand-alone cost test is the proper means to ensure that rates do not involve any abuse of monopoly power.
>
> The Commission is also correct in recognizing that the stand-alone cost test applies to rates for groups of services or shippers as well as individual services. Just as rates that return revenues in excess of the minimum current cost of providing a single service will invite entry by a competitor willing to charge rates which earn no more than that level of costs, rates consistently in excess of the minimum current cost of providing any group of services will also invite competition.
>
> We agree further, that stand-alone costs must include or reflect the total current replacement costs of providing a service or group of services in isolation. This is so whether current costs are higher or lower than costs that were incurred in the past, for the costs that pricing in competitive markets, i.e. the costs of entry, are always current replacement costs.[8]

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

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

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

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

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

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

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

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

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

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

[11] *Id.*

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

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

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

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

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

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

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

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

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

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

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

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

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

[14] Faulhaber V.S. p. 7.

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

[16] *Id.*

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

> In perfectly contestable markets, the price of a product will lie somewhere between its incremental and its stand-alone cost, just where it falls in that range depending on the state of demand. One cannot legitimately infer that monopoly power is exercised from data showing that prices do not exceed stand-alone costs, and stand-alone costs constitute the proper cost-based ceilings upon prices, preventing both cross-subsidization and the exercise of monopoly power (see Faulhaber (1975) for tests of cross-subsidy and their equivalence).
>
> * * *
>
> Thus, the forces of idealized potential competition in perfectly contestable markets enforce cost constraints on prices, but prices remain sensitive to demands as well. Actual and potential competition are effective if they constrain rates in this way, and in such circumstances regulatory intervention is completely unwarranted. But if, in fact, market forces are not sufficiently strong, then there is likely to be a proper role for regulation, and the theoretical guidelines derived from the workings of contestable markets are the appropriate ones to apply. That is, prices must be constrained to lie between incremental and stand-alone costs.[22]

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

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

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

[22] Baumol, William J. and Robert D. Willig, "Contestability: Developments since the Book," *Oxford Economic Papers*, New Series, Vol. 38, Supplement: Strategic Behaviour and Industrial Competition (Nov., 1986), pp. 31-32.

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

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

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

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

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

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

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

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

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

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

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

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

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

[27] *Id.*

Figure 1

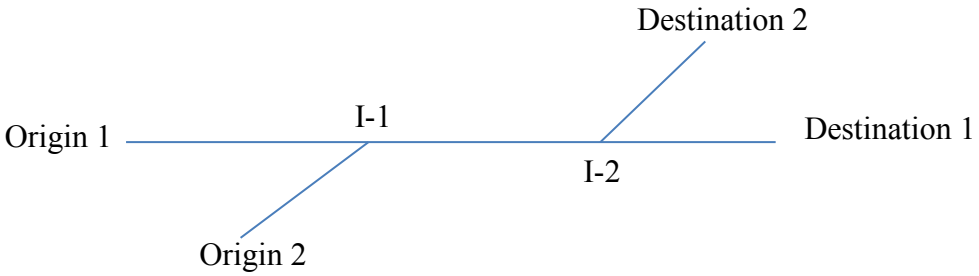


Table 1

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

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

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

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

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

VIII. Conclusion

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

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

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

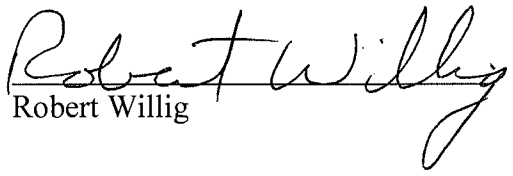
[28] *Coal Rate Guidelines, Nationwide*, Ex Parte No. 347 (Sub-No. 1), at 11 (Feb. 8, 1983).

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

VERIFICATION

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

Executed: November 1, 2014



Robert Willig

Appendix A

August 2014

Curriculum Vitae

Name: **Robert D. Willig**

Address: 220 Ridgeview Road, Princeton, New Jersey 08540

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

Marital Status: Married, four children

Education:

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

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

A.B. Mathematics, Harvard University, 1967.

Professional Positions:

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

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

Deputy Assistant Attorney General, U.S. Department of Justice, l989-1991.

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

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

Economics Research Department, Bell Laboratories, 1973-77.

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

Other Professional Activities

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

Advisory Committee, Compass Lexecon 2010 -

OECD Advisory Council for Mexican Economic Reform, 2008 - 2009

Senior Consultant, Compass Lexecon, 2008 -

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

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

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

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

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

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

Editorial Board, Utilities Policy, 1990-2001.

Leif Johanson Lecturer, University of Oslo, November 1988.

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

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

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

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

Fellow, Econometric Society, 1981-.

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

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

Nominating Committee, American Economic Association, 1980-1981.

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

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

Program Committee, 1980 World Congress of the Econometric Society.

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

Organizer, American Economic Association Meetings: 1980, 1982.

American Bar Association Section 7 Clayton Act Committee, 198l.

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

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

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

Visiting Fellow, University of Warwick, July 1977.

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

Published Articles and Book Chapters:

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

"Activating Actavis: A More Complete Story" (with Barry C. Harris, Kevin M. Murphy, and Matthew B. Wright), Antitrust, vol. 28, No. 2 (Spring), 2014.

"'Reverse Payments' in Settlements of Patent Litigation: Split Opinions on Schering-Plough's K-Dur (2005 and 2012)" (with John P. Bigelow), in The Antitrust Revolution (Sixth Edition), (J. Kwoka and Laurence White, eds.), Oxford University Press, 2013.

"The Delta-Northwest Merger: Consumer Benefits from Airline Network Effects (2008)" (with Mark Israel, Bryan Keating and Daniel Rubinfeld), in The Antitrust Revolution **(**Sixth Edition), (J. Kwoka and Laurence White, eds.), Oxford University Press, 2013.

"Airline Network Effects and Consumer Welfare" (with Bryan Keating, Mark Israel and Daniel Rubinfeld), Review of Network Economics, published online November 2013.

"The Liftoff of Consumer Benefits from the Broadband Revolution" (with Mark Dutz and Jon Orszag), Review of Network Economics (2012) vol. 11, issue 4, article 2.

"Competition and innovation-driven inclusive growth" (with Mark Dutz, Ioannis Kessides and Stephen O'Connell), in Promoting Inclusive Growth: Challenges and Policies, Luiz de Mello and Mark Dutz (eds.), OECD, 2011.

"Unilateral Competitive Effects of Mergers: Upward Pricing Pressure, Product Quality, and Other Extensions," Review of Industrial Organization (2011) 39:19–38.

"Antitrust and Patent Settlements: The Pharmaceutical Cases," (with John Bigelow) in The Antitrust Revolution (Fifth Edition), John Kwoka and Lawrence White (eds.), 2009.

"The 1982 Department of Justice Merger Guidelines: An Economic Assessment," (with J. Ordover) reprinted in Economics of Antitrust Law, Benjamin Klein (ed.), Edward Elgar, 2008.

"On the Antitrust Treatment of Production Joint Ventures," (with Carl Shapiro) reprinted in Economics of Antitrust Law, Benjamin Klein (ed.), Edward Elgar, 2008.

"Consumer's Surplus Without Apology," reprinted in Applied Welfare Economics, Richard Just, Darrel Hueth and Andrew Schmitz (eds.), Edward Elgar, 2008; reprinted in Readings in Social Welfare: Theory and Policy, Robert E. Kuenne (ed.), Blackwell, 2000, pp. 86-97; reprinted in Readings in Microeconomic Theory, M. M. La Manna (ed.), Dryden Press, 1997, pp. 201-212.

"The Risk of Contagion from Multi-Market Contact," (with Charles Thomas), The International Journal of Industrial Organization, Vol. 24, Issue 6 (Nov. 2006), pp 1157 – 1184.

"Pareto-Superior Nonlinear Outlay Schedules," reprinted in The Economics of Public Utilities, Ray Rees (ed.), Edward Elgar, 2006; reprinted in The Economics of Price Discrimination, G. Norman, (ed.), Edward Elgar, 1999.

"Economic Effects of Antidumping Policy," reprinted in The WTO and Anti-Dumping, Douglas Nelson (ed.), Edward Elgar, 2005.

"Merger Analysis, Industrial Organization Theory and the Merger Guidelines," reprinted in Antitrust and Competition Policy, Andrew Kleit (ed.) Edward Elgar, 2005

"Antitrust Policy Towards Agreements That Settle Patent Litigation," (with John Bigelow), Antitrust Bulletin, Fall 2004, pp. 655-698.

"Economies of Scope," (with John Panzar), reprinted in The Economics of Business Strategy, John Kay (ed.), Edward Elgar, 2003.

"Panel on Substantive Standards for Mergers and the Role of Efficiencies," in International Antitrust Law & Policy, Barry E. Hawk (ed.), Juris Publishing, 2003.

"Practical Rules for Pricing Access in Telecommunications," (with J. Ordover) in Second Generation Reforms in Infrastructure Services , F. Basanes and R. Willig (eds.), Johns Hopkins Press, 2002.

"Comments on Antitrust Policy in the Clinton Administration," in American Economic Policy in the 1990s, J. Frankel and P. Orszag (eds.), MIT Press, 2002.

"Entrepreneurship, Access Policy and Economic Development: Lessons from Industrial Organization," (with M. Dutz and J. Ordover), European Economic Review, (44)4-6 (2000), pp. 739-747.

"Public Versus Regulated Private Enterprise," reprinted in Privatization in Developing Countries, P. Cook and C. Kirkpatrick (eds.), Edward Elgar, 2000.

"Deregulation v. the Legal Culture: Panel Discussion," in Is the Telecommunications Act of 1996 Broken?, G. Sidak (ed.), AEI Press, 1999.

"Economic Principles to Guide Post-Privatization Governance," in Can Privatization Deliver? Infrastructure for Latin America, R. Willig co-editor, Johns Hopkins Press, 1999.

"Access and Bundling in High-Technology Markets," (with J. A. Ordover), in Competition, Innovation and the Microsoft Monopoly: Antitrust in the Digital Marketplace, J. A. Eisenach and T. Lenard (eds.), Kluwer, 1999.

"Competitive Rail Regulation Rules: Should Price Ceilings Constrain Final Products or Inputs?," (With W. J. Baumol), Journal of Transport Economics and Policy, Vol. 33, Part 1, pp. 1-11.

"Economic Effects of Antidumping Policy," Brookings Trade Forum: 1998, 19-41.

"Interview With Economist Robert D. Willig," Antitrust , Vol. 11, No. 2, Spring 1997, pp.11-15.

"Parity Pricing and its Critics: A Necessary Condition for Efficiency in Provision of Bottleneck Services to Competitors," (with W. J. Baumol and J. A. Ordover), Yale Journal on Regulation, Vol. 14, No. 1, Winter 1997, pp. 145-164.

"Restructuring Regulation of the Rail Industry," (with Ioannis Kessides), in Private Sector, Quarterly No. 4, September 1995, pp. 5 - 8. Reprinted in Viewpoint, October, 1995, The World Bank. Reprinted in Private Sector, *special edition*: Infrastructure, June 1996.

"Competition and Regulation in the Railroad Industry," (with Ioannis Kessides), in Regulatory Policies and Reform: A Comparative Perspective, C. Frischtak (ed.), World Bank, 1996.

"Economic Rationales for the Scope of Privatization," (with Carl Shapiro), reprinted in The Political Economy of Privatization and Deregulation, E. E. Bailey and J. R. Pack (eds.), The International Library of Critical Writings in Economics, Edward Elgar Publishing Co., 1995, pp.

95-130.

"Weak Invisible Hand Theorems on the Sustainability of Multi-product Natural Monopoly," (with W. Baumol and E. Bailey), reprinted in The Political Economy of Privatization and Deregulation, E. E. Bailey and J. R. Pack (eds.), The International Library of Critical Writings in Economics, Edward Elgar Publishing Co., 1995, pp. 245-260.

"Economists' View: The Department of Justice Draft Guidelines for the Licensing and Acquisition of Intellectual Property," (with J. Ordover), Antitrust, V. 9, No. 2 (spring 1995), 29-36.

"Public Versus Regulated Private Enterprise," in Proceedings of the World Bank Annual Conference on Development Economics 1993, L. Summers (ed.), The World Bank, 1994.

"Economics and the 1992 Merger Guidelines: A Brief Survey," (with J. Ordover), Review of Industrial Organization, V. 8, No. 2, (1993), pp. 139-150.

"The Role of Sunk Costs in the 1992 Guidelines' Entry Analysis," Antitrust, V. 6, No. 3 (summer 1992).

"Antitrust Lessons from the Airlines Industry: The DOJ Experience," Antitrust Law Journal, V. 60, No. 2 (1992).

"William J. Baumol," (with E. E. Bailey), in New Horizons in Economic Thought: Appraisals of Leading Economists, W. J. Samuels (ed.), Edward Elgar, 1992.

"Anti-Monopoly Policies and Institutions," in The Emergence of Market Economies in Eastern Europe, Christopher Clague and Gordon Rausser (eds.), Basil Blackwell, 1992.

"Economics and the 1992 Merger Guidelines," (with Janusz Ordover), in Collaborations Among Competitors: Antitrust Policy and Economics, Eleanor Fox and James Halverson (eds.), American Bar Association, 1992.

"On the Antitrust Treatment of Production Joint Ventures," (with Carl Shapiro), reprinted in Collaborations Among Competitors: Antitrust Policy and Economics, Eleanor Fox and James Halverson (eds), American Bar Association, 1992.

"Merger Analysis, Industrial Organization Theory, and Merger Guidelines," Brookings Papers on Economic Activity -- Microeconomics 1991, pp. 281-332.

"On the Antitrust Treatment of Production Joint Ventures," (with C. Shapiro), Journal of Economic Perspectives, Vol. 4, No. 3, Summer 1990, pp. 113-130.

"Economic Rationales for the Scope of Privatization," (with Carl Shapiro), in The Political Economy of Public Sector Reform and Privatization, E.N. Suleiman and J. Waterbury (eds.),

Westview Press, Inc., 1990, pp. 55-87.

"Contestable Market Theory and Regulatory Reform," in Telecommunications Deregulation: Market Power and Cost Allocation, J.R. Allison and D.L. Thomas (eds.), Ballinger, 1990.

"Address To The Section," Antitrust Law Section Symposium, New York State Bar Association, 1990.

"Price Caps: A Rational Means to Protect Telecommunications Consumers and Competition," (with W. Baumol), Review of Business, Vol. 10, No. 4, Spring 1989, pp. 3-8.

"U.S.-Japanese VER: A Case Study from a Competition Policy Perspective," (with M. Dutz) in The Costs of Restricting Imports, The Automobile Industry. OECD, 1988.

"Contestable Markets," in The New Palgrave: A Dictionary of Economics, J. Eatwell, M. Milgate, and P. Newman (eds.), 1987.

"Do Entry Conditions Vary Across Markets: Comments," Brookings Papers on Economic Activity, 3 - 1987, pp. 872-877.

"Railroad Deregulation: Using Competition as a Guide," (with W. Baumol), Regulation, January/February 1987, Vol. 11, No. 1, pp. 28-36.

"How Arbitrary is 'Arbitrary'? - or, Toward the Deserved Demise of Full Cost Allocation," (with W. Baumol and M. Koehn), Public Utilities Fortnightly, September 1987, Vol. 120, No. 5, pp. 16-22.

"Contestability: Developments Since the Book," (with W. Baumol), Oxford Economic Papers, December 1986, pp. 9-36.

"The Changing Economic Environment in Telecommunications: Technological Change and Deregulation," in Proceedings from the Telecommunications Deregulation Forum; Karl Eller Center; 1986.

"Perspectives on Mergers and World Competition," (with J. Ordover), in Antitrust and Regulation, R.E. Grieson (ed.), Lexington, 1986.

"On the Theory of Perfectly Contestable Markets," (with J. Panzar and W. Baumol), in New Developments in The Analysis of Market Structure, J. Stiglitz and F. Mathewson (eds.), MIT Press, 1986.

"InterLATA Capacity Growth and Market Competition," (with C. Shapiro), in Telecommunications and Equity: Policy Research Issues, J. Miller (ed.), North Holland, 1986.

"Corporate Governance and Market Structure," in Economic Policy in Theory and Practice, A.

Razin and E. Sadka (eds.), Macmillan Press, 1986.

"Antitrust for High-Technology Industries: Assessing Research Joint Ventures and Mergers," (with J. Ordover), Journal of Law and Economics, Vol 28(2), May 1985, pp. 311-334.

"Non-Price Anticompetitive Behavior by Dominant Firms Toward the Producers of Complementary Products," (with J. Ordover and A. Sykes), in Antitrust and Regulation, F.M. Fisher (ed.), MIT Press, 1985.

"Telephones and Computers: The Costs of Artificial Separation," (with W. Baumol), Regulation, March/April 1985.

"Transfer Principles in Income Redistribution," (with P. Fishburn), Journal of Public Economics, 25 (1984), pp. 1-6.

"Market Structure and Government Intervention in Access Markets," in Telecommunications Access and Public Policy, A. Baughcam and G. Faulhaber (eds.), 1984.

"Pricing Issues in the Deregulation of Railroad Rates," (with W. Baumol), in Economic Analysis of Regulated Markets: European and U. S. Perspectives, J. Finsinger (ed.), 1983.

"Local Telephone Pricing in a Competitive Environment," (with J. Ordover), in Telecommunications Regulation Today and Tomorrow, E. Noam (ed.), Harcourt Brace Jovanovich, 1983.

"Economics and Postal Pricing Policy," (with B. Owen), in The Future of the Postal Service, J. Fleishman (ed.), Praeger, 1983.

"Selected Aspects of the Welfare Economics of Postal Pricing," in Telecommunications Policy Annual, Praeger, 1987.

"The Case for Freeing AT&T" (with M. Katz), Regulation, July-Aug. 1983, pp. 43-52.

"Predatory Systems Rivalry: A Reply" (with J. Ordover and A. Sykes), Columbia Law Review, Vol. 83, June 1983, pp. 1150-1166. Reprinted in Corporate Counsel's Handbook - 1984.

"Sector Differentiated Capital Taxation with Imperfect Competition and Interindustry Flows," Journal of Public Economics, Vol. 21, 1983.

"Contestable Markets: An Uprising in the Theory of Industry Structure: Reply," (with W.J. Baumol and J.C. Panzar), American Economic Review, Vol. 73, No. 3, June 1983, pp. 491-496.

"The 1982 Department of Justice Merger Guidelines: An Economic Assessment," (with J. Ordover), California Law Review, Vol. 71, No. 2, March 1983, pp. 535-574. Reprinted in Antitrust Policy in Transition: The Convergence of Law and Economics, E.M. Fox and J.T. Halverson (eds.), 1984.

"Intertemporal Failures of the Invisible Hand: Theory and Implications for International Market Dominance," (with W.J. Baumol), Indian Economic Review, Vol. XVI, Nos. 1 and 2, January-June 1981, pp. 1-12.

"Unfair International Trade Practices," (with J. Ordover and A. Sykes), Journal of International Law and Politics, Vol. 15, No. 2, winter 1983, pp. 323-337.

"Journals as Shared Goods: Reply," (with J. Ordover), American Economic Review, V. 72, No. 3, June 1982, pp. 603-607.

"Herfindahl Concentration, Rivalry, and Mergers," (with J. Ordover and A. Sykes), Harvard Law Review, V. 95, No. 8, June 1982, pp. 1857-l875.

"An Economic Definition of Predation: Pricing and Product Innovation," (with J. Ordover), Yale Law Journal, Vol. 90: 473, December 1981, pp. 1-44.

"Fixed Costs, Sunk Costs, Entry Barriers, and the Sustainability of Monopoly," (with W. Baumol), Quarterly Journal of Economics, Vol. 96, No. 3, August 1981, pp. 405-432.

"Social Welfare Dominance," American Economic Review, Vol. 71, No. 2, May 1981, pp. 200-204.

"Economies of Scope," (with J. Panzar), American Economic Review, Vol. 72, No. 2, May 1981, pp. 268-272.

"Income-Distribution Concerns in Regulatory Policymaking," (with E.E. Bailey) in Studies in Public Regulation (G. Fromm, ed.), MIT Press, Cambridge, 1981, pp. 79-118.

"An Economic Definition of Predatory Product Innovation," (with J. Ordover), in Strategic Predation and Antitrust Analysis, S. Salop (ed.), 1981.

"What Can Markets Control?" in Perspectives on Postal Service Issues, R. Sherman (ed.), American Enterprise Institute, 1980.

"Pricing Decisions and the Regulatory Process," in Proceedings of the 1979 Rate Symposium on Problems of Regulated Industries, University of Missouri-Columbia Extension Publications, 1980, pp. 379-388.

"The Theory of Network Access Pricing," in Issues in Public Utility Regulation, H.M. Trebing (ed.), MSU Public Utilities Papers, 1979.

"Customer Equity and Local Measured Service," in Perspectives on Local Measured Service, J. Baude, etal. (ed.), 1979, pp. 71-80.

"The Role of Information in Designing Social Policy Towards Externalities," (with J. Ordover),

Journal of Public Economics, V. 12, 1979, pp. 271-299.

"Economies of Scale and the Profitability of Marginal-Cost Pricing: Reply," (with J. Panzar), Quarterly Journal of Economics, Vol. 93, No. 4, Novmber 1979, pp. 743-4.

"Theoretical Determinants of the Industrial Demand for Electricity by Time of Day," (with J. Panzar) Journal of Econometrics, V. 9, 1979, pp. 193-207.

"Industry Performance Gradient Indexes," (with R. Dansby), American Economic Review, V. 69, No. 3, June 1979, pp. 249-260.

"The Economic Gradient Method," (with E. Bailey), American Economic Review, Vol. 69, No. 2, May 1979, pp. 96-101.

"Multiproduct Technology and Market Structure," American Economic Review, Vol. 69, No. 2, May 1979, pp. 346-351.

"Consumer's Surplus Without Apology: Reply," American Economic Review, Vol. 69, No. 3, June 1979, pp. 469-474.

"Decisions with Estimation Uncertainty," (with R. Klein, D. Sibley, and L. Rafsky), Econometrica, V. 46, No. 6, November 1978, pp. 1363-1388.

"Incremental Consumer's Surplus and Hedonic Price Adjustment," Journal of Economic Theory, V. 17, No. 2, April 1978, pp. 227-253.

"Recent Theoretical Developments in Financial Theory: Discussion, "The Journal of Finance, V. 33, No. 3, June 1978, pp. 792-794.

"The Optimal Provision of Journals Qua Sometimes Shared Goods," (with J. Ordover), American Economic Review, V. 68, No. 3, June 1978, pp. 324-338.

"On the Comparative Statics of a Competitive Industry With Infra-marginal Firms," (with J. Panzar), American Economic Review, V. 68, No. 3, June 1978, pp. 474-478.

"Pareto Superior Nonlinear Outlay Schedules," Bell Journal of Economics, Vol. 9, No. 1, Spring 1978, pp. 56-69.

"Predatoriness and Discriminatory Pricing," in The Economics of Anti-Trust: Course of Study Materials, American Law Institute-American Bar Association, 1978.

"Economies of Scale in Multi-Output Production," (with J. Panzar), Quarterly Journal of Economics, V. 91, No. 3, August 1977, pp. 481-494.

"Weak Invisible Hand Theorems on the Sustainability of Multi-product Natural Monopoly," (with W. Baumol and E. Bailey), American Economic Review, V. 67, No. 3, June 1977, pp.

350-365.

"Free Entry and the Sustainability of Natural Monopoly," (with J. Panzar), Bell Journal of Economics, Spring 1977, pp. 1-22.

"Risk Invariance and Ordinally Additive Utility Functions," Econometrica, V. 45, No. 3, April 1977, pp. 621-640.

"Ramsey-Optimal Pricing of Long Distance Telephone Services," (with E. Bailey), in Pricing in Regulated Industries, Theory and Application, J. Wenders (ed.), Mountain State Telephone and Telegraph Co., 1977, pp. 68-97.

"Network Externalities and Optimal Telecommunications Pricing: A Preliminary Sketch," (with R. Klein), in Proceedings of Fifth Annual Telecommunications Policy Research Conference, Volume II, NTIS, 1977, pp. 475-505.

"Otsenka ekonomicheskoi effektivnosti proizvodstvennoi informatsii" ["The Evaluation of the Economic Benefits of Productive Information"] in Doklady Sovetskikh i Amerikanskikh Spetsialistov Predstavlennye na Pervyi Sovetsko-Amerikanskii Simpozium po Ekonomicheskoi Effektivnosti Informat sionnogo Obsluzhivaniia [Papers of Soviet and American Specialists Presented at the First Soviet- American Symposium on Costs and Benefits of Information Services], All Soviet Scientific Technical Information Center, Moscow, 1976.

"Vindication of a 'Common Mistake' in Welfare Economics," (with J. Panzar), Journal of Political Economy, V. 84, No. 6, December 1976, pp. 1361-1364.

"Consumer's Surplus Without Apology," American Economic Review, V. 66, No. 4, September 1976, pp. 589-597.

Books

Second Generation Reforms in Infrastructure Services, F. Basanes and R. Willig (eds.), Johns Hopkins Press, 2002.

Can Privatization Deliver? Infrastructure for Latin America, R. Willig co-editor, Johns Hopkins Press, 1999.

Handbook of Industrial Organization, (edited with R. Schmalensee), North Holland Press, Volumes 1 and 2, 1989.

Contestable Markets and the Theory of Industry Structure, (with W.J. Baumol and J.C. Panzar), Harcourt Brace Jovanovich, 1982. Second Edition, 1989.

Welfare Analysis of Policies Affecting Prices and Products, Garland Press, 1980.

Unpublished Papers and Reports:

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

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

"Public Comments on the 2010 Draft Horizontal Merger Guidelines," paper posted to Federal Trade Commission website, 6/4/2010

"An Econometric Analysis of the Matching Between Football Student-Athletes and Colleges," (with Yair Eilat, Bryan Keating and Jon Orszag), submitted for publication.

Supreme Court Amicus Brief Regarding Morgan Stanley Capital Group Inc. v. Public Utility District No. 1 of Snohomish County, Washington, (co-authored), AEI-Brookings Joint Center Brief No. 07-02, 12/2/07

"(Allegedly) Monopolizing Tying Via Product Innovation," statement before the Department of Justice/Federal Trade Commission Section 2 Hearings, November 1, 2006.

"Assessment of U.S. Merger Enforcement Policy," statement before the Antitrust Modernization Commission, 11/17/05.

"Investment is Appropriately Stimulated by TELRIC," in Pricing Based on Economic Cost, 12/2003.

"Brief of Amici Curiae Economics Professors, re Verizon v. Trinko, In the Supreme Court of the U.S.," (with W.J. Baumol, J.O. Ordover and F.R. Warren-Boulton), 7/25/2003.

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

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

"Effective Deregulation of Residential Electric Service," 2001

"Anticompetitive Forced Rail Access" (with W. J. Baumol), 2000

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

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

"Demonopolization," (with Sally Van Siclen), OECD Vienna Seminar Paper, 1993.

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

"The Effects of Capped NTS Charges on Long Distance Competition," (with M. Katz).

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

"Industry Economic Analysis in the Legal Arena," 1987.

"Deregulation of Long Distance Telephone Services: A Public Interest Assessment," (with M. Katz).

"Competition-Related Trade Issues," report prepared for OECD.

"Herfindahl Concentration Index," (with J. Ordover), Memorandum for ABA Section 7 Clayton Act Committee, Project on Revising the Merger Guidelines, March 1981.

"Market Power and Market Definition," (with J. Ordover), Memorandum for ABA Section 7 Clayton Act Committee, Project on Revising the Merger Guidelines, May 1981.

"The Continuing Need for and National Benefits Derived from the REA Telephone Loan Programs - An Economic Assessment," 1981.

"The Economics of Equipment Leasing: Costing and Pricing," 1980.

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

"Price Indexes and Intertemporal Welfare," Bell Laboratories Economics Discussion Paper, 1974.

"Consumer's Surplus: A Rigorous Cookbook," Technical Report #98, Economics Series, I.M.S.S.S., Stanford University, l973.

"An Economic-Demographic Model of the Housing Sector," (with B. Hickman and M. Hinz), Center for Research in Economic Growth, Stanford University, 1973.

Invited Conference Presentations:

Brookings Institution Conference on The Economics of the Airline Industry

"Airline Network Effects and Consumer Welfare" 2012

AGEP Public Policy Conference on Pharmaceutical Industry Economics, Regulation and Legal Issues; Law and Economics Center, George Mason University School of Law
"Pharmaceutical Brand-Generic Disputes" 2012

U.S.-EU Alliance Study Peer Review Conferences
"Review of Cooperative Agreements in Transatlantic Airline Markets" 2012
"The Research Agenda Ahead" 2012

Antitrust in the High Tech Sector Conference
"Developments in Merger Enforcement" 2012

Georgetown Center for Business and Public Policy, Conference on the Evolution of Regulation
"Reflections on Regulation" 2011

Antitrust Forum, New York State Bar Association
"Upward Price Pressure, Market Definition and Supply Mobility" 2011

American Bar Association, Antitrust Section, Annual Convention
"The New Merger Guidelines' Analytic Highlights" 2011

OECD and World Bank Conference on Challenges and Policies for Promoting Inclusive Growth
"Inclusive Growth From Competition and Innovation" 2011

Villanova School of Business Executive MBA Conference
"Airline Network Effects, Competition and Consumer Welfare" 2011

NYU School of Law Conference on Critical Directions in Antitrust
"Unilateral Competitive Effects" 2010

Conf. on the State of European Competition Law and Enforcement in a Transatlantic Context
"Recent Developments in Merger Control" 2010

Center on Regulation and Competition, Universidad de Chile Law School
"Economic Regulation and the Limits of Antitrust Law" 2010

Center on Regulation and Competition, Universidad de Chile Law School
"Merger Policy and Guidelines Revision" 2010

Faculty of Economics, Universidad de Chile
"Network Effects in Airlines Markets" 2010

Georgetown Law Global Antitrust Enforcement Symposium
"New US Merger Guidelines" 2010

FTI London Financial Services Conference
"Competition and Regulatory Reform" 2010

NY State Bar Association Annual Antitrust Conference
"New Media Competition Policy" 2009

Antitrust Law Spring Meeting of the ABA
"Antitrust and the Failing Economy Defense" 2009

Georgetown Law Global Antitrust Enforcement Symposium
"Mergers: New Enforcement Attitudes in a Time of Economic Challenge" 2009

Phoenix Center US Telecoms Symposium
"Assessment of Competition in the Wireless Industry" 2009

FTC and DOJ Horizontal Merger Guidelines Workshop
"Direct Evidence is No Magic Bullet" 2009

Northwestern Law Research Symposium: Antitrust Economics and Competition Policy
"Discussion of Antitrust Evaluation of Horizontal Mergers" 2008

Inside Counsel Super-Conference
"Navigating Mixed Signals under Section 2 of the Sherman Act" 2008

Federal Trade Commission Workshop on Unilateral Effects in Mergers
"Best Evidence and Market Definition" 2008

European Policy Forum, Rules for Growth: Telecommunications Regulatory Reform
"What Kind of Regulation For Business Services?" 2007

Japanese Competition Policy Research Center, Symposium on M&A and Competition Policy
"Merger Policy Going Forward With Economics and the Economy" 2007

Federal Trade Commission and Department of Justice Section 2 Hearings
"Section 2 Policy and Economic Analytic Methodologies" 2007

Pennsylvania Bar Institute, Antitrust Law Committee CLE
"The Economics of Resale Price Maintenance and Class Certification" 2007

Pennsylvania Bar Institute, Antitrust Law Committee CLE
"Antitrust Class Certification – An Economist's Perspective" 2007

Fordham Competition Law Institute, International Competition Economics Training Seminar
"Monopolization and Abuse of Dominance" 2007

Canadian Bar Association Annual Fall Conference on Competition Law

"Economic Tools for the Competition Lawyer" 2007

Conference on Managing Litigation and Business Risk in Multi-jurisdiction Antitrust Matters
"Economic Analysis in Multi-jurisdictional Merger Control" 2007

World Bank Conference on Structuring Regulatory Frameworks for Dynamic and Competitive South Eastern European Markets
"The Roles of Government Regulation in a Dynamic Economy" 2006

Department of Justice/Federal Trade Commission Section 2 Hearings
"(Allegedly) Monopolizing Tying Via Product Innovation" 2006

Fordham Competition Law Institute, Competition Law Seminar
"Monopolization and Abuse of Dominance" 2006

Practicing Law Institute on Intellectual Property Antitrust
"Relevant Markets for Intellectual Property Antitrust" 2006

PLI Annual Antitrust Law Institute
"Cutting Edge Issues in Economics" 2006

World Bank's Knowledge Economy Forum V
"Innovation, Growth and Competition" 2006

Charles University Seminar Series
"The Dangers of Over-Ambitious Antitrust Regulation" 2006

NY State Bar Association Antitrust Law Section Annual Meeting
"Efficient Integration or Illegal Monopolization?" 2006

World Bank Seminar
"The Dangers of Over-Ambitious Regulation" 2005

ABA Section of Antitrust Law 2005 Fall Forum
"Is There a Gap Between the Guidelines and Agency Practice?" 2005

Hearing of Antitrust Modernization Commission
"Assessment of U.S. Merger Enforcement Policy" 2005

LEAR Conference on Advances in the Economics of Competition Law
"Exclusionary Pricing Practices" 2005

Annual Antitrust Law Institute
"Cutting Edge Issues in Economics" 2005

PRIOR Symposium on States and Stem Cells

"Assessing the Economics of State Stem Cell Programs" 2005

ABA Section of Antitrust Law – AALS Scholars Showcase
"Distinguishing Anticompetitive Conduct" 2005

Allied Social Science Associations National Convention
"Antitrust in the New Economy" 2005

ABA Section of Antitrust Law 2004 Fall Forum
"Advances in Economic Analysis of Antitrust" 2004

Phoenix Center State Regulator Retreat
"Regulatory Policy for the Telecommunications Revolution" 2004

OECD Competition Committee
"Use of Economic Evidence in Merger Control" 2004

Justice Department/Federal Trade Commission Joint Workshop
"Merger Enforcement" 2004

Phoenix Center Annual U.S. Telecoms Symposium
"Incumbent Market Power" 2003

Center for Economic Policy Studies Symposium on Troubled Industries
"What Role for Government in Telecommunications?" 2003

Princeton Workshop on Price Risk and the Future of the Electric Markets
"The Structure of the Electricity Markets" 2003

2003 Antitrust Conference
"International Competition Policy and Trade Policy" 2003

International Industrial Organization Conference
"Intellectual Property System Reform" 2003

ABA Section of Antitrust Law 2002 Fall Forum
"Competition, Regulation and Pharmaceuticals" 2002

Fordham Conference on International Antitrust Law and Policy
"Substantive Standards for Mergers and the Role of Efficiencies" 2002

Department of Justice Telecom Workshop
"Stimulating Investment and the Telecommunications Act of 1996" 2002

Department of Commerce Conference on the State of the Telecom Sector
"Stimulating Investment and the Telecommunications Act of 1996" 2002

Law and Public Affairs Conference on the Future of Internet Regulation
"Open Access and Competition Policy Principles" 2002

Center for Economic Policy Studies Symposium on Energy Policy
"The Future of Power Supply" 2002

The Conference Board: Antitrust Issues in Today's Economy
"The 1982 Merger Guidelines at 20" 2002

Federal Energy Regulatory Commission Workshop
"Effective Deregulation of Residential Electric Service" 2001

IPEA International Seminar on Regulation and Competition
"Electricity Markets: Deregulation of Residential Service" 2001
"Lessons for Brazil from Abroad" 2001

ABA Antitrust Law Section Task Force Conference
"Time, Change, and Materiality for Monopolization Analyses" 2001

Harvard University Conference on American Economic Policy in the 1990s
"Comments on Antitrust Policy in the Clinton Administration" 2001

Tel-Aviv Workshop on Industrial Organization and Anti-Trust
"The Risk of Contagion from Multimarket Contact" 2001

2001 Antitrust Conference
"Collusion Cases: Cutting Edge or Over the Edge?" 2001
"Dys-regulation of California Electricity" 2001

FTC Public Workshop on Competition Policy for E-Commerce
"Necessary Conditions for Cooperation to be Problematic" 2001

HIID International Workshop on Infrastructure Policy
"Infrastructure Privatization and Regulation" 2000

Villa Mondragone International Economic Seminar
"Competition Policy for Network and Internet Markets" 2000

New Developments in Railroad Economics: Infrastructure Investment and Access Policies
"Railroad Access, Regulation, and Market Structure" 2000

The Multilateral Trading System at the Millennium
"Efficiency Gains From Further Liberalization" 2000

Singapore – World Bank Symposium on Competition Law and Policy
"Policy Towards Cartels and Collusion" 2000

CEPS: Is It a New World?: Economic Surprises of the Last Decade
"The Internet and E-Commerce" 2000

Cutting Edge Antitrust: Issues and Enforcement Policies
"The Direction of Antitrust Entering the New Millennium" 2000

The Conference Board: Antitrust Issues in Today's Economy
"Antitrust Analysis of Industries With Network Effects" 1999

CEPS: New Directions in Antitrust
"Antitrust in a High-Tech World" 1999

World Bank Meeting on Competition and Regulatory Policies for Development
"Economic Principles to Guide Post-Privatization Governance" 1999

1999 Antitrust Conference
"Antitrust and the Pace of Technological Development" 1999
"Restructuring the Electric Utility Industry" 1999

HIID International Workshop on Privatization, Regulatory Reform and Corporate Governance
"Privatization and Post-Privatization Regulation of Natural Monopolies" 1999

The Federalist Society: Telecommunications Deregulation: Promises Made, Potential Lost?
"Grading the Regulators" 1999

Inter-American Development Bank: Second Generation Issues In the Reform Of Public Services
"Post-Privatization Governance" 1999
"Issues Surrounding Access Arrangements" 1999

Economic Development Institute of the World Bank -- Program on Competition Policy
"Policy Towards Horizontal Mergers" 1998

Twenty-fifth Anniversary Seminar for the Economic Analysis Group of the Department of

Justice
"Market Definition in Antitrust Analysis" 1998

HIID International Workshop on Privatization, Regulatory Reform and Corporate Governance
"Infrastructure Architecture and Regulation: Railroads" 1998

EU Committee Competition Conference – Market Power
"US/EC Perspective on Market Definition" 1998

Federal Trade Commission Roundtable
"Antitrust Policy for Joint Ventures" 1998

1998 Antitrust Conference
"Communications Mergers" 1998

The Progress and Freedom Foundation Conference on Competition, Convergence, and the Microsoft Monopoly
Access and Bundling in High-Technology Markets 1998

FTC Program on The Effective Integration of Economic Analysis into Antitrust Litigation
The Role of Economic Evidence and Testimony 1997

FTC Hearings on Classical Market Power in Joint Ventures
Microeconomic Analysis and Guideline 1997

World Bank Economists --Week IV Keynote
Making Markets More Effective With Competition Policy 1997

Brookings Trade Policy Forum
Competition Policy and Antidumping: The Economic Effects 1997

University of Malaya and Harvard University Conference on The Impact of Globalisation and Privatisation on Malaysia and Asia in the Year 2020
Microeconomics, Privatization, and Vertical Integration 1997

ABA Section of Antitrust Law Conference on The Telecommunications Industry
Current Economic Issues in Telecommunications 1997

Antitrust 1998: The Annual Briefing
The Re-Emergence of Distribution Issues 1997

Inter-American Development Bank Conference on Private Investment, Infrastructure Reform and Governance in Latin America & the Caribbean
Economic Principles to Guide Post-Privatization Governance 1997

Harvard Forum on Regulatory Reform and Privatization of Telecommunications in the Middle East
Privatization: Methods and Pricing Issues 1997

American Enterprise Institute for Public Policy Research Conference
Discussion of Local Competition and Legal Culture 1997

Harvard Program on Global Reform and Privatization of Public Enterprises
"Infrastructure Privatization and Regulation: Freight" 1997

World Bank Competition Policy Workshop
"Competition Policy for Entrepreneurship and Growth" 1997

Eastern Economics Association Paul Samuelson Lecture
"Bottleneck Access in Regulation and Competition Policy" 1997

ABA Annual Meeting, Section of Antitrust Law
"Antitrust in the 21st Century: The Efficiencies Guidelines" 1997

Peruvian Ministry of Energy and Mines Conference on Regulation of Public Utilities
"Regulation: Theoretical Context and Advantages vs. Disadvantages" 1997

The FCC: New Priorities and Future Directions
"Competition in the Telecommunications Industry" 1997

American Enterprise Institute Studies in Telecommunications Deregulation
"The Scope of Competition in Telecommunications" 1996

George Mason Law Review Symposium on Antitrust in the Information Revolution
"Introduction to the Economic Theory of Antitrust and Information" 1996

Korean Telecommunications Public Lecture
"Market Opening and Fair Competition" 1996

Korea Telecommunications Forum
"Desirable Interconnection Policy in a Competitive Market" 1996

European Association for Research in Industrial Economics Annual Conference
"Bottleneck Access: Regulation and Competition Policy" 1996

Harvard Program on Global Reform and Privatization of Public Enterprises
"Railroad and Other Infrastructure Privatization" 1996

FCC Forum on Antitrust and Economic Issues Involved with InterLATA Entry
"The Scope of Telecommunications Competition" 1996

Citizens for a Sound Economy Policy Watch on Telecommunications Interconnection
"The Economics of Interconnection" 1996

World Bank Seminar on Experiences with Corporatization
"Strategic Directions of Privatization" 1996

FCC Economic Forum on the Economics of Interconnection
Lessons from Other Industries 1996

ABA Annual Meeting, Section of Antitrust Law
The Integration, Disintegration, and Reintegration
of the Entertainment Industry 1996

Conference Board: 1996 Antitrust Conference
How Economics Influences Antitrust and Vice Versa 1996

Antitrust 1996: A Special Briefing
Joint Ventures and Strategic Alliances 1996

New York State Bar Association Section of Antitrust Law Winter Meeting
Commentary on Horizontal Effects Issues 1996

FTC Hearings on the Changing Nature of Competition in a Global and Innovation-Driven Age
Vertical Issues for Networks and Standards 1995

Wharton Seminar on Applied Microeconomics
Access Policies with Imperfect Regulation 1995

Antitrust 1996, Washington D.C.
Assessing Joint Ventures for Diminution of Competition 1995

ABA Annual Meeting, Section of Antitrust Law
Refusals to Deal -- Economic Tests for Competitive Harm 1995

FTC Seminar on Antitrust Enforcement Analysis
Diagnosing Collusion Possibilities 1995

Philadelphia Bar Education Center: Antitrust Fundamentals
Antitrust--The Underlying Economics 1995

Vanderbilt University Conference on Financial Markets

Why Do Christie and Schultz Infer Collusion From Their Data? 1995

ABA Section of Antitrust Law Chair=s Showcase Program
Discussion of Telecommunications Competition Policy 1995

Conference Board: 1995 Antitrust Conference
Analysis of Mergers and Joint Ventures 1995

ABA Conference on The New Antitrust: Policy of the '90s
Antitrust on the Super Highways/Super Airways 1994

ITC Hearings on The Economic Effects of Outstanding Title VII Orders
"The Economic Impacts of Antidumping Policies" 1994

OECD Working Conference on Trade and Competition Policy
"Empirical Evidence on The Nature of Anti-dumping Actions" 1994

Antitrust 1995, Washington D.C.
"Rigorous Antitrust Standards for Distribution Arrangements" 1994

ABA -- Georgetown Law Center: Post Chicago-Economics: New Theories - New Cases?
"Economic Foundations for Vertical Merger Guidelines" 1994

Conference Board: Antitrust Issues in Today's Economy
"New Democrats, Old Agencies: Competition Law and Policy" 1994

Federal Reserve Board Distinguished Economist Series
"Regulated Private Enterprise Versus Public Enterprise" 1994

Institut d'Etudes Politiques de Paris
"Lectures on Competition Policy and Privatization" 1993

Canadian Bureau of Competition Policy Academic Seminar Series, Toronto.
"Public Versus Regulated Private Enterprise" 1993

CEPS Symposium on The Clinton Administration: A Preliminary Report Card
"Policy Towards Business" 1993

Columbia Institute for Tele-Information Conference on Competition in Network Industries, New York, NY
"Discussion of Deregulation of Networks: What Has Worked and What Hasn't" 1993

World Bank Annual Conference on Development Economics
"Public Versus Regulated Private Enterprise" 1993

Center for Public Utilities Conference on Current Issues Challenging the Regulatory Process
"The Economics of Current Issues in Telecommunications Regulation" 1992
"The Role of Markets in Presently Regulated Industries" 1992

The Conference Board's Conference on Antitrust Issues in Today's Economy, New York, NY
"Antitrust in the Global Economy" 1992
"Monopoly Issues for the '90s" 1993

Columbia University Seminar on Applied Economic Theory, New York, NY
"Economic Rationales for the Scope of Privatization" 1992

Howrey & Simon Conference on Antitrust Developments, Washington, DC
"Competitive Effects of Concern in the Merger Guidelines" 1992

Arnold & Porter Colloquium on Merger Enforcement, Washington, DC
"The Economic Foundations of the Merger Guidelines" 1992

American Bar Association, Section on Antitrust Law Leadership Council Conference, Monterey, CA
"Applying the 1992 Merger Guidelines" 1992

OECD Competition Policy Meeting, Paris, France
"The Economic Impacts of Antidumping Policy" 1992

Center for Public Choice Lecture Series, George Mason University Arlington, VA
"The Economic Impacts of Antidumping Policy" 1992

Brookings Institution Microeconomics Panel, Washington, DC,
"Discussion of the Evolution of Industry Structure" 1992

AT&T Conference on Antitrust Essentials
"Antitrust Standards for Mergers and Joint Ventures" 1991

ABA Institute on The Cutting Edge of Antitrust: Market Power
"Assessing and Proving Market Power: Barriers to Entry" 1991

Second Annual Workshop of the Competition Law and Policy Institute of New Zealand
"Merger Analysis, Industrial Organization Theory, and Merger Guidelines" 1991
"Exclusive Dealing and the Fisher & Paykel Case" 1991

Special Seminar of the New Zealand Treasury
"Strategic Behavior, Antitrust, and The Regulation of Natural Monopoly" 1991

Public Seminar of the Australian Trade Practices Commission
"Antitrust Issues of the 1990's" 1991

National Association of Attorneys General Antitrust Seminar
"Antitrust Economics" 1991

District of Columbia Bar's 1991 Annual Convention
"Administrative and Judicial Trends in Federal Antitrust Enforcement" 1991

ABA Spring Meeting
"Antitrust Lessons From the Airline Industry" 1991

Conference on The Transition to a Market Economy - Institutional Aspects
"Anti-Monopoly Policies and Institutions" 1991

Conference Board's Thirtieth Antitrust Conference
"Antitrust Issues in Today's Economy" 1991

American Association for the Advancement of Science Annual Meeting
"Methodologies for Economic Analysis of Mergers" 1991

General Seminar, Johns Hopkins University
"Economic Rationales for the Scope of Privatization" 1991

Capitol Economics Speakers Series
"Economics of Merger Guidelines" 1991

CRA Conference on Antitrust Issues in Regulated Industries
"Enforcement Priorities and Economic Principles" 1990

Pepper Hamilton & Scheetz Anniversary Colloquium
"New Developments in Antitrust Economics" 1990

PLI Program on Federal Antitrust Enforcement in the 90's
"The Antitrust Agenda of the 90's" 1990

FTC Distinguished Speakers Seminar
"The Evolving Merger Guidelines" 1990

The World Bank Speakers Series
"The Role of Antitrust Policy in an Open Economy" 1990

Seminar of the Secretary of Commerce and Industrial Development of Mexico
"Transitions to a Market Economy" 1990

Southern Economics Association
"Entry in Antitrust Analysis of Mergers" 1990
"Discussion of Strategic Investment and Timing of Entry" 1990

American Enterprise Institute Conference on Policy Approaches to the Deregulation of Network Industries
"Discussion of Network Problems and Solutions" 1990

American Enterprise Institute Conference on Innovation, Intellectual Property, and World Competition
"Law and Economics Framework for Analysis" 1990

Banco Nacional de Desenvolvimento Economico Social Lecture
"Competition Policy: Harnessing Private Interests for the Public Interest" 1990

Western Economics Association Annual Meetings
"New Directions in Antitrust from a New Administration" 1990
"New Directions in Merger Enforcement: The View from Washington" 1990

Woodrow Wilson School Alumni Colloquium
"Microeconomic Policy Analysis and Antitrust--Washington 1990" 1990

Arnold & Porter Lecture Series
"Advocating Competition" 1991
"Antitrust Enforcement" 1990

ABA Antitrust Section Convention
"Recent Developments in Market Definition and Merger Analysis" 1990

Federal Bar Association
"Joint Production Legislation: Competitive Necessity or Cartel Shield?" 1990

Pew Charitable Trusts Conference
"Economics and National Security" 1990

ABA Antitrust Section Midwinter Council Meeting
"Fine-tuning the Merger Guidelines" 1990
"The State of the Antitrust Division" 1991

International Telecommunications Society Conference
"Discussion of the Impact of Telecommunications in the UK" 1989

The Economists of New Jersey Conference
"Recent Perspectives on Regulation" 1989

Conference on Current Issues Challenging the Regulatory Process
"Innovative Pricing and Regulatory Reform" 1989
"Competitive Wheeling" 1989

Conference Board: Antitrust Issues in Today's Economy
"Foreign Trade Issues and Antitrust" 1989

McKinsey & Co. Mini-MBA Conference
"Economic Analysis of Pricing, Costing, and Strategic Business Behavior" 1989
1994

Olin Conference on Regulatory Mechanism Design
"Revolutions in Regulatory Theory and Practice: Exploring The Gap" 1989

University of Dundee Conference on Industrial Organization and Strategic Behavior
"Mergers in Differentiated Product Industries" 1988

Leif Johanson Lectures at the University of Oslo
"Normative Issues in Industrial Organization" 1988

Mergers and Competitiveness: Spain Facing the EEC
"Merger Policy" 1988
"R&D Joint Ventures" 1988

New Dimensions in Pricing Electricity
"Competitive Pricing and Regulatory Reform" 1988

Program for Integrating Economics and National Security: Second Annual Colloquium
"Arming Decisions Under Asymmetric Information" 1988

European Association for Research in Industrial Economics
"U.S. Railroad Deregulation and the Public Interest" 1987
"Economic Rationales for the Scope of Privatization" 1989
"Discussion of Licensing of Innovations" 1990

Annenberg Conference on Rate of Return Regulation in the Presence of Rapid Technical Change
"Discussion of Regulatory Mechanism Design in the Presence
of Research, Innovation, and Spillover Effects" 1987

Special Brookings Papers Meeting
"Discussion of Empirical Approaches to Strategic Behavior" 1987
"New Merger Guidelines" 1990

Deregulation or Regulation for Telecommunications in the 1990's
"How Effective are State and Federal Regulations?" 1987

Conference Board Roundtable on Antitrust
"Research and Production Joint Ventures" 1990
"Intellectual Property and Antitrust" 1987

Current Issues in Telephone Regulation
"Economic Approaches to Market Dominance: Applicability of Contestable Markets" 1987

Harvard Business School Forum on Telecommunications
"Regulation of Information Services" 1987

The Fowler Challenge: Deregulation and Competition in The Local Telecommunications Market
"Why Reinvent the Wheel?" 1986

World Bank Seminar on Frontiers of Economics
"What Every Economist Should Know About Contestable Markets" 1986
Bell Communications Research Conference on Regulation and Information
"Fuzzy Regulatory Rules" 1986

Karl Eller Center Forum on Telecommunications
"The Changing Economic Environment in Telecommunications: Technological Change and Deregulation" 1986

Railroad Accounting Principles Board Colloquium
"Contestable Market Theory and ICC Regulation 1986

Canadian Embassy Conference on Current Issues in Canadian -- U.S. Trade and Investment
"Regulatory Revolution in the Infrastructure Industries" 1985

Eagleton Institute Conference on Telecommunications in Transition
"Industry in Transition: Economic and Public Policy Overview" 1985

Brown University Citicorp Lecture
"Logic of Regulation and Deregulation" 1985

Columbia University Communications Research Forum
"Long Distance Competition Policy" 1985

American Enterprise Institute Public Policy Week
"The Political Economy of Regulatory Reform" 1984

MIT Communications Forum
"Deregulation of AT&T Communications" 1984

Bureau of Census Longitudinal Establishment Data File and Diversification Study Conference
"Potential Uses of The File" 1984

Federal Bar Association Symposium on Joint Ventures
"The Economics of Joint Venture Assessment" 1984

Hoover Institute Conference on Antitrust
"Antitrust for High-Technology Industries" 1984

NSF Workshop on Predation and Industrial Targeting
"Current Economic Analysis of Predatory Practices" 1983

The Institute for Study of Regulation Symposium: Pricing Electric, Gas, and Telecommunications Services Today and for the Future
"Contestability As A Guide for Regulation and Deregulation" 1984

University of Pennsylvania Economics Day Symposium
"Contestability and Competition: Guides for Regulation and Deregulation" 1984

Pinhas Sapir Conference on Economic Policy in Theory and Practice
"Corporate Governance and Market Structure" 1984

Centre of Planning and Economic Research of Greece
"Issues About Industrial Deregulation" 1984
"Contestability: New Research Agenda" 1984

Hebrew and Tel Aviv Universities Conference on Public Economics
"Social Welfare Dominance Extended and Applied to Excise Taxation" 1983

NBER Conference on Industrial Organization and International Trade
"Perspectives on Horizontal Mergers in World Markets" 1983

Workshop on Local Access: Strategies for Public Policy
"Market Structure and Government Intervention in Access Markets" 1982

NBER Conference on Strategic Behavior and International Trade
"Industrial Strategy with Committed Firms: Discussion" 1982

Columbia University Graduate School of Business, Conference on Regulation and New Telecommunication Networks
"Local Pricing in a Competitive Environment" 1982

International Economic Association Roundtable Conference on New Developments in the Theory of Market Structure

"Theory of Contestability" 1982
"Product Dev., Investment, and the Evolution of Market Structures" 1982

N.Y.U. Conference on Competition and World Markets: Law and Economics
"Competition and Trade Policy--International Predation" 1982

CNRS-ISPE-NBER Conference on the Taxation of Capital
"Welfare Effects of Investment Under Imperfect Competition" 1982

Internationales Institut fur Management und Verwalturg Regulation Conference
"Welfare, Regulatory Boundaries, and the Sustainability of Oligopolies" 1981
NBER-Kellogg Graduate School of Management Conference on the
Econometrics of Market Models with Imperfect Competition
"Discussion of Measurement of Monopoly Behavior: An
Application to the Cigarette Industry" 1981

The Peterkin Lecture at Rice University
"Deregulation: Ideology or Logic?" 1981

FTC Seminar on Antitrust Analysis
"Viewpoints on Horizontal Mergers 1982
"Predation as a Tactical Inducement for Exit" 1980

NBER Conference on Industrial Organization and Public Policy
"An Economic Definition of Predation" 1980

The Center for Advanced Studies in Managerial Economics Conference on The Economics of Telecommunication
"Pricing Local Service as an Input" 1980

Aspen Institute Conference on the Future of the Postal Service
"Welfare Economics of Postal Pricing" 1979

Department of Justice Antitrust Seminar
"The Industry Performance Gradient Index" 1979

Eastern Economic Association Convention
"The Social Performance of Deregulated Markets for Telecom Services"
1979

Industry Workshop Association Convention
"Customer Equity and Local Measured Service" 1979

Symposium on Ratemaking Problems of Regulated Industries
"Pricing Decisions and the Regulatory Process" 1979

Woodrow Wilson School Alumni Conference
"The Push for Deregulation" 1979

NBER Conference on Industrial Organization
"Intertemporal Sustainability" 1979

World Congress of the Econometric Society
"Theoretical Industrial Organization" 1980

Institute of Public Utilities Conference on Current Issues in Public Utilities Regulation
"Network Access Pricing" 1978

ALI-ABA Conference on the Economics of Antitrust
"Predatoriness and Discriminatory Pricing" 1978

AEI Conference on Postal Service Issues
"What Can Markets Control?" 1978

University of Virginia Conference on the Economics of Regulation
"Public Interest Pricing" 1978

DRI Utility Conference
"Marginal Cost Pricing in the Utility Industry: Impact and Analysis" 1978

International Meeting of the Institute of Management Sciences
"The Envelope Theorem" 1977

University of Warwick Workshop on Oligopoly
"Industry Performance Gradient Indexes" 1977

North American Econometric Society Convention
"Intertemporal Sustainability" 1979
"Social Welfare Dominance" 1978
"Economies of Scope, DAIC, and Markets with Joint Production" 1977

Telecommunications Policy Research Conference
"Transition to Competitive Markets" 1986
"InterLATA Capacity Growth, Capped NTS Charges and Long Distance Competition" 1985
"Market Power in The Telecommunications Industry" 1984
"FCC Policy on Local Access Pricing" 1983
"Do We Need a Regulatory Safety Net in Telecommunications?" 1982
"Anticompetitive Vertical Conduct" 1981
"Electronic Mail and Postal Pricing" 1980
"Monopoly, Competition and Efficiency": Chairman 1979

"A Common Carrier Research Agenda" 1978
"Empirical Views of Ramsey Optimal Telephone Pricing" 1977
"Recent Research on Regulated Market Structure" 1976
"Some General Equilibrium Views of Optimal Pricing" 1975

National Bureau of Economic Research Conference on Theoretical Industrial Organization
"Compensating Variation as a Measure of Welfare Change" 1976
Conference on Pricing in Regulated Industries: Theory & Application
"Ramsey Optimal Pricing of Long Distance Telephone Services" 1977

NBER Conference on Public Regulation
"Income Distributional Concerns in Regulatory Policy-Making" 1977

Allied Social Science Associations National Convention
"Merger Guidelines and Economic Theory" 1990
Discussion of "Competitive Rules for Joint Ventures" 1989
"New Schools in Industrial Organization" 1988
"Industry Economic Analysis in the Legal Arena" 1987
"Transportation Deregulation" 1984
Discussion of "Pricing and Costing of Telecommunications Services" 1983
Discussion of "An Exact Welfare Measure" 1982
"Optimal Deregulation of Telephone Services" 1982
"Sector Differentiated Capital Taxes" 1981
"Economies of Scope" 1980
"Social Welfare Dominance" 1980
"The Economic Definition of Predation" 1979
Discussion of "Lifeline Rates, Succor or Snare?" 1979
"Multiproduct Technology and Market Structure" 1978
"The Economic Gradient Method" 1978
"Methods for Public Interest Pricing" 1977
Discussion of "The Welfare Implications of New Financial Instruments" 1976
"Welfare Theory of Concentration Indices" 1976
Discussion of "Developments in Monopolistic Competition Theory" 1976
"Hedonic Price Adjustments" 1975
"Public Good Attributes of Information and its Optimal Pricing" 1975
"Risk Invariance and Ordinally Additive Utility Functions" 1974
"Consumer's Surplus: A Rigorous Cookbook" 1974

University of Chicago Symposium on the Economics of Regulated Public Utilities
"Optimal Prices for Public Purposes" 1976

American Society for Information Science
"The Social Value of Information: An Economist's View" 1975

Institute for Mathematical Studies in the Social Sciences Summer Seminar

"The Sustainability of Natural Monopoly" 1975

U.S.-U.S.S.R. Symposium on Estimating Costs and Benefits of Information Services
"The Evaluation of the Economic Benefits of Productive Information" 1975

NYU-Columbia Symposium on Regulated Industries
"Ramsey Optimal Public Utility Pricing" 1975

Research Seminars:

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