

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

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FINAL OFFER RATE REVIEW

**OPENING COMMENTS OF
THE AMERICAN CHEMISTRY COUNCIL, THE FERTILIZER INSTITUTE,
THE NATIONAL INDUSTRIAL TRANSPORTATION LEAGUE,
THE CHLORINE INSTITUTE, AND THE CORN REFINERS ASSOCIATION**

The American Chemistry Council (“ACC”), The Fertilizer Institute (“TFI”), The National Industrial Transportation League (“League”), the Chlorine Institute, and the Corn Refiners Association (“CRA”) (collectively the “Coalition Associations”) jointly submit these Opening Comments in response to the Notice of Proposed Rulemaking served by the Surface Transportation Board (“Board”) in the above-captioned docket on September 12, 2019 (“NPRM”). The NPRM proposes a new procedure for challenging the reasonableness of rail rates that is based upon recommendations in a Report issued by the Board’s Rate Reform Task Force (“RRTF”) on April 25, 2019 (“RRTF Report”). The new procedures, which the Board calls “Final Offer Rate Review” or “FORR,” constitute an attempt to provide “a more accessible avenue for rate reasonableness review by the Board” in smaller cases by “providing faster, less costly review of claims of unreasonable rail rates.”¹

I. Statement of interest and summary of comments.

Collectively, the Coalition Associations represent a broad spectrum of shippers across multiple industries that depend upon meaningful and accessible regulation to prevent railroads

¹ NPRM at 7.

from abusing their market power to charge unreasonable rates. They strongly support the actions the Board has proposed to make rate reasonableness remedies more accessible to a greater population of captive shippers in this docket and in Docket Nos. EP 756, *Market Dominance Streamlined Approach* (Served Sept. 12, 2019), and EP 761, *Hearing on Revenue Adequacy* (served Sept. 12, 2019). They also believe that these proposals must be part of a broader, holistic effort to reduce the need for regulation of rail rates through enhanced competition.

FORR establishes a *process* for rate reasonableness cases but does not prescribe a *methodology* to determine reasonableness.² Instead, FORR allows the parties to propose any methodology that satisfies the three sets of criteria outlined in the NPRM, which are the rail transportation policies, Long-Cannon factors, and appropriate economic principles.³ While the Coalition Associations support that approach, it nevertheless requires shippers to take a “leap-of-faith” that they will be able to develop methods that the Board ultimately will deem acceptable. It is absolutely critical, therefore, that the Board provides a reasonable opportunity for shippers to obtain crucial information to develop methodologies that are workable and supportable.

In these comments, the Coalition Associations offer substantive improvements to ensure complainants have access to sufficient information to devise defensible methodologies for determining rate reasonableness. This requires extending the discovery period to 35 days, creating an expedited procedure for motions to compel, and expanding access to the waybill sample. In addition, the Coalition Associations propose a bifurcated market dominance process that allows complainants who cannot avail themselves of the streamlined market dominance process proposed in EP 756 to still use the FORR process. They also suggest modifications to, and clarifications of, the relief caps to better reflect the utility of the FORR process.

² NPRM at 15.

³ NPRM at 10-11.

Furthermore, they question the Board’s rationale for excluding Class II and III carriers from the expedited and less costly FORR process, which leaves those carriers subject only to the admittedly complex, lengthy, and expensive SAC process. In Exhibit 1, the Coalition Associations have presented both clean and redlined versions of the proposed regulations in Appendix A of the NPRM to reflect their proposed modifications to the Board’s proposals.⁴

Finally, through these comments and testimony in EP 761, ACC presents a new methodology for determining rate reasonableness that combines the rate benchmarking principles recommended by the Transportation Research Board (“TRB”)⁵ and the revenue-adequacy constraint discussed in *Coal Rate Guidelines, Nationwide*, 1 I.C.C. 2d 520, 534-37 (1985) (“*Guidelines*”). ACC’s proposed rate benchmarking methodology is a strong candidate for use in the FORR process. Moreover, the methodology is as economically robust as SAC and thus should be available for use by all shippers in all circumstances without limiting the available relief. The presentation of this new methodology is sponsored by the attached Verified Statement of Kevin W. Caves and associated electronic work papers (“Caves V.S.”).⁶

⁴ Due to some overlap between this proceeding and EP 756, the proposed rules in Exhibit 1 should be considered in concert with the proposed rules in Exhibit 1 of the Coalition Associations’ opening comments in EP 756.

⁵ Transportation Research Board, *Modernizing Freight Rail Regulation*, Special Report 318, National Academies of Sciences, Engineering, and Medicine (2015), *available at* <http://www.trb.org/Main/Blurbs/172736.aspx>. The TRB’ prepared this report pursuant Congressional directive in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users of 2005, Public Law 109-59, Section 9007.

⁶ The electronic workpapers have been filed under seal because they contain data from the Confidential Costed Waybill Sample. Any party desiring access to these workpapers is advised to submit an appropriate request for waybill access to the Board. Once a party has signed the appropriate waybill access agreements with the Board, Thompson Hine may share the workpapers with that party.

II. There is an urgent need for an alternative rate case standard that is accessible to carload shippers.

The Board's current procedures for determining maximum reasonable rail rates have proven to be ineffective for, and inaccessible to, the vast majority of captive rail shippers that ship in carload quantities. For over 20 years, the only method was the Stand-Alone Cost ("SAC") process, which was "too costly, too time consuming, and too unpredictable," especially for carload shippers.⁷ Despite efforts to develop alternatives to SAC, the resulting procedures also have been cumbersome, costly, and ineffective, as they have tried to mimic SAC results. For these and other reasons, Board members have stated in recent cases involving carload traffic that finding an alternative to SAC should be a priority. The Board significantly advances that priority with the FORR proposal in the Notice.

A SAC case is an enormous undertaking, and "[e]ven the most straightforward SAC case . . . involves a lengthy and complex proceeding."⁸ From start-to-finish, a SAC case can take over five years, not including appeals. Litigation costs for unit train coal shippers were upwards of \$5 million over a decade ago in 2007.⁹ They are even more costly today and especially for carload shippers who often must design a more extensive SAC network to serve scores of origin-destination pairs and model more complex operations.

To develop a SAC case, a shipper must design and construct a hypothetical railroad (called a "Stand-Alone Railroad" or "SARR"), accounting for everything from the number, type, and transportation costs of rail ties; to the terrain the railroad traverses; to maintenance

⁷ *Total Petrochemicals & Refining USA, Inc. v. CSX Transp.*, NOR 42121, slip op. at 48 (STB served Sept. 14, 2016) (Begeman, dissenting) ("*Total*").

⁸ *E.I. DuPont de Nemours & Co. v. Norfolk S. Ry.*, NOR 42125, slip op. at 6 (STB served Dec. 23, 2015) ("*DuPont*").

⁹ *See Simplified Standards for Rail Rate Cases*, EP 646 (Sub-No. 1), slip op. at 30 (STB served Sept. 5, 2007) ("*Simplified Standards*").

requirements.¹⁰ To defend against the shipper’s case, the defendant must assess the feasibility of this hypothetical railroad, effectively developing its own SARR.¹¹ Not only does this process disadvantage shippers and encourage railroads to dispute issues,¹² but also it “require[s] the collection, analysis, and presentation of massive quantities of detailed data” and involves “enormous evidentiary burdens and costs on both parties”¹³ As a result, the parties submit evidentiary filings that involve “thousands of pages of evidence and workpapers, along with massive electronic spreadsheets”¹⁴

SAC cases are burdensome even for the Board.¹⁵ According to Chairman Begeman, “hundreds, if not thousands, of calls are made at the Board that lead up to its determination of whether a rate is unreasonable.”¹⁶ Many of these calls involve “disputes over minutiae . . . that . . . seem far removed from the core question at issue – the reasonableness of a rate.”¹⁷ This includes “arguments over details of the imaginary restrooms needed for the imaginary crew for the imaginary railroad”¹⁸

¹⁰ *Consumers Energy Co. v. CSX Transp., Inc.*, NOR 42142, slip op. at 22, 99, 208-09 (STB updated Mar. 14, 2018) (“*Consumers*”).

¹¹ *See id.* at 42 n. 47.

¹² *See Pub. Serv. Co. of Colo. v. Burlington N. & Santa Fe Ry.*, STB No. 42057, slip op. at 5 (STB served Jan. 19, 2005) (“In SAC cases, the railroad has the advantage of having much greater knowledge and experience in how to construct and operate a railroad. Moreover, as a potential repeat participant in SAC cases, the defendant carrier may have an incentive to contest every detail of a SAC presentation.”)

¹³ *Duke Energy Corp. v. CSX Transp. Inc. (Duke/CSXT)*, 7 S.T.B. 402, 415 (2004).

¹⁴ *Duke Energy Corp. v. Norfolk S. Ry. (Duke/NS)*, 7 S.T.B. 394, 395 (2004).

¹⁵ *See Duke/CSXT*, 7 S.T.B. at 415.

¹⁶ *See Sunbelt Chlor Alkali P’ship v. Norfolk S. Ry.*, NOR 42130, slip op. at 32 (STB served Jun. 30, 2016) (Begeman, dissenting) (“*Sunbelt*”).

¹⁷ *See Consumers*, slip op. at 74 (Miller, commenting).

¹⁸ *Id.* at 74 (Begeman, dissenting).

These problems with the SAC test cannot be remedied with tweaks. In the latest rate case decision, Chairman Begeman observed that the Board’s latest SAC tweaks were not effective: “The Board has taken several recent actions to help expedite the SAC process for future cases, as directed by the Surface Transportation Board Reauthorization Act of 2015. But with every SAC case, it seems that more and more issues are raised for the Board to resolve pertaining to the hypothetical railroad, which increases the burden on the parties and makes meeting the new expedited deadlines all the more difficult.”¹⁹

Despite its burdensome requirements, SAC often has been labeled the “gold standard” of the Board’s rate review methodologies. One might expect that to be the case with all the complexity and detail that is required. But, as the RRTF has observed, “we are deeply worried that SAC as it is currently practiced promotes a sense of false precision.”²⁰ That observation prompted the RRTF to conclude that, “[i]f rate reasonableness provisions are to be meaningful to any but a limited number of the largest rail shippers, they must be changed to provide avenues of relief for other shippers.”²¹

The Board’s SAC methodology as currently practiced “promotes a sense of false precision” in part because it is poorly connected to its economic roots. The economist who originally developed the SAC concept characterizes the Board’s SAC test as “so far from the models in which it was originally developed as to be unrecognizable.”²² Those models involved profit-constrained monopolies whose prices were fully regulated, and in the context of those models, SAC identifies the rate at which a cross-subsidy occurs and a competitive railroad would

¹⁹ *Consumers*, slip op. at 74 (Begeman, commenting).

²⁰ RRTF Report at 6.

²¹ *Id.*

²² Verified Statement of Gerald R. Faulhaber at 2, Reply of Concerned Shipper Ass’ns, *Railroad Revenue Adequacy*, EP 722 (Nov. 4, 2014).

enter the market if it were contestable.²³ But the railroad industry is not contestable, not fully profit-constrained, and not a monopoly industry.²⁴ Additionally, under the SAC test, the only competitive option is a wholly-independent SARR that transports the complainant's traffic from its origin to its ultimate destination. While this is consistent with the economic models used to develop SAC, in which the *only* alternative was a new entrant, it does not jibe with a railroad industry where captivity typically is limited to a bottleneck segment at the origin or destination.²⁵

Chairman Begeman has stressed that “[i]t may not be easy (or very fast) to ultimately develop a new approach, but it has to be a top Board priority.”²⁶ Former Board member Miller has made similar calls, stating in 2016 that “I believe that now is the time for the Board to begin a major review and discussion of alternatives to SAC.”²⁷ Thus, there is a clear and urgent need for concrete proposals like the FORR to move the process of achieving those objectives towards a conclusion.

The FORR process should be just a beginning, however, and not an end. The Board has proposed FORR for low value cases. But there are alternative rate standards that are as economically supportable as SAC, perhaps more so, and can be litigated in a much shorter time and at a much lower cost. In Part IV below, ACC presents one such alternative that, although ideally-suited for use in FORR cases, is sufficiently robust economically to constitute an alternative to SAC in all cases without any of the relief limits the Board proposes to impose upon FORR cases.

²³ *Id.* at 2.

²⁴ *Id.* at 2-3.

²⁵ *Id.* at 4-6.

²⁶ *Total*, slip op. at 48 (Begeman, dissenting).

²⁷ *Sunbelt*, slip op. at 44 (Miller, concurring).

III. The FORR process has the potential to provide meaningful access to rate regulation with a few minor adjustments.

The FORR process is conceptually sound but requires certain minor modifications for implementation to be practical and meaningful. This section addresses those modifications.

A. The FORR timeline is reasonable with minor adjustments.

The Board has proposed a timeline of 135 days from Complaint to Decision in an FORR case.²⁸ The Coalition Associations generally consider that a reasonable timeline, although they propose tweaking various components elsewhere in these comments. Specifically, they propose to increase discovery by 14 days to 35 days, permit an optional bifurcation of market dominance that would add 49 days, and provide an expedited process for motions to compel that could add 21 days. Depending upon whether the latter two options are exercised in any given FORR case, those proposals could increase the 135-day timeline by 14 to 85 days.

On the other hand, the Coalition Associations would reduce the time the Board allots itself for reaching a decision from 90 days after the filing of replies to 60 days. As the Board itself has observed, the Canadian final offer arbitration process provides for decisions in as little as 30, and no more than 60, days.²⁹ This reduction would offset nearly half, and in some cases all, of the increases to the timeline that the Coalition Associations have proposed.

B. Discovery must provide a reasonable opportunity for complainants to obtain the information needed to satisfy the FORR criteria.

The Coalition Associations support the Board's efforts to simplify and expedite discovery, which has been a major cause of protracted and costly rate-case proceedings. Certain of the Board's proposals, however, should be modified to ensure that the parties have an

²⁸ NPRM at 13-14.

²⁹ NPRM at 6, n. 11.

adequate opportunity to develop substantive evidence. Specifically, the Board should extend the discovery period to 35 days and establish an expedited process for handling motions to compel.

1. Increase discovery to 35 days.

Experience with the discovery process suggests that the 21 days the Board has proposed for discovery is insufficient. Upon receipt of discovery requests from the opposing party, counsel first must review the requests to understand the nature and scope of material and identify any requests that may be objectionable. Counsel then must share the requests with the client who must determine whether it has the information, where it is located, in what form it exists, and the time and effort to retrieve and send it to counsel. Frequently, counsel must interview many different employees to discern this information. Counsel then must review the information provided by the client for both responsiveness and privilege and process it for production to the other party. This requires several weeks even in the best of circumstances.

The Board has proposed to assess the reasonableness of discovery requests in the FORR evaluation phase based upon what a party can reasonably be expected to provide in just 21 days.³⁰ Because shippers are more likely to require discovery of the railroads on rate reasonableness, this very short discovery window could be used by railroads to justify refusals to provide valuable material information. An unduly short discovery window thus could jeopardize a complainant's ability to present much, if any, substantive evidence. This is particularly important for FORR cases because the Board has not mandated any methodology, but has left the formulation of a methodology and development of supporting evidence to the parties' initiative so long as it satisfies certain minimum criteria. By extending the discovery period to 35 days,

³⁰ NPRM at 8.

the Board would add two all-important weeks that could be the critical difference in a party's ability to present substantive evidence while still providing an expeditious process.

2. Adopt an expedited process for motions to compel.

For similar reasons, the Coalition Associations oppose the Board's proposal to eliminate motions to compel discovery in FORR cases. Although the Board would take a party's unreasonable denial of discovery into account when evaluating which party's final offer to select, a railroad may still have an incentive to withhold critical information. A complainant that has been denied adequate discovery to make a prima facie case could find it unable to present any viable alternative to the railroad's final offer.

Instead of eliminating motions to compel, the Coalition Associations propose that each party be permitted to file a single motion to compel that aggregates all the discovery disputes with the other party and that the Board adopt expedited handling procedures. Both parties should be required to file their motions to compel ten days prior to the close of discovery.³¹ During the pendency of such motions, the procedural schedule would be tolled. Each party would be permitted seven days each for reply and rebuttal, and the Board would endeavor to issue its decision in seven days. Upon the Board issuing a decision, the procedural clock would resume, and any party ordered to respond to discovery must do so within the remaining ten days in the discovery period. This expedited process would delay an FORR proceeding by no more than 21 days, and only if a party actually files a motion to compel.

There is an additional practical reason for not eliminating motions to compel. The NPRM only considers discovery disputes in the context of the rate reasonableness presentation. But discovery also encompasses market dominance. Even the streamlined market dominance

³¹ This works best if the Board increases the discovery period to 35 days as advocated in the preceding section.

approach the Board proposes in EP 756, and suggests would be required in FORR cases, does not eliminate a railroad's need for market dominance discovery to rebut the presumptions established by demonstrating the six requisite criteria. The Board's solution to address unwarranted withholding of discovery by giving less weight to the offending party's final offer rate proposal does not address disputes over market dominance discovery. In contrast, the Coalition Associations' expedited proposal for motions to compel allows for resolution of both types of discovery disputes.

C. Additional years of waybill data are required to address the FORR rate reasonableness criteria.

The Coalition Associations support the Board's proposal to make waybill sample data available to the parties in FORR cases.³² Indeed, the waybill sample is likely to play a significant role in FORR cases in view of the proposed curtailments to discovery. However, the Board should make more years of data available and clarify that it will provide access to the confidential waybill sample, including unmasked revenue data.

The criteria by which the Board proposes to make final offer selections in FORR cases make expanded waybill access a critical factor in the success of its proposal. Those criteria encompass the rail transportation policies at 49 U.S.C. § 10101, the Long-Cannon factors in 49 U.S.C. § 10701(d)(2), and appropriate economic principles.³³ Revenue adequacy is key to two of the rail transportation policies.³⁴ The Long-Cannon factors similarly are to be applied "recognizing the policy . . . that rail carriers shall earn adequate revenues, as established by the

³² NPRM at 9.

³³ NPRM at 10.

³⁴ 49 U.S.C. § 10101(3), (6).

Board under section 10704(a)(2) of this title.”³⁵ Lastly, the agency has identified revenue adequacy as an essential element of the constrained market pricing economic principles that are the bedrock of its rate reasonableness standards, including the appropriate degree of differential pricing.³⁶

The importance of revenue adequacy thus requires that the Board provide sufficient years of waybill data to develop economically meaningful final offers in FORR cases. The agency has stated “that revenue adequacy is a long-term concept that calls for a company, *over time*, to average return on investment equal to its cost of capital” and suggested that a complete business cycle may be an appropriate time over which to measure long-term revenue adequacy.³⁷ In EP 761, at 2, the Board has sought comment on a definition that encompasses a minimum of five years, and potentially more, based upon the foregoing statements in *Guidelines*. The average post-World War II business cycle has lasted approximately six years.³⁸

In both this docket and EP 761, ACC is proposing a revenue-adequacy rate reasonableness standard that is ideally suited for FORR cases. That methodology requires sufficient waybill data to measure long-term revenue adequacy and to develop a rate benchmarking model that covers that period at a minimum. ACC has proposed to use the post-World War II average business cycle of six years as the measure of long-term revenue adequacy, but the proposed definition in EP 761 could be substituted as an alternative. Either measure,

³⁵ 49 U.S.C. § 10701(d)(2).

³⁶ *Guidelines* at 525-28, 534-37.

³⁷ *Guidelines* at 536 (emphasis in original).

³⁸ According to the National Bureau of Economic Research, for the years 1945-2009, the average business cycle duration was between 58.4 and 69.5 months, depending on how the cycles are measured. See <http://www.nber.org/cycles.html>.

however, would require access to five or more years of waybill data.³⁹ To provide anything less could undermine the strength of FORR evidence that seeks to address the revenue adequacy concepts that are woven throughout the rail transportation policies, Long-Cannon factors, and appropriate economic principles.

Finally, the Board should clarify that it intends to provide the full waybill sample to the parties, including unmasked revenue. That is implicit in the Board's citation to *Waybill Data Released in Three-Benchmark Rail Rate Proceedings*, EP 646 (Sub-No. 3) (served March 12, 2012), which provides for the release of unmasked revenue in Three-Benchmark cases. This fact should be clearly stated. The utility of waybill data in a rate case is defeated if the actual rates are masked.

D. FORR should not be restricted to streamlined market dominance cases.

The Board has proposed that only complainants who elect to use the streamlined market dominance process proposed in EP 756 could use the FORR rate review process.⁴⁰ But it has solicited comments on whether complainants should have the option to use the non-streamlined market dominance process in FORR cases. The Coalition Associations oppose restricting FORR to cases where the complainant elects streamlined market dominance.

The principal rationale for conditioning the use of FORR upon also using streamlined market dominance is that the expedited FORR timeline may make it too difficult for parties to submit a non-streamlined presentation.⁴¹ Regardless of whether that is accurate in any given

³⁹ The proposed definition in the RRTF Report would vary in years based upon the length of the then-current economic cycle. Due to the unprecedented length of the current cycle, a dozen years of waybill data would be necessary in a rate-benchmarking case brought today. RRTF at 34. In contrast, ACC's definition would always be six years.

⁴⁰ NPRM at 9-10.

⁴¹ NPRM at 9.

case, a complainant should have the option to bifurcate its market dominance and rate reasonableness evidence so that it can use FORR. Market dominance evidence can be submitted on an expedited procedural schedule that increases the total FORR procedural schedule by less than 50 days.

Specifically, market dominance and rate reasonableness discovery can occur simultaneously and within the same time frame, just as they would in a non-bifurcated FORR proceeding.⁴² Upon the close of discovery, the complainant's opening market dominance evidence would be submitted 14 days later, the railroad's reply evidence 21 days after that, and complainant's rebuttal evidence 14 days thereafter. All evidentiary presentations would be limited to 30 pages of narrative, inclusive of verified statements and material created for the litigation, but there would be no page limit on exhibits.⁴³ Immediately after rebuttal evidence, the FORR schedule would begin with the simultaneous filing of rate reasonableness analyses and final offers within 14 days. The Board still would issue a consolidated decision on market dominance and rate reasonableness at the conclusion of the entire FORR process. This bifurcated process adds a total of just 49 days to the FORR schedule during which time the parties can focus their efforts entirely upon market dominance without detracting from their preparation of rate reasonableness evidence.

⁴² As discussed elsewhere in these comments, the Coalition Associations propose to extend the discovery period from 21 days to 35 days.

⁴³ As discussed in the opening comments of the Coalition Associations in EP 756, 30 pages should be ample for small cases like FORR. The reason for excluding exhibits from the page limits is that a party cannot control the size of a relevant document that might be produced in discovery or in the public domain. Exhibits, however, must be limited to only public sources or material produced by either party in discovery; a party cannot use exhibits to present information created by the party for the litigation, such as studies, graphs or charts, to circumvent the 30-page limit. Because exhibits have been removed from the page limits, the Coalition Associations have set the narrative page limit at 30 pages instead of the 50-page limit proposed by the Board in EP 756.

For reasons set forth more fully in their opening comments in EP 756, the Coalition Associations propose that all market dominance presentations adhere to the foregoing schedule if the complainant opts for a bifurcated approach. In FORR presentations, complainants still could opt for a non-bifurcated (i.e., streamlined) approach when they can meet the six criteria for using the streamlined approach in EP 756.

E. Relief Caps

The Board has proposed a 2-year rate prescription period and a \$4 million relief cap in FORR cases.⁴⁴ In general, the Coalition Associations support those proposals with some clarifications.

First, the Board's discussion of rate prescriptions and reparations is somewhat confusing. The Coalition Associations interpret the Board's proposal to be that a complainant can receive up to two years of reparations in addition to a two-year rate prescription, and that the \$4 million relief cap would apply to both combined. The Coalition Associations oppose counting reparations toward the two-year prescription period or the \$4 million relief cap. The Board should permit two years of reparations, consistent with 49 U.S.C. § 11705(c), and two years of a forward-looking rate prescription. Only the 2-year prescription period should be subject to the \$4 million relief cap and that period should begin on the date of a final appealable decision. Any damages accruing prior to that date would constitute reparations. This separation is important because most carload shippers, who function in highly competitive markets, need predictable transportation costs to successfully obtain business in the first place. As such, they need a prescribed rate for a minimum of 2 years regardless of the potential for reparations in prior years.

⁴⁴ NPRM at 14-16. As stated in note 31 of the NPRM, the \$4 million cap actually is higher once the Board applies the indexing that previously has been applied to the \$4 million relief cap adopted for Three-Benchmark cases in Docket No. EP 715, *Rate Regulation Reforms*, slip op. at 22-25 (served July 18, 2013).

In contrast, because complainants receive reparations for traffic tendered prior to filing a complaint and during litigation, they are undertaking an added risk by spending money for which they may not receive any refund if they lose their case. The Coalition Associations do not object to having a separate relief cap for reparations, which would cover the period from two years prior to the date of the Complaint through the date of a final decision. Alternatively, the Board could adopt a single relief cap of \$8 million .

Second, the Coalition Associations agree that the FORR relief caps should be *no less than* the caps previously adopted for Three-Benchmark cases. However, in calculating the Three Benchmark caps, the Board failed to consider all of the additional costs associated with SAC and Simplified-SAC cases. The Board looked only at out-of-pocket litigation costs. This ignores costs associated with a much longer procedural schedule which easily can double a complainant's total costs in a SAC case. Specifically, a complainant must not only pay the challenged tariff rate for several years, it often must pay higher rates on unchallenged rates due to "rate bundling." The insidious effects of rate bundling on rate case accessibility are discussed in greater detail in Part V below. Those are real costs to complainants because a complainant either chooses to absorb the higher cost during the litigation knowing that it risks recovering nothing if it loses, or it foregoes the business altogether during the litigation due to the high rail rate in which case that cost can never be recovered.

Third, the reasonableness of the Board's proposed relief cap for FORR cases depends upon how the cap is applied. The Coalition Associations presume that FORR cases would be lane-specific, *i.e.*, each case challenges the rate applicable to a single origin-destination pair. Only under that assumption is the proposed relief cap reasonable. Any requirement that a complainant aggregate multiple origin-destination pairs into a single case under a single relief

cap would be unreasonable for many reasons. Because carload shippers often tender traffic from multiple origins to hundreds of destinations, a Simplified-SAC or Full-SAC case would require them to design SARRs that replicate a clear majority of the defendant-railroad's existing rail network. This already has been borne out in SARRs of unprecedented size in three recent SAC cases brought by M&G Polymers, DuPont, and Total Petrochemicals.⁴⁵ The cost of litigating such enormous SAC cases are far more than the cost of litigating the typical unit train SAC case that the Board has used to develop the current relief caps in simplified rate cases.⁴⁶ Also, the expedited timeline for FORR cases will be more difficult to meet when claims are aggregated because each claim really is a separate case for developing evidence. Similarly, the amount of discovery for multiple lanes would increase, especially for market dominance. The Board's proposal to restrict FORR cases to facts that also satisfy streamlined market dominance further limits aggregation.

Finally, as the Board also acknowledges, "because FORR does not prescribe a particular methodology—nor a methodology necessarily less precise than any pre-existing procedures—the Board's prior rationale for capping relief based on the cost of the next more complicated procedures does not necessarily or neatly apply here."⁴⁷ Part IV below presents a methodology that is ideally-suited for an FORR case, is no less precise than SAC, and is just as economically sound, if not more so. Such methodologies should not be subject to relief caps at all. The Board, therefore, should permit parties, on a case-by-case basis, to argue that their chosen methodology should not be subject to a relief cap, and the Board should be willing to waive the caps when it deems that such a showing has been made.

⁴⁵ *M&G Polymers USA LLC v. CSX Transp. Inc.*, NOR 42123; *DuPont*; *Total*.

⁴⁶ *Simplified Standards*, slip op. at 30-31.

⁴⁷ NPRM at 15.

F. The FORR process is optimal for challenging the rates of Class II and III railroads.

The Board has proposed to deny shippers the ability to invoke the FORR process to challenge purely local rates of Class II and III railroads.⁴⁸ The only rationale offered for doing so, however, is that most rate cases to date indicate that complainants' concerns relate primarily to Class I railroads. Although all recent rate cases have been against Class I railroads, it does not necessarily follow that there are few concerns with Class II and III rates. Rather, the dearth of cases against Class II and III railroads also is because SAC and Simplified-SAC are the only options available to challenge Class II and III railroad rates. Three-Benchmark cannot be used because Class II and III carriers do not contribute to the waybill sample that is the source of the comparable rates used in that methodology. This inability to invoke the Board's only existing small case methodology in challenges to Class II and III rail rates is a compelling reason on its own to apply FORR to those carriers. Moreover, as a growing number of Class III railroads are now owned by large holding companies and are reclaiming their pricing authority from their Class I connections, there is a growing potential need for rate remedies in that venue.

Finally, it is illogical to exempt Class II and III railroads from the less onerous and costly FORR process while subjecting them solely to the lengthy and expensive SAC process. The benefits of a lower cost and expeditious rate case process accrue to them as well as to shippers.

⁴⁸ NPRM at 16-17.

IV. Rate Benchmarking is an alternative rate methodology ideally-suited to FORR and also is supported by the same economic principles as SAC.

ACC has spent the past 18 months developing a rate benchmarking methodology to determine the reasonableness of rates published by revenue-adequate Class I railroads.⁴⁹ That methodology could be used in an FORR proceeding with a single minor modification to the Board's proposals. Specifically, as discussed in Part III.C above, the Board would need to make more than four years of the Waybill Sample available to the parties. Rate benchmarking is an ideal methodology for FORR cases because it requires very little discovery; has been designed with the rail transportation policies, Long-Cannon factors, and appropriate economic principles in mind; accounts for the degree of differential pricing needed to maintain long-term revenue-adequacy; and is easily litigated within the Board's proposed FORR timeline. Although rate benchmarking substantially complements the FORR process, it is just as robust as SAC and thus should not be subject to relief caps.⁵⁰ The only constraint upon its use is that the defendant railroad must be revenue adequate. Because rate benchmarking implements the revenue adequacy constraint of *Coal Rate Guidelines*, ACC presents additional details of that methodology in its written testimony in EP 761, *Hearing on Revenue Adequacy*.

A. The mechanics of rate benchmarking and implementation of the revenue-adequacy constraint.

The attached Verified Statement of Kevin Caves describes the underlying mechanics of rate benchmarking and implementation of the revenue-adequacy constraint. The approach developed

⁴⁹ The NPRM acknowledges these efforts and their relevance to this proceeding. See NPRM at 17-18 (citation to WB 17-44 refers to ACC's waybill request for the purpose of developing new rate reasonableness alternatives).

⁵⁰ The Board has solicited comments on whether to establish a two-tiered relief procedure in which the top tier would have a longer procedural schedule but no relief cap. NPRM at 16. Because rate benchmarking can be litigated within the Board's currently-proposed procedural schedule, there is no need to create a second tier with a longer procedural schedule to warrant removing the proposed relief cap.

by Dr. Caves, hereinafter referenced as the “Benchmark Method,” addresses rate reasonableness determinations in two steps:

- First, Dr. Caves developed and tested an econometric model to predict competitive benchmark rates for captive rail movements based upon economically relevant shipment characteristics of competitive rail movements using real-world data, including the Board’s Confidential Costed Waybill Sample (“CCWS”). He calls this the “Benchmark Model.”
- Second, in recognition of the Board’s regulatory objective to permit the differential pricing of captive traffic above competitive rate levels only to the extent necessary to achieve and maintain revenue adequacy, Dr. Caves developed the “Competitive Threshold” or “CT,” which is a multiplier that is applied to the Benchmark Model’s predicted competitive rate to determine the appropriate degree of differential pricing consistent with the Board’s rail revenue adequacy standard. *Caves V.S.* ¶2.

Together, these two steps constitute the Benchmark Method, which prescribes a maximum reasonable rate based upon the characteristics of the rail movement to which the challenged rate applies and application of the CT multiplier. As that process would be virtually automatic, the time and expense of rate case litigation effectively would be reduced to the market dominance question.

In his verified statement, Dr. Caves describes econometric modeling in general, followed by a discussion of the data he used to develop the Benchmark Model, the filters he employed to identify competitive rail movements in the data, and the defining characteristics of competitive moves that he employed as explanatory variables in the regression equation. After developing the Benchmark Model, Dr. Caves applied the regression equation to 3.5 million data points from

the waybill sample and evaluated the results. Caves. V.S., ¶ 23. The Benchmark Model produced results that were both highly statistically significant and made economic sense. *Id.* ¶¶ 23-24. After analyzing the statistical significance of the results, Dr. Caves discusses limitations that he encountered based upon the limited years of CCWS data and the masked revenue data available to him and how access to more complete data would improve those results. Caves V.S. at ¶¶ 8, 11, 23, 27, 33, 36.

Next, Dr. Caves has presented a “proof of concept” illustration of how to calculate and apply the CT annually to determine the permissible degree of differential pricing. Unlike the regression analysis, however, Dr. Caves was not able to overcome the effect of using masked revenue on the CT calculation. Therefore, his development of the CT is purely to illustrate the concept; the results do not reflect a real-world application of the model. *Id.*, ¶ 33. Although ACC requested access to unmasked revenues and additional years of waybill data to prepare a more robust presentation of its methodology in both this docket and EP 761, its request was denied.⁵¹ Dr. Caves has provided instructions that enable the Board itself to substitute unmasked revenues and additional years of data in the model and to calculate a true CT. *Id.*, App. 1

In summary, Dr. Caves has offered the Board a working model to serve as a baseline proposal upon which to build an economically sound and practical Benchmark Method for determining maximum reasonable rates on market dominant rail movements. This methodology that is based upon the same economic principles of constrained market pricing that underlay the Board’s existing rate reasonableness methods, but without the time, cost, and complexity associated with those methods.

⁵¹ Waybill Request WB19-48, Letter from William Brennan to Jeffrey Moreno (Sept. 30, 2019).

B. Benefits of rate benchmarking.

The Benchmark Method avoids the high cost and complexity of SAC cases and can be litigated far more quickly. Shippers and railroads would no longer need to spend millions of dollars constructing and evaluating a hypothetical SARR. Nor would they need to litigate myriad disagreements over the SARR's design and operations. In fact, there would be little litigation regarding the maximum rate determination because the model relies upon objective factual inputs about a movement, such as distance and commodity type, over which there should be little reasonable disagreement. Additionally, the algorithm need not vary by case, eliminating the need for case-specific litigation of the model, which has plagued SAC.

The model also increases the predictability of rate relief, which both improves access to rate remedies and reduces the need for access. At the outset of a SAC case, shippers and railroads have little understanding of the relief that may be granted. This promotes a “kitchen sink” approach to litigation, where both parties dispute as much as possible not knowing what battles are actually worth fighting. It also keeps many shippers with valid complaints on the sidelines, fearing that they could spend millions of dollars and half a decade litigating a rate case only to lose on a technicality, a novel issue raised by the railroad, or a variety of seemingly inconsequential issues that result in a death by a thousand cuts. Even if a shipper is able to win, petitions for reconsideration and appeals are likely to drag out for years or the relief may be inconsequential. A benchmarking model that is not prone to a case-by-case attack on hundreds of fronts will give shippers the predictability they need to challenge a rate and help all stakeholders avoid wasteful litigation.

As an offshoot of increased predictability, railroads and shippers will be more likely to reach commercial agreement on rates. During the rate negotiation process, they can use the Benchmark Method to identify the maximum reasonable rate and immediately determine

whether a rate is too high or too low without any need to resort to the Board. This should drive railroads and shippers to agree on a reasonable rate and avoid situations where a shipper must choose between a high contract rate, which may be unreasonable, but cannot be challenged, and an even higher tariff rate, which can be challenged only at an astronomical expense and with little litigation certainty.

The Benchmark Method also has clear benefits for the Board. It eliminates the need for the Board to make “hundreds, if not thousands, of calls” to determine whether a rate is unreasonable.⁵² Moreover, by providing greater predictability to shippers and railroads, it avoids the need for litigation at all in many cases and reduces the number of issues the Board must decide in cases that are brought before it. This enables the Board to direct more resources to other pressing matters.

The Benchmark Method is similar conceptually to, but economically more robust than, the existing Three-Benchmark approach, which is the rate reasonableness standard that the Board originally adopted for use in small rate cases in the 1996 *Simplified Standards* decision. The Three Benchmark approach is a simplistic comparison of the average R/VC ratio for a “comparable” traffic group selected from the CCWS through a final arbitration process and adjusted up or down based upon the defendant’s degree of revenue adequacy or inadequacy. This benchmark comparison group, however, is not necessarily reflective of competitive movements and is not determined by statistical methods. Also, litigation still is necessary to decide between each party’s benchmark group. In contrast, Dr. Caves’ approach employs objective criteria to identify a group of competitive movements and applies established statistical techniques to develop a model that predicts competitive rate levels for captive movements based

⁵² See *Sunbelt*, slip op. at 32 (Begeman, dissenting) (noting the myriad decisions the Board makes in resolving a SAC case).

upon the factors that have the greatest influence upon competitive rate levels. He then develops the CT to reflect the degree of differential pricing above the predicted rate level that, when applied to all captive movements, is needed to maintain revenue adequacy. Furthermore, unlike the Three-Benchmark approach which necessarily relies upon URCS to determine R/VC ratios, the Benchmark Method avoids URCS, which the TRB Report has described as fundamentally flawed.⁵³ The Benchmark Method thus is a more direct and robust application of economic principles in *Guidelines* than the Three-Benchmark method.

The Board should consider adopting the Benchmark Method as an approved rate methodology that is equal to SAC. This would require the Board to formally adopt a regression model with explanatory variables, data sources, time periods, and competitive movement filters. The Board also would need to formally adopt a formula for calculating the CT and determine an appropriate rate prescription duration. Once the Board has concluded a rulemaking proceeding to formalize these matters, a rate case under the Benchmark Method effectively would be reduced to the market dominance determination.

In the interim, however, the Benchmark Method is an ideal rate reasonableness methodology for complainants to use in FORR cases. Absent formal rules, complainants would have to update the regression model and CT in every individual case. But because Dr. Caves already has demonstrated how to do this, the added work still could be completed within the proposed FORR time frames. Because the Benchmark Method relies entirely upon the CCWS, very little, if any, discovery of the railroad would be required. As discussed in Part III.C, however, it would be essential to provide more than four years of CCWS data. All of this could easily be accomplished within the proposed FORR procedural parameters. Indeed, the FORR

⁵³ TRB Report, pp. 110-19.

process could serve as a proving ground for the Benchmark Method, allowing the Board to work out issues through precedent that eventually could be formalized in a rulemaking proceeding. In the absence of formal rules, rate benchmarking offers less predictability for the parties, however.

V. To address the negative impact of “rate bundling” on the accessibility of rate remedies, FORR must be part of broad, holistic solution that includes enhanced competition.

FORR must be part of a broader initiative to reduce reliance upon regulatory rate relief by enhancing competition. Otherwise, railroads can continue to hinder the accessibility of rate remedies through “rate bundling,” which ties a railroad’s offer of reasonable rates on some lanes to a shipper’s acceptance of unreasonably high rates on other lanes.

Shippers repeatedly have complained that railroads can and do discourage rate complaints by bundling all of a shipper’s traffic into “all or nothing” contracts. For example, a shipper with 100 lanes may wish to challenge the rates in just 10 lanes as unreasonable. The railroad will not contract for 90 lanes, however, while the shipper challenges the rates for the other 10. Rather, the shipper must pay higher tariff rates in all 100 lanes and decide whether to include some or all of the other 90 lanes in the rate case if it believes those tariff rates are unreasonably high. That is the main, if not sole, reason why recent SAC cases involving carload traffic brought by DuPont, Total Petrochemicals, and M&G Polymers have encompassed anywhere from 60 to 138 lanes. Even in an expedited FORR process, the prospect of paying tariff rates on all lanes presents a significant barrier to a shipper seeking rate relief.

Railroads can insist upon bundling in most instances because the shipper has no alternative for most, if not all, of the remaining 90 lanes in the above example. As a result, the railroad faces little to no risk of losing that traffic while the shipper pays higher tariff rates on all lanes during the pending rate case. If a shipper has competitive alternatives for enough of the

remaining lanes that the railroad risks losing significant traffic volume if it only offers a bundled contract for all 100 lanes, railroads would have to factor that consequence into their negotiating position. But that is a very rare scenario. Enhanced competition, through measures such as competitive switching and changes to the Board's "bottleneck rules," can create a more level playing field. Increasing the number of lanes and traffic volume with a competitive option means that a railroad has less leverage to hold that traffic hostage to discourage challenges to unreasonable rates in other lanes. Shippers, in turn, will be better able to benefit from improved access to rate reasonableness regulatory protections through FORR.

Congress intended that enhanced competition play an important role within the broad deregulatory framework of the Staggers Rail Act of 1980 by allowing the market, rather than the government, to regulate a greater portion of rail movements.

The new railroad transportation policy established by this bill emphasizes the need for increased intramodal and intermodal competition . . . As the Government moves toward significantly less regulation of the services offered by railroads, the Government should encourage, rather than discourage, competition among railroads. Competition among railroads, or at least the realistic threat of competition, can serve as an important safeguard against inadequate service or unreasonably high prices.”⁵⁴

The Conference Committee underscored the importance of increasing competition when it noted that “[a] number of provisions [in the bill] are included to foster greater competition by simplifying coordination, minor merger procedures, entry and reciprocal switching agreements.”⁵⁵ The Congressional emphasis is to “foster” greater competition.

The national rail transportation policies to enhance competition are designed as a complement to, not a substitute for, regulatory rate protections. Enhanced competition *both*

⁵⁴ S. Report No. 96-470, 96th Cong. 2d Sess., p. 41 (emphasis added).

⁵⁵ H. Report No. 96-1430, 96th Cong 2d Sess., p. 80 (emphasis added).

reduces the need for regulatory rate protection *and* enhances the accessibility and effectiveness of rate remedies when needed. The Coalition Associations urge the Board to progress pending proposals to enhance competition together with its EP 755 and EP 756 proposals to make regulatory rate reasonableness remedies more accessible.

Respectfully submitted,

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November 12, 2019

Exhibit 1

PART 1111—COMPLAINT AND INVESTIGATION PROCEDURES

3. The authority citation for part 1111 is revised to read as follows:

49 U.S.C. 10701, 10704, 11701, and 1321

4. Amend § 1111.3 by revising paragraph (c) to read as follows:

§ 1111.3 Amended and supplemental complaints.

* * * * *

(c) *Simplified Standards.* A complaint filed under Simplified-SAC or Three-Benchmark may be amended once before the filing of opening evidence to opt for a different rate reasonableness methodology, among Three-Benchmark, Simplified-SAC, or stand-alone cost. If so amended, the procedural schedule begins again under the new methodology as set forth at §§ 1111.9 and 1111.10. However, only one mediation period per complaint shall be required. A complaint filed under Final Offer Rate Review may not be amended to opt for Three-Benchmark, Simplified-SAC, or stand-alone cost, and a complaint filed under Three-Benchmark, Simplified-SAC, or stand-alone cost may not be amended to opt for Final Offer Rate Review.

0. Amend § 1111.5 by revising paragraphs (a), (b), (c), and (e) to read as

follows: **§ 1111.5 Answers and cross complaints.**

(a) *Generally.* Other than in cases under Final Offer Rate Review, which does not require the filing of an answer, an answer shall be filed within the time provided in paragraph (c) of this section. An answer should be responsive to the complaint and should fully advise the Board and the parties of the nature of the defense. In answering a complaint challenging the reasonableness of a rail rate, the defendant should indicate whether it will contend that the Board is deprived of jurisdiction to hear the complaint because the revenue-variable cost percentage generated by the traffic is less than 180 percent, or the traffic is subject to effective product or geographic competition. In response to a complaint filed under Simplified-SAC or Three-Benchmark, the answer must include the defendant's preliminary estimate of the variable cost of each challenged movement calculated using the unadjusted figures produced by the URCS Phase III program.

(b) *Disclosure with Simplified-SAC or Three-Benchmark answer.* The defendant must provide to the complainant all documents that it relied upon to determine the inputs used in the URCS Phase III program.

(c) *Time for filing; copies; service.* Other than in cases under Final Offer Rate Review, which does not require the filing of an answer, an answer must be filed with the Board within 20 days after the service of the complaint or within such additional time as the Board may provide. The defendant must serve copies of the answer upon the complainant and any other defendants.

* * * * *

(e) *Failure to answer complaint.* Other than in cases under Final Offer Rate Review, which does not require the filing of an answer, averments in a complaint are admitted when not denied in an answer to the complaint.

* * * * *

6. Amend § 1111.10 by adding paragraph (a)(3) to read as follows:

§ 1111.10 Procedural schedule in cases using simplified standards.

(a) *Procedural Schedule.* Absent a specific order by the Board, the following general procedural schedules will apply in cases using the simplified standards:

* * * * *

(3)(i) In cases relying upon the Final Offer Rate Review procedure:

(A) Day -5—Complainant files notice of intent to initiate case and serves notice on defendant.

(B) Day 0—Complaint filed; discovery begins.

(C) Day ~~24~~35—Discovery closes.

(D) Day ~~35~~49—Market dominance filings, rate reasonableness analyses, and final offers.

(E) Day ~~45~~59—Replies.

(F) Day ~~52~~66—Telephonic evidentiary hearing before an administrative law judge, as described in § 1111.142(~~ce~~) of this chapter, at the discretion of the complainant (market dominance).

(G) Day ~~135~~119—Board decision.

(ii) In addition, the Board will appoint a liaison within five business days after the Board receives the pre-filing notification.

(iii) With its final offer, each party must submit an explanation of the methodology it used.

(iv) The complainant may elect to use the streamlined market dominance approach in § 1111.14 of this chapter, if it can make a prima facie showing on market dominance pursuant to § 1111.13(b) of this Chapter. Otherwise, the bifurcated market dominance procedures in § 1111.12 of this Chapter are applicable.

* * * * *

7. Amend § 1111.11 by revising paragraph (b) to read as follows:

§ 1111.11 Meeting to discuss procedural matters.

* * * * *

(b) *Stand-alone cost or simplified standards complaints.*

~~(4)~~ In complaints challenging the reasonableness of a rail rate based on stand-alone cost, Simplified-SAC, or Three-Benchmark, the parties shall meet, or discuss by telephone or

through email, discovery and procedural matters within 7 days after the complaint is filed in stand-alone cost cases, and 7 days after the mediation period ends in Simplified-SAC or Three-Benchmark cases. The parties should inform the Board as soon as possible thereafter whether there are unresolved disputes that require Board intervention and, if so, the nature of such disputes.

~~(2) In complaints challenging the reasonableness of a rail rate under Final Offer Rate Review, the parties may not seek Board intervention in discovery disputes, but the parties should discuss discovery matters with one another to the extent necessary.~~

PART 1114—EVIDENCE; DISCOVERY

8. The authority citation for part 1114 continues to read as follows:

5 U.S.C. 559; 49 U.S.C. 1321.

9. Amend § 1114.21 by adding paragraph (a)(4) to read as follows:

§ 1114.21 Applicability; general provisions.

(a) * * *

(4) Time periods specified in this subpart do not apply in cases under Final Offer Rate Review or to the bifurcated market dominance approach. Instead, parties in cases under Final Offer Rate Review and the bifurcated market dominance approach should serve requests, answers to requests, objections, and other discovery-related communications within a reasonable time given the length of the discovery period.

* * * * *

5. Amend § 1114.24 by revising paragraph (h) to read as follows:

§ 1114.24 Depositions; procedures.

* * * * *

(h) *Return*. The officer shall securely seal the deposition in an envelope endorsed with sufficient information to identify the proceeding and marked “Deposition of (here insert name of witness)” and shall either personally deliver or promptly send the original and one copy of all exhibits by e-filing (provided the filing complies with 49 CFR 1104.1(e)) or registered mail to the Office of Proceedings. A deposition to be offered in evidence must reach the Board not later than 5 days before the date it is to be so offered.

* * * * *

6. Amend § 1114.31 by revising paragraphs (a) and (d) to read as follows:

§ 1114.31 Failure to respond to discovery.

(a) *Failure to answer*. If a deponent fails to answer or gives an evasive answer or incomplete answer to a question propounded under § 1114.24(a), or a party fails to answer or gives evasive or incomplete answers to written interrogatories served pursuant to § 1114.26(a), the party seeking discovery may apply for an order compelling an answer by motion filed with the Board and served on all parties and deponents. Such motion to compel an answer must be filed with the Board and served on all parties and deponents. Except in cases under Final Offer Rate Review or the bifurcated market dominance approach, such ~~Such~~ motion to compel an answer must be filed with the Board within 10 days after the failure to obtain a responsive answer upon deposition, or within 10 days after expiration of the period allowed for submission

of answers to interrogatories. On matters relating to a deposition on oral examination, the proponent of the question may complete or adjourn the examination before he applies for an order. ~~Motions to compel may not be filed in cases under Final Offer Rate Review.~~

(1) *Reply to motion to compel generally.* Except in rate cases to be considered under the stand-alone cost methodology, ~~or simplified standards, Final Offer Rate Review, or the bifurcated market dominance approach,~~ the time for filing a reply to a motion to compel is governed by 49 CFR 1104.13.

(2) *Motions to compel in stand-alone cost and simplified standards rate cases.* (i) Motions to compel in stand-alone cost, Simplified-SAC, and Three-Benchmark rate cases must include a certification that the movant has in good faith conferred or attempted to confer with the person or party failing to answer discovery to obtain it without Board intervention.

(ii) In a rate case to be considered under the stand-alone cost, Simplified-SAC, or Three-Benchmark methodologies, a reply to a motion to compel must be filed with the Board within 10 days of when the motion to compel is filed.

(3) Motions to compel in final offer rate review cases. (i) In a rate case to be considered under the final offer rate review process, each party may file a single motion to compel on Day 25 of the discovery period. All of a party's discovery disputes with the other party must be consolidated into this single motion. Replies are due within seven days and rebuttals seven days thereafter. The Board will endeavor to issue its decision seven days after the filing of rebuttals. (ii) The procedural schedule for final offer rate review cases shall be tolled from Day 25 until the Board decides any motions to compel. Upon issuance of the Board's decision, the normal procedural schedule will resume, and the parties shall have the remaining ten days before discovery closes to comply with a Board decision ordering a party to respond to discovery.

(4) Motions to compel under the bifurcated market dominance approach outside of Final Offer Rate Review cases. Other than in cases under Final Offer Rate Review, when market dominance is litigated pursuant to the bifurcated approach in § 1111.12 of this Chapter, motions to compel discovery shall be governed by the procedures set forth therein.

~~(3)(5)~~ *Conference with parties on motion to compel.* Within 5 business days after the filing of a reply to a motion to compel in a rate case to be considered under the stand-alone cost methodology, Simplified-SAC, or Three-Benchmark, Board staff may convene a conference with the parties to discuss the dispute, attempt to narrow the issues, and gather any further information needed to render a ruling.

~~(4)(6)~~ *Ruling on motion to compel in stand-alone cost, Simplified-SAC, and Three-Benchmark rate cases.* Within 5 business days after a conference with the parties convened pursuant to paragraph (a)(35) of this section, the Director of the Office of Proceedings will issue a summary ruling on the motion to compel discovery. If no conference is convened, the Director of the Office of Proceedings will issue this summary ruling within 10 days after the filing of the reply to the motion to compel. Appeals of a Director's ruling will proceed under 49 CFR 1115.9, and the Board will attempt to rule on such appeals within 20 days after the filing of the reply to the appeal.

* * * * *

(d) *Failure of party to attend or serve answers.* If a party or a person or an officer, director, managing agent, or employee of a party or person willfully fails to appear before the officer who is to take his deposition, after being served with a proper notice, or fails to serve answers to interrogatories submitted under § 1114.26, after proper service of such interrogatories, the Board on motion and notice may strike out all or any part of any pleading of that party or person, or dismiss the proceeding or any part thereof. ~~Such a motion may not be filed in a case under Final Offer Rate Review.~~ In lieu of any such order or in addition thereto, the Board shall require the party failing to act or the attorney advising that party or both to pay the reasonable expenses, including attorney's fees, caused by the failure, unless the Board finds that the failure was substantially justified or that other circumstances make an award of expenses unjust.

PART 1115—APPELLATE PROCEDURES

12. The authority citation for part 1115 continues to read as follows:

5 U.S.C. 559; 49 U.S.C. 1321; 49 U.S.C. 11708.

13. Amend § 1115.3 by revising paragraph (e) to read as follows:

§ 1115.3 Board actions other than initial decisions.

* * * * *

(e) Petitions must be filed within 20 days after the service of the action or within any further period (not to exceed 20 days) as the Board may authorize. However, in cases under Final Offer Rate Review, petitions must be filed within 5 days after the service of the action, and replies to petitions must be filed within 10 days after the service of the action.

* * * * *

PART 1111—COMPLAINT AND INVESTIGATION PROCEDURES

3. The authority citation for part 1111 is revised to read as follows:

49 U.S.C. 10701, 10704, 11701, and 1321

4. Amend § 1111.3 by revising paragraph (c) to read as follows:

§ 1111.3 Amended and supplemental complaints.

* * * * *

(c) *Simplified Standards.* A complaint filed under Simplified-SAC or Three-Benchmark may be amended once before the filing of opening evidence to opt for a different rate reasonableness methodology, among Three-Benchmark, Simplified-SAC, or stand-alone cost. If so amended, the procedural schedule begins again under the new methodology as set forth at §§ 1111.9 and 1111.10. However, only one mediation period per complaint shall be required. A complaint filed under Final Offer Rate Review may not be amended to opt for Three-Benchmark, Simplified-SAC, or stand-alone cost, and a complaint filed under Three-Benchmark, Simplified-SAC, or stand-alone cost may not be amended to opt for Final Offer Rate Review.

0. Amend § 1111.5 by revising paragraphs (a), (b), (c), and (e) to read as

follows: **§ 1111.5 Answers and cross complaints.**

(a) *Generally.* Other than in cases under Final Offer Rate Review, which does not require the filing of an answer, an answer shall be filed within the time provided in paragraph (c) of this section. An answer should be responsive to the complaint and should fully advise the Board and the parties of the nature of the defense. In answering a complaint challenging the reasonableness of a rail rate, the defendant should indicate whether it will contend that the Board is deprived of jurisdiction to hear the complaint because the revenue-variable cost percentage generated by the traffic is less than 180 percent, or the traffic is subject to effective product or geographic competition. In response to a complaint filed under Simplified-SAC or Three-Benchmark, the answer must include the defendant's preliminary estimate of the variable cost of each challenged movement calculated using the unadjusted figures produced by the URCS Phase III program.

(b) *Disclosure with Simplified-SAC or Three-Benchmark answer.* The defendant must provide to the complainant all documents that it relied upon to determine the inputs used in the URCS Phase III program.

(c) *Time for filing; copies; service.* Other than in cases under Final Offer Rate Review, which does not require the filing of an answer, an answer must be filed with the Board within 20 days after the service of the complaint or within such additional time as the Board may provide. The defendant must serve copies of the answer upon the complainant and any other defendants.

* * * * *

(e) *Failure to answer complaint.* Other than in cases under Final Offer Rate Review, which does not require the filing of an answer, averments in a complaint are admitted when not denied in an answer to the complaint.

* * * * *

6. Amend § 1111.10 by adding paragraph (a)(3) to read as follows:

§ 1111.10 Procedural schedule in cases using simplified standards.

(a) *Procedural Schedule.* Absent a specific order by the Board, the following general procedural schedules will apply in cases using the simplified standards:

* * * * *

(3)(i) In cases relying upon the Final Offer Rate Review procedure:

(A) Day -5—Complainant files notice of intent to initiate case and serves notice on defendant.

(B) Day 0—Complaint filed; discovery begins.

(C) Day 35—Discovery closes.

(D) Day 49—Market dominance filings, rate reasonableness analyses, and final offers.

(E) Day 59—Replies.

(F) Day 66—Telephonic evidentiary hearing before an administrative law judge, as described in § 1111.14(c) of this chapter, at the discretion of the complainant (market dominance).

(G) Day 119—Board decision.

(ii) In addition, the Board will appoint a liaison within five business days after the Board receives the pre-filing notification.

(iii) With its final offer, each party must submit an explanation of the methodology it used.

(iv) The complainant may elect to use the streamlined market dominance approach in § 1111.14 of this chapter, if it can make a prima facie showing on market dominance pursuant to § 1111.13(b) of this Chapter. Otherwise, the bifurcated market dominance procedures in § 1111.12 of this Chapter are applicable.

* * * * *

7. Amend § 1111.11 by revising paragraph (b) to read as follows:

§ 1111.11 Meeting to discuss procedural matters.

* * * * *

(b) *Stand-alone cost or simplified standards complaints.* In complaints challenging the reasonableness of a rail rate based on stand-alone cost, Simplified-SAC, or Three-Benchmark, the parties shall meet, or discuss by telephone or through email, discovery and

procedural matters within 7 days after the complaint is filed in stand-alone cost cases, and 7 days after the mediation period ends in Simplified-SAC or Three-Benchmark cases. The parties should inform the Board as soon as possible thereafter whether there are unresolved disputes that require Board intervention and, if so, the nature of such disputes.

PART 1114—EVIDENCE; DISCOVERY

8. The authority citation for part 1114 continues to read as follows:

5 U.S.C. 559; 49 U.S.C. 1321.

9. Amend § 1114.21 by adding paragraph (a)(4) to read as follows:

§ 1114.21 Applicability; general provisions.

(a) * * *

(4) Time periods specified in this subpart do not apply in cases under Final Offer Rate Review or to the bifurcated market dominance approach. Instead, parties in cases under Final Offer Rate Review and the bifurcated market dominance approach should serve requests, answers to requests, objections, and other discovery-related communications within a reasonable time given the length of the discovery period.

* * * * *

5. Amend § 1114.24 by revising paragraph (h) to read as follows:

§ 1114.24 Depositions; procedures.

* * * * *

(h) *Return.* The officer shall securely seal the deposition in an envelope endorsed with sufficient information to identify the proceeding and marked “Deposition of (here insert name of witness)” and shall either personally deliver or promptly send the original and one copy of all exhibits by e-filing (provided the filing complies with 49 CFR 1104.1(e)) or registered mail to the Office of Proceedings. A deposition to be offered in evidence must reach the Board not later than 5 days before the date it is to be so offered.

* * * * *

6. Amend § 1114.31 by revising paragraphs (a) and (d) to read as follows:

§ 1114.31 Failure to respond to discovery.

(a) *Failure to answer.* If a deponent fails to answer or gives an evasive answer or incomplete answer to a question propounded under § 1114.24(a), or a party fails to answer or gives evasive or incomplete answers to written interrogatories served pursuant to § 1114.26(a), the party seeking discovery may apply for an order compelling an answer by motion filed with the Board and served on all parties and deponents. Such motion to compel an answer must be filed with the Board and served on all parties and deponents. Except in cases under Final Offer Rate Review or the bifurcated market dominance approach, such motion to compel an answer must be filed with the Board within 10 days after the failure to obtain a responsive answer upon deposition, or within 10 days after expiration of the period allowed for submission of answers to interrogatories. On matters relating to a deposition on oral examination, the proponent of the question may complete or adjourn the examination before he applies for an order.

(1) *Reply to motion to compel generally.* Except in rate cases to be considered under the stand-alone cost methodology, simplified standards, Final Offer Rate Review, or the bifurcated market dominance approach, the time for filing a reply to a motion to compel is governed by 49 CFR 1104.13.

(2) *Motions to compel in stand-alone cost and simplified standards rate cases.* (i) Motions to compel in stand-alone cost, Simplified-SAC, and Three-Benchmark rate cases must include a certification that the movant has in good faith conferred or attempted to confer with the person or party failing to answer discovery to obtain it without Board intervention.

(ii) In a rate case to be considered under the stand-alone cost, Simplified-SAC, or Three-Benchmark methodologies, a reply to a motion to compel must be filed with the Board within 10 days of when the motion to compel is filed.

(3) *Motions to compel in final offer rate review cases.* (i) In a rate case to be considered under the final offer rate review process, each party may file a single motion to compel on Day 25 of the discovery period. All of a party's discovery disputes with the other party must be consolidated into this single motion. Replies are due within seven days and rebuttals seven days thereafter. The Board will endeavor to issue its decision seven days after the filing of rebuttals. (ii) The procedural schedule for final offer rate review cases shall be tolled from Day 25 until the Board decides any motions to compel. Upon issuance of the Board's decision, the normal procedural schedule will resume, and the parties shall have the remaining ten days before discovery closes to comply with a Board decision ordering a party to respond to discovery.

(4) *Motions to compel under the bifurcated market dominance approach outside of Final Offer Rate Review cases.* Other than in cases under Final Offer Rate Review, when market dominance is litigated pursuant to the bifurcated approach in § 1111.12 of this Chapter, motions to compel discovery shall be governed by the procedures set forth therein.

(5) *Conference with parties on motion to compel.* Within 5 business days after the filing of a reply to a motion to compel in a rate case to be considered under the stand-alone cost methodology, Simplified-SAC, or Three-Benchmark, Board staff may convene a conference with the parties to discuss the dispute, attempt to narrow the issues, and gather any further information needed to render a ruling.

(6) *Ruling on motion to compel in stand-alone cost, Simplified-SAC, and Three-Benchmark rate cases.* Within 5 business days after a conference with the parties convened pursuant to paragraph (a)(5) of this section, the Director of the Office of Proceedings will issue a summary ruling on the motion to compel discovery. If no conference is convened, the Director of the Office of Proceedings will issue this summary ruling within 10 days after the filing of the reply to the motion to compel. Appeals of a Director's ruling will proceed under 49 CFR 1115.9, and the Board will attempt to rule on such appeals within 20 days after the filing of the reply to the appeal.

* * * * *

(d) *Failure of party to attend or serve answers.* If a party or a person or an officer, director, managing agent, or employee of a party or person willfully fails to appear before the officer who is to take his deposition, after being served with a proper notice, or fails to serve answers to interrogatories submitted under § 1114.26, after proper service of such

interrogatories, the Board on motion and notice may strike out all or any part of any pleading of that party or person, or dismiss the proceeding or any part thereof. In lieu of any such order or in addition thereto, the Board shall require the party failing to act or the attorney advising that party or both to pay the reasonable expenses, including attorney's fees, caused by the failure, unless the Board finds that the failure was substantially justified or that other circumstances make an award of expenses unjust.

PART 1115—APPELLATE PROCEDURES

12. The authority citation for part 1115 continues to read as follows:

5 U.S.C. 559; 49 U.S.C. 1321; 49 U.S.C. 11708.

13. Amend § 1115.3 by revising paragraph (e) to read as follows:

§ 1115.3 Board actions other than initial decisions.

* * * * *

(e) Petitions must be filed within 20 days after the service of the action or within any further period (not to exceed 20 days) as the Board may authorize. However, in cases under Final Offer Rate Review, petitions must be filed within 5 days after the service of the action, and replies to petitions must be filed within 10 days after the service of the action.

* * * * *

Verified Statement of
Dr. Kevin W. Caves

BEFORE THE
SURFACE TRANSPORTATION BOARD

STB DOCKET NO. EP 755
FINAL OFFER RATE REVIEW

STB DOCKET NO. EP 761
HEARING ON REVENUE ADEQUACY

Verified Statement of
Kevin W. Caves, PhD
On Behalf of
The American Chemistry Council

Dated: November 12, 2019

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INTRODUCTION

1. In the Board's 2015 hearings in the above-captioned matter, I provided expert testimony describing, in general terms, how an econometric model ("Benchmark Model") could be developed for providing meaningful and economically justified rate relief to captive shippers.¹ Broadly speaking, a Benchmark Model would use statistical methods to compare a rail rate paid by a captive shipper to rates paid by similar shipments in competitive markets. The more the captive shipper's actual rate exceeds the predicted rate, the more likely it is that the differential is attributable to the exercise of market power. A finding of a sufficiently large differential would make that rate a candidate for further scrutiny, potentially setting in motion procedures designed to reduce it.² The Transportation Research Board ("TRB") has constructed illustrative models as a "proof of concept" demonstrating how a Benchmark Model might be implemented in practice to prove market dominance.³

2. I have been asked by the American Chemistry Council "ACC" to (1) to demonstrate the empirical implementation and viability of a Benchmark Model to determine maximum reasonable rates for revenue adequate railroads using real-world data, including the STB's Confidential Waybill Sample ("CWS"); and, (2) to demonstrate, using the Benchmark Model and railroad financial data, the implementation of the Competitive Threshold ("CT"), defined 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.

¹ Public Hearing, STB Docket No. Ex Parte 722 & STB Docket No. Ex Parte 664, *Consolidated Hearing Testimony of Jeffrey O. Moreno, Paul M. Donovan, Dr. Kevin W. Caves, Thomas D. Crowley, and Henry J. Roman On Behalf of the Concerned Shipper Associations*, Surface Transportation Board (July 23, 2015) [hereafter, 2015 Consolidated Testimony].

² *Id.*

³ Transportation Research Board, *Modernizing Freight Rail Regulation*, Special Report 318, National Academies of Sciences, Engineering, and Medicine (2015), available at <http://www.trb.org/Main/Blurbs/172736.aspx>.

SUMMARY OF CONCLUSIONS

- My analysis demonstrates that a Benchmark Model encompassing all commodities in the CWS can be implemented empirically using the CWS and publicly available data.
- Although unmasked revenue data from the CWS have not been made available to me, I have implemented statistical measures to control for the noise introduced by masking, and the resulting Benchmark Model yields statistically significant and economically reasonable results. These results are robust to variations in the definition of the competitive sample on which the Benchmark Model is estimated. Of course, the accuracy of the Benchmark Model could only improve if it were implemented using unmasked revenue data, which are available to the STB.
- I applied the Benchmark Model to predict comparable competitive rates for potentially noncompetitive shipments. In my baseline Benchmark Model, the actual rates for potentially noncompetitive shipments in the CWS exceed the predicted rates for comparable competitive shipments by approximately 48 percent on average.
- For approximately 26 percent of potentially noncompetitive shipments, the actual rate exceeds the predicted competitive rate by more than 50 percent (the ratio exceeds 1.5). For approximately 12 percent of potentially noncompetitive shipments, the actual rate is more than double the predicted competitive rate. For approximately four percent of potentially noncompetitive shipments, the actual rate is more than triple the predicted competitive rate. For approximately one percent of potentially noncompetitive shipments, the actual rate is more than five times the predicted competitive rate.
- In my illustrative analysis of the Competitive Threshold, I use a multi-year approach to assessing revenue adequacy. The analysis shows that three of the major Class I Railroads (BNSF, NS, and UP) are found to be revenue adequate for the six-year period from 2008 – 2013, despite the fact that this time period includes the Great Recession and its aftermath.
- Moreover, these three railroads would have remained revenue adequate, even under the assumption that the rates for all of their potentially noncompetitive traffic would have been subject to regulation based on the Benchmark Model. Revenue adequacy would have been maintained even in the presence of substantial downward adjustments to more closely align potentially noncompetitive rates with comparable competitive pricing benchmarks.

QUALIFICATIONS

3. My name is Kevin W. Caves. I am a Senior Economist at Econ One Research Inc. I have applied my expertise to a variety of industries, including cable, broadcasting, energy, finance, freight rail, Internet & tech platforms, healthcare, wireless and wireline networks, payment cards, pharmaceuticals, and professional sports. My published work has appeared in numerous popular and academic outlets, including *Antitrust*, *The Antitrust Source*, *The Atlantic*, *Broadcasting & Cable*, *The Capitol Forum*, *Communications & Strategies*, *Competition Policy International*, *Econometrica*, *The Economist*, *The Economists' Voice*, *Forbes*, *George Mason Law Review*, *Information Economics & Policy*, *Journal of Competition Law & Economics*, *Labor Law Journal*, *Regulation*, *Research in Law & Economics*, *Review of Network Economics*, and *Telecommunications Policy*. I have published two book chapters, and I serve on the Editorial Advisory Board of the *Journal of Transportation Law, Logistics, & Policy*. In conjunction with my co-authors in academia, I have developed econometric techniques that have been integrated into STATA, a leading statistical software package used globally by economists and empirical analysts in a range of disciplines. A copy of my CV is attached at Appendix 2.

I. STATISTICAL BENCHMARKING METHODS ARE GENERALLY ACCEPTED AND WIDELY USED IN ACADEMIA, GOVERNMENT, AND THE PRIVATE SECTOR

4. The Benchmark Model developed in this report is grounded in standard and generally accepted statistical techniques. In this report, I will use the term “econometrics” to refer to the statistical techniques underlying the Benchmark Method. Econometrics is distinguished from other branches of mathematical statistics because it focuses on the analysis of nonexperimental data—that is, data not obtained from controlled experiments—as is the case

here.⁴ Econometric methods are “based upon the development of statistical methods for estimating economic relationships, testing economic theories, and evaluating and implementing government and business policy.”⁵

5. As such, econometric methods are widely used by economists and other analysts in academia, government, and private businesses.⁶ Many government agencies (including the STB) employ economists trained in econometrics.⁷ Econometric techniques are also commonly accepted by courts for use in litigation. The Federal Judicial Center’s *Reference Manual on Scientific Evidence* characterizes regression analysis (the standard econometric tool for analyzing

⁴ See, e.g., JEFFREY M. WOOLDRIDGE, INTRODUCTORY ECONOMETRICS: A MODERN APPROACH (South-Western 2009 4th ed.) [hereafter, “Wooldridge,”] at 2 (“Econometrics has evolved as a separate discipline from mathematical statistics because the former focuses on the problems inherent in collecting and analyzing nonexperimental economic data. Nonexperimental data are not accumulated through controlled experiments on individuals, firms, or segments of the economy. (Nonexperimental data are sometimes called observational data, or retrospective data, to emphasize the fact that the researcher is a passive collector of the data.)”)

⁵ *Id.* at 1.

⁶ *Id.* See also R. CARTER HILL, WILLIAM E. GRIFFITHS, & GEORGE G. JUDGE, UNDERGRADUATE ECONOMETRICS (John Wiley & Sons 2nd ed. 2001) [hereafter “Hill et. al.”], at 1 (“The importance of econometrics extends far beyond the discipline of economics. Econometrics is a set of research tools also employed in the business disciplines of accounting, finance, marketing, and management. It is also used by social scientists, specifically researchers in history, political science, and sociology. Econometrics plays an important role in such diverse fields as forestry, and in agricultural economics...Thus research methods employed by economists, which comprise the field of econometrics, are useful to a broad spectrum of individuals.”) See also CHRISTIAAN HEIJ ET. AL., ECONOMETRIC METHODS WITH APPLICATIONS IN BUSINESS AND ECONOMICS (Oxford University Press 2004), at Introduction (“Decision making in business and economics is often supported by the use of quantitative information. Econometrics is concerned with summarizing relevant data information by means of a model. Such econometric models help to understand the relation between economic and business variables and to analyse the possible effects of decisions...Nowadays econometrics forms an indispensable tool to model empirical reality in almost all economic and business disciplines.”) See also B. ESPEN ECKBO, ED. HANDBOOK OF CORPORATE FINANCE: EMPIRICAL CORPORATE FINANCE, Vol. 1 (North Holland 2007), Part 1 (reviewing various econometric applications in corporate finance). See also JEFFREY D. CAMM ET. AL. ESSENTIALS OF BUSINESS ANALYTICS (South-Western 2nd ed. 2016).

⁷ A partial list at the federal level, based on recent job postings, includes the Census Bureau, the Bureau of Economic Analysis, the Bureau of Labor Statistics, the Department of the Treasury, the Department of Justice, the Congressional Budget Office, the Energy Information Administration, the Environmental Protection Agency, Fannie Mae, the Federal Communications Commission, the Federal Deposit Insurance Corporation, the Federal Energy Regulatory Commission, the Federal Housing Finance Agency, the Federal Trade Commission, the Federal Reserve System, the Food and Drug Administration, the Government Accountability Office, the Office of the Comptroller of the Currency, and the Securities and Exchange Commission. See, e.g., *Job Openings for Economists*, available at <https://www.aeaweb.org/joe/>.

relationships between variables) as “a well-accepted scientific methodology.”⁸ Econometric techniques “occupy a central place in antitrust litigation,”⁹ and have frequently been used in other forms of litigation as well.¹⁰

6. Econometric models predict an outcome (the “dependent variable”), using a set of predictors (the “explanatory variables”). In the Benchmark Model, the dependent variable is the rate (measured in dollars per ton-mile) paid for a competitive shipment, while the explanatory variables include economically relevant shipment characteristics. Once the statistical relationship between shipment characteristics and rates has been established (that is, once the econometric model has been estimated), this relationship is used to predict the rates that would be expected to prevail under competitive conditions, using the shipment characteristics from potentially non-competitive shipments. The effectively competitive sample serves as a benchmark because only effectively competitive shipments are used to estimate the econometric model (and thus to predict the relationship between shipment characteristics and competitive rates). To illustrate, the diagram below provides a simplified depiction of a Benchmark Model, with a single explanatory variable equal to the distance traveled for a given shipment.¹¹

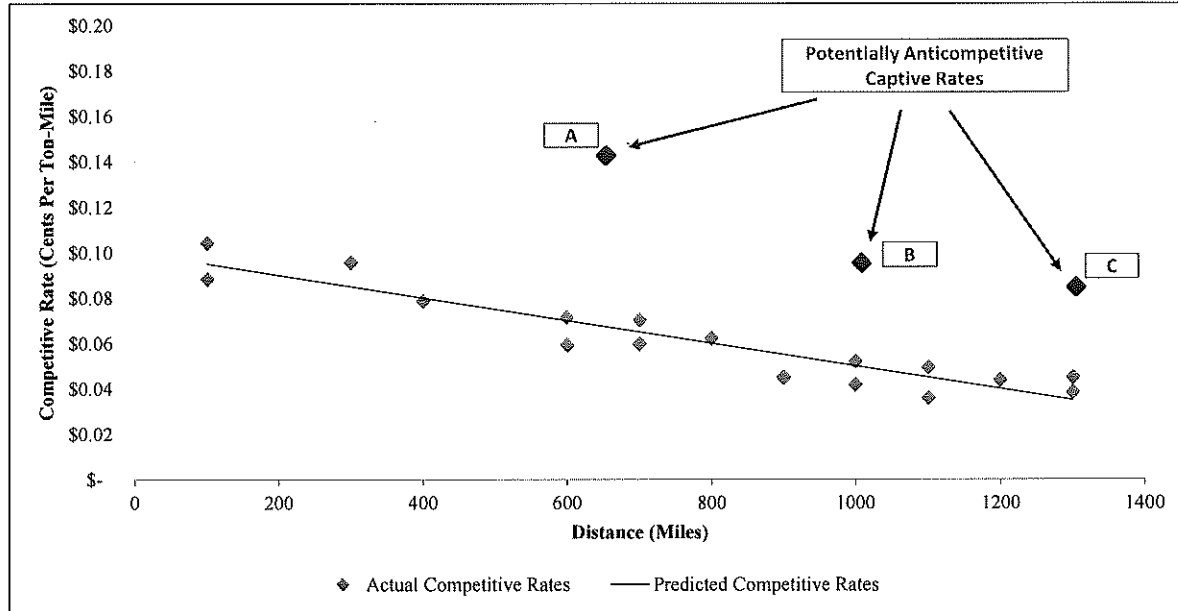
⁸ FEDERAL JUDICIAL CENTER, REFERENCE MANUAL ON SCIENTIFIC EVIDENCE (The National Academies Press 3rd ed. 2011) [hereafter “Reference Manual”], at 308 (“Because multiple regression is a well-accepted scientific methodology, courts have frequently admitted testimony based on multiple regression studies...”)

⁹ Justin McCrary & Daniel L. Rubinfeld, “Measuring Benchmark Damages in Antitrust Litigation,” 3(1) *Journal of Econometric Methods* 63-74 (2004).

¹⁰ Reference Manual at 306-307 (“Over the past several decades, the use of multiple regression analysis in court has grown widely. Regression analysis has been used most frequently in cases of sex and race discrimination, antitrust violations, and cases involving class certification (under Rule 23). However, there are a range of other applications, including census undercounts, voting rights, the study of the deterrent effect of the death penalty, rate regulation, and intellectual property.”)

¹¹ See 2015 Consolidated Testimony Part III.B.1.

FIGURE 1: ILLUSTRATIVE BENCHMARK MODEL



7. As seen above, the illustrative model depicts a simple linear relationship between the distance traveled (in miles), and rate charged for competitive shipments (in cents per ton-mile). Shipments over greater distances tend to charge lower prices per ton-mile.¹² The higher a captive rate is above the regression line, the more likely it is that the observed rate reflects a lack of competition. Conversely, rates that are close to (or below) the regression line would not raise anticompetitive concerns. Predictive analyses of this nature are a standard tool of econometrics.¹³ Moreover, the specific circumstances of the freight rail industry—in which market-based rates have arisen over time as result of deregulation—make the Benchmark Model particularly applicable to the industry.

¹² TRB Report at Appendix B, Tables B-2, B-5, B-8, B-11 (showing negative and statistically significant distance coefficients).

¹³ See, e.g., Wooldridge at 206 – 215.

II. THE BENCHMARK MODEL

8. In this section, I describe the Benchmark Model that I have developed using CWS data for each of the years made available to me (2006 – 2013).¹⁴ Although unmasked revenue data from the CWS have not been made available to me, I have implemented statistical measures to control for the noise introduced by masking, and the Benchmark Model yields statistically significant and economically reasonable results. Of course, the accuracy of the Benchmark Model could only improve if it were implemented using unmasked revenue data, which are available to the STB. The data and programs used to generate the results summarized in this report are being produced to the STB, along with instructions on how to modify the analysis to incorporate (1) unmasked CWS data; and, (2) CWS data from more recent time periods. Appendix 1 summarizes this production.

A. Data

9. In this section, I describe the data used to implement the Benchmark Model. The dependent variable, which the Benchmark Model is designed to predict, is the revenue per ton-mile for a given movement in the CWS. Because contracted rates are confidential, railroads are permitted to disguise (or “mask”) their contract revenues by “factoring them by a scalar value at the three-digit STCC level.”¹⁵ In contrast, tariffed rates are not confidential and therefore are not masked. The CWS also includes a data field (the “calculated rate flag”) indicating whether or not the revenue for a given waybill is masked. In the version of the CWS made available to me, the revenues of the contracted rates are masked. In addition, the “calculated rate flag” is not

¹⁴ For purposes of my analysis, I limited the CWS to shipments within the United States.

¹⁵ See *2013 Surface Transportation Board Carload Waybill Sample Reference Guide* (October 21, 2014) at 176.

populated. It is therefore not possible to determine whether a masking factor has been applied to a given shipment, and (if so) what that masking factor is.

10. To predict revenue per ton-mile, the Benchmark Model uses shipment characteristics available in the CWS, data fields calculated from the CWS, and other data sources. All in all, the Benchmark Model uses approximately 10,000 factors to predict competitive rates. As summarized in Table 1 below, these include the total distance of the shipment, the size of the shipment (measured by number of carloads), the number of railroads involved in the movement, a private car indicator, and an indicator for hazardous materials. Also included is the “Rebill Code,” which is used to identify joint line moves under Rule 11.¹⁶ Additional control variables include “fixed effects” for each individual 5-digit STCC (which control for factors that cause rates for one commodity to be higher or lower, on average, than other commodities), fixed effects by year (which control for factors that cause rates for one year to be higher or lower, on average, than in other years), and fixed effects by railroad (which control for pricing differences between railroads).¹⁷

11. Finally, to control for measurement error introduced by masking, the model also includes indicator variables specific to each unique combination of a 3-digit STCC, railroad, and year. (As explained above, in each year of the CWS, each railroad can apply a different masking factor to each 3-digit STCC). These masking factor indicators control for factors that cause rates

¹⁶ Under Rule 11, each railroad involved in a joint movement typically invoices the shipper separately for only that railroad’s portion of the movement. The Rebill Code can take on four different values (Local Shipment, Originated-Delivered, Received-Delivered, and Received-Terminated). The latter three categories indicate that the shipment is part of a Rule 11 movement. My regression model includes separate controls for each of these categories.

¹⁷ There are eleven Class 1 Railroads in the data set, owned by seven entities: BNSF, Canadian National, Canadian Pacific, CSX, Kansas City Southern, Norfolk Southern, and Union Pacific. When multiple railroads were involved in a shipment, the railroad accounting for the longest distance was used.

for a particular 3-digit STCC commodity shipped on a particular railroad during a particular year to be higher or lower, on average, than any other combination of 3-digit STCC, railroad, and year.

TABLE 1: DATA FIELDS USED IN BENCHMARK MODEL

Data Field	Source/Details
Revenue ¹⁸	CWS: Freight Revenue (Code 15) + Transit Charges (Code 16) + Miscellaneous Charges (Code 17) + Fuel Surcharges (Code 202)
Weight	CWS: Billed Weight Tons (Code 99)
Deregulation Flag	CWS: Deregulation Flag (Code 96)
Distance	CWS: Total Distance (Code 123)
Revenue per Ton-Mile	[Revenue]/[Weight*Distance]
Shipment Size	CWS: Number of Carloads (Code 5)
# of RRs in Movement	CWS: Junction Frequency (Code 87) + 1
Private Car Indicator	CWS: Car Ownership Category (Code 93)
3 & 5-digit STCC	CWS: Commodity Code (non-HAZMAT STCC) (Code 76)
Hazardous Materials Indicator	CWS: Based on 49 series Commodity Code (STCC-HAZMAT) (Code 12)
Rule 11 Indicator	CWS: Rebill Code (Code 24)
Reporting Railroad Indicator	CWS: Reporting Railroad (Code 31)
Longest Railroad Indicator	CWS: Based on longest Railroad Distance (Codes 113-119)
Year Indicator	CWS Year
Masking Factor Indicator	Separate Indicator for Each Unique Combination of Reporting Railroad, Year, 3-digit STCC
Number of Alternative Class I Rail Road Stations Within 10 Miles of Origin and Destination	CWS, Station Master Data, GIS
Number of Water Ports Within 10 Miles of Origin and Destination	CWS, Port Series Data, GIS

12. The Benchmark Model also utilizes data to measure the competitive alternatives that may have been available to a shipper for a given CWS movement. One indicator of potential competition is the number of Class I railroads within a given distance of the origin and destination

¹⁸ Revenue figures are adjusted to 2009 dollars using the Consumer Price Index as reported by the St. Louis Federal Reserve, available at <https://fred.stlouisfed.org/>

stations of a given CWS movement. To determine the proximity of potentially competitive rail alternatives, the location of each station in the CWS was identified based on the standard point locator code (“SPLC”), freight station accounting code (“FSAC”), and railroad name included in the waybill information. Taken together, these data provided the latitude and longitude of the origin and destination of each shipment in the CWS. To measure the proximity of potential competition from Class I railroads, I used the railroad network geographic information system (GIS) data for Class I railroads available from the Centralized Station Master (CSM) database.

13. Another indicator of potential competition is the presence of commercial water ports on the same waterway.¹⁹ To determine the proximity of potentially competitive water-based alternatives, I used Port Series data published by the U.S. Army Corps of Engineers to identify commercial ports.²⁰ I used GIS data to measure the proximity of each origin and destination station in the CWS to each commercial water port.

B. Econometric Analysis

1. Defining a Competitive Sample

14. Before the Benchmark Model can be implemented, a sample of competitive movements (a “Benchmark Group”) must be identified. A CWS movement was included in the competitive sample if it satisfied any of four criteria. *First*, all deregulated (exempt) shipments were included in the competitive sample. For exempt commodities, regulation has been deemed “not needed to protect shippers from the abuse of market power.”²¹ According to the TRB, the

¹⁹ A port is assigned to one or more waterway systems based on its location. The waterway systems are: The Mississippi River and its tributaries, the Great Lakes and Erie Canal, the Columbia River, the West Coast (excluding Alaska), the East Coast, the Gulf Coast, Puget Sound, and Alaska.

²⁰ For example, ferry terminals, recreational vessel docks, and other non-commercial ports are excluded.

²¹ 49 USC §10502.

“practical capability to be moved by truck”²² became “the de facto standard for deciding whether a commodity should be considered inherently competitive and granted a categorical exemption.”²³ In addition to trucking competition, water-based competition is also considered in commodity exemptions.²⁴ *Second*, all shipments potentially subject to rail competition were also included in the competitive sample. I classified a movement as subject to rail competition if there was at least one competing Class I railroad operating within five miles of the origin station, provided that the same Class I railroad also operated within five miles of the destination station of the movement.²⁵ *Third*, all shipments subject to water-based competition were also included in the competitive sample. I classified a CWS movement as subject to water-based competition if at least one port on the same waterway was located within five miles of both the origin station and the destination station. *Fourth*, all shipments subject to trucking competition were also included in the competitive sample. I classified a CWS movement as subject to trucking competition if the movement was less than 200 miles, and if the size of the shipment was less than five carloads.²⁶ Finally, although a movement’s revenue-to-variable-cost (“R/VC”) ratio determines whether the

²² TRB Report at 20, n. 18.

²³ *Id.*

²⁴ United States Government Accountability Office, *Freight Rail Pricing: Contracts Provide Shippers and Railroads Flexibility, but High Rates Concern Some Shippers* (December 2016), at 5 (“Some commodities were later exempted from STB’s jurisdiction, primarily commodities that could be shipped by boxcar or intermodal containers, in part because these goods can also be transported by other competitive alternatives such as barge or truck and are therefore unlikely to be captive.”) *See also* STB Docket No. Ex Parte 722, *Review of Commodity, Boxcar, and TOFC/COFC Exemptions, Notice of Proposed Rulemaking*, Surface Transportation Board (March 23, 2016) (“When steel production was located primarily in the Great Lakes region, water carriage was an option for transportation—e.g., over the Great Lakes themselves—but is now less so after the migration to the South.”)

²⁵ I confirmed that my results are robust to alternative distance thresholds. See Table 3 below.

²⁶ As explained above, exempt commodities may be subject to trucking competition, and are also included in the competitive sample.

rate is legally eligible to be challenged, I did not use R/VC to screen shipments into the competitive sample.²⁷

15. As seen in Table 2A, approximately 25 percent of all CWS shipments are deregulated; approximately 64 percent of all CWS shipments have potential rail competition; about 7 percent have potential water-based competition, and approximately 5 percent satisfy the trucking screen. Altogether, approximately 76 percent of the movements in the CWS fall within the competitive sample. Therefore, about 24 percent of shipments in the CWS are classified as potentially noncompetitive.

16. Unsurprisingly, the percentage of shipments classified as competitive varies significantly from one two-digit STCC to the next. For several commodities, 100 percent of the CWS movements are classified into the competitive sample. For example, all Textile Mill Products movements are deregulated. Therefore, all Textile Mill Products shipments are included in the competitive sample. For other commodities, a significant percentage falls outside the competitive sample. For example, in the case of Chemicals or Allied Products, about three percent of movements are deregulated; about 42 percent have potential rail competition, about 15 percent have potential water competition, and about 15 percent satisfy the trucking screen. Altogether, about 54 percent of Chemicals or Allied Products shipments in the CWS fall within the competitive sample. Therefore, about 46 percent of Chemicals or Allied Products shipments are classified as potentially noncompetitive.

²⁷ Given that unmasked revenues have not been made available to me, such a screen would not accurately capture shipments that fall above or below the statutory R/VC screen of 180. Even if unmasked data were available, I would be reluctant to apply a competitive screen based on a legal standard in the absence of economic evidence supporting such a screen. In contrast, the R/VC screen would be applied when implementing the competitive threshold analysis in Part III below, because rates with R/VC below 180 are not subject to regulation under current law.

TABLE 2A: COMPETITIVE SCREENS (UNWEIGHTED)

Commodity Name	STCC Code (2-Digit)	Share of CWS Shipments Satisfying Screen 1 (Dereg.)	Share of CWS Shipments Satisfying Screen 2 (Paired Class I RR within 5 Miles of O & D)	Share of CWS Shipments Satisfying Screen 3 (Port within 5 Miles of O & D on Same Waterway)	Share of CWS Shipments Satisfying Trucking Screen 4 (<200 Miles, <5 Cars)	Share of CWS Shipments Satisfying Any Screen
ALL	ALL	24.7%	63.5%	6.5%	4.7%	76.2%
Farm Products	1	19.3%	47.3%	1.7%	3.1%	54.8%
Forest Products	8	0.0%	71.5%	0.4%	0.6%	71.5%
Fresh Fish or Other Marine Products	9	100.0%	81.5%	4.8%	0.9%	100.0%
Metallic ores	10	0.0%	65.4%	1.8%	1.5%	66.5%
Coal	11	0.0%	29.4%	1.3%	0.1%	29.7%
Petroleum (Crude)	13	0.0%	11.4%	0.7%	1.2%	12.1%
Non Metal Minerals	14	47.2%	19.2%	5.6%	4.2%	57.5%
Ordnance or Accessories	19	0.0%	23.3%	1.6%	0.0%	23.3%
Food or Kindred Products	20	26.9%	53.8%	5.5%	5.3%	65.1%
Tobacco	21	0.0%	100.0%	0.0%	0.0%	100.0%
Textile Mill Products	22	100.0%	74.4%	2.3%	4.2%	100.0%
Apparel or Other Textile Products or Knit Apparel	23	100.0%	66.7%	2.2%	1.4%	100.0%
Lumber or Wood Products Exc. Furniture	24	100.0%	28.8%	1.5%	20.2%	100.0%
Furniture or Fixtures	25	100.0%	66.2%	4.0%	0.2%	100.0%
Pulp, Paper or Allied Products	26	63.0%	45.9%	5.2%	6.2%	83.1%
Printed Products	27	100.0%	86.6%	1.4%	0.2%	100.0%
Chemicals or Allied Products	28	2.5%	41.7%	14.8%	14.6%	53.8%
Petroleum/Coal Products	29	6.6%	44.2%	12.5%	13.8%	54.7%
Rubber or Miscellaneous Plastics Products	30	80.3%	71.9%	4.6%	1.0%	90.5%

Commodity Name	STCC Code (2-Digit)	Share of CWS Shipments Satisfying Screen 1 (Dereg.)	Share of CWS Shipments Satisfying Screen 2 (Paired Class 1 RR within 5 Miles of O & D)	Share of CWS Shipments Satisfying Screen 3 (Port within 5 Miles of O & D on Same Waterway)	Share of CWS Shipments Satisfying Trucking Screen 4 (<200 Miles, <5 Cars)	Share of CWS Shipments Satisfying Any Screen
Leather or Leather Products	31	100.0%	57.2%	0.8%	0.2%	100.0%
Clay, Concrete, Glass or Stone Products	32	45.6%	26.5%	4.8%	11.8%	59.9%
Primary Metal Products, Including Galvanized Coating or Other Allied Processing	33	100.0%	49.4%	10.1%	16.6%	100.0%
Fabricated Metal Exc. ordnance, Machinery, or Transportation Equipment	34	94.1%	73.6%	2.9%	1.1%	98.8%
Machinery	35	75.3%	67.0%	2.9%	1.3%	89.4%
Electrical Machinery, Equipment or Supplies	36	98.8%	70.7%	4.5%	0.3%	99.5%
Transportation Equipment	37	91.1%	63.7%	6.1%	7.9%	96.7%
Instruments, Goods, Optical Goods, Watches or Clocks	38	100.0%	74.3%	0.8%	1.4%	100.0%
Miscellaneous Products	39	100.0%	70.9%	3.0%	0.2%	100.0%
Waste or Scrap Materials Not Identified by Producing Industry	40	78.5%	54.6%	5.0%	14.5%	92.9%
Miscellaneous Freight Shipments	41	15.6%	69.2%	2.1%	0.9%	74.7%
Containers, Carriers or Devices, Shipping, Returned Empty	42	0.3%	78.6%	7.8%	3.2%	79.2%
Mail, Express or Other Contract Traffic	43	0.0%	94.8%	19.6%	0.0%	94.8%
Freight Forwarder	44	0.0%	91.5%	9.9%	0.1%	91.6%
Shipper Association or Similar Traffic	45	0.0%	78.8%	5.1%	0.0%	78.8%
Miscellaneous Mixed Shipments	46	0.0%	82.6%	6.3%	0.2%	82.7%
Small Packaged Freight Shipments	47	0.0%	96.5%	2.3%	0.0%	96.5%
Waste Hazardous or Waste Hazardous Substances	48	0.0%	32.3%	8.4%	7.1%	41.3%

17. Table 2B repeats the same exercise, this time weighting each data point by its CWS expansion factor. As seen below, approximately 80 percent of the weighted movements fall within the competitive sample. Conversely, approximately 20 percent of the weighted CWS movements do not, and are therefore potentially noncompetitive. As before, there is significant variation from one two-digit STCC code to the next.

TABLE 2B: COMPETITIVE SCREENS (WEIGHTED BY EXPANSION FACTORS)

Commodity Name	STCC Code (2-Digit)	Share of CWS Shipments Satisfying Screen 1 (Deregulation)	Share of CWS Shipments Satisfying Screen 2 (Paired Class I RR within 5 Miles of O & D)	Share of CWS Shipments Satisfying Screen 3 (Port within 5 Miles of O & D on Same Waterway)	Share of CWS Shipments Satisfying Screening Screen 4 (<200 Miles, <5 Cars)	Share of CWS Shipments Satisfying Any Screen
ALL	ALL	25.9%	67.2%	6.9%	5.1%	80.0%
Farm Products	1	33.1%	68.2%	1.4%	5.0%	79.9%
Forest Products	8	0.0%	71.6%	0.4%	0.6%	71.6%
Fresh Fish or Other Marine Products	9	100.0%	81.5%	4.8%	0.9%	100.0%
Metallic ores	10	0.0%	28.4%	5.0%	6.4%	33.1%
Coal	11	0.0%	27.0%	1.3%	1.7%	27.8%
Petroleum (Crude)	13	0.0%	17.4%	1.3%	2.6%	18.8%
Non Metal Minerals	14	19.3%	18.6%	4.8%	6.9%	37.9%
Ordnance or Accessories	19	0.0%	27.8%	1.9%	0.0%	27.8%
Food or Kindred Products	20	28.5%	54.9%	5.5%	5.4%	66.6%
Tobacco	21	0.0%	100.0%	0.0%	0.0%	100.0%
Textile Mill Products	22	100.0%	74.4%	2.3%	4.2%	100.0%
Apparel or Other Textile Products or Knit Apparel	23	100.0%	66.7%	2.2%	1.4%	100.0%
Lumber or Wood Products Exc. Furniture	24	100.0%	28.9%	1.5%	21.1%	100.0%
Furniture or Fixtures	25	100.0%	66.2%	4.0%	0.2%	100.0%

Commodity Name	STCC Code (2-Digit)	Share of CWS Shipments Satisfying Screen 1 (Deregulation)	Share of CWS Shipments Satisfying Screen 2 (Paired Class 1 RR within 5 Miles of O & D)	Share of CWS Shipments Satisfying Screen 3 (Port within 5 Miles of O & D on Same Waterway)	Share of CWS Shipments Satisfying Trucking Screen 4 (<200 Miles, <5 Cars)	Share of CWS Shipments Satisfying Any Screen
Pulp, Paper or Allied Products	26	63.0%	45.9%	5.1%	6.1%	83.1%
Printed Products	27	100.0%	86.6%	1.4%	0.2%	100.0%
Chemicals or Allied Products	28	2.6%	42.4%	15.2%	15.3%	54.9%
Petroleum/Coal Products	29	2.6%	44.3%	12.4%	15.9%	53.5%
Rubber or Miscellaneous Plastics Products	30	80.3%	71.9%	4.6%	1.0%	90.5%
Leather or Leather Products	31	100.0%	57.2%	0.8%	0.2%	100.0%
Clay, Concrete, Glass or Stone Products	32	42.9%	26.2%	4.9%	12.8%	57.9%
Primary Metal Products, Including Galvanized Coating or Other Allied Processing	33	100.0%	49.1%	10.1%	17.1%	100.0%
Fabricated Metal Exc. ordnance, Machinery, or Transportation Equipment	34	94.1%	73.7%	2.9%	1.1%	98.8%
Machinery	35	76.7%	67.7%	2.8%	1.2%	90.3%
Electrical Machinery, Equipment or Supplies	36	99.0%	70.7%	4.5%	0.3%	99.6%
Transportation Equipment	37	92.8%	64.0%	6.0%	7.9%	97.5%
Instruments, Goods, Optical Goods, Watches or Clocks	38	100.0%	74.3%	0.8%	1.4%	100.0%
Miscellaneous Products	39	100.0%	70.9%	3.0%	0.2%	100.0%
Waste or Scrap Materials Not Identified by Producing Industry	40	80.0%	56.8%	5.0%	15.0%	95.1%
Miscellaneous Freight Shipments	41	16.1%	70.0%	1.9%	0.9%	75.8%
Containers, Carriers or Devices, Shipping, Returned Empty	42	0.3%	78.6%	7.8%	3.2%	79.2%
Mail, Express or Other Contract Traffic	43	0.0%	94.9%	19.6%	0.0%	94.9%
Freight Forwarder	44	0.0%	91.5%	9.9%	0.1%	91.6%

Commodity Name	STCC Code (2-Digit)	Share of CWS Shipments Satisfying Screen 1 (Deregulation)	Share of CWS Shipments Satisfying Screen 2 (Paired Class I RR within 5 Miles of O & D)	Share of CWS Shipments Satisfying Screen 3 (Port within 5 Miles of O & D on Same Waterway)	Share of CWS Shipments Satisfying Screening Screen 4 (<200 Miles, <5 Cars)	Share of CWS Shipments Satisfying Any Screen
Shipper Association or Similar Traffic	45	0.0%	78.8%	5.1%	0.0%	78.8%
Miscellaneous Mixed Shipments	46	0.0%	82.6%	6.3%	0.2%	82.7%
Small Packaged Freight Shipments	47	0.0%	96.5%	2.3%	0.0%	96.5%
Waste Hazardous or Waste Hazardous Substances	48	0.0%	31.6%	7.1%	7.4%	41.0%

18. It bears emphasis that what ultimately matters when defining a competitive sample is (1) establishing an economically reasonable and workable set of criteria for identifying CWS shipments subject to effective competition; and (2) applying these criteria consistently. Of course, it is not practical to expect that the Board (or anyone else) could design a workable set of criteria that would flawlessly identify effectively competitive shipments in each and every instance. Any workable process would involve some error. Fortunately, such errors would not be expected to undermine the reliability of the Benchmark Model.

19. To see this, note that a classification scheme can commit two types of errors: It can mistakenly exclude a competitive shipment from the effectively competitive sample (a “Type I Error”), or it can mistakenly include a noncompetitive shipment in the effectively competitive sample (a “Type II Error”). A Type I Error would occur when a truly competitive shipment is flagged because it meets some set of criteria triggering a concern that the shipment may not be sufficiently competitive to warrant inclusion in the effectively competitive sample. But Type I Errors do not render the Benchmark Model unreliable, because the shipments that remain in the effectively competitive sample would still reflect competitive conditions—and only these shipments are used to estimate the Benchmark Model. Put differently, reliance on an under-

inclusive classification scheme would not imply that the resulting sample of competitive shipments is not effectively competitive.

20. Conversely, a Type II error would occur when a noncompetitive shipment is included in the effectively competitive sample because the selection criteria are not strict enough for that particular shipment. This over-inclusiveness would dilute the degree of competition reflected in the effectively competitive sample. This would render the Benchmark Model more conservative, in the sense of making it less likely that the Benchmark Model would indicate that a potentially noncompetitive price is significantly above the competitive level. Thus, the potential for Type II Errors can be added to the list of reasons why the Benchmark Method is inherently conservative and unlikely to adversely affect railroads' revenue adequacy.²⁸

2. Econometric Model

21. After a competitive sample has been identified, the data from the competitive sample are used to estimate an econometric model. The econometric model can be written:

$$\ln(r_{it}) = \alpha + \alpha_i + m_{it} + \sum_j \beta_j X_{ijt} + \varepsilon_{it}$$

Above, r_{it} is the revenue per ton-mile for given CWS movement i in year t . The natural log of revenue per ton-mile, $\ln(r_{it})$, is the dependent variable that the econometric model is designed to predict. The term α_i represents fixed effects; there is one fixed effect for each 5-digit STCC code.²⁹ The term m_{it} represents indicator variables designed to control for revenue masking, and

²⁸ See 2015 Consolidated Testimony Part III.B.3.

²⁹ As explained above, these fixed effects control for factors that cause rates for one commodity to be higher or lower, on average, than other commodities.

also control for fixed effects by year and railroad.³⁰ The X_{ijt} represent other characteristics of the shipment, such as distance and size. (Although the β_j are the same for all commodities, it would be conceptually straightforward to allow these parameters to vary by STCC code. This would allow, for example, the effect of shipment distance on revenue per ton-mile to be different for different commodities). Finally, ε_{it} is a random error term (a standard component of any econometric model). Each observation in the regression is weighted by the CWS expansion factor.³¹

22. The output of the econometric model is displayed in Table 3 below. Results are presented for nine different Benchmark Groups (BG1 – BG9). The baseline Benchmark Model uses Benchmark Group One (BG1), which is the same competitive sample detailed in Tables 2A-2B above. In the remaining Benchmark Groups, the set of shipments classified in the competitive sample is expanded in various ways. For example, in BG2, the allowable distance to Class 1 railroads is increased from 5 miles to 25 miles. Moving from BG1 to BG9, the allowable distances to rail and water competition vary between 5 miles and 50 miles.

23. The regression utilizes more than 3.5 million data points and explains approximately 57 percent of the variation in (masked) revenue per ton-mile (R -squared = 0.572).³²

³⁰ As explained above, each railroad can mask their contract revenues by multiplying revenues by a scalar value at the three-digit STCC level. Accordingly, there is a separate masking factor indicator for each unique combination of railroad, year, and 3-digit STCC. Because the masking factor indicators span all railroads and years, they also control for fixed effects by railroad and year.

³¹ The expansion factor for a movement in the CWS is equal to the number of shipments that this shipment represents in the population of shipments served by the railroad annually. It is equal to the inverse of the sampling rate.

³² By way of comparison, when the TRB used unmasked revenue data to estimate individual, commodity-level regression models, the reported R -squared statistics ranged from 65.6 percent (for Chemicals and Allied Products) to 78.5 percent (for Coal). TRB Report, Appendix B. The explanatory power of the Benchmark Model would be expected to increase when applied to unmasked revenue data. The explanatory power of the Benchmark Model could also be increased by allowing the parameters of the model to vary by STCC code (which is conceptually straightforward, as noted above). In any case, it bears emphasis that, in econometrics, a “high” R -squared is not

The coefficients on each of the shipment characteristics is highly statistically significant, and the effects of the shipment characteristics on revenue per ton-mile make economic sense. The coefficient on the natural logarithm of the shipment distance is consistently negative, at approximately -0.6. This indicates that a ten percent increase in the distance of a movement is, all else equal, associated with a decrease in revenue per ton-mile of approximately 6 percent. Therefore, longer shipments appear to be discounted relative to shorter movements, presumably because the railroad's cost per ton-mile tends to be smaller for longer movements due to scale economies. The coefficient on the natural logarithm of the shipment size, as measured by the number of carloads, is consistently negative, at approximately -0.06 to -0.07. This means that a ten percent increase in the size of a shipment is, all else equal, associated with a decrease in revenue per ton-mile of approximately 0.6 to 0.7 percent. Again, this appears to reflect scale economies.

necessarily indicative of a favorable result, nor is a "low" R -squared necessarily indicative of an unfavorable result. Even a regression with a seemingly low R -squared can generate statistically valid predictions. This is particularly true when the sample size is large, as is the case here. *See, e.g.,* JEFFREY M. WOOLDRIDGE, *INTRODUCTORY ECONOMETRICS: A MODERN APPROACH* 199 (South-Western Cengage Learning 4th ed. 2009) [hereafter, "WOOLDRIDGE"] ("Until now, we have not focused much on the size of R^2 in evaluating our regression models, because beginning students tend to put too much weight on R -squared...choosing a set of explanatory variables based on the size of the R -squared can lead to nonsensical models... A small R -squared does imply that the error variance is large relative to the variance of y , which means we may have a hard time precisely estimating the [regression coefficients]. But remember...that *a large error variance can be offset by a large sample size*: if we have enough data, we may be able to precisely estimate the partial effects even though we have not controlled for many unobserved factors.") (emphasis added). *See also* DAMODAR GUJARATI, *BASIC ECONOMETRICS* 222–223 (McGraw-Hill 2008) ("[A] high r^2 is not evidence in favor of the model and a low r^2 is not evidence against it.")

TABLE 3: BENCHMARK MODEL REGRESSIONS
Dependent Variable = $\ln(\text{Revenue Per Ton-Mile})$

Explanatory Variable	BG1 (5mi RR, 5mi Water)	BG2 (25mi RR, 5mi Water)	BG3 (50mi RR, 5mi Water)	BG4 (5mi RR, 25mi Water)	BG5 (25mi RR, 25mi Water)	BG6 (50mi RR, 25mi Water)	BG7 (5mi RR, 50mi Water)	BG8 (25mi RR, 50mi Water)	BG9 (50mi RR, 50mi Water)
<i>Log of Total Distance (Miles)</i>	-0.635*** (0.000)	-0.623*** (0.000)	-0.619*** (0.000)	-0.635*** (0.000)	-0.623*** (0.000)	-0.618*** (0.000)	-0.634*** (0.000)	-0.622*** (0.000)	-0.618*** (0.000)
<i>Log of Carloads</i>	-0.068*** (0.000)	-0.065*** (0.000)	-0.061*** (0.000)	-0.065*** (0.000)	-0.064*** (0.000)	-0.066*** (0.000)	-0.063*** (0.000)	-0.063*** (0.000)	-0.066*** (0.000)
<i>Number of Railroads in Shipment</i>	0.2*** (0.000)	0.202*** (0.000)	0.207*** (0.000)	0.201*** (0.000)	0.203*** (0.000)	0.207*** (0.000)	0.201*** (0.000)	0.203*** (0.000)	0.208*** (0.000)
<i>Private Car Flag</i>	-0.09*** (0.000)	-0.092*** (0.000)	-0.092*** (0.000)	-0.09*** (0.000)	-0.092*** (0.000)	-0.092*** (0.000)	-0.09*** (0.000)	-0.092*** (0.000)	-0.092*** (0.000)
<i>Hazmat Flag</i>	0.141*** (0.000)	0.152*** (0.000)	0.146*** (0.000)	0.14*** (0.000)	0.152*** (0.000)	0.146*** (0.000)	0.134*** (0.000)	0.15*** (0.000)	0.145*** (0.000)
<i>Rule 11 Flag - Origin to Intermed</i>	-0.055*** (0.000)	-0.056*** (0.000)	-0.057*** (0.000)	-0.054*** (0.000)	-0.056*** (0.000)	-0.057*** (0.000)	-0.053*** (0.000)	-0.056*** (0.000)	-0.057*** (0.000)
<i>Rule 11 Flag - Intermed to Intermed</i>	-0.221*** (0.000)	-0.208*** (0.000)	-0.209*** (0.000)	-0.219*** (0.000)	-0.209*** (0.000)	-0.21*** (0.000)	-0.219*** (0.000)	-0.209*** (0.000)	-0.21*** (0.000)
<i>Rule 11 Flag - Intermed to Dest</i>	-0.09*** (0.000)	-0.079*** (0.000)	-0.08*** (0.000)	-0.089*** (0.000)	-0.079*** (0.000)	-0.08*** (0.000)	-0.087*** (0.000)	-0.079*** (0.000)	-0.08*** (0.000)
<i>Constant</i>	1.709*** (0.000)	1.608*** (0.000)	1.565*** (0.000)	1.689 (1.000)	1.603 (0.999)	1.56 (1.000)	1.683*** (0.000)	1.6*** (0.000)	1.565*** (0.000)
# of 5-digit STCC FE (α_i)	868	857	863	855	853	872	862	865	868
# Masking Factor Controls (m_i)	9,661	10,363	10,622	9,821	10,420	10,642	9,971	10,485	10,682
Observations	3,496,978	4,123,077	4,265,047	3,542,402	4,135,900	4,273,501	3,588,840	4,154,818	4,285,131
R-Squared	57.2%	55.5%	55.5%	57.2%	55.5%	55.5%	57.2%	55.5%	55.5%

Notes: Robust p -values in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Each observation is weighted by its expansion factor, the inverse of the waybill sampling rate. All regressions include fixed effects by 5-digit STCC, as well as separate fixed effects for each unique combination of railroad, year, and 3-digit STCC

24. On the other hand, the coefficient on the number of railroads involved in the movement is consistently positive: The more railroads involved in a shipment, the higher the rate; movements involving multiple railroads appear to have characteristics that make them more costly to perform. The coefficient on the private car indicator is consistently negative, indicating that shippers pay lower rates when the railroad does not provide the cars for the shipment. The hazardous materials coefficient is consistently positive, indicating that hazardous materials are more expensive to ship than are non-hazardous materials. The Rule 11 Flags are consistently negative, indicating that rates are lower for shipments that form part of a joint movement. For example, a movement from the origin to an intermediate station is approximately 5.5 percent less expensive than a non-Rule 11 movement, while a movement between two intermediate stations is approximately 22 percent less expensive than a non-Rule 11 movement. Finally, the regression includes fixed effects for more than 850 5-digit STCC codes,³³ and approximately 10,000 masking factor controls. Standard econometric tests confirm that both the 5-digit STCC fixed effects and the masking factor controls contribute significantly to the explanatory power of the regression model.

C. Results

25. As explained above, approximately 24 percent of CWS movements are classified as potentially noncompetitive. In this section, I use the Benchmark Model to identify movements with abnormally high rates within this potentially noncompetitive sample. For each potentially noncompetitive movement in the CWS, I used the Benchmark Model to predict what the revenue per

³³ There are more than one thousand 5-digit STCC codes in the competitive sample. However, the fixed effects for some of these 5-digit STCC codes are collinear with the masking factor controls. In these cases, the fixed effects are dropped from the regression. This does not affect the predictions of the regression model: The predictions would be the same if a fixed effect were included for every 5-digit STCC code in the competitive sample. In this case, some of the masking factor controls—those that are collinear with the 5-digit STCC code fixed effects—would be dropped instead. In either case, the regression model generates mathematically identical predictions.

ton-mile would for a shipment with comparable characteristics in the competitive sample. I then compared the actual rate paid by the shipper to the predicted competitive rate. As explained below, the actual rates for potentially noncompetitive shipments in the CWS exceed the predicted rates for comparable competitive shipments by approximately 48 percent on average.

26. For each shipment in the potentially noncompetitive sample, I used the shipment characteristics used in the econometric model to obtain the predicted rate for a comparable competitive shipment. As explained above, these characteristics include the distance of the shipment, the number of carloads, the number of railroads involved in the shipment, whether or not private cars were used, and whether or not hazardous materials were shipped. They also include the 5-digit STCC code of the shipment. Also required is the year, railroad, and 3-digit STCC of the potentially noncompetitive shipment; this information determines the masking factor correction that is applied to the shipment.

27. For the baseline competitive sample, BG1, there are approximately 1,095,000 potentially noncompetitive movements in the CWS. Of these, I was able to obtain predicted competitive rates for approximately 1,081,000, or about 99 percent. Predicted competitive rates are unavailable for approximately one percent of the potentially noncompetitive sample because it was not possible to apply a masking factor correction to these movements. Masking factor corrections could not be performed for this small percentage of movements because they involved a combination of year, railroad, and 3-digit STCC that did not appear in the competitive sample.³⁴

28. For each movement in the competitive sample, I computed the ratio of (1) the actual rate reported in the CWS; to (2) the predicted rate for a comparable competitive shipment. As seen

³⁴ Of course, masking factor corrections would not be needed if the unmasked CWS data were available. Therefore, using the unmasked sample, predicted competitive rates could have been obtained for more than 99 percent of potentially noncompetitive movements.

in Table 4 below, on average, across all potentially noncompetitive shipments, the actual rate exceeds the predicted competitive rate by approximately 48 percent on average. For approximately 26 percent of potentially noncompetitive shipments, the actual rate exceeds the predicted competitive rate by more than 50 percent (the ratio exceeds 1.5). For approximately 12 percent of potentially noncompetitive shipments, the actual rate is more than double the predicted competitive rate. For approximately four percent of potentially noncompetitive shipments, the actual rate is more than triple the predicted competitive rate. For approximately one percent of potentially noncompetitive shipments, the actual rate is more than five times the predicted competitive rate.

29. I performed comparable calculations for each two-digit STCC, the results of which are also reported in Table 4. For all but one two-digit STCC, the actual rate exceeds the predicted competitive rate on average.³⁵ For example, in the case of Chemicals or Allied Products, the actual rate exceeds the predicted competitive rate by about 33 percent on average. For approximately 25 percent of potentially noncompetitive shipments of Chemicals or Allied Products, the actual rate exceeds the predicted competitive rate by more than 50 percent. For approximately ten percent of potentially noncompetitive shipments of Chemicals or Allied Products, the actual rate is more than double the predicted competitive rate. For approximately 2.5 percent of potentially noncompetitive shipments of Chemicals or Allied Products, the actual rate is more than triple the predicted competitive rate. For approximately 0.6 percent of potentially noncompetitive shipments of Chemicals or Allied Products, the actual rate is more than five times the predicted competitive rate.

³⁵ As seen below, "Shipper Association or Similar Traffic" has a ratio of 0.99.

TABLE 4: RATIO OF ACTUAL RATE TO COMPARABLE PREDICTED COMPETITIVE RATE FOR BASELINE BENCHMARK GROUP (5MI RR, 5MI WATER)

Commodity Name	STCC Code (2-Digit)	Avg. Ratio	% with Ratio > 1.5	% with Ratio > 2	% with Ratio > 3	% with Ratio > 5
ALL	ALL	1.48	26.1%	11.6%	3.7%	0.9%
Farm Products	1	1.34	18.3%	5.8%	2.0%	0.9%
Forest Products	8	1.25	19.7%	8.8%	1.5%	0.0%
Fresh Fish or Other Marine Products	9	N/A	N/A	N/A	N/A	N/A
Metallic ores	10	1.68	16.4%	10.5%	2.9%	2.6%
Coal ³⁶	11	1.95	30.1%	11.8%	1.8%	0.5%
Petroleum (Crude)	13	1.21	8.4%	2.1%	1.1%	0.6%
Non Metal Minerals	14	2.06	14.3%	4.3%	1.8%	0.5%
Ordinance or Accessories	19	6.31	47.5%	32.1%	21.1%	12.2%
Food or Kindred Products	20	1.17	17.8%	5.7%	1.4%	0.3%
Tobacco	21	N/A	N/A	N/A	N/A	N/A
Textile Mill Products	22	N/A	N/A	N/A	N/A	N/A
Apparel or Other Textile Products or Knit Apparel	23	N/A	N/A	N/A	N/A	N/A
Lumber or Wood Products Exc. Furniture	24	N/A	N/A	N/A	N/A	N/A
Furniture or Fixtures	25	N/A	N/A	N/A	N/A	N/A
Pulp, Paper or Allied Products	26	1.24	21.1%	7.4%	1.7%	0.4%
Printed Products	27	N/A	N/A	N/A	N/A	N/A
Chemicals or Allied Products	28	1.33	24.8%	10.0%	2.5%	0.6%

³⁶ Some Coal movements contain extreme values for revenue per ton mile, on the order of 10,000 times the average. Therefore, approximately 0.8 percent of percent of Coal observations are excluded from the analysis as outliers.

Commodity Name	STCC Code (2-Digit)	Avg. Ratio	% with Ratio > 1.5	% with Ratio > 2	% with Ratio > 3	% with Ratio > 5
Petroleum/Coal Products	29	1.27	13.6%	4.4%	1.9%	0.9%
Rubber or Miscellaneous Plastics Products	30	1.15	17.6%	7.3%	1.2%	0.2%
Leather or Leather Products	31	N/A	N/A	N/A	N/A	N/A
Clay, Concrete, Glass or Stone Products	32	1.29	24.9%	8.1%	2.0%	0.4%
Primary Metal Products, Including Galvanized Coating or Other Allied Processing	33	N/A	N/A	N/A	N/A	N/A
Fabricated Metal Exc. ordnance, Machinery, or Transportation Equipment	34	1.86	46.3%	33.9%	14.1%	3.4%
Machinery	35	1.36	28.2%	15.9%	6.0%	1.9%
Electrical Machinery, Equipment or Supplies	36	1.29	21.1%	11.9%	8.3%	3.7%
Transportation Equipment	37	1.15	16.1%	7.5%	2.6%	0.6%
Instruments, Goods, Optical Goods, Watches or Clocks	38	N/A	N/A	N/A	N/A	N/A
Miscellaneous Products	39	N/A	N/A	N/A	N/A	N/A
Waste or Scrap Materials Not Identified by Producing Industry	40	1.72	48.3%	26.0%	10.9%	1.5%
Miscellaneous Freight Shipments	41	1.59	33.4%	17.7%	6.4%	2.9%
Containers, Carriers or Devices, Shipping, Returned Empty	42	1.30	31.6%	12.0%	2.4%	0.4%
Mail, Express or Other Contract Traffic	43	1.45	44.0%	18.2%	1.3%	0.0%
Freight Forwarder	44	1.34	25.6%	12.2%	5.0%	1.5%
Shipper Association or Similar Traffic	45	0.99	17.4%	8.3%	3.0%	0.0%
Miscellaneous Mixed Shipments	46	1.45	32.5%	18.4%	7.5%	1.7%
Small Packaged Freight Shipments	47	1.24	34.0%	13.2%	1.5%	0.5%
Waste Hazardous or Waste Hazardous Substances	48	1.16	15.5%	7.8%	3.3%	1.7%

30. In the next section, I demonstrate how the Benchmark Model could be applied in practice to place an upper bound on the extent to which rates in the potentially noncompetitive sample would be permitted to exceed the predicted benchmark rates.

III. APPLYING THE BENCHMARK MODEL USING THE COMPETITIVE THRESHOLD

31. In addition to identifying shipments potentially eligible for rate relief, the Benchmark Method, combined with railroad financial data, provides an economically sound basis for determining the amount of rate relief that shippers should receive while still satisfying the regulatory requirements of revenue adequacy. The STB could implement a Benchmark-based rate standard by allowing captive rates to exceed competitive rates by a predetermined Competitive Threshold. As demonstrated below, the level of CT would be selected based on an analysis of revenue adequacy: For any given value of the CT, and for any given railroad, the STB could calculate the effect of rate regulation on railroad revenue (assuming conservatively that all eligible shippers successfully petition the STB for rate relief). A higher value for CT would have less of an effect on railroad revenues than a lower value. Of course, to the extent that railroads achieve revenue adequacy from revenues earned on competitive traffic, these revenues would remain unaffected.

32. Determining the acceptable value for CT would ultimately be a policy choice. Although such a decision is likely to be controversial, the process through which the STB would assess the expected effect of CT on railroads' revenue adequacy would be transparent to all parties. Regardless of what value for CT is selected, rate relief would, by construction, prioritize the subset of captive shippers that is most likely subject to unreasonably high rates. This would allow the STB to preserve the railroad industry's ability to set differential prices to captive shippers, while granting consistent and transparent rate relief. For several reasons, implementing the CT is not equivalent to implementing rate-of-return regulation. First, the CT regulates the extent to which captive rates are

permitted to exceed their competitive counterparts, as opposed to the rate of return earned by the railroad: Railroads that earn rates of return in excess of the cost of capital are subject to rate regulation only to the extent that these excess returns are the result of charging supracompetitive prices to captive shippers. To the extent that a railroad's excess returns are attributable to procompetitive activity, such as efficient cost reductions, these returns are not penalized under the CT method. Second, surplus revenue attributable to competitive traffic, or indeed any traffic with R/VC less than 180, would obviously not be subject to regulation. Third, rate relief would, in practice, be limited to shippers that successfully brought a case before the STB, and successfully proved market dominance.

33. Below I provide an illustrative example of how the CT could be applied in practice. My calculations are limited by the fact that unmasked revenue data have not been made available to me. Nevertheless, the calculations below clarify how a CT analysis would proceed. My calculations conservatively assume that every potentially noncompetitive movement receives rate relief up to that allowed by the CT. In practice, fewer movements would be affected. Rates with R/VC below 180 (which cannot be identified without unmasked data) would not be eligible for relief. Movements for which market dominance could not be demonstrated would also be ineligible for rate relief.

34. The calculations below also conservatively assume that that, whenever rate relief is granted, the railroad's revenue would fall in proportion to the amount of rate relief granted to the shipper. For example, if rate relief causes a shipper's rates for a movement to fall by ten percent, the revenues earned by the railroad on that movement is also assumed to decline by ten percent. In reality, the quantity of ton-miles shipped on such movements is likely to increase as the shipper takes advantage of the lower rate, partially offsetting the railroad's loss in revenue. Thus, in this example,

the railroad's revenue on the movements in question would be expected to decline by less than ten percent.³⁷

35. However, it bears emphasis that the lack of unmasked revenue data makes my calculations less conservative to the extent that railroads earn a disproportionate share of their freight revenue from shipments whose rates substantially exceed their competitive benchmarks. Given unmasked revenue data, it would be possible to weight CWS movements by their respective revenues and thus to eliminate this source of bias in these illustrative CT calculations.

36. My prior testimony explained that it is reasonable to measure revenue adequacy over a period of approximately six years.³⁸ Given the CWS data currently available to me, the most recently available six-year period is 2008 – 2013. During the first three years of this time period, which include the Great Recession,³⁹ nearly all railroads were deemed revenue inadequate.⁴⁰ Barring another economic crisis of historic proportions, this time period is unlikely to be representative of the economic conditions that would be expected to prevail going forward. Therefore, for illustrative

³⁷ To obtain a more precise estimate of the likely effect on revenue, downward-sloping shipper demand could be factored into the CT calculations. This could be accomplished using estimates of shipper demand elasticities obtained from the relevant economic literature. See, e.g., US Army Corps of Engineers, "A Survey Of The Freight Transportation Demand Literature And A Comparison Of Elasticity Estimates," IWR Report 05-NETS-R-01 (January 2005), available at: <http://www.iwr.usace.army.mil/Portals/70/docs/iwrreports/05-NETS-R-01.pdf> (Independent elasticity estimates could also be obtained using standard econometric techniques). In addition, it would be necessary to take into account the increased operating costs that railroads would incur as a result of increased shipper demand. Railroads report their operating expenses for use in the STB's revenue adequacy determinations.

³⁸ Public Hearing, STB Docket No. Ex Parte 722 & STB Docket No. Ex Parte 664, *Consolidated Hearing Testimony of Jeffrey O. Moreno, Paul M. Donovan, Dr. Kevin W. Caves, Thomas D. Crowley, and Henry J. Roman On Behalf of the Concerned Shipper Associations*, Surface Transportation Board (July 23, 2015) at 5 – 8.

³⁹ The Great Recession officially spanned December 2007 – June 2009. See National Bureau of Economic Research, US Business Cycle Expansions and Contractions, available at: <https://www.nber.org/cycles.html> However, it took several additional years for standard macroeconomic indicators such as output and employment to approach pre-crisis levels. See, e.g., Arne L. Kalleberg & Till M. Von Wachter, *The U.S. Labor Market During and After the Great Recession: Continuities and Transformations* 3(3) THE RUSSELL SAGE FOUNDATION JOURNAL OF THE SOCIAL SCIENCES 1-19 (2017) at 3 ("Over time, it quickly became apparent that perhaps the most unusual and unexpected feature of the Great Recession was the persistence of weak economic conditions in its aftermath.")

⁴⁰ In 2008, only Norfolk Southern was revenue adequate. In 2009, no railroad was revenue adequate. In 2010, only Union Pacific was deemed revenue adequate.

purposes, below I demonstrate how to implement the CT for both (1) the most recently available three-year period (2011 – 2013); and (2) the most recently available six-year period (2008 – 2013).

37. Table 5 below illustrates the application of the CT using the STB’s revenue adequacy determinations for 2011 – 2013. For each of the five Class I railroads, I implemented a multi-year version of the STB’s annual calculations, which compare each railroad’s annual tax-adjusted rate of return on net investment (“ROI”) to the railroad industry cost of capital estimated by the STB. My multi-year calculation is directly analogous to the STB’s annual revenue adequacy calculations. It compares each railroad’s weighted average ROI to the weighted average industry cost of capital over the three-year period. In calculating the weighted average ROI, each railroad’s ROI for a given year is weighted by that railroad’s tax adjusted net investment base for that same year.⁴¹ Similarly, in calculating the weighted average industry cost of capital, the cost of capital for a given year receives a weight equal to the aggregate tax adjusted net investment base across all railroads during that year.

38. As seen in Table 5, three railroads (BNSF, Norfolk Southern, and UP) are found to be revenue adequate for 2011 – 2013. For each of these three railroads, I calculated the minimum viable CT, defined as the lowest value of the CT that would still maintain revenue adequacy for that railroad over the same three-year period.⁴²

⁴¹ A railroad’s weighted average ROI is equal to the ratio of (a) its average annual Adjusted Net Railway Operating Income to (b) its average Tax Adjusted Net Investment Base. For example, let I_t be a railroad’s Adjusted Net Railway Operating Income in year t , and let B_t be a railroad’s Tax Adjusted Net Investment Base in year t . The railroad’s ROI in year t is equal to $R_t = I_t/B_t$. The railroad’s weighted average ROI across any two sequential years is equal to $(B_1R_1 + B_2R_2)/(B_1 + B_2) = [(I_1 + I_2)/2]/[(B_1 + B_2)/2]$, which is the ratio of the railroad’s average annual Adjusted Net Railway Operating Income to its average Adjusted Net Investment Base.

⁴² This involved determining, for each movement in the potentially non-competitive sample, and for each candidate CT value, the Revenue Reduction Factor (“RRF”) implied by the adjustment which, when multiplied against the revenue per ton-mile of a movement, brings the rate in line with the CT. For example, suppose that the CT is equal to 2.0. If the ratio of a potentially noncompetitive rate to the benchmark rate is 2.25, the RRF is equal to $2.0/2.25 = 0.889$ (implying rate relief of approximately 11 percent). On the other hand, if the ratio of a potentially noncompetitive rate to the benchmark rate is 2.0 or less, the RRF is equal to one (implying no rate relief). The RRF is also set equal to one for all movements outside of the potentially noncompetitive sample, because these movements are ineligible for rate relief

TABLE 5: ILLUSTRATIVE COMPETITIVE THRESHOLD ANALYSIS (2011-2013)

Class I Railroad	BNSF	CSX	GT	KCS	NS	SOO	UP
Avg. Annual Freight Revenue	\$20,282,766	\$11,543,077	\$2,733,508	\$1,153,368	\$10,755,618	\$1,544,799	\$19,625,883
Avg. Annual Adj. Net Railway Op. Inc.	\$3,647,063	\$1,802,672	\$709,088	\$232,003	\$1,997,112	\$230,993	\$4,046,578
Avg. Annual Tax Adj. Net Inv. Base	\$27,362,172	\$16,734,217	\$6,893,202	\$2,422,909	\$16,471,374	\$2,829,974	\$28,057,339
Weighted Avg. Annual Tax Adj. ROI	13.33%	10.77%	10.29%	9.58%	12.12%	8.16%	14.42%
Weighted Avg. Industry Cost of Capital	11.33%						
Revenue Adequate?	Yes	No	No	No	Yes	No	Yes
Minimum Viable Competitive Threshold	1.00	N/A	N/A	N/A	1.80	N/A	1.00
Revenue Reduction Factor	0.97374	N/A	N/A	N/A	0.98845	N/A	0.95840
Avg. Annual Reduction in Freight Rev.	\$532,574	N/A	N/A	N/A	\$124,277	N/A	\$816,430
Avg. Annual Adj. Net Railway Op. Inc. [After Applying CT]	\$3,114,489	N/A	N/A	N/A	\$1,872,835	N/A	\$3,230,148
Avg. Annual Tax Adj. Net Inv. Base	\$27,362,172	N/A	N/A	N/A	\$16,471,374	N/A	\$28,057,339
Weighted Avg. Annual Tax Adj. ROI [After Applying CT]	11.38%	N/A	N/A	N/A	11.37%	N/A	11.51%

All dollar values in thousands. *Source:* Docket No. EP 552 (Sub-No. 18), Appendix B; STB Annual Report Financial Data, Table 210, "Results of Operations", available at <https://www.stb.gov/econdata.nsf>

39. For example, as seen in Table 5, BNSF's weighted average ROI for 2011-2013 comes to 13.33 percent, well above the weighted average industry cost of capital of 11.33 percent. The minimum viable CT for BNSF is equal to 1.00. This means that, even if BNSF were constrained to charge all potentially captive shippers rates equal to their comparable competitive benchmarks (reducing BNSF's annual freight revenue by approximately \$532,574,000), BNSF would have remained revenue adequate, earning a weighted average ROI of 11.38 percent. By similar calculations, the minimum viable CT for UP is also equal to 1.00. Although this would have reduced UP's revenue by approximately \$816,430,000 annually, this still would have permitted UP to earn a weighted average ROI of 11.51 percent from 2011 – 2013.

under the Benchmark Method. For each railroad, I calculated the weighted average RRF across all of that railroad's 2011 - 2013 movements in the CWS, with each movement weighted by its expansion factor, and by the railroad's annual freight revenues. (If unmasked revenues were available, the calculation would instead be weighted by the revenue earned on each movement). The weighted average RRF provides an estimate of the extent to which each railroad's freight revenue would be reduced if all the rates for all potentially noncompetitive traffic were adjusted downward to the level given by the CT.

40. The minimum viable CT for Norfolk Southern is approximately 1.8, implying revenue reductions of approximately \$124,277,000 per year on average. The remaining railroads are not revenue adequate, so the CT is not applicable to them.

41. Calculations such as these would provide a starting point for determining the extent to which each railroad's rates should be constrained by the competitive benchmarks implied by the Benchmark Model while still preserving revenue adequacy. Beginning with the minimum viable CT, the STB could use similar calculations to determine the effect on revenue adequacy for any higher CT value deemed appropriate.

42. Finally, Table 6 performs analogous calculations, this time expanding the analysis to the full six- year period (2008 – 2013). As seen below, even when the years encompassing the Great Recession are included, the same three Class I railroads (BNSF, NS, and UP) would have remained revenue adequate for the six-year period, even if rates to captive shippers has been constrained by regulation according to the Benchmark Model. For example, the minimum viable CT for BNSF is approximately 1.7. Had BNSF been subject to this CT for the period from 2008 through 2013, its freight revenue would have been reduced by an estimated \$124,630,000 per year over the six-year period, allowing it to earn an ROI in excess of the weighted average industry cost of capital of 11.20 percent.

TABLE 5: ILLUSTRATIVE COMPETITIVE THRESHOLD ANALYSIS (2008-2013)

Class I Railroad	BNSF	CSX	GT	KCS	NS	SOO	UP
Avg. Annual Freight Revenue	\$18,162,759	\$10,442,469	\$2,408,390	\$1,036,654	\$9,891,241	\$1,239,154	\$17,573,108
Avg. Annual Adj. Net Railway Op. Inc.	\$2,995,747	\$1,627,533	\$614,464	\$193,177	\$1,802,335	\$204,271	\$3,328,338
Avg. Annual Tax Adj. Net Inv. Base	\$25,621,938	\$16,289,700	\$6,556,736	\$2,172,176	\$15,717,922	\$2,575,452	\$26,810,163
Weighted Avg. Annual Tax Adj. ROI	11.69%	9.99%	9.37%	8.89%	11.47%	7.93%	12.41%
Weighted Avg. Industry Cost of Capital	11.20%						
Revenue Adequate?	Yes	No	No	No	Yes	No	Yes
Minimum Viable Competitive Threshold	1.70	N/A	N/A	N/A	2.30	N/A	1.45
Revenue Reduction Factor	0.99314	N/A	N/A	N/A	0.99603	N/A	0.98295
Avg. Annual Reduction in Freight Rev.	\$124,630	N/A	N/A	N/A	\$39,310	N/A	\$299,634
Avg. Annual Adj. Net Railway Op. Inc. [After Applying CT]	\$2,871,117	N/A	N/A	N/A	\$1,763,026	N/A	\$3,028,704
Avg. Annual Tax Adj. Net Inv. Base	\$25,621,938	N/A	N/A	N/A	\$15,717,922	N/A	\$26,810,163
Weighted Avg. Annual Tax Adj. ROI [After Applying CT]	11.21%	N/A	N/A	N/A	11.22%	N/A	11.30%

All dollar values in thousands. Sources: Docket No. EP 552 (Sub-No. 18), Appendix B; STB Annual Report Financial Data, Table 210, "Results of Operations", available at <https://www.stb.gov/econdata.nsf>

CONCLUSION

43. For the reasons given above, I conclude that a Benchmark Model encompassing all commodities in the CWS can be implemented empirically using the CWS and publicly available data. I also conclude that the data, methods, and techniques detailed above provide an economically sound basis for determining the amount of rate relief that shippers should receive while still satisfying the regulatory requirements of revenue adequacy.

APPENDIX 1: SUMMARY OF AND INSTRUCTIONS FOR WORK PAPERS

44. The data and programs used to generate the results summarized in this report are being produced to the STB. The workpapers contain:

- 1) Masked CWS data (2006 – 2013)
- 2) Auxiliary data used to augment the CWS
- 3) STATA “.do” files with code to replicate the analysis summarized in this report
- 4) Formatted Excel tables corresponding to the tables in this report (produced by STATA).

45. To create the regression database and replicate the output in this report, use STATA to run program “00_Do_All.do” in the “do” folder, after editing the “[ROOT]” file path placeholder in each of the STATA .do files.

46. To run the model with a different CWS dataset, minor modifications to the .do files are required. First, in “04_CWS_Data_Build.do”, modify line 41 to point to the alternative CWS data. If the alternative CWS data are *unmasked*, make three additional modifications: First, comment out lines 102-104 in “04_CWS_Data_Build.do” and remove the variable “maskingFE” from line 319. Second, comment out line 55 in “05_BG_Regressions.do” and instead use the regression code in line 56. Finally, comment out lines 81-96 and uncomment lines 99-117 in “05_BG_Regressions.do”

47. Once all STATA code has been executed, raw output data can be found within the “Output” folder. If an alternative CWS dataset is used, overwrite the existing raw data tabs within the exhibits in the “Formatted Tables” folder with the new output. Doing so will automatically update the exhibits to reflect the alternative CWS data.

APPENDIX 2: CURRICULUM VITAE OF KEVIN W. CAVES



Curriculum Vitae of Kevin W. Caves

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Education

- Ph.D. Economics, University of California at Los Angeles, December 2005
Fields of Study: Industrial Organization, Applied Econometrics
- M.A. Economics, University of California at Los Angeles, May 2002
- B.A. *Magna cum laude*, Departmental Honors in Economics, Haverford College, May 1998

Current Position

Senior Economist, Econ One Research, September 2018 to Present

Employment History

- Vice President, Economists Incorporated, November 2016 to August 2018
- Senior Economist, Economists Incorporated, January 2014 to November 2016
- Director, Navigant Economics, March 2011 to December 2013
- Associate Director, Navigant Economics, February 2010 to March 2011
- Vice President, Empiris LLC, September 2008 to February 2010
- Senior Economist, Criterion Economics LLC, October 2006 to September 2008

Senior Consultant, Deloitte & Touche LLP, September 2005 to October 2006

Teaching Fellow, Department of Economics, UCLA, January 2002 to June 2004

Assistant Economist, Federal Reserve Bank of New York, August 1998 to June 2000

Publications and Research Papers

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

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

Interview with *IT Business Edge* on Rural Utilities Service Broadband Subsidies (May 17, 2011).

Reviewer

International Journal of the Economics of Business

Journal of Competition Law & Economics

Journal of Transportation Law, Logistics & Policy
(Editorial Advisory Board)

Research in Transportation Economics

Review of Network Economics

Honors and Awards

Howard Fellowship for Excellency in Teaching, University of California at Los Angeles, Spring 2005.

Graduate Fellowship, University of California at Los Angeles, 2000 – 2004.

Departmental Honors in Economics, Haverford College, May 1998.
Phi Beta Kappa Society, elected May 1998.