

BEFORE THE
SURFACE TRANSPORTATION BOARD

Docket No. EP 711 (Sub-No. 1)

RECIPROCAL SWITCHING

POST HEARING COMMENTS

submitted by

THE COALITION ASSOCIATIONS

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Exhibit 1: Supplemental Verified Statement of Dr. Kevin Caves

Exhibit 2: “Verified Statement of Steven C. Salop,” “Union Pacific Railroad Company’s Comments and Requests for Conditions,” Docket No. FD 36500, *Canadian Pac. Ry. Ltd. et al. – Control – Kansas City Southern et al.* (filed Feb. 28, 2022)

Exhibit 3: “Opening Comments of Joint Shippers,” Docket No. EP 766, *Joint Petition for Rulemaking to Modernize Annual Revenue Adequacy Determinations* (filed May 17, 2021)

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The Coalition Associations¹ hereby submit these supplemental comments in response to the Surface Transportation Board (“STB” or “Board”) decision served on March 23, 2022. In accord with that decision, these comments are limited to issues raised at the hearing held on March 15-16 and in written materials submitted in response to the Board’s December 28, 2021, notice. These comments are supported by the following three exhibits:

- Exhibit No. 1 is the “Supplemental Verified Statement of Dr. Kevin Caves” (“Caves S.V.S.”). Dr. Caves responds to comparisons made in the February 14, 2022, written testimony of the Association of American Railroads (“AAR”), including the “Verified Statement of Debra J. Aron” (“Aron V.S.”), between reciprocal switching and the

¹ The “Coalition Associations” are the American Chemistry Council (“ACC”), The Chlorine Institute (“TCI”), the Corn Refiners Association (“CRA”), The Fertilizer Institute (“TFI”), and The National Industrial Transportation League (“NITL”). Except for CRA, each Association previously submitted comments in this proceeding as members of the Shipper Coalition for Railroad Competition (“Shipper Coalition”).

telecommunications industry experience with shared access under the Telecommunications Act of 1996 (“TCA”).

- Exhibit No. 2 is the “Verified Statement of Steven C. Salop” submitted on February 28, 2022 (“Salop V.S.”), in support of “Union Pacific Railroad Company’s Comments and Requests for Conditions” on the proposed acquisition of the Kansas City Southern Railway Company (“KCS”) by the Canadian Pacific Railway Company (“CP”) in Docket No. FD 36500, *Canadian Pac. Ry. Ltd. et al. – Control – Kansas City Southern et al.* (“CP/KCS Control”). Professor Salop’s testimony confirms that the vertical effects of past rail consolidations undoubtedly caused competitive harm to shippers that was not recognized by the STB when it approved those mergers.
- Exhibit No. 3 attaches the “Opening Comments of Joint Shippers,” filed on May 17, 2021, in Docket No. EP 766, *Joint Petition for Rulemaking to Modernize Annual Revenue Adequacy Determinations*. Those comments respond to the Verified Statement of Prof. Kevin M. Murphy and Prof. Mark E. Zmijewski from that same docket (“M&Z V.S.”), which was attached as Exhibit C to the “Supplemental Comments of Norfolk Southern Railway Company,” filed in this docket on February 14, 2022.

I. RAIL CONSOLIDATION AND THE VASTLY IMPROVED FINANCIAL HEALTH OF THE RAIL INDUSTRY JUSTIFY THE PROPOSED MODIFICATIONS TO THE RECIPROCAL SWITCHING RULES.

There has been much debate in both the written and hearing testimony over the Board’s justifications for modifying the reciprocal switching rules. The hearing testimony establishes without a doubt that the cumulative vertical effects of past rail consolidations and the vastly improved financial health of the rail industry, both separately and in combination, justify the proposed modifications to the reciprocal switching rules.

Reciprocal switching is a critical statutory tool to partially reverse and mitigate the cumulative vertical foreclosure effects of more than three decades of rail consolidation. With each merger, the bottleneck segments serving captive shipper locations have grown longer, which enabled bottleneck carriers to foreclose the ability of captive shippers to access alternative carriers on downstream competitive segments. Although the STB, and the Interstate Commerce Commission (“ICC”) before it, acknowledged this potential for foreclosure, they invoked the “one-lump” theory to conclude that there would be no harm to shippers resulting from extended bottlenecks because, pre-merger, the bottleneck carrier already was in a position to extract the full monopoly profit for the entire route.² Therefore, the agencies held that extending the bottleneck distance by merging with a downstream carrier would not harm the captive shipper.

Today, however, economic theory recognizes that vertical integration is far more likely to cause competitive harm than the one-lump theory acknowledges. Indeed, Union Pacific Railroad (“UP”), through the “Verified Statement of Steven C. Salop” filed in *CP/KCS Control* on February 28, 2022 (attached as Ex. 2), cogently made this point. Professor Salop observes that the one-lump theory “is not broadly accepted today” because it “applies only under very limited market conditions.”³ Specifically, modern economic theory holds that post-merger foreclosure often is profitable to railroads and harmful to shippers unless, pre-merger, both railroads have perfect information about each other’s costs and prices and are selling homogenous (*i.e.*,

² *E.g.*, *Burlington Northern Inc. et al. – Control and Merger – Santa Fe Pacific Corp. et al.*, 10 I.C.C.2d 661, 747-57 (1995), *aff’d sub nom*, *Western Resources, Inc. v. STB*, 109 F.3d 782 (D.C. Cir. 1997); *Union Pac. Corp. et al. – Control – Missouri-Kansas-Tex. R.R. Co. et al.*, 4 I.C.C. 2d 409, 476 (1988); *Chi., Milw, St. Paul and Pac. R.R. Co. – Reorganization – Acquisition by Grand Trunk Corp.*, 2 I.C.C. 2d 427, 455 (1985); *Union Pacific– Control – Missouri Pacific*, 366 I.C.C. 462, 538 (1982).

³ Salop V.S., ¶ 21. He further observes that the vertical merger guidelines updated by the Department of Justice and Federal Trade Commission in 2020 did not adopt the one-lump theory. *Id.*, ¶ 25.

undifferentiated) products.⁴ Professor Salop observes that “[i]mperfect information and differentiated products are the norm, not the exception.”⁵

With respect to rail mergers, Professor Salop testifies that, “[b]ecause carriers do not set uniform rates for all movements a vertical merger can lead to a diversity of outcomes across commodity groups, routes and specific shippers.”⁶ Furthermore, he declares that “the effects... may differ across origin/destination markets and commodities. Even within a single origin/destination market for a specific commodity, the fact that the carriers do not set the same rate for every shipper and every movement means that a merger may harm some shippers while benefitting others with different demand characteristics or whose shipments have different costs.”⁷ Thus, among the thousands of movements impacted by each of the past rail mergers, harmful impacts ineluctably have occurred for substantial traffic volumes that were not remedied by the agency.

The exertion of this market power across the rail industry has been most pronounced since 2004 when the inflation-adjusted spread between rail revenue per ton mile (“RPTM”) and operating expense per ton mile (“OEPTM”) began to increase dramatically and has continued to do so through the present. As illustrated in Figure 1, from 1985-2004, changes in real RPTM

⁴ Salop V.S., ¶¶ 31-33.

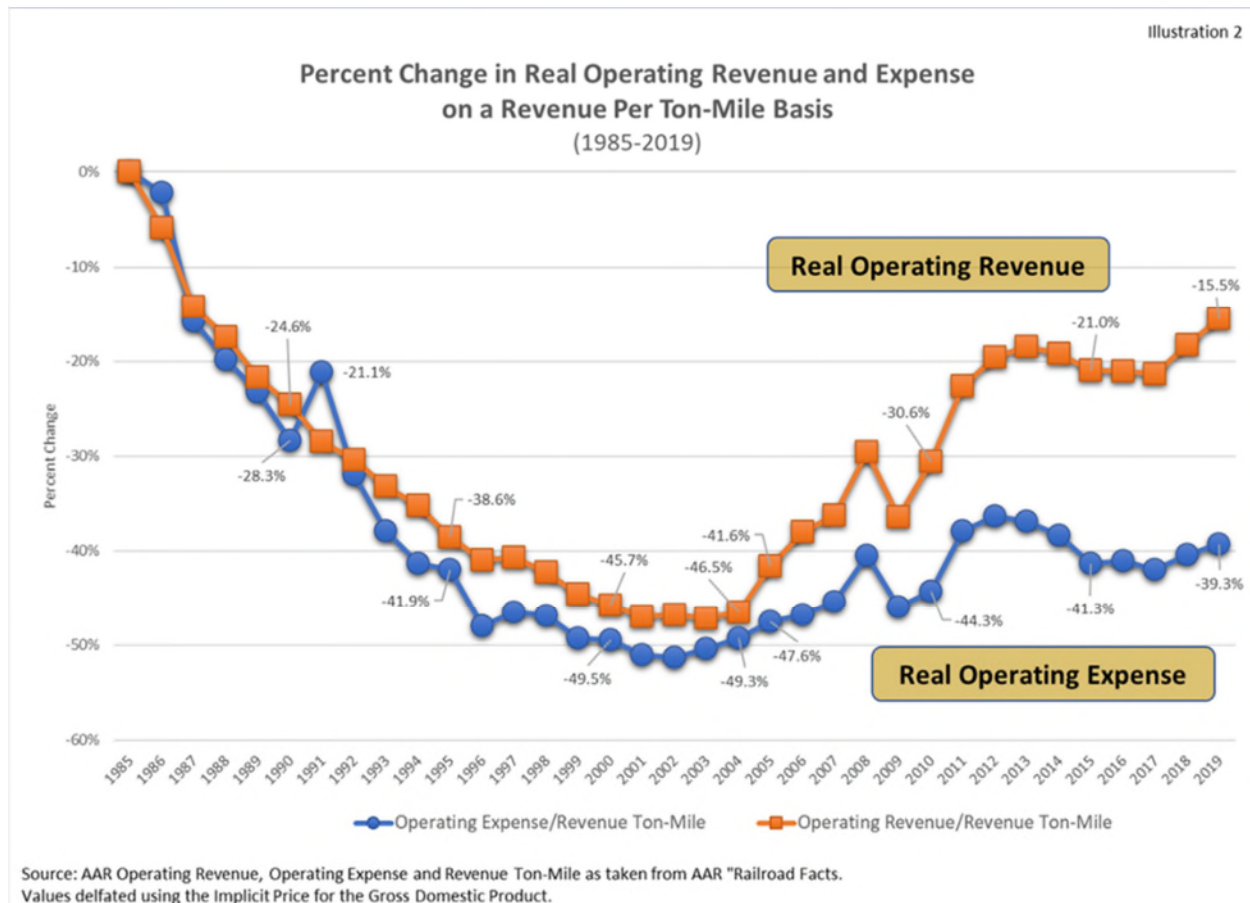
⁵ Salop V.S., ¶ 60. For example, railroads typically lack perfect information regarding each other’s costs and rates offered to the shipper at the time that they quote their rates.” *Id.*, ¶ 37. In addition, “the transport services provided by rail carriers ... can differ with respect to distance from a shipper’s business to the origin and destination stations, the speed of the shipment, frequency and reliability, customer service, the likelihood of damage, payment terms, and so on.” *Id.*, ¶ 40.

⁶ Salop V.S., ¶ 46.

⁷ Salop V.S., ¶ 53.

tracked changes in real OEPTM. In contrast, since 2004, RPTM has increased much faster than OEPTM. This spread represents the growing profitability of the rail industry.

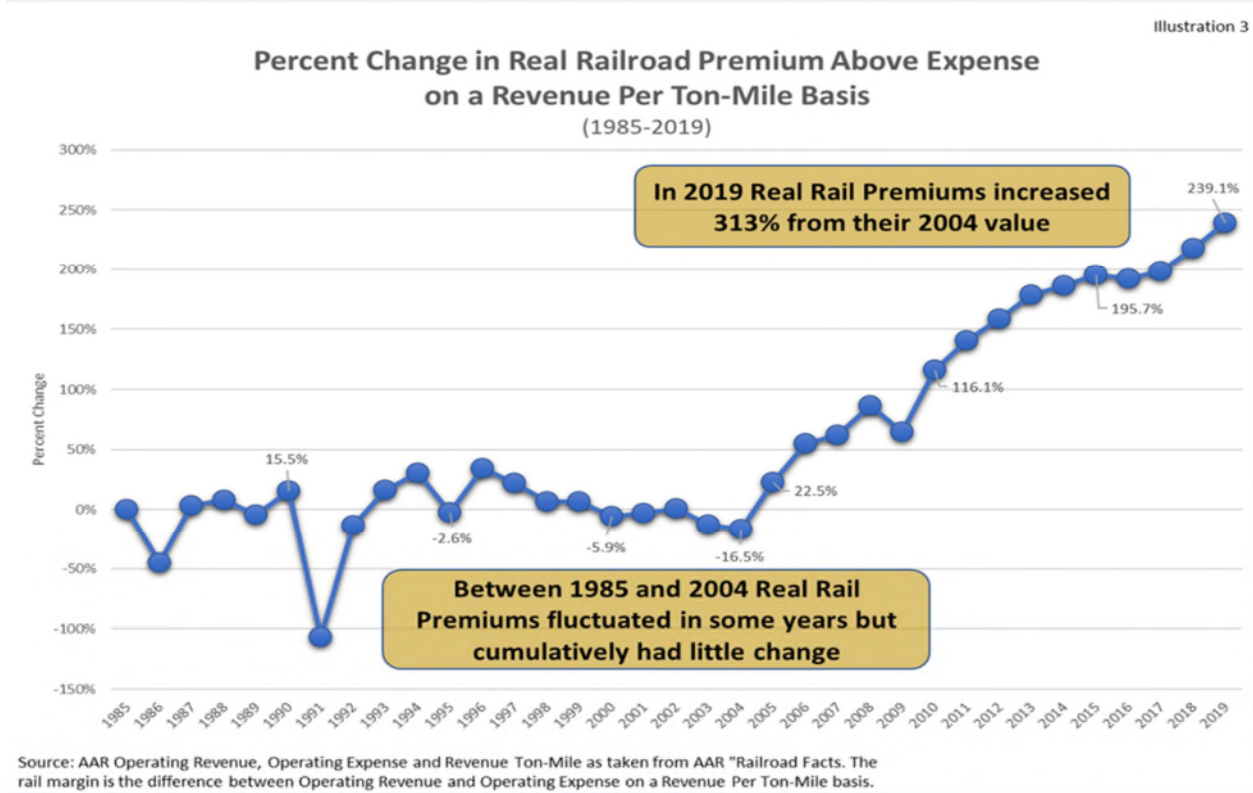
Figure 1



Source: <https://www.railwayage.com/financeleasing/stbs-annual-rail-rate-index-study-a-deeper-dive/?RAchannel=home>

Figure 2 employs the same underlying data to show the year-over-year change in the inflation-adjusted spread shown in Figure 1. That spread (*i.e.*, the profitability of the rail industry) has increased every year since 2004 except for a small dip during the Great Recession in 2009 for a cumulative 314% increase through 2019. The increase since 1985, when the ICC adopted the current reciprocal switching rules, is 239% through 2019.

Figure 2



Source: <https://www.railwayage.com/financeleasing/stbs-annual-rail-rate-index-study-a-deeper-dive/?RAchannel=home>

The dire financial condition of the rail industry in 1985 was a factor in the ICC's adoption of the current reciprocal switching rules. The industry was beset by bankruptcies and no Class I railroad was earning its cost of capital. By setting a standard for reciprocal switching above what the statute required, the agency sought to maximize the universe of captive traffic that railroads could differentially price to achieve revenue adequacy. But that decision came at the cost of enhancing competition through reciprocal switching as envisioned by Congress in the Staggers Act.⁸

⁸ See "Comments of the Shipper Coalition for Railroad Competition," pp. 14-16 (filed Oct. 26, 2016) ("Shipper Coalition Op."); "Reply Comments of the Shipper Coalition for Railroad Competition," pp. 14-17 (filed Jan. 13, 2017) (Shipper Coalition Reply").

Since 1985, tremendous consolidation of the rail industry has further constrained competition while, contemporaneously, the industry's profitability has surged.⁹ These changes warrant the proposed modifications to the standard for obtaining reciprocal switching so that: (1) some of the competition lost due to the foreclosure effects of prior mergers can be restored, and (2) the competitive benefits that Congress intended for reciprocal switching to provide can at long last be achieved through a more even balance between those rail transportation policies intended to promote revenue adequacy and those intended to enhance reliance upon competition.

II. AAR'S OWN ANALYSIS SHOWS THAT THE SCOPE OF SWITCHING UNDER THE PROPOSED RULES WILL BE NARROW.

Throughout this proceeding, the AAR has contended that the potential scope of reciprocal switching under the proposed rules would extend to nearly all non-exempt traffic. In its February 14, 2022, written testimony, the AAR updated its prior analysis of that scope using 2019 waybill data.¹⁰ But a close examination of that analysis reveals that only a small fraction of this "potentially eligible" traffic in the AAR analysis is likely even to pursue reciprocal switching because most of the "potentially eligible" traffic universe that AAR has identified will not benefit from it.

The AAR analysis identifies potentially eligible non-exempt traffic separately for Prongs 1 and 2 of the proposed rules and at radii of 10, 15, 30, 50, and 100 miles. For Prong 1, the

⁹ The rail industry cannot, and does not, deny the dramatic improvement in its financial status since 1985. NS, however, attempts to distract the Board from this fact by portraying railroads as poor when benchmarking the rail industry return on investment ("ROI") against the median ROI of the S&P 500 companies. To make this argument, NS attached the M&Z verified statement filed in EP 766 to its pre-hearing written testimony in this docket. To ensure a balanced record in this proceeding, the Coalition Associations are submitting the "Opening Comments of Joint Shippers," filed on May 17, 2021, in EP 766, as Exhibit 3 to this post-hearing testimony.

¹⁰ See "Verified Statement and Written Testimony of Michael R. Baranowski and Nathaniel S. Zebrowski," pp. 4-14 ("B&Z V.S.").

public interest standard, AAR concludes that 76% of carloads would be eligible at 10 miles and 92% at 100 miles.¹¹ For Prong 2, the competitive access standard, AAR concludes that 16% of carloads would be eligible at 10 miles and 67% at 100 miles.¹² Neither assessment of “eligible” traffic, however, informs how many potentially eligible carloads actually will “qualify” for reciprocal switching under Prongs 1 or 2, or whether those shippers would benefit sufficiently from reciprocal switching, either due to low traffic volume or an inefficient switch, to justify the time and expense of STB litigation.

According to AAR’s analysis, over two-thirds of the potentially eligible traffic identified under Prong 2 currently consists of single-line moves that would be converted to joint line moves by a reciprocal switch.¹³ Except in very rare instances where the destination is directly served by the alternate railroad, it clearly would be inefficient for a shipper to use reciprocal switching to convert a single line move to a joint line move. That is because all such conversions would require two switches and two switch fees – one near the origin from the incumbent to the competitor and the other near the destination from the competitor back to the incumbent. It is implausible that a shipper would seek reciprocal switching in cases where the alternative carrier would add the complication and delays of two extra switches and inject greater inefficiencies into the shipper’s supply chain. Thus, it is reasonable to conclude that reciprocal switching will occur predominantly on joint line moves that will change the interchange locations between existing carriers rather than add more carriers and switches.

¹¹ B&Z V.S., p. 7, Table 2.

¹² B&Z V.S., p. 6, Table 1.

¹³ B&Z V.S., p. 3 (states that less than one-third of potentially affected traffic is currently interlined, which means the remaining two-thirds is single line). *See also*, page 12, Table 5, at a 30-mile radius. B&Z did not perform a similar analysis of “potentially eligible” traffic under Prong 1.

Only one-third of the potentially eligible traffic under Prong 2 in the AAR's analysis constitutes joint line movements.¹⁴ This includes traffic within a reasonable distance of what "is or can be a working interchange."¹⁵ The most efficient switches, however, will occur at existing interchanges rather than newly created interchanges. According to the AAR's analysis, only 18% of potentially eligible carloads under Prong 2 are within 30 miles of an existing interchange.¹⁶ This further narrows the probable scope of reciprocal switching.

Finally, AAR estimated that the portion of potentially eligible carloads under Prong 2 that are both joint line moves and within 30 miles of an existing interchange is just 6.7%.¹⁷ This is the universe of traffic that is most likely to seek reciprocal switching because it is the most likely to benefit from it. That fact, however, does not mean that all this traffic will qualify for reciprocal switching under Prong 2 or that the volume of traffic on every move will be sufficient for the shipper to justify the time and expense of litigating a switch case before the STB. Nor does it mean that shippers will use reciprocal switching for all qualifying traffic, if granted by the STB. Thus, 6.7% is a far more realistic, upper-bound, projection of traffic that is likely to request reciprocal switching.

Because this more realistic scope of the proposed rules is so much lower than AAR's estimation of potentially eligible traffic, the Coalition Associations do not believe it is necessary to narrow the applicability of those rules. However, if the Board were to significantly narrow the applicability of the proposed rules in response to the worst-case scenarios posited by the rail

¹⁴ B&Z V.S., p. 3.

¹⁵ "Notice of Proposed Rulemaking," *Reciprocal Switching*, Docket No. EP 711 (Sub-No. 1), slip op. at 41-42 (served July 27, 2016) (text of proposed rules at § 1145.2(a)(1)(ii) and § 1145.2(a)(2)(iii)) ("2016 NPRM").

¹⁶ B&Z V.S., p. 13, Table 6.

¹⁷ B&Z V.S., p. 13, Table 7.

industry, it could do so as an initial matter, with an intent to gradually expand their scope as experience is gained through cases and implementation of reciprocal switching. Two potential reasonable approaches for initially narrowing the scope of eligible traffic include:

- As to Prong 2, limit reciprocal switching to locations where “there is a working interchange” instead of where “there is or can be a working interchange.”¹⁸ As a result, reciprocal switch requests that would create new interchange locations on the rail network could only be sought under Prong 1 where the full impacts of such additions could be considered in the requisite cost-benefit analysis.
- As to Prongs 1 and 2, limit reciprocal switching to movements that would not require a switch at both the origin and destination to complete the transportation. This would avoid switches that convert single-line routes to joint line routes, except when the alternate carrier can provide direct service to either the origin or destination.

III. **A CONDUCT OR FAULT-BASED STANDARD FOR RECIPROCAL SWITCHING IS UNNECESSARY AND UNDESIRABLE.**

At the public hearing, there was extensive discussion surrounding the absence of a conduct, or fault-based, standard for reciprocal switching, primarily in the context of Prong 2. But the current rule already is a conduct-based standard and the very purpose of this proceeding has been to move away from that standard, based on significant changes in the rail industry since

¹⁸ At the public hearing, Chairman Oberman inquired about a similar proposal that would restrict grants of reciprocal switching to existing locations where the incumbent already is engaged in reciprocal switching for other traffic. That proposal, however, is unduly and unnecessarily narrow. Existing reciprocal switch locations are merely a subset of existing interchanges. An existing interchange without reciprocal switching is operationally indistinguishable from one with reciprocal switching. Both are equally capable of handling additional reciprocal switching because the operations required to accomplish a reciprocal switch between rail carriers are the same as those required to switch traffic between rail carriers at existing interchange locations. Therefore, drawing a distinction between existing interchange locations and existing reciprocal switch locations would be arbitrary.

1985, towards achieving the unrealized potential of reciprocal switching to encourage greater competition.¹⁹ A conduct-based standard would be contrary to the statutory objective of encouraging competition through reciprocal switching and would deprive shippers of competitive benefits that are unrelated to a fault or conduct requirement.

Congress intended reciprocal switching to be a tool for encouraging competition.²⁰ The benefits of competition, in turn, extend beyond merely providing a temporary remedy for inadequate service. Competition disciplines an incumbent railroad's behavior by providing long-term incentives for it to compete for its long-haul on price and service terms, including the negotiation of more balanced contract terms that may include remedies for service failures.

That competitive discipline cannot be achieved with a conduct-based standard. Under a conduct-based regime, an alternate carrier would never have the opportunity to compete against the incumbent carrier for the shipper's traffic. It would not enter the picture unless and until the incumbent experienced a major service failure. Its role then would be to provide a service alternative for the shipper to avoid the incumbent's service failure and that role would end when the incumbent restores adequate service. At no point would there ever be any competition between the two carriers. In contrast, the proposed reciprocal switching rules provide a long-term competitive alternative to continually discipline the incumbent's behavior.²¹

¹⁹ 2016 NPRM, pp. 8-9, 15-17.

²⁰ See, Shipper Coalition Reply, pp. 14-17.

²¹ If the Board were to adopt a conduct-based standard, the resulting grant of reciprocal switching must be long-term to overcome this deficiency. As the Coalition Associations stated in their January 2017 reply comments, "[a] minimum 10-year period is necessary for shippers to justify their investment of time and money in a reciprocal switch case and to realize the benefits of switching through contracts of sufficient duration for the prevailing carrier to recoup any infrastructure investment made to handle the shipper's traffic." Shipper Coalition Reply, p. 125. Furthermore, knowing that switching will be long-term, once granted, the incumbent carrier will

A conduct-based standard also is less effective at remedying inadequate service because it is reactive rather than proactive. Under a conduct-based standard, a shipper first must experience a service problem before it can request reciprocal switching. Then it must spend time and money to litigate a case at the STB before switching is awarded. By that time, the shipper already has sustained serious damage and the service inadequacy also may be resolved.

In contrast, reciprocal switching is proactive in several ways. First, a shipper with reciprocal switching already granted under the rules will be able to respond immediately to the incumbent's service failures without having to petition the Board. The hearing demonstrated both that this was invaluable during PSR-related service meltdowns to the few shippers who did have access to reciprocal switching and that interswitching, which is the Canadian version of reciprocal switching, has played a similar role. Second, the competitive benefits of reciprocal switching strengthen the shipper's ability to negotiate transportation service terms to better mitigate and compensate it for service failures.²²

For all the foregoing reasons, the Board also should reject rail industry arguments at the hearing that the Board's current rules for temporary service orders ("TSO"), at 49 C.F.R. Part 1147, are sufficient to address service problems without modifying the reciprocal switching rules. First, as discussed above, the reciprocal switching rules serve a broader competitive purpose than the TSO rules, which only provide temporary access to an alternative carrier for the

have the strongest incentive to proactively behave competitively to forestall a competitive switch request.

²² This particular competitive benefit even has the ability to mitigate harm from first-mile, last-mile ("FMLM") service issues despite the fact that reciprocal switching is not a solution for FMLM issues because the incumbent provides FMLM services regardless of which carrier provides the line-haul service. Specifically, the possibility of losing its long-haul may render the incumbent more willing to accept accountability for its FMLM service failures in a contract if it retains the business.

duration of a service inadequacy.²³ Second, a TSO cannot be implemented with sufficient speed to mitigate service harms in most scenarios. The harm already must have occurred before a shipper can file a petition for relief and that harm will only grow while the shipper negotiates a commitment from an alternative carrier, prepares its petition, goes through 45 days of reply and rebuttal submissions, and waits for the STB's decision.²⁴ In summary, the conduct-based TSO rules do not provide the full benefits of competition and are inadequate even as a remedy for service failures.

Despite the limits of a conduct-based standard for reciprocal switching, some Board Members at the hearing expressed concern that Prong 2 should require more than a market dominance showing due to the potentially eligible volume of traffic and the potential unintended consequences for other traffic.²⁵ As discussed in Part II above, the potentially eligible traffic estimates provided by the AAR grossly exceed the most realistic scope of the proposed rules. Moreover, it would be far more preferable to narrow the applicability of Prong 2, as discussed in Part II above, than to append a conduct standard to the proposed rules; the former preserves the

²³ A shipper can only obtain a TSO by demonstrating “a substantial, measurable deterioration or other demonstrated inadequacy in rail service” and the TSO can be terminated once the incumbent can restore adequate service. *See*, 49 C.F.R. § 1147.1(a) & (c)(1).

²⁴ The emergency service order (“ESO”) rules, at 49 C.F.R. Part 1146, were intended to provide more expedited relief pending a TSO. But all the same steps apply to an ESO as a TSO, except that the reply and rebuttal period is reduced to eight days. This minimum two-week process is too long to address a true emergency situation.

²⁵ In post-hearing ex parte discussions, those concerns focused upon exceptional, atypical, circumstances that would be specific to an individual reciprocal switch request. To deny all qualified traffic the full competitive benefits of reciprocal switching under the proposed rules based on exceptional circumstances that may never arise would be to allow the tail to wag the dog. The case-by-case approach under the proposed rules is able to identify and filter out such requests. Moreover, the incumbent carrier has both the ability and incentive to present evidence of such concerns if they are present in a specific case.

full competitive benefits of reciprocal switching whereas the latter constitutes a mostly ineffective solution for temporary service problems.

IV. THE HEARING EXPOSED RAILROAD OPERATING OBJECTIONS FOR THE EXAGGERATED WORST-CASE SCENARIOS THAT THEY ARE.

Throughout this rulemaking, the Coalition Associations have presented evidence that rail industry concerns with the operational impacts of reciprocal switching are predicated on worst-case scenarios that the railroads misrepresent as typical.²⁶ Several railroads brought their senior operations officers to the hearing to repeat these claims. Under questioning by Chairman Oberman, however, they ultimately conceded that, when reciprocal switching occurs at existing interchange locations, there is unlikely to be any additional handling of rail cars by the incumbent, and there may be no additional handling at all when reciprocal switching merely changes the location of the existing interchange as opposed to creating a new interchange. As discussed in Part II above, the most realistic scope of reciprocal switching will entail precisely those circumstances and the Board could modify the rules to ensure that is the case if it deems such modifications necessary or desirable.

The railroad operating witnesses, however, raised a new concern at the hearing regarding even these most probable reciprocal switch scenarios. Specifically, they claimed that, even when there are no operating changes, the switched cars will consume more yard capacity because they will occupy yard track for a longer period waiting for the interchange train. But the truth depends on when the interchange train departs the yard versus the incumbent's road train that otherwise would transport the cars. If the interchange train departs sooner than the road train, the

²⁶ Shipper Coalition Reply, pp. 96-116, Reply Verified Statement of John Orrison ("Orrison R.V.S."); "Written Testimony Submitted by The Coalition Associations," pp. 13-17 (filed Feb. 14, 2022) ("Coalition Hearing Testimony").

switched car might consume less yard capacity. Regardless, this is not even an issue at yards that are not operating at capacity. Furthermore, if the switch will cause capacity problems, railroads typically negotiate operating adjustments to their Interline Service Agreements in response to operating environment changes.²⁷ In the rare instance where that is not possible, the incumbent carrier can argue that point as a reason to deny that specific switch request.

Finally, at the hearing, some rail witnesses tried to equate reciprocal switching with open routing. Again, Chairman Oberman clearly understood the fallacy of such claims, which the rail witnesses had little choice but to concede. Whereas open routing allows the shipper to select interchanges at any point on a route, reciprocal switching only permits selection of the nearest interchange that is within a reasonable distance of the origin or destination.

V. RECIPROCAL SWITCHING DOES NOT THREATEN RAIL INVESTMENT.

Throughout this rulemaking, the Coalition Associations have demonstrated how reciprocal switching has the potential to increase investment, contrary to rail industry claims that it will decrease investment.²⁸ At the hearing, the Chief Financial Officer for CSX presented a numerical illustration to show how reciprocal switching could change the outcome of a decision to invest in certain infrastructure to serve a shipper. In that scenario, CSX required 10 years to recoup its investment, but only had a 3-year contract commitment from the shipper. In a captive scenario, CSX estimated it had a 75% chance of retaining the traffic in Years 4-10 (versus losing the business to trucks) absent reciprocal switching, but only a 50% chance of retaining the traffic with reciprocal switching (at a lower rate). According to CSX, that differential between the captive and competitive scenarios constituted the difference between making the investment or

²⁷ See, Shipper Coalition Reply, Orrison R.V.S., pp. 5-6, 8-9.

²⁸ See, Shipper Coalition Reply, pp. 116-23, “Reply Verified Statement of Kevin W. Caves, Ph.D.,” pp. 15-26 (“Caves R.V.S.”); Coalition Hearing Testimony, pp. 18-19.

not. The solution to this alleged problem in a world with reciprocal switching, however, is straight-forward.

To justify the investment in this illustration, CSX can recoup its investment by entering a longer-term contract with the shipper, thereby eliminating all uncertainty that it will retain the shipper's business. The shipper then must decide whether it values that investment at the rate premiums that CSX may need to charge relative to the alternate railroad's rates, if any. The shipper thus makes that decision based on competitive considerations.

Dr. Kevin Caves, in prior testimony in this rulemaking as an economic witness for the Shipper Coalition, described the "Arrow Effect" or "Replacement Effect," which tends to be strongest when significant barriers to entry exist.²⁹ A monopolist may find that a particular investment does not yield much additional business because its market share already is quite high, whereas a competitor making the same investment would expect to profit more because it could gain a substantial share of the market previously served by the monopolist. In such situations, there is substantial empirical evidence that heightened competitive pressures cause firms to invest more, not less, to improve their efficiency. Indeed, after the Staggers Act freed the rail industry to compete more effectively with trucks, railroads increased their investments significantly despite declining real rates.

VI. "REASONABLE DISTANCE" SHOULD BE DEFINED BY THE ACTUAL OPERATIONS OF THE INCUMBENT BETWEEN THE SHIPPER'S FACILITY AND THE NEAREST WORKING INTERCHANGE.

From the outset, the Coalition Associations have maintained a consistent definition of "reasonable distance."³⁰ Their definition is pegged to the functions of a terminal because the

²⁹ Shipper Coalition Reply, Caves R.V.S., ¶¶ 41-42.

³⁰ Shipper Coalition Op., pp. 36-40; Shipper Coalition Reply, pp. 75-81, 82-83.

operations required to perform reciprocal switching are comparable to terminal functions. The Coalition Associations, however, have opposed rail industry attempts to limit reciprocal switching to terminal areas because there is no bright line definition of a “terminal,” the railroads themselves do not publicly identify the geographic boundaries of their terminals, and allowing railroads to draw such lines would be arbitrary and susceptible to gaming.

Although there is no bright-line definition for a “terminal,” there is precedent as to the functions and characteristics of a terminal. For example, “[a] ‘terminal area’...must contain and cannot extend significantly beyond recognized *terminal facilities*, such as freight or classification yards or team tracks, and a cohesive commercial area immediately served by those facilities.”³¹ In addition, *terminal facilities* consist of “any property of a carrier which assists in the performance of the functions of a terminal” and “the nature of the facilities and the character of the area in which they are located are as important as the use of the facility.”³² Thus, by identifying terminal facilities, a reasonable distance would encompass any shipper location served by local trains operating out of those facilities.

As the Coalition Associations testified at the hearing, this standard lends itself to a general rule-of-thumb that, if a reciprocal switch can be completed without movement in a road train, the shipper facility is within a “reasonable distance” of a working interchange because local trains tend to perform most terminal functions. There essentially are two switching scenarios that should always fall within this definition of “reasonable distance.” In the simplest scenario, the local train that serves a customer facility operates out of the same yard where the

³¹ *Dakota, Minn. & E. R.R. Corp – Control – Iowa, Chi. & E. RR Corp.*, FD 34178, Dec. No. 7, slip op. at 41, n. 65, quoting *Rio Grande Industries, Inc. – Purchase and Related Trackage Rights – Soo Line RR Co.*, FD 31505, Dec. No. 6, 1989 ICC LEXIS 351, *27 [italics added].

³² *Id.*

interchange occurs. In more complex scenarios, although the interchange may occur in a different yard, the local train that serves a customer facility operates through a yard that is served by another local train that connects to the yard where the interchange occurs. This may be more common in large urban areas with multiple interconnected rail yards.

Although most movements that require transportation on a road train to reach the interchange point would not constitute a reasonable distance under this definition, any such presumption should be rebuttable because there may be switches performed by road trains that also provide the same services as a local train for some movements. For example, if a road train routinely stops en route to switch a customer instead of a local train, that facility could still qualify as being within a reasonable distance of a working interchange.

VII. THE BOARD NEED NOT DELAY THIS PROCEEDING TO DEVISE A SWITCH FEE METHODOLOGY.

The Board posed several questions at the hearing regarding how it should set the level of the switch fee when the stakeholders cannot agree. Those questions concerned the methodology for setting the fee and under what terms and circumstances a shipper may challenge the switch fee.

As a threshold matter, the Coalition Associations point out that they have proposed a methodology for setting the switch fee that is based upon modifications to the Board's methodology for setting trackage rights fees in FD No. 30,000 (Sub No. 16), *St. Louis Southwestern Ry. Co. – Trackage Rights Over Missouri Pac. R.R. Co – Kansas City to St. Louis* (the "SSW Methodology").³³ Indeed, they have offered the most detailed approach of any party

³³ Shipper Coalition Op., pp. 50-53, "Verified Statement of Thomas D. Crowley and Daniel L. Fapp," pp. 14-27 ("Crowley/Fapp V.S.").

in this rulemaking. Their approach is designed to recover the incumbent carrier's variable and fixed costs of providing the switch plus a reasonable return on investment based on usage.

Because the rail industry has been more focused on defeating the proposed rule outright, rail carriers have not offered a detailed approach of their own – except to insist that any approach be based on the principal of “efficient component pricing.” For reasons that have been covered extensively in prior submissions of the Coalition Associations, to the extent that a rail carrier's prices currently exceed competitive levels, efficient component pricing will protect that market power by locking in supra-competitive profits and thereby prevent shippers from benefiting from the price competition that a rival carrier could bring.³⁴

Next, because Section 11102(c) only refers to the Board setting the switch fee when the carriers do not agree among themselves, the Board has inquired whether and under what terms a shipper could challenge a switch fee to which the carriers have agreed. It should be academic that a shipper may challenge the switch fee. To conclude otherwise would ignore the rail transportation policies “to maintain reasonable rates,” “to encourage honest and efficient management,” and “to avoid undue concentrations of market power,” by allowing carriers to collude over the switch fee to prevent reciprocal switching from functioning as intended to encourage competition.³⁵

It also should be academic that the Board can apply the same standards to switch fee disputes regardless of whether the dispute is between two carriers or a carrier and a shipper. The objective of preserving the benefits of reciprocal switching while adequately compensating the incumbent carrier is the same in both circumstances.

³⁴ See, Shipper Coalition Op., pp. 53-54, Crowley/Fapp V.S., pp. 28-30; Shipper Coalition Reply, pp. 131-38, Caves R.V.S., 6-12; Coalition Hearing Testimony, pp. 32-33.

³⁵ 49 U.S.C. § 10101(6), (9), & (12).

That raises one final question, which is whether the Board's jurisdiction over a shipper's challenge to the switch fee arises under the rate reasonableness section at 49 U.S.C. § 10701 or the reciprocal switching section at § 11102(c). The primary significance of this question is that the shipper must demonstrate market dominance before it can challenge a rate under the former section, whereas market dominance is not a prerequisite under the latter. This is a moot question for reciprocal switching awarded under Prong 2 of the proposed rules because market dominance already is a part of the shipper's required proof. Therefore, the answer to this question is only consequential for switching awarded under Prong 1. The ultimate answer to this question likely depends upon whether a switch fee is a "rate" under Section 10701.

Railroads assess many charges in addition to their transportation rates, such as demurrage, storage, and accessorial fees, each of which has a distinct purpose separate from the transportation charge. As the Coalition Associations have amply demonstrated from the outset of this rulemaking, Congress intended that reciprocal switching encourage competition. The level of the switch fee is critical to the effectiveness of that competition. Thus, it is reasonable to conclude that switch fees are more like demurrage and accessorial charges than to a transportation rate and thus should not be subject to Section 10701.

Except for the switch fee methodology itself, the foregoing questions were not raised prior to the hearing, and thus it could be difficult to resolve them without injecting further delay into this eleven-year-old proceeding. There is no need, however, to answer those questions in this docket at this time. After all, the Board never adopted a switch fee methodology or addressed these other questions in the current reciprocal switch rule that has been in place for 35 years. Those questions currently would be, and can continue to be, addressed as needed through individual adjudications.

Nevertheless, the Coalition Associations have a strong preference ultimately to resolve these matters through the rulemaking, rather than the adjudicatory, process. Therefore, while they oppose any delay to this proceeding to resolve questions about the switch fee, the Coalition Associations urge the Board to open a new sub-docket in EP 711 to address all issues concerning the switch fee.

VIII. COMPARISONS BETWEEN RECIPROCAL SWITCHING AND THE SHARED ACCESS EXPERIENCE OF THE TELECOMMUNICATIONS INDUSTRY ARE MISPLACED.

The AAR's written testimony compares reciprocal switching with the shared access experience of the telecommunications industry following The Telecommunications Act of 1996 ("TCA").³⁶ AAR submitted the Verified Statement of Debra J. Aron, which sets forth a history of the TCA and the Federal Communications Commission's ("FCC") attempts to implement the TCA's shared access regime. Notably, however, not once does Dr. Aron draw a comparison with reciprocal switching. Rather, it is AAR's counsel who draw that comparison and proclaim that the rail experience with reciprocal switching "will be even worse."³⁷ The Coalition Associations are submitting the "Supplemental Verified Statement of Dr. Kevin Caves" (attached as Exhibit 1) to demonstrate several critical differences between the rail and telecommunications industries that expose AAR's false analogy.

First, the TCA was intended to promote competition from new entrants which lacked their own fully built networks. In contrast, reciprocal switching facilitates head-to-head competition between two entrenched facilities-based incumbents with their own extensive

³⁶ AAR Supp. Comments, pp. 64-67, Aron V.S.

³⁷ *Id.*, p. 66.

networks.³⁸ Furthermore, no one has argued that reciprocal switching is intended to spur entry by new railroads.³⁹

Second, the TCA unbundled virtually every component of the incumbent's network and required incumbents to grant competitors access to each component.⁴⁰ In the case of the so-called UNE platform, the FCC required an incumbent to grant access to 100% of its network infrastructure.⁴¹ In contrast, reciprocal switching affects only that portion of an incumbent railroad's network that extends from an origin or destination to the nearest working interchange within a reasonable distance.⁴² Nor does reciprocal switching entail the sharing of those facilities. Rather, it functions to deny the bottleneck carrier its long-haul; the bottleneck carrier still provides the complete service over the bottleneck segment.

Third, the TCA effectively subjected an incumbent carrier's entire customer base to competition from multiple competitors with little or no infrastructure of their own. In contrast, as demonstrated in Part II above, reciprocal switching will introduce a much smaller proportion of rail traffic to competition that will be provided by a single rail competitor with its own extensive infrastructure.

Fourth, the TCA attempted to create competition to traditional telephone industry incumbents just as new and disruptive technologies were transforming the industry in a way that rendered traditional telephony obsolete.⁴³ This weakened the incumbent carrier's market power

³⁸ Caves S.V.S., ¶¶ 3, 12, 14.

³⁹ Caves S.V.S., ¶ 21.

⁴⁰ Caves S.V.S., ¶ 12.

⁴¹ Caves S.V.S., ¶ 13.

⁴² Caves S.V.S., ¶ 14.

⁴³ Caves S.V.S., ¶ 18.

and, with it, the key economic justification for shared access.⁴⁴ In contrast, no comparably disruptive technology is on the horizon for the rail industry, especially for the captive traffic expected to benefit most from reciprocal switching.⁴⁵

The critical factors underlying the foregoing differences are the lack of extensive facilities-based competitors under the TCA and the much broader scope of access under the TCA both in terms of the incumbent's facilities and customers. Because both the incumbent and competitor railroads in a reciprocal switch own and operate extensive proprietary networks, they have incentives to price the switched traffic to ensure it contributes to paying down their fixed costs, which could not be said for telecommunications competitors under the TCA.⁴⁶ The telecommunications competitors, freed of their own fixed costs, could out-compete the incumbents on an uneven playing field. Furthermore, because the competition resulting from reciprocal switching still results in a duopoly, both carriers will retain substantial market power to preserve their ability to differentially price the switched traffic, albeit to a lesser degree.⁴⁷ Thus, AAR's attempt to tar reciprocal switching with the missteps of the TCA completely misses the mark. As noted by Dr. Caves, Dr. Aron's statement does not conclude that reciprocal switching would somehow be "worse" than telecom access regulation, nor does it provide an economic basis for AAR to make this extreme assertion.⁴⁸

⁴⁴ Caves S.V.S., ¶ 19.

⁴⁵ Caves S.V.S., ¶ 20.

⁴⁶ Caves S.V.S., ¶ 15.

⁴⁷ Caves S.V.S., ¶ 20.

⁴⁸ Caves S.V.S., ¶ 11.

IX. CANADIAN INTERSWITCHING IS USED AS A TOOL TO PROMOTE INTRAMODAL COMPETITION AND HAS NOT CAUSED OPERATIONAL OR FINANCIAL HARMS TO THE CANADIAN RAILROADS.

Throughout this proceeding the Coalition Associations have reassured the Board that Canadian interswitching rights, which have existed for over 100 years and are far broader in scope than the Board's proposed rules, have not resulted in widespread operational or financial impacts to the Canadian railroads.⁴⁹ The rail industry downplays the century of success and competitive benefits derived from interswitching and has focused instead on historical policy and network differences between the United States and Canada. However, CP, which has operated under interswitching regulations for many decades, admits that "Interswitching in Canada works fairly well most of the time"⁵⁰ and that, when complexity does exist, "Canada's railroads have developed intricate interswitching agreements and operating protocols over the years, in order to manage this complexity and reduce congestion."⁵¹

The detailed Verified Statement of Mr. Thomas Maville, submitted to the Board in 2013 as part of the NITL's analysis of its own reciprocal switching proposal made in 2011, and the decisions of the Canadian regulators described in that statement, contradict the rail industry's claim that interswitching is not used as a pro-competitive tool in Canada. At the time of his expert testimony, Mr. Maville had over 40 years' experience with rail freight transportation in

⁴⁹ Shipper Coalition Reply, pp. 110-116; NITL Opening Submission, pp. 59-62 (filed March 1, 2013) ("NITL Op. Submission").

⁵⁰ Canadian Pacific Comments, p. 6 (filed Feb. 14, 2022) ("CP Comments").

⁵¹ CP Comments, p. 3.

Canada in both the public and private sectors, including serving as an economist and senior officer at the Canadian Transport Commission⁵² between 1977 and 1996.⁵³

Mr. Maville explained that, by the mid-1980s, promoting intramodal competition had become the “primary focus” of interswitching regulation.⁵⁴ Ironically, it was during this same time period that the ICC established the current high bar for reciprocal switching in the United States that Canada was evaluating whether to expand its interswitching distance limits from 4 linear miles to 30 radial kilometers. Mr. Maville also explained that the 1988 decision of the National Transportation Agency of Canada to expand the interswitching distance limits established the encouragement of rail competition where it does not currently exist as an interswitching policy initiative:

The government policy initiatives in respect of interswitching are clear. In expanding the previous interswitching limit of four track miles to the current 30 kilometre radius limitation, ***the legislators demonstrated a desire to provide for greater access to competitive service for captive shippers....*** In this regard, the general policy objective of NTA, 1987, as referenced in subsection 3 (1)...was designed to encourage competition for traffic through the...use of the competitive access provisions of expanded interswitching and competitive line rates.... ***In other word, the current interswitching provisions were designed to foster competition where it does not presently exist, in order to encourage effective negotiations between shippers and carriers.***⁵⁵

⁵² The Canadian Transport Commission was the predecessor agency to the National Transportation Agency and the current Canadian Transportation Agency.

⁵³ “Verified Statement of Thomas L. Maville, President TL Maville & Associates Inc.,” p. 2 (attached to NITL Op. Submission as Ex. 2) (“Maville VS”).

⁵⁴ Maville VS, p. 8, *quoting* Canadian Transport Commission, Railway Transport committee, Staff Report “Enquiry into Freight Traffic Interswitching Regulations,” April 1985, p. 32 (emphasis added).

⁵⁵ Maville VS, p. 12, *citing* National Transportation Agency of Canada Decision No. 269-R-1988, August 18, 1988, p. 2 (emphasis added).

The policies and purpose underlying Canada’s interswitching regulation are consistent with the reciprocal switching statute in the United States, as well as the rail transportation policies “to allow, to the *maximum extent possible*, competition and the demand for services to establish reasonable rates for transportation by rail” and “to ensure the development and continuation of a sound rail transportation system *with effective competition among rail carriers* and with other modes, to meet the needs of the public....”⁵⁶

In addition, US-based shippers who also have facilities in Canada contradict statements by CP and CN that shippers in Canada do not use interswitching as a competitive tool.

Following are several examples of the important competitive benefits shippers obtain from Canadian interswitching (and the voluminous record includes many more such examples going back to the inception of this proceeding):

- Nutrien commented that, “In Canada and in select locations in the United States, Nutrien has seen how interswitching and reciprocal switching, respectively, can improve service, cost, and reliability.” “[Nutrien’s] experience has been that rail carriers are more competitive in their rates and more responsive in service when competition via interswitching and reciprocal switching is available.”⁵⁷
- Indorama Ventures stated that, “The reciprocal switching right in Canada helps to keep rail freight rates reasonable and the railroad quickly reacting to service issues. It provides major benefits to shippers and receivers and has not resulted in significant adverse effects to the railroads by causing service problems. If anything, reciprocal switching has improved service overall for Indorama.”⁵⁸
- Shell Chemical commented that, “Shell also moves product by rail in Canada and has had direct experience with the Inter-switching regime used in Canada for many years. The system works seamlessly to provide competitive choice to otherwise captive rail shippers based on cost and performance, operating the same as any free market. We

⁵⁶ 49 U.S.C. § 10101(1) and (4) (emphasis added).

⁵⁷ Nutrien Comments, p. 3 (filed Feb. 14, 2022).

⁵⁸ Indorama Ventures Comments, p. 3 (filed Feb. 14, 2022).

see strong parallels with how competitive switching would work in the US if adopted.”⁵⁹

- Dow Chemical Company explained that “Dow’s own use of Canadian interswitching underscores that competitive switching will rarely shift traffic away from an incumbent. Dow has access to interswitching at its Fort Saskatchewan, Alberta, facility. And it has consistently maintained this facility’s traffic with the incumbent under multi-year agreements.”⁶⁰

These statements from U.S. companies that operate in Canada and have access to interswitching plainly demonstrate that, regardless of the origin of Canada’s interswitching regulation, more recent experience and intent has been to use interswitching to realize the benefits of intramodal competition, including improved service, reasonable rates, and bi-lateral commercial agreements. These companies, and many more whose supply chains depend on rail service, support expanded reciprocal switching under the Board’s proposal to allow the benefits of rail competition to also flourish in the United States.

Finally, as explained in the Coalition’s February 14th testimony, a perfect “apples-to-apples” comparison is not required for the Board to draw reasonable inferences from the Canadian experience when evaluating the risks of operational and financial harms alleged by the railroads.⁶¹ The Board has the necessary expertise to weigh the information in the record regarding Canadian interswitching and, in doing so, will determine that the severe operational and financial harms that the railroads allege will occur from expanded reciprocal switching are grossly exaggerated. The experience in Canada demonstrates that such risks are extremely low and can be mitigated through routine operating protocols.⁶²

⁵⁹ Shell Chemical LP Comments, p. 2 (filed Feb. 14, 2022).

⁶⁰ Dow Chemical Company Comments, p. 13 (filed Feb. 14, 2022).

⁶¹ See Coalition Hearing Testimony, pp. 22-24.

⁶² See CP Comments, p. 3.

Further, the structural differences between the *automatic* interswitching rights in Canada and the measured case-by-case approach of the Board’s proposal, including the built-in safeguard requiring evaluation of any potential operational risks, provide further reassurance that the Board can manage the implementation of reciprocal switching effectively to avoid any adverse consequences.⁶³ Canada has determined that any costs associated with interswitching are manageable and outweighed by the benefits of competition. The record in this proceeding compels the Board to reach this same conclusion.

X. THE COALITION ASSOCIATIONS ARE WARY OF UNION PACIFIC’S PROPOSAL TO FORM A NEGOTIATING COMMITTEE WHICH IS LIKELY TO FURTHER DELAY THIS PROCEEDING.

The Coalition Associations close these comments by responding to UP’s suggestion at the hearing for shippers and carriers to form a committee of stakeholders to pursue solutions to the issues raised in this proceeding. The Associations’ reaction is similar to that expressed by Board Member Primus at the hearing, that this idea is “eleven years too late.” However, because the Board’s March 23, 2022, decision “strongly encourages interested parties...to continue discussing the important issues raised in this case and to pursue collaborative solutions while the Board continues its own consideration in this proceeding,” the Associations do not want to ignore this subject altogether.

The Coalition Associations always remain open to discussing solutions to the multitude of problems between shippers and rail carriers. UP’s proposal, however, lacks context, specificity, or broad buy-in from the other Class I railroads. It is unclear if UP’s proposal even relates to ways to make reciprocal switching work to encourage competition. Throughout the eleven years of this proceeding, neither UP or any other railroad, has offered constructive

⁶³ See Coalition Hearing Testimony, pp. 23-24.

feedback on the Board's proposed rules or offered reasonable suggestions for how to implement reciprocal switching based on the current features of the rail industry. Rather, UP and the other Class I carriers appeared more interested in the same types of stop-gap measures discussed at the hearing, namely, greater reliance upon the Board's temporary service order rules and adopting their rate case arbitration proposal in EP 765. Neither AAR nor any individual railroad has offered any reciprocal switching proposal in their latest comments or hearing testimony that would lead the Coalition Associations to believe they are serious about addressing captive shippers' problems by increasing rail competition. Part V above sets forth the Associations' position on temporary service orders and the Coalition Associations' comments in EP 765 sets forth their position on the rail industry's arbitration proposal. Having said that, if the rail industry has more to propose that would advance the objectives of greater competition, the Coalition Associations remain open to considering them.

Finally, the Coalition Associations harbor a healthy dose of skepticism that UP's eleventh-hour proposal is designed to force this proceeding into overtime just as the Board has expressed its priority to conclude this long-standing proceeding. At this late stage, the Associations object to any proposal that would delay the Board's issuance of a final rule in this proceeding, and they are gratified that the March 23rd decision affirms the Board's intent to push forward independent of any committee that may arise from UP's proposal.

Respectfully submitted,

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On Behalf of:

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The Fertilizer Institute

The National Industrial Transportation League

Corn Refiners Association

April 4, 2022

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On Behalf of:

The Chlorine Institute

Exhibit 1

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

**Ex Parte No.711
(Sub No. 1)
Reciprocal Switching**

Supplemental Verified Statement and Written Testimony of

Kevin W. Caves, Ph.D.

On Behalf of

The American Chemistry Council

The Fertilizer Institute

The Corn Refiners Association

Dated: March 31, 2022

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INTRODUCTION

1. I have been asked by the American Chemistry Council, The Fertilizer Institute, and the Corn Refiners Association (“Shippers”) to respond to certain arguments made by the Association of American Railroads (“AAR”) attempting to draw parallels between the proposed reciprocal switching rules at issue here¹ and access pricing regimes promulgated by the Federal Communications Commission (“FCC”) in the wake of the Telecommunications Act of 1996 (“Telecom Act”).² The AAR asserts that the STB, in considering reciprocal switching as a regulatory remedy in the railroad industry, should “take caution” due to “failed regulatory experiments...in the telecommunications industry.”³ According to the AAR, “[e]very reason exists to think that the rail experience will not be as bad as the telecommunications experience—it will be even worse.”⁴

2. I have also been asked to respond to the testimony of Dr. Debra Aron to the extent relevant in evaluating the AAR’s claims.⁵ Tellingly, Dr. Aron refrains from drawing parallels between reciprocal switching and telecom regulation, offering no opinion on whether or the extent

¹ I understand that, under current regulations, a shipper remains captive to the railroad with which its shipment originated for as far along the shipper’s route as the origin railroad can carry the traffic on its own network, regardless of the proximity of other rail networks that might otherwise compete for the shipper’s business along the route. I understand that the proposed regulation would grant captive shippers the right to obtain service from a nearby competitor railroad through reciprocal switching. According to the proposed regulations, the STB “would require the establishment of a switching arrangement when the switching arrangement either was practicable and in the public interest or was necessary to provide competitive rail service.” STB Notice, Docket No. EP 711 (Sub-No. 1), *Reciprocal Switching* (December 27, 2021), at 3. I understand that the proposed regulation would require the originating railroad to transport a shipper’s rail cars to a specified interchange point, allowing the traffic to be switched to a competing carrier, thereby enabling a competing carrier to offer its own single-line rate from the shipper’s facility to the destination even where it does not have facilities that reach the shipper’s facility. *Id.* at 2.

² I have previously submitted testimony in this proceeding. *See* Reply Verified Statement of Kevin W. Caves, Ph.D. On Behalf of The Shipper Coalition for Railroad Competition (January 9, 2017) [hereafter, “Caves 2017 Testimony”].

³ Supplemental Comments of the Association of American Railroads (February 14, 2022) [hereafter, “AAR Comments”] at 64-67 (“The Board Should Take Caution from the Failed Regulatory Experiments with Forced Sharing in the Telecommunications Industry”).

⁴ *Id.* at 66.

⁵ Verified Statement and Written Testimony of Debra J. Aron (February 14, 2022) [hereafter, “Aron VS”].

to which reciprocal switching in the railroad industry is likely to resemble the telecom experience.⁶ The AAR's extreme views on reciprocal switching go far beyond the limited scope of Dr. Aron's opinions. The AAR's views are also contradicted by various eminent economists and industry analysts, as well as decades of practical experience in the Canadian railroad industry, in which regulators have employed transparent formulae to implement interswitching. The STB, like Canadian railroad regulators before it, is under no obligation to adopt complex regulations such as the Total Element Long Run Incremental Cost ("TELRIC") methodology promulgated by the FCC to implement access pricing for Unbundled Network Elements ("UNEs").⁷ Similarly complex regulations already exist in the form of the standalone cost ("SAC") test, which the AAR praises incongruously.

3. The AAR also ignores or misconstrues critical distinctions between telecom access regulations—intended to promote competition from new entrants lacking their own fully-built telecom networks, and made increasingly obsolete over time by robust competition from new and emerging communications technologies—and reciprocal switching, which targets head-to-head competition between entrenched facilities-based incumbents with extensive rail networks, substantial market power over many shippers, and no competitive relief in sight from new or

⁶ Dr. Aron's testimony focuses instead on reviewing the history of FCC regulation. Dr. Aron's testimony mentions the railroad industry only once. *Id.* at 2 ("The telecommunications industry became subject to a legal requirement in 1996 by which incumbent carriers were required to provide components of their networks to their competitors to enable their competitors to provide certain competitive services. I have been asked by the AAR to provide a description of the regulatory process that ensued to implement those requirements, their effects on the industry, and the lessons learned in the telecommunications industry that *may be useful* for the Board as it considers imposing its own new network sharing obligations on the railroad industry.") (emphasis added).

⁷ TELRIC is "a forward-looking cost methodology that calculates the cost today of building and operating an efficient facility, as opposed to the cost of an existing facility at the time it was built." *See, e.g.,* Notice of Proposed Rulemaking, *In the Matter of Review of the Commission's Rules Regarding the Pricing of Unbundled Network Elements and the Resale of Service by Incumbent Local Exchange Carriers*, Before the Federal Communications Commission, WC Docket No. 03-173 (September 15, 2003), ¶2. *See also* First Report and Order, *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, and Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers*, Before the Federal Communications Commission, CC Docket Nos. 96-98 and 95-185, FCC 36-325 (August 8, 1996), ¶¶678-90.

emerging technologies. For these and other reasons detailed below, I conclude that the AAR's flawed analogy to telecom regulation does not withstand scrutiny.

QUALIFICATIONS

4. My name is Kevin W. Caves. I am an Economic Expert at Infotech Consulting, a nationally recognized firm with extensive expertise in economics, econometrics, and statistics. I served as Assistant Economist at the Federal Reserve Bank of New York before receiving my doctorate from the University of California at Los Angeles in 2005, specializing in applied econometrics and industrial organization. I apply my expertise in microeconomics and econometrics to a broad range of industries and research topics. I have testified as an expert witness in U.S. district court, government agencies, and arbitration. My professional experience spans antitrust, class actions, consumer products, labor economics, mergers, price fixing, public policy analysis, sector-specific regulation, and other areas. I have experience in 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.

5. My work has been published in popular outlets, law journals and peer-reviewed economics journals, such as *The Atlantic*, *Antitrust*, *Antitrust Source*, *Communications & Strategies*, *Competition Policy International*, *Econometrica*, *George Mason Law Review*, *Information Economics & Policy*, *Journal of Competition Law & Economics*, *Journal of Sports Economics*, *Labor Law Journal*, *Research in Law & Economics*, and the *Review of Network Economics*. I have published two book chapters, and have served on the editorial advisory board of the *Journal of Transportation Law, Logistics, & Policy*. I have developed econometric techniques now taught to graduate students and integrated into STATA, a leading statistical software package. A copy of my CV is attached at Appendix 1.

THE AAR'S FLAWED ANALOGY TO TELECOM REGULATION DOES NOT WITHSTAND SCRUTINY

A. Economists Recognize That Reciprocal Switching Can Promote Competition While Minimizing The Need For Complex Regulation

6. In contrast to the musings of AAR attorneys, economists recognize that the economic benefits of reciprocal switching are likely substantial. Comments submitted in this proceeding by (among others) economists of the Economic Analysis Group (“EAG”) of the Department of Justice (“DOJ”) emphasize the economic benefits of reciprocal switching, explaining that reciprocal switching is “a well-tailored first step to provide captive shippers the benefit of some competition while reducing the need for complex rate regulation.”⁸

7. The DOJ economists explain that reciprocal switching “likely will enhance competition and help make crucial supply chains more resilient for three overarching reasons.”⁹ First, reciprocal switching can open up competition between multiple railroads where none existed before, allowing for enhanced competition over price and service “over the vast majority of the distance to the cargo’s destination.”¹⁰ Second, reciprocal switching is unlikely to impose economically inefficient costs on the railroad industry: Class I railroads already provide voluntary reciprocal switching services to each other hundreds of times per day. Canadian railroads have improved both their financial performance and their service despite being subject to interswitching regulation for many decades.¹¹ Third, reciprocal switching “minimizes the need for complex rate regulation,”¹² particularly in light of the well-documented costs and inefficiencies of regulatory

3. ⁸ Comment Of The United States Department Of Justice (February 28, 2022) [hereafter, “DOJ Comments”] at

⁹ *Id.* at 4.

¹⁰ *Id.*

¹¹ *Id.* at 6-7. *See also* Transportation Research Board, *Modernizing Freight Rail Regulation*, Special Report 318, NATIONAL ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE (2015) [hereafter, “TRB Report”] at 170-171.

¹² DOJ Comments at 7.

alternatives such as the SAC test.¹³ Again, the Canadian experience illustrates the feasibility of efficient implementation.¹⁴

8. Another group of experts, including distinguished economists working under the auspices of the National Academies of Sciences, endorsed reciprocal switching in a 2015 report published by the Transportation Research Board (“TRB Report”).¹⁵ The TRB Report recommended that parties in rate arbitration be permitted to propose reciprocal switching arrangements in final offer arbitration, explaining that “there should be no need for regulators to set switching fee schedules or to establish applicable distance limits, since such terms should be part of any offer put before the arbitrator that included reciprocal switching.”¹⁶ Nowhere does the TRB Report draw an analogy between reciprocal switching and telecom regulation.

9. Nor does the TRB Report reject as unworkable a “broad (i.e., Canadian-style) application of reciprocal switching;” to the contrary, it notes that the Canadian experience suggests that a broad approach would be “administratively feasible.”¹⁷ Although the TRB Report suggests that a “possible starting point for STB in assessing the impact of reciprocal switching is to allow its use in a more limited setting,” such as a “remedy for rates that have already been ruled unreasonable,”¹⁸ it does not say that this should necessarily be the ending point. Instead, it explains that assessments of a broader proposal “will depend on its specific design features and on

¹³ See, e.g., Caves 2017 Testimony ¶¶18-24; TRB Report at 197-200; 124-126; Russell Pittman, *Against the Stand-Alone-Cost Test in U.S. Freight Rail Regulation*, 38 JOURNAL OF REGULATORY ECONOMICS 313-326 (2010).

¹⁴ DOJ Comments at 6-7; see also TRB Report at 173 (“The Canadian experience with setting switching fees on the basis of an uncomplicated but variable schedule suggests that setting such fees would be administratively feasible, but the size and structure of the fees would affect the amount of competitive activity at the margin.”). Put differently, the amount of competition induced by reciprocal switching naturally depends, in part, on the fee structure.

¹⁵ TRB Report at 8 (“**Recommendation: Allow reciprocal switching as a remedy for unreasonable rates.** Permit parties in rate arbitrations to propose reciprocal switching arrangements in their offers to resolve the dispute if they so desire and allow the arbitrator to order that such arrangements be made.”)

¹⁶ *Id.*

¹⁷ *Id.* at 173.

¹⁸ *Id.* at 173-174.

assumptions about the circumstances in which it would be applied.”¹⁹ The TRB Report’s openness to reciprocal switching is a far cry from the AAR’s extreme position.

10. The AAR’s extreme views are also contradicted by industry analysts and economists retained by the STB to study reciprocal switching. As Union Pacific’s own economist has acknowledged in this proceeding, InterVISTAS Consulting concluded that differences between the telecommunications industry and the railroad industry “render the high degree of rate regulation and the access pricing rule adopted in the telecommunications industry inapplicable to the railroad industry.”²⁰ In a comprehensive report commissioned by the STB, economists from Christensen Associates explained that reciprocal switching is an “incremental policy,” and concluded that reciprocal switching has “a greater likelihood of resolving shipper concerns via competitive response, without leading to material adverse changes to railroad costs and efficiency.”²¹ According to the Christensen economists, incremental policies such as reciprocal switching “will be the least costly in terms of loss of economic efficiency and, in our opinion, the most likely to produce competitive responses by railroads.”²² The Christensen economists also recognized that increased competition resulting from reciprocal switching can overcome any static efficiency losses incurred by railroads, because “there would be a likely gain in economies of density if volumes increase.”²³

¹⁹ *Id.* at 173.

²⁰ See Verified Statement of Joshua Wright on behalf of Union Pacific Railroad Company (October 26, 2016) [hereafter, “Wright VS”] ¶102, n. 114 (acknowledging that the 2016 InterVISTAS Consulting report “analyzed the distinctions between the railroad and telecommunications industry, and concluded that such differences render the high degree of rate regulation and the access pricing rule adopted in the telecommunications industry inapplicable to the railroad industry.”) (Citing InterVISTAS, “An Examination Of The STB’s Approach To Freight Rail Rate Regulation And Options For Simplification,” (September 14, 2016), at 99-105)). Dr. Wright opined that “the telecommunications industry’s experiences with a suboptimal access pricing rule are still instructive as to the consequences such a rule entails in general.” Wright VS ¶102, n. 114. Again, this is a far cry from the AAR’s extreme view that “[e]very reason exists to think that the rail experience will not be as bad as the telecommunications experience—it will be even worse.” AAR Comments at 66.

²¹ Christensen Associates, *A Study Of Competition In The U.S. Freight Railroad Industry and Analysis of Proposals That Might Enhance Competition*, Revised Final Report (November 2009), Executive Summary, at ES-40.

²² *Id.* Vol. 3, at 22-13.

²³ *Id.*

B. Dr. Aron’s Statement Does Not Endorse AAR’s Flawed Analogy

11. Dr. Aron’s testimony reviews the history of certain telecom regulations following passage of the Telecom Act in 1996, under which Incumbent Local Exchange Carriers (“ILECs”) were obligated to lease UNEs to Competitive Local Exchange Carriers (“CLECs”), which often owned little (if any) network infrastructure. Dr. Aron’s testimony is almost completely silent on the railroad industry, which is mentioned just once; in describing her assignment, Dr. Aron explains:

I have been asked by the AAR to provide a description of the regulatory process that ensued to implement those requirements, their effects on the industry, and the lessons learned in the telecommunications industry that *may be useful* for the Board as it considers imposing its own new network sharing obligations on the railroad industry.²⁴

Dr. Aron does not opine that any of the lessons she draws from the telecom experience actually are useful to the STB, let alone explain how any such lessons could or should inform the Board’s decision making. Dr. Aron’s statement does not conclude that reciprocal switching would somehow be “worse” than telecom access regulation, nor does it provide an economic basis for AAR to make this extreme assertion.

C. Reciprocal Switching Does Not Require The Extensive Network Sharing Regulations Promulgated by the FCC

12. Access pricing regulations in telecommunications were intended to encourage entry and expansion by CLECs, which were not “facilities-based” competitors in the sense that they lacked their own fully-built telecom networks with which to reach end-customers. In an effort to approximate robust, head-to-head competition between facilities-based competitors, CLECs were given regulated access to UNEs.²⁵ Unbundling regulations in the telecom industry were so extensive

²⁴ Aron VS at 2 (emphasis added).

²⁵ See, e.g., Jerry Hausman & J. Gregory Sidak, *Telecommunications Regulation: Current Approaches with the End in Sight*, in NANCY ROSE, *ECONOMIC REGULATION AND ITS REFORM: WHAT HAVE WE LEARNED?* (Natural Bureau of Economic Research, University of Chicago Press 2014) [hereafter, “Hausman & Sidak”], Chapter 6.

that “virtually no component of an incumbent’s network was immune from unbundling obligations[.]”²⁶

13. For example, in the case of the so-called UNE platform (“UNE-P”), one hundred percent of the network infrastructure necessary to serve an end-customer was unbundled at regulated rates.²⁷ In the case of the FCC’s “line sharing” requirement, CLECs were given the right to lease the high-frequency portion of an ILEC’s local loop (“HFPL”) to requesting carriers at regulated wholesale rates, and to use the shared link to provide data services to retail customers.²⁸ Economists generally concluded that the FCC’s access pricing regulations allowed CLECs to enter the market without properly incentivizing CLECs to make the investments necessary to build out or complete their own networks.²⁹

14. Reciprocal switching, in contrast, is intended to promote competition between entrenched incumbents with their own extensive networks already in place. Because Class I railroads already possess the network infrastructure necessary to serve end-customers, there is no need for the extensive network sharing previously implemented in the telecom industry. Unlike telecom access regulations, reciprocal switching does not require one railroad to run traffic over a competing railroad’s network. Reciprocal switching implicates only the segment of track necessary to transfer

²⁶ *Id.* at 362.

²⁷ *Id.* at 364; see also Jerry Ellig & James Nicholas Taylor, *What Did the Unbundled Network Element Platform Cost?* 14 JOURNAL OF COMMUNICATIONS LAW AND TECHNOLOGY POLICY (2005) at 2 (“The Telecommunications Act directs the FCC to issue regulations requiring incumbent local exchange carriers (“ILECs”) to lease “unbundled” elements of their local networks to competitors at regulated rates. The statute also requires incumbents to lease the entire suite of network elements necessary to provide local telephone service—the “unbundled network element platform” (“UNE-P”).”)

²⁸ Hausman & Sidak at 363.

²⁹ Nancy Rose, *Learning from the Past: Insights for the Regulation of Economic Activity*, in NANCY ROSE, ECONOMIC REGULATION AND ITS REFORM: WHAT HAVE WE LEARNED? (Natural Bureau of Economic Research, University of Chicago Press 2014), at 15 (“TSLRIC-style pricing of access to local telephone infrastructure gives potential entrants a free option to test a market and exit without paying for sunk investment costs. Not surprisingly, few choose to build their own networks when they can instead ‘rent’ at lower cost[.]”)

traffic from the incumbent railroad's network to the nearest working interchange with the competing railroad's network.

15. Relatedly, because both of the railroads involved in a reciprocal switching arrangement own and operate extensive proprietary networks, the variable profits earned by a competing railroad as a result of reciprocal switching are available to pay down that railroad's fixed costs. This is obviously true of the voluntary switching that routinely occurs today in the industry, and the same basic economic logic would apply under mandatory reciprocal switching. In contrast, as discussed above, mandated UNE pricing in telecom involved a transfer of revenue from a facilities-based competitor (the ILEC) to a competitor that might invest little (if anything) in its own network infrastructure (the CLEC).

D. Canada's Practical Experience With Reciprocal Switching Further Refutes the AAR's Flawed Analogy

16. In contrast to the AAR's flawed parallel to telecom access regulations, the Canadian experience with interswitching regulation provides an obvious economic analogy. Canadian railroads have been governed by interswitching regulations since the early 20th century. If a Canadian shipper has access to only one railroad at the origin or at the destination, the shipment can be transferred to a competing railroad within 30 kilometers. The railroad from which the traffic is switched is compensated according to transparent formulae, with fees varying in proportion to the distance of the shipment and the number of carloads.³⁰

17. I have seen no evidence that the Canadian experience provides any support for the AAR's extreme views on reciprocal switching. As DOJ economists have observed in this proceeding, "Canada uses a requirement similar to the Board's proposal to protect its captive

³⁰ See, e.g., Railway Association of Canada, *Comparison of Canadian and United States Rail Economic Regulations* (January 20, 2015) at 118-119; see also TRB Report at 170-171.

shippers...There is every reason to believe a similar system would benefit captive shippers in the United States along with their customers, suppliers, and ultimately the American public.”³¹ Similarly, the TRB Report explained that “[t]he Canadian experience with setting switching fees on the basis of an uncomplicated but variable schedule suggests that setting such fees would be administratively feasible[.]”³² Dr. Aron’s testimony is conspicuously silent on the Canadian experience with reciprocal switching, and provides no basis for AAR’s unfounded suggestion that the regulatory experience in an entirely different industry (telecom) is somehow more instructive to the STB than decades of practical experience in the Canadian railroad industry.

E. The Railroad Industry Lacks The Relatively Robust Competition of The Modern Telecom Industry

18. In stark contrast to the railroad industry, competition from new and disruptive technologies has transformed the telecom industry since passage of the Telecom Act of 1996. Facilities-based entrants such as mobile wireless operators and cable companies with fiber networks offering voice and broadband, as well as Internet-based communication technologies from e-mail to Facebook to WhatsApp, have rendered traditional telephony increasingly obsolete for many customers.³³ As Dr. Aron acknowledges, “[c]ompetition in telecommunications was emerging and poised to expand prior to the [Telecom Act].”³⁴

19. These competitive developments weakened the key economic justification for the FCC’s access pricing regulations, which originated in an era when the ILECs had far more market power than they do today. These trends have brought the telecom industry closer to “the expected

³¹ DOJ Comments at 5-6. *See also* Reply Comment, U.S. Department of Agriculture (May 30, 2013), at 3 (“Canadian interswitching has neither impeded railroad efficiency nor decreased customer satisfaction.”)

³² TRB Report at 173.

³³ Hausman & Sidak at 345. *See also* Kevin Caves, *Quantifying Price-Driven Wireless Substitution in Telephony*, 35 TELECOMMUNICATIONS POLICY 984-998 (December 2011).

³⁴ Aron VS at 15.

endpoint of competitive local [telecom] markets, which should be facilities-based competition.”³⁵ When the FCC removed its line-sharing requirement in 2003, it “recognized the substantial intermodal competition from cable companies, which lessened any competitive benefits associated with line sharing.”³⁶ Similarly, in its 2015 *Open Internet Order*, the FCC allowed peering and Internet traffic exchange arrangements to be worked out through voluntary commercial negotiations, instead of requiring networks to peer with one another. The FCC’s rationale for its light touch approach to regulation was predicated on the existence and continuation of “robust competition”³⁷ in the market, maintained by “vigorous antitrust enforcement.”³⁸

20. In contrast, it is widely recognized that today’s highly concentrated railroad industry is dominated by entrenched incumbents with substantial market power over many shippers, without any new competitive entrants or disruptive technologies in sight. As the DOJ economists explain, “concerns about the effects of industry concentration justify seeking avenues to further competition in the industry. Since the last wave of class I consolidation in the 1990s, railroad markets are more concentrated, railroads have more pricing discretion, and railroad rates have more than doubled since 2002, rising twice as fast as general inflation.”³⁹ The DOJ economists further explain why the railroad industry is “particularly susceptible” to anticompetitive conduct.⁴⁰ Elementary economics shows that monopolistic or oligopolistic firms can exercise substantial market power, particularly

³⁵ Hausman & Sidak at 345.

³⁶ *Id.* at 363. *See also FCC Adopts New Rules for Network Unbundling Obligations Of Incumbent Local Phone Carriers*, CC Docket 01-338 (News Release, February 20, 2003).

³⁷ Federal Communications Commission, *In the Matter of Protecting and Promoting the Open Internet*, GN Docket No. 14-28, (March 12, 2015), ¶203.

³⁸ *Id.* (“Our ‘light touch’ approach does not directly regulate interconnection practices. Of course, this regulatory backstop is not a substitute for robust competition. The Commission’s regulatory and enforcement oversight...is complementary to vigorous antitrust enforcement...[I]t will remain essential for the Commission, as well as the Department of Justice, to continue to carefully monitor, review, and where appropriate, take action against any anti-competitive mergers, acquisitions, agreements or conduct.”)

³⁹ DOJ Comments at 7.

⁴⁰ DOJ Comments at 4-5.

when there is no credible prospect of competitive entry.⁴¹ Economists recognize that, for shippers facing monopolistic or oligopolistic market structures, the existing SAC test cannot be expected to offer meaningful competitive relief.⁴² Even the AAR acknowledges frankly that that there is no realistic chance for a “wave of new entrants to the capital-intensive rail industry.”⁴³

21. Given that the railroad industry lacks the relatively robust competition of the modern telecom industry, it makes good economic sense to consider incremental regulations such as reciprocal switching. Unlike the 1996 Telecom Act, the objective of reciprocal switching is obviously not to spur entry by new railroads. The purpose is to engender increased competition among the existing incumbents in markets most vulnerable to anticompetitive conduct.

CONCLUSION

22. For the reasons given above, I conclude that the AAR’s attempt to analogize reciprocal switching in the railroad industry to the FCC’s access pricing regulations following the 1996 Telecom Act is without merit and should be disregarded.

⁴¹ See, e.g., Caves 2017 Testimony ¶31.

⁴² See, e.g., Caves 2017 Testimony ¶¶18-24; TRB Report at 197-200; 124-126; Russell Pittman, *Against the Stand-Alone-Cost Test in U.S. Freight Rail Regulation*, 38 JOURNAL OF REGULATORY ECONOMICS 313-326 (2010).

⁴³ AAR Comments at 66.

* * *

I, Kevin W. Caves, declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge. Further, I certify that I am qualified and authorized to file this Verified Statement.

A handwritten signature in black ink, appearing to be 'KWC', is written above a horizontal line.

Kevin W. Caves

Executed on March 31, 2022.

APPENDIX 1: CURRICULUM VITAE OF KEVIN W. CAVES

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Professional Background

Dr. Caves has applied his expertise in microeconomics and econometrics to a broad range of clients, industries, and research topics. He has served as a testifying expert in [U.S. district court](#), before [federal regulators](#), and in arbitration. He has applied his 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](#). His published work has appeared in numerous popular and academic outlets. Dr. Caves is co-developer of the [Akerberg-Caves-Frazer \("ACF"\) algorithm](#), an econometric technique now widely taught to graduate students. The ACF algorithm has been [integrated into STATA](#), a leading statistical software package used globally by economists and empirical analysts in a range of disciplines.

Expert Economist, Infotech Consulting, February 2021 to Present

Partner, Econ One Research, September 2018 to February 2021

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 NY, August 1998 to June 2000

Education

2005 Ph.D. Economics, University of California at Los Angeles
2002 M.A. Economics, University of California at Los Angeles
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Publications and Research Papers

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

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

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

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

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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

Fellowships, 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.

Exhibit 2

BEFORE THE
SURFACE TRANSPORTATION BOARD

Finance Docket No. 36500

CANADIAN PACIFIC RAILWAY LIMITED; CANADIAN PACIFIC RAILWAY
COMPANY; SOO LINE RAILROAD COMPANY; CENTRAL MAINE & QUEBEC
RAILWAY US INC.; DAKOTA, MINNESOTA & EASTERN RAILROAD
CORPORATION; AND DELAWARE & HUDSON RAILWAY COMPANY, INC.

—CONTROL—

KANSAS CITY SOUTHERN; THE KANSAS CITY SOUTHERN RAILWAY COMPANY;
GATEWAY EASTERN RAILWAY COMPANY; AND THE TEXAS MEXICAN
RAILWAY COMPANY

VERIFIED STATEMENT

OF

STEVEN C. SALOP

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1. Qualifications and Assignment

1.1 Qualifications

1. I am Professor of Economics and Law and Georgetown University Law Center, where I teach courses in antitrust economics and law. I am also a Senior Consultant at Charles River Associates. My research and consulting focuses on antitrust, competition and regulation. I have written articles in various areas of antitrust and competition economics, law and policy with various co-authors. These articles have analyzed various economic, policy and legal issues in vertical and horizontal mergers, joint ventures, exclusionary and coordinated conduct. I have also written articles with various co-authors on the competitive effects of imperfect information, oligopoly interaction, network effects and monopolistic competition.
2. My work on the economic analysis and competitive effects of vertical mergers, as well as vertical merger enforcement policy and law, includes articles with various co-authors published in the American Economic Review, Yale Law Journal, Antitrust Law Journal, and the Review of Industrial Organization, among others. I was the lead panelist on the Vertical Merger panel at the FTC antitrust hearings in 2018. Along with several co-authors, I provided comments on the draft Vertical Merger Guidelines in March 2020. I have also written about the shortcomings of those Guidelines, which are now in the process of being revised. I have provided economic consulting on numerous vertical mergers with the Antitrust Division of the Department of Justice, merging parties, and third parties concerned with adverse competitive effects of specific vertical mergers.
3. I earned a BA degree at University of Pennsylvania, Summa Cum Laude in 1968 and a PhD in Economics from Yale University in 1972. Before joining the faculty of the Georgetown Law Center, I was a staff economist at the Federal Reserve Board, the Civil Aeronautics Board, and the Federal Trade Commission (FTC). At the FTC, I also served as the Assistant Director for Industry Analysis and the Associate Director for Special Projects. I have been honored with lifetime achievement awards from the Association of American Law Schools (AALS) Section on Antitrust & Economic Regulation (in 2019) and the American Antitrust Institute (in 2010). My Curriculum Vitae is attached at Appendix A.

1.2 Assignment

4. I am providing this statement at the request of Union Pacific Railroad Company (UP) in connection with the Surface Transportation Board's review of the proposed acquisition of control of Kansas City Southern (KCS) by Canadian Pacific (CP). I have been asked to focus on the effects of the transaction on competition for rail movements between the United States and Mexico through the Laredo gateway. UP relies on a KCS subsidiary, Kansas City Southern de México (KCSM), to transport a significant amount of U.S.-Mexico cross-border rail traffic south of Laredo.
5. I have been asked by counsel for UP to address several issues: (a) the applicability of the one-lump theory to the proposed merger; (b) whether the proposed merger raises substantial concerns of causing anticompetitive effects from foreclosure; and (c) whether there is an administrable methodology that the Board could require the post-merger firm to employ in order to set commercially reasonable interline rates, to prevent anticompetitive foreclosure.

2. Introduction and Executive Summary

6. This proceeding involves the proposed combination of CP and KCS. CP's network in Canada extends from the Port of Vancouver on the Pacific Coast to the Port of Saint John on the Atlantic Coast, and its network in the United States includes connections to Minneapolis, Chicago, Detroit, and Kansas City. KCS's operations center is in Shreveport, and its lines extend north to Kansas City, west to Dallas, east to Meridian, southeast to New Orleans, and south to Beaumont, Corpus Christi, the Laredo gateway, and Mexico. The rail networks of KCS and CP connect at Kansas City.
7. KCSM operates between Laredo (and Brownsville) and the industrial heartland of Mexico under a franchise obtained from the Mexican government. In 2005, KCS acquired a controlling interest in KCSM's predecessor, Transportación Ferroviaria Mexicana (TFM). At about the same time, KCS acquired control of the Texas Mexican Railway (TM). TM had rights to operate on UP lines between a connection with KCS in Beaumont and Corpus Christi, and TM owned its own line between Corpus Christi and Laredo.
8. UP has routes throughout the western United States, including an independent route between Laredo and the Upper Midwest. UP owns a 26% passive interest in Ferrocarril Mexicano (FXE), but has no control over FXE's operations or pricing.

9. UP and KCSM interchange a substantial amount of traffic at Laredo, including large quantities of finished automobiles and automobile parts moving between Mexico and the Upper Midwest. UP does not have its own rail lines in Mexico, and relies on KCSM's lines. At the same time, KCS's route north of Laredo is less efficient than UP's, and KCS does not have lines serving the Upper Midwest. KCS also has an alternative to UP: it moves traffic between Laredo and Corpus Christi, where it interchanges with BNSF Railway. BNSF has its own extensive network in the western United States. Shippers also can use KCS to move traffic between Laredo and Kansas City, where KCS can hand it off to CP. KCS also connects with other railroads at other points on its network.
10. In seeking authority to merge, CP and KCS emphasize the combined company's potential ability to divert a significant amount of traffic from KCSM-UP routes and KCSM-KCS-BNSF routes to single-line routes of the combined railroad (CPKC). My analysis mainly focuses on how CPKC can achieve such diversion by foreclosure arising from higher rates being charged to customers of carriers interlining with KCSM on movements between Mexico and the U.S., via the Laredo gateway.
11. Although the Board has traditionally relied on the "one-lump" theory to presume that end-to-end mergers are procompetitive, my economic analysis summarized in this report leads to the conclusion that the one-lump theory does not support such a presumption in this matter. Modern economic theory has recognized that the one-lump presumption does not apply under certain market conditions, in particular, when (a) the market participants sell differentiated products (i.e., products that shippers do not view as perfect substitutes at equal rates), or (b) the carriers set their rates based on imperfect information about each other's costs and rates. Both of these deviations from the conditions that are necessary to sustain the one-lump theory are present in the markets that will be affected by the proposed transaction. My report provides a series of models and examples based on the economics literature to illustrate these market conditions under which the theory does not apply and the impact that deviations from those conditions will have on the reliability of the presumption in this matter.
12. When the one-lump theory does not apply, an end-to-end merger between a monopoly carrier on one segment and one of the competing carriers on the other segment may have anticompetitive effects. I further conclude that this merger raises serious concerns about the likelihood of such effects on rates and service for shippers using the Laredo gateway. Absent an effective remedy, the merged firm will have both the incentive and the ability to implement anticompetitive strategies that foreclose competitors such as UP and BNSF that rely on interlining with KCSM. Specifically, CPKC will have the incentive and ability to drive traffic to CPKC by raising the rates that KCSM charges for interline movements on

routes where KCSM has an effective monopoly and CPKC competes with UP. As a result of the merger, foreclosure will generate incremental revenue and profits earned by the merged firm on those routes where KCS can interline with CP, over and above what KCS would earn before the merger if it foreclosed UP and BNSF with higher rates. By foreclosing competition from UP and BNSF with these higher rates, CPKC also will be able to raise its own rates and harm shippers. Thus, the post-merger foreclosure incentives rise above the level of any pre-merger incentives.

13. The evidence presented later in this report indicates substantial foreclosure concerns from the proposed CPKC merger. Two examples focused on movements between Chicago and Mexico of finished automobiles and automobile parts show that a hypothetical foreclosure strategy of KCSM charging UP prohibitive rates for these interline movements would be profitable for the merged firm. The merged CPKC would have an increased incentive and ability to raise KCSM interline rates due to the addition of the revenue and profits earned on the CP portion of diverted shipments.
14. Applicants attempt to allay concerns about foreclosure through the expert report of Dr. Robert Majure. He concedes that an end-to-end merger is capable of impairing competition in some circumstances. But Dr. Majure does not describe or explain those circumstances, nor does he analyze foreclosure concerns in depth to demonstrate that those concerns are not present here. Instead, Dr. Majure seems to assume that there must be *no incentive* for a vertically integrated monopolist to foreclose in this case because it must already be capturing all the monopoly profits without foreclosure and without the merger. But Dr. Majure provides no data or analysis to support that assumption. Instead, he attempts to dismiss the possibility of foreclosure by claiming that the prior acquisition by KCS of TM and KCSM's predecessor, TFM, which brought KCS control of the Laredo gateway, did not result in foreclosure. But the only data that Dr. Majure provides to support this claim is a snapshot of northbound traffic shares from 2019, fifteen years after the merger. Dr. Majure's analysis of that limited data sample lacks probative value, however, because it is equally consistent with a finding of "some foreclosure" as with "no foreclosure." Dr. Majure specifically does not address whether the shares he observes would have been different but-for the merger. He also fails to explain why the merger would not increase the foreclosure incentives in light of the ability to capture additional revenue and profits on the CP portion of diverted movements.
15. Dr. Majure also asserts that a vertically integrated merged carrier would have no *ability* to foreclose an unintegrated rival carrier to the detriment of shippers, if that rival can obtain interline service from another unintegrated carrier. To support this assertion, Dr. Majure suggests that shippers could discipline anticompetitive behavior by a post-merger KCSM by

turning to FXE for movements between Mexico and the U.S. However, he offers no evidence that FXE actually provides a viable option for all (or even most) shippers using KCSM. He also fails to address Applicants' economic incentive to raise rates on interline routes, even when shippers might feasibly use FXE, because he fails to acknowledge that CPKC could reasonably anticipate that FXE would raise its own rates in response, thus accommodating CPKC's rate increase and providing CPKC with a reinforcing incentive to raise its rates.

16. Applicants' witnesses Brown and Zebrowski state that the merged firm will be able to divert traffic from UP and others by reducing its costs and increasing its service quality.¹ Their formulation also essentially concedes an ability to foreclose. That is, if a merged firm with a monopoly on one segment can divert traffic by reducing its own costs, then it normally also can divert traffic by raising its rivals' costs. Reducing its own costs allows the firm to gain traffic by decreasing its rates, while raising rivals' costs allows the firm to gain traffic by causing the rivals to increase their rates. After the merger, CPKC can raise rivals' costs by raising the rates it charges for interline movements with those rivals.
17. Vertical mergers can also lead to downward pricing pressure from elimination of double marginalization (EDM). However, to whatever extent EDM may be a significant factor in this matter — and Applicants' submissions, including Dr. Majure's statement, do not suggest that it will be a significant (if any) factor — there is no reason to expect that any such downward pricing pressure from EDM would completely offset and reverse the upward pricing pressure from foreclosure incentives. Although Applicants' experts Brown & Zebrowski have claimed that the merger will result in efficiency benefits, they also assume that diversions from competing interline routes will not be the result of rate decreases. Moreover, UP witnesses have opined that the efficiencies that the parties claim from the transaction are overstated and that the merged firm will have to grow their single-line traffic and revenues by foreclosing, rather than by increasing competition.²
18. If the Board is inclined to approve the transaction, it would need to impose a remedy to prevent such harms. One potential behavioral remedy would be to require that when a shipper asks the merged firm to provide a rate for KCSM service that could be used as part

¹ *Verified Statement of Richard W. Brown and Nathan S. Zebrowski* (October 29, 2021) (*hereinafter*, Brown & Zebrowski V.S.) at ¶¶5, 7, 11 in CPKC Application, *Canadian Pac. Ry. Corp.—Control & Merger—Kansas City, S.* (F.D. 36500) (*hereinafter*, APP).

² *See generally Verified Statement of Thomas C. Haley* (February 25, 2022) (*hereinafter*, Haley V.S.); *Verified Statement of Kenny Rocker and John Turner* (February 27, 2022) (*hereinafter*, Rocker & Turner V.S.). These statements, along with this one, are being submitted as part of Union Pacific's Comments on the APP.

of an interline rate with UP and a rate for CPKC single-line service on a competitive origin-destination route, the merged firm must provide the shipper a rate for KCSM service using the type of formula presented in this report for developing competitively reasonable Rule 11 rates. The Board should also protect against non-rate-based methods of foreclosure by requiring the merged firm to refrain from unilaterally changing operations affecting interline traffic moving via the Laredo gateway.

19. Specifically, I suggest that the Board consider the following administrable, readily enforceable formula for developing competitively reasonable Rule 11 rates: The Applicants state that “when a customer requests a rate for only the former-CP or former-KCS portion of an origin-to-destination routing, we will provide the shipper with a Rule 11 rate to the gateway.”³ Using this language, when a shipper asks CPKC to provide a rate for CPKC service on only former-CP or former-KCS/KCSM portions of an origin-to-destination route, and a rate for CPKC single-line service on a competitive route, the merged firm must provide a Rule 11 rate for the former-CP or former-KCS/KCSM portions that reflects a mileage-based prorate of its CPKC single-line rate. The prorate would be equal to the ratio of (a) the miles of the merged firm from the origin point to the interchange point to (b) the miles of the merged firm from the origin to the interchange *plus* the miles of the merged firm from the interchange point to the destination point. As I explain in detail below, this remedial approach allows the merged firm and shippers to obtain the benefits of the transaction, while at the same time protecting shippers from harm.
20. The remainder of this report is organized as follows. Section 3 explains why modern economic analysis rejects the one-lump theory in the circumstances presented by the proposed transaction. It also sets out general conditions under which end-to-end mergers have anticompetitive effects and the reasons why there are serious concerns of anticompetitive effects on routes where there is a monopolist on one segment and competition on the other, so that a procompetitive policy presumption would not be appropriate in this matter. Section 4 briefly explains why modern economic analysis does not support the view that the presence of a competing interline option like FXE would eliminate the ability and incentive of an integrated carrier to foreclose competition from a downstream rival. Section 5 provides empirical analysis that confirms that the merger raises substantial foreclosure concerns. Section 6 explains why Dr. Majure’s analysis of the likely competitive effects of the proposed CPKC merger lacks probative value. Section 7 describes a prescribed formula for developing commercially reasonable Rule 11 rates for the monopoly segment of interline movements. The Appendices present details of the technical

³ APP., *Verified Statement of John Brooks* (October 29, 2021) (*hereinafter*, Brooks V.S.) at ¶46.

economic analysis and models, as well as my Curriculum Vitae and a list of materials relied upon.

3. Modern Economic Analysis Rejects the Application of the One-Lump Theory to the Proposed Merger

21. The Board historically has relied on the “one-lump” theory to presume that end-to-end mergers with a monopolist in one segment and competition in the other segment will *not* cause competitive harm. In fact, the theory assumes that an end-to-end merger will have no economic effects on profits or rates. In analyzing petitions in opposition to the merger of the Burlington Northern Railroad and the Atchison, Topeka and Santa Fe Railway in 1997, the D.C. Circuit characterized the one-lump theory as a “broadly accepted economic proposition.”⁴ However, as discussed in detail in this section, the one-lump theory is not broadly accepted today. In fact, modern economic analysis makes it clear that it applies only under very limited market conditions that are not present in the case of the CPKC merger.
22. The economic underpinning of the one-lump theory in rail transport is the so-called “single monopoly profit” theory developed in the early industrial organization economics literature analyzing tying⁵ and then applied to vertical mergers.⁶ In this economic model applied to vertical mergers, one firm has a monopoly in producing an “input,” while there is perfect competition among the competing firms, (*i.e.*, two or more firms with perfect information producing an undifferentiated (homogeneous) “output”) that use the input and sell that output to consumers.⁷ According to this theory, the monopolist would not need to acquire one or both of the competitors in the output market in order to be able to extract all of its input monopoly profits from consumers. That is, the acquisition does not change anything,

⁴ *Western Resources, Inc. v. Surface Transp. Bd.*, 109 F.3d 782, 788 (D.C. Cir. 1997).

⁵ Ward S. Bowman, *Tying Arrangements and the Leverage Problem*, 67 YALE L. J. 19 (1957). *See also* Aaron Director & Edward H. Levi, *Law and the Future: Trade Regulation*, 51 NW. U. L. REV. 281 (1956); M.L. Burstein, *The Economics of Tie-in Sales*, 42 REV. ECON. & STAT. 68 (1960).

⁶ R.H. Bork, *THE ANTITRUST PARADOX* 229 (1978).

⁷ The logic of this “vertical” merger model also applies to mergers of complementary products. In that version, there is a monopoly producer of one of the complements and multiple competitors for the other complement. Consumers purchase a bundle of the two complementary products.

absent efficiencies, because there is only “one lump” of monopoly profits that can be extracted by the monopolist, and it can do so either with or without the acquisition.⁸

23. Even assuming that the theory could apply in some circumstances, it is important to recognize that the theory relies on several very restrictive assumptions about markets that greatly limit its applicability to transactions such as the proposed CPKC merger. Modern academic work has confirmed these limitations.⁹ As detailed in this report, when there is an upstream monopolist, there are market conditions in which the single monopoly profit theory is upended. These involve conditions under which the competing downstream firms earn a positive margin over costs, arising from the fact that the companies are selling differentiated products or operating with imperfect information regarding each other’s prices and costs.¹⁰

⁸ As stated by the ICC in a 1982 decision, “[A] carrier with a destination monopoly will likely push the through rate as high as possible and keep the monopoly profits to itself by playing off competing connecting carriers against one another in setting divisions. That is, the through rate will be at the level maximizing net revenue for the traffic, subject to regulatory limits, and the destination carrier will establish favorable through service with the origin carrier willing to take the lowest division of the through rate for its segment of the movement.” See *Union Pac. Corp. —Control— Missouri Pac. Corp.*, 366 I.C.C. 462, 538 (1982). The Applicants in the Burlington Northern/Atchison Topeka and Santa Fe merger referred to this as the “one-lump” theory. See *Burlington Northern, Inc.—Control & Merger— Santa Fe Pac. Corp.*, 10 I.C.C.2d 661,749 (1995). See also *Western Resources, Inc. v. Surface Transp. Bd.*, 109 F.3d 782, 787 (D.C. Cir. 1997).

⁹ See, e.g., Louis Kaplow, *Extension of Monopoly Power through Leverage*, 85 COLUM. L. REV. 515 (1985); Michael D. Whinston, *Tying, Foreclosure, and Exclusion*, 80 AM. ECON. REV. 837 (1990); Michael H. Riordan & Steven C. Salop, *Evaluating Vertical Mergers: A Post-Chicago Approach*, 63 ANTITRUST L.J. 513 (1995); Dennis W. Carlton & Michael Waldman, *The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries*, 33 RAND J. ECON. 194 (2002).

¹⁰ Another general situation involves contractual negotiations with pre-payments, when the upstream monopoly firm negotiates input prices that contain lump sum payments (or take-or-pay contracts or large volume rebates) with each of the two competing downstream firms selling homogeneous products and the price terms offered to one competitor are not observed by the other competitor. In this negotiation structure, the monopoly carrier may be unable to implement the monopoly outcome in the pre-merger market because each firm will fear that the monopolist will opportunistically offer the other firm a better deal, which makes each firm unwilling to agree to the contract terms. However, by acquiring one of the competing carriers and foreclosing the unintegrated carrier, the vertically integrated carrier is able to charge the full monopoly price and earn monopoly profits. Hart & Tirole (1990) describe this result when the monopoly carrier makes take-it-or-leave-it contract offers, rather than engaging in bilateral bargaining. See Oliver Hart & Jean Tirole, *Vertical Mergers and Market Foreclosure*, BROOKINGS PAPERS ON ECONOMIC ACTIVITY – MICROECONOMICS 208 (1990). For a scenario with differentiated products and two-part tariffs, see R. Preston McAfee & Marius Schwartz, *Opportunism in Multilateral Vertical Contracting: Nondiscrimination, Exclusivity and Uniformity*, 84 AM. ECON. REV. 219-21 (1994).

24. Moreover, the results of modern economic analysis lead to greater concerns that vertical mergers will result in anticompetitive effects.¹¹ This highlights the need to take the limitations of the one-lump theory into account when determining whether to apply its presumption in a given case.
25. Similarly, vertical merger enforcement today also avoids presuming, based on the single monopoly profit theory, that all such mergers are procompetitive. For example, there have been three recent FTC vertical merger enforcement actions – Illumina/Grail,¹² NVIDIA/ARM,¹³ and (most recently) Lockheed Martin/Aerojet Rocketdyne¹⁴ – and a previous DOJ investigation (LAM/KLA)¹⁵ that each involved allegations that the upstream

¹¹ See, e.g., Marissa Beck & Fiona Scott Morton, *Evaluating the Evidence on Vertical Mergers*, 273 REV. IND. ORG. (2021); Steven C. Salop, *Invigorating Vertical Merger Enforcement*, 127 YALE L.J. 1962 (2018); Gregory S Crawford, Robin S. Lee, Michael D. Whinston & Ali Yurukoglu, *The Welfare Effects of Vertical Integration in Multichannel Television Markets*, 86 ECONOMETRICA 891 (2018); Jonathan B. Baker, *Taking the Error out of “Error Cost” Analysis: What’s Wrong with Antitrust’s Right*, 80 ANTITRUST L.J. 1, 15-17 (2015); Jonathan B. Baker, *Exclusion as a Core Competition Concern*, 78 ANTITRUST L.J. 527 (2013); Serge Moresi & Steven C. Salop, *vGUPPI: Scoring Unilateral Pricing Incentives in Vertical Mergers*, 79 ANTITRUST L.J. 185 (2013); Jay Pil Choi, *Mergers With Bundling in Complementary Markets*, 61 J. IND. ORG. 553, 556 (2008); Yongmin Chen, *On Vertical Mergers and Their Competitive Effects*, 32 RAND J. ECON 667 (2001); Patrick Rey & Jean Tirole, *A Primer on Foreclosure*, in 3 HANDBOOK OF INDUSTRIAL ORGANIZATION 2145 (Mark Armstrong & Robert H. Porter eds., 2007); Michael H. Riordan, *Competitive Effects of Vertical Integration*, in HANDBOOK OF ANTITRUST ECONOMICS 145 (Paolo Buccirossi ed., 2008); Michael H. Riordan & Steven C. Salop, *Evaluating Vertical Mergers: A Post-Chicago Approach*, 63 ANTITRUST L.J. 513 (1995); Janusz A. Ordover, Garth Saloner & Steven C. Salop, *Equilibrium Vertical Foreclosure*, 80 AM. ECON. REV. 127 (1990); Michael Salinger, *Vertical Mergers and Market Foreclosure*, 103 Q.J. ECON. 345 (1988); Thomas G. Krattenmaker & Steven C. Salop, *Anticompetitive Exclusion: Raising Rivals’ Costs to Achieve Power over Price*, 96 YALE L.J. 209 (1986).

¹² *FTC Challenges Illumina’s Proposed Acquisition of Cancer Detection Test Maker Grail*, Federal Trade Commission Press Release (March 30, 2021), <https://www.ftc.gov/news-events/press-releases/2021/03/ftc-challenges-illumina-proposed-acquisition-cancer-detection>.

¹³ *FTC Sues To Block \$40 Billion Semiconductor Chip Merger—Vertical deal between chip supplier Nvidia and chip design provider ARM*, Federal Trade Commission Press Release (December 2, 2021), <https://www.ftc.gov/news-events/press-releases/2021/12/ftc-sues-block-40-billion-semiconductor-chip-merger>.

¹⁴ *FTC Sues to Block Lockheed Martin Corporation’s \$4.4 Billion Vertical Acquisition of Aerojet Rocketdyne Holdings Inc.* Federal Trade Commission Press Release (January 25, 2022), <https://www.ftc.gov/news-events/press-releases/2022/01/ftc-sues-block-lockheed-martin-corporations-44-billion-vertical>.

¹⁵ *Lam Research Corp. and KLA-Tencor Corp. Abandon Merger Plans*, Department of Justice Press Release, October 5, 2016, <https://www.justice.gov/opa/pr/lam-research-corp-and-kla-tencor-corp-abandon-merger-plans>; See also *The Interesting Case of the Vertical Merger*, Jon Sallet, Deputy Assistance Attorney General for Litigation at Department of Justice Antitrust Division, Remarks as

firm was dominant and that the post-merger firm could use foreclosure strategies to undermine downstream rivals, to the detriment of consumers. The DOJ and FTC also issued new Vertical Merger Guidelines (VMGs) in June 2020 that did not adopt the single monopoly profit theory and did not presume that vertical mergers involving a monopolist in one market are procompetitive, merger guidelines that now are being revised to correct what the Agencies have characterized as legal and economic errors.¹⁶

3.1 The Limited Applicability of the One-Lump Theory

26. In this section, I illustrate the one-lump theory and its limitations in a concrete way, by considering the situation where one railroad has a monopoly on one segment of a through movement and merges with one of the two railroads that compete on the other segment to complete the movement. This scenario is illustrated below in Figure 1, which shows a through movement from an origin (O) through a common interchange point (I) to a destination (D). I denote Railroads X and Y as the “originating” carriers, each having routes from O to I. Railroad A is the “destination” carrier. It is a monopolist on the segment from I to D. In the through pricing model,¹⁷ the shipper asks the originating Carriers X and Y for through rate quotes for the entire movement, and X and Y each obtains a (dollar) “division” from destination Carrier A for carriage on the destination segment.¹⁸ Following the use of

Prepared for Delivery at ABA Fall Forum (November 17, 2016),
<https://www.justice.gov/opa/speech/file/938236/download>.

¹⁶ U.S. Department of Justice and The Federal Trade Commission, *Vertical Merger Guidelines* (June 30, 2020), available at https://www.ftc.gov/system/files/documents/reports/us-department-justice-federal-trade-commission-vertical-merger-guidelines/vertical_merger_guidelines_6-30-20.pdf. U.S. Department of Justice and The Federal Trade Commission, *Request for Information on Merger Enforcement* (January 18, 2022) at n.3, available at <https://www.justice.gov/opa/press-release/file/1463566/download>.

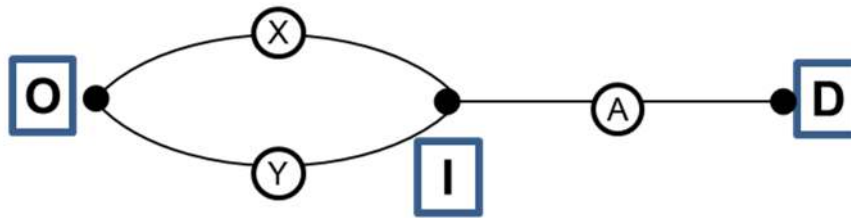
¹⁷ This through pricing framework is the typical economics framework for vertical mergers. In this framework, the monopoly carrier is providing an “input” to the competing carriers, who then sell an “output” (i.e., interline service from O-to-D) to the shippers. Applying the jargon of inputs and outputs, the economics framework typically would refer to the monopoly carrier as “upstream” (i.e., selling an input) and the competing carriers as “downstream” (i.e., selling the “output” to the customer). Most of the economic literature on vertical mergers applies this through pricing (e.g., upstream monopolist and downstream competitor) framework. The economic analysis of mergers of firms producing complementary products is analogous. See U.S. Department of Justice and The Federal Trade Commission, *Vertical Merger Guidelines* (June 30, 2020) at 9.

¹⁸ This same framework obviously would carry over exactly to a movement in the opposite direction where the shipper asks Railroads X and Y for through rate quotes.

the term in the industry, Carrier A's *division* is the price or rate it gets for carrying the freight from I to D.¹⁹

27. If the one-lump theory holds, an acquisition by Carrier A of (say) Carrier X, will not have any anticompetitive effects. This is because Carrier A is presumably already extracting its full monopoly profit by charging a high (dollar) division for its I-to-D segment that is equal to the "one monopoly lump," and the acquisition therefore cannot increase its ability to exploit its market power.

**Figure 1:
Illustration of Railroad Interconnection With a
Monopolist on One Segment**



28. Referring to Figure 1, assume that the two competing carriers (X and Y) on the originating segment O-I sell a homogenous product with identical marginal costs and compete solely on the basis of rates. Also assume that each carrier has perfect information about the other carriers' rates and costs for the movement at issue. Monopoly Carrier A has a marginal cost of \$150.²⁰ Further suppose the competing Carriers X and Y, provide undifferentiated transportation, do not conspire with each other, and have identical marginal costs of \$100. Assume also that the shipper has an alternative to rail transport that it would choose if the cost of rail transport were more than its "reservation price" of \$400.²¹ Thus, the \$400 reservation price is the "monopoly" through rate.

¹⁹ The division is treated as a dollar amount, not an agreed-upon fraction of whatever through rate is charged by the destination carrier. I understand the terminology developed when railroads used to establish divisions as a percentage of the through rate charged to the shipper.

²⁰ The marginal cost includes a competitive return on investment.

²¹ The shipper's reservation price thus is the maximum through rate it is willing to pay, and would shift to another transportation mode or corridor if the quoted through rate exceeds this level.

29. Under these assumed conditions, competition between Carriers X and Y would drive their rate down to their marginal costs of \$100.²² Because Carrier A knows that Carriers X and Y will set their rates at \$100 and also knows the shipper's reservation price, monopoly Carrier A would maximize its profits by charging a rate of \$300 for its segment. The shipper would pay a total through rate equal to \$400 (i.e., A's \$300 monopoly price plus X's or Y's \$100 rate).²³ This is equal to the shipper's reservation price. The monopoly carrier would earn a profit (i.e., price less marginal costs) of \$150 (i.e., \$300 - \$150).
30. Under these assumed, perfect conditions, Carrier A's acquisition of Carrier X (and/or Carrier Y) would affect neither the total through rate paid by the shipper, nor Carrier A's profit.²⁴ Carrier A/X would earn the same profit regardless of whether it offered a single-line rate at \$400 or its former division rate of \$300 for its segment. In the case of a single-line rate, Carrier A/X would earn \$400, while incurring the variable costs of \$250 (i.e., \$100 + \$150) from handling the traffic on both segments, for a profit of \$150 (i.e., \$400 - \$250) — the same amount it could earn by agreeing to its former division of \$300 and costs of \$150 to move the traffic over the I-to-D segment. Thus, according to the one-lump theory, Carrier A would not increase its profit if it foreclosed competition from Carrier Y, either by refusing to interline with Carrier Y or by raising its required division.²⁵
31. This example rests on several assumptions, however, that make it apply only to very limited market conditions. It assumes that Carrier A is, in fact, already extracting its single monopoly profit, that is, there are no obstacles that prevent the pre-merger Carrier A from successfully earning that monopoly profit. To reach these results, it assumes that the

²² If either carrier offers a rate at some level above \$100, the other carrier would undercut it. The model assumes that there is no collusion. The marginal costs include a competitive return on investment.

²³ The economics literature generally uses the term "prices" instead of "rates." I will use the terms interchangeably in this report.

²⁴ When all the other assumption are made, the one-lump theory still can apply if the shipper has elastic demand. For example, suppose that the shipper would choose to move two units by train if the total through rate were \$390 per unit. Then, the monopoly carrier would set the division equal to \$290 per unit and the two competing carriers would set through rates of \$390 per unit. Because there is perfect competition between the two competing carriers, the monopoly carrier has no incentive to merge with one of the two competing carriers and, if it did, the merger would have no effect on the total through rate paid by the shipper.

²⁵ In this report, I often will focus on the use of price to foreclose, which I sometimes will refer to as "pricing foreclosure," rather than other non-price forms of foreclosure, such as causing delays, or an outright refusal to interline. Total foreclosure also may involve setting such a high division that interlining is prohibitively expensive for Carrier Y. I will discuss the profitability of a hypothetical total foreclosure strategy in a later section.

carriers are operating with perfect information about each other's costs and prices. And it also assumes that Carriers X and Y are selling homogenous (i.e., undifferentiated) products.

32. Modern economic analysis has confirmed that the one-lump theory does not apply in circumstances that deviate from these assumptions. In addition, absent these assumptions, foreclosure by the post-merger firm often is profitable and harmful to shippers. As I explain in more detail in the next two sections, both types of deviations from the assumed conditions— imperfect information and differentiated products — likely are present in the proposed transaction. Either of them would be sufficient to render the one-lump theory inapplicable in most real-world markets and specifically in this matter.
33. When the one-lump theory does not hold and there is monopoly in one segment but competition in the other segment (or competition in both segments), an end-to-end merger can lead to foreclosure and reduce competition, which in the rail context could take the form of increased divisions or segment fees levied by the monopoly carrier and increased interline rates charged by the competing carriers, higher single-line rates and harm to shippers. Thus, a procompetitive policy presumption also would be inappropriate in this matter.
34. In the absence of a one-lump presumption, these likely anticompetitive effects need to be balanced against any procompetitive benefits. In the polar case of a purely end-to-end merger between two monopoly carriers each protected by prohibitive entry barriers, neither of which faces any actual or potential competition, economic analysis suggests that the merger often can lead to lower rates.²⁶ This competitive benefit is referred to as “elimination of double marginalization” (EDM) and is driven by the idea that a lower price by one carrier benefits the other carrier by expanding its sales.
35. However, economic analysis demonstrates that the analysis and potential effects of vertical mergers differ substantially when there is competition at one or both levels. In those cases, EDM tends to be smaller because margins are lower. Even in the case of a monopoly carrier on one segment, when prices on the competitive segment exceed marginal costs due to product differentiation or imperfect information, the downward pricing pressure from EDM

²⁶ Absent cooperation, each carrier's rate setting would not take into account the benefits accruing to the other carrier from it setting a lower rate. By merging, the carriers would take these benefits into account and charge lower rates. There are two important exceptions, however. When there are monopolists at each level, they may be able to achieve the benefits of cooperation without a merger, relying instead on a contractual agreement or mutual trust, which means that the merger would not lead to lower prices. The role of entry barriers also is important: if these carriers were likely advantaged potential entrants (or entry sponsors) into each other's market, that fear of potential entry might have constrained their pre-merger prices all the way down to the competitive level. If so, the merger then would eliminate those constraints and so would lead to higher prices. See, e.g., Steven C. Salop, *Invigorating Vertical Merger Enforcement*, 127 YALE L.J. 1962, 1976-77 (2018).

often will be smaller than the upward pricing pressure from foreclosure. If a lower price by the merging competing carrier mostly diverts sales away from other competing carriers (that connect with the merging monopoly carrier), rather than expanding total market sales, the incentive to lower prices as a result of EDM could be quite small and is less likely to be the dominant pricing incentive generated by a merger. This is because the loss of profitable divisions on interline sales by the monopoly carrier is an “opportunity cost” of reducing the rate of the merging carrier on the competitive segment.²⁷ The relative magnitudes of the upward pricing pressure from foreclosure and the downward pricing pressure from merger-specific EDM are discussed below.

3.2 The One-Lump Theory Does Not Hold When the Carriers Have Imperfect Information About Each Other’s Costs and Rates

36. Even if the competing firms sell homogenous products—that is, they compete only on price—the “one lump” theory does not hold in a market structure in which each pre-merger carrier faces imperfect information regarding the costs and rates of the other carriers. In such a market, the pre-merger monopoly carrier is generally unable to extract the full monopoly profit from the shipper, but is better able to do so after merging with one of the competing carriers. The merger creates an increased incentive and ability for the merged firm to foreclose rivals, leading to harm to both shippers and unintegrated carriers.²⁸
37. This is not a minor exception to the conditions required for the one-lump theory. My understanding is that UP and KCS typically lack perfect information regarding each other’s costs and rates offered to the shipper at the time that they quote their rates.²⁹ The costs incurred by the carriers for a particular shipment, and thus the rates offered by the carriers for that shipment, will differ according to numerous factors.³⁰ Similarly, where KCSM

²⁷ This “opportunity cost” occurs whenever the increased sales resulting from the merged firm reducing its single-line rate to shippers involve diverting profitable sales away from a competing carrier that interconnects with the monopoly segment of the merged firm. For an example of this type of opportunity cost, see Carl Shapiro, *Vertical Mergers and Input Foreclosure: Lessons from the AT&T/Time Warner Case*, 59 REV. IND. ORG. 303, 325-26 (2021). See also Yongmin Chen, *supra* note 11; Moresi & Salop, *supra* note 11.

²⁸ This market structure is analyzed in detail in an economics article by Serge Moresi, David Reitman, Steven C. Salop & Yianis Sarafidis, *Vertical Mergers in a Model of Upstream Monopoly and Incomplete Information*, 59 REV. IND. ORG. 363 (2021).

²⁹ See generally *Rocker & Turner V.S.*

³⁰ See KCS and CP’s Joint Responses and Objections to UP’s Second Set of Discovery Requests, Response to Request No. 148. (“revenue and pricing are determined on a variety of factors and

provides its revenue requirements to UP and BNSF, KCSM typically does not know the costs of UP or BNSF or the rates they ultimately offer to shippers. Absent knowledge of the rates or costs of the other carriers, each carrier must base its rate offer on its expectations of the likely rates of the other carriers, as well as its own costs. This uncertainty creates the possibility that the monopoly carrier will not be able to set its pre-merger divisions at the monopoly level, which means that it is not earning its “one monopoly lump.” Fearing that setting a high rate might lead to a total price above the shipper’s reservation price and the loss of the traffic, the monopoly carrier will hold down its rate. A merger that reduces that uncertainty thus increases the likelihood that the merged firm will be able to profitably raise rates post-merger.³¹

38. In the pre-merger market, a monopoly carrier with imperfect information about the other carriers’ costs and rates cannot obtain its “single monopoly profit” because it cannot set its own rate to ensure that the through rate is equal to, but does not exceed, the shipper’s reservation price. Competition in the pre-merger market with imperfect information leads to the shipper obtaining a through rate below its reservation price some fraction of the time, in particular, when the competing carriers’ costs are relatively low for the particular shipper’s movement.³² When their costs are higher, the shipper either pays its reservation price for the rail transport or chooses an alternative mode.³³ Combining the effects of the varied cost realizations for particular movements, the average through rate paid by the shipper in the pre-merger market will be less than its reservation price. In other words, some of the surplus accrues to the shipper and the competing carriers. In Appendix B, this analysis is illustrated with a numerical example.
39. Looking again at Figure 1, contrary to the one-lump presumption, a merger between the monopoly Carrier A and one of the carriers on the competitive segment —say, Carrier X— *does* change the incentives and ability of the merged firm to foreclose, by improving the

considerations, including but not limited to the market, operating and cost considerations, the type of service, volume, risk premiums (such as hazardous materials or high- end commodities), asset availability, network capacity, competitive modes of transportation, and regulatory requirements. The same considerations apply to cross-border rates.”)

³¹ Moresi et. al., *supra* note 28. In the *Western Resources* case, *supra* note 4 at 791, the D.C. Circuit suggested that better information would not have an adverse effect on shippers. The Commission apparently did not contemplate the possibility that the monopoly carrier would recognize the risk that a high division might make it uneconomical for the competing carriers to set through prices at or below the shipper’s reservation price; and that the monopoly carrier would respond to this risk by setting a lower division, and then the competing carriers would have sufficiently low costs such that they would compete the through price down to a level below the shipper’s reservation price.

³² For the general analysis, *see* Moresi et al., *supra* note 28.

³³ When the shipper chooses the alternative, it gains no surplus value, i.e., the shipper obtains the same value as if it paid a rate for rail transport on these carriers equal to its reservation price.

merged carrier's information. After, and as a result of, the merger, the merging carriers will now know each other's costs and prices, and thus will be able to set a single-line rate equal to the shipper's reservation price, extracting the full monopoly revenue from the shipper.³⁴ At the same time, the merged carrier will have increased incentives to act on its ability to foreclose by setting a high rate for interline service (or revenue requirement).³⁵ The shipper will end up worse off from the merger because it will always pay a through rate equal to its reservation price.

3.3 The One-Lump Theory Does Not Hold When the Competing Carriers Sell Differentiated Products

40. The previous model assumed the downstream competitors sold homogenous products—that they competed solely on price. However, the transport services provided by rail carriers are generally differentiated, not homogenous. The services can differ with respect to distance from a shipper's business to the origin and destination stations, the speed of the shipment, frequency and reliability, customer service, the likelihood of damage, payment terms, and so on. That differentiation leads rail transport rates to exceed marginal costs.³⁶

³⁴ The same reasoning and results apply for a Rule 11 rate since the shipper can obtain the rate from the monopoly carrier and then have the bidding competition between the two competing carriers. As with through rates, the shipper gains the benefit of pre-merger competition that allows it to pay a through rate that is, on average, below its reservation price and to earn a positive surplus. After the merger, the shipper is forced to pay a through rate equal to its reservation price and obtains zero surplus. At the same time, the merger increases the profits of the merging carriers and reduces the profit of the rival unintegrated carrier.

³⁵ The shipper is worse off because it will always pay a through equal to its reservation price, regardless of whether Carrier Y or Carrier X will win the competition post-merger. The merged carrier will set a division for its segment that is relatively high in the following sense. If the unintegrated rival Carrier Y has a sufficiently lower cost than Carrier X, then Carrier Y will win the competition for the shipper's business and the merged carrier will earn a higher profit from supplying interline service to Carrier Y than it would earn from its single-line rate (equal to the shipper's reservation price). This allows the merged firm to let Carrier Y serve the shipper when Carrier Y is significantly more efficient and, at the same time, to extract a portion of the efficiency rent of Carrier Y. See also the numerical example in Appendix B.

³⁶ See, e.g., Laurits R. Christensen Assoc. Inc., A STUDY OF COMPETITION IN THE U.S. FREIGHT RAILROAD INDUSTRY AND ANALYSIS OF PROPOSALS THAT MIGHT ENHANCE COMPETITION (2009) vol 2 at 10-5 ("estimate of the RPTM/MC ratio peaked at 217 percent in 1994 and has ranged in recent years between 150 and 170 percent"). See also Laurits R. Christensen Assoc. Inc., AN UPDATE TO THE STUDY OF COMPETITION IN THE U.S. FREIGHT RAILROAD INDUSTRY (2010) at 4-5.

41. When competing carriers sell differentiated products, the one-lump theory does not apply to an end-to-end merger involving a monopoly carrier and one of the competing carriers.³⁷ Because their products are not perfect substitutes, the competing carriers in the pre-merger market are able successfully to charge through rates that exceed their marginal costs. As a result, the monopolist cannot unilaterally achieve the monopoly outcome, and may have an incentive to merge with one of the two competing carriers. This basic structure applies to the CPKC merger.
42. In this matter, KCSM is a monopoly carrier for some UP movements originating or terminating in Mexico and KCS controls the Laredo gateway. UP and KCS today provide competing, differentiated service. Therefore, there already are foreclosure concerns involving movements on KCSM before this merger, and the CPKC merger exacerbates these foreclosure concerns. This is because the incremental revenue and profits on the CP segments of current actual and potential movement movements increases the financial gains to the merged firm of foreclosure of UP in the form of higher rates, even if the Laredo gateway is open.
43. In the post-merger market, a merged firm has greater ability to act on its incentive to foreclose unintegrated carriers in order to increase its division for the monopoly segment – to get closer to the monopoly profit it is unable to extract in the pre-merger market. This places upward cost pressure on the unintegrated carrier, which in turn places upward pressure on the carrier's through rate, ultimately harming shippers who prefer this interline movement. This also will permit and incentivize the merged firm to raise its single-line rate, thereby leading to harm to all shippers. Even taking into account the possibility of some EDM effects (which Dr. Majure does not suggest), there is certainly no economic basis for a general presumption that a vertical merger in such a market will be either procompetitive or competitively neutral, and there are strong reasons to expect net anticompetitive effects under the circumstances of the proposed transaction.

3.3.1 Simulation Model Analysis

44. When firms (or rail carriers) in vertically adjacent markets merge, the merger can involve foreclosure incentives that lead to upward pressure on prices. This occurs when the merged firm can cause customers of its unintegrated competitors to divert to the merging partner by raising the cost of using the unintegrated competitors. When one merging rail carrier has a monopoly position on its segment, it can foreclose the unintegrated competitors of its merging partner by eliminating their access to its segment or by raising the division it

³⁷ Economic analyses of vertical mergers with differentiated products dates back to Joseph J. Spengler, *Vertical Integration and Antitrust Policy*, 58 J. POL. ECON. 347 (1950). For more recent articles, see the articles cited in *supra* note 11, among others.

charges the unintegrated carrier for movements on its monopoly segment, or its Rule 11 rate for the segment.

45. In the first instance, the magnitude of the incentive to foreclose depends on the margins of the merging carriers and the diversion ratio from the foreclosed carriers to the merging partner. Foreclosure raises the costs of the carriers competing with the merging carrier, either directly if they pay the increased interline rate or indirectly if the increased interline division is paid by the independent carrier. In either case, foreclosure leads to upward pricing pressure on the rates paid by shippers. The merger also can lead to downward pressure on rates from merger-specific EDM, marginal cost savings or product quality improvements. The magnitude of the downward pricing pressure depends on the magnitude of the merger-specific benefits, as well as the opportunity cost discussed above, which also depends on margins and diversion ratios.³⁸
46. The ultimate impact of the merger on shippers depends on the tension and magnitudes of these upward and downward pricing pressures. As a general matter, a vertical merger can lead to a diverse set of outcomes. In some cases, the merger can lead to higher rates borne by all shippers.³⁹ This is the expected outcome when the merger-specific efficiency benefits are small. The merger alternatively can lead to higher rates borne by the shipper customers that rely on interline movements with the foreclosed independent carriers, while leading to lower rates for the shippers that opt for single-line service by the merged carrier. The merger also can lead to lower rates charged to all shippers. This is most likely to occur when both merging parties have monopoly positions and the merger-specific EDM and merger-specific efficiencies are very large. Because carriers do not set uniform rates for all movements, a vertical merger can lead to a diversity of outcomes across commodity groups, routes and specific shippers.
47. What can be predicted is that the one-lump theory is rejected because the carriers' products and services are differentiated. (As explained above, the one-lump theory also is separately rejected because the carriers have imperfect information.) If there are only de minimis merger-specific EDM, marginal cost savings, and quality improvements, then one can predict with confidence that all shippers likely will be harmed. If there are no competitors on both segments, then one can predict that shippers will not be harmed.⁴⁰ But in the middle ground, the multitude of factors that enter into the determination of the impact of the merger on shippers means that it is not possible to make definitive general predictions that

³⁸ For technical analysis, see Moresi & Salop, *supra* note 11.

³⁹ This was the outcome in the imperfect information model, where the imperfect information plays a analogous role to product differentiation.

⁴⁰ However, even this prediction is subject to the caveat noted earlier, *supra* note 26.

all shippers will benefit or that the transaction will be competitively neutral or positive. The facts will matter.

48. With sufficient data, one approach could be to estimate the upward pricing pressure on the through rate for interline movements on unintegrated carriers arising from the foreclosure incentives and, similarly, estimate the downward (or possibly net upward) pricing pressure on the single-line rate of the integrated carrier from the combination of the opportunity cost, merger-specific EDM, and other efficiencies. If the disparity between upward and downward pricing pressure (in either direction) is large, then a confident prediction might be made.⁴¹ In a real-world merger, this prediction could differ across product categories, routes, and shippers. Applicants (and Dr. Majure) did not conduct this analysis.
49. One also could extend this upward and downward pricing pressure analysis by combining those factors into an equilibrium merger simulation model. However, this approach raises the additional complexity of having to assume a specific demand curve and type of competitive interaction among the carriers. Even if the type of demand curve were known, it would be necessary to estimate the structural parameters of demand, which is not simple. It would also be necessary to have detailed information on carriers' margins for both a complete pricing pressure analysis and for simulation modeling. Again, Dr. Majure (and Applicants) did not conduct this analysis.
50. In Section 5, I take a simpler approach to showing the foreclosure concerns from the proposed merger. As described there, I analyze the profitability of a hypothetical total foreclosure strategy by the merged firm, that is, denying UP access to KCSM for movements of finished automobiles and automobile parts between Mexico and Chicago. The merged firm could carry out this hypothetical total foreclosure strategy by raising its rates on interline movements with UP. (While the concern here is more on smaller rate increases than closing the Laredo gateway, the analysis of a hypothetical total foreclosure strategy is a standard, conservative approach to gauging foreclosure incentives. If a hypothetical total foreclosure strategy after a merger is profitable at current rates, that indicates that the merged firm will have an incentive to raise its division or rate charged for the monopoly segment.) That analysis is only illustrative in that it involves only examples of certain movements. It also does not analyze the impact of merger-specific cost savings and quality improvements, although UP witnesses have concluded that those efficiencies are small.⁴²

⁴¹ See Moresi & Salop, *supra* note 11. See also Serge Moresi & Steven C. Salop, *When Vertical is Horizontal: How Vertical Mergers Lead to Increases in "Effective" Concentration*, 59 REV. IND. ORG. 177 (2021).

⁴² Haley V.S. at ¶¶18–36.

51. I have also constructed two versions of a general simulation model that I describe in the remainder of this subsection. They are intended for the limited purpose of showing that the one-lump theory does not apply and that vertical mergers can lead to a wide variety of impacts, even after taking EDM into account. These models demonstrate that there is no economic basis for presuming that end-to-end rail mergers involving a monopoly carrier are procompetitive or competitively neutral. I am not using these simulation models to claim that this particular vertical merger is anticompetitive. Instead, this analysis demonstrates that one cannot use such general simulation models to claim that the proposed merger is procompetitive or even competitively neutral.⁴³
52. One version of the model assumes that the carriers quote take-it-or-leave-it prices. The monopoly Carrier A quotes take-it-or-leave-it divisions to the competing Carriers X and Y, and the latter carriers quote take-it-or-leave-it through prices to the shipper, which is a common assumption in economic models of vertical integration. This structure of the model also captures Rule 11 pricing, where the shipper obtains the rates on the monopoly segment (i.e., one rate if the shipper will use Carrier X and a possibly different rate if it will use Carrier Y) and then has a bidding competition between the competing Carriers X and Y, where the information on the monopoly carrier's rates is taken into account. A second version of the model assumes that there is inter-carrier bargaining between the monopoly Carrier A and each of the competing Carriers X and Y over the divisions.
53. The simulation models are designed to capture a variety of demand and cost conditions. These varying demand and cost conditions can be thought of as reflecting the variations in characteristics of shippers, commodities, and origin-destination routes. The simulations thus recognize the effects of a merger may differ across origin/destination markets and commodities.⁴⁴ Even within a single origin/destination market for a specific commodity, the fact that the carriers do not set the same rate for every shipper and every movement means

⁴³ In this regard, I want to emphasize that the models are not calibrated—that is, the values of the demand and cost parameters are not set to replicate any market shares or margins observed in this transaction. For one thing, every market is different. In addition, such calibration would be very difficult, if not impossible, to implement for this merger in an accurate way, and so would be subject to substantial criticisms. For an example of the controversial use of a vertical merger simulation model in litigation, *see* Shapiro, *supra* note 27; *United States v. AT&T, Inc.*, 310 F. Supp. 3d 161 (D.D.C. 2018); *United States v. AT&T, Inc.*, 916 F.3d 1029 (D.C. Cir. 2019).

⁴⁴ I also am not claiming that these are the only possible parameter assumptions. I expect that a different set of assumptions or a different demand structure could lead to different results. Such results would not undermine the validity of the conclusions I reach, as the simulation models are intended only to illustrate the diversity of effects of vertical mergers involving a monopoly carrier, the failure of the one-lump theory, and the potentially serious foreclosure concerns that can arise.

that a merger may harm some shippers while benefiting others with different demand characteristics or whose shipments have different costs.

54. The results of the simulation models show that some or all shippers can be harmed from foreclosure effects of end-to-end mergers. They also show the possibility that some shippers can be benefited. Because the simulations cover such a broad range of circumstances to capture different competitive interactions, the models indicate a wide range of possible results for particular shippers. This is precisely the point. While the one-lump theory implies that the price to shippers would not change as a result of a vertical merger when one of the merging parties appears to have a monopoly over certain routes, the simulations show that significant price changes are far from being the exception and, in fact, occur in a broad set of market conditions. Thus, these results make it clear that the one-lump theory does not apply when there is product differentiation in the competitive segment. An end-to-end merger can harm some or all shippers, even after taking any EDM into account. The simulation results thus also make it clear that a general procompetitive presumption cannot be justified with respect to the proposed merger on the basis of economic analysis.

3.3.1.1 Simulation Model with Carrier Take-It-or-Leave-It Pricing

55. The first version of the simulation model analyzes a scenario when the carriers face elastic demand from shippers and set take-it-or-leave-it rates. In the pre-merger market, the monopoly carrier sets divisions to the two competing carriers which then set interline rates. In the post-merger market, the unintegrated and integrated carriers compete for each shipper's movement. The integrated carrier sets a single-line rate and the independent carrier sets an interline rate, which depends in part on the division set by the integrated carrier for its monopoly segment.⁴⁵ The simulation model calculates a range of outcomes for a number of demand parameters and costs, which are combined to create a large number of diverse market conditions that lead in turn to a range of pre-merger market shares and rates for the two competing carriers, and divisions for the monopoly carrier. The model follows the railroad literature by assuming that the shippers' demand has a logit demand structure.⁴⁶

⁴⁵ The structure of the technical model equivalently assumes that the monopoly carrier offers its service to its merger partner at a nominal price equal to marginal cost and the merger partner sets the through rate for the shipper, although the merger effects do not depend on the magnitude of this nominal transfer price.

⁴⁶ Yanyou Chen, *Network Structure and Efficiency Gains from Mergers: Evidence from U.S. Freight Railroads*, Working paper (2021); Daniel Coublucq, *Demand Estimation with Selection Bias: A Dynamic Game Approach with an Application to the US Railroad Industry*, 94 DICE Discussion Paper (2013); Bart Jourquin, *Estimating Elasticities for Freight Transport Using a Network Model: An Applied Methodological Framework*, 9 J. TRANSP. TECH. 1 (2019).

56. The technical details of the model are described in more detail in Appendix C.⁴⁷ In some scenarios, the two competing carriers increase their through rates after the merger and, therefore, all shippers are harmed by the merger. In other scenarios, the interline rate of the unintegrated carrier rises while the single-line rate of the now-integrated carrier falls. In this latter scenario, the shippers that use the unintegrated carrier are harmed but the shippers that use the single-line rate are benefited.⁴⁸ Specifically, in this model, the single-line rate of the merged carrier rises when the pre-merger volume share of the merging competing carrier is less than about 25%, and often also when its share is in the 25-40% range. But when its pre-merger share exceeds 40%, the single-line rate of the merged carrier typically falls. Thus, this version of the model illustrates how a vertical merger can harm some or all of the shippers, depending on the particular demand and cost conditions. For this reason, a general or conclusive presumption of no anticompetitive effects resulting from a vertical merger in these market conditions, in the context of imperfect information and/or differentiated products, would not be appropriate.

3.3.1.2 Simulation Model With Inter-Carrier Bargaining

57. In a 1982 order, the ICC suggested that inter-carrier bargaining could lead to market conditions that would support application of the one-lump theory.⁴⁹ I have also analyzed a version of the model where the divisions charged by the monopoly carrier to the two competing carriers are determined through bilateral negotiations in which the two negotiating parties have equal bargaining power.⁵⁰ (By contrast, the previous version of the model, which included take-it-or-leave-it divisions, effectively assumed that the monopoly carrier has all the bargaining power.) As before, the model assumes that the competing carriers set take-it-or-leave-it through rates to the shipper. The simulation results for this

⁴⁷ The simulation model builds on the approach in Gopal Das Varma & Martino De Stefano, *Equilibrium Analysis of Vertical Mergers*, 65 ANTITRUST BULLETIN 445 (2020), which uses the equivalent of through pricing. This article analyzes both take-it-or-leave-it inter-firm pricing and bargaining, as I do in this report. However, that article provides only a single example for demand and cost conditions rather than a range of market conditions. Gleb Domnenko & David S. Sibley, *Simulating Vertical Mergers and the Vertical GUPPI Approach*, (May 15, 2020) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3606641 also simulates vertical mergers for a range of market conditions, but with a different demand structure and more limited reporting of results.

⁴⁸ I am not claiming that it is impossible for both through rates to fall and all shippers to benefit from a hypothetical merger. As I describe in later sections, however, I conclude that the proposed CPKC merger is likely to lead to anticompetitive foreclosure, not lower rates for all shippers.

⁴⁹ *Union Pac. Corp. —Control— Missouri Pac. Corp.*, 366 I.C.C. 462 (1982).

⁵⁰ Economists refer to this as “Nash Bargaining.” See John Nash, *The Bargaining Problem*, 18 ECONOMETRICA 155 (1950); Ken Binmore, Ariel Rubinstein and Asher Wolinsky, *The Nash Bargaining Solution in Economic Modeling*, 17 RAND J ECON 176 (1986).

bargaining version of the model lead to a variety of pre-merger market shares and rates, as described in more detail in Appendix D.

58. In this bargaining version of the model, the impact of the vertical merger on shippers is more adverse. The merger always leads to an increase in the interline rate charged to shippers who opt for the unintegrated carrier. The merger also almost always leads to an increase in the single-line rate charged to shippers by the integrated carrier. When the single-line rate falls, it decreases only slightly. Moreover, the rate increases typically are larger than those in the previous model where the monopoly carrier sets take-it-or-leave-it divisions.
59. Thus, this inter-carrier bargaining version of the simulation model similarly demonstrates that the one-lump theory does not hold when carriers on the competitive segment offer differentiated products and services. It also indicates serious concerns about shipper harms from foreclosure in markets that have such characteristics. The likelihood and magnitude of shipper harms are higher in this scenario than those in the previous version of the model with take-it-or-leave-it divisions.

3.4 Implications for the Board's Analysis of the Proposed CPKC Merger

60. The economic analysis of vertical mergers carried out in this section shows the inapplicability of the one-lump presumption if the competing carriers are selling differentiated products or if the carriers have only imperfect information about each other's costs and rates. The one-lump theory fails for all but the polar case. Nor can one argue that the world is close to this polar case. Imperfect information and differentiated products are the norm, not the exception. And when there is imperfect information or differentiated products, end-to-end mergers can harm some or all shippers under normal conditions.
61. When the one-lump theory does not apply, there can be incentives to foreclose. Those foreclosure incentives already exist today, because KCS controls KCSM, and they will be enhanced by the merger with CP. This is because adding CP's revenue and earnings increases the financial benefits the post-merger firm will gain by diverting traffic to itself and away from rivals. While EDM might mitigate these foreclosure concerns, the results of the simulation model show how such benefits can and often do fall short. Nor have the Applicants provided any data or analysis to rebut the concerns, which the simulation models support, that the merger could result in anticompetitive foreclosure. Instead, as I discuss further in Section 6 below, Dr. Majure has essentially assumed away foreclosure and apparently has concluded that merger-specific EDM is not important.

4. Modern Economic Analysis Rejects the Assumption that There Is No Incentive or Ability to Foreclose When There Is a Competing Carrier for Each Segment

62. In this section, I briefly analyze the impact of the proposed merger on the portion of the traffic where FXE might be a feasible alternative for the Mexican leg of a rail movement.
63. In his statement, Dr. Majure discusses the situation where the potentially foreclosed rival has an alternative to the merged carrier, and concludes that the merged carrier has no ability (and hence no incentive) to foreclose. However, Dr. Majure does not carry out any actual economic analysis of this issue. Instead, he stops at the assumption that when there is an ostensible perfectly-substitutable alternative routing, this alternative will provide the same effective safeguard against rate increases after the merger as in the pre-merger market.⁵¹ As Dr. Majure puts it,

Next, consider the other hypothetical shipper, who can readily switch to another railroad or mode of transportation. Perhaps this second shipper can rely on FXE's network in Mexico as a suitable alternative to KCSM for originating its movements. For the shipper with ready alternatives, there would be no *ability* for a combined CP/KCS to force inferior terms on the shipper. Doing so would only lead to loss of the traffic – or failure to attract new traffic – contrary to the company's economic incentives.⁵²

64. I understand that many shippers in fact cannot rely on FXE.⁵³ But, in addition, Dr. Majure fails to take into account that even where the second upstream carrier may provide a practical alternative to the merging carrier, the merger will change the economic incentives of the integrated carrier, as well as those of the unintegrated alternative carrier, in ways that reduce the effectiveness of the competitive safeguards that the alternative carrier provided before the merger.
65. I can explain this result with the following hypothetical scenario drawn from the economics literature. Instead of assuming that a railroad has a monopoly on one segment of a through movement, suppose there is a second carrier on that segment. This scenario is illustrated

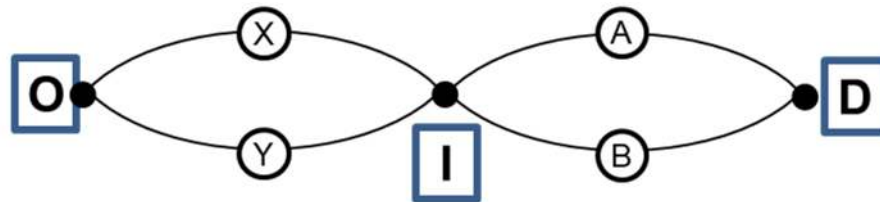
⁵¹ Dr. Majure appears simply to rely on a quotation from the Board's BNSF 1995 merger decision that suggests that a merger will not weaken the "safeguards" provided by alternative carriers. (APP., *Verified Statement of W. Robert Majure* (October 29, 2021) (*hereinafter*, Majure V.S.) at ¶25.)

⁵² Majure V.S. *supra* note 51 at ¶25 (emphasis in original).

⁵³ Rucker & Turner V.S. at 16.

below in Figure 2, where Railroads X and Y compete on the segment from O to I and Railroads A and B compete on the routes from I to D.

Figure 2: Duopoly Competition



66. Assume that Carrier B is not only a feasible alternative to Carrier A, but Carrier B has the same costs and product attributes of Carrier A, so it is a *perfect substitute* for Carrier A, and so there is intense pre-merger competition between Carriers A and B. Consider next the impact of a merger between Carriers A and X. Dr. Majure suggests that the existence of Carrier B would totally deter Carrier A from raising its fee to the unintegrated downstream Carrier Y (or to shippers that want to use Carrier Y).
67. But economic analysis of this simple model indicates that this conclusion is incorrect.⁵⁴ Despite the fact that Carrier B is a perfect substitute for the merging Carrier A, the merged carrier would still have a post-merger incentive to raise its division to Carrier Y. This is because the merged carrier would correctly anticipate that Carrier B would respond by raising the division it charges to Carrier Y. (Carrier B similarly would anticipate that Carrier A will have the incentive to raise its division.) This will lead to both carriers charging higher divisions. Thus, even if Carrier Y selects Carrier B for the origin segment, the higher division paid for that interline segment makes it more likely that the merged carrier will win the bidding, even when it sets a higher through rate than before the merger.
68. Thus, it is erroneous to focus solely on the technical “ability” to substitute. It is also necessary to analyze the impact of the merger on the “incentives” to foreclose. The mere technical “ability” to substitute does not eliminate the incentive of the merged carrier to foreclose by raising its division. To assume otherwise, as Dr. Majure appears to do, amounts to assuming that no vertical merger can raise competitive concerns when there are two carriers on both segments (or, more generally, two firms in each market).

⁵⁴ See Ordover et al., *supra* note 11.

69. When Carriers A and B are perfect substitutes with identical costs and quality, the pre-merger competition drives their rates down to marginal cost, so there is no EDM (put simply, there are no margins for the merger to eliminate). However, if they are imperfect substitutes, the carriers may be able to set pre-merger rates that are higher than their marginal costs, which means that a merger may permit some EDM. But there is no economic reason to think that downward pressure on rates will be the dominant factor. In fact, the greater is Carrier Y's ability to substitute between Carriers A and B, the lower is the likelihood that downward pricing pressure will be the driving factor in the merged carrier's incentives and the more likely it is that the rates offered to shippers by both carriers will rise. Moreover, the more inelastic is the aggregate demand for the service provided by Carriers X and Y, the greater will be the merged firm's opportunity cost of lowering its through rate. The opportunity cost also is higher if Carrier A charges a higher pre-merger rate to the independent Carrier Y than to its future merger partner, Carrier X.
70. Thus, economic analysis does not support a general proposition that an alternative upstream carrier eliminates the risk and potential shipper harms from pricing foreclosure that raises the cost of the unintegrated downstream rival. Even if there is a feasible "ability" to substitute, the merged carrier still may have an incentive to raise the fee it charges its unintegrated downstream competitor. This can lead to harm to shippers who end up paying higher rates and perhaps obtaining less preferred service. To the extent that the merged carrier has higher costs—for example, because it has inferior routings—efficiency also may suffer.
71. The structure of competition between UP and the merged CPKC on shipments to and from Mexico is somewhat more complicated than the hypothetical scenario just analyzed. Even when it is a feasible alternative, FXE is not a perfect substitute for KCSM.⁵⁵ KCS also currently has some power to raise its fees to CP on interline shipments, which means that there is potential for EDM if CP and KCSM merge. However, one cannot assume that the downward pricing pressure after such a merger will dominate the upward pricing pressure from foreclosure. In fact, if FXE and KCSM are very close competitors for UP, then foreclosure will tend to be more profitable, because the competition would have driven their pre-merger rates virtually down to marginal cost.

⁵⁵ The fact that UP has a partial ownership interest in FXE does not change the results. This is a passive ownership interest. UP does not have any control over FXE's prices. Thus, while UP would take into account that it recovers some fraction of FXE's overcharges on interline movements, that recovery does not make FXE a perfect substitute for KCSM and thus will not eliminate the effects of the foreclosure. Moreover, understanding that UP will "discount" the overcharges in this way gives FXE the incentive to raise its fees by even more than if there were no UP ownership interest.

72. In short, there are substantial foreclosure concerns even for shippers that view FXE as a possible substitute for KCSM. Simply observing that KCSM is not a monopolist, but faces FXE as a feasible alternative—and again, Dr. Majure presents that as a hypothesis, not an established fact—does not eliminate the ability or the incentive of the merged firm to engage in foreclosure strategies against UP on Mexican routes.

5. Empirical Analysis Confirms that the CPKC Merger Raises Serious Foreclosure Concerns

73. Brown and Zebrowski (B&Z) estimate divertible and likely diverted traffic that moves through the Laredo gateway. That is, they estimate a magnitude of traffic that they conclude potentially *could* be diverted from competitors to the merged CPKC. They then judged that a specific fraction of that divertible traffic likely *would* be diverted to the merged carrier as a result of post-merger quality improvements.
74. Figure 3 reports B&Z's estimates of the level of potentially divertible traffic to the merged firm that currently flows over the Laredo gateway as well as B&Z's estimates of likely diversion, with likely diversion being somewhat less than half of the potentially divertible traffic on average. Figure 3 reports the carloads, rather than the associated revenue. This analysis indicates substantial likely diversion, taking B&Z's assumptions at face value that there would be no foreclosure tactics by CPKC.
75. While B&Z assume that there is no foreclosure, their formulation essentially concedes an ability to foreclose by raising rivals' costs of competing interline movements. That is, if an integrated firm with monopoly power on one segment can divert traffic by reducing its own costs, then it normally also can divert traffic by raising its rivals' costs. Reducing its own costs allows the firm to gain traffic by decreasing its prices, while raising rivals' costs allows the firm to gain traffic by causing the rivals to increase their prices. After the merger, CPKC can raise rivals' costs by raising the KCSM rates it charges for interline movements with those rivals.
76. Even taking B&Z's estimates of likely diverted traffic at current rates as a given, the merged firm could further increase the traffic diversion rate by engaging in supplemental foreclosure tactics such as raising KCSM rates on interline movements or non-price foreclosure tactics. If those foreclosure tactics were to drive the diversion up to the level that B&Z viewed as potential diversion, that would involve more than twice the diversion rate they treated as likely. The merged firm has a greater incentive to engage in foreclosure than KCS does currently because shipments diverted from UP will allow the merged firm to capture the carloads (and associated revenue and profit) for the CP segments as well as the KCS segments.

Figure 3: B&Z Estimated Potential and Likely Diversions Through Laredo

Select Traffic Screened as Eligible For Diversion

	<i>Total Originated/Terminated at Laredo</i>		
	Potential Diversion (Carloads/ Containers)	Likely Diversion (Carloads/ Containers)	Percentage Likely Diverted
Intermodal	{{ }}	{{ }}	{{ }}
Automotive	{{ }}	{{ }}	{{ }}
Metals, minerals and consumer products	{{ }}	{{ }}	{{ }}
Energy, chemicals and plastics	{{ }}	{{ }}	{{ }}
Grain Products	{{ }}	{{ }}	{{ }}
Total	{{ }}	{{ }}	{{ }}

Source: Brown & Zebrowski V.S., workpaper “8 - Diversion Identification.xlsx”

77. Extending B&Z’s analysis, a strategy of using foreclosure tactics to cause increased diversion likely would be profitable for the merged firm. I will use the illustrative example of diversion of movements of finished automobiles from Laredo to Chicago. I specifically will undertake the common analysis of evaluating the profitability of a hypothetical total foreclosure strategy of completely denying UP effective access to interlining with KCSM by raising KCSM’s rates to prohibitive levels.⁵⁶ By this analysis, I am not predicting that CPKC will engage in such a total foreclosure strategy. Instead, I am using this analysis as a conservative gauge of the profitability of foreclosure by raising KCSM’s rates.
78. To explain the basic methodology of this profitability analysis, suppose that the merged firm were to substantially raise the per carload rates charged for UP movements from Mexico origins to Laredo to prohibitively higher levels, where UP effectively would be totally foreclosed from using KCSM as a practical matter. To illustrate the impact of this hypothetical total diversion strategy on the profits of CPKC, assume initially in an overly optimistic way that UP were able to retain (say) half the movements subject to this foreclosure by trucking the merchandise to Laredo or using FXE instead, despite the higher cost of these alternatives. In that case, the merged firm would sacrifice the revenue and margin on half of the UP movements over KCSM (i.e., the movements that UP would retain by using trucks or FXE) but it would obtain the revenue and margin for carriage from

⁵⁶ Such a profitability analysis is routinely used in merger analysis. *See, e.g.,* Vertical Merger Guidelines (Example 2); Moresi & Salop, *supra* note 11 at 208. The profitability analysis is a conservative approach to foreclosure incentives. *Id.* at 208-10.

Laredo to Chicago on the half of the UP movements that it captures (i.e., the movements that it diverts from UP to itself).⁵⁷

79. To estimate the increase in the revenue earned by the merged firm from this total foreclosure strategy, Figure 4 reports B&Z's estimates of the amount of revenue per carload that the merged firm would earn on movements diverted from UP and other carriers for finished automobile movements. If the merged firm would obtain the current UP rates on the Laredo-Chicago movement on diverted traffic, the merged firm would earn revenue of {{ }}.⁵⁸ KCS earns revenue of only {{ }} on KCSM movements that interline with UP at Laredo. Thus, if UP were able to retain as much as half the shipments after it was totally foreclosed from KCSM, the merged firm would gain {{ }} on the U.S. portion on the half of the shipments it captures, while losing the KCSM revenue of {{ }} on the half of the shipments that UP is able to retain. Thus, on balance, the total foreclosure strategy would dramatically increase CPKC's revenue.⁵⁹ Assuming that the percentage price/cost margins were not wildly different, the strategy would be highly profitable.⁶⁰ For other routes where the potential CPKC revenue gained is higher, foreclosure would be even more profitable.
80. Given these single line and KCSM rates, I next calculate the "critical percentage" of shipments that UP would have to retain in order for the total foreclosure strategy of the merged firm to be unprofitable. The critical percentage is about {{ }} to maintain the

⁵⁷ To keep the illustrative example simpler, I assume that BNSF is not a possible alternative carrier for these UP shipments. If it were, the merged firm also could foreclose BNSF from access to these or all Mexican shipments. That would make the analysis more complicated since the rate charged on shipments interlined to BNSF might be somewhat higher than that charged to UP. However, given the huge disparity between gains and losses from the foreclosure strategy, this simplification will not change the results.

⁵⁸ The mileage on CPKC would be about 300 miles longer than the UP mileage. However, B&Z assume that the merger would make the CPKC service competitive with UP (absent any foreclosure).

⁵⁹ Assuming that UP initially had 200 movements and the merged firm captures 100 of them, the merged firm would earn revenue of {{ }} in total on those 100 movements, while losing revenue of {{ }} on the lost KCSM movements.

⁶⁰ To show the profitability despite differential margins with an extreme (worst-case) example, suppose that the dollar margin on the KCSM movement is \$1,000 (i.e., about {{ }} rate), while the dollar margin on the Laredo-Chicago movement is only \$2,000 (i.e., about {{ }} rate). In this scenario, the merged firm would earn increased profits of \$200,000 on those 100 movements gained, while losing profits of \$100,000 on the 100 lost KCSM movements for a net increase in profits of \$100,000 on those 200 original movements.

same revenue.⁶¹ UP witnesses have explained that such a high retention rate is not viable.⁶² While this analysis indicates that the merged firm would increase profits by totally foreclosing UP, it normally is more profitable to raise rates rather than totally foreclose.

81. As noted earlier, I am not suggesting that CPKC would close the Laredo gateway or charge such prohibitive rates so as to completely foreclose UP. Instead, the merger raises serious concerns that the merged firm would partially foreclose by raising KCSM rates on shipments through the Laredo gateway to Chicago and the upper Midwest in order to divert traffic to CPKC to some degree, and possibly also engage in some non-price foreclosure tactics that are difficult to detect.

Figure 4: CPKC Foreclosure Incentives: Finished Automobiles

CPKC Incremental Revenue from a UP Diverted Movement	{{ }}
Average KCSM Revenue for the Mexican Portion of a UP Movement	{{ }}

Sources:

1. Brown & Zebrowski V.S., workpaper “4 - Traffic Screening.xlsx”
2. Brown & Zebrowski V.S., workpaper “8 - Diversion Identification.xlsx”

82. Figure 5 provides a similar analysis for southbound automobile parts from Chicago to Laredo. UP would have to be able to retain at least a “critical percentage” equal to {{ }} of the shipments to prevent this total foreclosure strategy from increasing the net revenue of the merged firm.⁶³ Again, UP witnesses have explained that such a high retention rate is not viable.⁶⁴ And as discussed above, increasing rates by some amount is normally more profitable than totally foreclosing. This also shows a concern that the merger would lead to higher rates charged to UP. And, as with finished automobiles, it will be even more profitable for other movements when revenue gained is higher.

⁶¹ If UP retained {{ }} of the carloads, the merged firm’s loss of the {{ }} per carload on this {{ }} of the shipments would equal the gain of {{ }} per carload on the {{ }} of shipments diverted by the merged firm. This assumes equal percentage margins on both segments. As noted above, if the percentage margins differ on the two segments, the critical percentage would be adjusted accordingly.

⁶² *Rocker & Turner V.S.* at 11-16.

⁶³ If UP retained {{ }} of the carloads, the merged firm’s loss of the {{ }} per carload on this {{ }} of the shipments would equal the gain of {{ }} per carload on the {{ }} of shipments diverted by the merged firm. This assumes equal percentage margins on both segments. As noted above, if the percentage margins differ on the two segments, the critical percentage would be adjusted accordingly.

⁶⁴ *See Rocker & Turner V.S.* at 11-16.

Figure 5: CPKC Foreclosure Incentives: Automobile Parts

CPKC Incremental Revenue from a UP Diverted Movement	{{ }}
Average KCSM Revenue for the Mexican Portion of a UP Movement	{{ }}

Sources:

1. Brown & Zebrowski V.S., workpaper “4 - Traffic Screening.xlsx”
2. Brown & Zebrowski V.S., workpaper “8 - Diversion Identification.xlsx”

83. The Applicants claim that the merger will lead to quality improvements and cost decreases.⁶⁵ They might try to argue that these would offset the foreclosure incentives indicated by this analysis. But UP witness Thomas Haley explains that a substantial portion of the single-line cost savings anticipated by Applicants is not merger-related.⁶⁶ Further, Mr. Haley explains that Applicants assume traffic will divert to longer, less efficient routes. His testimony suggests Applicants would have to grow their single-line traffic and revenues by foreclosing, rather than by increasing competition. In this regard, while B&Z attribute the diversion to cost and quality improvements, diversion alternatively could be achieved by raising the cost of UP interline movements by increasing the fee charged by KCSM to UP (or to shippers that want to use UP). Rate reductions for the purpose of inducing shippers to switch from UP to CPKC would be unnecessary if the merged carrier foreclosed competing carriers by raising the rate for KCSM’s monopoly segment.
84. B&Z also are not claiming that rates on these competing movements will decline. For diverted traffic moving between Mexico and the United States through the Laredo gateway, B&Z apparently attribute all the diversions of traffic to quality improvements, not to rate decreases. This is because they assume that rate reductions are not needed to divert traffic away from UP’s interline service on movements through Mexico, even though the diversion will move traffic to longer, less efficient routes. They assume that CPKC would offer rate reductions only “in order to attract traffic away from existing single-line service to CPKC single-line service.”⁶⁷ Since UP will be interlining with KCSM, it will not be providing single-line service.⁶⁸ Thus, B&Z are effectively assuming that the merged firm’s rates will

⁶⁵ See, e.g., APP., *Verified Statement of Dean Vargas* (October 29, 2021) (*hereinafter*, Vargas V.S.) at ¶41, Table 2.

⁶⁶ See, e.g., Haley V.S. at ¶¶13–17.

⁶⁷ Brown & Zebrowski V.S. at ¶32. (“[W]e considered it appropriate to assume that CP/KCS would be required to offer rate reductions averaging five percent in order to attract traffic away from existing single-line service to CP/KCS single-line service.”) However, they do not treat movements that include KCSM as single-line. See Brown & Zebrowski V.S., workpaper “8 - Diversion Identification.xlsx”.

⁶⁸ Brown & Zebrowski V.S., workpaper “8 - Diversion Identification.xlsx”

stay the same for all cross-border traffic diverted from UP. This assumption also suggests that shippers will not benefit from lower rates.

6. Dr. Majure's Analysis of Traffic Flows at Laredo Lacks Probative Value

85. Dr. Majure reports data on traffic shares for the northbound traffic that KCSM brought to the Laredo gateway from Mexico in 2019. Dr. Majure asserts that this analysis is “consistent” with the absence of foreclosure incentives at the Laredo gateway,⁶⁹ implies a preference for single-line service,⁷⁰ and demonstrates the potential benefits to shippers from a combination of CP and KCS.⁷¹
86. However, Dr. Majure's empirical analysis lacks probative value. This single snapshot of shares in 2019 (15 years after KCS's earlier acquisitions of TFM and TM) is equally consistent with the opposite of what Dr. Majure claims. Based solely on the analysis as presented, one cannot conclude one way or the other whether KCS's earlier acquisition resulted in any foreclosure of UP in the past, or whether the merged firm will foreclose UP in the future. Nor does this data provide evidence of a meaningful preference for single-line service or overall benefits to shippers from the merger.

6.1 Dr. Majure's Traffic Share Data Does Not Disprove the Existence of Foreclosure Concerns

87. In Exhibit 2 of his Verified Statement, Dr. Majure presents shares of northbound rail traffic passing through the Laredo gateway in 2019. Dr. Majure's exhibit is reproduced below in Figure 6.

⁶⁹ Majure V.S. at ¶30 (“That sizable percentage is consistent with KCS having an incentive to provide shippers with their preferred route and carrier...”).

⁷⁰ Majure V.S. at ¶32-33.

⁷¹ Majure V.S. at ¶34.

Figure 6: Reproduction of Dr. Majure's Exhibit 2

{{

}}

88. Dr. Majure reports that in 2019, KCSM interchanged {{ }} of shipments with UP at the Laredo gateway for which KCS can serve the final destination (Line 1 in Figure 6).⁷² He claims that this “sizable percentage is consistent with KCS having an incentive to provide shippers [after the previous merger] with their preferred route and carrier – interchanging as necessary to meet the shipper’s preference rather than forcing shippers to use KCS alone.”⁷³

⁷² KCS also interchanges {{ }} of shipments with UP destined for areas that KCS cannot serve. (Line 2 of Figure 6). This equality in the percentage of shipments interchanged might be thought to suggest that KCS is not foreclosing any shipments to areas that it can serve. Dr. Majure properly does not make such a claim. This is because the commodity categories, shipment lengths and values and other factors are not constant. Nor is it likely that the equality would be found for apples-to-apples comparisons or for other years.

⁷³ Majure V.S. at ¶30.

89. This figure lacks probative value. This is because Dr. Majure provides no counterfactual against which to measure this {{ }} result. Without knowing what percent of carloads *would have been interchanged* with UP at Laredo had the KCS/TFM/TM transactions not been consummated (i.e., in the counterfactual “but-for” world), one cannot reasonably conclude that UP’s {{ }} share in 2019 indicates that “interchange activity at the Laredo gateway demonstrates a combined CP/KCS would not have the ability and incentive to preclude its rivals’ access to gateways.”⁷⁴ These shares may be inconsistent with a claim of *complete foreclosure* of UP, but they do not establish that there has been *no foreclosure* arising from interline fee increases or higher KCSM divisions. For example, suppose that UP’s share would have been 90% absent foreclosure resulting from the previous merger. In that case, a {{ }} UP share would be indicative of substantial foreclosure.
90. One possible benchmark might be to compare UP’s share in 2019 to the level before all the effects of previous transactions occurred. That is, one might compare UP’s share before the KCS/TFM/TM transaction versus 2019. As shown in Figure 7, UP’s share of northbound shipments was 90% before the acquisitions. By 2019, the share had fallen to {{ }}, as discussed above. Similarly KCS share of southbound was only 9% and it is {{ }} much higher today, as shown in Figure 8 below. Thus, this is equally “consistent” with the acquisitions leading to foreclosure of UP.

Figure 7: Pre-KCS/TFM/TM Shares of Movements via All U.S./Mexico Gateways

Railroad	Northbound	Southbound
UP	90%	79%
KCSR/Tex Mex	3%	9%

Source: Kansas City Southern —Control— the Kansas City Southern Railway Company, Gateway Eastern Railway Company, and the Texas Mexican Railway Company, STB Finance Docket No. 34342 at 12 (2004).

91. As Dr. Majure recognized at his deposition,⁷⁵ there are other possible explanations that also are “consistent” with the decline in UP’s share post-2004/2005 and the corresponding

⁷⁴ Majure V.S. at ¶31.

⁷⁵ Deposition of W. Robert Majure, February 7, 2022 at 229, (“It’s very hard to make that kind of comparison over a long period like this. And in particular, there are a lot of things that have been changing that would affect this. . . So I would expect changes to happen from investments. I would expect changes to happen from—changes in demand over time. . . So even just the composition of what the traffic is is probably changed somewhat. So those are just some of the reasons why trying to do this over time might lead to a misleading conclusion.”).

increase in KCS's share, such as secular improvements in KCS service over this period. These alternatives reduce if not totally eliminate the probative value of the change in the shares. But I note that if Dr. Majure's reasoning regarding the {{ }} in 2019 were to be credited, then so must also be this decline from {{ }} in 2004-2005 down to {{ }}. That is, this large reduction in UP's share over time (and the corresponding increase in KCS's share) equally could be said to be "consistent" with foreclosure by KCS.⁷⁶

92. Dr. Majure's apparent conclusion that his Exhibit 2 rebuts foreclosure concerns also ignores the fact that the foreclosure incentives would be increased after the merger because of the incremental revenue earned on the CP portion of movements diverted to the merged firm from the foreclosure. For example, Figure 6 indicates that there are {{ }} movements to areas not served by KCS today that the merged CPKC could serve and for which UP currently obtains a { } share at Laredo. These movements are ones that the merged firm could divert from UP, BNSF or others by raising the rate for KCSM's monopoly segment. This is another reason why his Exhibit lacks probative value.
93. In addition, because Dr. Majure does not take into account the likelihood and potential harms from foreclosure, his conclusion that the merger likely will benefit shippers on these routes also lacks probative value.

6.2 Analysis of Southbound Traffic Through the Laredo Gateway Does Not Support Dr. Majure's Conclusion that There Are No Foreclosure Concerns

94. Dr. Majure did not analyze southbound traffic through the Laredo gateway in his report. However, there are similar foreclosure concerns relating to southbound traffic: KCSM could increase the rate for southbound movements interchanged with UP at the Laredo gateway in order to increase the cost to shippers of using UP for the U.S. portion of a movement and thereby increase traffic obtained by KCS instead. Figure 8 presents UP and KCS' 2019 shares of southbound carloads interchanged with KCSM at the Laredo gateway in the same format used by Dr. Majure in his northbound analysis. UP's share of southbound traffic (i.e., share of traffic interchanged at the Laredo gateway from areas KCS serves) is only {{ }}, far less than the {{ }} share Dr. Majure found for northbound traffic.
95. Had Dr. Majure analyzed southbound traffic in his report, and if he had applied his rule on northbound traffic that a "sizable percentage [share of UP] is consistent with KCS having an incentive to provide shippers with their preferred route and carrier ... rather than forcing

⁷⁶ Dr. Majure refers to {{ }} rate of interchange traffic as "consistent with KCS having no ability to force shippers into using KCS." (Majure V.S. at ¶31.)

shippers to use KCS alone,”⁷⁷ he then should have concluded that UP’s “small” {{ }} share of traffic from areas that KCS serves (versus {{ }} share for traffic from areas that KCS does not serve) is “consistent” with a significant foreclosure concern.⁷⁸ Similarly, KCS’s “large” {{ }} share of southbound carloads from areas is much higher than the {{ }} of northbound traffic he flagged. Thus, Dr. Majure should have concluded that this high rate indicated that foreclosure was occurring.

96. Of course, these metrics also are subject to the same criticism of Dr. Majure’s analysis that I made earlier: these figures do not compare this percentage to an estimated percentage in the but-for world absent the merger.

Figure 8: Shares of Southbound Traffic Interchanged at Laredo Gateway with KCSM

Area	Total Carloads	UP share at Laredo Gateway	KCS Share at Laredo Gateway		
			Total KCS Share [A = B + C]	BNSF to KCS at Robstown or Corpus Christi [B]	KCS share before Robstown or Corpus Christi [C]
KCS serves...	{{ }}	{{ }}	{{ }}	{{ }}	{{ }}
KCS does not serve...	{{ }}	{{ }}	{{ }}	{{ }}	{{ }}
KCS does not serve and CP serves...	{{ }}	{{ }}	{{ }}	{{ }}	{{ }}
... and UP and BNSF do not serve	{{ }}	{{ }}	{{ }}	{{ }}	{{ }}
... and UP or BNSF serves	{{ }}	{{ }}	{{ }}	{{ }}	{{ }}
All traffic through Laredo to Mexico	{{ }}	{{ }}	{{ }}	{{ }}	{{ }}

Sources:

CP-KCS Traffic Tapes, 2019
 Confidential Waybill Sample, 2019
 CP Intermodal Containers to Railcar Conversion Factor.xls
 KCS R-1 Annual Report, 2019

⁷⁷ Majure V.S. at ¶30.

⁷⁸ Dr. Majure writes that he did not report these southbound traffic figures because “[w]hile UP’s concern could have applied to southbound traffic as well, I test the effect on the northbound traffic as I can readily categorize movements of this traffic in terms of whether an interchange with another railroad happened as early in the movement as feasible.” Majure V.S. at note 17. However, the primary statistic needed for the southbound analysis is UP’s share in areas KCS serves, which can readily be calculated using a definition for “serves” focused on origin points that is comparable to the termination points used in the northbound analysis.

6.3 Dr. Majure's Data Do Not Provide Evidence of a Preference for Single-Line Service

97. Dr. Majure also suggests that the data reported in Figure 6 above demonstrate a shipper preference for single-line service.⁷⁹ Dr. Majure specifically points to the fact that KCS has a higher share at the Laredo gateway when it is able to provide single-line service beyond Laredo/Robstown/Corpus Christi ({{ }}), as shown in line 1) than it does for traffic bound for areas where KCS could not deliver to the ultimate destination ({{ }}), as shown in line 2). However, just as it is not possible to draw a conclusion about foreclosure in the absence of an estimate of the outcome absent the merger, it also is not possible to draw a conclusion about shipper preferences for single-line service from Dr. Majure's Exhibit 2. This higher share could have been the result of foreclosure rather than preference for single-line service or some other product differentiation or cost factor.
98. Other data do not indicate a strong preference for single-line service. For example, Figure 9 reports northbound carload shipments through Laredo to Kansas City for finished automobiles. KCS *single-line* movements accounted for only {{ }} of finished automobiles from Laredo to Kansas City, whereas UP *interline* movements accounted for {{ }} of these shipments. Thus, these percentages do not indicate a strong preference for single-line service provided by KCS.

Figure 9: Northbound Finished Automobile Shipments through Laredo to Kansas City-2019

Routing Railroads North of Mexican Border	Total Carloads	Share
KCS Total	{{ }}	{{ }}
KCS-BNSF	{{ }}	{{ }}
KCS	{{ }}	{{ }}
UP Total	{{ }}	{{ }}
UP	{{ }}	{{ }}
Total	{{ }}	

Source: Brown & Zebrowski V.S., workpaper "4 - Traffic Screening.xlsx"

Note: Movements with railroad routing "KCS-NS" are grouped with movements with railroad routing "KCS".

⁷⁹ Majure V.S. at ¶32. ("That difference, {{ }} percent [KCS share] where KCS could offer a single-line service compared to {{ }} [KCS share] where they could not, suggests that shippers have a preference for single-line service.").

6.4 Dr. Majure's Flawed Argument that There Are No "Pre-Existing Constraints" on Foreclosure

99. At his deposition, Dr. Majure suggested that it was important to identify whether there was an "unexploited pre-merger way to influence competition that becomes feasible to implement as a result of the merger."⁸⁰ He identified this as "one of the conditions for when a vertical merger might have an anticompetitive effect."⁸¹ He also testified that he reached "the conclusion that they don't have any unexploited power in a way that might be unlocked by a merger."⁸² In its Response to CSX Interrogatory 27, Applicants' counsel fulsomely described Dr. Majure's statement as demanding identification of a "pre-existing constraint" that prevents CP and/or KCS from engaging in conduct that would lessen competition absent the merger, and that there is a "credible mechanism" by which the merger would make the constraint "no longer bind," so that "unexploited potential to impair competition could be realized" after the merger.
100. Stated more simply, Dr. Majure and the Applicants suggest that it is necessary for the Board or opponents to identify pre-merger constraints on successful foreclosure conduct and explain how the merger would relax or eliminate these constraints. As noted above, Dr. Majure testified that he was unable to identify any such constraints.
101. But such pre-merger constraints are not difficult to identify here. There are legal and economic reasons why CP and KCS would improve their ability to engage in successful anticompetitive conduct by merging rather than cooperating absent the merger. These reasons are the pre-merger constraints that are relaxed or eliminated by the merger.
102. Consider the scenario of foreclosure of UP by KCSM. Absent the merger, it is conceivable that CP and KCS/KCSM could strike a foreclosure contract by which CP would compensate KCS in consideration of KCS engaging in conduct to raise the costs of UP and BNSF for their interline movements (e.g., by raising KCSM rates or delaying shipments of UP and BNSF) in order to cause some shippers to divert to CP/KCS interline movements. The profitability analysis in Section 5 explains that this foreclosure would increase the combined profits of CP and KCS/KCSM. Thus, one might hypothesize that they could reach a mutually beneficial deal to share the profits absent the merger and thus the merger would not have incremental foreclosure effects. Stated differently, this reasoning might be assumed to imply that there is no pre-merger constraint that the merger would unbind.

⁸⁰ See, e.g., Majure Deposition at 90.

⁸¹ *Id.*

⁸² *Id.* at 71.

103. However, this would-be pre-merger contract would face an obvious *legal constraint*. The agreement would violate Section 1 of the Sherman Act. As stated, it amounts to a naked exclusionary agreement that would harm competition and competitors. The parties similarly would be in legal jeopardy—in light of both antitrust and STB constraints—if they re-framed the pre-merger contract to make CP the exclusive interline partner of KCS, since the contract would likely harm shippers. These legal constraints are a clear “pre-existing constraint” that would (in the Applicants’ words) “limit the feasibility of arrangements CP and/or KCS could have, as separate entities, to align their respective incentives and abilities in a fashion that would lessen competition.”⁸³
104. This would-be pre-merger agreement also would face an *economic constraint* from the combination of private information and related strategic bargaining incentives of the two parties. CP and KCS/KCSM would have to agree on how to divide the increased profits from the foreclosure. In that negotiation, each side would have the incentive to understate its benefits and overstate its costs in order to claim a larger share of the anticompetitive pie.⁸⁴ As a result, they may well fail to reach an agreement, even ignoring legal constraints on such an agreement such as the Sherman Act and other legal restrictions. (Of course, these legal constraints make agreeing on relative costs and benefits and arranging for the side payments even harder, given the need to avoid detection.) The merger solves this problem of private information and strategic bargaining incentives by permitting open communication and eliminating the need to allocate the gains between the two separate parties. Indeed, the Applicants make the analogous argument about such information/bargaining constraints in explaining why CP and KCS would be unable to achieve the claimed efficiency benefits absent the merger.⁸⁵
105. Similar informational/bargaining incentive constraints also would constrain CP and KCS from achieving the foreclosure benefits the merger allows that I discussed in Section 3.2. That section explains how the vertical merger leads to information exchange between the merging Carriers A and X and how that information sharing permits the merged Carrier A/X profitably to raise the division quoted to Carrier Y, while in turn causing shippers to pay higher rates on average. In principle, Dr. Majure might postulate that Carriers A and X could have cooperated in the pre-merger world by exchanging the requisite information and sharing the higher profits. However, this information sharing would be constrained by the

⁸³ KCS and CP's Supplemental Joint Responses and Objections to CSXT's Second Set of Discovery Requests, Response to Int. No. 27.

⁸⁴ This is a standard constraint when bargaining parties have private information. It has been used to explain why parties do not always settle litigation in advance of spending enormous sums, why there are wars, and other more mundane examples of two parties failing to reach a mutually beneficial agreement.

⁸⁵ Brooks V.S. at ¶¶28-36.

same sort of private information/strategic bargaining incentives constraints as above. Each party would have the incentive to misrepresent in order to get a large share of the profits. This is not simply a theoretical constraint. As UP witnesses Rocker & Turner have explained, UP and other carriers maintain confidentiality over their Rule 11 rates quoted to shippers and do not share them with other carriers.⁸⁶ Moreover, rational shippers would have the incentive to prohibit such information sharing that would lead to higher rates.

106. Finally, it is important to add that Dr. Majure makes the assumption that there is no foreclosure today, and that any foreclosure incentives are neutralized by the KCS previous and current commitments. However, as discussed above, his claim of no-foreclosure is unsupported, due to the fact that he made no effort to identify what would have occurred in the but-for world absent KCS's acquisition of the Mexican rail assets, as he conceded in his deposition.⁸⁷ An assumption that the KCS current commitments also would prevent significant foreclosure by CPKC is flawed because it ignores the fact that CPKC's post-merger incentives to evade adherence to the commitments in order to foreclose are greater than KCS's standalone incentives. This is because the merged firm will capture the larger combined revenue and profits from the foreclosure, as discussed in Section 5. That is, there will be a greater post-merger incentive to evade whatever pre-merger constraints occur from the commitments (or constraints from any other pre-merger impediments that might not be observable to outsiders). And in light of how difficult it must be to detect violations of the rate commitments (as discussed in the next section), it also follows that foreclosure risks are increased by the merger.

7. A Specific Commercially Reasonable Rule 11 Rate Methodology for CPKC's Monopoly Segments Can Avoid Foreclosure Concerns

107. In this section, I discuss a commercially reasonable Rule 11 rate formula to address foreclosure concerns raised by the merger.

7.1 Applicants' Commitments are Vague and Insufficient

108. The analysis in this report confirms that there are significant anticompetitive foreclosure concerns raised by the merger. Dr. Majure suggests that CP has made commitments sufficient to prevent any foreclosure. As he explains, "CP's willingness to make the same sort of commitments adopted by KCS at Laredo [in the KCS-KCSM merger]. . . ." means

⁸⁶ Rocker & Turner V.S. at 9-10. See also Deposition of John Brooks, February 4, 2022, at 51-52.

⁸⁷ Majure Deposition at 102-107.

that “CP/KCS should be expected to interchange traffic even where it can offer an enhanced service if the shipper, nevertheless, prefers a different routing or wants to use a different carrier.”⁸⁸

109. Applicants have stated a commitment, through CP’s Executive Vice President and Chief Marketing Officer John Brooks, to maintain Laredo as an open gateway, pursuant to a previous commitment that KCS made in 2003 with its acquisition of what became KCSM.⁸⁹ By “open” gateway, Mr. Brooks states first that CPKC will maintain the “operational efficiency” of gateways like Laredo “to maintain efficient operations... wherever traffic levels warrant—in terms of both the through train services to and from the gateways as well as the operational capabilities and infrastructure necessary to carry out efficient interchange.”⁹⁰
110. Applicants have also committed generally to maintaining the “commercial viability” of gateways like Laredo, such that “when a customer requests a rate for only the former-CP or former-KCS portion of an origin-to-destination routing, we will provide the shipper with a Rule 11 rate to the gateway.”⁹¹ By this commitment, Mr. Brooks states that “we will not make it impossible to construct viable interline options for shippers by refusing to quote commercially reasonable rates.”⁹²
111. However, this pricing commitment is vague and incomplete. Mr. Brooks’ statement does not define either “viable” or “commercially reasonable rates.” Nor is it clear whether this commitment applies to KCSM rates to-or-from the Laredo gateway. Without a firm understanding of what this rate entails, the commitment is meaningless.
112. This concern about the vagueness of CP’s commitments is buttressed by some of the ambiguities in Mr. Brooks’ Verified Statement, which includes many of the promises summarized above but which also raises additional questions. Importantly, Mr. Brooks distinguishes between interlining (a) on routes where the combined CPKC “will not reach” and where they will “obviously” maintain their ability to interchange efficiently (e.g.,

⁸⁸ Majure V.S. at ¶38.

⁸⁹ Brooks V.S. at ¶¶35, 42. Brooks further states that “CP also looks forward to stepping into KCS’s shoes to continue cooperating with UP on interline traffic over the important Laredo gateway.”

⁹⁰ Brooks V.S. at ¶45.

⁹¹ Brooks V.S. at ¶46.

⁹² *Id.* “Commercial viability” is not the same as “commercial reasonableness.” Mr. Brooks’ “commercial viability” standard would appear to allow CP to attempt to engage in margin squeezes by raising its Rule 11 rates for its segment of interline movements. That standard would allow substantial single-line rate increases by the integrated carrier, to the detriment of shippers.

interchange with UP at the Kansas City gateway serving Powder River Basin coal)⁹³ and (b) traffic that either CP or KCS interchange today but that CPKC can potentially “serve better” with their integrated routing post-merger (e.g., service from Mexico through Laredo to the Upper Midwest).⁹⁴ Regarding the latter, Applicants offer only a “promise” not to try to foreclose non-integrated competitors that customers may prefer to use because “that would hurt us in the long run by damaging the value of our brand as a promise of customer value.”⁹⁵ This suggests that Applicants understand the difference between routes on which there might be an incentive to foreclose an interline “competitor,” and those with an interline “partner” where this incentive is missing. Yet Applicants make only vague promises not to foreclose competitors, and those are premised only on maintaining CPKC’s brand value with customers. This type of commitment is flatly insufficient to protect competition and shippers.

113. Applicants have conceded the fact that its commitments are insufficient. In its letter to the NITL, CP explained this insufficiency as follows:

{{

}}⁹⁶

114. KCSM states that it sets rates to all users on a non-discriminatory basis.⁹⁷ However, a commitment for KCSM to charge the same nominal rate for shipments that interchange with UP at the Laredo gateway as for the same or similar shipments that interchange with KCS

⁹³ Brooks V.S. at ¶39. Brooks also refers to these as “friendly” connections—i.e., ones where each partner needs the other to serve the customer. Brooks V.S. at ¶28.

⁹⁴ Brooks V.S. at ¶40.

⁹⁵ *Id.*

⁹⁶ Letter from CP to National Industrial Transportation League (June 25, 2021) (CP-HC-00000851-854) at ¶¶2-3.

⁹⁷ KCS and CP's Joint Responses and Objections to UP's First Set of Discovery Requests, Response to Request No. 63. (“All Commercial rates are to be offered to shippers in a non-discriminatory manner. As a result of the interplay of these laws, if KCSM provides one shipper with a rate from Mexico to the Laredo gateway, it must in general also provide other shippers with a similar rate.”) KCS and CP's Joint Responses and Objections to UP's Third Set of Discovery Requests, Responses to Request Nos. 176, 186.

would not prevent foreclosure.⁹⁸ KCS (or CPKC) can achieve an effective price foreclosure goal by setting a high nominal rate for KCSM that raises UP's costs to whatever level is desired and then setting whatever KCSM/KCS (or CPKC) through rate as desired by adjusting the Rule 11 rate on the KCS segment in the US or the single-line rate.⁹⁹ KCS has this discretion. It explains that it sets rates on the basis of numerous factors "including but not limited to the market, operating and cost considerations, the type of service, volume, risk premiums (such as hazardous materials or high end commodities), asset availability, network capacity, competitive modes of transportation, and regulatory requirements."¹⁰⁰ At the same time, KCS has discretion because the portion assigned to KCSM vs. KCS would be purely an accounting matter for the combined corporation.¹⁰¹

115. Indeed, Applicants have essentially conceded that it would be impossible for UP (or the Board) to determine whether KCSM's current rates are reasonable or not. As Applicants' attorneys explained in response to UP's Motion to Compel,

The Board did not define "commercially reasonable" in its 2004 Tex Mex decision. See Tex Mex Decision at 19. There are no set metrics; there are no dollar caps. There is no ruler by which UP could even determine, at this later date and with full hindsight, whether a particular rate offered for one customer in 2019 for intermodal traffic between Mexico City and Kansas City is "commercially reasonable" without wild speculation.¹⁰²

116. A commitment that is not easily enforceable because it lacks any metrics or any basis on which to evaluate compliance offers no protection to competition or shippers.¹⁰³ Only an administrable and enforceable methodology for setting and determining commercially reasonable rates for interline movements can mitigate the risk of anticompetitive foreclosure.

⁹⁸ This same basic analysis applies to shipments that interchange with BNSF at Corpus Christi or Robstown.

⁹⁹ See, *supra* note 97 at No. 168. KCS and CP's Joint Responses and Objections to UP's Second Set of Discovery Requests, Response to Request No. 148.

¹⁰⁰ *Id.*

¹⁰¹ It is possible that tax consequences could differ. However, this likely would be a second-order effect.

¹⁰² Applicants' Reply To UP's Motion to Compel (Feb. 7, 2022).

¹⁰³ See, e.g., Antitrust Division, Department of Justice, MERGER REMEDIES MANUAL (September 2020) at 8, 16.

7.2 A Proposed Commercially Reasonable Rate Formula for CPKC Monopoly Segments

117. The Board should consider the following methodology for the determination of commercially reasonable Rule 11 rates for KCSM movements to-and-from the Laredo gateway. I refer to this methodology as the Competitively Reasonable Rate (CRR) formula. Under the CRR formula, when a shipper asks CPKC for a single-line rate for the portion of a movement served by CPKC and a Rule 11 rate solely for the monopoly portion, CPKC would set KCSM's Rule 11 rate as a prorated percentage of the merged firm's single-line rate for the entire movement. In the case of UP movements involving the Laredo gateway, the CPKC monopoly portion would be the portion from the Mexican origin or destination point to the Laredo gateway. In the case of BNSF movements, the CPKC monopoly portion would be the portion from the Mexican point to the BNSF interchange point at Robstown or Corpus Christi. The prorated percentage in the CRR formula would be set equal to the ratio of the KCSM miles (or the KCSM and KCS miles, in the case of BNSF movements) to the KCSM/KCS/CP single-line miles from the origin to the destination (or to an interchange with another carrier).
118. To illustrate, suppose that CPKC quotes a through rate of \$6000 for a class of merchandise for movements from its origin station in Mexico to Chicago. Suppose that the KCSM miles from the origin station to the Laredo gateway represents one-third (i.e., 33.3%) of the miles for the merged firm's full movement to Chicago. In that case, the CRR for KCSM's share of the movement to the Laredo gateway would be \$2000 (i.e., 33.3% x \$6000). These rates would be disclosed to the shipper, not to the competitors of the merged firm.
119. To paraphrase the Applicant's language that "when a customer requests a rate for only the former-CP or former-KCS portion of an origin-to-destination routing, we will provide the shipper with a Rule 11 rate to the gateway,"¹⁰⁴ the CRR might be phrased as follows: when a shipper requests a rate for CPKC service on only the former-CP or former-KCS/KCSM portions of an origin-to-destination route and a rate for CPKC single-line service on a competitive route, the merged firm must provide a Rule 11 rate for the former-CP or former-KCS/KCSM portions that reflects a mileage-based prorate of its single-line rate. The prorate would be equal to the ratio of (a) the miles of the merged firm from the origin point to the interchange point to (b) the miles of the merged firm from the origin to the

¹⁰⁴ Brooks V.S. at ¶46.

interchange *plus* the miles of the merged firm from the interchange point to the destination point.¹⁰⁵

120. This CRR formula has several advantages over other more complex methodologies.¹⁰⁶ First, the administrative costs are low. The CRR is straightforward for the merged carrier to calculate and implement. Compliance also can be easily monitored by the shipper, which will be given both rates by the merged CPKC. Thus, it can be enforced the shipper itself. It similarly is simple for the Board (or an arbitrator) to resolve disputes under this approach, unlike the great complexity and interminable disputes associated with efforts to actually estimate the relevant marginal costs of the two segments and other factors.¹⁰⁷ Second, the CRR protects competition. It ensures access to commercially reasonable interline rates; it prevents the integrated carrier from engaging in a margin squeeze against the interline carrier; and it does not permit the unintegrated carrier automatically to see the single-line rate. Third, the CRR does not regulate the single-line rate; it simply sets the Rule 11 rate on the monopoly segment in accordance with CPKC's own rate decisions.

7.3 The CRR Formula Will Not Reduce Competition

121. Applicants might attempt to argue that the CRR formula will force rate equalization and deter rate reductions driven by lower costs in the same way as the now-discredited DT&I

¹⁰⁵ The Applicant's Michael R. Baranowski has not suggested that KCSM's operating costs should be treated as exceeding KCS's cost. As he stated, "I also assumed, based on high-level comparisons of KCS and KCSM costs per unit of output that KCS URCS costs are a reasonable surrogate for KCSM costs for diverted volumes. (APP., *Verified Statement of Michael R. Baranowski* (October 29, 2021) (*hereinafter*, *Baranowski V.S.*) ¶22 at 415.) Applying the MSP adjustment avoids any argument that CPKC would be disadvantaged by the CRR methodology.

¹⁰⁶ These complex alternatives might include a specified mark-up over some measure of costs; the rates charged before the merger, adjusted for objectively measured cost and other changes; rates charged on other comparable routes unaffected by the merger; etc. These alternatives all involve judgment calls (e.g., the level of the mark-up; the particular routes or historical period used as benchmarks; any other factors used to adjust rate levels). As a result, they involve higher administrative cost and complexity that also could lead to more disputes and an inability to resolve these disputes quickly.

¹⁰⁷ Allowing the CPKC the discretion to base the division on its own estimate of the relative costs of the two movements would effectively permit it to set a very high rate for the interline segment under the guise of it being reasonable under the circumstances. In its responses to discovery, KCS states that it assigns revenue divisions between KCS and KCSM "based on the circumstances particular to the move, including but not limited to mileage divisions, operating cost considerations, overall base costs (such as higher fuel costs in Mexico or additional security needs), WACC differences in the United States and Mexico, and regulatory requirements (such as TUCE (Max) rate considerations in Mexico)" KCS and CP's Joint Responses and Objections to UP's Second Set of Discovery Requests, Response to Request No. 148. This approach would be impossible for the shipper or a third party to evaluate easily in real time, but rather would lead to more disputes that would be difficult to resolve in an accurate or timely way.

conditions. However, this criticism is not well-founded. This is because the CRR is far narrower than the DT&I conditions¹⁰⁸ and is formulated to preserve competition among the carriers. In particular, the CRR does not constrain the single-line rate of the merged firm; it simply bases the Rule 11 rate on the monopoly segment of the carrier's independently-determined rate. Nor does the CRR require a negotiation with the competing interline carrier.

122. Applicants also might argue that the CRR formula will reduce competition by diminishing its incentive to reduce its rates in response to cost savings achieved by the merger. While it is the case that reductions in CPKC's single-line rates will lead to some reductions in the CRR, the CRR will not reduce competition for several reasons.
123. First, this argument overlooks the fact that the goal and impact of the CRR is to prevent price foreclosure that would otherwise occur, and which would lead to *higher* single-line rates and *higher* rates charged on interline routes. As demonstrated by the economic analysis presented in this report, CPKC will have the ability and incentive to foreclose unintegrated competitors by raising its rates for its portion of interline movements that would allow it to raise its single-line rates. By preventing that foreclosure, competition will be maintained, not deterred.
124. Second, any reduction in the Rule 11 rate caused by the CRR will amount to only a fraction of the reduction in the single-line rate. For example, suppose that CPKC were to reduce its costs by \$100 and decided to reduce its single-line rate by \$50, taking the other \$50 as an increase in its margin. If its monopoly segment accounted for one-third of the mileage of the total movement, the CRR would fall by \$15. Even if the interline competitor passed on this entire \$15 fee reduction, it would not be able to match CPKC's single-line rate reduction. Thus, CPKC could still gain more business and a higher margin.

¹⁰⁸ Rulemaking Concerning Traffic Protective Conditions In Railroad Consolidation Proceedings, 366 I.C.C. 112 (1982).

VERIFICATION

I, Steven C. Salop, declare under penalty of perjury that the foregoing is true and correct. Further, I certify that I am qualified and authorized to file this Verified Statement.

Executed on February 27, 2022.

/s/ Steven C. Salop

Appendix A. Professor Salop's Curriculum Vitae

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PERSONAL Born, December 23, 1946; Married to Judith R. Gelman, three children; U.S. Citizen.

FIELDS OF SPECIALIZATION

Industrial Organization, Competition and Antitrust Policy, Economics of Information, Economic Analysis of Law.

DEGREES

Ph.D.	Economics, Yale University, 1972
M. Phil.	Economics, Yale University, 1972
B.A.	University of Pennsylvania, 1968

AWARDS

AALS Antitrust Section Lifetime Achievement Award (2019);
AAI Antitrust Achievement Award (2010);
Summa Cum Laude, with Honors in Economics, University of Pennsylvania, 1968;
Schoenbaum Prize in Economics, University of Pennsylvania, 1968;
NSF Graduate Fellowship, 1968-72;
Phi Beta Kappa, 1968.

EMPLOYMENT EXPERIENCE

Professor of Economics and Law, Georgetown University Law Center (at GULC since August 1981).

Guest Scholar, Brookings Institution, 1990-1991.

Visiting Professor, Massachusetts Institute of Technology, Spring 1986.

Visiting Interdisciplinary Professor, Georgetown University Law Center, July 1981-June 1982.

Associate Director for Special Projects, Bureau of Economics, Federal Trade Commission, January 1980-June 1981.

Assistant Director for Industry Analysis, Bureau of Economics, Federal Trade Commission, September 1979-January 1980.

Deputy Assistant Director for Consumer Protection, Bureau of Economics, Federal Trade Commission, December 1978-September 1979.

Economist, Division of Consumer Protection, Bureau of Economics, Federal Trade Commission. July 1978-December 1978.

Visiting Professor, Department of Economics, University of Pennsylvania, September 1977-June 1978.

Economist, Office of Economic Analysis, Civil Aeronautics Board, September 1977-July 1978.

Economist, Federal Reserve Board, July 1972-September 1977.

Adjunct Professor, Department of Economics, George Washington University, September 1975- January 1978.

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SELECTED PROFESSIONAL ACTIVITIES

Co-Chair, Georgetown Global Antitrust Enforcement Symposium (2013- present)

ABA Antitrust Masters Course (2016, 2014, 2012, 2010)

American Antitrust Institute (AAI) Advisory Board

ABA Antitrust Presidential Transition Taskforce (2012)

Associate Editor, JOURNAL OF INDUSTRIAL ECONOMICS (1997-2000)

Advisory Committee, FTC Hearings on Global and Innovation-Based Competition (1996).

Associate Editor (Industrial Organization), JOURNAL OF ECONOMIC PERSPECTIVES (1987-1993).

ABA Antitrust Task Force on Second Requests (1990).

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Associate Editor, JOURNAL OF INDUSTRIAL ECONOMICS (1983-1988).

Associate Editor, INTERNATIONAL JOURNAL OF INDUSTRIAL ORGANIZATION (1984-1989).

Secretary, Antitrust Section, American Association of Law Schools (1983-1984).

Memberships: American Economic Association, American Bar Association, Phi Beta Kappa.

Nominating Committee: American Economic Association, 1982.

Economics Editorial Advisor, JOURNAL OF CONSUMER RESEARCH, 1982.

OTHER ACTIVITIES

Senior Consultant, Charles River Associates

President, Salop Economics Inc. (1982-present)

Board of Directors, Charles River Associates (1998-2008)

Board of Trustees, The Lowell School (1989-1995)

Appendix B. Numerical Example of Foreclosure with Imperfect Information

The analysis of pre-merger and post-merger competition can be illustrated with a numerical example where the shipper obtains through rates from the competing carriers. The results do not depend on the specific parameter values of the example.¹⁰⁹ As in the example of the one-lump theory (see paragraphs 36–39 above), suppose that the shipper’s reservation price is \$400 and that demand is inelastic (say, equal to 1 unit) for any price below \$400. However, assume now that instead of the competing carriers each having a cost of \$100, their costs for the specific movement for the specific shipper may be different and may fall anywhere (independently and uniformly) within a range of \$50 to \$150, so that the cost of either competing carrier is equal to \$100 *on average*, but may differ for a particular shipper’s movements. Assume further that neither competing carrier knows the other’s cost and, more importantly, that the monopoly carrier does not know the costs of the competing carriers. To show the effect of imperfect information in the simplest context, one can continue to assume that the monopoly carrier’s cost is \$150 and that the competing carriers know this cost.¹¹⁰ Furthermore, when the competing carriers bid for the shipper’s movement, one can assume for simplicity that they each observe the division that the monopoly carrier has quoted to the other competing carrier.

Under these conditions, in the pre-merger market, each competing carrier will offer a through rate to the shipper that depends on its own total cost, its expectations about likely rates offered by the other competing carrier, and the bid process used by the shipper.¹¹¹ The total cost of a competing carrier includes the division quoted by the monopoly carrier, which I discuss further

¹⁰⁹ Moresi et al., *supra* note 28, demonstrates that the one-lump theory is rejected under general conditions when the monopoly carrier has imperfect information regarding the competing carriers’ costs and the shipper has inelastic demand up to its maximum reservation price. The numerical example presented in this appendix is consistent with that article, and the equilibrium prices reported here were calculated using the formulas provided in the article.

¹¹⁰ If the monopolist’s costs also vary, the analysis is more complicated. But the one-lump theory still does not apply.

¹¹¹ In the formal model of Moresi et al., *supra* note 28, the carriers’ “offers” are their “best” (i.e., minimum) price offers. The shipper chooses the carrier by running sequential bid rounds where each carrier continues to lower its prices until one of the carriers drops out. A carrier will drop out rather than bid below its costs. Thus, in this situation, the winning bidder will be the carrier with the lower cost realization. But it will be paid a price above its own costs, at a level just below the cost of the other, higher cost carrier. For example, if the two carriers have costs of \$80 and \$120 respectively for a particular movement, the \$80 cost carrier will win the competition and be paid a price of \$119.99, that is, approximately \$120. In technical economic terms, this is equivalent to what economists denote as a “second price” auction. However, as shown in that article, the main post-merger results are the same in the scenario where the carriers make sealed-bid offers, what economists denote as a “first price” auction, and the pre-merger results have the same expected value.

below. Each competing carrier thus will offer a through rate to the shipper that depends on its costs for the specific movement and will have an incentive to offer a higher through rate in situations where its costs are higher. The shipper will then choose the movement with the lowest through rate.

The monopoly carrier bases its own division quotes on its imperfect information about the competing carriers' likely costs and mark-ups. To illustrate, suppose that the monopoly carrier knows that the competing carriers have costs in the \$50-\$150 range, but does not know the actual costs or resulting contributions to the through rate each will bid to the shipper in its through rate offer. It would not make economic sense for the monopoly carrier to set a division higher than \$350. If it did, the competing carriers would be unable to offer through rates that do not exceed the shipper's reservation price of \$400, even at the minimum cost of \$50.

Applying the analysis in the Moresi et al. article, the monopoly carrier will quote a division to each competing carrier of \$283.33 to maximize its *expected profits*.¹¹² Each competing carrier would then form its own through rate offer to the shipper using this quote from the monopoly carrier, along with its own cost and its expectations of the cost and resulting rate of the other competing carrier. Note that, if a competing carrier's cost is higher than \$116.67 (which is possible since costs are anywhere between \$50 and \$150), then that carrier will not bother to bid since it cannot offer a through rate below the shipper's reservation price of \$400. However, if both competing carriers have costs below \$116.67, then the winning bid is less than \$400 and thus the shipper will obtain some "surplus" value. For example, if the through rate paid is \$390, the shipper will obtain a surplus of \$10 (i.e., \$400 - \$390). But if the costs are sufficiently high – say, each competing carrier has a cost of \$120 – then the two competing carriers will not be able to offer rates below the shipper's reservation price of \$400, and so the shipper will go elsewhere.

To summarize, competition in the pre-merger market with imperfect information leads to the shipper obtaining a through rate below its reservation price some fraction of the time, in particular, when the competing carriers' cost realizations are relatively low. When their cost realizations are higher, the shipper either pays its \$400 reservation price for the rail transport or chooses the alternative. Combining the effects of the various possible cost realizations for particular movements, the average through rate paid by the shipper (conditional on the shipper using rail transport) will be less than its reservation price. The monopoly carrier is unable to extract the full monopoly profit margin, contrary to the one-lump theory. Instead, some of the surplus accrues to the shipper and the competing carriers.

Consider next the effect of a vertical merger between the monopoly carrier and one of the competing carriers on the other segment. After the merger, the vertically-integrated carrier

¹¹² The pre-merger equilibrium division of \$283.33 is obtained using the formula in Moresi et al., *supra* note 28.

offers a division to the independent competing carrier, and then the two carriers bid through rates to the shipper. However, when the now-integrated monopoly carrier quotes the division to the independent competing carrier, it does so based on the perfect information it now has about the cost of its merger partner and – as before – on the imperfect information it has about the cost and through price offer of the unintegrated competing carrier.¹¹³

One possible strategy is for the integrated carrier to offer a full monopoly single-line rate of \$400 to the shipper and a prohibitively high division to the independent carrier that makes it impossible for the independent carrier to offer a through rate that does not exceed the shipper's \$400 reservation price. Since the independent carrier's costs are no less than \$50, the monopoly carrier can quote a division of \$350 or more, in which case the through price offered by the independent carrier to the shipper necessarily will exceed \$400. An equally profitable alternative would be to offer a division to the independent carrier such that the merged firm would earn the same profit margin from the division as it would from its single-line rate of \$400. For example, if the costs of the merged carrier for the entire movement are \$270 (i.e., \$150 incurred by the monopoly carrier and \$120 incurred by the merging competing carrier), it could earn profit of \$130 (i.e., \$400 - \$270) by winning the movement at its single-line rate of \$400. Alternatively, the merged carrier could quote a division of \$280 to the independent carrier; the latter would win against the single-line bid of \$400 whenever its cost realization is smaller than \$120 (i.e., \$400 - \$280) and the merged carrier would earn a profit of \$130 (i.e., \$280 - \$150) regardless of which carrier wins the bidding competition.

But a more profitable strategy is for the monopoly carrier to offer a single-line price to the shipper of \$400 and quote a division to the independent carrier that is somewhat higher (i.e., between \$280 and \$350 in the above example) and will assure that the monopoly carrier earns a *larger* profit (than \$130) if the independent carrier wins the interline movement than the monopolist would earn if it won the single-line bid at \$400. To illustrate, suppose the costs of the merged carrier for the entire movement are \$270 (as before) and the monopoly carrier quotes a division to the independent carrier of \$315.¹¹⁴ If the independent carrier's costs exceed \$85, then it will not be able to bid a through rate of less than \$400 and still cover its costs, in which case the merged firm will win the movement at a single-line rate of \$400 and earn profits of \$130 (i.e., \$400 less its costs of \$270). But, if the independent carrier's costs are below \$85, then the merged firm would earn profits of \$165 (i.e., \$315 minus its costs of \$150) on the interline segment (since the independent carrier has sufficiently low costs to offer a through rate below \$400). For example, if the independent carrier has costs of (say) \$80, it would have total costs of

¹¹³ The single-line rate offered by the merged carrier to the shipper accounts for “elimination of double marginalization” (EDM) incentives from the merger.

¹¹⁴ The post-merger equilibrium division of \$315 is obtained using the formula in Moresi et al., *supra* note 28.

\$395 (i.e., $\$80 + \315 for the interline segment) and in principle could offer a through rate between \$395 and \$400. It would have the rational incentive to offer a through rate of just below \$400, say a rate of \$399 (or even \$399.99). This is because it would properly anticipate that the merged firm was offering a single-line rate of \$400. Thus, the independent carrier could offer a rate of \$399 (or \$399.99) to the shipper and still win the movement. As a result, the shipper would pay a total through rate of virtually \$400.

To summarize, the vertical merger harms the shipper. The shipper pays a total through rate of \$400 if the cost realization of the unintegrated competing carrier is \$85 or above, and a rate of virtually \$400 if the competing carrier's cost is less than \$85. These \$400 rates are equal to the shipper's reservation price, so the shipper obtains zero surplus. Thus, after the merger, the shipper always pays \$400 for rail transport (in which case it obtains no surplus).¹¹⁵ By contrast, the shipper sometimes does obtain a positive surplus in the pre-merger world as a result of the imperfect information. This occurs when the costs of the competing carriers are relatively low so that the winning rate is less than the shipper's reservation price.

The merger harms the shipper by improving the information available to the merged carrier and, in this numerical example, gives the merged carrier an incentive to foreclose the independent carrier by raising the interline fee from \$283.33 to \$315.¹¹⁶ Post-merger, the rate paid by the shipper will never be less than \$400 (or \$399.99). The higher rate resulting from the merger also leads the profits of the monopoly carrier and its merger partner to rise, relative to their pre-merger profits.

¹¹⁵ In this numerical example, the highest cost realization of a competing carrier is \$150 and the cost of the monopoly carrier is \$150, and therefore the maximum total cost is \$300, which is smaller than the shipper's reservation price of \$400. It follows that, post-merger, the shipper always obtains at least one bid at \$400 (from the merged carrier). Moresi et al., *supra* note 28, also consider situations where the maximum total cost is higher than the shipper's reservation price, in which case post-merger the shipper sometimes does not obtain any bid and must use an alternative transport mode.

¹¹⁶ In general, the division quoted to the independent carrier can increase or decrease post-merger. See Moresi et al., *supra* note 28, Proposition 3. However, the shipper is nonetheless always harmed.

Appendix C. Equilibrium Simulation Model With Upstream Monopoly and Differentiated Products, Downstream Duopoly: Take-It-or-Leave-It Offers

This technical appendix describes the first equilibrium simulation model.

C.1. Description of the Merger Model

In the model, there are two rail transport segments. The monopoly segment is served by a single monopolist carrier, referred to as Carrier A. The competitive segment is served by two competing carriers, referred to as Carriers X and Y. Shippers use these carriers for their through movements. There are thus two competing rail options for a shipper. One option is to use Carriers A and X, and the other option is to use Carriers A and Y. The model assumes that shippers view these two options as non-homogeneous, differentiated transport services.

In the pre-merger market, Carriers A, X, and Y each sets its rate to maximize its own profit. The model formally assumes through pricing both pre-merger and post-merger.¹¹⁷ It further assumes that Carrier A quotes divisions for its segment to the two competing Carriers X and Y. Given these divisions offered by Carrier A, the competing Carriers X and Y offer through rates to shippers.

In the post-merger market, Carriers A and X operate as a single vertically-integrated Carrier A/X, that sets a single-line rate to the shipper and a division to Carrier Y, in order to maximize its total profits from the two segments. The model assumes that Carrier A/X quotes a division for its monopoly segment to Carrier Y, and then the two Carriers A/X and Y compete by offering through rates to the shipper.¹¹⁸

There are two common technical interpretations of shipper demand in this model. One interpretation is that there are numerous shippers with the same general disutility from price, but with idiosyncratic preferences for carriers, so that not all shippers select the same competing carrier. Under this interpretation, each of the two competing carriers faces a demand function that measures the total demand for its services and that depends on the two through rates set by both competing carriers. A second interpretation is that the carriers have imperfect information about the shipper's preferences. Under this interpretation, each of the two competing carriers faces a "demand function" or a winning probability function that measures the probability that

¹¹⁷ The model also captures Rule 11 pricing when the shipper obtains the rate on the monopoly segment before the competing carriers set their competitive quotes.

¹¹⁸ The model follows the basic approach in Das Varma & De Stefano, *supra* note 47. See also Domnenko & Sibley, *supra* note 47.

the carrier will be selected by the shipper and that depends on the two through rates offered to the shipper.¹¹⁹

In addition, there also are two technical interpretations of the structure of the shippers' bid requests and the associated bidding competition. One interpretation is that each shipper specifies the total volume it wants to ship, runs a "first-score" auction for all of its volume, and each of the two competing carriers submits a (sealed) bid for the shipper's entire volume.¹²⁰ Under this interpretation, each of the two competing carriers faces a winning probability function and rates are total payments for the specified volume. EDM here reflects the fact that a lower bid to the shipper leads to an increased probability of winning the shipper's business. Another interpretation is that each of the two competing Carriers X and Y (or A/X and Y after the merger) posts its unit rate (e.g., per carload) and then, based on the posted unit rates, a shipper with particular preferences for a volume of shipments chooses which carrier to use and how much volume to ship.¹²¹ Under this interpretation, each of the two competing carriers faces a demand function for its transport services that is "downward sloping" (such that a higher price yields lower demand), and rates are per unit of volume shipped.¹²²

The simulation model is run for many different values of the demand and cost parameters, so as to generate a range of pre-merger market shares (or winning probabilities) and prices, and a variety of merger effects on prices of rail transport services.¹²³

¹¹⁹ Quoting a lower rate increases the probability of winning.

¹²⁰ A first-score auction generalizes a first-price auction by allowing carriers to offer differentiated products and allowing shippers to choose the product with the highest score (i.e., utility net of price). A first-score auction where non-price product characteristics are fixed is equivalent to a Nash-Bertrand pricing game where shippers select only a single product, as is the case under a standard logit demand structure. See Nathan H. Miller, *Modeling the Effects of Mergers in Procurement*, 37 INT'L J. IND. ORG 201 (2014).

¹²¹ Under this interpretation, shippers' behavior is somewhat different than in the standard logit model since they choose both a carrier and a volume. (In the standard logit model, all shippers want to ship one unit and each shipper chooses a single carrier to transport that unit.) Nevertheless, the model assumes that the competing Carriers X and Y face demand functions that have a logit-like shape.

¹²² Post-merger, one can think of the monopoly carrier (Carrier A) transferring its service internally to the merger partner (Carrier X) at a nominal price equal to marginal cost, although the merger effects do not depend on the magnitude of this nominal transfer price.

¹²³ By contrast, Das Varma & De Stefano, *supra* note 47 consider only a single numerical example.

C.2. Description of the Simulation Analysis

The simulation model is formulated as a two-stage game:

Stage 1. Carrier A sets the divisions that Carriers X and Y must pay to Carrier A for transport services on Carrier A's monopoly segment. Carrier A sets the divisions to maximize its own profit. (Post-merger, Carrier A/X sets the division that Carrier Y pays for transport services on the monopoly segment. Carrier A/X maximizes its total profits, i.e., the total profits of former Carriers A and X.)

Stage 2. Carriers X and Y compete for the shippers' business by simultaneously setting through rates.¹²⁴ Each carrier seeks to maximize its own profit. (Post-merger, Carriers A/X and Y simultaneously set through rates. Carrier A/X sets its single-line rate to maximize its total profits, i.e., the total profits of former Carriers A and X.)

The pre-merger model is solved using backward induction. This involves deriving the equilibrium rates set by Carriers X and Y (in stage 2), for any given divisions set by Carrier A (in stage 1), and then deriving the equilibrium divisions, assuming that Carrier A correctly anticipates how changing the divisions would affect the through rates of the two competing carriers and hence their volumes of transport on the monopoly segment. The post-merger model also is solved in a similar way using backward induction.

The model assumes that shippers have heterogeneous preferences over the carriers' services. Following the railroad literature, the model assumes that carriers face demand functions (or winning probability functions) that have a logit structure.¹²⁵ The model further assumes that each shipper has three shipping options available: Carrier X and Carrier A; Carrier Y and Carrier A; and an alternative mode of transport for the entire through movement. Under the logit structure, the first two options are called the "inside goods" and the third option is called the "outside good."

The model captures the heterogeneous preferences of shippers by using the standard discrete choice modeling approach and applying it to a large number of different bidding competitions. Each bidding competition is different because there are many different through movements (e.g., different origins and destinations) and many different product categories. As discussed earlier, each bidding competition can be interpreted as involving either a large number of heterogeneous shippers or a single shipper with preferences that are unknown to the competing carriers. Thus, a

¹²⁴ The model assumes that Carriers X and Y engage in standard Bertrand-Nash competition with differentiated products and perfect information about each other's cost and demand functions.

¹²⁵ See Yanyou Chen, *Network Structure and Efficiency Gains from Mergers: Evidence from U.S. Freight Railroads*, Working paper (2021)

shipper may have a preference for Carrier X over Carrier Y, even if both carriers charge the same through rate, while a different shipper may have a preference for Carrier Y over Carrier X.¹²⁶

For each bidding competition, the utility of a shipper from using Carrier X or Carrier Y depends on (i) a demand “fixed effect” that is specific to the carrier (V_X or V_Y) and is the same for all shippers; (ii) the through rate charged by the carrier (p_X or p_Y); (iii) a “price coefficient” (b) that is the same for all shippers and captures the shippers’ marginal utility of income and affects the elasticity of demand faced by the carriers; and (iv) an idiosyncratic preference shock (e_{jX} or e_{jY}) that captures each shipper’s personal preferences. The utility from using the outside good is, without loss of generality, normalized to a shock e_{j0} (i.e., the systematic component of the utility for the outside good, which is common across shippers, is normalized to zero).

The underlying demand structure can be summarized as follow:

- The utility of shipper j from using Carrier X is given by: $U_{jX} = V_X - b \cdot p_X + e_{jX}$
- The utility of shipper j from using Carrier Y is given by: $U_{jY} = V_Y - b \cdot p_Y + e_{jY}$
- The utility of shipper j from using the outside good is given by: $U_{j0} = e_{j0}$

The model is solved for the following parameter values in order to generate a very broad range of results:

- Three possible values for each of the two fixed effects V_X and V_Y (i.e., 8, 12, and 16);
- Three possible values for the price coefficient b (i.e., 0.05, 0.075, and 0.1);
- Three possible values for each of the two unit costs of production incurred by the two competing Carriers X and Y (i.e., 20, 25, and 30).
- Three possible values for the unit cost of production incurred by the monopoly Carrier A (i.e., 5, 7.5, and 10).
- The “preference shocks” $\{e_{jX}, e_{jY}, e_{j0}\}$ are distributed over $[-\infty, +\infty]$ with Gumbel (extreme value) distribution and are independent of each other.¹²⁷

¹²⁶ See Steven T. Berry, *Estimating Discrete-Choice Models of Product Differentiation*, 25 RAND J. ECON. 242 (1994); Jeffrey M. Perloff & Steven C. Salop, *Equilibrium with Product Differentiation*, 52 REV. ECON. STUD. 107 (1985); Simon P. Anderson, André De Palma, & Jacques-François Thisse, *Demand for Differentiated Products, Discrete Choice Models, and the Characteristics Approach*, 56 REV. ECON. STUD. 21 (1989).

¹²⁷ This is a standard assumption. See, e.g., Gregory J. Werden and Luke M. Froeb, *Unilateral Competitive Effects of Horizontal Mergers*, in Paolo Buccirossi (ed.), *ADVANCES IN THE ECONOMICS OF COMPETITION LAW* (2006).

It follows that the simulation analysis comprises a total of 729 different combinations of the demand and cost parameters (i.e., $3^6 = 729$). Each combination can be thought of as corresponding to a different bidding or price competition.

C.3. Simulation Model Results

The simulation model generates a sample of pre-merger equilibrium outcomes (“pre-merger bidding or price competitions”). For each pre-merger outcome, the simulation model computes the post-merger equilibrium outcome and calculates the merger effects on prices.

The simulation results can be summarized as follows. These results are then illustrated in the Figures below.

- a. Result 1: The merger of Carriers A and X always leads the vertically-integrated Carrier A/X to increase the division (W_Y) charged to the unintegrated Carrier Y.
- b. Result 2: The merger of Carriers A and X always leads to an increase in the through rate (P_Y) that carrier Y charges to shippers.
- c. Result 3a: The merger of Carriers A and X tends to lead to an increase in the through rate (P_X) that the merged Carrier A/X charges to shippers when the pre-merger volume share (S_X) of merging Carrier X is less than about 25%, and often also when that share is in the 25-40% range.
- d. Result 3b: The merger of Carriers A and X tends to lead to a decrease in the through rate (P_X) that the merged Carrier A/X charges to shippers when the pre-merger volume share (S_X) of the merging Carrier X exceeds about 40%, and sometimes also when that share is in the 25-40% range.

The following Figures show these results. Each dot represents a different bidding or pricing competition (with a different set of cost and demand parameters).

Figure C1 shows (on the vertical axis) the post-merger percentage changes in the division (W_Y) charged to the unintegrated Carrier Y for all the various values of the pre-merger equilibrium volume share (or winning probability) of merging Carrier X implied by the model (on the horizontal axis).¹²⁸ To make it easier to read, Figure C2 shows the same results but restricts attention to bidding or pricing competitions where Carrier X has a pre-merger equilibrium volume share (or winning probability) smaller than or equal to 50%. Figure C3 and Figure C4

¹²⁸ The shares (or winning probabilities) are calculated excluding the outside good.

respectively show the post-merger percentage changes in the through rates (P_Y and P_X) that the unintegrated Carrier Y and the merged Carrier A/X charge to shippers.

Figure C1

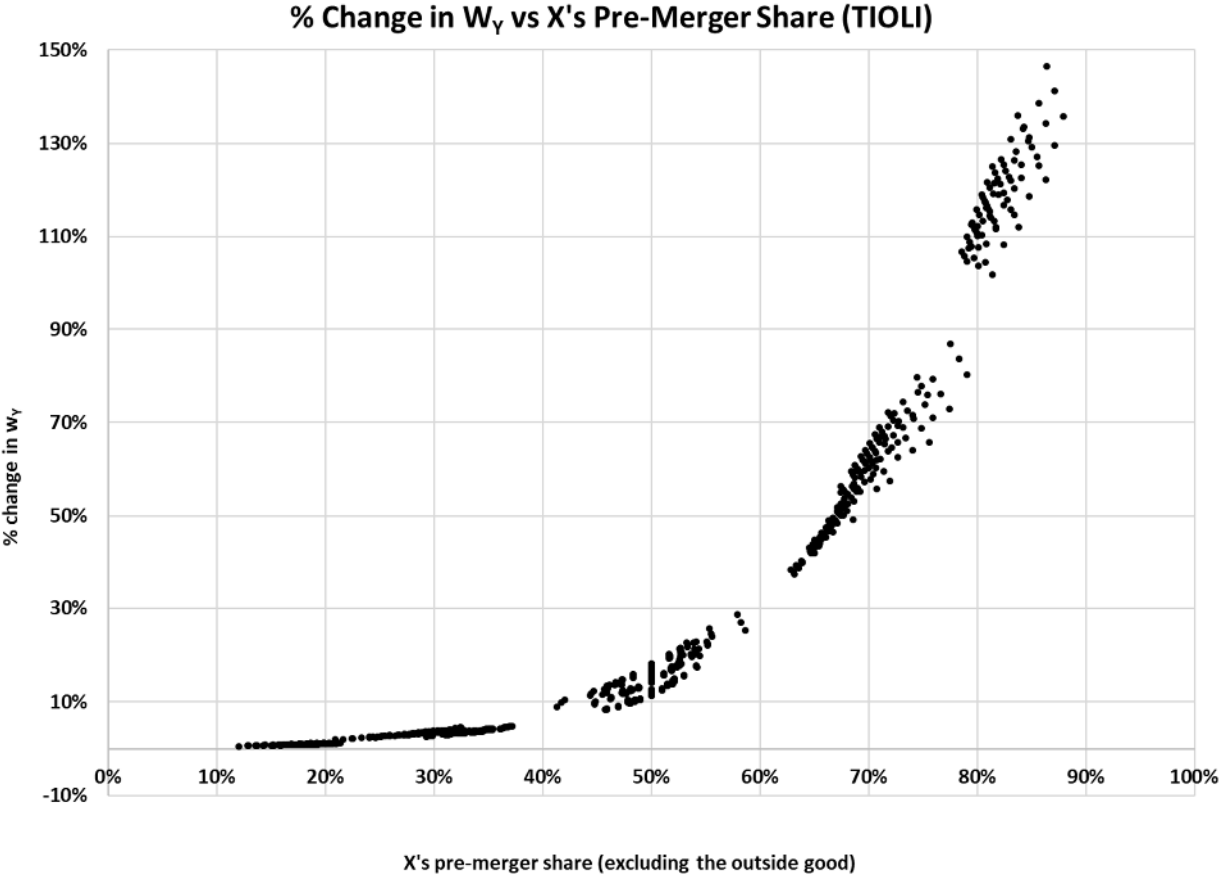


Figure C2

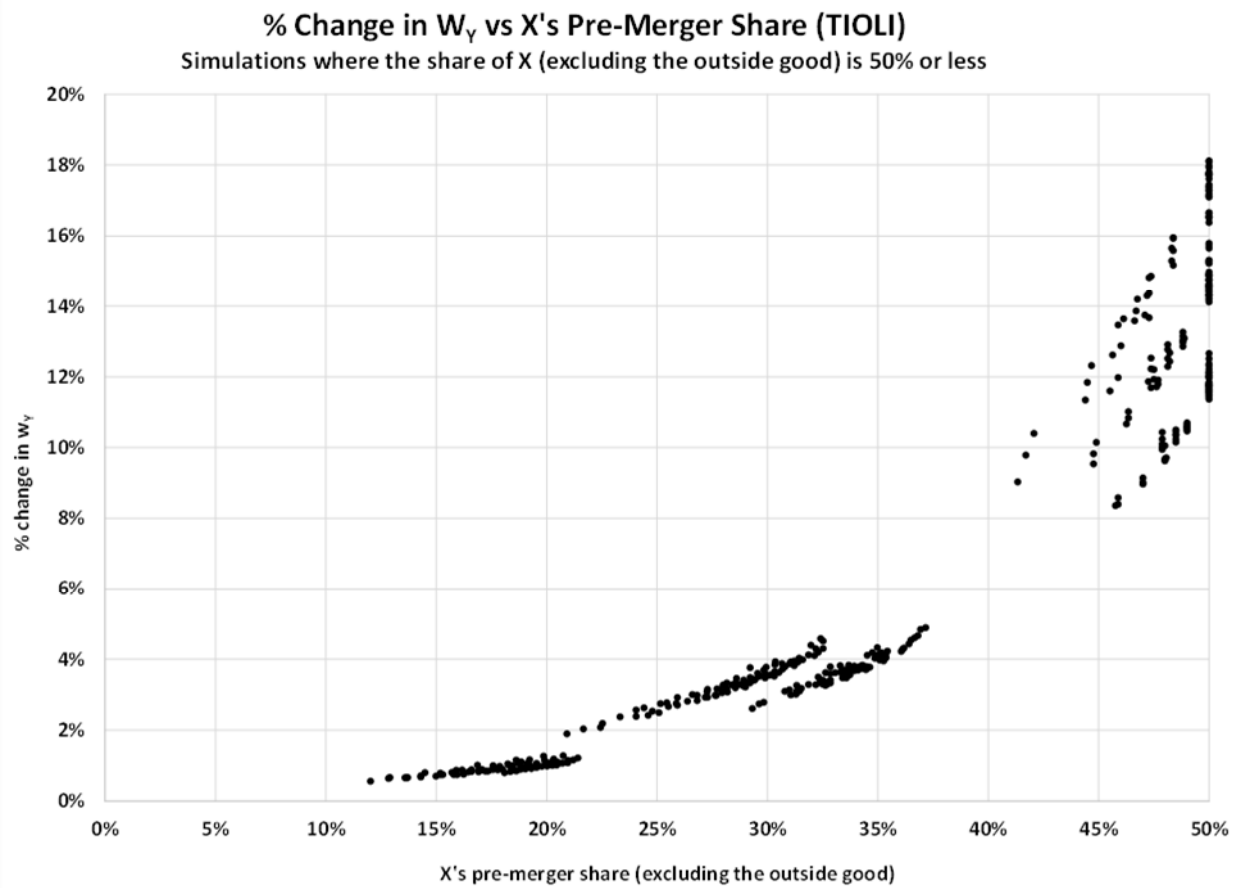


Figure C3

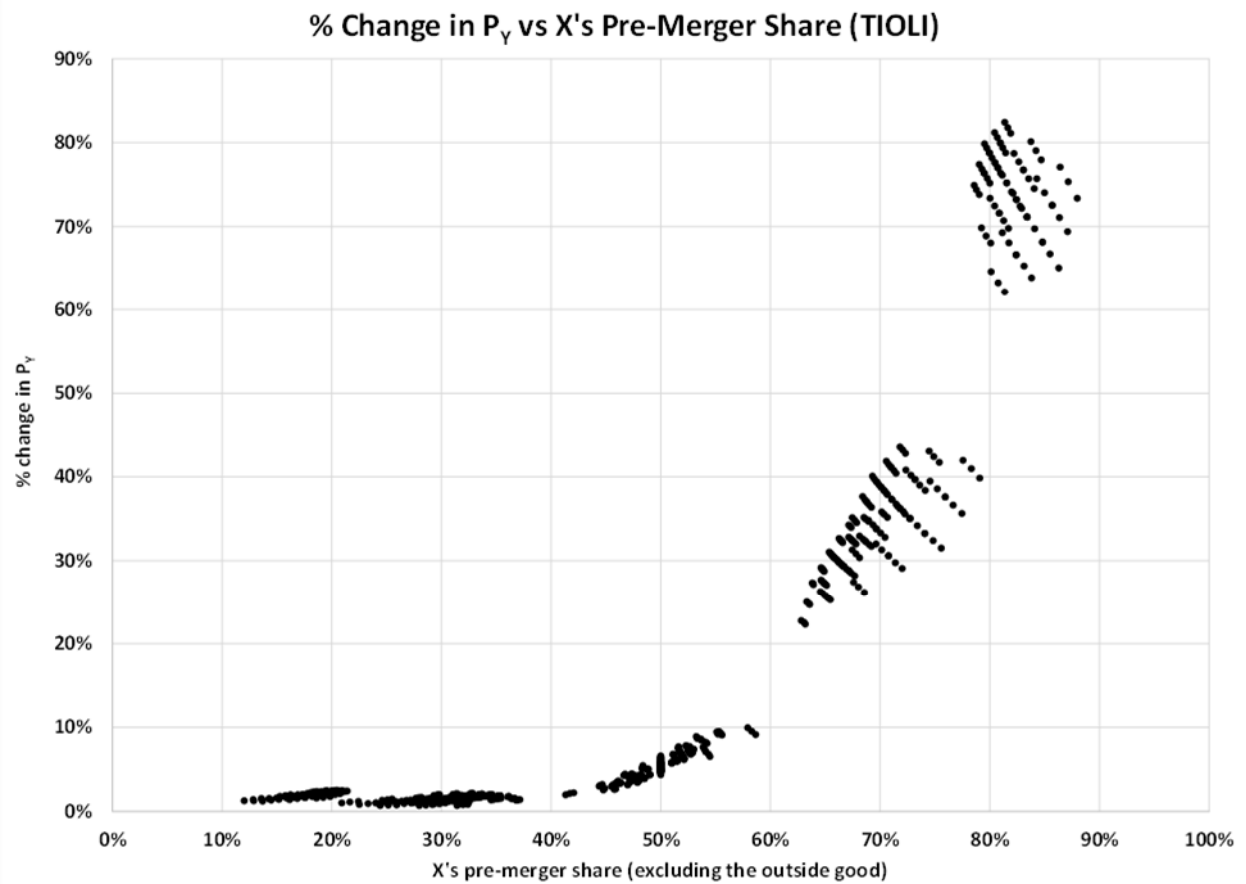
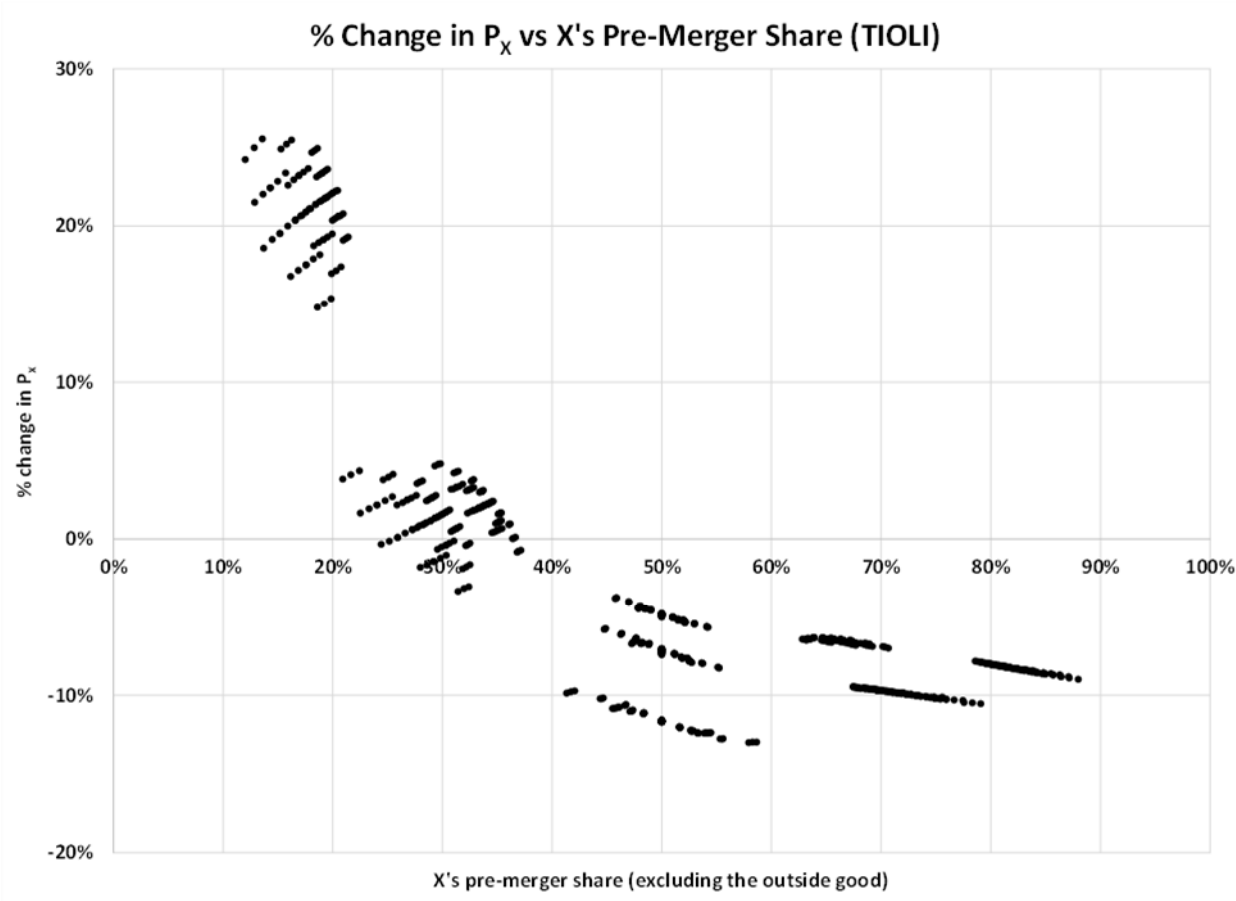


Figure C4



Appendix D. Equilibrium Simulation Model With Upstream Monopoly and Differentiated Products, Downstream Duopoly: Inter-Carrier Negotiations

This appendix describes the variant of the equilibrium simulation model described in Appendix C with inter-carrier negotiations. Since many assumptions are the same in the two models, I will focus mainly on the differences between the models.

D.1. Description of the Merger Model

In the pre-merger market, Carriers A and X negotiate the division for Carrier X's through movements, and at the same time Carriers A and Y negotiate the division for Carrier Y's through movements. Given these negotiated divisions, the competing Carriers X and Y offer through prices to shippers.

In the post-merger market, Carriers A/X and Y negotiate the division for Carrier Y's through movements, and then the two Carriers A/X and Y compete by offering through rates to the shipper.

D.2. Description of the Simulation Analysis

The simulation model is formulated as a two-stage game:

Stage 1. Carrier A simultaneously negotiates bilaterally with each of Carriers X and Y over the division for each carrier's through movements. (Post-merger, Carriers A/X and Y negotiate the division for Carrier Y's through movements.) The model assumes that negotiating carriers have equal bargaining power.¹²⁹

Stage 2. Same as in Appendix C.

The pre-merger model is solved using backward induction. This involves deriving the equilibrium rates set by Carriers X and Y (in stage 2), for any given divisions negotiated between Carrier A and Carriers X and Y (in stage 1), and then deriving the equilibrium divisions negotiated among the three carriers, assuming that all three carriers correctly anticipate how changing the divisions would affect the through rates of the two competing carriers and hence

¹²⁹ I use the standard Nash-in-Nash bargaining assumption. See, for example, Allan Collard-Wexler, Gautam Gowrisankaran, and Robin S. Lee, "Nash-in-Nash" Bargaining: A Microfoundation for Applied Work, 127 J. POL. ECON. 163(2019).

their volumes of transport on the monopoly segment and the competitive segment. The post-merger model also is solved in a similar way using backward induction.

The model is solved for the same sets of parameter values as in Appendix C.

D.3. Simulation Model Results

The simulation model generates a sample of pre-merger equilibrium outcomes (“pre-merger bidding or price competitions”). For each pre-merger outcome, the simulation model computes the post-merger equilibrium outcome and calculates the merger effects on prices.

The simulation results can be summarized as follows. These results are then illustrated in the Figures below.

- Result 1: The merger of Carriers A and X always leads to the vertically-integrated Carrier A/X negotiating a higher division (W_Y) with the unintegrated Carrier Y.
- Result 2: The merger of Carriers A and X always leads to an increase in the through rate (P_Y) that carrier Y charges to shippers.
- Result 3: The merger of Carriers A and X almost always leads to an increase in the through rate (P_X) that the merged Carrier A/X charges to shippers.

The following Figures show these results.

Figure D1 shows (on the vertical axis) the post-merger percentage changes in the division (W_Y) negotiated with the unintegrated Carrier Y for all the various values of the pre-merger equilibrium volume share (or winning probability) of merging Carrier X implied by the model (on the horizontal axis). Figure D2 shows the same results but restricts attention to bidding or pricing competitions where Carrier X has a pre-merger equilibrium volume share (or winning probability) smaller than or equal to 50%. Figure D3 and Figure D4 respectively show the post-merger percentage changes in the through rates (P_Y and P_X) that the unintegrated Carrier Y and the merged Carrier A/X charge to shippers.

Figure D1

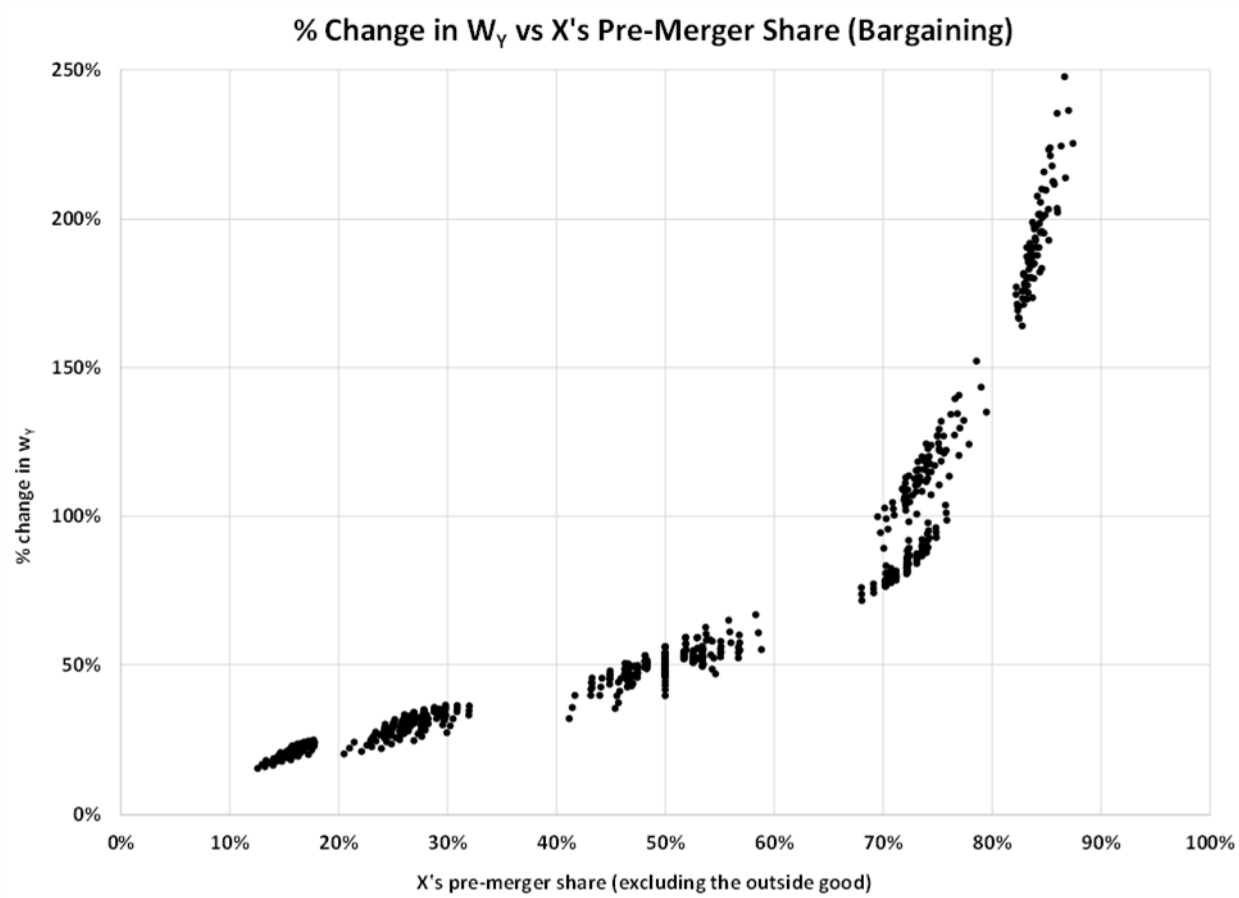


Figure D2

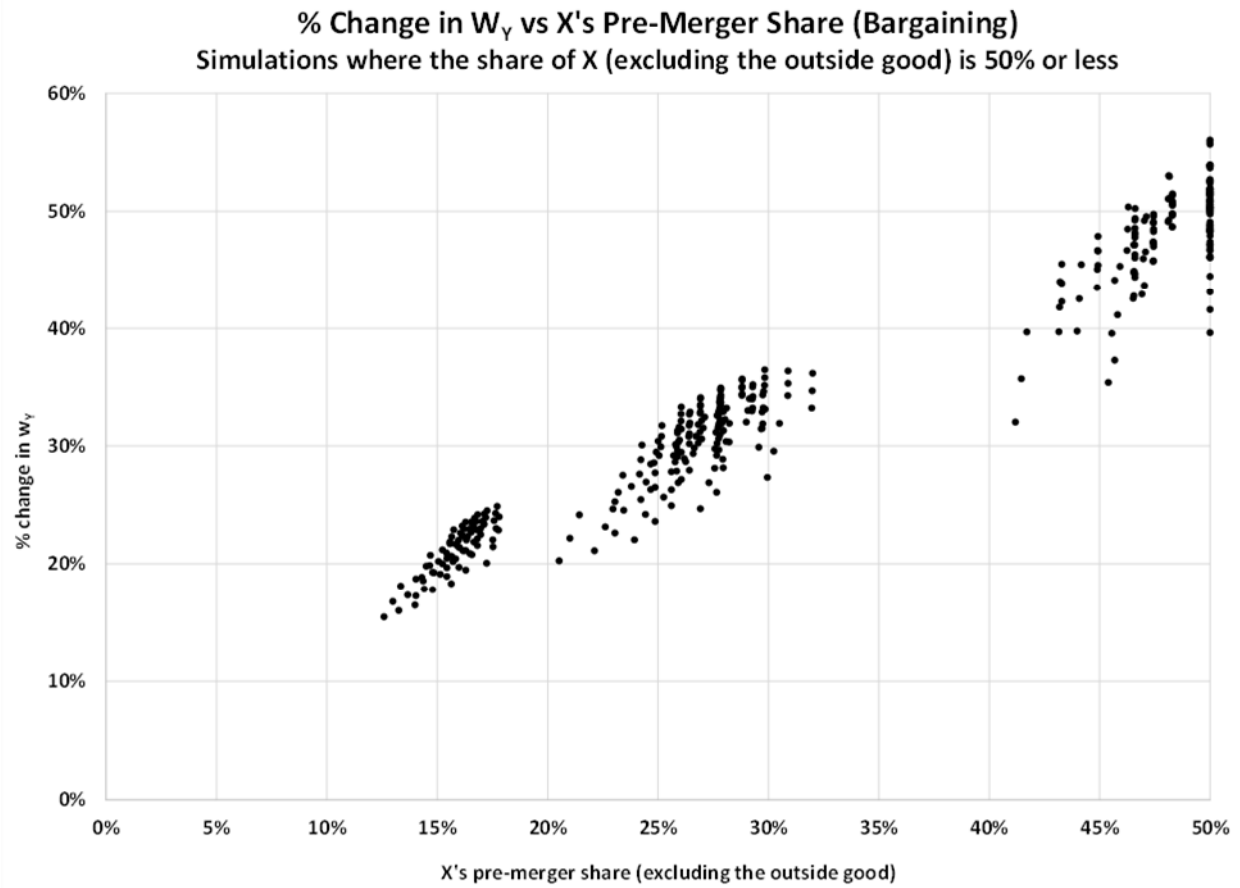


Figure D3

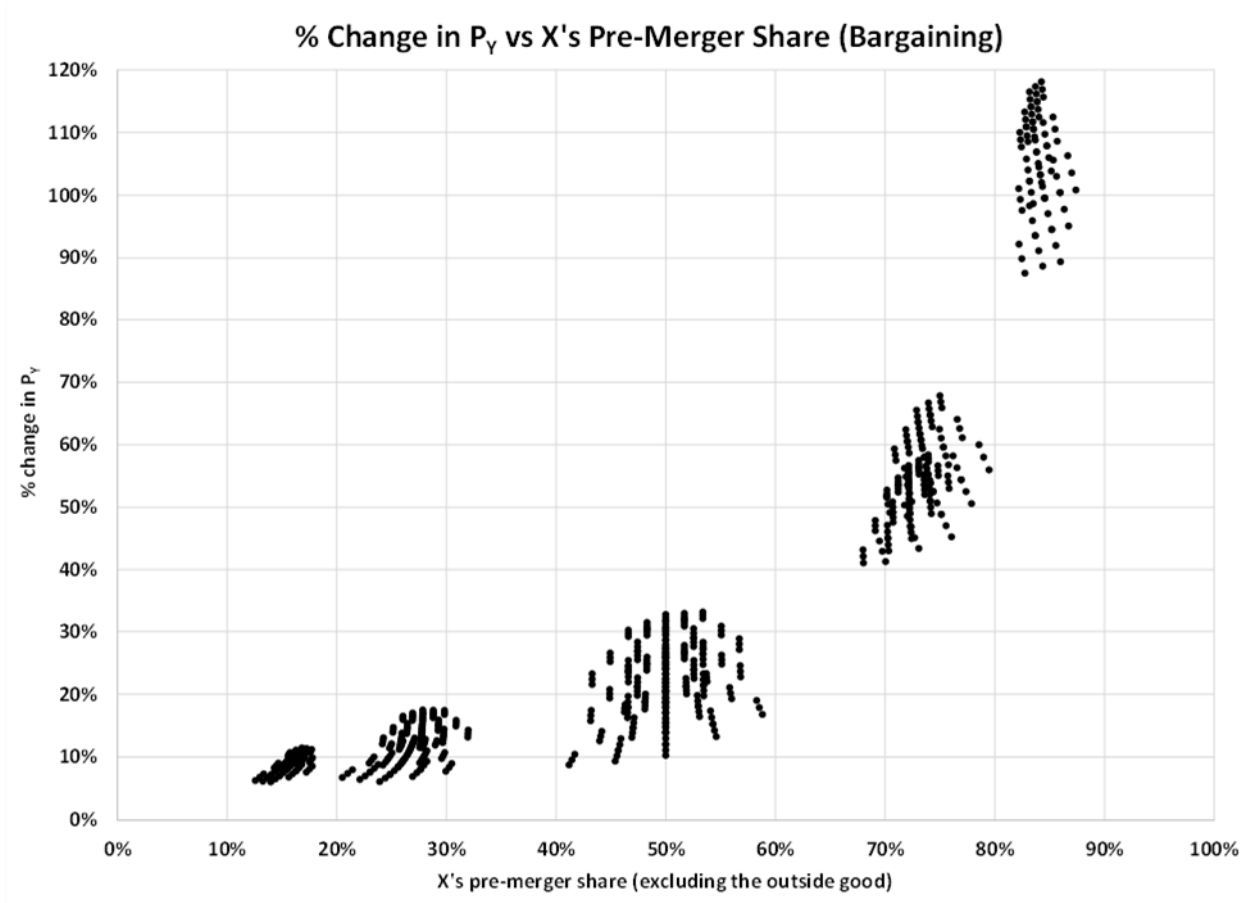
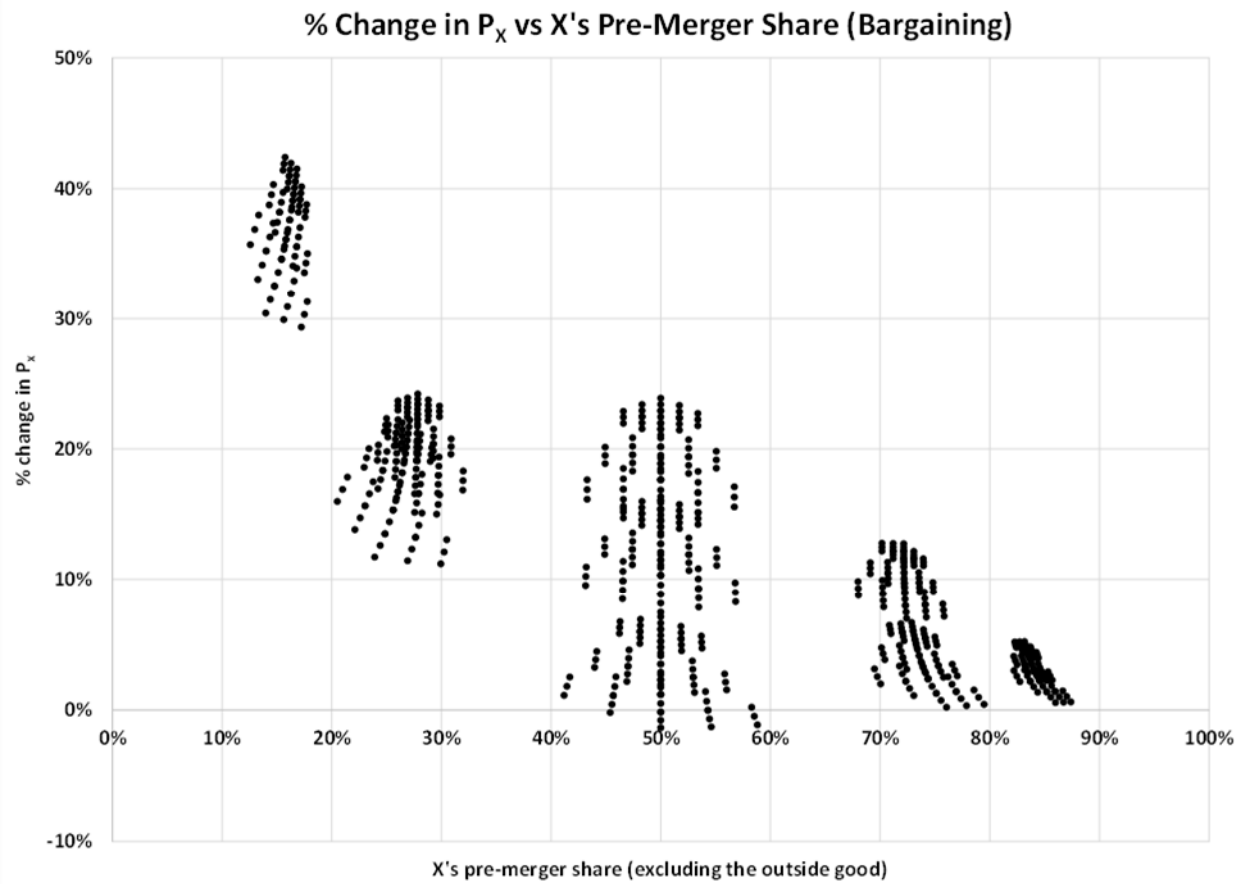


Figure D4



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Exhibit 3

Before the Surface Transportation Board

302369

STB Docket No. EP 766

**Joint Petition for Rulemaking—Annual Revenue Adequacy
Determinations**

ENTERED
Office of Proceedings
May 17, 2021
Part of
Public Record

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Dated: May 17, 2021

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The American Chemistry Council, American Fuel & Petrochemical Manufacturers, Corn Refiners Association, National Grain and Feed Association, The Chlorine Institute, The Fertilizer Institute, and The National Industrial Transportation League (collectively, Joint Shippers) file these comments in response to the Surface Transportation Board’s decision served on December 30, 2020, in docket EP 766 seeking public comment on a petition filed on September 1, 2020, by Union Pacific Railroad Company (UP), Norfolk Southern Railway Company (NS), and the U.S. rail operating affiliates of Canadian National Railway Company (CN) (collectively, Joint Carriers) seeking a rulemaking for the purpose of changing the Board’s procedures for determining the revenue adequacy of Class I rail carriers. These comments are supported by the attached verified statement of G. Bennett Stewart, III (“Stewart V.S.”). Mr. Stewart has spent the past 40 years working on practical applications of the concept of economic profit through a valuation and management framework that he developed, called EVA or economic value added.

I. Introduction and Summary.

In their Petition, Joint Carriers propose to revamp the Board’s revenue-adequacy methodology in such a way that no railroad would be considered revenue adequate unless it is more profitable than half the S&P 500 firms (less railroads, financials, and real estate firms). While Joint Carriers claim this will provide the Board with a more accurate assessment, the proposal would produce distorted and implausible results. It would turn revenue adequacy into a measure of superstar financial health that half of the firms in the S&P 500—a curated collection of top-

performing and high-potential firms—would fail to achieve. Moreover, the proposal would cause the Board to view all Class I railroads as woefully revenue inadequate today and likely for years to come, despite real-world financial data showing that Class I railroads are attracting investment and earning strong returns. The proposal represents a radical departure from the Board’s established revenue-adequacy determinations without any sound statutory or economic rationale

Ironically, within months of Joint Carriers filing the Petition, multiple Class I railroads have applied to the Board to acquire other railroads, in what would be the largest railroad mergers in over a decade.¹ One proposed merger involves Canadian Pacific Railway (CP) acquiring Kansas City Southern (KCS)—both are railroads that the Board historically has deemed revenue inadequate. CP’s proposal triggered a competing bid by one of the Joint Carriers, CN, that raised the substantial premium CP has agreed to pay for KCS’s stock by a full 21%.² CN has since sweetened its bid, winning over KCS’s board of directors.³ Clearly, Class I

¹ Notice of Intent, *Canadian Nat’l Ry.—Control—Kan. City S. Ry.*, FD 36514 (STB Apr. 20, 2021); Notice of Intent, *Canadian Pac. Ry.—Control—Kan. City S.*, FD 36500 (STB Mar. 22, 2021); Application, *CSX Corp.—Control & Merger—Pan Am Systems, Inc.*, FD 36472 (STB Feb. 25, 2021).

² Press Release, Canadian Nat’l Ry., CN Makes Superior Proposal to Combine With Kansas City Southern (Apr. 20, 2021), <https://www.cn.ca/en/news/2021/04/cn-makes-superior-proposal-to-combine-with-kansas-city-southern/>.

³ Press Release, Canadian Nat’l Ry., CN Proposal Deemed Superior by Kansas City Southern (May 13, 2021), <https://www.cn.ca/en/news/2021/05/cn-proposal-deemed-superior-by-kansas-city-southern/>.

railroads do not seem to have any reservations about whether investments in their industry will produce adequate returns.⁴

Simply put, the Board's current revenue-adequacy methodology provides ample protection for railroads' financial needs, consistent with promoting a safe and efficient rail transportation system. As explained in Part II below, the railroad industry is thriving, and now is not the time to focus on how much more money Class I railroads should be allowed to earn through their differential pricing of captive traffic.⁵ The Board should instead prioritize its existing rulemakings to enhance rail-to-rail competition and make rate-reasonableness review more accessible and meaningful to rail shippers. Focusing on these rulemakings will promote a healthy, efficient, and competitive rail network, providing greater benefits than adjustments to a revenue-adequacy methodology that is economically sound and accurately depicts the financial health of the Class I railroads.

These comments focus specifically on Joint Carriers' Comparison Proposal, under which they propose that a railroad is revenue adequate only if its return on investment (ROI) less the railroad industry cost of capital (COC) exceeds the ROI

⁴ Joint Carriers suggest that railroads will invest internally generated funds outside the industry if they cannot earn a competitive return from investing internally. (Pet. 46-47.)

⁵ The ability of the rail industry to differentially price captive traffic exists precisely because of that captivity. An important function of the Board's revenue-adequacy determinations is to inform the Board about when it should refrain from exercising its regulatory powers to protect captive traffic.

less COC of the median S&P 500 firm (less railroads, financials, and real estate companies).⁶

Part III explains that the Comparison Proposal is inconsistent with the statutory revenue-adequacy factors at 49 U.S.C. § 10704(a)(2).

- The comparison to the median S&P 500 firm or any other threshold has no bearing on whether a railroad is earning a “reasonable and economic profit or return,” can raise “needed equity capital,” and can “attract and retain capital in amounts adequate to provide a sound transportation system.”⁷
- The Comparison Proposal requires a positive “economic profit,” which is not required under the statutory definition of revenue adequacy and would create economic inefficiencies.
- The Comparison Proposal would transform the revenue-adequacy determination into a measure of market power, which is not required under the statutory definition of revenue adequacy and would conflict with the broader statutory scheme.

Part IV explains that the Joint Carriers’ criticisms of the Board’s revenue-adequacy methodology are incorrect, and the methodology produces conservative results because they underestimate the true level of revenue adequacy.

⁶ (Pet. 20-21.)

⁷ 49 U.S.C. § 10704(a)(2).

- The use of book values ensures that railroads will be allowed—but not guaranteed—to earn returns that cover the cost of future investments while providing a competitive return.
- The Board’s use of the railroad industry cost of capital satisfies all the factors of revenue adequacy under 49 U.S.C. § 10704(a)(2) and, thus, enables railroads to effectively compete for capital.
- The Board overstates the railroad industry cost of capital and, thus, sets the revenue-adequacy threshold above the minimum required under 49 U.S.C. § 10704(a)(2).
- Valid supplemental indicators of revenue adequacy corroborate the Board’s recent revenue-adequacy findings.

II. Redefining the revenue-adequacy methodology should not be a high priority.

Despite the past decade-plus of strong financial performance by Class I railroads, Joint Carriers are calling on the Board to redefine its revenue-adequacy methodology in a way that would, to the surprise of no one, portray all Class I railroads as woefully revenue inadequate today and likely for years to come. Finding ways to change the revenue-adequacy methodology to recast financially sound Class I railroads as revenue inadequate should not be the Board’s priority. Instead, the Board should focus on existing rulemakings that would give captive shippers meaningful access to the Board’s unreasonable rate remedies and to competition.

A. The rail industry is thriving financially under the current standard.

The financial health of the freight-rail industry has flourished even for those rail carriers that the current standard has deemed revenue inadequate. The stock prices of Class I railroads have been rising, outpacing the S&P 500 index. Railroads are making substantial investments in their businesses while returning billions of dollars to their shareholders. This is not the struggling freight-rail industry that existed in 1976, when Congress established the revenue-adequacy standard.⁸

Since the Great Recession, railroad stock prices have far outpaced the S&P 500 index. During this period, the stock price of CN, the least profitable Class I railroad under the revenue-adequacy standard, increased about twice as fast as the S&P 500 index. The publicly traded Class I railroads with the highest percentage gains—UP, CSX, and KCS, rose approximately 2.5 times as fast as the S&P 500.

Railroads / SP 500 Index	Percent Increase 12/4/2007 to 3/19/2021⁹
UP	665%
CSX	659%
KCS	654%
CP	599%
NS	509%
CN	485%
S&P 500 Index	268%

⁸ Congress established the revenue-adequacy standard in the Railroad Revitalization and Regulatory Reform Act of 1976 (4R Act), Pub. L. 94-210 § 205, 90 Stat. 31, 41 (1976).

⁹ Based on closing prices reported by Yahoo!Finance. The National Bureau of Economic Research identifies December 4, 2007 as the start of the Great Recession. Nat'l Bureau of Econ. Research, US Business Cycle Expansions and Contractions, <https://www.nber.org/research/data/us-business-cycle-expansions-and-contractions> (last visited May 17, 2021).

Even over just the past 5 years, railroad stock prices have kept pace with or exceeded the gains of the S&P 500 index. The following table shows that, during this period, all publicly traded Class I railroads except CN are beating the S&P 500 index by at least 63%. CN trails the S&P 500 index by just 3%.

Railroads / S&P 500 Index	Percent Increase Over Last 5 Years¹⁰
CSX	336%
NS	310%
CP	283%
KCS	256%
UP	254%
S&P 500 Index	191%
CN	188%

Although increasing stock prices do not tell the full picture of a railroad’s financial health, outpacing the S&P 500 index over the long term cannot be ignored. At the very least, it confirms the conservatively high bar that the Board has set for revenue adequacy under the current standard.

Beyond stock prices, other measures show that the railroad industry is financially strong.

In UP’s most recent annual report, its chairman exclaims that its “operating ratio was a record 59.9%,” locomotive and workforce productivity improved 14% and 11% respectively; “Union Pacific returned \$6.3 billion to our shareholders in 2020,”

¹⁰ Based on closing prices reported by Yahoo!Finance for March 18, 2016 and March 19, 2021.

including \$2.6 billion in dividends which he noted were “maintained . . . through the economic downturn;” and UP invested \$2.84 billion in its business.¹¹

NS’s most recent annual report leads with a “Financial Highlights” page showing its total shareholder returns outpacing that of the S&P 500 index by a wide margin since December 2015.¹² In the report, the chairman tells shareholders that NS “attained a record low 61.8% operating ratio” and “funded \$1.5 billion in capital improvement projects.”¹³ He also explained that “our board approved dividend distributions of \$960 million, a 1% increase over the previous year,”¹⁴ in which NS raised dividends by 18% for a total payout of \$949 million.¹⁵ NS also “repurchased more than \$1.4 billion of the company’s shares.”¹⁶ In NS’s 2019 annual report, which describes NS’s performance leading into the COVID-19 pandemic, the chairman explained that NS “saw record income from railway operations as well as growth in net income and earnings per share.”¹⁷

In CN’s most recent annual report, its president and CEO explained that CN “annually invest[s] approximately 20% of [its] revenues” in its business and, “despite the financial impacts of the global pandemic, we held our capital budget

¹¹ Union Pacific Corp., Annual Report (Form 10-K), at 3-4 (Feb. 5, 2021).

¹² Norfolk Southern Corp., Annual Report (Feb. 4, 2021).

¹³ Norfolk Southern Corp., Annual Report 1, 4 (Feb. 4, 2021).

¹⁴ Norfolk Southern Corp., Annual Report 4 (Feb. 4, 2021).

¹⁵ Norfolk Southern Corp., Annual Report 4 (Feb. 6, 2020).

¹⁶ Norfolk Southern Corp., Annual Report 4 (Feb. 4, 2021).

¹⁷ Norfolk Southern Corp., Annual Report 1 (Feb. 6, 2020).

fairly steady and invested \$2.9 billion [CDN] back into the business.”¹⁸ The report also explains that CN increased its quarterly dividend per share by 7% and paid \$1.6 billion CDN in dividends in 2020 and plans to invest approximately \$3 billion CDN in its capital program in 2021.¹⁹ CN’s 2019 annual report, which describes its financial performance leading into the COVID-19 pandemic, states that CN returned \$3.2 billion CDN to shareholders in dividends and share repurchases, achieved its 24th consecutive increase in annual dividends, increased dividends an average of 16% each year since 2000, and has repurchased \$23 billion CDN in shares since 2000.²⁰ CN’s annual report also explains that CN invested \$3.9 billion CDN in its business,²¹ and its US subsidiaries maintain sufficient cash to meet their respective operational requirements.²²

Nowhere in their latest annual reports did UP, NS, or CN identify their revenue-adequacy figure reported by the Board. To the extent these reports made comparisons to the S&P 500, these comparisons were on stock price or total shareholder return.

It is not just railroad executives who have been claiming that railroads are in good financial health. Warren Buffett, one of the world’s most iconic investors and

¹⁸ Canadian National Ry., Annual Report at iv (2021).

¹⁹ Canadian National Ry., Annual Report 8 (2021).

²⁰ Canadian National Ry., Annual Report at iv (2020).

²¹ Canadian National Ry., Annual Report 6 (2020).

²² Canadian National Ry., Annual Report 26 (2020).

chairman of Berkshire Hathaway Inc., which owns BNSF Railway, frequently praises BNSF. In his 2021 letter to shareholders, he called BNSF one of Berkshire’s four “jewels.”²³ In the same letter, Mr. Buffett explains that, despite BNSF making large investments in fixed assets and that BNSF “must spend whatever it takes to maximize safety and service throughout its vast system,”²⁴ “BNSF has paid substantial dividends to Berkshire.”²⁵ He also states that “BNSF . . . will require major capital expenditures for decades to come. The good news is that [it is] likely to deliver appropriate returns on the incremental investment.”²⁶

The robust financial status of the railroad industry is also reflected in the Board’s revenue-adequacy determinations. Four of the seven Class I railroads have been revenue adequate consistently over the past decade.²⁷ A fifth, CSX, has been revenue adequate the last two years, having been on the verge of revenue adequacy for the preceding eight years.²⁸

²³ Letter from Warren E. Buffet, Chairman of the Board, Berkshire Hathaway Inc., to Shareholders of Berkshire Hathaway Inc. 5-6 (Feb. 27, 2021).

²⁴ Letter from Warren E. Buffet, Chairman of the Board, Berkshire Hathaway Inc., to Shareholders of Berkshire Hathaway Inc. 13 (Feb. 27, 2021).

²⁵ Letter from Warren E. Buffet, Chairman of the Board, Berkshire Hathaway Inc., to Shareholders of Berkshire Hathaway Inc. 14 (Feb. 27, 2021).

²⁶ Letter from Warren E. Buffet, Chairman of the Board, Berkshire Hathaway Inc., to Shareholders of Berkshire Hathaway Inc. 13 (Feb. 27, 2021).

²⁷ Surface Transp. Bd., Economic Data, <https://prod.stb.gov/reports-data/economic-data/> (last visited May 17, 2021) (“Revenue Adequacy” tab).

²⁸ *Id.*

This shift to revenue adequacy reflects that the financial health of today's railroad industry looks nothing like it did approximately 40 years ago when Congress first required the Interstate Commerce Commission to determine revenue adequacy. By 1976, when Congress passed the Railroad Revitalization and Regulatory Reform Act defining revenue adequacy, "the industry was rolling to the brink of ruin, with infrastructure so deficient rail cars simply fell off tracks."²⁹ The Penn Central, which was the largest railroad and the sixth largest corporation at the time in the United States, had declared bankruptcy six years earlier, and its bankruptcy would hold the title of the largest U.S. bankruptcy until the Enron bankruptcy in 2001.³⁰ At least three Class I railroads were in bankruptcy reorganization, and one-third of Class I railroads were earning a negative return on investment.³¹ Class I railroads had accumulated over \$4 billion in deferred maintenance and delayed capital expenditures,³² and more than 47,000 miles of

²⁹ Ass'n of Am. R.Rs., *The Staggers Rail Act 40th Anniversary*, <https://www.aar.org/campaigns/the-staggers-rail-act-40th-anniversary/> (last visited May 17, 2021).

³⁰ Wayne Duggan, *This Day in Market History: Penn Central Bankruptcy*, Yahoo!Finance (June 21, 2018), <https://finance.yahoo.com/news/day-market-history-penn-central-180215022.html#:~:text=When%20the%20U.S.%20government%20refused,the%20largest%20in%20American%20history.>

³¹ U.S. Gen. Accounting Office, *Economic and Financial Impacts of the Staggers Rail Act of 1980* at 11 (1990).

³² *Id.*

track operated at reduced speeds because of unsafe conditions.³³ By 1980, when Congress enacted the Staggers Rail Act provisions requiring annual revenue-adequacy determinations and making revenue adequacy a factor in determining the reasonableness of rail rates,³⁴ the rail share of intercity freight had fallen from 75% in 1929 to 38%.³⁵

Thanks to the current revenue-adequacy standard and other regulatory reforms, Class I railroads have become Wall Street darlings. Their returns on investment are nearly three times higher than in the 1980s, shortly after Congress stepped in to save them from financial ruin.³⁶ They also have made tremendous improvements in efficiency and productivity, and have shed unnecessary infrastructure and equipment in part through mergers that have resulted in duopolies in the eastern and western halves of the United States. Today's railroads are thriving businesses.

³³ Ass'n of Am. R.Rs., *A Short History of U.S. Freight Railroads* 3 (2021), <https://www.aar.org/wp-content/uploads/2020/08/AAR-Railroad-Short-History-Fact-Sheet.pdf>.

³⁴ Staggers Rail Act of 1980, Pub. L. 96-448 §§ 201(a), 205(b)(1), 94 Stat. 1895, 1899, 1906 (1980).

³⁵ U.S. Gen. Accounting Office, *supra* note 31, at 30.

³⁶ Ass'n of Am. R.Rs., *Freight Railroads Under Balanced Economic Regulation* 2 (2021), <https://www.aar.org/wp-content/uploads/2020/08/AAR-Railroads-Under-Balanced-Economic-Regulation-Fact-Sheet.pdf>. Under the title "Better Financial Health," the Association of American Railroad's explains that "[r]eturn on investment, which had been falling for decades, was 4.4% in the 1980s, 7% in the 1990s, 8% from 2000 to 2009 and 12% from 2010 to 2019." *Id.*

B. The agency should prioritize pending rulemakings to enhance competition through competitive switching and make rate remedies more accessible to captive shippers.

While railroads were earning reputations as Wall Street darlings, shippers' access to competitive rail service has not improved and their ability to challenge unreasonable rates has deteriorated. The Board has two pending rulemakings to address these challenges: Ex Parte No. 711 (Sub-No. 1), *Reciprocal Switching*, which would promote competition through changes to the Board's competitive-switching rules; and Ex Parte No. 755, *Final Offer Rate Review*, which would make rate challenges more accessible to shippers by providing a new procedural mechanism for challenging rail rates. The Board should focus on completing these rulemakings, which both are at the final-rule stage, instead of considering unnecessary adjustments to how it measures railroad financial health.

The past decade has shown that the process for challenging unreasonable rail rates is generally unworkable. The Stand-Alone Cost methodology for challenging rates has been "too costly, too time consuming, and too unpredictable," especially for carload traffic.³⁷ While the Board has attempted to make rate review more accessible by adopting simplified methodologies, rate challenges under these methodologies are still too costly and complex.³⁸ Because of the high costs and

³⁷ *Total Petrochemicals & Refining USA, Inc. v. CSX Transp.*, NOR 42121, slip op. at 48 (STB served Sept. 14, 2016) (Begeman, Comm'r, dissenting).

³⁸ *See Final Offer Rate Review*, EP 755, slip op. at 2-4 (STB served Sept. 12, 2019).

complexity, few cases have been brought under these simplified methodologies, the last one nearly a decade ago.³⁹

Since many shippers lack an accessible mechanism for challenging unreasonable rail rates, the Board should expedite the completion of its Final Offer Rate Review (FORR) rulemaking. Prioritizing the rule would also be consistent with Congress's 2015 directive to the Board to establish simplified and expedited methods for determining the reasonableness of challenged rates.⁴⁰

In addition to lacking meaningful access to rate challenges, shippers have not seen improved access to competition. A key mechanism for accessing competition is competitive switching, which involves an incumbent carrier transporting a captive shipper's traffic to the nearest interchange point, where it switches the traffic to a competing carrier for a switching fee. A 1986 decision by the Interstate Commerce Commission effectively severed access to competitive switching by finding that relief under the Commission's then new competitive-switching rules required a finding that the incumbent carrier "has engaged or is likely to engage in conduct that is contrary to the rail transportation policy or is otherwise anticompetitive."⁴¹ Three years later, the agency stated that relief under the current standard "is available

³⁹ Surface Transp. Bd., *Rail Rate Cases at the STB*, <https://prod.stb.gov/wp-content/uploads/Rate-Case-List-11-19-2019.pdf> (last visited May 17, 2021).

⁴⁰ 49 U.S.C. § 10701(d)(3). In contrast, Congress has not issued a similar directive to revise the revenue-adequacy methodology despite multiple Board proceedings over the past few decades to review the methodology.

⁴¹ *Midtec Paper Corp. v. Chicago & N.W. Transp. Co.*, 3 I.C.C. 2d 171, 181 (1986).

for the classical categories of competitive abuse: foreclosure; refusal to deal; price squeeze; or any other recognizable form of monopolization or predation.”⁴² But in an industry with few participants, even fewer competitors, and high barriers to entry, there is no need for railroads to engage in such behavior to exert market power. This set the bar for competitive switching so high that only a handful of cases were ever filed, and none was successful.

The Board has proposed to make competitive switching more accessible in docket Ex Parte No. 711 (Sub-No. 1) by revising the standards for obtaining competitive switching so they do not effectively bar relief. Unfortunately, its efforts have stalled—the rulemaking proceeding has been dormant since the Board issued a proposed rule and received comments approximately 5 years ago.⁴³

Moving forward with issuing a final rule in Ex Parte No. 711 (Sub-No. 1) would not only enhance access to competitive switching, but also fulfill Congress’s intent “to allow, to the maximum extent possible, competition and the demand for services to establish reasonable rates for transportation by rail.”⁴⁴ Joint Carriers acknowledge that the Rail Transportation Policy (RTP) at 49 U.S.C. § 10101 reflects Congress’s intent “that competition be recognized as the best control on the ability of railroads to raise rates.”⁴⁵ The RTP also contains other pro-competition objectives

⁴² *Vista Chem. Co. v. Atchison, T. & S.F. Ry.*, 5 I.C.C. 2d 331, 335 (1989).

⁴³ *See Reciprocal Switching*, EP 711 (Sub-No. 1) (STB served July 27, 2016).

⁴⁴ 49 U.S.C. § 10101(1).

⁴⁵ (Pet. 9-10.)

that would be promoted through greater accessibility to competitive switching, including: minimizing Federal regulatory control over rail transportation,⁴⁶ ensuring effective competition and coordination between carriers,⁴⁷ reducing barriers to entry,⁴⁸ prohibiting predatory pricing and practices,⁴⁹ and avoiding undue concentrations of market power.⁵⁰ Competitive switching enhances competition by maximizing the route distance over which a second rail carrier can compete to transport traffic and, in some instances, permits competition to occur where it otherwise would be entirely foreclosed by the incumbent carrier's long-haul rights under the statute.⁵¹ It also can help address service issues by enabling traffic to avoid portions of the incumbent carrier's line where the problems exist.

The Board thus should direct its resources to completing the FORR and competitive-switching rulemakings instead of launching a new proceeding to redefine the standard of revenue adequacy. There is no rational justification for the Board to raise the already conservatively high revenue-adequacy bar for a financially thriving rail industry.

⁴⁶ 49 U.S.C. § 10101(2).

⁴⁷ 49 U.S.C. § 10101(4).

⁴⁸ 49 U.S.C. § 10101(7).

⁴⁹ 49 U.S.C. § 10101(12).

⁵⁰ *Id.*

⁵¹ Reciprocal switching is an express exception to a carrier's long-haul rights. *See* 49 U.S.C. § 10705(a)(2)(A).

III. The Comparison Proposal is inconsistent with the 49 U.S.C. 10704(a)(2) statutory factors for determining revenue adequacy.

The Joint Carriers tout the Comparison Proposal as providing a more accurate measure of whether a railroad is earning a “reasonable and economic profit or return (or both)” and can “rais[e] needed equity capital.”⁵² In their view, a railroad cannot satisfy these revenue-adequacy factors unless it is more profitable than the median S&P 500 firm.⁵³ But tying revenue adequacy to the profitability of the median S&P 500 firm would transform revenue adequacy into a standard of superstar financial health that half the firms in the S&P 500 (less railroads, financials, and real estate firms)—a collection of top-performing and highly valued firms—would be unable to attain.

The flaws with the Comparison Proposal do not end with the absurd results it would produce. The Comparison Proposal assumes that a “reasonable and economic profit or return (or both)” is an economic profit above zero.⁵⁴ This not only ignores the plain language of this statutory revenue-adequacy factor, but it also would allow railroads to produce higher returns than necessary to cover investors’ opportunity costs (i.e., what they could earn in other investments, adjusted for risk). Additionally, Joint Carriers have designed the Comparison Proposal to measure market power,⁵⁵ which is not required under the statutory revenue-adequacy factors

⁵² (Pet. 24.) *See* 49 U.S.C. § 10704(a)(2).

⁵³ (Pet. 28-29, 31-32.)

⁵⁴ (Pet. 27-28.)

⁵⁵ (Pet. 32.)

and is inconsistent with how Congress has addressed market power elsewhere in the ICC Termination Act of 1995 (ICCTA).⁵⁶

A. Comparing a railroad’s profitability to that of the median S&P 500 firm, or any other threshold firm, has no bearing on whether the railroad achieves the statutory definition of revenue adequacy and would produce erroneous results.

The profitability of the median S&P 500 firm, or any other firm, is an irrelevant and inaccurate measure of revenue adequacy. It has no basis in the statutory definition of revenue adequacy, which looks to promote a financially sustainable railroad industry rather than transform railroads into leading firms. And it is not economically justified, overlooking that railroads compete for capital with *all* firms based on whether they earn their cost of capital and that a firm’s profitability is highly dependent on its industry.

1. Congress defined revenue adequacy as whether a railroad can attract sufficient capital, not whether it is more profitable than half the S&P 500.

Nowhere did Congress suggest that railroads should outperform any firm, much less half the S&P500, to be revenue adequate. Congress defined the revenue-adequacy standard as whether a railroad could earn a reasonable and economic profit or return sufficient to attract necessary capital to maintain its operations. Specifically, it directed the Board to establish revenue levels that are “adequate, under honest, economical, and efficient management, for the infrastructure and investment needed to meet the present and future demand for rail services and to

⁵⁶ ICC Termination Act of 1995, Pub. L. 104-88, 109 Stat. 803 (1995).

cover total operating expenses, including depreciation and obsolescence, plus a reasonable and economic profit or return (or both) on capital employed in the business.”⁵⁷ It clarified that these revenue levels must “provide a flow of net income plus depreciation adequate to support prudent capital outlays, assure repayment of a reasonable level of debt, and permit the raising of needed equity capital, and cover the effects of inflation.”⁵⁸ It also stated that these revenue levels must “attract and retain capital in amounts adequate to provide a sound transportation system in the United States.”⁵⁹

The point of establishing the revenue-adequacy standard was not to make railroads leading firms. Congress instead established the revenue-adequacy standard to help railroads achieve financial sustainability after being under severe financial distress leading into the 1970s. And Congress’s description of revenue adequacy recognizes that the key to a financially sustainable railroad industry is being able to attract sufficient capital investment, not to be a financial superstar among all firms.

Despite the clear intent of Congress to promote financial sustainability through the revenue-adequacy standard, the Comparison Proposal would transform revenue adequacy into a measure of whether railroads are top financial performers. Under the Comparison Proposal, railroads would have to earn economic profits

⁵⁷ 49 U.S.C. § 10704(a)(2).

⁵⁸ 49 U.S.C. § 10704(a)(2)(A).

⁵⁹ 49 U.S.C. § 10704(a)(2)(B).

exceeding half the S&P500—a grouping of some of the most successful firms—to be deemed revenue adequate. That is like telling a high school student that she is not in adequate physical health unless she can outrun half the varsity cross-country team.

2. The median S&P 500 firm, or any other threshold firm, is an irrelevant benchmark for determining whether a railroad can compete for capital.

Railroads and other firms do not raise needed equity capital on the basis of whether they are more profitable than other firms, let alone the median S&P 500 firm. As Mr. Stewart explains, “railroads, like any other company, compete for capital against *all* other firms in the global market.”⁶⁰ Firms “win” this competition and raise needed capital by earning their cost of capital.⁶¹

A key economic principle is that a firm can attract sufficient investment if it produces returns that meet or exceed what an investor can reasonably expect to earn elsewhere, adjusted for risk. Mr. Stewart explains that investors will make capital available for *all* investments that will earn at least the same return as a risk-free investment plus a premium to compensate for added investment risk.⁶² As investment risk goes up, investors expect to earn a higher return commensurate with what they would earn from investments of similar risk.⁶³ So, an investment

⁶⁰ Stewart V.S. 27.

⁶¹ *Id.*

⁶² *Id.* at 27-28.

⁶³ *Id.* at 28.

can attract all the equity capital it needs by producing a return equivalent to what investors could expect to earn from other investments of similar risk.

This principle of capital allocation is captured by using a firm's cost of capital as a measure of whether it can attract necessary equity investment. Mr. Stewart explains that the Capital Asset Pricing Model (CAPM), which the Board uses to determine the railroad industry's cost of equity capital, accounts for what investors could reasonably earn from other similarly risky investments.⁶⁴ Specifically, it calculates the risk premium by using the returns that investors could reasonably expect to earn above the risk-free return by investing in the stock market, and adjusts those returns to account for the difference between market risk and the risk of the investment.⁶⁵ Thus, a railroad that is earning its cost of capital is also earning what investors could reasonably expect to earn by investing in other investments of similar risk or by investing in riskier investments and incurring the costs of such additional risk. To put it another way, an investor that invests in a railroad that earns its cost of capital would not expect to earn higher returns elsewhere, when accounting for risk.

Certainly, some firms regularly produce returns in excess of their cost of capital. But this does not mean that firms that just earn their cost of capital are

⁶⁴ *Id.* at 28, 30.

⁶⁵ *Id.* at 28, 30; *Railroad Cost of Capital—2019*, EP 558 (Sub-No. 23), slip op. at 7 (STB served Aug. 5, 2020). The Board uses the S&P 500 index as a proxy for the market and makes a risk adjustment reflecting the difference in risk between Class I railroads and the broader market. *Railroad Cost of Capital—2019*, EP 558 (Sub-No. 23), slip op. at 7-10 (STB served Aug. 5, 2020).

unable to attract and retain sufficient investment. These firms are still able to provide returns that are at least equivalent to what an investor could expect from the broader market.

Additionally, Joint Carriers' claim that a comparison to the median S&P 500 firm's profitability is justified because railroads and S&P 500 firms are large firms is irrelevant to whether railroads can raise needed equity capital. As Mr. Stewart explains, investors can combine investments to achieve a specific risk-return profile.⁶⁶ An investor thus may compare a railroad with a pool of other firms and bonds that do not have any common characteristics. Adopting a simplification that railroads compete for capital only with the large firms in the S&P 500 ignores this economic reality. Simply stated, "[t]here is no economic justification to compare railroads against other large companies."⁶⁷ Railroads can compete effectively for capital with other large firms if they earn no more than *their* cost of capital.

3. The profitability of the median S&P 500 firm or any other threshold firm has no bearing on whether a railroad is earning a reasonable profit or return.

Joint Carriers claim that comparing railroad profitability to that of the median S&P 500 firm gives effect to the "reasonable and economic profit or return" element of revenue adequacy because "[t]he median S&P Differential . . . will capture . . . the normal and reasonable economic profit enjoyed by other unregulated

⁶⁶ Stewart V.S. 28-29.

⁶⁷ *Id.* at 29.

companies in competitive markets.”⁶⁸ But nothing about the median S&P 500 firm’s profitability, or that of any other threshold firm, is normal or reasonable for any other firm, much less a railroad.

A firm’s profitability is highly correlated to its industry. Mr. Stewart explains that “industry is a crucial factor, typically the single most important factor, in determining a company’s ROI potential.”⁶⁹ Firms in industries that have highly differentiated products or services, rapid growth, patent protection, brand equity, high up-front costs and low incremental costs leading to a first-strike advantage, or network effects from the aggregation of data and consumer interest, or that involve algorithms or software, are inherently more profitable and earn higher ROI’s than those participating in mature, slow-growth businesses that provide commodity products and services with little differentiation in an environment of intense price rivalry or those whose returns are regulated.⁷⁰ Thus, no wonder that freight railroads, which are mature, slow-growth businesses, provide a commodity service with little differentiation, and are partially regulated, have low profits compared to that of the median S&P 500 firm and most other firms in the S&P 500.⁷¹ So, the profits of the median S&P 500 firm will always be elusive for railroads as well as firms in many other industries.

⁶⁸ (Pet. 32.)

⁶⁹ Stewart V.S. 31.

⁷⁰ *Id.* at 34.

⁷¹ *See id.*

Railroads also lack the structural attributes necessary to consistently generate the high returns on investment earned by many S&P 500 firms. Mr. Stewart explains that knowledge-intensive industries, which involve R&D, brands, software, and algorithms, are increasingly becoming more profitable than heavy industry, like railroads.⁷² According to one study, “margins are being squeezed in capital-intensive industries, where operational efficiency has become crucial.”⁷³ This study also observes that labor-intensive industries have relatively low profit margins.⁷⁴ On these profitability attributes—knowledge intensity, capital intensity, and labor intensity—the study ranks the transportation sector in the top quartile for labor intensity, second quartile for capital intensity, and bottom quartile for knowledge intensity,⁷⁵ which is a concoction for lower profitability.

Another factor placing railroads at a profitability disadvantage relative to the S&P 500 is their lack of significant foreign sales. Mr. Stewart explains that foreign sales “can enhance profitability and ROI by helping companies to expand scale and cover fixed costs and to propel learning and knowledge transfer.”⁷⁶ He also observes

⁷² *Id.* at 35-36.

⁷³ McKinsey & Co., *Playing to Win: The New Global Competition for Corporate Profits* (2015), https://www.mckinsey.com/~media/mckinsey/business%20functions/strategy%20and%20corporate%20finance/our%20insights/the%20new%20global%20competition%20for%20corporate%20profits/mgi%20global%20competition_full%20report_sep%202015.ashx.

⁷⁴ *Id.* at 6-7.

⁷⁵ *Id.* at 7.

⁷⁶ Stewart V.S. 37.

that foreign sales accounted for 29% of S&P 500 revenues in 2019, although only 2% of these revenues were from Canada and Mexico.⁷⁷ For the industrial sector, which Joint Carriers suggest as a fallback comparison for railroads, the foreign-sales percentage was approximately 44% in 2018.⁷⁸ In contrast, of the publicly traded U.S. railroads (excluding operating entities of CN and CP), only UP and KCS have foreign sales, amounting to 11% and 47% of their sales, respectively.⁷⁹ And these foreign sales were limited to Mexico, where KCS has a significant rail network.⁸⁰ This relative absence of foreign sales outside of North America places railroads at a profitability disadvantage to other S&P 500 firms.

Additionally, because the S&P 500 is a constantly updated list of high-performing and high-potential firms, the profitability of the median S&P 500 firm poorly represents the typical or expected profitability of firms in highly competitive markets. S&P Dow Jones Indices LLC, which maintains the S&P 500, touts the index as covering “leading companies from leading industries.”⁸¹ In his verified statement, Mr. Stewart describes the S&P 500 as a collection of “winners in the

⁷⁷ *Id.*

⁷⁸ *Id.* at 37-38.

⁷⁹ *Id.* at 37.

⁸⁰ *Id.*

⁸¹ S&P Dow Jones Indices LLC, *S&P 500* 1, <https://www.spglobal.com/spdji/en/documents/additional-material/sp-500-brochure.pdf> (last visited May 17, 2021) (“The S&P 500 does not simply contain the 500 largest stocks; rather, it covers leading companies from leading industries.”).

business environment.”⁸² He further explains that, because the index is limited to winning firms, “it overstates the returns that can be expected from firms operating in competitive markets.”⁸³

Four times a year, the S&P 500’s Index Committee looks at replacing firms.⁸⁴ Mr. Stewart explains that firms that have been recently cut from the index (other than firms cut because they were acquired) either were facing significant performance challenges or were performing well, but not as well as their competition.⁸⁵ Their replacements were in knowledge-intensive, intangible-asset rich, new-economy sectors, and thus had a high potential for earning high returns.⁸⁶

Over time, this churn of firms positions the S&P 500 as an index that is hard for even professional investors to beat.⁸⁷ Mr. Stewart observes in his verified statement that the makeup of the S&P 500 has shifted dramatically over past decades as old-economy firms have been replaced by new-economy firms with greater potential.⁸⁸ Firms in healthcare and information-technology sectors, both

⁸² Stewart V.S. 39.

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ *Id.* at 39-43.

⁸⁶ *Id.* at 43.

⁸⁷ Anu R. Ganti & Craig J. Lazzara, S&P Dow Jones Indices LLC, *Style Bias and Active Performance* 2 (2021), <https://www.spglobal.com/spdji/en/documents/research/research-style-bias-and-active-performance.pdf>

⁸⁸ Stewart V.S. 43.

highly profitable, have increased from 33 firms in 1970 to 130 today.⁸⁹ Over the same period, firms in mining and metals, energy, and industrials sectors, which have low or moderate profitability, have declined from 233 firms to 99.⁹⁰ Today's S&P 500 index thus says little about the normal and reasonable profits that should be expected from railroads.

4. If Joint Carriers' criticism of the Board's use of book values is correct, comparing railroad profitability to the median S&P 500 firm or any other firm would result in a massive error.

Joint Carriers claim that the Comparison Proposal is necessary to mitigate the alleged error caused by the Board's use of book values instead of replacement costs to calculate return on investment when determining revenue adequacy.⁹¹ But even if the Joint Carriers are correct about the error (which they are not, as explained below in Part IV.A), the Comparison Proposal does not correct for it and, at worst, compounds it.

Joint Carriers claim that the error occurs because accounting rates of return, which are based on book values, are not probative of economic rates of return.⁹² According to their experts, this arises because, "depending on the characteristics of a particular firm, the difference between accounting rates of return and its economic rate of return can be very large and can be either positive or negative."⁹³ Given this

⁸⁹ *Id.* at 43-44.

⁹⁰ *Id.*

⁹¹ (Pet. 3-4, 24, 39.)

⁹² (Pet. at 16.)

⁹³ (Murphy & Zmijewski V.S. 45, Sept. 1, 2020.)

allegedly wild inaccuracy, two firms with the same accounting profits may have completely different economic profits, one being positive and the other negative. Thus, comparing the accounting profits of two firms would do nothing to eliminate the alleged measurement error arising from the use of accounting returns. As Mr. Stewart observes, it would just compound the measurement error of both firms, resulting in a massive error.⁹⁴

To borrow from Joint Carriers' thermometer example,⁹⁵ Joint Carriers are essentially proposing that the Board can determine whether Washington, D.C., is warmer than another city, like Chicago, by taking their temperatures using a thermometer with errors that "can be very large and can be either positive or negative"⁹⁶ and comparing them. But if the thermometer is as wildly inaccurate as they describe, it might show that Chicago is warmer than Washington on a day when Washington is actually warmer than Chicago. And the next day, without any change in actual air temperature of each city, the thermometer may show Washington being excessively warm compared to Chicago. If Chairman Oberman were to use this method to determine what to pack on his trips between Chicago and Washington, he might show up at the Board's office in flip flops and a t-shirt on a day when the Potomac River is frozen solid.

⁹⁴ Stewart V.S. 26.

⁹⁵ (Pet. 31.)

⁹⁶ (Murphy & Zmijewski V.S. 45.)

5. The Comparison Proposal inherently overstates the ROI of the median S&P 500 firm.

As Joint Carriers recognize, applying the Board's ROI formula to S&P 500 firms would result in overstated ROIs and make the Comparison Proposal unworkable because the formula does not capture the substantial investment that many S&P 500 firms have in non-goodwill intangible assets.⁹⁷ The Joint Carriers have proposed a "correction"⁹⁸ to ROI to address the investment in these assets, which Mr. Stewart agrees is appropriate.⁹⁹ But this is only the tip of the iceberg of necessary adjustments. The very need for so many adjustments exemplifies Mr. Stewart's overarching point that the S&P 500 simply is not an appropriate comparison group.¹⁰⁰

The Joint Carriers' adjustment for non-goodwill intangible assets addresses only a portion of the investment in these assets. The problem arises from how accountants record investments in non-goodwill intangible assets. As explained by Joint Carriers' experts, accountants record a firm's investments in intangible assets only when the firm acquires them from another company.¹⁰¹ But the vast majority of non-goodwill intangible assets are self-created by firms rather than acquired.¹⁰²

⁹⁷ (Pet. 35.)

⁹⁸ (Pet. 35.)

⁹⁹ Stewart V.S. 45.

¹⁰⁰ *Id.*

¹⁰¹ (Murphy & Zmijewski V.S. 59 n.98.)

¹⁰² Stewart V.S. 4, 46.

For those non-goodwill intangible assets, accountants expense the investment.¹⁰³ So reported investments in non-goodwill intangible assets will continue to understate actual investments in these assets even after making the adjustments that the Joint Carriers propose, especially for the high-tech, brand-rich firms that pervade the S&P 500.¹⁰⁴

As Mr. Stewart explains, relying on the investment in non-goodwill intangible assets reported in accounting records, which Joint Carriers appear to do, ignores spending on intangibles that could be expected to bring future benefits by contributing to revenues and profits.¹⁰⁵ For example, it ignores research and development expenditures that may generate patents and their associated returns or breakthrough innovations that others cannot quickly replicate.¹⁰⁶ It also ignores spending on advertising to develop and maintain consumer brands.¹⁰⁷

The result is an inaccurate portrait of the profitability of many S&P 500 firms, especially the most profitable firms. As explained above, the makeup of the S&P 500 has shifted toward firms in knowledge-intensive industries. Not only are firms in these industries among the most profitable in the S&P 500, but they also rely heavily on R&D, advertising, and other non-goodwill intangible assets, like

¹⁰³ (Murphy & Zmijewski V.S. n.98.)

¹⁰⁴ Stewart V.S. 45.

¹⁰⁵ Stewart V.S. 46.

¹⁰⁶ *Id.*

¹⁰⁷ *Id.* at 47.

software, films, copyrights, and trademarks, that are self-generated.¹⁰⁸ Even after applying the Joint Carriers’ proposed correction, these and any other firms having self-generated non-goodwill intangible assets will still have overstated ROIs.

Myriad additional corrections are necessary to calculate ROIs that properly reflect investment in self-generated non-goodwill intangible assets.¹⁰⁹ As Mr. Stewart explains, some industries have unique accounting methods for non-goodwill intangible assets.¹¹⁰ The need to correct the Board’s ROI formula to address non-goodwill intangible assets, which railroads typically do not have, and the large number of corrections underscore that S&P 500 firms are not a relevant benchmark for railroads.

6. The Comparison Proposal cannot be salvaged by using the Industrials sector as a fallback benchmark.

Joint Carriers’ experts have provided the S&P 500 Industrials sector group as an alternative comparison group, noting that the results of a comparison to this group “would be similar to that of the main S&P 500 group.”¹¹¹ But as Mr. Stewart explains, use of the Industrials sector in the Comparison Proposal is subject to the same criticisms as use of the broader S&P 500.¹¹²

¹⁰⁸ *Id.* at 45.

¹⁰⁹ *Id.* at 48.

¹¹⁰ *Id.* at 47.

¹¹¹ (Joint Carriers’ Resp. to Replies 11-12, Oct. 13, 2020.)

¹¹² Stewart V.S. 48.

Mr. Stewart explains that the Industrials sector contains multiple distinct industries that are different from and inherently more profitable than railroads.¹¹³ For example, the Industrials sector includes aerospace and defense firms, construction-engineering firms, and research and consulting firms.¹¹⁴ As explained above, profitability is highly dependent on industry sector, and lumping railroads with these and other unrelated Industrials sub-sectors results in an unreasonable profitability expectation.

Mr. Stewart also analyzed the structural profitability attributes of firms in the Industrials sector, finding that Industrials outside transportation firms contain attributes much more likely to translate to higher profitability compared to railroads and, in fact, generate higher profitability.¹¹⁵ Specifically, using financial data for Industrials firms, he measured three attributes shown to be correlated to profitability: intellectual capital (higher intellectual capital indicates higher profitability), plant intensity (lower plant intensity correlates to higher profitability), and global breadth (higher revenues from outside the U.S. indicates attributes associated with higher profitability).¹¹⁶ Non-transportation Industrials firms showed higher intellectual capital, lower plant intensity, and greater global

¹¹³ *Id.*

¹¹⁴ *Id.*

¹¹⁵ *Id.* at 48-50.

¹¹⁶ *Id.* at 48-49.

reach than transportation firms, all indicators of higher profitability.¹¹⁷ Thus, non-transportation Industrials firms possess profitability attributes that give them an advantage over transportation firms and prevent a fair profitability comparison.¹¹⁸

B. The Comparison Proposal imposes an economic profit requirement that is not in the statute.

Joint Carriers claim that their Comparison Proposal gives effect to the “reasonable and economic profit or return” statutory language because the median S&P Differential “captures . . . [a] reasonable economic profit,”¹¹⁹ which they define as an “economic profit” above zero.¹²⁰ But Congress did not define revenue adequacy as requiring a positive “economic profit.” Instead, it stated that the Board’s revenue-adequacy standard must allow railroads to earn “a reasonable and economic profit *or* return (*or both*).”¹²¹

Recognizing that the plain language of the revenue-adequacy definition does not require a positive economic profit is important because, as Mr. Stewart explains, the term “economic profit” is different from accounting profit and, in economic parlance, an “economic profit” greater than zero is inefficient.¹²² It is nonsense to contend that Congress intended to establish a revenue-adequacy standard that is

¹¹⁷ *Id.* at 49-50.

¹¹⁸ *See id.* at 50.

¹¹⁹ (Pet. 32.)

¹²⁰ (Pet. 27-28.)

¹²¹ 49 U.S.C. § 10704(a)(2) (emphasis added).

¹²² Stewart V.S. 10-11, 13.

inefficient by requiring an “economic profit” greater than zero, especially when the statute dictates that revenue adequacy is to be determined “under honest, economical, and *efficient* management”¹²³ Moreover, the statute states that the required level of revenue adequacy should “support prudent capital outlays, assure the repayment of a reasonable level of debt, permit the raising of needed equity capital” and “attract and retain capital in amounts adequate to provide a sound transportation system in the United States.”¹²⁴ As Mr. Stewart further explains, a firm that earns exactly zero “economic profit” by definition has satisfied all of these indicators of revenue adequacy.¹²⁵ Thus, there is no rational justification for arguing that railroad “economic profit” must be greater than zero to be revenue adequate.

C. The Comparison Proposal attempts to measure the rail industry’s market power instead of its ability to raise capital.

The Comparison Proposal attempts to transform the revenue-adequacy determination from a measure of a railroad’s ability to attract capital to a measure of a railroad’s market power. This transformation has no basis in the statutory revenue-adequacy factors, which focus on whether a railroad can attract and retain necessary capital. And it conflicts with Congress’s design of the broader ICCTA, which addresses market power through other mechanisms.

¹²³ 49 U.S.C. § 10704(a)(2) (emphasis added).

¹²⁴ 49 U.S.C. § 10704(a)(2)(A) & (B).

¹²⁵ Stewart V.S. 13.

Joint Carriers’ economic witnesses describe the Comparison Proposal as solving “how to evaluate whether railroads’ rate of return exceeds their cost of capital by an amount that suggests *a failure of competition* rather than the normal variation of rates of return expected in a competitive marketplace.”¹²⁶ Their theory behind the Comparison Proposal is that “to understand whether railroads are earning a return on invested capital that is indicative of at least the potential for rates to be *unconstrained by competition*, it is necessary to benchmark any revenue adequacy measure adopted by the Board against corresponding measures we observe for firms operating under competitive conditions.”¹²⁷ The witnesses select the median S&P 500 firm as the revenue-adequacy benchmark claiming that, “[i]f the railroads earn a rate of return net of cost of capital no higher than the average or median S&P firm, then there would be no presumption that railroads are earning abnormal returns and can set rates *without constraint from competition . . .*.”¹²⁸

None of the factors in Congress’s revenue-adequacy definition supports setting the revenue-adequacy threshold at a level indicative of a potential abuse of market power. The definition describes the revenue-adequacy threshold as the revenue level sufficient to cover operating costs, allow for needed infrastructure and investment, and provide a reasonable and economic profit or return (or both).¹²⁹ It

¹²⁶ (Murphy & Zmijewski V.S. 30 (emphasis added).)

¹²⁷ (Murphy & Zmijewski V.S. 32 (emphasis added).)

¹²⁸ (Murphy & Zmijewski V.S. 32 (emphasis added).)

¹²⁹ 49 U.S.C. § 10704(a)(2).

also explains that this revenue level “should . . . permit the raising of needed equity capital . . . and attract and retain capital in amounts adequate to provide a sound transportation system.”¹³⁰ The thrust of this definition is that railroads are revenue adequate if they earn the profits or returns necessary to attract and retain necessary capital. An abuse of market power is irrelevant to this inquiry.

Congress’s decision to omit references to market power and competition in its definition of revenue adequacy cannot be ignored. The Supreme Court has recognized that, “[w]here Congress includes language in one section of a statute, but omits it in another section of the same Act, it is generally presumed that Congress acted intentionally and purposefully in the disparate inclusion or exclusion.”¹³¹ When Congress enacted the definition of revenue adequacy in the Railroad Revitalization and Regulatory Reform Act, it simultaneously enacted the RTP, which expressly directs the Board to consider competition when establishing reasonable rates for rail transportation, to ensure effective competition, and to maintain reasonable rates absent effective competition.¹³² The RTP also identifies a policy of the government “to avoid undue concentrations of market power.”¹³³ The broader ICCTA also contains provisions expressly directing the Board to consider “competition” and “anticompetitive effects” when determining whether to regulate a

¹³⁰ 49 U.S.C. § 10704(a)(2)(A)-(B).

¹³¹ *Russello v. United States*, 464 U.S. 16, 23 (1983).

¹³² 49 U.S.C. § 10101(1), (4), (6).

¹³³ 49 U.S.C. § 10101(12).

rail rate;¹³⁴ authorizing agreements or combinations for pooling or division of traffic, services, or earnings;¹³⁵ and approving consolidations, mergers, and acquisitions of control involving rail carriers.¹³⁶ It also expressly directs the Board to consider “market power” when exempting rail carrier transportation from regulation.¹³⁷ Congress certainly knew how to require the Board to consider competition and market power when exercising its regulatory authority. Congress’s decision not to include market power or competition as a factor in revenue adequacy makes clear that it did not intend for revenue adequacy to be set at a level that reflects a failure of competition.

Joint Carriers’ focus upon revenue adequacy as a measure of market power appears to be in response to calls for the Board to develop standards for applying the revenue-adequacy constraint in *Coal Rate Guidelines*, which describes revenue adequacy as a constraint upon the degree to which a railroad may exercise its market power to engage in differential pricing.¹³⁸ As revenue adequacy pertains to rate regulation, it is not a measure of market power or competitive failure. The existence of market power or competitive failure is evaluated through the market-dominance determination in rate cases, not the annual revenue-adequacy determination.

¹³⁴ 49 U.S.C. § 10707(b).

¹³⁵ 49 U.S.C. § 11322(a)(2).

¹³⁶ 49 U.S.C. § 11324(b)(5), (d)(1).

¹³⁷ 49 U.S.C. § 10502(a)(2)(B).

¹³⁸ *Coal Rate Guidelines, Nationwide*, 1 I.C.C. 2d 520, 535-36 (1985).

At bottom, setting the revenue-adequacy threshold at a level corresponding to a potential abuse of market power would transform the Board's annual revenue-adequacy into a measure of market power, which Congress never intended.

IV. The Board's current revenue-adequacy methodology is conservative.

Joint Carriers have based the Comparison Proposal on the false assertion that the Board's current revenue-adequacy methodology overstates whether railroads are earning adequate revenues.¹³⁹ In reality, however, the Board's current methodology is conservative and provides ample assurance that the statutory revenue-adequacy factors are achieved.

A. The use of replacement costs is neither necessary nor appropriate.

Joint Carriers criticize the Board's use of book values instead of replacement costs when calculating railroad ROIs for revenue-adequacy purposes as "overstat[ing] railroad ROIs (and thus revenue adequacy)"¹⁴⁰ and causing ROIs to "often [be] uninformative about a firm's ability to attract capital in the future."¹⁴¹ But this ignores the fact that book values reflect replacement costs if and when assets are actually replaced or new additions are made.¹⁴² Thus, using book values avoids modulating regulatory protections afforded to railroads based on shifting winds of replacement costs that may never be incurred. And it allows railroads to

¹³⁹ (Pet. 5.)

¹⁴⁰ (Pet. 16.)

¹⁴¹ (Pet. 30.)

¹⁴² Stewart V.S. 20.

generate revenue levels sufficient to cover the costs of current and future investments and provide a competitive return to investors, which is all that revenue adequacy requires.

As an initial matter, using replacement costs to calculate ROI is unnecessary to allow railroads to earn a return on future investments that is sufficient to attract capital. Mr. Stewart explains that “all that is required to maintain the health of the industry and to attract capital for the investments is for the railroads to be able to cover the replacement cost of the assets *that they actually replace or that are new additions.*”¹⁴³ Since book value reflects replacement costs when an asset is actually replaced or added, and since the replacement cost is recovered through depreciation charges deducted against future earnings, the Board’s use of a book-value ROI to calculate revenue adequacy assures railroads and their investors that railroads *will be allowed*—but not *guaranteed*—to earn a return on future investments that is competitive and permits raising needed equity capital.

Additionally, the notion that an accurate assessment of ROI versus the cost of capital can only be obtained if all assets are marked from book value to replacement cost is incorrect and inappropriate in the context of revenue adequacy. Mr. Stewart explains that the key difference between book value and replacement costs is that replacement costs reflect inflation, general and real.¹⁴⁴ Mr. Stewart also explains that general inflation—an increase in prices of all goods and services

¹⁴³ *Id.* at 16.

¹⁴⁴ *Id.* at 15.

due to a change in monetary supply—effectively washes out in a proper replacement-cost ROI calculation because, alongside the increase in the investment base due to general inflation, the appreciation in existing assets from general inflation is recognized as a holding gain that is added to returns.¹⁴⁵ Accounting for this holding gain is necessary because, as Mr. Stewart explains, the cost of capital that the STB uses to judge ROI includes an inflation premium that represents investors’ expected compensation for inflation.¹⁴⁶ Bottom line, the difference between book value and replacement costs due to general inflation likely has only a marginal impact on the ROI spread versus the cost of capital.

To the extent any difference between book value and replacement costs arises from real inflation, using replacement costs to calculate ROI would be inappropriate. Real inflation, which is a price change relative to prices of all other goods and services, occurs in response to an imbalance between supply and demand.¹⁴⁷ If replacement costs increase due to real inflation, railroad ROIs computed on the replacement cost of the assets would fall in relation to their cost of capital. In the context of revenue adequacy, this effectively gives railroads the freedom to generate returns on increases in replacement costs that are unpredictable, likely temporary, and may never actually be incurred. As Mr. Stewart explains, this would provide railroads “a massive windfall at the expense of

¹⁴⁵ *Id.* at 18-20.

¹⁴⁶ *Id.* at 19.

¹⁴⁷ *Id.* at 15.

their customers”¹⁴⁸ and could encourage railroads to replace existing assets with new assets regardless of whether it is economically sensible.¹⁴⁹

Real inflation can also cause the use of replacement costs to have negative consequences for railroads that are inconsistent with the goals of revenue adequacy. If replacement costs decrease due to real inflation, railroad ROIs would increase in relation to their cost of capital and the revenue-adequacy standard would afford railroads less protection to earn a return that covers their original cost. Mr. Stewart explains that this could result in railroads not being able to cover the debt they incurred to finance an asset,¹⁵⁰ which is inconsistent with the goal of assisting carriers to achieve revenue levels that “assure the repayment of a reasonable level of debt.”¹⁵¹

Replacement costs may also differ from book values due to differences in depreciation that are unrelated to inflation. But accounting for these differences is unnecessary and inappropriate. As Mr. Stewart explains, even if book depreciation is inaccurate, the Board’s revenue-adequacy standard still would allow railroads to recover the full cost of an investment plus a return on the investment equal to the railroad industry cost of capital.¹⁵² Thus, should a railroad continue to use an asset

¹⁴⁸ *Id.* at 16.

¹⁴⁹ *Id.*

¹⁵⁰ *Id.* at 17.

¹⁵¹ 49 U.S.C. § 10704(a)(2)(A).

¹⁵² Stewart V.S. 20-21, 23.

after it has been fully depreciated, any returns from that asset would be an unexpected windfall for the railroad and completely unnecessary to maintain its financial health.¹⁵³ Conversely, if an asset does not produce an ROI that is at least equal to the railroad-industry COC (i.e., actual depreciation exceeds book depreciation), the use of book depreciation allows the railroad to make up the difference by exercising its market power through an appropriate level of differential pricing without regulatory intervention.¹⁵⁴

In sum, using book values to calculate ROI ensures that railroads will be allowed to earn a return on future investments that Mr. Stewart describes as “sufficient to cover all costs, including the opportunity cost of capital, and thus to attract capital for new investments that are economically warranted to maintain the health of the rail system.”¹⁵⁵

B. The current methodology advances all the factors of revenue adequacy under 49 U.S.C. § 10704(a)(2).

Joint Carriers claim that the Board’s revenue-adequacy measurement, which looks at whether a railroad’s ROI is at least equal to the railroad industry cost of capital, “fails to effectively reflect” whether railroads are earning revenues “sufficient to: i) allow for infrastructure and investment needed to meet present and future demand for rail services; ii) cover total operating expenses, including

¹⁵³ *Id.* at 24.

¹⁵⁴ *Id.*

¹⁵⁵ *Id.* at 23.

depreciation; and iii) provide for a reasonable and economic profit or return (or both) on capital employed in business.”¹⁵⁶ But the railroad industry’s cost of capital identifies the revenue requirements necessary to satisfy each of these revenue-adequacy factors under 49 U.S.C. § 10704(a)(2). It also represents the profitability that investors reasonably expect of their investments and, thus, is a profit level that will “permit the raising of needed equity capital” and “attract and retain capital in amounts adequate to provide a sound transportation system.”¹⁵⁷

First, the cost of capital allows for a railroad to cover its “total operating expenses, including depreciation and obsolescence.”¹⁵⁸ As Mr. Stewart explains in his verified statement, because a railroad’s costs are subtracted from its revenues when calculating its return on investment, a railroad cannot earn its cost of capital without covering all its costs, including operating costs, depreciation, and taxes.¹⁵⁹

Second, the cost of capital also allows for “infrastructure and investment needed to meet present and future demand for rail services.”¹⁶⁰ As a railroad replaces assets or adds new assets, the replacement cost of those assets is capitalized in the railroad’s investment base.¹⁶¹ Using a cost-of-capital standard for

¹⁵⁶ (Pet. 27 n.55.)

¹⁵⁷ 49 U.S.C. § 10704(a)(2)(A)-(B).

¹⁵⁸ *See* 49 U.S.C. § 10704(a)(2).

¹⁵⁹ Stewart V.S. 6-8.

¹⁶⁰ *See* 49 U.S.C. § 10704(a)(2).

¹⁶¹ *See* Stewart V.S. 20 (explaining that book accounting uses replacement costs for new asset acquisitions).

revenue adequacy allows a railroad to earn a return on each investment at least equal to the rail industry cost of capital.¹⁶² Additionally, it allows railroads to recover their initial investment through depreciation, which is deducted from returns over the life of each asset.¹⁶³ The cost-of-capital standard thus allows railroads to recover the cost of their current and future investments in infrastructure and assets plus generate a return on these investments equal to the cost of capital.

Third, as Mr. Stewart shows, a railroad that earns its cost of capital also can repay its debts and cover interest expense.¹⁶⁴ The interest cost is a component in the overall cost of capital (along with the estimated cost of equity capital); thus, covering the cost of capital generates profits more than sufficient to pay the interest on debts.¹⁶⁵ Also, the principal on loans is repaid from depreciation, which is a non-cash charged deducted from returns.¹⁶⁶ Therefore, any firm that earns an ROI equal to its COC will be able to service its debts and attract additional loans for investment purposes.¹⁶⁷

¹⁶² *Id.*

¹⁶³ *Id.* at 23.

¹⁶⁴ *Id.* at 9, 10.

¹⁶⁵ *Id.* at 6-8

¹⁶⁶ *Id.* at 7.

¹⁶⁷ *Id.* at 8, 10, 14.

Fourth, the cost of capital represents a “reasonable and economic profit or return (or both)”¹⁶⁸ that is sufficient to “raise needed equity capital”¹⁶⁹ and “attract and retain investment in amounts adequate to provide a sound transportation system.”¹⁷⁰ As Mr. Stewart explains, an economic profit is profit net the opportunity cost of capital.¹⁷¹ When economic profit is zero, a firm is providing an ROI equal to its COC¹⁷² and thus “covering all of its costs, including operating costs, depreciation and taxes, and also the cost of giving its investors—its debtors and shareholders alike—a fully competitive return on their investment.”¹⁷³ In other words, “[a] breakeven economic profit is the tautological definition of ‘revenue adequacy.’”¹⁷⁴

When a firm is earning a breakeven economic profit (i.e. $ROI = COC$), it can attract and retain necessary capital. The cost of capital, by definition, is the rate of return that investors could expect to earn on other equally risky investments. If a firm is earning this threshold return, investors are willing to provide additional capital to the firm because they cannot expect to earn higher returns by investing elsewhere.¹⁷⁵ $ROI = COC$ is thus the definition of a fully competitive business.¹⁷⁶

¹⁶⁸ See 49 U.S.C. § 10704(a)(2).

¹⁶⁹ See 49 U.S.C. § 10704(a)(2)(A).

¹⁷⁰ See 49 U.S.C. § 10704(a)(2)(B).

¹⁷¹ Stewart V.S. 8.

¹⁷² *Id.* at 8-9.

¹⁷³ *Id.* at 8.

¹⁷⁴ *Id.*

¹⁷⁵ *Id.* at 29-31.

¹⁷⁶ *Id.* at 28-29.

The CAPM model that the Board uses to measure the railroad-industry cost of capital correctly recognizes the need for investments to be competitive on a risk-adjusted basis. The cost of capital is based on where a firm falls along the risk-return continuum defined by the return of a risk-free investment and the return of the market of all risky securities.¹⁷⁷ As investment risk increases, the compensation for risk increases at the same rate that returns increase between a risk-free investment and the market.¹⁷⁸ So, a firm in a steady business with less risk than the market would only have to produce returns between the risk-free return and market return, and a company operating in a cyclical business with a stock riskier than the market would have to generate above market returns. Earning any less than this amount would encourage investors to move their money elsewhere. Earning greater returns is unnecessary to attract capital because investors cannot expect to earn greater returns from other investments at the same risk level.

Another way to think of this is that, when a railroad earns its cost of capital, it provides an adequate return on equity to its shareholders. As Mr. Stewart explains, railroad cost of capital is a weighted average of the cost of equity (i.e., the cost of capital from the perspective of equity investors) and the cost of debt (i.e., the interest expense to compensate debt holders).¹⁷⁹ Thus, a railroad that generates a

¹⁷⁷ *Id.* at 28.

¹⁷⁸ *Id.* at 28, 30.

¹⁷⁹ *Id.* at 6-7.

return on investment equal to its cost of capital covers both its cost of debt and its cost of equity and, thus, its cost of capital.¹⁸⁰

The Board's use of the railroad-industry cost of capital also assures investors that railroads will be allowed to preserve investor wealth without regulatory intervention by the Board. Mr. Stewart explains that wealth is preserved when the intrinsic value of an investment is equal to the capital money put into the investment.¹⁸¹ Where a firm's net operating profits after taxes equals its capital charge (i.e., its current level of capital multiplied by its cost of capital), the firm's intrinsic value is equal to the current investment in the firm.¹⁸² To put it differently, a firm whose ROI=COC will have an intrinsic value equal to investment in the firm, enabling investors to recover their investment when they sell their shares and to earn their cost of capital while invested in the firm.¹⁸³

At bottom, a railroad that is revenue adequate under the Board's current standard, which reflects a breakeven economic profit, is able to cover its costs, provide for infrastructure and investment, preserve the value of investments in the railroad, and generate a return for investors that is competitive with the return that they could obtain elsewhere, adjusted for risk. As the Interstate Commerce Commission recognized when it adopted the standard, using the cost of capital to

¹⁸⁰ *Id.* at 10.

¹⁸¹ *Id.* at 9-10.

¹⁸² *Id.*

¹⁸³ *Id.*

measure the adequacy of railroad returns “is widely agreed to be the minimum necessary to attract and maintain capital in the railroad, or any other, industry,”¹⁸⁴ and “[t]his is a standard principle of economics.”¹⁸⁵ While investors may be happier if the railroad generates higher returns, no reasonable investor would turn its nose up at the returns that this standard allows railroads to generate.

C. The current methodology overstates the cost of capital.

When calculating the cost of capital for revenue-adequacy determinations, the Board uses historic market returns reflecting a bygone era of heightened performance. The result is an elevated cost-of-capital figure that allows a railroad to earn a return on equity that is higher than what the investment community would consider as the railroad’s true cost of equity capital. This adds a layer of conservatism to the Board’s revenue-adequacy determinations and further undermines the Joint Carriers’ claims of inaccuracy as justification for the Comparison Proposal.

The cost of capital that the Board uses in its revenue-adequacy methodology is a weighted average based on the cost of debt and cost of equity of the railroad industry.¹⁸⁶ To arrive at the cost of equity, the Board adds the rate of return offered by a 20-year U.S. Treasury Bond, called the risk-free rate, to the return that the

¹⁸⁴ *Standards for R.R. Revenue Adequacy*, 364 I.C.C. 803, 809 (1981).

¹⁸⁵ *Standards for R.R. Revenue Adequacy*, 364 I.C.C. 803, 809 n.5 (1981).

¹⁸⁶ *Railroad Cost of Capital—2019*, EP 558 (Sub-No. 23), slip op. at 14 (STB served Aug. 5, 2020).

equity market produces in excess of the risk-free rate, called the Market Risk Premium, after adjusting the Market Risk Premium for the difference in risk between the railroad industry and the market.¹⁸⁷ The market return used to calculate the Market Risk Premium is the average return of the S&P 500 dating back to 1926.¹⁸⁸

The Board's use of historic stock-market performance overstates expected market performance, resulting in an inflated Market Risk Premium. As Mr. Stewart explains, the market produced unusually high returns in the past due to several factors including: a reduction in trading and transaction costs, and an increase in transparency; declining interest rates; the advantage that U.S. firms held in the aftermath of World War II decimating large economies outside the United States; and investors' use of a lower Market Risk Premium today than in 1926, partially due to an unexpectedly rapid advance in wealth and economic wellbeing.¹⁸⁹

Mr. Stewart estimates that the Market Risk Premium that the Board used for 2019 overstates the cost of equity by 3.15%, resulting in an overstated cost of capital of at least 2%.¹⁹⁰ He explains that Institutional Shareholder Services, which is a leading provider of corporate governance and responsible investment solutions,

¹⁸⁷ *Id.* at 7.

¹⁸⁸ *Id.*

¹⁸⁹ Stewart V.S. 58-59.

¹⁹⁰ *Id.* at 57.

market intelligence, and fund services, uses a Market Risk Premium of 4% rather than the 7.15% that the Board used.¹⁹¹ The Market Risk Premium is in line with the 5% Market Risk Premium that Western Coal Traffic League suggested for 2019 based on a recommendation by Duff & Phelps.¹⁹²

The Board's use of an overstated Market Risk Premium unnecessarily raises the bar for revenue adequacy, which ultimately allows railroads to differentially price their captive traffic over and above what is necessary to earn a reasonable and economic profit or return that is sufficient to attract and retain necessary capital for current and future rail service.

D. The results of the current methodology are consistent with valid supplemental indicators of revenue adequacy.

A comparison of the results of the Board's revenue-adequacy determinations to other indicators of financial health confirm that the Board's determinations are accurate, if not favorable to the railroads.

As Joint Shippers explained in their Reply to the Petition, filed on September 20, 2020, real-world financial data shows that railroads have had ample access to capital for decades, even when most Class I railroads were not revenue adequate under the Board's measure. Joint Carriers dispute this, claiming that use of stock prices and similar financial data cannot be relied upon to determine revenue

¹⁹¹ *Id.*

¹⁹² *Railroad Cost of Capital—2019*, EP 558 (Sub-No. 23), slip op. at 8 (STB served Aug. 5, 2020).

adequacy.¹⁹³ They also claimed that evidence showing railroads are able to raise capital does not prove revenue adequacy.¹⁹⁴ But, while real world financial data and evidence showing that railroads are attracting investment may not be sufficient on their own to prove revenue adequacy, they can corroborate a finding that a railroad is revenue adequate.

According to Mr. Stewart, rising stock prices would corroborate a finding that railroads are revenue adequate.¹⁹⁵ He explains that stock prices react to changes in the spread between ROI and COC, rising when investors foresee a higher ROI and falling when they foresee a lower ROI.¹⁹⁶ Thus, the Board's determinations that railroads are revenue adequate are probably accurate if the railroads have rising stock prices, which all railroads have had over the past decade.

Similarly, cash distributions in the form of dividends or stock buybacks can validate revenue adequacy findings when viewed in the proper context. As Mr. Stewart explains, whether a firm can distribute cash and earn an ROI that is at least equal to its cost of capital depends on the growth rate of its earnings and rate of reinvestment.¹⁹⁷ A railroad that is growing its earnings while, at the same time, reinvesting significant amounts of profits in its business and making capital

¹⁹³ (Joint Carriers' Resp. to Replies 7-8.)

¹⁹⁴ (Joint Carriers' Resp. to Replies 8-9.)

¹⁹⁵ Stewart V.S. 53.

¹⁹⁶ *Id.*

¹⁹⁷ *Id.* at 54.

distributions is likely to have a high ROI.¹⁹⁸ Conversely, a railroad that is not reinvesting large amounts and has low growth probably has a low ROI.¹⁹⁹

Applying these principles to railroad financial metrics supports recent findings of revenue adequacy. Mr. Stewart explains that railroad Total Shareholder Return, which is the compound average return from dividend yield and capital appreciation, has been 15-20% per year over the 10 years ending 2019, which is strong.²⁰⁰ Over the same period, railroads maintained high levels of capital spending, earned healthy levels of Free Cash Flow—profits in excess of the capital invested in the business each year—and distributed billions in cash to investors via dividends and stock buybacks.²⁰¹ Because these metrics show that railroads were able to invest aggressively while still generating surplus cash to distribute, they corroborate recent findings that railroads are revenue adequate.²⁰²

V. Conclusion.

Comparing railroads' profitability to that of the median S&P 500 firm or any other benchmark has no bearing on whether they can compete for capital and are otherwise revenue adequate. Moreover, the Board's current revenue-adequacy methodology is conservative, appropriately accounts for future investment needs of railroads, and produces results that are consistent with supplemental financial

¹⁹⁸ *Id.* at 54-55.

¹⁹⁹ *Id.*

²⁰⁰ *Id.* at 56.

²⁰¹ *Id.*

²⁰² *Id.*

indicators of revenue adequacy. The Board should have confidence that its current revenue-adequacy methodology provides ample protection for railroad financial needs, consistent with promoting a safe and efficient rail transportation system. For these and the other reasons expressed in these comments, Joint Shippers urge the Board not to disturb its current revenue-adequacy methodology and, instead, focus on issuing final rules in its Final Offer Rate Review and competitive-switching proceedings.

Respectfully submitted,

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Dated: May 17, 2021

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

Ex Parte No. 766

**JOINT PETITION FOR RULEMAKING TO MODERNIZE ANNUAL
REVENUE ADEQUACY DETERMINATIONS**

VERIFIED STATEMENT OF

BENNETT STEWART

MAY 17, 2021

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I. INTRODUCTION AND SUMMARY

A. Credentials

My name is Bennett Stewart. Over the past 40 years, I have been at the forefront of the practical applications of economic profit under the name of EVA, or economic value added, a valuation and management framework that I developed and which *Fortune* dubbed “the real key to creating wealth.” EVA was adopted by hundreds of companies globally following publication of my 1992 book, *The Quest for Value*, which was the first to present EVA and advocate its use.

I was a principal founder and Senior Partner of Stern Stewart & Co., the firm that first defined EVA and put it on the map, starting in the 1980s. I formed EVA Dimensions in 2006 to enhance EVA with software and data bases and valuation analytics.

In 2018, EVA Dimensions was sold to Institutional Shareholder Services (“ISS”), which is the global leader in corporate governance ratings and analysis. Over the succeeding two-and-a-half years, I guided the integration of EVA into ISS’s proxy research, pay-for-performance assessment, corporate analytical solutions, and equity research services. Importantly, I defined the four key EVA ratio metrics that ISS is using as a supplement to Total Shareholder Return (“TSR”) to judge the quality of corporate performance and executive pay alignment.

I also am the inventor of PRVit (for the “Performance-Risk-Valuation investment technology”), an EVA-based stock rating model that has gained a wide following and that ISS licenses to institutional investors and professional equity analysts.

The latest generation of EVA, which includes a powerful ratio-based analytical framework, is chronicled in my book, *Best Practice EVA*, published in 2013.

I currently am CEO of Stewart Consulting Service, a one-man boutique for all things EVA-related, including presentations to boards and senior management teams that want to know more about how to derive value from EVA, and designing and implementing EVA-based incentive plans. My CV is attached to this Verified Statement in Appendix A.

B. Assignment

I have been asked by a group of trade associations¹ to review and critique the methodology developed by Petitioners'² expert witnesses, Professors Kevin Murphy and Mark Zmijewski ("M&Z"), to modify how the Surface Transportation Board ("STB" or "Board") determines the "revenue adequacy" of the freight rail industry. M&Z submitted their proposed methodology in a Verified Statement attached to a "Joint Petition for Rulemaking" that Petitioners filed with the STB on September 1, 2020 ("M&Z VS").

Specifically, I have been asked to address the following questions:

1. Whether the Board's current methodology for determining that a railroad is revenue adequate when its Return on Investment ("ROI") equals the industry Cost-of-Capital ("COC"), which I abbreviate hereafter as "ROI = COC," makes economic sense and is consistent with the statutory definition of revenue adequacy at 49 U.S.C. § 10704(a)(2)?
2. Whether the substitution of replacement costs for accounting book values in the ROI calculation is necessary or appropriate to measure revenue adequacy?
3. Whether the M&Z proposal to determine revenue adequacy based upon a benchmarking methodology that compares the financial performance of the railroads to the financial performance of selected S&P 500 companies makes economic sense and is consistent with the statutory definition of revenue adequacy?
4. Whether metrics used by financial markets to make investment decisions are appropriate indicators of revenue adequacy in the rail industry?

I address each of those questions in Parts II through V of my testimony below.

¹ Those trade associations are comprised of the American Chemistry Council, the American Fuel and Petrochemical Manufacturers, The Chlorine Institute, the Corn Refiners Association, The Fertilizer Institute, the National Grain and Feed Association, and The National Industrial Transportation League.

² Petitioners are Canadian National Railway, Norfolk Southern Railway and Union Pacific Railroad.

C. Summary of Conclusions

Based upon my experience in the world of financial markets and analysis of both the Board's current method of determining revenue adequacy and the M&Z proposed method, I have reached the following conclusions:

1. The Board's current method of determining the revenue adequacy of railroads achieves the stated goals in the statute. Any company that earns $ROI = COC$ will cover all its operating costs, including taxes and depreciation, as well as generate an acceptable return on the capital tied up in its business. By definition, $ROI = COC$ means that a firm is earning its cost of equity and repaying all of its debt. $ROI = COC$ constitutes a breakeven "economic profit," which is distinct from accounting profit because it deducts the opportunity cost of using equity capital, which is a cost that is completely ignored in the computation of accounting profits. An $ROI > COC$ generates a surplus for investors that is an economically inefficient result. The statute requires revenue "adequacy," not superiority.
2. It is neither necessary nor appropriate to substitute replacement costs for book values when calculating ROI in the revenue adequacy determination. The entire predicate for replacing the current revenue adequacy methodology with the M&Z proposal is that the current $ROI = COC$ methodology is inaccurate because ROI is based upon the book values of assets rather than their replacement costs. That predicate is wrong.
 - Replacement costs are not required to attract new investment. As railroads acquire new assets at current prices and those assets enter into capital, and assuming $ROI = COC$ is maintained, they will be able to increase their revenues and profits to cover the cost of acquiring and financing those new assets, as the statute requires. In contrast, substituting replacement costs for book values could motivate railroads to replace existing assets with new assets regardless of whether that is an economically sensible thing to do and could generate unjustified windfalls. Thus, so long as $ROI = COC$ is used to judge revenue adequacy, a new investment in a period automatically translates into an ability to earn revenues and profits *in future periods* that are fully competitive and commensurate with investor expectations.
 - Differences between accounting depreciation and economic depreciation do not justify the use of replacement costs. The investment in and returns due to fully depreciated assets that remain in the investment base already have been fully realized by the retrospective application of

the ROI = COC standard over the accounting depreciation period. Any return on those assets over a longer period is a windfall that is not necessary to guarantee financial health or access to capital. Moreover, any adjustments for under-depreciated assets must be netted against adjustments for over-depreciated assets and would be rife for debate and error.

3. There is no economic justification for determining revenue adequacy by comparing the ROI – COC spread of railroads against the median ROI – COC spread of selected S&P 500 companies. As observed in my first two conclusions, the Board already is using the proper measure of revenue adequacy to capture the statutory standards fully and accurately, and thus, no change is warranted. In contrast, the M&Z proposal is arbitrary, generates absurd results, and is economically meaningless.

- Neither the S&P 500 nor any other group of firms is an appropriate benchmark. Railroads compete for capital against all firms, not just the elite firms of the S&P 500. The M&Z proposal would irrationally and arbitrarily determine a railroad to be revenue inadequate unless its ROI – COC spread exceeds that of half of this elite group. But the rail industry lacks the structural attributes that enable most S&P 500 firms to earn high ROIs. M&Z's alternative comparison to just the S&P Industrials firms similarly is inappropriate because railroads also lack the structural attributes of most firms in that group. There is no reason to think that the profitability enjoyed by firms in either group has any relevance for setting a profitability standard that investors require from a railroad.
- Significant adjustments to the ROIs of most S&P 500 firms would be required to render an apples-to-apples comparison with railroad ROIs. As M&Z acknowledge, it is necessary to add non-goodwill intangibles to the capital of many S&P 500 firms before measuring their ROIs to avoid significantly overstating their ROIs vis-à-vis railroads. This is because non-goodwill intangibles are the factors most responsible for high ROIs among many S&P 500 firms but have no impact upon railroad ROIs. But the M&Z adjustments only capture investments in non-goodwill intangibles that are acquired from another company, not when they are self-created. The fact that most non-goodwill intangibles are self-created, not acquired, means that the M&Z adjustments fall woefully short of establishing ROIs that are comparable with the rail industry. The required adjustments are innumerable, vary by industry, and are subject to debate over how to accurately account for them. The very need for so many adjustments, moreover, is confirmation that S&P 500

firms operate in businesses with production factors and success factors that are distinctly different from the railroads, thus rendering the S&P 500 irrelevant as a comparison group for determining railroad revenue adequacy.

4. The metrics used by financial markets to make investment decisions confirm the revenue adequacy of the rail industry.

- Applying the M&Z proposal would mean that the Class I railroads are far from being revenue adequate, which is contrary to observable financial market metrics. Over the 10 years ending in 2019, Total Shareholder Return has been 15-20% per annum for each Class I railroad. Over that same period, the railroads have maintained a healthy rate of capital spending and had a strong positive free cash flow from which they have paid dividends and repurchased stock. M&Z assert that such financial metrics are uninformative, irrelevant, and inconclusive. But, when railroads are generating $ROI = COC$, *and their stock prices are rising*, the combination should be considered even more persuasive evidence that the industry is financially healthy. In addition, when a company is investing, growing, and experiencing a rising stock price and attractive return for its investors, then the distribution of cash can also be taken as a reliable supplemental indicator of its financial health.
- Because the Board's measure of rail industry COC overstates the market risk premium, railroads are more revenue adequate than the current ROI – COC spread indicates.

II. THE STATUTORY DEFINITION OF REVENUE ADEQUACY IS CONSISTENT WITH MAINTAINING $ROI = COC$

Congress has instructed the STB to annually assess the revenue adequacy of railroads as codified at 49 U.S.C. § 10704(a)(2) (*italics added*):

(2) The Board shall maintain and revise as necessary standards and procedures for establishing revenue levels for rail carriers providing transportation subject to its jurisdiction under this part that are adequate, under honest, economical, and efficient management, for the infrastructure and investment needed to meet the present and future demand for rail services *to cover total operating expenses, including depreciation and obsolescence, plus a reasonable and economic profit or return (or both) on capital employed in the*

business. The Board shall make an adequate and continuing effort to assist those carriers in attaining revenue levels prescribed under this paragraph.

Revenue levels established under this paragraph should—(A) provide a flow of net income plus depreciation adequate to support prudent capital outlays, assure the repayment of a reasonable level of debt, permit the raising of needed equity capital, and cover the effects of inflation; and (B) attract and retain capital in amounts adequate to provide a sound transportation system in the United States.

The Board has defined a railroad to be revenue adequate in a year if $ROI = COC$. In my view this determination of revenue adequacy meets the requirements set forth at 49 U.S.C. § 10704(a)(2) and is well grounded in economic theory.

A. Any Company that Earns an $ROI = COC$ Can Cover All Its Costs

As a purely mathematical matter, a company that generates a return on its investment base that is equal to its cost of capital will automatically cover all its operating costs, including taxes and the depreciation of its wasting assets, as well as generate a perfectly acceptable return on the capital tied up in its business.

An example can help to show this. Suppose a company has invested \$100 in capital in its business, consisting of \$20 in working capital and \$80 in the net book value of its property, plant and equipment (“PPE”). Assume further that the PPE net book value is the difference between a gross book value of \$160 and \$80 in accumulated depreciation. Suppose the capital is financed by a combination of \$40 in debt and \$60 in equity, including retained earnings. Assume the debt has an average interest charge of 3% after tax, and that the cost of equity appropriate to the firm is 8%, representing a fair premium over government bond yields to compensate shareholders for risk. The firm’s weighted average cost of capital therefore is 6%, as shown in the table below:

Working Capital	\$20
Net PPE	\$80
Gross PPE	\$160
- Accumulated Depreciation	\$80
Capital	\$100

	1	2	3=1x2/100
Debt	\$ 40	3%	1.2%
Equity	\$ 60	8%	4.8%
Capital	\$ 100		6.0%

Suppose the firm incurs cash operating costs of \$84, pays tax at a 25% rate, and registers a depreciation charge of \$8 by virtue of recovering the \$160 in gross PPE over an average asset life of 20 years. The firm would have to generate revenues of \$100 to generate an ROI = COC, as presented in the table below:

Revenues	\$100
- Cash Operating Costs	<u>\$84</u>
<i>Gross Margin</i>	16.0%
EBITDA	\$16
- Depreciation	<u>\$8</u>
EBIT	\$8
Tax @ 25%	<u>\$2</u>
NOPAT	\$6
Capital Charge 6% x \$100	<u>\$6</u>
Economic Profit (EVA)	\$0

With \$100 in revenues and cash operating costs of \$84, the firm's earnings before interest, taxes, depreciation, and amortization ("EBITDA") is \$16 and the EBITDA margin is 16%. EBIT is \$8 after deducting \$8 of depreciation. Taxes are \$2 at a 25% rate. The \$6 remainder is Net Operating Profit After Taxes, or NOPAT.

Economic profit, or EVA, for “economic value added,” as I call it, is generally understood to be the profit measured net of the opportunity cost of capital.³ More formally, economic profit can be defined as NOPAT less a capital charge one computes by multiplying the firm’s cost of capital times the amount of capital tied up in its business. The capital charge represents the NOPAT required to just meet the investors’ return expectations and fairly compensate them for bearing risk.

In the example, the capital charge is \$6, computed by multiplying the \$100 of capital times the 6% cost of capital, and as a result, and by design, EVA is zero. The firm is earning a NOPAT of \$6 and must earn a NOPAT of \$6 to meet expected returns. With zero EVA, the firm is covering all of its costs, including operating costs, depreciation and taxes, and also the cost of giving its investors – its debt holders and shareholders alike – a fully competitive return on their investment. A breakeven economic profit thus is the tautological definition of “revenue adequacy.”

B. Adequate Economic Profit Translates into ROI Adequacy

Economic profit is a function of a firm’s ROI. As shown in the table below, the \$6 NOPAT the firm earns represents a 6% return on its \$100 in capital. The 6% ROI just matches the firm’s 6% cost of capital. Its ROI – COC spread is thus 0%, which directly ties to its economic profit. The reason is that a firm’s economic profit may also be computed as the ROI – COC spread it is earning multiplied by the amount of capital that is earning the spread. Economic profit, in other words, is the dollar spread between ROI and COC.

NOPAT	\$6.0
Capital	<u>\$100</u>
Return on Capital (ROI)	6.0%
Cost of Capital	<u>6.0%</u>
ROI - COC	0.0%
x Capital	<u>\$100</u>
Economic Profit (EVA)	\$0.0

³ An economic profit is the difference between the revenue a business has received from its outputs and the opportunity costs of its inputs; cited in A Dictionary of Economics (5 ed.), 2017, Oxford University Press, by Nigar Hashimzade, Gareth Myles, and John Black.

A breakeven or zero economic profit thus implies and requires that $ROI = COC$, and vice versa. A firm is incapable of earning zero economic profits without earning a positive and attractive ROI that matches its cost of capital.

C. Adequate Economic Profit Translates into Return on Equity (“ROE”) Adequacy

The adequacy of $ROI = COC$ also can be demonstrated in terms of the firm’s return on equity. ROE is net income divided by the firm’s equity capital, where the net income available to the shareholders is the NOPAT generated in the business minus the after-tax interest expense paid to the debt holders. In the example, the interest on the firm’s debt of \$40 at an after-tax interest rate of 3% is \$1.20, which leaves a net income of \$4.80. Divide that by the firm’s \$60 in equity capital, and the firm’s return on equity is 8%, matching the firm’s 8% cost of equity (“COE”).

NOPAT	\$6.0
- Interest Expense After Tax	\$1.2
Net Income	\$4.8
Equity	\$60
Return on Equity	8%

Zero economic profit thus also implies and requires that a firm’s ROE will equal the cost of its equity capital.

D. Revenue Adequacy Is Also Reflected in a Firm’s Intrinsic Value

The intrinsic value of a firm’s core business, ignoring its future growth opportunities for simplicity, is determined by capitalizing its current NOPAT profits by the firm’s weighted average cost of capital, to wit:

$$\text{Intrinsic Value} = \text{NOPAT} / \text{COC}$$

NOPAT is the cash flow generated in operations, net of the charge for depreciation. NOPAT, in other words, is the sustainable amount of cash flow that could be distributed each year to investors while maintaining the asset base.

In the foregoing example, NOPAT is \$6, COC is 6%, and thus the firm's intrinsic value is \$100:

$$\text{Intrinsic Value} = \$6/6\% = \$100$$

If an investor pays \$100 for the firm *in toto*, and the firm earns and distributes \$6 in NOPAT each year, the investor always earns a 6% return on the value paid, which (by assumption) is precisely the return required to compensate the investor for bearing the riskiness of the investment.

In other words, if ROI = COC and economic profits break even, investors would be willing to pay a market value for the business that is equal to the capital tied up in the business. In that way the investors' wealth is preserved – they can always recoup their investment by selling their shares for intrinsic value – and they are guaranteed to earn the risk-adjusted return they are seeking on the price they pay, each year.

E. ROI = COC Guarantees Debt Repayment

If a firm that breaks even on EVA can return the money that shareholders have invested and a cost of equity return on top of that, as has been demonstrated, then the firm also must be able to repay the principal on its debt and cover the interest, too, for the simple reason that shareholders are paid after lenders are paid. Lenders take great pains to write loan covenants that assure they have a priority access to the firm's cash flows. That being the case, so long as a breakeven EVA firm takes care of the shareholders who stand at the back of the cash flow line, it is assured of catering to those lenders and other claimants that stand ahead in the line.

F. Break-Even Economic Profit Is a Sensible Rule to Judge Revenue Adequacy

It can appear, as a matter of semantics, that an "economic profit" as referred to in the statute must be positive, or else it would be a loss. Indeed, the Petitioners cite definitions of economic profit as referring to the profit *in excess of* a charge for capital, with the suggestion that an economic profit cannot be zero or negative. That is incorrect, however. Economic profit is a term of art that refers to a special way to

compute profit that stands in contrast to the profit computed according to accounting principles. It is not necessarily positive.

In the economics and accounting literature, and in common practice, economic profit is defined to be the income that remains after deducting the opportunity cost of all resources used in the business, which is how it was originally defined by the renowned English economist, Alfred Marshall, who in 1890 wrote: “What remains of his [the owner’s] profits after deducting interest on his capital at the current rate may be called his earnings of undertaking or management.”⁴ Economic profit is thus distinct from accounting profit because it deducts the opportunity cost of using equity capital, which is a cost that is completely ignored in the computation of accounting profits.

In practical terms, and as has been shown, economic profit is defined as NOPAT less a capital charge one computes by multiplying a firm’s invested capital by its overall or weighted-average cost of capital. To continue the example that I introduced in Parts II.A. through D. above:

$$\text{Economic Profit (or EVA)} = \text{NOPAT} - \text{a Capital Charge}$$

$$\text{Economic Profit (or EVA)} = \text{NOPAT} - \text{COC} \times \text{Capital}$$

$$\text{Economic Profit (or EVA)} = \$6 - 6\% \times \$100 = \$0$$

McKinsey & Co., also gives this same definition to economic profit in their classic textbook on measuring and managing the value of businesses.⁵

$$\begin{aligned} \text{Economic Profit} &= \text{NOPLAT} - \text{Capital} \\ &= \text{NOPLAT} - (\text{Invested Capital} \times \text{WACC}) \end{aligned}$$

NOPLAT, or Net Operating Profit Less Actual Taxes, is conceptually identical to NOPAT, and WACC, for weighted average cost of capital, is synonymous with COC.

⁴ Alfred Marshall, *Principles of Economics*, vol. 1 (New York: MacMillan, 1890), pg. 142.

⁵ *Valuation: Measuring and Managing the Value of Companies* (3rd Edition), (John Wiley & Sons, Inc, 2000), pg. 144.

Economic profit is simply the result of the calculation formula. Economic profit is negative when a company is unable to generate an operating profit sufficient to cover the overall required return on its capital, as is the case in many mature, slow growth or declining businesses. Economic profit also can be, and often is, zero or very close to it, especially in highly competitive businesses marked by undifferentiated and un-evolving products and services in fragmented markets characterized by intense price rivalry.

While investors are willing to support a firm that earns $ROI = COC$, they would be happier, of course, and willing to pay an even higher value, if ROI was greater than COC . But the statute does not require the railroads to generate a surplus profit and a surfeit of value. Only “adequacy” is required. Financial health is the goal, not super-star athleticism. Let’s examine the consequences of condoning $ROI > COC$.

	Adequate	Surplus
Revenues	\$100	\$102
- Cash Operating Costs	<u>\$84</u>	<u>\$84</u>
<i>Gross Margin</i>	16.0%	17.6%
EBITDA	\$16	\$18
- Depreciation	<u>\$8</u>	<u>\$8</u>
EBIT	\$8	\$10
Tax @ 25%	<u>\$2</u>	<u>\$2.5</u>
NOPAT	\$6	\$7.5
Capital Charge 6% x \$100	<u>\$6</u>	<u>\$6</u>
Economic Profit (EVA)	\$0	\$1.5
NOPAT	\$6.0	\$7.5
- Interest Expense After Tax	\$1.2	\$1.2
Net Income	\$4.8	\$6.3
Equity	\$60	\$60
Return on Equity	8%	10.5%
NOPAT	\$6.0	\$7.5
Capital	<u>\$100</u>	<u>\$100</u>
Return on Capital (ROI)	6.0%	7.5%
Cost of Capital	<u>6.0%</u>	<u>6.0%</u>
ROI - COC	0.0%	1.5%
x Capital	<u>\$100</u>	<u>\$100</u>
Economic Profit (EVA)	\$0.0	\$1.5

Referring to the “Surplus” column on the right, suppose that a railroad with market dominance can exert price power and raise revenues from \$100 to \$102 for exactly

the same bundle of services, with all other costs and capital remaining the same. The results are:

1. NOPAT increases from \$6 to \$7.5
2. ROI increases from 6% to 7.5%; $\text{ROI} > \text{COC}$
3. ROE increases from 8% to 10.5%; $\text{ROE} > \text{COE}$
4. Economic profit is positive and increases from \$0 to \$1.5
5. The firm's intrinsic value increases from \$100 (\$6/6%) to \$125 (\$7.5/6%)
6. Investors realize a windfall; they put or left \$100 in the business and will now realize \$125 in intrinsic value

For the firm's shareholders, this is a blessing. They will realize returns above what they could expect to earn on other equally risky investments. They will benefit from an expansion in their wealth, and not just merely preserving it.

But the shareholders' gains come at the expense of economic efficiency and fairness. The railroad has unjustifiably raised prices by 2%. It is unjustified because the price exceeds the all-in long run cost of providing the service. The price increase will be borne as a deadweight loss by the shippers and their shareholders, employees, and customers. If the price increase is fully passed on in the prices that the shippers' charge, for example, then their customers will be forced to pay higher prices for what they buy and to curtail purchases to some degree, both of which will feed back into lower profits and lower wages and less employment at the shippers.

Finally, judging that revenues are adequate if $\text{ROI} = \text{COC}$ is not the same as mandating that railroad returns be regulated. Railroads could earn $\text{ROI} > \text{COC}$ if that is the result of innovation and productivity gains, but not if it is the result of exploiting market dominance. That so, there are no adverse incentives or distorted decisions induced by judging revenue adequacy by $\text{ROI} = \text{COC}$. It is vitally important, therefore, that the STB does not permit the railroads to exert market power to raise prices when doing so would generate $\text{ROI} > \text{COC}$.

In sum, the term “economic profit” as commonly understood and used in business practice does not denote a result that is necessarily positive in any degree. The Board is perfectly justified in judging a business to be financially adequate if $ROI = COC$ and economic profits are zero because a firm that breaks even on economic profit implies all the following conclusions:

1. $ROI = COC$ (return on investment = cost of capital)
2. $ROE = COE$ (return on equity = cost of equity)
3. Revenues are adequate to cover all cash operating costs, the periodic depreciation of the assets, taxes, and a profit that provides a fully-acceptable, market-competitive, risk-adjusted return on capital and return on equity
4. The firm’s EBITDA and EBITDA Margin are positive and fully competitive
5. The firm’s cash flow from operations is (more than) sufficient to retire the debt that has been raised to finance the acquisition of its business assets
6. The intrinsic market value of the business = the net book value of the capital invested in the business, and thus, owner wealth is preserved, by definition
7. The firm has access to additional capital to meet customer needs

Thus, defining revenue adequacy as earning $ROI = COC$, which is the equivalent of zero economic profit, is fully consistent with the statutory requirements for revenue adequacy.

III. REPLACEMENT COSTS ARE NEITHER NECESSARY NOR APPROPRIATE TO THE CALCULATION OF ROI.

Petitioners have asserted that, because the railroads’ assets and capital are carried by accountants at historical depreciated costs and not current replacement costs, which are thought to be much higher, their ROIs are fundamentally

overstated.⁶ (Petition, pp. 16, 25) They then assert that this overstatement will make it more difficult for railroads to attract and retain capital. (*Id.*, p. 17) Neither assertion is accurate.

A. The Difference Between Replacement Costs and Book Values Is Inflation.

The principal reason for using replacement costs instead of book values is to account for inflation. When talking about inflation, it is useful to divide it into two parts. The first component is the increase in the overall price level, as indicated by the consumer price index (“CPI”), Personal Consumption Expenditure (“PCE”) index, or gross national product (“GNP”) deflator. This is the general increase in prices due to an expansion in the money supply above the growth in economic output. This price increase built into all prices, including the prices paid to replace railroad assets. The second component is the real price change, the change in the price relative to other goods and services in an absolute sense. The following formula links these two parts:

$$\text{Nominal Price Inflation} = \text{General Inflation Rate} + \text{Real Inflation Rate}$$

If, for example, the replacement cost of assets increases by 5% when general price inflation was 3%, then the real price increase was 2%. This is the increase that would occur absent any general inflation. Let’s consider these two effects upon ROI in sequence.

1. The Impact of Real Price Changes on ROI

The real cost of replacing railroad assets changes with supply and demand conditions in the markets for making the assets. For example, assume there is an increase in demand for rail shipping services, which raises the demand among railroads to acquire additional rail assets. Then, in the short term and before capacity can adjust, the real cost of acquiring rail assets increases.

Should this unpredicted and likely temporary increase in the real price of acquiring new rail assets be applied to re-price all the assets that a railroad currently

⁶ Notably, although M&Z assert that historical depreciated costs may produce an inaccurate ROI, they do not assert that the inaccuracy necessarily will overstate ROI, as Petitioners assert. (M&Z V.S., ¶¶ 46 n. 38, 58).

owns, as would happen if replacement cost were applied across the board? Certainly not. That would provide the railroads with a massive windfall at the expense of their customers. By hiking the entire asset base to current replacement cost, and maintaining $ROI = COC$ as the revenue adequacy standard, the railroads would be able to raise prices across the board and earn, absent regulatory intervention, a massive increase in profit that is unwarranted by economic theory.

In fact, *all that is required to maintain the health of the industry and to continue to attract capital for the investments is for the railroads to be able to cover the replacement cost of the assets that they actually replace or that are new additions, and not the entire asset base.* As the railroads acquire new assets at current prices and those assets enter capital, and assuming $ROI = COC$ is maintained, they will be able to increase their revenues and profits to cover the cost of acquiring and financing those new assets, as the statute requires, and without handing the railroads a windfall for the repricing of all their assets, which is unnecessary and ill-advised.

McKinsey & Co. agrees, noting⁷:

The replacement cost approach values the plants at the cost to replace them today. We disagree with the replacement cost approach for the simple reason that assets do not have to be and may never be replaced. It may be economically justifiable to continue to use an old asset even though the cost of replacing it with new equipment may outweigh the higher profits that the new asset will eventually generate.

Ironically, then, should the STB apply replacement costs to the assets, the railroads could be motivated to replace existing assets with new assets regardless of whether that is an economically sensible thing to do.

Consider also what would happen if real replacement costs decrease. Assume the companies that manufacture railroad equipment achieve productivity gains, and that they pass the gains on, at least in part, into lower prices for rail equipment, meaning the replacement costs decrease. If the lower replacement costs for new rail

⁷ "Valuation," McKinsey & Co., 3rd edition, 2000, John Wiley & Sons, page 184.

assets were used to reprice the railroads' entire asset base, the Carriers would be unable to earn an appropriate return on what they originally paid for the assets even though such carriers would be deemed revenue adequate under this standard. Asset values could be expropriated by regulatory intervention that forces the railroads to lower prices and earn less profit to maintain $ROI = COC$ on the marked-down asset base. In an extreme case, the railroads might not be able to repay the debts that were incurred to finance the legacy asset base.

In conclusion, so long as the goals are to ensure (1) there is no expropriation of the value of prior investments or windfall and (2) the railroads can access incremental capital at current prices to meet emerging market needs, then the revenue standard of $ROI = COC$ on the net book value of the asset base is a perfectly suitable formula. Let's consider a simple example of this.

Suppose a railroad invests \$100 in new assets in a period. Assuming it has a cost of capital of 6%, the railroad will be entitled to earn NOPAT profit of \$6 on that investment. Assuming, as in the prior example, an income tax rate of 25%, an asset depreciation life of 20 years, which is equivalent to an annual depreciation charge of \$5, and a gross margin of 16%, the railroad would be permitted to increase its revenues in an amount of \$81 without raising any presumption of monopoly pricing.

	Adequate
Revenues	\$81
- Cash Operating Costs	<u>\$68</u>
<i>Gross Margin</i>	16.0%
EBITDA	\$13
- Depreciation	<u>\$5</u>
EBIT	\$8
Tax @ 25%	<u>\$2</u>
NOPAT	\$6
Capital Charge 6% x \$100	<u>\$6</u>
Economic Profit (EVA)	\$0

Thus, so long as $ROI = COC$ is used to judge revenue adequacy, a new investment in a period automatically translates into an ability to earn revenues and profits *in future periods* that are fully competitive and commensurate with investor expectations. The rule correctly connects new investments with future performance opportunities.

2. The Impact of General Price-Level Inflation on ROI.

Let's now examine the case where there is equilibrium in the markets for railroad equipment, meaning there is no change in real replacement costs, but there is an increase in the general price level, commonly called inflation. The cumulative effect of inflation over time will lead to the reported net book value of assets to be understated in terms of their value in the currency of the day. As the Petitioners allege, this will lead to an overstatement of ROI. Current profits are being compared to historical asset bases.

However, offsetting this, an properly computed ROI based on replacement costs would have to include the gain in the net asset value due to inflation as part of the return. Whatever the net book value of the assets would be without inflation will be greater with inflation. The difference – the appreciation due to inflation – is a holding gain that must be factored into NOPAT and into the computation of the ROI.

If, for example, the net depreciated book value of the assets at the beginning of the year was \$100, and inflation was 2% during the year, then those same assets would be worth \$102 at the end of the period (ignoring depreciation). Therefore, a holding gain of \$2 would need to be included in NOPAT and factored into ROI and the computation of economic profits. As a technical matter, the appropriate accounting entry is to credit earnings, i.e., increase NOPAT, to reflect the inflationary holding gain on the assets, and then to debit, or to increase, the corresponding PPE assets to bring them up to current inflated cost.

There are three ways to think about why it is sensible to include the inflation gain in the return:

1. The assets have appreciated in value due to general inflation.
2. It is more accurate, however, to say that assets of unchanged value, that have maintained the same real value, are simply worth more in terms of a currency that has decreased in value; what is recorded is not so much a holding gain as a currency loss.
3. But, it is most accurate to say that, whatever profits the assets could be expected to generate absent inflation will be larger when repriced and expressed in terms of the current currency value; it is not the asset values that are being repriced; it is the profits and cash flows that the

assets can be expected to generate that are being repriced and that produce a gain from holding the assets.

Stated succinctly, the correct way to compute the ROI in the face of general price level inflation is (i) to assume that the entire net depreciated asset base is sold at the end of the year for its book value restated in current monetary terms, (ii) to record the year-over-year inflation gain from holding the assets as part of profits and as part of the return, and (iii) then to assume the proceeds are used to re-purchase the assets at the year-end monetary values, stepping them up to establish the base for computing the return in the next year.

Including the holding gain in ROI is also justified by and consistent with the inclusion of an inflation premium in the cost of capital. Investors understandably want to keep pace with inflation and earn a real return in true purchasing power terms. Accordingly, the cost of capital that the STB applies to judge ROI includes an expected compensation for inflation, called the Fisher effect after the economist Irving Fisher who first noted that the interest rates we observe and the costs of capital we compute, called nominal rates, are based on a real return rate plus expected inflation:

$$\text{Cost of Capital} = \text{Real Cost of Capital} + \text{Inflation}$$

The inflation rate that enters the COC is the general economy-wide rate, a CPI or CPE rate, not an asset specific rate, because investors want to maintain their general purchasing power across all available goods and services. They are not, for example, specifically interested in acquiring or keeping pace with railroad assets. Thus, if we are to properly compare ROIs with costs of capital that incorporate an inflation premium, the company's NOPAT and its ROI must include the holding gains on the assets that are due to general inflation.

The foregoing adjustments to ROI and COC are not being made to the STB's revenue adequacy calculation, nor do I advocate for it. I am simply observing that the understatement of the book value asset base compared to replacement cost is offset by the exclusion of the inflationary holding gains on the assets. It is not *a priori* obvious the direction of the net impact. Moreover, the Petitioners have not provided evidence about the net impact of these offsetting errors.

3. Inflation Summary

As has been discussed, the inflation rate in the replacement cost of any asset can be divided into two components, first, a real price change relative to other goods and services and a second change due to a reduction in the purchasing power of the currency, commonly called inflation. Real price changes should not factor into an across-the-board adjustment for the replacement cost of railroad assets. Doing so would create windfall gains or losses when judging ROI versus COC and it might encourage the railroads to prematurely replace assets.

The correct incentive for management decisions, and an appropriate basis for judging revenue adequacy, is maintained so long as $ROI = COC$ on the depreciated net book value of assets because, as assets are replaced or new assets are acquired for expansion, the assets enter the accounting book value at their current replacement costs at that time. Replacement cost should be used for new asset acquisitions, not to revisit and adjust the historical value of assets. But this is what conventional book accounting already does.

If general inflation were to be recognized in the asset base, the inflationary gain realized in the period must also be included in NOPAT and factored into ROI. Because the inflation gains are not being included, any ROI overstatement is much less than it appears to be and may be non-existent. No evidence has been submitted to prove that any modification to how the Board calculates revenue adequacy is warranted.

B. ROI = COC Preserves the Value of Investments and Guarantees Access to Capital Even When Using Book Values to Calculate ROI.

So long as a firm continues to generate $ROI = COC$, investors are assured that any new investments they put into the firm and that add to the firm's capital base will be rewarded with a fully-competitive return on the investment and recognized with a market value that is equal to the invested capital, thus preserving the owners' wealth. As a result, any firm that maintains $ROI = COC$ is always guaranteed to have access to capital on favorable terms. This is true even when using depreciated book values to calculate ROI.

The following example demonstrates this point. Assume a railroad makes an investment of \$1,000 that has a depreciable life of 32 years (a typical average

depreciation rate for rail assets). Book depreciation is thus \$31.25 per year (\$1,000/32). The cash profits that could be earned in each period while maintaining the ROI - COC standard, assuming COC = 6%, are computed according to the following formula:

$$\text{Cash profit} = \text{COC} \times \text{Book Net Assets (beg of year)} + \text{Depreciation}$$

For example, in year 1, the computation is:

$$\begin{aligned} \text{Cash profit} &= \text{COC} \times \text{Book Net Assets (beg of year)} + \text{Depreciation} \\ \$91.25 &= 6\% \times \$1000 + \$31.25 \end{aligned}$$

In year two:

$$\begin{aligned} \text{Cash profit} &= \text{COC} \times \text{Book Net Assets (beg of year)} + \text{Depreciation} \\ \$89.38 &= 6\% \times (\$1000 - \$31.25) + \$31.25 \end{aligned}$$

The cash profit is projected to decline as the asset ages, which is sensible. As assets age, they tend to lose their technological edge and may require more maintenance and downtime. Even if the cash flows do not deteriorate in this exact stepwise pattern, the notion of a declining cash profit trend is realistic.

NOPAT is computed in each period as the projected cash profit less the \$31.25 in depreciation (taxes are ignored for simplicity).

ROI is computed by dividing the forecasted NOPAT by the net assets, or capital, outstanding at the beginning of the period. The result is that ROI is 6% in each period, and the ROI – COC spread is 0.0%, maintaining the standard for revenue adequacy.

Importantly, the present value of the projected cash profit (which is the Free Cash Flow because no new investment is forecast in the example), discounted at the 6% cost of capital, is \$1,000. The investors' wealth is thus preserved. They recover the value of the capital they have invested, and they also earn a 6% return on their capital each year, commensurate with the opportunity cost of the capital.

The year-by-year projection of the key data points is presented in the tables below:⁸

Years 1 – 10:

1 IRR	6%										
2 Depr Life (yrs)	32										
3 Year		1	2	3	4	5	6	7	8	9	10
4 Cash Flow		\$91	\$89	\$88	\$86	\$84	\$82	\$80	\$78	\$76	\$74
5 PV Factor		0.943	0.890	0.840	0.792	0.747	0.705	0.665	0.627	0.592	0.558
6 Present Value	\$1,000	\$86.08	\$79.54	\$73.47	\$67.82	\$62.58	\$57.72	\$53.20	\$49.02	\$45.13	\$41.53
7 Gross PPE		\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
8 Acc Dep		\$31	\$63	\$94	\$125	\$156	\$188	\$219	\$250	\$281	\$313
9 Net PPE		\$969	\$938	\$906	\$875	\$844	\$813	\$781	\$750	\$719	\$688
10 Depreciation		\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25
11 NOPAT		\$60	\$58	\$56	\$54	\$53	\$51	\$49	\$47	\$45	\$43
12 Capital (BOY)		\$1,000	\$969	\$938	\$906	\$875	\$844	\$813	\$781	\$750	\$719
13 ROI		6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
14 COC		6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
15 ROI - COC		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Years 11– 21:

1 IRR	6%											
2 Depr Life (yrs)	32											
3 Year		11	12	13	14	15	16	17	18	19	20	21
4 Cash Flow		\$73	\$71	\$69	\$67	\$65	\$63	\$61	\$59	\$58	\$56	\$54
5 PV Factor		0.527	0.497	0.469	0.442	0.417	0.394	0.371	0.350	0.331	0.312	0.294
6 Present Value	\$1,000	\$38.19	\$35.10	\$32.23	\$29.58	\$27.12	\$24.85	\$22.75	\$20.80	\$19.00	\$17.34	\$15.81
7 Gross PPE		\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
8 Acc Dep		\$344	\$375	\$406	\$438	\$469	\$500	\$531	\$563	\$594	\$625	\$656
9 Net PPE		\$656	\$625	\$594	\$563	\$531	\$500	\$469	\$438	\$406	\$375	\$344
10 Depreciation		\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25
11 NOPAT		\$41	\$39	\$38	\$36	\$34	\$32	\$30	\$28	\$26	\$24	\$23
12 Capital (BOY)		\$688	\$656	\$625	\$594	\$563	\$531	\$500	\$469	\$438	\$406	\$375
13 ROI		6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
14 COC		6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
15 ROI - COC		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

⁸ See electronic work paper “ROI Guaranteed for New Investments.xlsx”

Years 21– 32:

1 IRR		6%										
2 Depr Life (yrs)		32										
3 Year		22	23	24	25	26	27	28	29	30	31	32
4 Cash Flow		\$52	\$50	\$48	\$46	\$44	\$43	\$41	\$39	\$37	\$35	\$33
5 PV Factor		0.278	0.262	0.247	0.233	0.220	0.207	0.196	0.185	0.174	0.164	0.155
6 Present Value	\$1,000	\$14.40	\$13.09	\$11.89	\$10.78	\$9.75	\$8.81	\$7.95	\$7.15	\$6.42	\$5.75	\$5.13
7 Gross PPE		\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
8 Acc Dep		\$688	\$719	\$750	\$781	\$813	\$844	\$875	\$906	\$938	\$969	\$1,000
9 Net PPE		\$313	\$281	\$250	\$219	\$188	\$156	\$125	\$94	\$63	\$31	\$0
10 Depreciation		\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25	\$31.25
11 NOPAT		\$21	\$19	\$17	\$15	\$13	\$11	\$9	\$8	\$6	\$4	\$2
12 Capital (BOY)		\$344	\$313	\$281	\$250	\$219	\$188	\$156	\$125	\$94	\$63	\$31
13 ROI		6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
14 COC		6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
15 ROI - COC		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

The foregoing example demonstrates that applying the Board’s current measure of $ROI = COC$ to judge revenue adequacy guarantees the railroads will be able to generate cash flows sufficient to cover all costs, including the opportunity cost of the capital, and thus to attract capital for new investments that are economically warranted to maintain the health of the railroad system.

C. The Investment in, and Returns Due to, Fully Depreciated Assets Are Fully Realized in Prior Periods

M&Z identify differences between accounting depreciation and economic depreciation as one reason why an accounting-based ROI is an inappropriate determinant of revenue adequacy. (M&Z V.S., ¶¶ 44-45) This distinction, however, does not undermine the ability of the current revenue adequacy standard to accurately assess the ability of railroads to attract and retain capital.

Book depreciation fully recovers the investments in assets over an assumed life. Even if the assumed life is inaccurate, railroads still will fully recover the investment in the assets via the annual depreciation charges, and if $ROI = COC$ is maintained as the standard to judge revenue adequacy, railroads also will be able to earn a fully-sufficient return each year on the capital that has not yet been recouped through prior depreciation charges without triggering regulatory scrutiny.

Assets that still contribute cash flows after they have been fully depreciated represent an unexpected windfall for the railroads. The cash flows from those assets are not necessary for the railroads to maintain the financial health of the industry.

Also consider the opposite case. If railroads make an investment that falls short of earning $ROI = COC$ over the assumed depreciable life, so that, in effect, the book depreciation understated the actual economic depreciation, the shortfall in the return (*i.e.*, revenue inadequacy) would permit the railroads to differentially price and earn more profits elsewhere in the system without triggering regulatory scrutiny.

Thus, if the STB elects to make an allowance for over-depreciated assets, to be fair and consistent, it would also have to make an offsetting adjustment for the assets that are under-depreciated. This is not a serious proposal but is only intended to demonstrate the one-sided nature of the arguments that have been advanced by the Petitioners.

By maintaining the $ROI = COC$ standard, railroads effectively could be challenged to offset the windfall cash flows from the extended asset lives of fully depreciated assets with rate constraints on captive traffic. They would be motivated to disgorge the windfall through lower and fairer rates, thus returning a surplus that is rightfully due to their customers and promoting more shipping activity in support of the economy.

Regardless, the impact of the extended cash flows derived from fully depreciated assets is apt to be minor in the aggregate. Continuing the example from the preceding section, if one assumes that the cash flows generated in the last year of the assumed depreciable life (the 32nd year) persist for another 8 years, in effect extending the economic life of the cash profit to 40 years from 32 years, or 25% longer, the present value of the additional cash flows at the 6% COC rate is \$30, or a 3% increase in present value on top of the \$1,000 investment.

Any attempt to fold fully depreciated assets into the capital base used to compute ROI is thus inappropriate for three reasons:

1. The investment in and returns due to those assets already have been fully realized by the retrospective application of the $ROI = COC$ standard. Any extended return on those assets is a windfall that is not necessary to

guarantee financial health or access to capital. The windfall rightly belongs to the shippers and to the economy at large.

2. The present value of making such adjustments prospectively is apt to be *de minimis* because the additional present value accrues only after an average depreciable life of 32 years has been exceeded.
3. Any adjustment is apt to be rife with estimation errors and an unnecessary source of ongoing debate. For example, to be fair and consistent, the STB would have to make an offsetting adjustment for assets that have been over-depreciated and that failed to recoup the original investment value.

IV. THERE IS NO NEED FOR, OR SENSE IN, JUDGING REVENUE ADEQUACY BASED UPON WHETHER THE RAILROADS ARE EARNING AN ROI – COC SPREAD THAT IS COMMENSURATE WITH THE ROI – COC SPREAD EARNED BY OTHER LARGE COMPANIES.

The Petitioners are advocating that the STB adopt a new methodology for judging the revenue adequacy of railroads. Specifically, the Petitioners' expert witnesses, M&Z, argue for the adoption of a benchmarking methodology because it is alleged to "mitigate the limitations and inaccuracies of accounting rates of return as estimates of the cost of capital:"

82. Economic research has shown that the limitations and inaccuracies of accounting-based rates of return make it difficult, and some say impossible, to draw any inferences about economic rates of return based on accounting rates of return. To the extent it is necessary to use accounting rates of return in comparison to the cost of capital to assess financial performance, using the proposed benchmarking methodology mitigates the limitations and inaccuracies of accounting rates of return as estimates of the cost of capital. (M&Z VS, ¶ 82)

In other words, M&Z claim that the benchmarking proposal is needed because accounting rates of return are poor estimates of economic rates of return, which was a finding M&Z took great pains to document:

46. A common finding, as expressed by Fisher and McGowan (1983), is that the difference between accounting rates of return and economic rates of return can be very large: "the theoretical effects are not so small that they can be neglected in practice. Indeed, they are very large"

They also concluded that the sign of the difference (error) depends on the characteristics of the company: “the accounting rate of return depends crucially on the time shape of benefits [cash flows], and the effect of growth on the accounting rate of return also depends on that time shape. In particular, it is not true that rapidly growing firms tend to understate their profits and slowly growing firms tend to overstate them. The effect can go the other way.” (M&Z VS, ¶ 46) (footnotes omitted)

Remarkably, M&Z simply assert that the benchmarking methodology they propose mitigates the measurement errors in accounting rates of return without advancing any arguments or offering any evidence in support of that contention. Indeed, given the inaccuracies they insist are prevalent in accounting returns, and that the size and even direction of the distortions are claimed to be unfathomable, **it is irrational for them to maintain that comparing ROIs measured with error with other ROIs also measured in error would result in anything but a massive error.**

In Parts II and III above, I have explained why the M&Z criticisms of using accounting rates of return to determine railroad revenue adequacy are misplaced and, thus, their predicate for proposing an alternative methodology is inaccurate. Nevertheless, even if the Board were to accept the legitimacy of the M&Z criticisms, in this Part IV, I address multiple deficiencies in the M&Z proposal to replace the Board’s sensible approach to determining revenue adequacy with a new methodology that benchmarks the spread of ROI – COC for the rail industry against the median spread for selected S&P 500 companies.

A. The S&P 500 Is Not A Relevant Benchmark Group

M&Z argue in favor of establishing a safe harbor ROI - COC spread for the railroads that is equal to the median ROI - COC spread earned by S&P 500 companies excluding railroads, financial institutions, and real estate companies (the “S&P 500” benchmarking group):

32. In order to understand whether railroads are earning a return on invested capital that is indicative of at least the potential for rates to be unconstrained by competition, it is necessary to benchmark any revenue adequacy measure adopted by the Board against corresponding

measures we observe for firms operating under competitive conditions. We propose below in Part IV that the firms included in the S&P 500 stock market index, which are the 500 large companies listed on U.S. stock exchanges designed to represent the U.S. stock market, exclusive of any railroad companies, provide a benchmark for evaluating whether revenue adequacy measures using accounting data indicate that railroads are unusually profitable. The firms whose stock is included in the index are large firms that compete with railroads for capital, including many customers of the railroads. (M&Z VS, ¶ 32)

Using the median firm in the S&P 500 to represent a profitability benchmark for the railroads is incorrect on several counts.

1. Railroads Must Compete for Capital Against All Firms

M&Z contend that the S&P 500 is a relevant benchmark group because it consists of other large firms against which the railroads compete for capital. In fact, the railroads, like any other company, compete for capital with *all* other firms in the global market and with the funding requirements of fiscal deficits.⁹

As a matter of mathematical balance, the amount of money that companies can invest is limited to the amount of household savings and corporate retained earnings (less the amount used to finance government deficits). There is thus a unique interest rate that equates the supply of savings from people and firms, which rises as interest rates increase and saving is rewarded, with the amount of money that companies can profitably invest, which decreases as interest rates and the cost of capital rise.¹⁰ That rate, reflecting the marginal opportunity cost of capital, establishes the key threshold to allocate capital and to judge corporate profitability. It is a rate set in the market to balance the supply of and demand for capital *in the aggregate*. That rate is also, by definition, the ROI provided by marginally acceptable investment projects. See the breakout box, “The Market Mechanism for Allocating Capital,” for greater elaboration.

⁹ The supply of capital is also augmented by the funds imported through running a trade deficit.

¹⁰ Technically, the available savings for investment is net of the funding of fiscal and trade deficits.

The Capital Asset Pricing Model, or CAPM, which the Board uses to determine the cost of equity capital, is simply an extension of this idea. It adjusts the universal, market-set threshold rate for the risk of specific companies and investments. CAPM starts with the prevailing rate of return on long-term US government bonds as a proxy for the return available from a risk-free investment, one in which the payback of principal and interest is virtually certain. A second point corresponds to an investment in the broad market, in principle, in all risky investments. Investors establish a required premium for bearing that additional risk, commonly called the “market risk premium,” or MRP, which is the extra annual rate of return required to induce investors to bear the market risk compared to a safe investment in government bonds.

All stocks are priced relative to those two points. An investor that buys low-risk food stocks, such as Campbell Soup or McCormick, only bears about half the risk of an investment in the broad market portfolio (a “beta” of 0.5), and accordingly, a risk-premium of half the MRP is acceptable. The stocks of many hi-tech companies, like NVIDIA, whose fortunes are closely tied to the economy and which have high fixed costs due to specialized resources, typically exhibit risk that is 50% greater than the market, and thus require a return premium 50% greater than the MRP. The CAPM formula expresses this:

$$\text{Required Return (or cost of equity)} = \text{Risk-Free Government Return} + \text{Beta} \times \text{MRP}$$

The formula governing risk and expected return is linear. It charts a straight line not as a matter of convenience, but as a consequence of arbitrage. It is derived from the idea that investors could match the risk and expected return of food stocks by putting half their money into the risky market and half into safe government bonds, and that investors could arbitrage the expected risk and return from purchasing \$100 of NVIDIA stock by allocating \$100 of their money plus \$50 borrowed on the margin to invest \$150 in the market, which gives them \$150 worth of risk and expected return per a \$100 investment, or a beta of 1.5. In similar fashion, any stock anywhere along the risk spectrum can be replicated through some combination of borrowing or lending at a fixed rate and investing in the market.

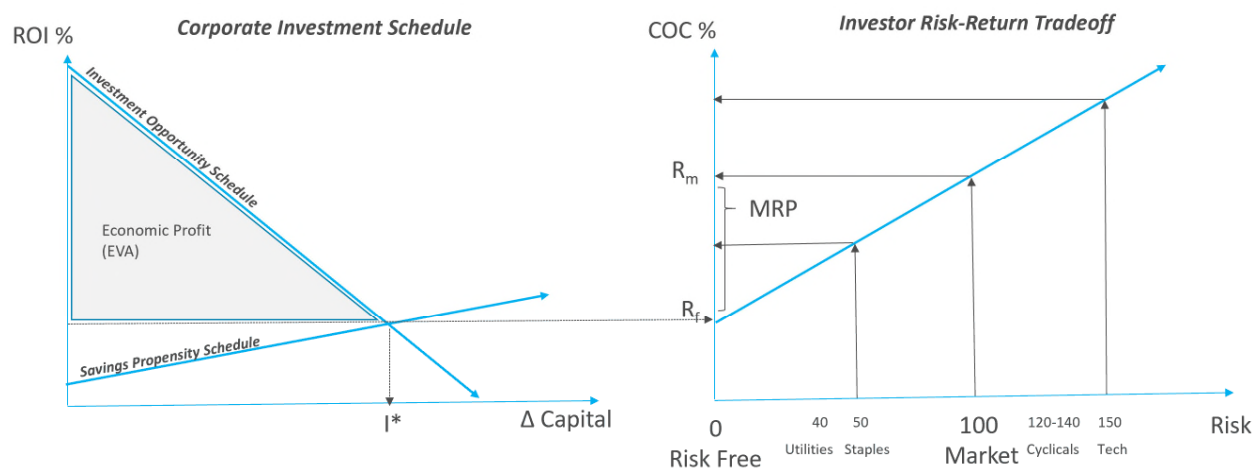
The competition for capital that determines COC is thus not limited to other firms of closely matching characteristics, because investors can always repackage a pool of securities to duplicate the risk return profile of individual stocks. Food stocks

compete with high-tech stocks for capital, indeed with all other stocks, once an allowance is made for their different risk characteristics. Thus, the comparison of ROI to COC, which embodies the appropriate required return for the risk, is the relevant benchmarking comparison from the perspective of the capital markets. It is all the benchmarking that is required for assessing revenue adequacy, as I have demonstrated in the preceding sections. There is no economic justification to compare railroads against other large companies.

The Market Mechanism for Allocating Capital

Our economic system is grounded in allowing free-market forces to determine the optimal allocation of capital. Two schedules explain how investors are induced to bring capital to the market and how the market allocates capital to its most promising uses.

The schedule at left (below) plots return on investment versus the amount of capital saved and invested in a period. The “Savings Propensity Schedule” rises as interest rates rise, as savers are induced to postpone consumption and invest more of their income for future returns. The downward sloping line, labelled the “Investment Opportunity Schedule,” represents the potential ROIs on company investment projects, assuming those projects are ranked from best to worst, from the investments with the highest ROI potential to the lowest. This schedule is refreshed each period as technology advances and as population and income grow.



The intersection of those schedules simultaneously determines the interest rate that will induce the exact supply of savings to come to the market that is needed to fund all worthwhile projects, denoted by I^* , which are the ones that make economic sense and that will earn at least the threshold return. If a company ends up making an investment that is expected to earn less than that breakeven return, it is in principle denying funds to projects that would be expected to earn the threshold return. The result is slower economic growth and a reduction in per capital income compared to an optimal allocation. The market discourages that. The penalty for misallocating capital is a stock price that trades at a discount to the investment (and the potential for shareholder activism).

The schedule at right converts that base, threshold return into a full array of equivalent interest rates that adjust for risk. This is the so-called “Capital Asset Pricing Model.” It starts with two points. First, by taking essentially no risk, an investor can still expect to earn a return by investing in safe government bonds, denoted as R_f , for the “risk-free rate.” A typical proxy is the 10-year U.S. government bond yield, currently about 1.5%. The second point is the return expected from investing in the market, in principle, in all risky securities, denoted by R_m , for the expected market return. Investors in the market expect to earn an additional return above the risk-free return to compensate for bearing the additional risk. The extra required return is called MRP, for Market Risk Premium. MRP cannot be known with precision, but available techniques make it possible to determine a realistic estimate (generally held to be between 4% and 6%).

All other investments can be scaled to the market. Basic foods and household staples equities only exhibit about half the risk of an investment in the market and accordingly, half the MRP is appropriate compensation. The stocks of hi-tech firms like NVIDIA, a maker of chips for computer graphics, data mining and AI, on the other hand, tend to exacerbate market swings, exhibiting typically 50% more risk, and hence, a risk premium 50% greater than the MRP is required to induce investors to buy the shares at no less than book value.

All the costs of capital on the risk-return tradeoff schedule are essentially the same cost. They are all effectively the market-set threshold return from the left schedule adjusted for the degree of risk in the companies and in their investment projects charted on the right schedule. When that base, threshold return, as adjusted for risk, i.e., the cost of capital, is carried back into the left schedule, the definition of economic profit emerges.

Economic profit, or EVA, is the upper left triangle. It is the product of the ROI – COC spread on each project, times the amount of capital invested in each project, summed over all projects.¹¹ For a company, it is its overall average ROI - COC spread, times its overall capital base. It is the NOPAT profit earned minus the NOPAT profit required to cover the opportunity cost of the firm's capital, which also equals the expected ROI on the marginally acceptable investment projects across all firms. In this way the global perspective of the capital markets is brought into the management of individual companies and the evaluation of their performance.

2. Company Profitability Is Determined by Its Industry

As discussed above, COC is the appropriate profitability benchmark for any company. Companies that earn COC are meeting the appropriate required return as set in the global market for capital against all other firms and available investment opportunities. The comparison to COC asks whether a company is at least equaling the return on the marginally acceptable project across the global portfolio of investment opportunities on a risk-adjusted basis. The Board need look no further to determine revenue adequacy than $ROI = COC$. Benchmarking $ROI - COC$ against the $ROI - COC$ spread of S&P 500 companies has no merit or economic justification.

Even setting aside this crucial qualification, the median S&P 500 firm would still not qualify as an appropriate profitability benchmark for railroads. That is because the S&P 500 is comprised of stocks from many industries, and industry is a crucial factor, typically the single most important factor, in determining a company's ROI potential. This is illustrated in a study by McKinsey, the consultancy, that estimated the average economic profit for 2,393 of the largest non-financial global firms by revenue over the 2010 to 2014 period, a five-year period that could be deemed "normal" as it encompasses the period after the recovery from the deep recession in 2008-09 and before the more recent (pre-Covid) boom times.¹² Their conclusions are as follows:

¹¹ In fact, EVA, or economic profit, can be negative, when $ROI < COC$. The upper left triangle is an idealization assuming all accepted projects generate $ROI \geq COC$.

¹² Strategy Beyond the Hockey Stick, McKinsey & Company, 2018, John Wiley & Sons.

1. “Market Forces are Pretty Efficient...The average company in our sample generates returns that exceed the cost of capital by 2%.¹³”
2. “The role of industry in [determining a company’s economic profit] is so substantial you’d rather be an average company in a great industry than a great company in an average industry.”¹⁴
3. The trend in your industry’s [economic profit] is the single most important of all 10 attributes [in determining whether your company is able to increase its economic profit].¹⁵

The McKinsey study demonstrates that, across a large sample of global firms, the average company’s ROI – COC spread is 2%, which is significantly less than the 9% ROI – COC spread that M&Z document as the median for S&P 500 companies over the 2006-2019 period.

There are several reasons for this. For one, McKinsey computes economic profit and ROI by making a different set of adjustments to reported financials that produce an ROI that more accurately reflects the firms’ true economic profitability.¹⁶

¹³ *Id.*, pages 45-46.

¹⁴ *Id.*, page 51.

¹⁵ *Id.*, page 101.

¹⁶ The major adjustments that McKinsey makes to compute ROI and economic profit are to:

1. Exclude excess cash (above 2% of sales) from capital, and remove interest and investment income from earnings
2. Deconsolidate financing subsidiaries
3. Remove non-operating assets, such as pension fund assets, tax loss carryforwards, excess real estate and discontinued operations, from capital
4. Include goodwill and acquired intangibles in capital
5. Capitalize operating leases in capital, add the imputed interest in rents to earnings
6. Capitalize and amortize R&D
7. Eliminate one-time charges, and gains and losses, from earnings
8. Convert accrual bookkeeping reserves to cash flow
9. Include deferred tax liabilities (due to normal operations) in capital
10. Adjust taxes to reflect cash payments (by backing the increase in deferred tax liabilities due to normal operations from earnings)

Compared to the STB ROI, the adjustments will tend to produce an ROI that is more comparable and accurate across a diverse group of companies. The tax adjustments, items 9 and 10, are similar to the adjustments that M&Z propose in computing an adjusted ROI that more closely approximates a cash-on-cash yield (the only difference is that the McKinsey adjustments are more sophisticated in removing

The McKinsey study also encompasses a larger number of firms drawn from a global pool, which is more representative of the outcomes generated in competitive markets than is the S&P 500. Given this evidence, even if the STB acceded to the view that some ROI - COC spread should be factored into the revenue adequacy determination, any benchmark over a 2% spread is clearly uncalled for (even assuming, which is doubtful, that the STB could implement a practical procedure to measure ROI across the S&P 500 with reasonable accuracy).

McKinsey also documents a well-known phenomenon. Industry matters, a lot. The profitability of an individual company is heavily influenced by the structural characteristics of the industry sector in which it operates. To demonstrate this, McKinsey presents a so-called Power Curve, shown below, which plots the average annual economic profit earned by sub-industry groups (excluding financials).

the tax impact of unusual items and non-operating activities). The other adjustments will also tend to produce lower ROIs for acquisitive firms (because of the inclusion of goodwill), for firms that rely on off-balance-sheet leases, and for mature, R&D intense firms that have accumulated a significant base of R&D capital. For other firms, the impact is indeterminate.

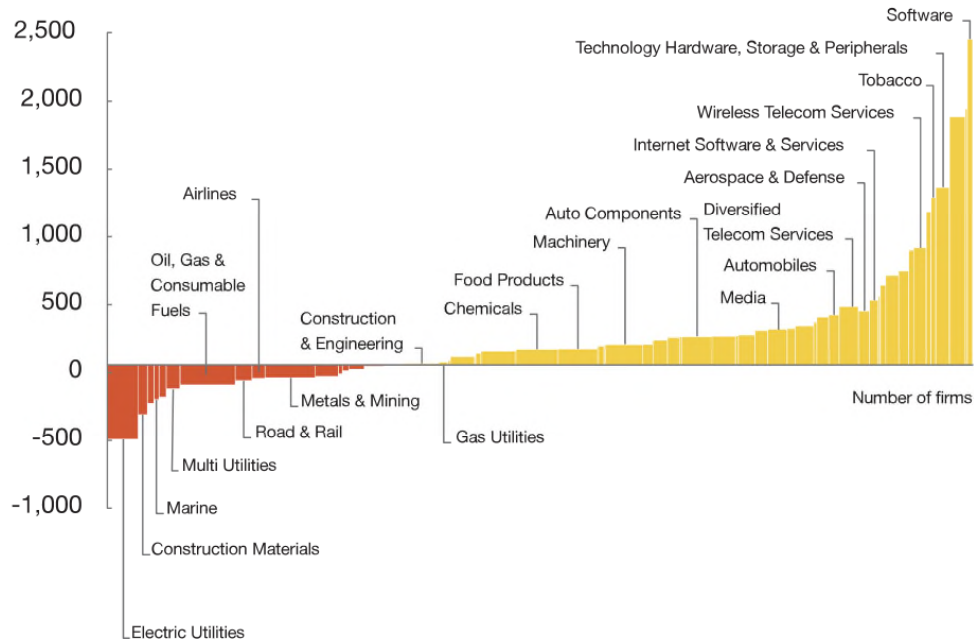
“Valuation,” McKinsey & Co., 5th edition, 2010, John Wiley & Sons, pages 131-161.

The industry Power Curve

Industries also have a Power Curve—where you play really matters

Average annual economic profit of firms within each industry, 2010–14

\$ Millions, N=2,393



Source: Is your strategy good enough to move you up on the power curve? By Martin Hirt, Leader of McKinsey's Global Strategy & Corporate Finance Practice; <https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/the-strategy-and-corporate-finance-blog/is-your-strategy-good-enough-to-move-you-up-on-the-power-curve>.

It is evident that ROI varies massively by industry, and that the firms that participate in industries that have highly differentiated products or services, rapid growth, patent protection, brand equity, high-up front costs and low incremental costs leading to a first strike advantage, or that are grounded in algorithms and software or with network effects from the aggregation of data and consumer interest, are inherently more profitable and earn higher ROI's than those participating in mature, slow growing businesses that provide commodity products and services with little differentiation in an environment of intense price rivalry (or those whose returns are regulated).

3. The S&P 500 Median ROI – COC Spread, or Any Other Percentile, Is an Irrelevant Benchmark

Considering the prominent role of industry in determining ROI, a proposal to use the median ROI - COC spread for the S&P 500 firms, which contains a

distribution of companies across almost all business sectors, as a profitability target for the railroads makes no sense. There is no reason to think that the profitability enjoyed by Software firms, Tech firms, Wireless Telecoms, Internet Software and Service providers, Media and Pharma and Medical Care companies, for example, would have any relevance for setting an expected profitability standard for a railroad. Yet those firms are heavily represented in the S&P 500.

Moreover, and for the same reason, there is no logic to choosing any other percentile among the S&P 500. To use the 10th or 25th percentile S&P 500 firm as a profitability threshold for the railroads, for example, is arbitrary, indefensible, and irrelevant.

4. Railroads Lack the Structural Attributes that Enable High ROIs

In a separate study, published in September 2015, McKinsey analyzed more than 28,000 firms around the world, each with more than \$200 million in annual revenue. The sample included nearly 17,000 publicly listed firms and 11,400 privately held firms across 42 countries and 18 sectors. The research covered the period from 1980 to 2013 to examine long-run trends.¹⁷

McKinsey documented a general uptrend in corporate profitability, but also observed:

The benefits of this corporate boom [increasingly higher ROIs across the board] have not been shared evenly. **Profits are increasingly shifting from heavy industry to idea-intensive sectors that revolve around R&D, brands, software, and algorithms.** Sectors such as pharmaceuticals, media, finance, and information technology have the highest margins. They are developing a winner-take-all dynamic, with a wide gap between the most profitable firms and everyone else.

¹⁷ “Playing to Win: The New Global Competition for Corporate Profits.” McKinsey Global Institute, September, 2015.
https://www.mckinsey.com/~/media/mckinsey/business%20functions/strategy%20and%20corporate%20finance/our%20insights/the%20new%20global%20competition%20for%20corporate%20profits/mgi%20global%20competition_full%20report_sep%202015.ashx

Meanwhile, margins are being squeezed in capital-intensive industries, where operational efficiency has become critical.

McKinsey also provided a table, shown below, depicting their assessment of the degree to which each of 18 main business sectors are knowledge intensive, labor intensive, or capital intensive. Pharma and Medical Devices companies, for example, are rated in the highest quartile of knowledge intensity, lowest in labor intensity, and medium in capital intensity. Those are precisely the attributes that enable firms to earn high ROIs in the modern economy.

Transportation firms, by contrast, are rated in the top quartile in labor intensity, second quartile in capital intensity, and in the lowest quartile in knowledge intensity. These are precisely the structural attributes that inhibit firms from earning anything more than just a basic, commodity rate of return.

Top quartile Second quartile Third quartile Bottom quartile						Profitability
Group	Sector archetype	Selected sectors	Know- ledge intensity	Labor intensity	Capital intensity	Average profit margin NOPLAT over sales, %
Idea- intensive goods and services	Intellectual property-intensive	Pharma/medical devices				19.8
		Technology hardware				7.8
	Technology- intensive	IT and business services				11.7
		Media				12.4
Labor- intensive consumer goods and services	Local consumer- facing	Consumer discre- tionary products				5.0
		Consumer staples				9.3
		Hospitality services				8.5
		Health-care services				3.9
		Retail				3.5
Capital- intensive goods and services	Capital goods	Construction				4.4
		Automobiles				5.4
		Machinery				6.8
		Processing				6.6
	Infrastructure	Transportation				6.0
		Telecom				13.4
		Utilities				8.5
		Extraction				5.8

This second McKinsey study provides powerful evidence and additional confirmation that industry matters a lot, and that railroads lack the structural attributes that would enable them to earn high ROI's absent an unwarranted exercise of market power. It

confirms that using the median ROI of the S&P 500, or indeed any percentile of any index, to establish a profitability threshold for the railroads is entirely off the mark.

5. Many S&P 500 Companies Have Significant Foreign Sales, But Railroads Do Not.

The absence of foreign sales is another indication the railroads are inherently mismatched to the S&P 500. Foreign Sales can enhance profitability and ROI by helping companies to expand scale and cover fixed costs and to propel learning and knowledge transfer.

Goldman Sachs reports that foreign sales accounted for 29% of the \$12 trillion aggregate S&P 500 revenues in 2019, down from 30% in 2018, and the lowest level in 10 years. Goldman Sachs found that about 12% of revenues were derived from Europe, Middle East, and Africa, while 9% of sales were sourced from the Asia-Pacific region. Only 2% of revenues stemmed from Canada and Mexico combined.¹⁸

According to S&P Dow Jones Indices, and as shown in the table below, the total foreign sales of the S&P 500 companies in 2018, the last year for which data could be located, was nearly 43%, and was 57% among information technology companies.¹⁹ By contrast, the percentage of foreign sales in 2019 was 0% for CSX and Norfolk Southern, 11% for Union Pacific, and 47% for Kansas City Southern²⁰, and all foreign sales of those companies were from Mexico. The percentage for Canadian National and Canadian Pacific was 32% and 27%, respectively, considering sales in the U.S. as “foreign.”²¹ In sum, all Class 1 railroad revenues are restricted to North America

¹⁸ S&P Dow Jones Indices Press Release: S&P 500 companies' non-US revenue share hits 10-year low – Goldman Sachs: <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/s-p-500-companies-non-us-revenue-share-hits-10-year-low-8211-goldman-sachs-59094991>.

¹⁹ S&P 500® 2018: Global Sales Year in Review: [20180816-sp-500-global-sales-2017.pdf \(spglobal.com\)](https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/s-p-500-global-sales-2018-year-in-review-8211-goldman-sachs-59094991); Due to incomplete reporting, the aggregate data does not permit simple foreign representation or sector analysis. For the purposes of this report, S&P reduced the pool to issues that have reported full foreign sales, and for which foreign sales represent between 15% and 85% of total sales, stating that “this is the best [available] approximation of the true aggregate values.”

²⁰ As a wholly owned Berkshire Hathaway company, BNSF doesn’t report its percentage of foreign sales. Management states, however, that the firm “only operates in North America” (<https://www.bnsf.com/ship-with-bnsf/maps-and-shipping-locations/overseas.html>)

²¹ All foreign sales data from ISS. See electronic work paper “Industrial Benchmark Comparison with Transportation Companies.xlsx,” Cells K67-73.

(and generally, just the U.S. and Canada (except Kansas City Southern and, to some extent, Union Pacific, in Mexico)), and thus they are unable to realize the benefits of a global reach.

Exhibit 5: Foreign Sales as a Percentage of Total Sector Sales						
SECTOR	2018 (%)	2017 (%)	2016 (%)	2015 (%)	2014 (%)	2013 (%)
Consumer Discretionary	34.00	34.07	35.05	37.43	41.36	40.96
Consumer Staples	32.65	32.53	33.67	34.95	39.14	39.79
Energy	51.28	54.06	58.88	57.88	56.23	54.64
Financials	30.08	31.20	30.81	31.13	31.21	32.31
Health Care	38.52	38.16	37.41	37.42	50.25	51.28
Industrials	43.75	44.57	44.89	44.86	46.17	45.91
Information Technology	58.19	56.85	57.15	57.78	59.39	56.60
Materials	56.82	52.71	53.03	53.47	54.54	54.45
Real Estate	-	-	-	-	-	-
Communication Services	44.74	-	-	-	-	-
Utilities	-	-	-	-	-	-
Total Non-U.S. (15%-85%)	42.90	42.65	43.16	44.35	47.82	46.29

Source: S&P Dow Jones Indices LLC from data provided by S&P Global Market Intelligence. Data as of July 2019. Past performance is no guarantee of future results. Table is provided for illustrative purposes.

6. The S&P 500 Is a Culled Group of the Most Profitable and Valuable Companies

Another concern with using the S&P 500 companies as a benchmark is that the company list is constantly refined to discharge firms with flagging fortunes and dwindling ROIs to replace them with up-and-coming stars. According to a brochure S&P Dow Jones Indices distributes to tout the S&P 500, “The S&P 500 does not simply contain the 500 largest stocks; rather, it covers leading companies from leading industries.”²² By design, it is populated with the most profitable firms in the most attractive industries, which makes it unrepresentative of the profitability norms to be expected in competitive markets considering all the companies that compete.

Consider, for example, that Pets.com and Webvan, two highflying Dot.Com stocks that declared bankruptcy, never made it into the S&P 500, but successful on-line firms, like Amazon and Facebook, did. The S&P 500 just features the winners in the business environment. It ignores all the capital investments and ROI losses

²² S&P Dow Jones Indices, S&P 500 explanatory brochure: [sp-500-brochure.pdf \(spglobal.com\)](http://spglobal.com/sp-500-brochure.pdf).

from start-up firms that never made it to scale. It thus overstates the returns that can be expected from firms operating in competitive markets.

Imagine that following a careful selection process, a college admits an academically promising class of students, but after the freshman year, some do not make the grade and drop out. They are replaced in the sophomore year by a group of seemingly qualified students. But again, some students drop out after the sophomore and junior years. By the time the seniors graduate, their academic scores are not representative of all the students who matriculated. The same is true for the S&P 500.

Membership in the S&P 500 is determined by a Standard & Poor's U.S. Index Committee, which makes changes four times a year, in March, June, September, and December. To qualify as a candidate for admission to the index, a company must currently have an unadjusted market cap of at least \$8.2 billion and at least four consecutive quarters of positive earnings. As soon as a company starts to lose money or its market value slips, it can be reviewed and often is removed. According to Kirk Spano, a money manager and financial columnist, "The S&P 500 has criteria for inclusion that aid in booting unprofitable shrinking companies off the index."²³

To illustrate, let's chronicle the changes in the Index in 2020. In September 2020, S&P announced a decision to cut 4 companies from the index:

1. Kohl's Corporation: a department store retail chain that as of February 2013 was the largest department store chain in the United States, with 1,158 locations, with stores in every U.S. state except Hawaii.
2. Helmerich & Payne, Inc.: an oil and gas contract drilling company.
3. Coty Inc.: a multinational beauty company, whose stock is down 85% since it acquired 43 beauty brands, including Cover Girl, from Procter & Gamble in 2015 for \$12.5 billion in a deal that saddled Coty with non-goodwill intangibles and debt, hampered innovation and other growth initiatives, led to losses and write-downs, and caused the company to vastly underperform most of its peers.

²³ [4 Oil Stocks About To Be Kicked Off The S&P 500 | Seeking Alpha](https://seekingalpha.com/article/4338219-4-oil-stocks-to-be-kicked-off-s-and-p-500)
(<https://seekingalpha.com/article/4338219-4-oil-stocks-to-be-kicked-off-s-and-p-500>).

4. H&R Block: a service firm that prepares tax returns through approximately 12,000 retail tax offices staffed by tax professionals worldwide, and in the process of shifting into consumer tax software and online tax preparation.

S&P simultaneously announced the addition of 4 replacement companies:

1. Teradyne, Inc.: an automatic test equipment designer and manufacturer that helps electronics companies such as Samsung, Qualcomm, Intel, Analog Devices, Texas Instruments and IBM to bring products to market faster with automated test solutions and collaborative robotics.
2. Catalent, Inc.: a global provider of delivery technologies, development, drug manufacturing, biologics, gene therapies and consumer health products that employs approximately 2,400 scientists and technicians.
3. Etsy: an American e-commerce website platform focused on handmade or vintage items and craft supplies.
4. West Pharmaceutical Services, Inc: a designer and manufacturer of injectable pharmaceutical packaging and delivery systems.

In December, 2020, S&P announced two other changes in the Index for the year: Tesla, the electric vehicle innovator, was added, and Apartment Investment and Management, an investor in, and manager of, apartment buildings, was deleted after it spun off a REIT.

Stock prices tell a similar story. As seen in the accompanying charts²⁴, the deleted firms experienced sharp declines in market value over 5 years before their dismissal while the firm's added to the Index appreciated handsomely, a sign that investors foresee robust profits and lofty ROIs in the years ahead.

²⁴ Source: Google Finance

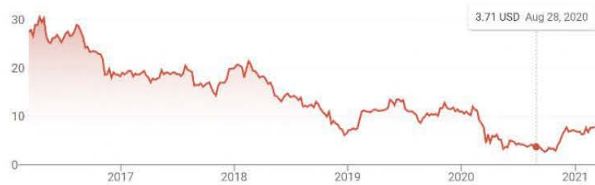
Market Summary > Coty Inc

7.82 USD

-0.0050 (0.064%) ↓

Closed: Mar 5, 4:08 PM EST -Disclaimer
After hours 7.89 +0.070 (0.90%)

1 day 5 days 1 month 6 months ytd 1 year 5 years max



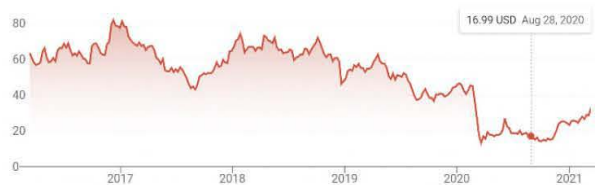
Market Summary > Helmerich & Payne, Inc.

32.44 USD

+3.62 (12.56%) ↑

Mar 5, 4:00 PM EST -Disclaimer

1 day 5 days 1 month 6 months ytd 1 year 5 years max



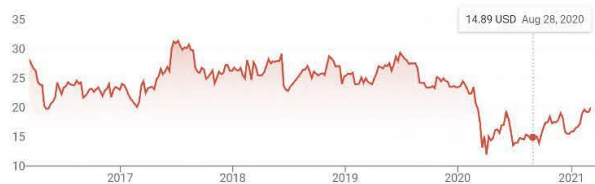
Market Summary > H & R Block Inc

19.91 USD

+0.33 (1.69%) ↑

Mar 5, 4:00 PM EST -Disclaimer

1 day 5 days 1 month 6 months ytd 1 year 5 years max



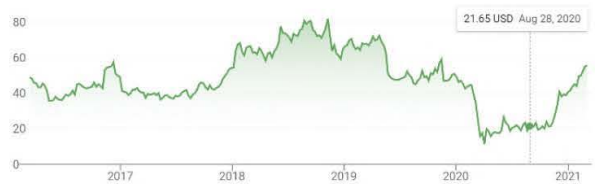
Market Summary > Kohl's Corporation

55.59 USD

+0.89 (1.63%) ↑

Mar 5, 4:00 PM EST -Disclaimer

1 day 5 days 1 month 6 months ytd 1 year 5 years max



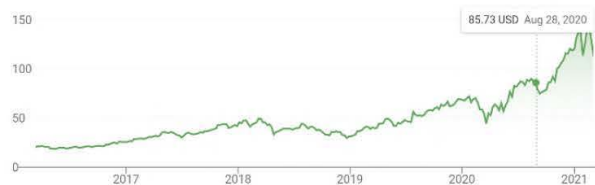
Market Summary > Teradyne, Inc.

113.90 USD

-0.070 (0.061%) ↓

Closed: Mar 5, 4:06 PM EST -Disclaimer
After hours 113.90 0.00 (0.00%)

1 day 5 days 1 month 6 months ytd 1 year 5 years max



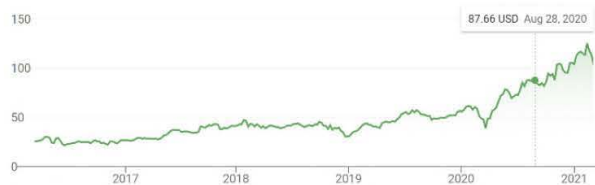
Market Summary > Catalant Inc

104.55 USD

+1.47 (1.43%) ↑

Mar 5, 4:03 PM EST -Disclaimer

1 day 5 days 1 month 6 months ytd 1 year 5 years max



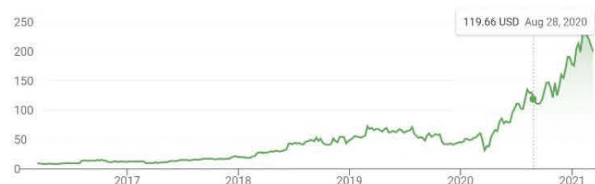
Market Summary > Etsy Inc

200.30 USD

+2.20 (1.11%) ↑

Closed: Mar 5, 4:06 PM EST -Disclaimer
After hours 200.30 0.00 (0.00%)

1 day 5 days 1 month 6 months ytd 1 year 5 years max



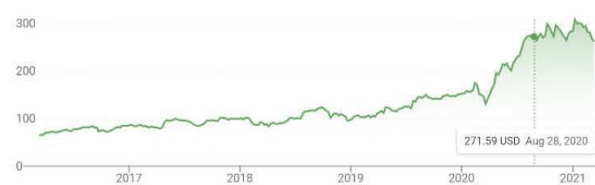
Market Summary > West Pharmaceutical Services Inc.

262.40 USD

+5.11 (1.99%) ↑

Mar 5, 4:04 PM EST -Disclaimer

1 day 5 days 1 month 6 months ytd 1 year 5 years max



Market Summary > Apartment Investment and Management Co

4.82 USD

+0.050 (1.05%) ↑

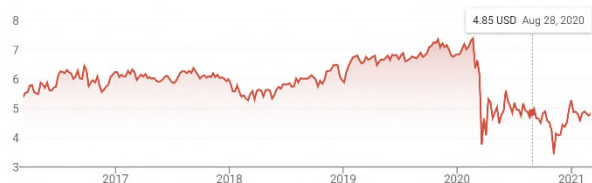
Closed: Mar 5, 4:03 PM EST · Disclaimer

After hours 4.78 -0.040 (0.83%)

NYSE: AIV

+ Follow

1 day 5 days 1 month 6 months ytd 1 year 5 years max



Market Summary > Tesla Inc

597.95 USD

-23.49 (3.78%) ↓

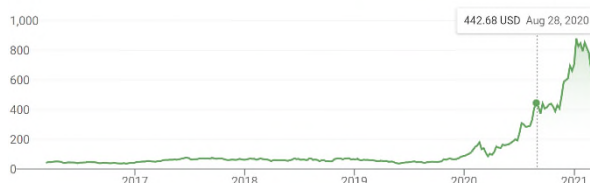
Closed: Mar 5, 4:16 PM EST · Disclaimer

After hours 595.00 -2.95 (0.49%)

NASDAQ: TSLA

+ Follow

1 day 5 days 1 month 6 months ytd 1 year 5 years max



In sum, the subtractions are in hard-asset businesses such as department stores and fossil fuels that are shrinking or else a firm like Coty that is suffering from a massive acquisition overpayment. The table below displays the 2019 ROIs as computed by M&Z per the STB formula and by M&Z's proposed modified ROI formula, and the COCs, of the exiting firms.

	ROI per STB	ROI per M&Z	COC
Kohls'	8.1%	7.8%	6.6%
Coty	36.7%	4.1%	8.3%
Helmerich & Payne	0.1%	0.8%	7.2%
H&R Block	64.6%	22.2%	7.8%

Kohl's ROI is barely above its COC, and certainly not up to snuff with the ROI of ETSY, which operates from clicks, an internet platform, bypassing the bricks.

By rights, as a brand-rich, established name company, Coty should be in the S&P 500. S&P discharged it from the list because its ROI became abysmal after accounting for the exorbitant prices paid for the brands it bought.

Helmerich and Payne generates the lowest ROI of the lot, a victim of the current surplus in fossil fuels and the emerging shift to alternatives.

H&R Block is highly profitable, but not compared to its closest competitor, Intuit, an S&P 500 firm that has a massive head start on an internet-based model for tax returns and small business accounting with its TurboTax and Quickbooks software tools. Intuit's ROI in 2019 was 222.2% per the STB methodology and 172.8% per M&Z, versus a COC of 9.2%. Once again, it's out with the old-economy-style business and in with the new.

Indeed, the companies added this past year are all in knowledge-based, intangible-asset rich, new-economy sectors, operating in high-tech, medical care, and emerging internet platforms. Tesla is intellect on wheels. The swap undoubtedly increased the ROI of the S&P 500 companies, and by design.

7. S&P 500 Sectors Rotate Over Time

The changes to the S&P 500 in any one year are not material as a statistical matter, but over time they are. The tendency for S&P to cull weak performers to make way for rising stars has accumulated in a shift from old economy to new economy businesses, as is evident in the table below, which displays the number of companies in the S&P 500 by sector.

Industry	1970	1980	1990	2000	2010	2015	2019
Communication Services	24	31	37	34	23	24	26
Consumer Discretionary	68	65	74	75	67	73	64
Consumer Staples	65	52	44	35	41	36	33
Diversified Mining & Metals	20	17	13	7	1	0	0
Energy	51	51	44	42	44	41	29
Financials	30	49	60	73	65	65	67
Health Care	17	32	40	52	53	58	62
Industrials	162	142	107	67	59	67	70
Information Technology	16	22	39	68	67	62	68
Materials	20	24	26	30	29	27	26
Real Estate	11	7	4	0	17	24	32
Utilities	31	22	29	29	32	28	28

Source: History of Companies and Industries Listed on the S&P 500, by Caleb Finch, posted October 3, 2019, <https://www.qad.com/blog/2019/10/sp-500-companies-over-time>²⁵

²⁵ See electronic work paper "Changes in the S&P500.xlsx"

The share of Health Care and Information Technology companies in the Index increased from a combined total of 33 companies in 1970 to 130 companies today, while Mining and Metals, Energy and Industrials shrank from 233 companies to 99. Among Industrials, only 70 firms are in the S&P 500 today compared to 162 in 1970.

8. Conclusion: The S&P 500 Index Is Not Relevant

In conclusion, the S&P Index Committee is determined that the S&P 500 represent not just the largest firms, but the most profitable ones. Their policies and practices replace firms and sectors that are losing share in ROI and market value with those on the vanguard of ROI and market value. This is an important additional reason why the S&P 500 Index companies are unsuited to establish an objective benchmark for judging the revenue adequacy of the railroads.

B. The M&Z Adjustments for Non-Goodwill Intangible Assets Are Incomplete

1. The M&Z Adjustments Prove that the S&P 500 Is a Meaningless Benchmark Group

M&Z correctly observe that the formula the STB applies to measure the ROI of railroads is not suitable to measure ROI across the S&P 500. In addition to making an adjustment for taxes, which I will not address,²⁶ M&Z advocate adding non-goodwill intangibles to capital before ROI is measured.

A-7. This adjustment has no meaningful effect on railroads' ROICs because railroads do not have substantial investments in non-goodwill intangible assets. However, this adjustment can have a meaningful effect on the ROIC of other S&P 500 companies who have substantial investments in non-goodwill intangible assets.⁹⁸

⁹⁸ Examples of non-goodwill intangible assets include assets such as patents, copyrights, trademarks, computer software, licenses, films, and import quotas. Accounting rules generally require companies to expense

²⁶ McKinsey also makes adjustments for deferred taxes, but its adjustments are more sophisticated than those proposed by M&Z. See note 16, above.

– as opposed to capitalize – expenditures that result in such assets but require companies to record the value of non-goodwill intangible assets when they acquire another company. (M&Z VS, Ex. A, ¶ A-7)

M&Z claim that this adjustment makes for more meaningful comparisons between railroad performance and that of other firms.

It does, but by proposing the adjustment, the Petitioners are conceding my main point, which is that the S&P 500 is not a meaningful reference group for the railroads. The very fact that the formula to compute the ROI for railroads does not translate to the S&P 500 is a tacit admission that the companies on that list are not a relevant benchmark group for the railroads. The ROI adjustment is proposed because the business models of many of the S&P 500 firms depend on creating, nurturing and leveraging non-goodwill intangibles, which are factors known to generate the potential for high ROIs. The fact that the adjustment for non-goodwill intangibles makes no difference to the railroads is because the railroad business is not knowledge intensive, as McKinsey put it. The business does not rely on intellectual capital in any marked respect, and yet, intellectual capital is the key factor enabling companies to earn high ROIs.

2. M&Z Do Not Account for Home-Grown Intangible Assets

M&Z's proposal to add non-goodwill intangibles to capital is correct as far as it goes but does not go far enough. As M&Z note:

Footnote 98. Accounting rules generally require companies to expense – as opposed to capitalize – expenditures that result in such assets but require companies to record the value of non-goodwill intangible assets when they acquire another company. (M&Z VS, Ex. A, ¶ A-7)

Accountants only recognize investments in non-goodwill intangibles when they are acquired from another company, but not when they are self-created. As a result, the capital invested in many high tech, brand rich companies is understated and their ROI's are overstated even when they do not make acquisitions, a phenomena that is widely recognized by financial analysts (as well as economists):

The deficiencies of intangible asset accounting are well known. The problem is that most intangibles are self-generated rather than purchased and the majority of these are not recognized in the balance sheet. Valuable intangibles that have ongoing use in the business, and that will contribute to future profits, are essentially ignored in financial reporting and any amount spent on creating or enhancing these assets is immediately expensed.

The Footnote Analyst²⁷

Authors, Steve Cooper and Dennis Jullens²⁸

Consider, for example, a hi-tech firm that is spending \$100 a year on research and development. Under accounting rules, the R&D expenditure is expensed. It is immediately deducted as a charge to earnings and does not make an appearance in balance-sheet capital. But from an economic perspective, capital represents all money spent in a period that could be expected to bring in future benefits by contributing to revenues and profits in subsequent periods, which is patently the case with R&D expenditures, many of which generate returns that are protected by patents or that result in breakthrough innovations that others cannot quickly replicate.

To illustrate, suppose the true economic life and payoff period of the company's R&D spending (not strictly as a matter of the spending in just one period, but as a chain of connected and coordinated investments over time) is five years (it would be longer for pharma and biotech companies or for blockbuster movies). Suppose further that the firm is in a steady state and spends the same \$100 each year on research. Then, under reported accounting, the firm expenses the \$100 in R&D each year and

²⁷ <https://www.footnotesanalyst.com/intangible-asset-accounting-and-the-value-false-negative/>

²⁸ Steve Cooper was a board member of the International Accounting Standards Board from 2007 to 2017. The IASB is the body that sets International Financial Reporting Standards (IFRS). He continues to be actively involved in financial reporting. Prior to his time at the IASB, he spent 11 years as head of UBS's Valuation and Accounting Research team.

Dennis Jullens teaches financial accounting, equity analysis and equity valuation at Amsterdam Business School, University of Amsterdam. He moved to academia in 2012 after 12 years in equity research at UBS, mostly in the Valuation and Accounting team. He also has been involved in accounting standard setting, being a past member of advisory committees for the IASB and EFRAG – a body that supports the European Commission.

no investment appears on its balance sheet. ROI measured off the firm's reported accounting balance sheet thus materially overstates its true ROI.

An alternative view, which corresponds to better representation of economic reality, is to add the \$100 in research outlays to the firm's balance sheet as a form of intangible capital and then to write off the investment over 5 years by charging \$20 a year to the earnings. The same thing happens the next year so that, in a steady state, the firm ends up writing off or amortizing a total of \$100 a year, which consists of \$20 from each of the past 5 years, so that its earnings, its NOPAT, would be the same as if it had expensed the R&D. The income charge is \$100 either way.

The balance sheet, though, is a different story. If the research investment is written off over five years, and is replenished each year, the net capital investment on the balance sheet will be \$250 in steady state ($5 \text{ years life}/2 * \$100 \text{ annual spending}$). It will be, on average, half-way through its life, so half remains on the books (once the accumulated amortization is deducted). With NOPAT the same, but capital higher, the resulting ROI is lower. Just as ROI decreased when M&Z folded in acquired non-goodwill intangibles, the same effect occurs when a company treats its own investments in R&D and brands the same as those it acquires. The ROI is not only lower; it is more accurate. It is more aligned to an internal rate of return calculation whereby an initial cash outlay for research is treated as the up-front investment that is followed by a series of cash inflows.

Once again, this adjustment will have no impact on the railroads or other basic commodity businesses that do not invest in R&D. But it would significantly diminish the ROIs measured for modern economy firms. It would render a more accurate portrait of corporate profitability, but, at the expense of more complexity in the calculation.

A fair and accurate ROI would also need to account for the advertising spending to create and nurture consumer brands and the leased assets of retailers, for example, as capital, too.

Consider also that many oil and gas firms use successful efforts accounting. Only the cost of drilling wells that lead to oil discoveries are capitalized and the unsuccessful efforts are expensed. As with R&D, this can lead to an understatement of the total capital that must be invested to produce energy. Full cost accounting,

whereby the total invested in all wells is capitalized and amortized over the lives of the successful wells, produces a more accurate estimate of the true ROI. Yet M&Z did not propose to address this.

The list of potential adjustments is overwhelming and could be a continuing source of disagreement. But this is the can of worms that is opened when one attempts to accurately measure the performance across the entire spectrum of businesses and use that as a benchmark. The Board should be very hesitant to leap into this abyss.

C. The Industrial Sector Also is Not a Relevant Benchmark for the Railroads

M&Z have offered the Industrial sector as a fallback benchmark group while noting that their conclusions about profitability would not change as a result of using Industrial companies as the benchmark instead of the S&P 500. That is true, but only because the Industrial group is subject to the same criticisms as the S&P 500, namely, that the Industrial sector also consists of distinct subsectors that are different from and inherently more profitable than the railroads.

The indexes lump all transportation companies, including the railroads, with many other businesses to form the Industrial sector. The other businesses include Aerospace and Defense, Construction Engineering, Electrical Components Manufacturing, Human Resources and Employment Services, Industrial Machinery, Research and Consulting Services, and Trading Companies, for example. Common sense dictates that the railroads have little in common with such businesses. In fact, it is a mere convenience to lump the railroads with these industrial firms. There is no compelling economic logic behind it.

I have employed three financial metrics to verify that transport companies, and railroads in particular, are distinctly different from other industrial firms.

1. The first is a measure of **intellectual capital**, measured by the sum of R&D and advertising expense as a percent of sales. The higher it is, the more knowledge-based, brand rich a company is deemed to be, which are known sources of value creation.
2. The second is a measure of **plant intensity**. It is the sum of depreciation expense and the cost of capital multiplied by the firm's average net PPE (property plant and equipment), expressed as percent of sales, where leased

assets are also treated as owned in this calculation. The larger the ratio, the more plant intensive a company is; the lower the ratio, the more a firm's business is service-oriented, which is a known success factor in the modern economy, as McKinsey has noted, for instance.

3. The third is **global breadth**, measured as the revenues derived outside the US as a percent of total revenues. The bigger the ratio, the more global reach a firm has, which enhances its ability to scale, to arbitrage markets, and to capitalize on its know-how.

The table below²⁹ compares these 2019 annual data metrics for three groups: 1. Industrials ex Transportation companies, 2. Transportation companies³⁰ ex the Railroads (essentially, airlines and trucking companies), and 3. the Railroads:

²⁹ Data Sources: ROI and COC data from M&Z; fundamental data from ISS. See electronic work paper "Industrials Benchmark Comparison with Transportation Companies.xlsx"

³⁰ Transportation companies, as here defined, exclude the three Air Freight and Logistics companies in the S&P 500, which are shown below:

<u>Company Name</u>	R&D + Advert % of Sales	Rent Chrg: Net PP&E % of Sales	Foreign Rev % of Sales	STB ROI	M&Z Adjusted ROI	COC	STB ROI- COC	M&Z Adj ROI-COC
C H ROBINSON WORLDWIDE INC	0.0%	1.1%	14.26	96.8%	65.0%	9.0%	87.8%	56.0%
EXPEDITORS INTL WASH INC	0.0%	2.8%	72.56	37.2%	36.2%	8.9%	28.4%	27.3%
UNITED PARCEL SERVICE INC	0.0%	8.6%	21.33	21.8%	17.8%	9.0%	12.8%	8.8%

CH Robinson and Expeditors International offer transportation logistics services. They arrange and manage transportation without doing much of it. Their business models and added value are heavily IT dependent, and are light on physical capital, which makes them distinctly different from the railroads and other transportation companies, not only in the structural characteristics of their business models, but in their inherent profitability. They are also much more global in orientation. UPS, on the other hand, is much more comparable to a railroad, but because I excluded all Air Freight and Logistics companies from the "Transportation" group and instead categorized them with other Industrials, I treated UPS the same for consistency.

	R&D + Advert % of Sales	Rent Chrg: Net PP&E % of Sales	Foreign Rev % of Sales	STB ROI	M&Z Adjusted ROI	COC	STB ROI- COC	M&Z Adj ROI-COC
Median								
Industrials ex Transportation	2.5%	4%	39%	44.6%	26.6%	9.1%	34.3%	18.3%
Transportation ex Railroad	0.6%	20%	12%	15.1%	12.8%	11.4%	3.7%	1.4%
Railroads	0.0%	33%	11%					
Average								
Industrials ex Transportation	2.5%	5%	38%	54.6%	29.5%	9.1%	42.4%	20.4%
Transportation ex Railroad	0.5%	17%	15%	16.4%	14.5%	10.6%	5.7%	3.9%
Railroads	0.0%	33%	17%					

Industrials ex Transportation firms deploy more intellectual capital. Their median combined R&D and ad spend runs at 2.5% of sales; the median spend is only 0.6% for Transport companies ex Railroads and is 0.0% for the Railroads.

Industrials ex Transportation firms are much lighter on PPE capital. Their median PPE intensity ratio is 4% of sales, compared with 20% for Transports ex Railroads and 33% for railroads. The railroads are massively PPE intensive, while the typical Industrial firm these days is much more services oriented.

Industrials ex Transportation firms have a far greater global reach. Their percentage of revenues derived from foreign markets is 39% compared to 12% and 11%, respectively. Even the 11% figure for the railroads is misleadingly high, because substantially all revenues are derived from the U.S., Canada, and Mexico, one continent³¹.

These structural industry differences, as expected, account for significant differences in profitability. The median M&Z adjusted ROI – COC spread is 18.3% for the Industrials ex Transportation companies and is only 1.4% for the Industrials ex Railroads (the data for the Railroads was not furnished in the M&Z file). Simply put, the Industrials outside the Transportation firms deploy much more intellectual capital and much less physical capital and are much more globally diversified. As a result of these comparative advantages, those firms are inherently capable of earning higher ROIs.

³¹ To compute the foreign revenues percent, the U.S. sales of the Canadian railroads were considered “foreign” revenues.

It is no more appropriate, therefore, to refer to the Industrial sector to establish a profitability benchmark for the railroads than it is to refer to the S&P 500.

V. FINANCIAL METRICS ARE LEGITIMATE SUPPLEMENTAL INDICATORS OF THE FINANCIAL HEALTH OF THE RAILROAD INDUSTRY.

In the “Reply of Joint Shippers” filed in this docket on September 21, 2020, the Joint Shippers referenced several financial metrics which indicate the rail industry is financially healthy and attractive, and has been able to raise capital and generate attractive returns for investors, even during times when ROI was judged less than COC by the STB. The Joint Shippers did not propose to use those metrics to replace the standard for judging revenue adequacy based on $ROI = COC$; rather, only to confirm the validity of that definition and its inherently conservative nature.

In their reply filed on October 13, 2020, the Petitioners presented a Verified Statement from M&Z (M&Z Reply VS) to support their claim that such financial metrics are uninformative, irrelevant, and inconclusive, and hence, should be ignored. In this section, I explain how those financial metrics helpfully confirm and supplement the $ROI = COC$ measure of revenue adequacy.

A. Raising and Investing Capital Is a Sign of Financial Health

In their October testimony, M&Z assert that a demonstrated ability to invest capital is not determinative of revenue adequacy:

- Observing a railroad making incremental investments that have expected economic returns greater than its cost of capital is not informative about whether the railroad’s expected economic return on its *total* invested capital exceeds its cost of capital... (M&Z Reply VS, ¶ 15) (*italics in original*)

This is a true statement, but inapplicable. First, as noted, the Joint Shippers never stated or proposed that the demonstrated ability to raise capital for individual projects would be used to define revenue adequacy. Nor did the Joint Shippers assert that an ability to raise capital for individual projects proves that $ROI > COC$ for the totality of invested capital. M&Z have set up a straw man to attack.

M&Z's own initial testimony in the Petition for Rulemaking refutes their case:

25. The proper economic rationale for evaluating whether a railroad is revenue adequate is to determine whether it can raise the funds necessary for financial health and growth in the long term. (M&Z VS, ¶ 25)

The opposite also is true. If the railroads are able to raise the funds necessary for financial health and growth over the long-run, which is the evidence that the Joint Shipper's submitted, then the railroads must of necessity be "revenue adequate" as is intended, *no matter which specific technique has been used as a proxy for determining revenue adequacy.*

M&Z dismiss the evidence as inapt on the grounds that the ability to raise capital does not comport with their proposed definition of revenue adequacy, to wit, that the ROI – COC spreads of the railroads must be comparable to that of other large firms, i.e. to the S&P 500 median. They write: "In order to compete for capital, the railroads' risk-adjusted expected returns must be comparable to that of companies with which the railroads compete for capital. Otherwise, investors will invest elsewhere." (M&Z VS, ¶ 10)

A demonstrated fact that the railroads have raised capital must indicate that their prospective ROI's on incremental capital are not less than COC, for even M&Z admit that, to raise capital, a firm must be able to earn attractive risk-adjusted returns relative to the firm's cost of capital. The evidence of capital raising is therefore a relevant supplemental indicator of revenue adequacy.

M&Z, of course, are setting too high a standard. Their postulate of revenue adequacy is incorrect. As I have shown in Parts II and III above, so long as a firm earns an ROI = COC, and is able to maintain ROI = COC with new investments that enter into its capital base, it will be able to cover all of its costs, including a fair return, and will be able to attract capital. It does not have to earn an ROI – COC spread in line with the median of large firms to attract capital. It just must earn ROI = COC to be fully competitive on a risk-adjusted basis. And once that is understood to be the correct definition of revenue adequacy, then the evidence that the railroads have been able to raise capital is in fact additional confirmation that the ROI = COC standard is legitimate.

M&Z attempt to dismiss the evidence because it does not comport with their alternative definition of revenue adequacy. But it is their alternative that should be dismissed, not the evidence.

B. Stock Prices and Shareholder Returns Are Valid Supplemental Indicators of Revenue Adequacy

M&Z attempt to discount the relevance of stock prices by constructing an example of a railroad that initially is earning its cost of capital and is able to replace its assets as they become fully depreciated, but that subsequently suffers a loss in profits that reduces its ROI below its COC, leading to a sharp drop in its stock price and an inability to replace its assets. Specifically, they note:

19. Investors who owned the railroad before the decline in expected financial performance incurred a loss of \$200 million (\$500 million – \$300 million) or 40%. The actual (observed) return to the investors of -40% is not informative about whether the railroad’s expected economic return on its total invested capital exceeds its cost of capital, because the investors’ actual return is based on the *changes* in the railroad’s expected financial performance and not the *level* of its expected financial performance. (M&Z Reply VS, ¶ 19) (emphasis in original)

It is true that stock prices react to unanticipated changes in performance, but the prices are reacting to changes *in ROI versus COC*. A stock price that is falling is a sign that the market foresees a lower ROI – COC spread, and a rising stock price tells us the market is projecting a higher ROI – COC spread than was previously thought possible. How then can a rising stock price ever be a bad sign? How is it not always a good sign, an indication the financial health of the company is improving? It is counter-intuitive to assert that rising stock prices cannot be taken as a cause for celebration and a manifestation of the improving health of the industry.

Joint Shippers are not suggesting the stock price evidence is conclusive on its own, nor are they advocating using stock price performance to supplant the ROI = COC standard, as M&Z imply. Rather, when the railroads are observed to be generating ROI = COC, *and their stock prices are rising*, the combination should be considered even more persuasive evidence that the industry is financially healthy

and revenues are fully adequate than either factor taken in isolation. It's worth noting the stock price performance, and not just to ignore it.

C. Cash Distributions Are a Reliable Indicator Once Put in Context

M&Z also dismiss the relevance of dividends and stock buy-backs as supplemental indicators of revenue adequacy. Their critique may be justified in some circumstances, but not those of the rail industry.

Some firms can distribute a cash bounty because they are highly profitable and generate so much cash from operations that they can cover all worthwhile investments and leave a remainder to pay out. But firms that are contracting, such as department store chains, can also pay out a lot of cash because they are liquidating their capital. The distribution of cash must be put into context.

The following math formula governs cash distributions:

$$\text{Growth} = \text{ROI} \times \text{Investment Spending Rate}$$

It says that the growth rate in a firm's earnings, specifically in its NOPAT profits, is equal to the return on investment the firm earns times its Investment Spending Rate, which is the percent of its earnings that are plowed back and reinvested into the business. If the Investment Rate is below 100%, a firm has surplus earnings to pay out. If it is above 100%, it will be unable to distribute cash but will have to raise it instead. Here are four examples:

	Growth =	ROI	x	Investment Spending Rate
Firm 1	10% =	10%	x	100%
Firm 2	10% =	20%	x	50%
Firm 3	2% =	5%	x	40%
Firm 4	20% =	15%	x	133%

Firm #1 is growing earnings at a 10% rate by plowing back all its earnings to fund projects that earn a 10% ROI.

Firm #2, because it is earning a 20% ROI and generating more cash from operations, can attain the same growth by reinvesting half its earnings back into the business, with the remainder available for distribution. In this case, holding growth constant, the ability to distribute more cash is equivalent to demonstrating that a higher return on investment is being earned in the business.

Firm #3 is typical of a department store chain. With an abysmal and unattractive ROI, and facing surplus retailing capacity, the firm is so restraining investments and closing stores that it generates positive cash flow net of investment. With meagre growth prospects in the business, investors want their money back, not to pour more in, and the firm is accommodating them. In this case the distribution of cash is an admission of failure, not success.

Firm #4 is a highly profitable “growth stock,” a firm with such an abundance of attractive investment options that it is not only investing all its earnings but is tapping the markets for additional capital to invest. It is growing very rapidly by pouring a great heap of money into projects with $ROI > COC$. Notably, and crucially, its economic profits are positive and rapidly expanding, which gives it the highest valuation of the companies shown here. Yet, for all that, it is importing capital, not paying it out. Cash distribution is, in effect, negative. But the cash flow deficit is not a sign of weakness, but of financial strength, signaling that it is a highly attractive haven for new money flows.

In sum, the distribution of cash, viewed in isolation, is not a reliable indicator of ROI versus COC. But when a company is investing, growing, and experiencing a rising stock price and attractive return for its investors, then the distribution of cash can also be taken as a reliable supplemental indicator of its financial health. These are the characteristics that were cited for the railroads

D. Updated Railroad Statistics Support Revenue Adequacy

The table below, covering the five-year period from 2014-2019 and the ten-year period from 2009 to 2019, provides supplemental evidence of revenue adequacy across the Class I railroads.³²

	5 Year TSR	10 Year TSR	5 Year Cum Cap Ex	10 year Cum Cap Ex	5 Year Cum FCF	10 Year Cum FCF	5 Year Cum Dividends	10 Year Cum Dividends	5 Year Cum Buyback	10 Year Cum Buyback
Burlington Northern Santa Fe *	NM	NM	\$19,522	\$38,034	\$27,346	\$14,613	\$20,950	\$37,039	NM	NM
Canadian National Railway **	9.8%	17.0%	\$11,852	\$20,761	\$12,803	\$25,588	\$4,802	\$7,978	\$7,552	\$13,888
Canadian Pacific **	9.2%	20.6%	\$5,555	\$11,037	\$6,524	\$10,290	\$1,229	\$2,292	\$4,896	\$6,666
CSX	16.9%	18.4%	\$10,402	\$21,627	\$14,689	\$24,072	\$3,588	\$6,227	\$11,874	\$16,494
Kansas City Southern	6.1%	17.6%	\$3,296	\$6,395	\$2,201	\$2,835	\$724	\$1,028	\$1,791	\$1,791
Norfolk Southern	14.5%	16.5%	\$9,965	\$19,925	\$12,837	\$20,815	\$3,904	\$6,942	\$7,770	\$12,917
Union Pacific	11.1%	21.3%	\$18,283	\$35,521	\$34,448	\$50,849	\$10,664	\$16,520	\$24,612	\$34,196

Currency: U.S. Dollar; Scale: Millions; Source ISS

* As a wholly-owned Subsidiary of Berkshire Hathaway Burlington Northern Santa Fe does not have a stock price and nor does it record stock buybacks

** Canadian \$ converted to US \$ at prevailing rates

Total Shareholder Return, or TSR, measured as the compound average return from dividend yield and capital appreciation, was 15-20% per annum over the 10 year interval ending 2019. Over the five years ending 2019, the median TSR was 10.5%, lower, but still positive in all cases and quite attractive.

The railroads maintained a comprehensively healthy rate of capital spending over both the ten-year and five-year intervals, with no sign of slowing down. The most recent five-year cumulative spending is very near to half of the ten-year sum, if not generally a little more, in all cases.

Free Cash Flow, or FCF, which is the NOPAT profits earned in the year less the year-over-year change in capital employed in the business, was strongly positive. The railroads are more than self-sufficient in funding their growth.

Thus, they can invest aggressively in maintaining and expanding their businesses while still generating a surplus cash flow to pay generous dividends and to repurchase their shares and return massive amounts of capital to investors. For example, Union Pacific alone paid out over \$35 billion to its investors over the five years ending in 2019!

³² See electronic work paper "Updated Railroad Metrics.xlsx"

These updated statistics confirm the impressive financial health of the Class I railroads and buttress the argument that the existing ROI = COC standard is in no danger of overstating revenue adequacy and, as I address in the next section, more than likely understates the current degree of revenue adequacy.

**E. The Current Measure of Revenue Adequacy Sets the Bar
“Conservatively High” Because the Cost of Capital the STB Is
Using May Be Too High**

If the STB’s estimate of the cost of capital is too high, then it also overstates both the railroads’ revenue adequacy needs and the amount of differential pricing that is necessary to ensure a financially sound carrier at the expense of fairness and economic efficiency. The STB determines the cost of equity capital using the standard Capital Asset Pricing Model Formula:

$$\text{Cost of Equity} = \text{Risk-Free Rate} + \text{Beta} \times \text{Market Risk Premium}$$

While each component could be debated, the Market Risk Premium, or MRP, is the most subjective and, thus, the most likely reason the cost of capital is overstated. Unlike the Risk-Free Rate, MRP is not directly observable as an interest rate, and unlike Beta, it is not subject to a given statistical formula. In principle, MRP represents the rate of return that investors could expect to earn by investing in the stock market compared to the prevailing risk-free return available from investing in the bond market. A variety of techniques have emerged to estimate it, but none can claim to be definitive and generally accepted.

The MRP that the STB is using, and which M&Z also used in their empirical work, appears to be excessively high. For example, the STB used an MRP of 7.15% in 2019. For reference, ISS, the global corporate governance authority which purchased the EVA data base and estimation technique from me in 2018, uses an MRP of 4%. Assuming a Beta of 1.0, for example, the difference produces a 3.15% overstated cost of equity, which might be 75% weighted in the capital structure (leaving 25% as debt), for at least a 2% overstatement of the weighted average cost of capital. If revenue adequacy is judged strictly by ROI = COC, as I advocate, reducing COC by 2% would also reduce the ROI that the Board assumes is needed to promote a safe and efficient rail transportation system by 2%.

The difference is significant. Why the gap? I have not been able to examine all the details behind the 7.15% MRP that STB uses, but based on my experience and knowledge I can offer the following observations:

1. It is common to estimate MRP by the cumulative difference between S&P 500 returns and the returns from government bonds or T-bills dating back to 1926, which is the first full year when financial data exists at the Center for Research in Security Prices at the University of Chicago (www.crsp.org). But over that span, four factors artificially and unsustainably inflated the returns in the US stock market:
 - a. **Decreased Trading Costs:** a stock price tends to discount the present value of future trading and transaction costs. As those costs decreased, stock prices and returns increased, thus increasing the observed spread of stock market returns over bond market returns. Trading costs are now so low that further decreases are unlikely.
 - b. **Declining Interest Rates:** Today, interest rates are near an all-time low, and are lower than in 1926. The long-run secular decline in rates decreased the cost of capital from then to now, also raising stock prices and returns in a manner that is unrepeatable going forward.
 - c. **Survivor Bias:** The S&P 500 reflects the returns for US companies, which were the best positioned to weather the trauma of WW II. The historical MRPs measured for countries like Britain, France, and Germany were much lower as virtually their total stock of wealth was wiped out.
 - d. **Reduction in MRP:** In economic theory, investors' risk aversion decreases as their wealth increases and they can afford to lose more, and as their time horizons for investing increase as life spans grow longer. If, as seems likely, investors are discounting stocks with a lower MRP today than they applied in 1926, in other words, that they are now willing to pay generally higher multiples now than in 1926, then stock prices have unexpectedly increased over the interval in a one-time transition that is unlikely to continue. The MRP can only go so low.

Ironically, and counterintuitively, then, as the expected, forward looking MRP declines, the backward looking measured MRP increases. An unrealistically high historical MRP estimate like 7.15% can be a sign that the expected prospective MRP has declined.

For all these reasons, the realized returns from the S&P 500 since 1926 are not likely to be repeated looking forward. Estimates of the MRP based upon long run historical returns are apt to overstate the true cost of capital. Yet the STB uses a variant of this technique.

2. A second popular technique looks at the realized stock market spread over bond returns over a shorter and more recent interval, such as the past ten or twenty years. These techniques are highly suspect for the following reasons:
 - a. The tradeoff of using only more recent data is the loss of statistical significance. There simply are not enough observations to harvest the signal from the noise, to extract the mean from the variance in the return data.
 - b. The statistical unreliability increases when the economic conditions have changed, as they have. There has been a steady secular decrease in interest rates over the past 40 years, from double digits to near zero, leading to an unsustainable inflation in returns and MRP over that time frame. Interest rates are now so low that there is no more powder left to propel a continued inflation in prices.
 - c. The Yale economist Robert Schiller has documented a long-run tendency for the market to revert to the mean, to migrate back to a more normal value. When the eponymous Schiller P/E (shown below; <https://www.multpl.com/shiller-pe>), which is the value of the S&P 500 divided by the inflation adjusted 10-year average trailing earnings of the S&P 500 companies, is high, as it is now, subsequent stock market returns tend to be lower than normal (and vice versa), which is another indication that the forward looking MRP is apt to be overstated by the recent past stock market performance.



3. Another class of estimation technique is based on computing the discount rate that converts security analyst forecast estimates to the current S&P 500 value. Others are based on surveying the sentiment of influential investors. These techniques tend to produce more realistic estimates of 4-6%.

McKinsey provides another data point. After reviewing many of the available techniques to estimate MRP, McKinsey concludes:

No matter how we annualize excess returns, group the aggregation windows, or simulate estimators, the excess returns on U.S. stocks over government bonds generally falls between 5 and 6 percent.³³

But again, even this conclusion is predicated on taking historical returns at face value and not accounting for the artificial and unsustainable inflation in the historical returns, which is a reason that I and ISS advocate using a 4% MRP.

In sum, the MRP the STB is using and, thus, the cost of capital it is applying to judge ROI is apt to be materially inflated. This is another reason why the current method to assess revenue adequacy by $ROI = COC$ results in a “conservatively high” bar to attaining revenue adequacy.

VI. SUMMARY AND CONCLUSION

To conclude, the Surface Transportation Board should continue to judge revenue adequacy by $ROI = COC$. A company that maintains $ROI = COC$ is meeting its economic mission at a minimum. It is perfectly able to cover all of its costs, fund growth, repay its debts, attract investors and provide them with a competitive return on their investment, and trade for a market value that preserves the value of the owner’s investments in the business.

In addition, substituting replacement costs for book values is unnecessary and undesirable for determining revenue adequacy. Maintaining $ROI = COC$ guarantees an attractive return on the investments that are made to replace assets or to expand

³³ “Valuation,” McKinsey & Co., 5th edition, 2010, John Wiley & Sons, page 241

the business. Such investments would enter the books at their current replacement costs as they are acquired.

As such, there is no need for the Board to devise a replacement methodology for determining revenue adequacy. But if there were such a need, the Petitioners' proposed S&P 500 benchmarking approach is economically meaningless and inappropriate. Moreover, the adjustments that are proposed in an attempt to render an apples-to-apples comparison between the ROI's of railroads and the S&P 500 firms are inadequate, and any attempt to make further adjustments would open a bottomless "Pandora's Box" of issues that only serve to illustrate why an S&P 500 comparison is baseless.

Finally, all my conclusions are confirmed by, and consistent with, the metrics by which the financial markets evaluate whether to invest their capital in railroads. All Class I railroads had very strong Total Shareholder Returns and free cash flow over the past decade while at the same time they made significant capital investments, paid dividends, and repurchased stock. Those metrics plainly demonstrate the ability of the railroads to fulfill each of the factors that comprise the statutory definition of revenue adequacy. If there is anything to criticize about the Board's application of the $ROI = COC$ standard, it is the Board's *overstatement* of COC, rather than an *understatement* of ROI, that warrants correcting because it has created a conservatively high bar for obtaining revenue adequacy.

VERIFICATION

I, Bennett Stewart, declare under penalty of perjury that the foregoing is true and correct. Further, I certify that I am qualified and authorized to file this Verified Statement.

A handwritten signature in black ink that reads "Bennett Stewart". The signature is written in a cursive, flowing style.

Bennett Stewart

Exhibit A

Curriculum Vita of Bennett Stewart

Overview:

Over the past 40 years, Bennett Stewart has been at the forefront of the practical applications of economic profit under the name of EVA, or economic value added, a valuation and management framework that he developed and which Fortune dubbed “the real key to creating wealth.” EVA was adopted by hundreds of companies globally following publication of his 1992 book, *The Quest for Value*, which was the first to present EVA and advocate its use.

Bennett was one of the principal founders and Senior Partner of Stern Stewart & Co., the firm that first defined EVA and put it on the map, starting in the 1980s. Bennett formed EVA Dimensions in 2006 to enhance EVA with software and data bases and valuation analytics.

In 2018, EVA Dimensions was sold to ISS, the global leader in corporate governance ratings and analysis. Over the next two-and-a-half years, Bennett guided the integration of EVA into ISS’ proxy research, pay-for-performance assessment, corporate analytical solutions, and equity research services. Importantly, Bennett defined the four key EVA ratio metrics that ISS is using as a supplement to Total Shareholder Return (“TSR”) to judge the quality of corporate performance and executive pay alignment.

Bennett also is the inventor of PRVit (for the “Performance-Risk-Valuation investment technology”), an EVA-based stock rating model that has gained a wide following and which ISS licenses to institutional investors and professional equity analysts.

The latest generation of EVA, which includes a powerful ratio-based analytical framework, is chronicled in his book, *Best Practice EVA*, published in 2013.

Bennett currently serves as CEO of Stewart Consulting Service, a one-man boutique for all things EVA-related, including presentations to boards and senior management teams that want to know more about how to derive value from EVA, and designing and implementing EVA-based incentive plans.

Education:

BSE (Electrical Engineering), Princeton University, 1974, Cum Laude

MBA, University of Chicago, 1976

Positions

Credit Trainee and Analyst, The Chase Manhattan Bank (July 1976 – July 1977)

Vice President, Chase Financial Policy (July 1977 – October 1992), the corporate financial consulting arm of the Chase Manhattan Bank

Senior Partner, Stern Stewart & Co. (Nov 1992 – Mar 2006), a consulting firm that developed EVA as a corporate system for value-based management and incentive compensation, and that assisted hundreds of companies globally to adopt it, including Coca-Cola, Eli Lilly, Monsanto, Pemex, Siemens, and Sony, for example

CEO, EVA Dimensions (Mar 2006 – Feb 2018), a company spun out of Stern Stewart to develop and market software tools and data bases to enhance the corporate applications of EVA in performance reporting and benchmarking, decision analysis, and valuations, including acquisitions

Senior Advisor, ISS (Feb 2018 – Jul 2020), responsible for integrating EVA into the ISS suite of services following the acquisition of EVA Dimensions by ISS (formerly Institutional Shareholder Services), the global leader in corporate governance analytics and data

CEO, Stewart Consulting Services (Aug 2020 to present), offering services in the practical applications of the concept of economic profit under the name of EVA, for economic value added.

Books

The Quest for Value: A Guide for Senior Managers, HarperBusiness, 1992 (792 pages)

"Bennett Stewart's book is a notable example of what we at Chicago have always believed: Nothing is more practical than good theory. His neatly chosen, real-world illustrations bring the basic concepts of finance vividly to life. The book can be read with profit (and enjoyment) by anyone with an interest in corporate finance, from beginning student to senior executive."

Merton H. Miller, Robert R. McCormick Distinguished Service Professor, Graduate School of Business, The University of Chicago, 1990 Nobel Prize winner

Best Practice EVA: The Definitive Guide to Measuring and Maximizing Shareholder Value, John Wiley & Sons, 2013 (311 pages)

“This is the best-ever guide to using EVA—the most valuable and important corporate finance tool of the past thirty years”

Geoff Colvin, Senior Editor at Large, *Fortune*

Publications

THE MOTIVES AND METHODS OF CORPORATE RESTRUCTURING

by Bennett Stewart and David M. Glassman, Stern Stewart & Co.

**THE JOURNAL OF APPLIED CORPORATE FINANCE, VOLUME 1
NUMBER 1, SPRING 1988**

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by Bennett Stewart and David M. Glassman, Stern Stewart & Co.

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by Bennett Stewart, Stern Stewart & Co.

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NUMBER 2, SUMMER 1994**

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by Joel M. Stern, Bennett Stewart, and Donald H. Chew, Stern Stewart & Co.

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NUMBER 2, SUMMER 1995**

THE EVA REVOLUTION

by Al Ehrbar and Bennett Stewart, Stern Stewart & Co.

**THE JOURNAL OF APPLIED CORPORATE FINANCE, VOLUME 12,
NUMBER 2, SUMMER 1999**

HOW TO FIX ACCOUNTING—

MEASURE AND REPORT ECONOMIC PROFIT

by Bennett Stewart, Stern Stewart & Co.

**THE JOURNAL OF APPLIED CORPORATE FINANCE, VOLUME 15,
NUMBER 3, SPRING 2003**

CHAMPIONS OF PROFITABLE GROWTH

by Bennett Stewart, Stern Stewart & Co.

HARVARD BUSINESS REVIEW, JULY-AUGUST 2004

THE *REAL* REASONS ENRON FAILED

by Bennett Stewart, Stern Stewart & Co.

**THE JOURNAL OF APPLIED CORPORATE FINANCE, VOLUME 18,
NUMBER 2, SPRING 2006**

EVA MOMENTUM:

THE ONE RATIO THAT TELLS THE WHOLE STORY

by Bennett Stewart, EVA Dimensions

**THE JOURNAL OF APPLIED CORPORATE FINANCE, VOLUME 21,
NUMBER 2, Spring 2009**

WHAT DETERMINES TSR

by Bennett Stewart, EVA Dimensions

**THE JOURNAL OF APPLIED CORPORATE FINANCE, VOLUME 26,
NUMBER 1, WINTER 2014**

**EVA, NOT EBITDA: A NEW FINANCIAL PARADIGM FOR PRIVATE EQUITY
FIRMS**

by Bennett Stewart, Senior Advisor, ISS

**THE JOURNAL OF APPLIED CORPORATE FINANCE, VOLUME 3,
NUMBER 13, SUMMER 2019**

Memorandum and articles published by ISS and available at The ISS EVA Resource Center (<https://www.issgovernance.com/solutions/iss-analytics/iss-eva-resource-center/>)

- Rightsizing the EVA Way in the COVID Economy
- A Case of Mistaken Identify: Correcting the Record on EVA
- EVA, Not EBITDA – a Better Measure of Investment Value
- The Four Key EVA Performance Ratios
- The Link Between EVA and TSR
- The EVA Measurement Formula: A Primer on Economic Value Added (EVA)
- Using EVA in Pay-for-Performance Analysis