

**BEFORE THE
SURFACE TRANSPORTATION BOARD

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**JOINT PETITION FOR RULEMAKING—ANNUAL REVENUE ADEQUACY
DETERMINATIONS**

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Exhibit 1: Reply Verified Statement of Professor Kevin M. Murphy and Professor Mark E. Zmijewski

Exhibit 2: Economists’ Statement in Support of the Staggers Act, *Coal Rate Guidelines, Nationwide*, ICC Docket No. EP 347 (Sub-No. 1) (filed Feb. 25, 1985)

INTRODUCTION

Union Pacific Railroad Company (“UP”), Norfolk Southern Railway Company (“NS”), and the U.S. operating affiliates of Canadian National Railway Company (“CN”) (collectively, “Joint Carriers”) again thank the Board for opening this proceeding¹ and respond herein to the comments recently filed by interested parties.

Joint Carriers make a simple request. The STB should use modern tools based on sound economics and best financial practices to more accurately monitor the financial health of the railroad industry. As Professors Murphy and Zmijewski (“Professors”) have explained, the best practice for measuring revenue adequacy is to either: (i) use replacement costs to calculate return on invested capital (“ROIC”) over the industry cost of capital (“COC”); or (ii) place the Board’s current revenue adequacy calculation into an economically valid context in order to understand whether railroads are actually earning an *economic* ROIC - COC—which is the definition of revenue adequacy, from the standpoint of both 49 U.S.C. § 10704(a)(2) and sound economic theory.

The benchmarking approach proposed by Joint Carriers and the Professors addresses two long-standing issues with the methodology created by the ICC over 40-years ago: measurement errors that result from using accounting values to calculate ROIC - COC and the complete failure to measure economic return at all.

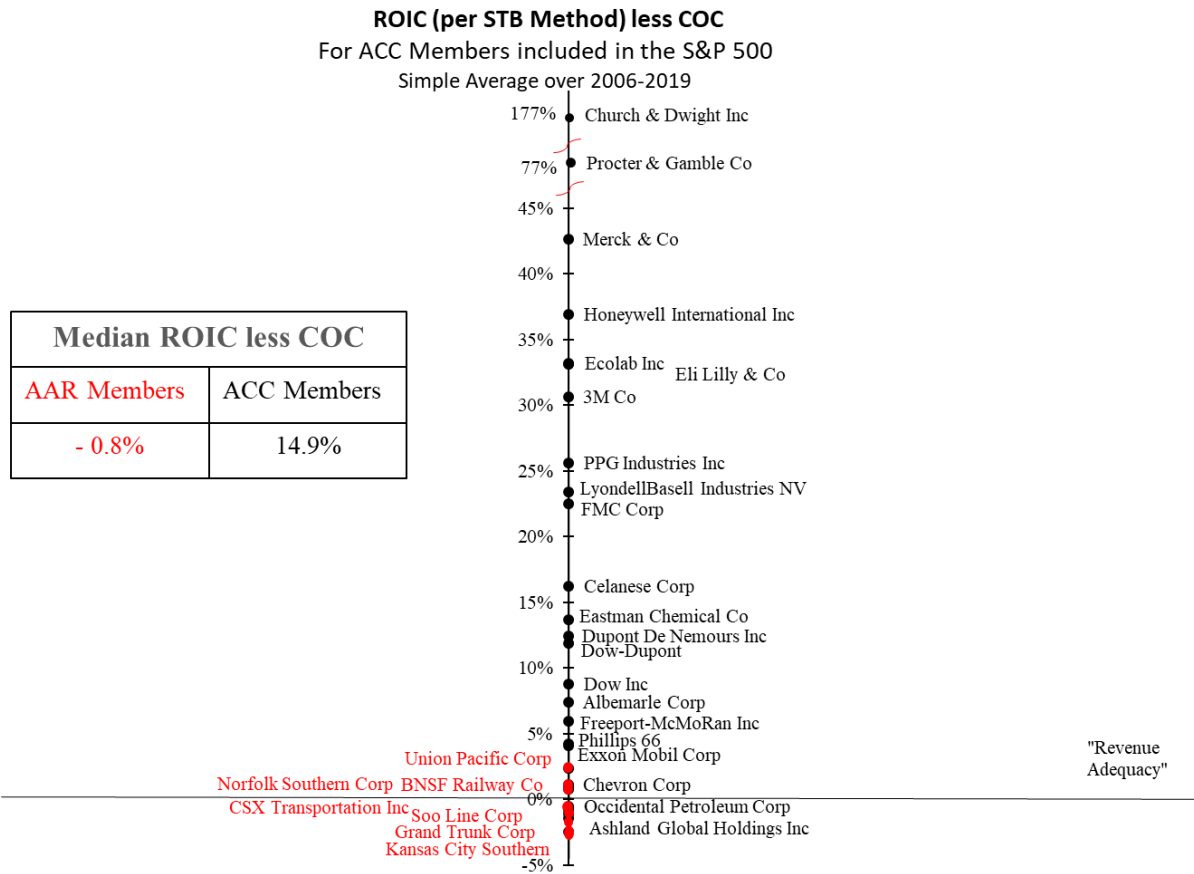
¹ See Decision, *Joint Petition for Rulemaking—Annual Revenue Adequacy Determinations*, STB Docket No. EP 766 (STB served Dec. 30, 2020), slip op. at 3–5.

The proposed benchmarking methodology is also simple. If the Board believes using replacement costs is too burdensome, the proposed approach would enable the STB instead to replicate its accounting measure of “revenue adequacy” for every company in the chosen comparison group of companies that represent the market in which railroads compete for capital (*e.g.*, the S&P 500, as proposed).

Context matters. Indeed, context is more important than the absolute measurement, given pervasive measurement errors in the Board’s current measure—errors that the ICC, STB, and generations of prominent economists have observed for decades. This proposed methodology would offer needed context to the Board’s current measure—a rich and robust dataset of companies against which the railroads compete for capital. This methodology can place railroad returns into an economically relevant context.

In response, two coalitions of rail customers want the STB to ignore highly relevant data and remain oblivious to the relative performance of the freight rail industry. But that relative performance tells a compelling story. For example, Figure 1 shows how members of the American Chemistry Council (“ACC”) vastly outperform the freight rail industry using the STB’s current revenue adequacy measure.

Figure 1: ROIC - COC of ACC Members in S&P 500 (STB method)



Source: Murphy & Zmijewski V.S.

Note: Simple average of annual values. For companies with data with less than full coverage, the average is taken over the years available.

In this case, placing the financial returns of the freight rail industry into context reveals important information for the STB, Congress, and customers. It dispels the claims perpetuated by some interests about rampant railroad profits that demand regulatory intervention. The facts simply paint a different picture. Despite decades of slow financial improvement, railroad returns on capital investment still lag behind other industries with which the railroads compete for capital. And these calculations went uncontested. It is therefore particularly jarring for the chemical industry—with accounting returns that dwarf those of the freight rail industry—to simultaneously insist the STB languish in the past, remain

oblivious to the relative performance of the freight rail industry, and then rely on those antiquated measurements of system-wide financial health to impose discredited utility-style earnings regulation on the industry.

The STB should use modern and economically sound tools to better monitor the financial health of the freight rail industry. Arguments to the contrary in the opening comments, including those of the Western Coal Traffic League / Seminole Electric Cooperative, Inc. (collectively, “WCTL”)² and the Joint Shippers³ (collectively, “Shipper Commenters”) are baseless.

First, Shipper Commenters seek to re-write the language of § 10704(a)(2) so that it no longer requires revenue adequacy to include a “reasonable and economic profit or return (or both).” 49 U.S.C. § 10704(a)(2). In particular, Shipper Commenters claim that: (i) § 10704(a)(2) defines revenue adequacy as merely the point at which a railroad is able to attract and retain capital⁴; and (ii) the phrase, “plus a reasonable and economic profit or return (or both),” somehow means zero economic profit.⁵ Both assertions are wrong. As explained by the Professors, the mere ability to attract and retain capital is uninformative of revenue adequacy—

² Opening Comments of the Western Coal Traffic League and Seminole Electric Cooperative, Inc., *Joint Petition for Rulemaking—Annual Revenue Adequacy Determinations*, STB Docket No. EP 766 (filed May 17, 2021) (“WCTL Comments”).

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

⁴ See, e.g., Joint Carriers Comments at 36.

⁵ See *id.* at 29–34, 45.

more is required by both economic principles and § 10704(a)(2).⁶ That “more” is an economic profit, and there are good reasons why § 10704(a)(2) requires revenue adequacy to include the opportunity to seek a *positive* economic profit (and not be penalized if it is earned): “[e]conomic efficiency requires that railroads be able to aim for a rate of return greater than their cost of capital ... an outcome that benefits [railroad] customers and should be encouraged by the Board.”⁷

Second, Shipper Commenters argue there is no measurement error in the current calculations created by the use of accounting measures. The reality is that “[w]ell-established economic principles and decades of economic research have shown that limitations and inaccuracies of *accounting-based* ROIC,” like the ROIC the Board currently uses to measure revenue adequacy, “make it difficult, possibly impossible, to infer *economic* rates of return.”⁸ The Professors are far from alone in their opinion here. A host of leading economists (over 50 of them, including two Nobel Laureates) has told the Board and ICC the same thing for years. And Congress agreed, requiring revenue adequacy to account for a “reasonable and

⁶ See Exhibit 1, Reply Verified Statement of Professors Kevin M. Murphy and Mark E. Zmijewski (“Murphy & Zmijewski Reply V.S.”), § II.A–B; Petitioner’s Response to Replies, *Joint Petition for Rulemaking to Modernize Annual Revenue Adequacy Determinations*, STB Docket No. EP 766 (filed Oct. 13, 2020), Supplemental Verified Statement of Professor Kevin M. Murphy and Professor Mark E. Zmijewski (“Murphy & Zmijewski Supplemental V.S.”), § IV.

⁷ See *Joint Petition for Rulemaking to Modernize Annual Revenue Adequacy Determinations*, STB Docket No. EP 766 (filed Sept. 1, 2020) (“Joint Petition”), Verified Statement of Professors Kevin M. Murphy & Professor Mark & Zmijewski (“Murphy & Zmijewski V.S.”), ¶ 11 (third bullet).

⁸ See Murphy & Zmijewski Reply V.S. ¶ 5.c. (emphasis added).

economic profit or return (or both),” 49 U.S.C. § 10704(a)(2), which acknowledges that revenue adequacy is a measure of *economic* rates of return. It follows, then, that the chief economic regulator of the U.S. freight rail industry—the world’s “largest, safest, and most cost-efficient freight system in the world”⁹—should not be using a measure of revenue adequacy that fails to actually measure revenue adequacy, particularly when improvements are readily at hand.

Third, Shipper Commenters hold fast to the idea that there is no benchmark group against which to compare the accounting returns of the freight rail industry. As the Professors explain, this position is unsupported by data or economic theory.¹⁰ The railroad industry is not a unicorn, so different from all other industries that its returns cannot be placed into context to gauge what reasonable economic profits should look like. Rather, the power of the proposed benchmarking approach is its ability to translate the convenient accounting-based measures of ROIC into the language of *economic* returns, which are the proper measure for revenue adequacy (according to both statutory requirements and sound economic principles).¹¹ Indeed, the “proposed benchmarking methodology is an important tool to prevent false conclusions based on accounting-based ROIC.”¹² Along these lines, the Professors

⁹ *The Freight Rail Network*, U.S. DEP’T OF TRANSP., FED. R.R. ADMIN., <https://railroads.dot.gov/rail-network-development/freight-rail-overview> (last visited Aug. 16, 2021).

¹⁰ See Murphy & Zmijewski Reply V.S. ¶¶ 3.c, 36–47.

¹¹ See 49 U.S.C. § 10704(a)(2); Murphy & Zmijewski Reply V.S. at n.30 (“the Board [must] ... have an accurate measure of the railroads’ true *economic* earnings to assess the financial performance of the railroads” (emphasis added)).

¹² Murphy & Zmijewski Reply V.S. ¶ 44.

have provided the Board with three different benchmarking groups,¹³ as well as two different revenue adequacy measurements,¹⁴ upon which to seek formal comment in an NPRM. Refusing to use any benchmark or otherwise address the well-known measurement errors in the Board's revenue adequacy measure would be poor regulatory policy and unjustified based on the record before the Board.

Fourth, Shipper Commenters attempt to persuade the Board that revising its revenue adequacy measure is not justified on the basis of a variety of distracting financial information unrelated to revenue adequacy.¹⁵ As the Professors explain, none of the financial metrics highlighted by Shipper Commenters (such as railroad stock performance or the mere ability to attract and retain capital) is informative of revenue adequacy.¹⁶ While Shipper Commenters seek to paint a picture of a railroad industry that is too profitable, monopolistic, and oppressive to shippers, these characterizations are supported by zero evidence. To the contrary, the available data points in the exact opposite direction: railroads have earned as-to-be-expected profits from *procompetitive* activity and, with those profits, have made astounding investments and significant efficiency gains—all to the benefit of their customers. As multiple leading economists and experts have explained to the Board:

¹³ Namely, the S&P 500 (excluding financial institutions and real estate companies), the S&P 500 Industrial Sector, and the S&P 500 Railroad Customers. *See* Murphy & Zmijewski V.S. ¶¶ 63–64.

¹⁴ Namely, the STB ROIC, which mimics the Board's existing approach, and the Adjusted STB ROIC, which makes recommended changes to the Board's calculation. *See* Murphy & Zmijewski V.S. ¶¶ 63–64.

¹⁵ *See* Joint Shippers Comments at 50–52; WCTL Comments at 13–14.

¹⁶ *See* Murphy & Zmijewski Reply V.S. ¶¶ 3.b, 28–35.

- “[T]he most exhaustive and rigorous studies ... commissioned by the Board itself, have repeatedly concluded that improvements in carrier financial performance under the Staggers Act have *not* been the result of enhanced exercise of market power. ... This conclusion is supported by independent academic research”¹⁷;
- “[C]laims ... that railroads are earning outsized returns ... are inaccurate”¹⁸;
- “The idea that freight firms are permitted to charge near-monopoly prices to captive shippers[] ... is patently false”¹⁹;
- “[I]ncreased profitability [in the freight rail industry] in recent years ... reflects increased, not reduced, competition and benefits for shippers, contrary to what some shippers may contend”²⁰;
- “The improved earnings have enabled railroads to reinvest more than half a trillion dollars in their operations. This investment has produced important innovations of substantial benefit to shippers and the public generally.”²¹

Thus, there is no valid economic, legal, or public policy basis for the Board to decline to update its revenue adequacy measure now that it has been confronted

¹⁷ Reply Comments of the Association of American Railroads, *Railroad Revenue Adequacy*, STB Docket No. EP 722 (filed Nov. 4, 2014), Reply Verified Statement of Joseph P. Kalt (“Kalt EP 722 Nov. 4, 2014 V.S.”), at 6–7.

¹⁸ Opening Comments of Union Pacific Railroad Company, *Railroad Revenue Adequacy*, STB Docket No. EP 722 (filed Sept. 5, 2014), Verified Statement of Ram Willner (“Willner EP 722 Sept. 5, 2014 V.S.”), at 2.

¹⁹ Reply Comments of the Association of American Railroads, *Railroad Revenue Adequacy*, STB Docket No. EP 722 (filed Nov. 4, 2014), Verified Statement of Professor Robert Willig (“Willig EP 722 Nov. 4, 2014 V.S.”), at 3 (internal quotation marks omitted).

²⁰ Opening Comments of Union Pacific Railroad Company, *Railroad Revenue Adequacy*, STB Docket No. EP 722 (filed Sept. 5, 2014), Verified Statement of Kevin M. Murphy (“Murphy EP 722 Sept. 5, 2014 V.S.”), at 6–7.

²¹ Opening Comments of Norfolk Southern, *Railroad Revenue Adequacy*, STB Docket No. EP 722 (filed Sept. 5, 2014), Verified Statement of Professor David Sappington (“Sappington EP 722 Sept. 5, 2014 V.S.”), at 12–13.

with evidence that: (i) the Board’s current measure is not measuring revenue adequacy at all, and (ii) superior tools that more accurately measure revenue adequacy are available and simple to implement—namely, the proposed benchmarking approach.

Finally, Shipper Commenters critique the proposed benchmarking methodology **without offering any alternative solutions**. The litigation strategy is clear—to raise baseless red herrings without offering solutions, in the hopes of discouraging the STB from issuing a formal NPRM. This gambit should be rejected for two reasons. First, the critiques lack merit. For example, use of the S&P 500 (or the alternative subsets thereof) is not undermined by changes in the S&P 500’s composition or by differences in firm profitability (or profitability potential), as Shipper Commenters claim.²² The Professors explain that use of the median “mitigates the effects of outliers.”²³ In addition, contrary to the claims of Shipper Commenters, the utility method for calculating deferred taxes is not only not required by GAAP, it is inconsistent with GAAP and produces absurd results that do not reflect the financial reality of a railroad, with just one example being the wild fluctuations that occur when Congress changes the corporate tax rate. These and other technical complaints raised by Shipper Commenters are debunked in the Reply Verified Statement of Professors Kevin Murphy and Mark Zmijewski, attached as Exhibit 1.

²² See WCTL Comments at 23–29; Joint Shippers Comments at 22–27.

²³ Murphy & Zmijewski Reply V.S. ¶ 3.c.iii.

Because no interested party has provided an alternative way to modernize the STB's revenue adequacy methodology, the Board should now issue an NPRM based on the current version of the Proposal.²⁴ Taking this next step would incentivize more constructive feedback from interested parties and allow the Board to explore further how to accurately estimate revenue adequacy in a way that is consistent with economic principles and § 10704(a)(2). Joint Carriers are not claiming to have the only solution to the problems that afflict the Board's revenue adequacy methodology; but they do have the only solution on record at present. Joint Carriers would welcome further public discussion and urge the Board to move forward to the next phase of this rulemaking proceeding.

In **Section I**, Joint Carriers respond to ill-advised suggestions that the STB continue to follow an economically unsound methodology adopted 40 years ago rather than update its measurement tools to accord with modern financial practices. This section demonstrates that: (1) claims that revenue adequacy can be validly measured using accounting values are contrary to an overwhelming body of economics; (2) claims that the current approach captures a "reasonable and economic profit" are incorrect; and (3) nothing justifies the continued distortions and measurement errors created by the ICC's decision from the 1980s to remove billions of dollars from the investment base under the so-called utility approach. In

²⁴ See generally Joint Petition; Petitioners' Response to Replies, *Joint Petition for Rulemaking—Annual Revenue Adequacy Determinations*, STB Docket No. EP 766 (filed Oct. 13, 2020); Opening Comments of Joint Carriers, *Joint Petition for Rulemaking—Annual Revenue Adequacy Determinations*, STB Docket No. EP 766 (filed May 17, 2021) ("Opening Comments of Joint Carriers").

Section II, Joint Carriers explain why the benchmarking proposal is economically and legally sound.

I. THE BOARD SHOULD USE MODERN TOOLS TO MEASURE REVENUE ADEQUACY.

There are serious problems with the Board’s current revenue adequacy measure. Because it fails to measure *economic* ROIC, it is not capturing the correct measure of revenue adequacy. The Board’s definition of revenue adequacy—“a ‘bright-line’ difference between a railroad’s ROIC and COC of zero over some time period”—is not informative of revenue adequacy, *i.e.*, “whether a railroad’s ... *economic* return is above its cost of capital.”²⁵ In their Reply Verified Statement, the Professors show via different scenarios how an accounting-based ROIC over COC can misleadingly suggest a firm is revenue adequate when, in fact, its economic rate of return is *below* its cost of capital.²⁶ These inaccuracies not only create a

²⁵ See Murphy & Zmijewski Reply V.S. ¶ 36; *see also* Reply Comments of Union Pacific Railroad Company, *Railroad Revenue Adequacy*, STB Docket No. EP 722 (filed Nov. 4, 2014), Reply Verified Statement of Professor Kevin M. Murphy (“Murphy EP 722 Nov. 4, 2014 V.S.”), at 1 (a railroad is not “revenue adequate in an economically meaningful way [until] ... it is ... earning a competitive return on the replacement or current cost of its assets”); Opening Comments of the Association of American Railroads, *Railroad Revenue Adequacy*, STB Docket No. EP 722 (filed Sept. 5, 2014), Verified Statement of Joseph P. Kalt, Ph.D (“Kalt EP 722 Sept. 5, 2014 V.S.”) at 4 (“Attempts to define and measure revenue adequacy based on quantification of accounting measures of the depreciated, historic book value of assets are conceptually misguided and, ultimately, contrary to the public’s interest”).

²⁶ See Murphy & Zmijewski Reply V.S. § III & Appendix A.

misleading public impression, they affect regulatory functions that rely on the Board's revenue adequacy calculations.²⁷

Such inaccuracies result because the Board's current revenue adequacy measure *is not actually measuring revenue adequacy*. As the Professors have explained, revenue adequacy is an *economic* measure that is properly measured by replacement costs.²⁸ If accounting (*i.e.*, book) value is used instead of replacement costs, "capital will flow into other industries."²⁹ Thus, there is wisdom in Congress's directive in § 10704(a)(2) that revenue adequacy must include a "reasonable and economic profit or return (or both)."³⁰

²⁷ See Joint Petition at 48 ("[T]he annual revenue adequacy findings are slowly creeping into rate setting, first in the Three-Benchmark test and more recently in the Board's widely-criticized limit-price test for market dominance. But even if the STB only uses the RSAM figure as originally designed (in the Three-Benchmark cases), the Board's refusal to provide the railroad a return on the value of capital investments will create an environment that is hostile to private investment and drive capital to other industries.").

²⁸ See Murphy & Zmijewski Reply V.S. § II.B; *see also infra* Table 1; Kalt EP 722 Sept. 5, 2014 V.S. at 28 ("Historic book value is not an appropriate metric for determining revenue adequacy[.]"); Opening Comments of Norfolk Southern, *Railroad Revenue Adequacy*, STB Docket No. EP 722, Verified Statement of Bradford Cornell ("Cornell EP 722 Sept. 5, 2014 V.S.") at 13 ("By not using economic depreciation and asset replacement values, the Board misstates ROI."); Reply Comments of the Association of American Railroads, *Railroad Revenue Adequacy*, STB Docket No. EP 722, Reply Verified Statement of Roger Brinner, Ph.D. ("Brinner EP 722 Nov. 4, 2014 V.S.") at 5 ("*historic cost measures* of total invested capital grossly understate the capital on which a return should be calculated by the STB").

²⁹ See Murphy & Zmijewski Reply V.S. ¶ 13.

³⁰ 49 U.S.C. § 10704(a)(2); *see* Joint Petition at 40–46.

Unfortunately, the Board's current methodology does not comply with this requirement (or others) in § 10704(a)(2).³¹ These problems are to be taken seriously by the Board, not only because it is charged by Congress with accurately monitoring revenue adequacy of Class I railroads on an annual basis, but because its errors in this regard could mislead the Board into making ill-advised policy changes that would harm the rail industry and its customers in long-lasting ways.

A. Revenue Adequacy Can Be Measured Only By Using Either Replacement Costs or a Benchmarking Approach.

Contrary to Shipper Commenters' and their experts' assertions, revenue adequacy should not be measured solely using accounting values because accounting values are uninformative of revenue adequacy. As the Professors explain, "the current method by which the Board makes its annual revenue adequacy determination is uninformative and potentially harmful to both railroads and shippers."³² The only method for validly measuring revenue adequacy—an economic concept—is to use either replacement costs or a benchmarking approach.

1. The most accurate way to measure revenue adequacy is to use replacement costs to calculate ROI.

Because revenue adequacy is a measure of economic profit, revenue adequacy is most accurately measured by using replacement costs to calculate ROIC - COC.³³ The contrary opinion by Joint Shippers' expert, Mr. Stewart—that replacement

³¹ See *infra* § I.B.

³² See Murphy & Zmijewski Reply V.S. ¶ 5.

³³ See Murphy & Zmijewski Reply V.S. ¶¶ 3.a.iii, 12–17.

costs are “neither necessary nor appropriate” when calculating ROI to determine revenue adequacy³⁴—is “incorrect,” “inconsistent with finance and economics, counter to the principles the Board applies [when calculating economic profit in rate reasonableness cases], and would result in underinvestment in railroads to the detriment of shippers.”³⁵ The Professors provide an example that shows why using replacement costs is necessary for calculating revenue adequacy: “[o]therwise, capital will flow into other industries.”³⁶

The Professors are not alone. Over and over again, leading economists have agreed that calculating revenue adequacy requires using replacement costs because accounting-based ROIC - COC is not informative of revenue adequacy.³⁷ For example, in 1985, a coalition of leading economists—including Nobel Laureates Kenneth Arrow and James Tobin—advised the ICC that “[t]he appropriate standard for determining the adequacy of railroad revenues is a rate of return equal to the

³⁴ Joint Shippers Comments, Stewart V.S. ¶ 2 (underlining omitted).

³⁵ Murphy & Zmijewski Reply V.S. ¶¶ 3.a.ii, 14.

³⁶ Murphy & Zmijewski Reply V.S. at ¶ 13.

³⁷ See, e.g., Kalt Sept. 5, 2014 V.S. at 28 (“Historic book value is not an appropriate metric for determining revenue adequacy[.]”); Cornell Sept. 5, 2014 V.S. at 13 (“return on book value will be uninformative about whether the firm can attract capital and be financially healthy”); Kalt Nov. 4, 2014 V.S. at 9 (“the critique of the use of book values is not a matter of serious economic debate”); Brinner Nove. 4, 2014 V.S. at 5 (“*historic cost measures* of total invested capital grossly understate the capital on which a return should be calculated”); Hamada & Gokhale V.A. ¶ 24 (“accounting ratios would not be sufficient to determine whether railroads are earning ‘reasonable and economic’ rates of return on their capital investments”); Murphy Sept. 5, 2014 V.S. at 7–8 (“Return on the historical net investment base used in the Board’s calculation of revenue adequacy is not informative about whether the railroads will be healthy in the long run ...”).

current cost of capital on the replacement value of all rail assets that are required to meet the demands for railroad service, regardless of the source of the funds used in investing in those assets.”³⁸ Table 1 below lays out the overwhelming number of world-class economists who uniformly advised the ICC or STB in 1985 that replacement cost is the correct measurement of railroad revenue adequacy.

Table 1
Economists Who Have Supported Use Of Replacement Costs To
Determine the Adequacy of Railroad Revenues

Kenneth J. Arrow, Stanford University	William J. Baumol, Princeton University
Allen R. Ferguson, A.F.E., Inc.	Hendrik S. Houthakker, Harvard University
Norman H. Jones Jr., N.H. Jones, Inc.	Isabel V. Sawhill, The Urban Institute
Lester Thurow, MIT	James Tobin, Yale University
Gardner Ackley, University of Michigan	Bruce Allen, Michigan State University
Arman A. Alchian, UCLA	Elizabeth Bailey, Carnegie-Mellon University
Francis Bator, Harvard University	George Break, Berkeley
Harrison S. Campbell, University of Lowell	William M. Capron, Boston University
Richard E. Caves, Harvard University	James A. Constantin, University of Oklahoma
James A. Constantin, University of Oklahoma	J. Dewey Daane, Vanderbilt University
Harold Demsetz, UCLA	George C. Eads, University of Maryland
Robert Eisner, Northwestern University	Jose A. Gomez-Ibanez, Harvard University
Gottfried Haberler, AEI	Robert H. Haveman, University of Wisconsin
Arnold C. Harberger, University of Chicago	Robert W. Harbeson, University of Illinois
Stanley J. Hille, University of Missouri	George W. Hilton, UCLA
Jack Hirshleifer, UCLA	Charles C. Holt, University of Texas at Austin

³⁸ Exhibit 2, Economists’ Statement in Support of the Staggers Act, *Coal Rate Guidelines, Nationwide*, ICC Docket No. EP 347 (Sub-No. 1) (filed Feb. 25, 1985) (“Economist Letter”), at 2; *accord*, R.R. Accounting Principles Bd., *R.R. Accounting Principles - Final Report*, Vol. 2, at 60 (Sept. 1, 1987), *available at* <http://archive.gao.gov/t2pbat20/134005.pdf> (“[C]urrent market valuation is preferable to historical valuation from a theoretical economic standpoint. In revenue adequacy applications, current market value represents that value upon which competitive returns must be earned to attract and retain capital.”).

Richard H. Holton, Berkeley	Leland L. Johnson, The Rand Corporation
Theodore E. Keeler, University of California	Michael H. Lee, Montana PSC
Paul W. McCracken, University of Michigan	William H. Meckling, University of Rochester
Alan H. Meltzer, Carnegie-Mellon University	Leon Moses, Northwestern University
Willard Mueller, Washington State University	James C. Nelson, Washington State University
Richard R. Nelson, Yale University	Edmund A. Nightingale, U. of Minnesota
Wallace E. Oates, University of Maryland	Walter Y. Oi, University of Rochester
Josephine E. Olson, University of Pittsburgh	Marc J. Roberts, Harvard University
Theodore Otis, Montana Pub. Serv. Reg.	Thomas Romer, Carnegie-Mellon University
Richard L. Schmalensee, MIT	Thomas C. Schelling, Harvard University
Richard Sullivan, Carnegie-Mellon University	Robert Willig, Princeton University
Lee Wilson, University of Wisconsin	Anthony M. Yezer, GW University
Richard Zeckhauser, Harvard University	

The wisdom of this esteemed group of economists has not waned over the years. Other prominent economists have echoed this 1985 coalition, including Professors Robert S. Hamada of the University of Chicago Booth School of Business; Bradford Cornell of the Anderson Graduate School of Management at the University of California, Los Angeles; Joseph Kalt of the John F. Kennedy School of Government at Harvard University; and Roger Brinner, previously a professor at the Massachusetts Institute of Technology and Harvard University.³⁹ Professors Murphy and Zmijewski are in very good company.

³⁹ See Reply of the Association of American Railroads, *Competition in the Railroad Industry*, STB Docket No. EP 705 (filed May 27, 2011), Joint Verified Statement of Robert S. Hamada & Rajiv B. Gokhale ¶ 24 (“accounting ratios would not be sufficient to determine whether railroads are earning ‘reasonable and economic’ rates of return on their capital investments. ... Returns are more appropriately measured using the current value of investment (i.e., replacement costs) ... [s]uch measures would be more consistent with the goals of the Staggers Act ...”); Kalt EP 722 Sept. 5, 2014 V.S. at 28 (“Historic book value is not an appropriate metric for determining revenue adequacy[.]”); Cornell EP 722 Sept. 5, 2014 V.S. at 13 (“By not

Rather than accepting the nearly universal view of prominent economists, Shipper Commenters urge the STB to gauge revenue adequacy based on accounting measurements of profits. The testimony before the STB, combined with peer-reviewed financial and economic literature referenced by the Professors, is overwhelmingly to the contrary. Indeed, the ICC itself acknowledged that replacement costs are the most accurate way to measure revenue adequacy,⁴⁰ but the Board thus far concluded that incorporating replacement cost calculations would be too burdensome for the Board’s annual revenue adequacy determinations.⁴¹ While Joint Carriers would not oppose the STB revisiting its refusal to explore a replacement cost measurement, this proceeding offers the STB an alternative path—continuing to use accounting measurements, but placing those measurements into a context that allows the Board to monitor railroad *economic* returns. In this way, the proposed benchmarking methodology would increase the

using economic depreciation and asset replacement values, the Board misstates ROI.”); Brinner EP 722 Nov. 4, 2014 V.S. at 5 (“*historic cost measures* of total invested capital grossly understate the capital on which a return should be calculated by the STB”).

⁴⁰ *Standards for Railroad Revenue Adequacy*, 364 I.C.C. 803, 820 (1981) (“While we perceive some difficulty in implementing a replacement cost valuation method, we believe that it is conceptually the best method available.”); *Standards for Railroad Revenue Adequacy*, 3 I.C.C.2d 261, 277 (1986) (“While current cost accounting [i.e., current replacement cost of assets] is theoretically preferable to original cost valuation, it cannot be practically implemented in a manner that we can be confident would produce accurate and reliable results.”).

⁴¹ See *Association of American Railroads—Petition Regarding Methodology for Determining Railroad Revenue Adequacy*, STB Docket No. EP 679 (STB served Oct. 24, 2008), slip op. at 5–6.

accuracy of the Board's annual revenue adequacy determinations without requiring the use of replacement costs.

2. The benchmarking approach enables the Board to use accounting values to estimate revenue adequacy as defined by § 10704(a)(2).

If using replacement costs to calculate economic profit is not an option, comparing the accounting-based ROIC - COC of one firm with that of other competitive firms can provide an estimate of the relative economic profit of the first firm. A well-known way to do this is to use a benchmarking approach like the one proposed by the Professors. A benchmarking approach is “an informative way” to evaluate whether a firm is earning an economic return using accounting-based ROIC - COC.⁴² In other words, the proposed benchmarking methodology is a way to ensure that an accounting-based revenue adequacy measure includes a “reasonable and economic profit or return (or both),” as required by § 10704(a)(2).

If the Board chooses to continue using accounting values in its revenue adequacy calculation, it is important that it adopt a benchmarking approach like the one proposed by Joint Carriers. As the Professors explain, the “proposed benchmarking methodology is an important tool to prevent false conclusions based on accounting-based ROIC and [to] thereby mitigate[], and hopefully prevent[], regulating and penalizing of railroads for reasons unrelated to noncompetitive pricing to shippers.”⁴³

⁴² See Murphy & Zmijewski Reply V.S. ¶¶ 36, 44.

⁴³ See Murphy & Zmijewski Reply V.S. ¶ 44.

The assertion by Shipper Commenters and their experts that a benchmarking approach is not valid because no companies are comparable to railroads is “unfounded and contrary to widely-accepted and standard ways” in which economic returns of companies are evaluated.⁴⁴ In particular, using benchmarking to compare the accounting-based returns of different types of companies in competitive markets provides a “meaningful assessment of ... financial performance” that is superior (*i.e.*, more accurate and economically sound) to looking at accounting-based returns in isolation, which “cannot inform the Board of whether a railroad’s ... *economic* return is above its cost of capital.”⁴⁵ In addition, the Professors explain that using the median “mitigates the effects of outliers” such that “the existence of outliers in the distribution of ROICs for some companies in the S&P 500 Index ... does not provide any reason to dismiss the benchmarking approach.”⁴⁶ Ultimately, “[u]sing benchmarking is a powerful modern financial practice that permits the STB to continue to use accounting measures of returns, but to place that data into a context that is informative about the economic returns of the rail industry.”⁴⁷

⁴⁴ See Murphy & Zmijewski Reply V.S. ¶ 3.c.ii.

⁴⁵ See Murphy & Zmijewski Reply V.S. ¶ 36.

⁴⁶ Murphy & Zmijewski Reply V.S. ¶¶ 3.c.iii, 42.

⁴⁷ See Murphy & Zmijewski Reply V.S. ¶ 46.

B. The Board’s Current Revenue Adequacy Measure Does Not Measure Revenue Adequacy as Defined by § 10704(a)(2).

As Joint Carriers and highly distinguished experts have explained, a railroad earning the Board’s current measure of revenue adequacy, ROI = COC based on accounting values, is not necessarily: (i) earning sufficient revenues to sustain the “infrastructure and investment needed to meet the present and future demand for rail services”; (ii) earning sufficient revenues to “attract and retain capital in amounts adequate to provide a sound transportation system in the United States”; or (iii) earning a “reasonable and economic profit or return (or both)” —all requirements of § 10704(a)(2).⁴⁸

An accounting-based measure of ROIC - COC like the one used by the Board cannot satisfy § 10704(a)(2) because it cannot measure economic profit, and economic profit is the *sine qua non* for earning sufficient revenues to sustain the “infrastructure and investment needed to meet the present *and future* demand for rail services” and to “attract and retain capital in amounts adequate to provide a

⁴⁸ See Murphy & Zmijewski Reply V.S. at ¶ 3.b & §§ II–III; Murphy & Zmijewski V.S. ¶¶ 22–27; Murphy EP 722 Sept. 5, 2014 V.S. at 7 (“the Board[’s] ... calculated measure of revenue adequacy does not ‘represent[] a reasonable level of profitability for a healthy carrier’ nor ‘assure shippers that the carrier will be able to meet their service needs for the long term’”); Murphy EP 722 Sept. 5, 2014 V.S. at 8 (railroad “current earnings are not sufficient today to attract the capital necessary to replace its assets, [even if] the Board[] find[s] [the railroad to be] ... revenue adequate. This is because the value of the necessary capital is not the net investment amount used by the Board in its revenue adequacy calculation, but rather the amount that it would take to replace those assets and construct an efficient railroad – which is much closer to the replacement cost of those assets”); Hamada & Gokhale V.S. ¶ 24 (“accounting ratios would not be sufficient to determine whether railroads are earning ‘reasonable and economic’ rates of return on their capital investments”).

sound transportation system in the United States.” 49 U.S.C. § 10704(a)(2) (emphasis added).⁴⁹ In other words, the Board’s definition of revenue adequacy—both in terms of economic and financial principles and the requirements of § 10704(a)(2)—should be based on an *economic* measure of ROIC - COC. This is the core problem with the Board’s current definition of revenue adequacy—because it is based on an accounting measure of ROIC - COC, it is uninformative of revenue adequacy if viewed in isolation.⁵⁰

Yet because Shipper Commenters risk their potential wealth transfer if the Board more accurately measures revenue adequacy in accordance with economic principles and § 10704(a)(a)’s requirements, they attempt to persuade the Board that there is no problem with its revenue adequacy definition. As explained next, all of these claims are baseless and should not dissuade the STB from noticing a proposal to use a benchmarking approach to better gauge the revenue adequacy of the freight rail industry.

⁴⁹ See Murphy EP 722 Sept. 5, 2014 V.S. at 7 (the Board’s measure of ROI “is a measure of the value of *past* investments (reduced for deferred taxes), and it provides no information about a railroad’s ability to attract the capital it needs to maintain and grow its network and operations, which is the relevant economic criterion for determining whether the carrier will be financially healthy and be able to serve its customers in the *future*”).

⁵⁰ Murphy & Zmijewski Reply V.S. ¶¶ 3.c, 5; Murphy & Zmijewski V.S. at 7 (“there is no way in which one can look at accounting rates of return and infer anything about relative economic profitability”); see Murphy EP 722 Nov. 4, 2014 V.S. at 2–3 (“The proper measure of revenue adequacy ... is [a railroad’s] return on the replacement or current cost of assets. As a matter of economics, evaluating whether a carrier is earning a return on investment sufficient to allow it to invest and meet demands for service in the long term requires the use of forward-looking investment costs—the amount of capital that the railroad would need in order to replace and expand its assets and replicate an efficient railroad.”).

1. A “reasonable and economic profit or return (or both)” does not mean zero economic or accounting profit.

Joint Shippers’ expert, Mr. Stewart, opines that the requirement in § 10704(a)(2) that revenue adequacy include “a reasonable and economic profit or return (or both) on capital employed in the business” actually means earning “zero” accounting profit.⁵¹ Mr. Stewart is wrong.

First, Mr. Stewart’s re-interpretation of § 10704(a)(2) would not fare well under statutory interpretation principles. “If the statutory language is plain, [courts] must enforce it according to its terms.”⁵² Here, the statutory language says “*plus a reasonable and economic profit or return (or both).*” 49 U.S.C. § 10704(a)(2). It would be absurd to interpret this language to mean zero *accounting* profits or returns, as Mr. Stewart suggests. Why would Congress go the convoluted route of saying, “*plus a reasonable and economic profit or return (or both),*” if it actually meant zero accounting profits? The plain meaning of the statute does not support Mr. Stewart’s position. Indeed, courts and other federal agencies have acknowledged that the terms, “economic profit” and “accounting profit,” have different plain meanings.⁵³

⁵¹ Joint Shippers Comments, Stewart V.S. at 3 ¶ 1 (inaccurately equating the Board’s accounting-based ROI = COC with a breakeven “economic profit”).

⁵² *King v. Burwell*, 576 U.S. 473, 486 (2015).

⁵³ *See In re Coca-Cola Co.*, 117 F.T.C. 795, 950 n.93 (1994) (“Economic profit accounts for the opportunity costs of all the assets that a firm uses in its business, while accounting profit reflects a firm’s explicit historical expenditures.”); *Bailey v. Allgas, Inc.*, 284 F.3d 1237, 1252 n.21 (11th Cir. 2002) (“Accounting profits differ from economic profits in several important ways ... [A]ccounting profits exceed economic profits. ... [S]ubstantial accounting profits ... may be consistent with

Even with regard to economic profits, the statutory language does not support an interpretation of “zero” economic profits. For example, it does not make sense to tell someone to make “plus” a zero economic profit or to make a “reasonable” zero economic profit. Nor does it make sense to say “zero” economic profit or return “(*or both*).” It is a “cardinal principle of statutory construction that courts must give effect, if possible, to every clause and word of a statute,”⁵⁴ and “[a]n interpretation that needlessly renders some words superfluous is suspect.”⁵⁵ The surrounding language also supports Joint Carriers’ interpretation⁵⁶ because § 10704(a)(2) speaks of the need for railroad revenues to be adequate “for the infrastructure and investment needed to meet the present *and future* demand for rail services.” This phrase inherently requires the use of economic, not accounting, measures of returns, because economic returns are forward-looking, whereas accounting returns are wholly uninformative about whether a railroad “will be able to attract investors in the future.”⁵⁷

trivial or zero economic profit and thus do not necessarily indicate any market power”).

⁵⁴ *Williams v. Taylor*, 529 U.S. 362, 364 (2000).

⁵⁵ *Crandon v. United States*, 494 U.S. 152, 171 (1990) (Scalia, J., concurring).

⁵⁶ Courts may look to the surrounding language as context to determine the plain meaning of a statutory phrase. *King*, 576 U.S. at 486.

⁵⁷ *See* Murphy EP 722 Sept. 5, 2014 V.S. at 7–8 (“As a matter of economics, the proper way to measure whether a carrier is earning a return on investment sufficient to allow it to invest and meet demands for service in the long term must use forward-looking investment costs. ... Return on the historical net investment base used in the Board’s calculation of revenue adequacy is not informative about whether the railroads will be healthy in the long run – whether they will be able to attract the capital necessary for replacement of their assets as they become economically obsolete or depreciate or the railroads need to invest in order to serve

Second, as the Professors explain, it is a principle of basic economics that a “reasonable economic profit” does not mean “zero” economic or accounting profit.⁵⁸ Rather, the term, “‘economic profit’ reflects an expected [positive] return on incremental investment.”⁵⁹ In other words, economic profit means the potential to earn an economic profit over the cost of capital: “the railroads must have the opportunity to aim for returns above their cost of capital, even over a period of many years, because a railroad cannot earn its cost of capital if it must endure periods when its rate of return is below the competitive level, yet it is denied the prospect of earning a return above its cost of capital at other times.”⁶⁰ Mr. Stewart’s opinion to the contrary “is inconsistent with finance and economics, counter to the principles the Board applies in rate reasonableness cases, and would result in underinvestment in railroads to the detriment of shippers.”⁶¹ Indeed, the Professors are not alone in their opinion:

- “[I]nvestors expect the companies in which they invest to *strive* to earn *more* than their [economic] cost of capital.”⁶²

new demands for their services.”); *accord In re Coca-Cola Co.*, 117 F.T.C. at 950 n.93 (1994). This meaning is also consistent with how the Board measures what is essentially (a proper) revenue adequacy analysis in its Stand-Alone Cost methodology. *See* Murphy & Zmijewski Reply V.S. ¶ 15.

⁵⁸ Murphy & Zmijewski Reply V.S. ¶ 12.

⁵⁹ *Id.*

⁶⁰ Murphy & Zmijewski Reply V.S. ¶ 26.

⁶¹ Murphy & Zmijewski Reply V.S. ¶ 14.

⁶² Willner EP 722 Sept. 5, 2014 V.S. at 6 (emphasis added); *see also* Murphy Sept. 5, 2014 V.S. at 27–28 (“Competitive firms strive to earn returns above their cost of capital ... Depriving railroads of the opportunity to benefit from procompetitive

- “There seems to be a false impression that in a competitive market, a firm or industry should only earn an average ROIC ... equal to its weighted average cost of capital (WACC). But this is neither true in economic theory nor empirical experience. ... [T]he average ROIC of the investing firm *will and should* exceed the WACC”⁶³
- “It is sound economic policy to maintain incentives for railroads to try to earn returns in excess of their cost of capital.”⁶⁴

2. The mere ability to attract and retain capital is not informative of revenue adequacy.

With no alternative plausible interpretation of § 10704(a)(2)’s language, Shipper Commenters attempt to equate revenue adequacy with the mere ability to attract and retain capital.⁶⁵ In other words, if a firm can attract and retain any capital, then it must be revenue adequate. While this assertion is a convenient way to re-write § 10704(a)(2) to rid it of the pesky requirement of a “reasonable and economic profit or return (or both),” the reality is that attracting and retaining capital is merely one element of revenue adequacy but does not, standing alone, equate to revenue adequacy. The plain language of § 10704(a)(2)—with its multiple requirements, including “a reasonable and economic profit”—makes this clear.

In addition, on the basis of logic alone, it cannot be that railroads are revenue adequate merely because they are able to attract and retain capital. If that were the

efforts to improve service and innovate will result, over the long term, in poorer performance by railroads and a reduced level of service for shippers”).

⁶³ Opening Comments of the Association of American Railroads, *Railroad Revenue Adequacy*, STB Docket No. EP 722 (filed Sept. 5, 2014), Verified Statement of Roger Brinner (“Brinner EP 722 Sept. 5, 2014 V.S.”), at 7.

⁶⁴ Kalt EP 722 Sept. 5, 2014 V.S. at 33–34.

⁶⁵ See, e.g., Joint Shippers Comments at 34.

case, railroads would have been revenue adequate in the 1970s—when the freight rail industry was struggling to stay out of bankruptcy but was nevertheless still able to access the debt markets and retain some earnings to reinvest in critical infrastructure.⁶⁶ Clearly, neither the ICC nor the Board has based revenue adequacy on the mere ability to attract and retain some amount of capital, and the Board should not do so now.

The Professors also rebut this assertion by pointing out that a company's mere ability to raise capital does not mean it "has earned an actual economic return on its invested capital equal to or greater than its cost of capital."⁶⁷ Essentially, "a company with an economic return on its invested capital that is less than its cost of capital can have positive expected free cash flows, which it can use to repay its debt and make distributions to its other investors."⁶⁸ In addition, the mere fact that a railroad is replacing or upgrading its current assets to maintain existing traffic or make its operations more efficient "does not provide evidence that it would be

⁶⁶ See *Simmons v. ICC*, 697 F.2d 326, 328 (D.C. Cir. 1982) ("The declining fortunes of the nation's rail industry came to a crucial focus in the 1970's, when the collapse of several major carriers necessitated a substantial federal effort to ensure the continuation of vital service and to restore the rail industry to a level of financial health sufficient to meet future needs for investment capital." (citing Staggers Act legislative history)); *Adequacy of Railroad Revenue (1978 Determination)*, 362 I.C.C. 199, 205, 213–214 (1979) (discussing data from 1957 through 1978, which showed railroads were able to attract and retain capital, and make capital investments, despite being in poor financial health: "On the national level, annual capital expenditures doubled over the 21-year period ... [but] "present spending levels are still asserted to be insufficient for the carriers' needs.")

⁶⁷ Murphy and Zmijewski Reply V.S. at ¶ 35.e.

⁶⁸ *Id.*

willing to [make investments that would enable it to] expand to serve new traffic” in the future.⁶⁹

3. The Board’s current revenue adequacy measure is misleading rather than “conservative.”

Shipper Commenters assert that the Board’s current methodology is actually “conservative,”⁷⁰ but this is baseless. The Professors illustrate with examples how revenue adequacy defined as an accounting-based ROIC=COC—far from being conservative—often misleadingly overstates revenue adequacy. This is because an accounting-based ROIC - COC is often positive even when a railroad’s economic returns are negative.⁷¹ In other words, the Board’s current methodology is signaling that a railroad is revenue adequate when, in fact, the railroad is not because it is not earning an economic profit—a requirement for revenue adequacy under both economic principles and § 10704(a)(2). Thus, because the Board’s current revenue adequacy measure has the potential of grossly overstating “revenue adequacy,” using the Board’s current revenue adequacy measure to regulate railroads (*i.e.*, “regulation at its worst”⁷²) would prevent railroads from covering their costs,

⁶⁹ Murphy and Zmijewski Reply V.S. at ¶ 25.

⁷⁰ Joint Shippers Comments at 38–52.

⁷¹ See Murphy & Zmijewski Reply V.S. ¶¶ 21–22, 35.a; *accord* Cornell EP 722 Sept. 5, 2014 V.S. at 17–18 (“a railroad that appears revenue adequate according to the Board’s measurement may not in fact be earning its [economic] cost of capital.”); Brinner EP 722 Nov. 4, 2014 V.S. at 5 (“*historic cost measures* of total invested capital grossly understate the capital on which a return should be calculated by the STB and by investors”).

⁷² Murphy EP 722 Nov. 4, 2014 V.S. at 10; see Murphy & Zmijewski Reply V.S. ¶ 45 (“the STB should resist the temptation to view railroad returns above the median of the benchmark as a sign of a market or regulatory failure[, as] ... [t]he railroad

disincentivize railroad investments in their network, and degrade the quality and safety of the rail network, to the detriment of customers and the wider economy.⁷³

C. Nothing Justifies the Board's Continued Use of the Utility Method, Which Further Distorts the Picture of Revenue Adequacy.

The Board's current revenue adequacy measure uses the so-called "utility method" to calculate deferred taxes in its accounting-based ROIC calculation for

industry could be outperforming its peers for entirely pro-competitive reasons"); Kalt EP 722 Nov. 4, 2014 V.S. at 18–19 ("A showing merely that a railroad is overall 'revenue adequate,' even by reference to a properly conceived measure of 'adequate,' would not constitute an economically coherent basis for regulatory intervention ... Such regulation ... has been widely discredited and largely abandoned by the United States and other developed nations."); Brinner EP 722 Sept. 5, 2014 V.S. at 8 ("even if a proper analysis of railroad rates of return indicated that railroads were earning above their cost of capital, such a conclusion should not result in regulation that limits railroad earnings."); Cornell EP 722 Sept. 5, 2014 V.S. at 13 ("any revenue adequacy constraint that relies on annual revenue adequacy findings is not economically sound"); Opening Comments of the Association of American Railroads, *Railroad Revenue Adequacy*, STB Docket No. EP 722 (filed Sept. 5, 2013), Verified Statement of B. Kelly Eakin, Mark E. Meitzen & Phiplip E. Schoech ("Christensen Associates"), at 16 ("adding a revenue adequacy component to the Board's standard for judging the reasonableness of rail freight rates is unwarranted and would be unwise").

⁷³ See Murphy & Zmijewski Reply V.S. ¶ 35.b; Murphy & Zmijewski V.S. ¶¶ 35–43; Sappington EP 722 Sept. 5, 2014 V.S. at 6–8 (allowing "shippers ... to demand prices below the prices that would prevail in a contestable market whenever a railroad is earning more than a specified level of earnings ... would thereby limit a railroad's financial gains without stemming its financial losses," "promote higher industry costs and corresponding higher industry prices," "limit[] incentives for innovation," and be "to the detriment of all shippers"); Murphy EP 722 Sept. 5, 2014 V.S. at 28 ("A regulatory regime where railroads are regulated differently depending on whether or not they are found to be revenue adequate would penalize efficient, profitable railroads and favor less efficient railroads"); Willig EP 722 Nov. 4, 2014 V.S. at 4 ("basing rate regulation on standards that are without theoretical support is a prescription for induced inefficiency, capital insufficiency, deterioration of service quality and repeat of the underlying causes of the troubled history of the industry before the successful response of the ICC and the STB to the Staggers Act").

making its annual revenue adequacy determinations. As Joint Carriers have previously explained, the utility method is not appropriate for freight railroads, which are not utilities and are not guaranteed any level of return.⁷⁴ Even when serving a captive shipper, a railroad is subject not to utility-style regulation, but “according to a very explicit criterion of ‘mimic competition.’”⁷⁵ The Board’s current use of the utility method is contrary to such “mimic competition” principles, at odds with basic valuation principles, and inconsistent with (and certainly not required by) GAAP. Importantly, the utility method also distorts the Board’s already inaccurate accounting-based ROIC - COC measure for revenue adequacy by further overstating railroad returns.⁷⁶

In response to the Board’s inquiries regarding the appropriateness of its continued use of the utility method, Shipper Commenters, and particularly WCTL, assert that: (i) the utility method conforms to GAAP;⁷⁷ (ii) the utility method provides a more accurate picture of railroad profitability;⁷⁸ and (iii) the utility method should be used to prevent railroads from earning “unneeded and

⁷⁴ Opening Comments of Joint Carriers at 20.

⁷⁵ Kalt EP 722 Sept. 5, 2014 V.S. at 11.

⁷⁶ See Joint Petition at 18–19, 38–49; *id.*, Murphy & Zmijewski V.S. ¶ 58; Kalt EP 722 Nov. 4, 2014 V.S. at 15 (“the STB’s exclusion of deferred taxes overstate the attractiveness of railroad industry investments”); Cornell EP 722 Sept. 5, 2014 V.S. at 19 (“The Board is more likely to find revenue adequacy when deferred taxes are deducted from the investment base, potentially restricting railroad investment”); Willner EP 722 Sept. 5, 2014 V.S. at 5 (“The Board’s adjustment for deferred income taxes ... produce[s] a higher apparent return.”).

⁷⁷ WCTL Comments at 30.

⁷⁸ *Id.* at 30–33.

unwarranted” returns “at the expense of captive customers.”⁷⁹ Each of these assertions is wrong.

1. GAAP does not require the use of the utility method, and the utility method is in fact inconsistent with GAAP.

Far from being required by GAAP, the utility method does not conform to GAAP. Because the utility method “excludes deferred income taxes on the balance sheet,” it “deviates from how GAAP measures assets (invested capital) on the balance sheet” and thus is inconsistent with GAAP.⁸⁰ In addition, GAAP does not require use of the utility method (or any other method) for purposes of calculating an accounting-based rate of return like the accounting-based ROIC the Board uses to make its annual revenue adequacy determinations. As the Professors explain, “GAAP does not cover, and it appears never to have covered, how to measure ROIC,” such that “accounting-based ROIC is not covered by GAAP” and “*is not a GAAP measure*” at all.⁸¹ In sum, GAAP does not restrict the Board in choosing an appropriate treatment of deferred taxes for its accounting-based ROIC calculation used in its annual revenue adequacy determinations.

2. The utility method distorts the picture of railroad profitability.

WCTL asserts that the utility method “provides a more accurate picture of railroad profitability” because deferred taxes offset funds that railroads otherwise

⁷⁹ *Id.* at 5, 33–35.

⁸⁰ Murphy & Zmijewski Reply V.S. ¶ 65.

⁸¹ Murphy & Zmijewski Reply V.S. ¶¶ 64, 71 (emphasis added).

would need to raise through debt or equity markets and are therefore “equivalent [to] interest-free loans [or] an implicit subsidy,” which “frees up funds for other purposes and reduces the effective cost of the asset investments.”⁸²

This position is wrong. As noted above, in 1985, scores of esteemed economists advised the ICC that “the appropriate standard for determining the adequacy of railroad revenues is a rate of return equal to the current cost of capital on the replacement value of all rail assets that are required to meet the demands for railroad service, *regardless of the source of the funds used in investing in those assets*.”⁸³ In other words, the economic question when determining revenue adequacy is what kind of economic return the railroad industry is earning on its capital investments and how that economic return compares to the opportunity cost of that investment.

For example, when a railroad retains earnings to invest in a bridge, yard, locomotives, or equipment, the opportunity cost of that investment is the return investors could enjoy if the earnings were returned to them and reinvested elsewhere. Whether the funds come from rail customers, lease payments from telecommunications companies, the sale of excess real property, lower taxes due to accelerated depreciation or any other tax benefit, or a pot of gold discovered on the property—the economic measurement of revenue adequacy is unaffected, as over fifty prominent economists explained long ago. Thus, revenue adequacy turns on the

⁸² WCTL Comments at 30–33.

⁸³ Exhibit 2, Economist Letter at 2.

economic value of the capital assets and the economic returns they generate—not the *source* of free cash flow.

Moreover, the idea of artificially reducing the ROIC to avoid a purported double benefit has no basis in the freight rail industry. As Joint Carriers have explained, public utilities are permitted to charge customers higher rates immediately to cover the future deferred taxes, which is necessary to give the benefit of the deferred taxes to the utility and promote investment (otherwise, if the regulator forces the utility to charge lower rates because of the lower taxes, passing the deferred tax benefit from the utility to the public, it would strip the utility of all benefits of the deferred tax program).⁸⁴ But the freight railroad industry does not operate this way. Freight railroads are not guaranteed returns, and prices and revenues are primarily driven by natural market forces, not by regulators.⁸⁵ Thus, it does not follow that railroads should be prevented from earning a return on investments funded in part by deferred taxes.

In particular, it does not matter whether deferred taxes are interest-free loans or government subsidies—when calculating accounting-based ROIC for purposes of comparing it to COC, basic valuation principles require that deferred taxes be treated simply as what they are: internally generated funds with the same opportunity costs of making investments as any other internally generated funds (such as funds from the sale of assets, investments designed to reduce taxes, or

⁸⁴ See Joint Petition at 44–46.

⁸⁵ *Id.*

improved productivity).⁸⁶ In other words, the source of the internal funds is irrelevant to the economic cost of re-investing that money in the railroad industry, and the opportunity cost of deploying capital internally is the cost of capital.⁸⁷

Moreover, far from providing a more accurate picture of railroad financial health, the utility method paints a picture of railroad returns that is both inaccurate and highly misleading. As Joint Carriers have explained with examples using two otherwise identical railroads, the utility method makes the railroad with more deferred tax *liabilities* appear to be more financially healthy, because that railroad has artificially higher rates of return.⁸⁸ This picture painted by the utility method does not accord with reality. Indeed, the utility method systematically skews upward the average return on investment over time, leaving the Board with a less accurate measure of railroad financial health.⁸⁹

Joint Carriers have also illustrated how changes in the corporate tax rate have exposed the inaccuracies of the utility method. The change in the corporate tax rate in 2017 caused the value of accumulated deferred taxes to drop, which would have skyrocketed the ROICs of Class I carriers, even though their actual ROICs had not changed.⁹⁰ If the Board continues to use the utility approach, these kinds of adjustments will have to be made in the future to avoid these same kinds of absurd

⁸⁶ *Id.* at 46–47

⁸⁷ *Id.* at 47.

⁸⁸ *Id.* 40–44.

⁸⁹ *Id.* at 43–44.

⁹⁰ *Id.* at 42.

results. Indeed, the Biden Administration has recently proposed raising the corporate tax rate to 28%⁹¹—a change that would again cause chaos to the STB revenue adequacy findings without the manual adjustments needed to fix the inaccuracies of the utility method.

3. The utility method is a poor fit for railroads.

With its requirement that freight rail prices be set by *natural* competition, and that freight railroads be supported by the Board in earning reasonable economic profits, Congress intended the Board to “treat[] the American railroad industry as any other business.”⁹² While the Board has a duty to provide remedies in *individual* instances where an abuse of market power is *proven*, the Board does not, and is not authorized to, engage in public-utility style regulation of the freight rail industry, even though railroads serve some solely-served shippers. As the Professors explain: “[r]ailroads were deregulated so that they could operate (without public funding) as private firms responsible for purchasing, operating, and maintaining the infrastructure and equipment needed to serve their customers

⁹¹ See, e.g., Sanjay Agarwal & Patrick Roach, *Biden’s Plan Relies on a Higher Corporate Tax Rate and Stronger Enforcement*, BLOOMBERG TAX (June 22, 2021, 1:00 AM), <https://news.bloombergtax.com/daily-tax-report/bidens-plan-relies-on-a-higher-corporate-tax-rate-and-stronger-enforcement>.

⁹² *Burlington N. R.R. Co. v. Pub. Util. Comm’n of Tex.*, 812 F.2d 231, 235 (5th Cir. 1987) (citing 126 Cong. Rec. 28,431 (1980) (statement of Rep. Staggers)); see *Groome & Assocs., Inc. v. Greenville Cty. Economic Develop. Corp.*, STB Docket No. 42087, at 12 (served July 27, 2005) (“Congress directed [in the Staggers Act] that railroads be treated more like ordinary businesses than like public utilities.”).

well,” and, to do this, “they must compete for necessary capital with the vast number of other firms ... worldwide.”⁹³

Yet Shipper Commenters assert that railroads should be treated as utilities because they serve some solely-served shippers, and therefore the utility method is across-the-board appropriate for the entire freight rail industry.⁹⁴ Once again, this assertion is baseless. Congress has not authorized the Board to treat railroads like public utilities *ever*—including when a solely-served shipper proves in an individual case that the carrier has market dominance over the transportation at issue.⁹⁵

D. Revenue Adequacy Cannot Be Measured By the Financial Information Shipper Commenters Urge the Board to Use.

Shipper Commenters ask the STB to ignore the relative performance of the freight rail industry in favor of invalid “supplemental indicators” of revenue adequacy, such as metrics related to railroad stock performance, stock buybacks, shareholder distributions, and cash flow⁹⁶—all of which are uninformative of revenue adequacy. As the Professors explain by way of an example, the “supplemental indicators” Shipper Commenters tout are economically invalid bases

⁹³ Murphy & Zmijewski Reply V.S. ¶ 5.a.

⁹⁴ See WCTL Comments at 30. The deferred taxes calculation is, of course, not limited to only those deferred taxes tied to solely-served traffic.

⁹⁵ *Western Coal Traffic League—Pet. for Decl. Order*, STB Docket No. FD 35506 (STB served July 25, 2013), slip op. at 15–16 (noting that an “analogy to principles of public utility regulation is inapposite” because “Congress deliberately chose to move away from a public utility model of regulation for the railroad industry”).

⁹⁶ See Joint Shippers Comments at 6–7, 50–52; see also Opening Comments of Dow, Inc., *Joint Petition for Rulemaking—Annual Revenue Adequacy Determinations*, STB Docket No. EP 766 (filed May 17, 2021), at 3–4; WCTL Comments at 20–23.

for monitoring revenue adequacy and should be rejected.⁹⁷ In particular, “a company earning an economic rate of return less than its cost of capital [can] generate[] substantial free cash flows ... to distribute to its investors (for example, dividends and stock repurchases)” as well as experience an “increase in value” (i.e., higher stock prices).⁹⁸ Thus, being alleged “darlings” of Wall Street does not revenue adequacy make.⁹⁹

The Shipper Commenters’ attempts to use economically invalid and misleading metrics to determine revenue adequacy are not new. For years, leading economists and experts have explained that financial metrics other than an economic (replacement-cost-based) ROIC - COC are not informative about revenue adequacy:

- “Certain shipper parties endorse the use of a ‘multiple indicators’ revenue adequacy methodology that relies on various ‘Wall Street’ metrics and a funds flow analysis. In 1981, the ICC considered and properly rejected use of funds flow and other financial ratios ... [to] measure ... revenue adequacy, a decision that it reaffirmed in 1986. From an economic perspective, the ICC was correct. These other financial metrics are not informative about railroads’ ability to attract the necessary capital to replace and expand their networks in the future, which should be the focus of the Board’s revenue adequacy determination.”¹⁰⁰
- “Claims of ‘revenue adequacy’ based on other criteria, such as a rising stock price or the willingness of the capital market to fund incremental investments, are unfounded.”¹⁰¹

⁹⁷ Murphy & Zmijewski Reply V.S. ¶ 3.b & § III.

⁹⁸ Murphy & Zmijewski Reply V.S. ¶¶ 88, 93.

⁹⁹ See Joint Shippers Comments at 12.

¹⁰⁰ Murphy EP 722 Nov. 4, 2014 V.S. at 7.

¹⁰¹ Kalt EP 722 Nov. 4, 2014 V.S. at 11.

- “The fact that a firm is able to pay dividends, fund capital expenditures, and also have retained earnings is unremarkable. It merely reflects a chosen finance strategy for the use of available funds. It says nothing about long-term sustainability.”¹⁰²

In addition, the financial information relied on by Shipper Commenters does not measure what § 10704(a)(2) requires for revenue adequacy. Neither strong stock performance, share buybacks, shareholder dividends, high income, revenue re-invested, low operating ratios, free cash flow, nor mere investor appeal are mentioned as key elements of revenue adequacy in § 10704(a)(2). This makes sense, because, as just explained, these metrics are wholly unrelated to revenue adequacy. A company on the verge of bankruptcy, but perceived by the market as approaching a massive rebound, could check the box for every single one of the above-listed metrics and still not be revenue adequate. Rather, an economic rate of return on the economic value of railroad assets is the hallmark of revenue adequacy because, when a company is earning a “reasonable and economic profit,” it is also satisfying the other requirements of § 10704(a)(2).

II. THE PROPOSED BENCHMARKING APPROACH IS ECONOMICALLY AND LEGALLY SOUND.

If the STB is going to reject the Shipper Commenters’ request to continue financial monitoring based on a misleading 40-year old methodology, the question is how to best modernize the methodology without unnecessarily burdening the STB. The proposed benchmarking methodology fits the bill as sound, simple, and

¹⁰² Brinner EP 722 Nov. 4, 2014 V.S. at 7.

superior. Shipper Commenters' critiques of the use of a benchmarking approach lack economic and legal validity.

A. The Benchmarking Approach Is Economically Valid.

The benchmarking approach has been proposed by two leading economists¹⁰³ based on well-known economic principles. The core feature of the benchmarking methodology is the ability to translate an accounting-based ROIC - COC measure into an estimate of an economic-based ROIC - COC measure. This is necessary because, as explained, an accounting-based ROIC - COC does not and cannot measure revenue adequacy, which is an *economic* measure of ROIC - COC. To accomplish this translation of sorts, the benchmarking methodology puts the Board's accounting-based ROIC - COC in an economic context: a representative sample of the market in which railroads compete for capital. This comparison enables the Board to monitor the *economic* performance of railroads over time and thus enables the Board to make revenue adequacy determinations that are more accurate. If the Board continues to use its current approach, it will risk causing "harmful regulatory effects" from its reliance on "accounting-based ROIC[, which] can provide false conclusions that a company's economic return is greater than its cost of capital when in reality it is not."¹⁰⁴

¹⁰³ See Murphy & Zmijewski V.S., Curriculum Vitae of Professor Kevin M. Murphy and Curriculum Vitae of Professor Mark E. Zmijewski.

¹⁰⁴ Murphy & Zmijewski Reply V.S. ¶ 83.

1. Differences in firm profitability do not undermine the benchmarking approach.

Shipper Commenters assert that any comparison approach like the proposed benchmarking approach is economically invalid because no firm's profitability is comparable to any other firm's profitability.¹⁰⁵ In particular, Joint Shippers' expert, Mr. Stewart, opines that because each firm has unique "profitability attributes," one firm's profitability cannot determine the reasonableness of another firm's profitability.¹⁰⁶ Mr. Stewart's thinking is flawed.

The idea that no companies are comparable to the railroads and thus a benchmarking methodology is uninformative as to revenue adequacy (*i.e.*, what might be a "reasonable and economic profit") is "unfounded and contrary to widely-accepted and standard ways that investors evaluate companies' financial performance."¹⁰⁷ The fact that there are outliers in the distribution of ROICs of the companies in the S&P 500 comparison groups simply supports the use of the median as a benchmark, which "mitigates the effects of [such] outliers."¹⁰⁸ Thus, the fact that companies differ within the comparison group "does not provide any reason to dismiss the benchmarking approach."¹⁰⁹ Mr. Stewart's contrary opinion ignores the "widely-known inaccuracies and limitations of using accounting-based ROIC to

¹⁰⁵ Joint Shippers Comments at 22–27, 31–33.

¹⁰⁶ *Id.* at 24, 32–33.

¹⁰⁷ Murphy & Zmijewsky Reply V.S. ¶ 3.c.ii.

¹⁰⁸ Murphy & Zmijewski Reply V.S. at ¶ 3.c.iii.

¹⁰⁹ Murphy & Zmijewski Reply V.S. ¶ 42.

estimate economic rates of return and thus wrongly conclude[s] that evaluating the railroads in isolation is more informative than using the benchmarking methodology” when, in fact, “[a]n assessment of whether a railroad is earning an economic return greater than its cost of capital based on a comparison of accounting-based ROIC to the cost of capital (“COC”) cannot be informative *without* using the widely-accepted and standard benchmarking methodology to compare the railroads’ financial performance to the financial performance of companies operating in competitive (unregulated) markets.”¹¹⁰

2. The S&P 500 is an economically valid comparison group and would not result in railroads earning “premium” economic returns.

Turning then to how to select a reasonable benchmark, Shipper Commenters assert that the S&P 500 is not an economically valid comparison group to determine railroad revenue adequacy for various reasons,¹¹¹ all of which are baseless.

First, Shipper Commenters assert the S&P 500 is not valid because it is not inclusive of all worldwide firms with which railroads compete for capital.¹¹² As the Professors have explained the S&P 500 is a “reasonable benchmarking group” because it fairly represents “the companies with which the railroads primarily compete for capital.”¹¹³ Thus, it is unnecessary for the Board to suffer the time and complexity of gathering data for all firms with which railroads compete for capital—

¹¹⁰ Murphy & Zmijewski Reply V.S. at ¶¶ 3.c.ii, 5.e (emphasis added).

¹¹¹ See WCTL Comments at 14–16, 23–29; Joint Shippers Comments at 17–31.

¹¹² See Joint Shippers Comments at 18.

¹¹³ Murphy & Zmijewski Supplemental V.S. § II.

a representative sample of the broader market in which railroads compete for capital (like the S&P 500) is appropriate.

Second, Shipper Commenters claim that the S&P 500 is inappropriate because railroads compete with firms based merely on “whether they earn their cost of capital.”¹¹⁴ This assertion is contradicted by both economic principles and empirical data. First, this position washes over the measurement errors from using accounting rather than economic valuations. Second, it is illogical to conclude that investors will not consider how the (risk-adjusted) returns from investing in the railroad industry compare to the returns offered by investing in other industries. Third, the empirical evidence also contradicts Shipper Commenter’s position. As the Professors have shown, over 80% of the S&P 500 earn accounting returns over their cost of capital, and these are the firms with which railroads compete for capital. It is irrational to conclude investors would be enticed to invest in firms earning an accounting-based ROIC – COC of zero when over 80% of the market could do quite a lot better—including many of the railroad’s own customers.

Essentially, Shipper Commenters believe the ROICs - COC of S&P 500 firms should not be compared to those of railroads because railroads should be limited to earning an accounting-based ROIC equal to or less than the industry cost of capital. But this flawed notion conflicts with the statute, which speaks of a reasonable economic profit. And it has already been debunked by the Professors—railroads are not revenue adequate when they earn accounting-based ROICs equal to or less than

¹¹⁴ See Joint Shippers Comments at 18.

(or even more than) the industry cost of capital; the appropriate measure of revenue adequacy is *economic* ROIC - COC, which can and should be permitted to be higher than the cost of capital.¹¹⁵ Indeed, the leading economists are clear: “Economic efficiency requires that railroads be able to aim for an economic rate of return greater than their cost of capital.”¹¹⁶ This is because, “[i]n competitive markets, the prospect of successfully out-earning one’s cost of capital drives innovation and investment.”¹¹⁷ Thus, “[i]t is sound economic policy to maintain incentives for railroads to try to earn [economic] returns in excess of their cost of capital.”¹¹⁸ To do otherwise “will result, over the long term, in poorer performance by railroads and a reduced level of service for shippers.”¹¹⁹

Third, Shipper Commenters claim that the S&P 500 is an inappropriate comparison group because it is composed of highly profitable firms and thus is uninformative as to (or skews too high) what should be deemed “reasonable” returns for the freight rail industry, which should purportedly be making lower profits given its capital intensity and slow growth characteristics.¹²⁰ These arguments fail. As an initial matter, the S&P 500 is not composed of the most “profitable” firms—the

¹¹⁵ See Murphy & Zmijewski Reply V.S. ¶ 5.d & § II.A–C.

¹¹⁶ Murphy & Zmijewski Reply V.S. ¶ 5.d; see *supra* § I.B.1 and notes 62–64.

¹¹⁷ Kalt EP 722 Sept. 5, 2014 V.S. at 33–34

¹¹⁸ *Id.*

¹¹⁹ Murphy EP 722 Sept. 5, 2014 V.S. at 28.

¹²⁰ See Joint Shippers Comments at 22–27.

criteria for inclusion in the S&P 500 “focus primarily on market capitalization and liquidity, ... not on high or highest profitability currently or historically.”¹²¹

While Shipper Commenters depict the S&P 500 as an elite club of excessively profitable firms, the reality is that many of the railroads’ customers, including Shipper Commenters themselves, are S&P 500 companies.¹²² In any event, the fact that some firms have higher or lower accounting-based ROICs - COC than other firms—even if substantially higher or lower—does not undermine using the S&P 500 as a comparison group for the reasons explained above—using a benchmarking point like the median “mitigate[s] the effects of the outliers” such that there is no “reason to dismiss the benchmarking approach,” including the use of the S&P 500 as the comparison group.¹²³

Neither would using the S&P 500 as the comparison group result in railroads earning “premium returns,” as WCTL argues.¹²⁴ In particular, WCTL claims that, because even the bottom S&P 500 firms are “likely to be very successful,” using the median of the S&P 500 as the benchmark for revenue adequacy allows railroads to earn “premium” returns over their cost of capital.¹²⁵ The only way the S&P 500 would be inappropriate due to “premium returns,” as WCTL argues, is if the S&P 500 was a representative of firms earning *noncompetitive* levels of profits (which it

¹²¹ Murphy & Zmijewski Supplemental V.S. ¶ 3.

¹²² *See supra*, Figure 1; Murphy & Zmijewski V.S., Tables 3 and 6.

¹²³ Murphy & Zmijewski Reply V.S. ¶ 42.

¹²⁴ *See* WCTL Comments at 14–18.

¹²⁵ *Id.* at 14.

is not). In other words, so long as the representative sample's profits are the result of competitive market forces—as are the profits in the S&P 500 comparison group—those profits are not “premium,” excessive, unattainable, or otherwise problematic. As Professor Kalt explained in Ex Parte 722, “revenues which would be generated by competitive market outcomes across a railroad’s network *are* the competitive market’s determination of adequate revenues.”¹²⁶ “Competitively determined revenues,” *whatever their level*, are a *good thing* the Board should support because they “provide the firm with the incentive to chase business it can efficiently serve, and the cash flow that justifies investments in that pursuit.”¹²⁷

The Professors chose the S&P 500 as their comparison group for the benchmarking approach because “the S&P 500 is the widely-accepted index that measures market performance of equities of the large-cap segment of the U.S. equities market,” which is the segment that “also includes the four U.S. publicly traded railroads subject to the STB’s Revenue Adequacy Determinations.”¹²⁸ In other words, the S&P 500 represents the “companies with which the railroads primarily compete for capital,” and “[c]omparing the railroads’ financial performance to other firms with whom the railroads compete for capital is a reasonable proxy for whether railroads are earning sufficient [economic] returns

¹²⁶ Kalt EP 722 Sept. 5, 2014 V.S. at 3–4 (emphasis added).

¹²⁷ *Id.* at 4.

¹²⁸ Murphy & Zmijewski Supplemental V.S. ¶ 4.

[needed] to attract the capital needed to invest and maintain their systems in the long-run.”¹²⁹

Joint Carriers maintain that the full S&P 500 would provide the most robust data set from which to understand railroad accounting-based ROICs - COC from an economic viewpoint.¹³⁰ This benchmark is easier to calculate and provides more data observations for the STB and stakeholders. It also bears repeating that the STB views its annual measurement as a starting point, not end point, such that if the measurement is to be used in an adjudication parties are free to submit other evidence—or other benchmarks—they believe would improve the precision of the Board’s annual findings. In these circumstances, the Joint Carriers’ position is that using the broadest benchmark to capture the most amount of information is the best approach for the annual findings, and tailoring the benchmark further for individual adjudications can be done at a later point, if needed.

3. The benchmarking approach would increase the accuracy of the Board’s revenue adequacy determinations and avoid harmful regulatory effects.

Shipper Commenters argue that the proposed benchmarking approach would somehow exacerbate the measurement errors in the Board’s current approach.¹³¹ In particular, Joint Shippers assert that comparing accounting rates of return of different firms would only “compound” the errors inherent in those accounting rates

¹²⁹ *Id.*

¹³⁰ See Opening Comments of Joint Carriers at 14–16.

¹³¹ See Joint Shippers Comments at 27–29.

of return because the errors could be large and either positive or negative.¹³² While it is true that using accounting-based ROIC - COC to measure revenue adequacy is rife with inaccuracies that distort the picture of railroad financial health, Joint Shippers are wrong that the proposed benchmarking approach exacerbates these inaccuracies.

Joint Shippers misinterpret the Professors' statement that "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."¹³³ The fact that a firm's accounting-based and economic ROICs - COC can differ wildly does not invalidate the proposed benchmark approach. To the contrary, the proposed benchmarking approach neutralizes the distortions of using accounting-based ROICs - COC to measure economic profit because it applies the same methodology to all firms in the comparison group and then sets a benchmark (e.g., the median or some percentile of the distribution), which mitigates outlier effects.¹³⁴ Indeed, the "proposed benchmarking methodology is an important tool to prevent false conclusions based on accounting-based rates of return and to thereby mitigate, and hopefully prevent, the regulation and penalizing of railroads for reasons unrelated to noncompetitive pricing to shippers."¹³⁵ Thus, while there is unquestionably noise created by the use of accounting measurements—noise that

¹³² See Joint Shippers Comments at 27–29.

¹³³ Joint Shippers Comments at 27 (quoting *Murphy & Zmijewski V.S.* ¶ 45).

¹³⁴ *Murphy & Zmijewski Reply V.S.* ¶¶ 3.c.iii, 41.

¹³⁵ *Murphy & Zmijewski Reply V.S.* ¶ 44.

cannot be perfectly quieted with a benchmarking approach—the perfect cannot be the enemy of the good.¹³⁶

B. The Comparison Approach Is Legally Valid.

Shipper Commenters also wrongly claim the proposed benchmarking approach does not satisfy the requirements of § 10704(a)(2). Joint Carriers have already explained in detail why their Proposal satisfies § 10704(a)(2).¹³⁷ Indeed, the proposed benchmarking approach remains the only proposal on record—including the Board’s current revenue adequacy methodology—that satisfies all the requirements of § 10704(a)(2), including the requirement that revenue adequacy include a “reasonable and economic profit or return (or both).”

In particular, Shipper Commenters assert that the Proposal is legally invalid because: (i) the proposed benchmarking methodology redefines revenue adequacy as being “more profitable than half the S&P 500”;¹³⁸ (ii) the proposed benchmarking methodology redefines revenue adequacy as a measure of market power;¹³⁹ and (iii) the proposed benchmarking methodology is not permitted by § 10704(a)(2)

¹³⁶ See *Simplified Standards for Rail Rate Cases*, STB Docket No. EP 646 (Sub-No. 1) (STB served Sept. 5, 2007), slip op. at 31 (“In the absence of any better evidence, we are guided by ... [an] estimate ...”); *id.* at 73 (“In the absence of any other suitable method, we do not believe the Board is precluded from using this approach.”)

¹³⁷ Opening Comments of Joint Carriers at 2–9.

¹³⁸ See Joint Shippers Comments at 1, 18–20.

¹³⁹ See Joint Shippers Comments at 34–38.

because § 10704(a)(2) does not mention a comparison approach.¹⁴⁰ Each claim is wrong.

First, the use of the median to gauge what constitutes reasonable economic profits is a feature of the proposal, not a flaw. By using the median (the point of central tendency of the data), the proposed methodology does three important things: (i) it addresses the measurement error caused by the use of accounting returns; (ii) it mitigates the effects of outliers in the distribution; and (iii) it provides a logical estimate of what a “reasonable” economic return is for Class I railroads, which operate as competitive firms in the competitive marketplace.¹⁴¹

Indeed, the use of a median for this purpose has already been endorsed and defended by the STB in a related context. In devising the Three-Benchmark methodology, the STB sought to use the comparison to a benchmark of other solely-served traffic to gauge what is the maximum reasonable lawful rate for the complaining customer.¹⁴² Citing D.C. Circuit precedent for the proposition that use of the mean or median is entirely logical, the STB concluded it was appropriate to

¹⁴⁰ See WCTL Comments at 10.

¹⁴¹ See *Murphy & Zmijewski Reply* V.S. ¶¶ 3.b.iii, 41; Kalt EP 722 Sept. 5, 2014 V.S. at 2–3 (“revenues which would be generated by competitive market outcomes across a railroad’s network *are* the competitive market’s determination of adequate revenues”) (emphasis added).

¹⁴² See *Rate Guidelines—Non-Coal Proceedings*, 1 S.T.B. 1004, 1038 (STB served Dec. 31, 1996).

use the mean of the benchmark group to assess the reasonableness of the railroad's challenged rate.¹⁴³ The same logic applies with equal force here.

In this case, the statute requires the STB to include a “reasonable economic profit” in its measurement of revenue adequacy. And it is entirely logical and proper to conclude that a “reasonable economic profit” equates to the central tendency (median) of a robust benchmark group of industries in well-functioning, unregulated markets against whom the railroad industry competes with for capital. The reality is that, based on the record currently before the Board, the “median” of that broad group of industries is the best available evidence of the central tendency of returns in the competitive marketplace—a benchmark against which the railroad industry should be judged to determine what is “reasonable” and what is not.

Second, Shipper Commenters' assertion that the proposed benchmarking approach redefines revenue adequacy as a measure of market power is wrong.¹⁴⁴ The benchmarking approach does not measure market power, nor could it. Market power must be determined on a case-by-case basis with an eye towards the myriad competitive pressures on the particular traffic that is subject to the Board's review. Far from being a measure of market power, the benchmarking approach is akin to a translator for someone who speaks the Economic language but is visiting a country

¹⁴³ *Simplified Standards for Rail Rate Cases*, STB Docket No. EP 646 (Sub-No. 1) (STB served Sept. 5, 2007), slip op. at 75–76 (citing *Tenn. Gas Pipeline Co. v. FERC*, 925 F.2d 1206, 1213 (D.C. Cir. 1991) (an average is “an obvious place to begin when there is no information that would incline the decision-maker to prefer one estimate over another”)).

¹⁴⁴ See Joint Shippers Comments at 34–38.

that speaks Accounting. The benchmarking approach enables the Board to understand its accounting values—which cannot measure economic profit or, in turn, revenue adequacy—in the language of economic values. This “translation” has nothing to do with market power and everything to do with capturing and measuring a “reasonable economic profit” by looking to other well-functioning competitive industries.

The only relation the benchmarking approach has to market power is the Professors’ counsel to the Board that, “[i]f the railroads earn a rate of return net of cost of capital no higher than the ... median S&P firm, then there would be no *presumption* that railroads are earning abnormal returns[,] ... set[ting] rates without constraint from competition, or that shippers’ current protections under the Board’s SAC and related proceedings are not sufficient.”¹⁴⁵ The point of this statement is not that the benchmarking approach measures market power (it does not), but that the benchmarking approach shows that the Board is not justified in believing railroads are engaged in anticompetitive activity merely because they earn an accounting or economic ROIC over the industry cost of capital.¹⁴⁶

¹⁴⁵ Murphy & Zmijewski V.S. ¶ 2.

¹⁴⁶ As the Professors have explained, even if railroads earn accounting-based ROICs - COC above the median S&P 500 company, that also does not justify the Board assuming railroads are engaged in anticompetitive activity. To the contrary, higher-than-median accounting returns could result for procompetitive reasons, such as greater efficiency, benefits from risky investments, and increases in demand that exceeded forecasts. Murphy & Zmijewski Reply V.S. ¶¶ 8, 47 (citing Murphy & Zmijewski V.S. ¶¶ 84–85).

Third, it does not matter, as WCTL argues, that § 10704(a)(2) does not mention a comparison or benchmarking approach.¹⁴⁷ Nothing in § 10704(a)(2) tells the Board *how* to measure revenue adequacy, it just tells the Board what revenue adequacy includes. The proposed benchmarking methodology satisfies every requirement in § 10704(a)(2). No other proposal on record, nor the Board's current methodology, can say the same.

C. No Precedent or Policy Reasons Prevent the Board From Moving Forward in This Rulemaking.

WCTL claims that agency precedent prevents the Board from moving forward with this rulemaking and issuing an NPRM.¹⁴⁸ This too is untrue. In particular, *Omaha Public Power District* is not relevant to how the Board calculates revenue adequacy, much less controlling, as WCTL argues.¹⁴⁹ In that case, the ICC discussed how to calculate a stand-alone railroad's (SARR) cost of capital in the context of a rate case and rejected a proposal to calculate the SARR's cost of capital based on the cost of capital of the traffic group at issue.¹⁵⁰

But Joint Carriers are not proposing to calculate a SARR's cost of capital based on a traffic group. Instead, Joint Carriers' Proposal uses the Board's current methodology (with three recommended changes with regard to deferred taxes and

¹⁴⁷ WCTL Comments at 10.

¹⁴⁸ See WCTL Comments at 11–12.

¹⁴⁹ *Id.*

¹⁵⁰ *Omaha Public Power Dist. v. Burlington N. R.R. Co.*, 3 I.C.C.2d 123, 147–48 (1986).

non-goodwill intangible assets, as set forth in the Adjusted STB ROIC measure¹⁵¹) and applies it to every firm in the S&P 500 to understand how the Board's accounting-based ROIC - COC measure relates to railroads' economic profits.

Nevertheless, WCTL claims that *Omaha Public Power District* "prohibit[s]" the Proposal because the ICC noted that "[c]apital costs ... differ ... largely on the evaluation of risk" and "the risk factor in the cost of railroad capital is likely [different] from that of other industries."¹⁵² But the proposed benchmarking approach already captures differences in risk factors by mirroring the cost of capital calculation used by the STB. Both the multi-stage DCF model and the Capital Asset Pricing Model estimate the cost of capital for a firm or industry in ways that explicitly adjust for differences in perceived non-diversifiable risk. The benchmarking approach advocated by the Professors simply takes the ROIC – COC, as calculated by the STB (or adjusted in reasonable ways for all), and then places the railroad performance into context.

There are also no valid policy reasons to prevent the Board from moving forward with an NPRM in this proceeding. Claims by Shipper Commenters that the Board should decline to more accurately measure revenue adequacy because railroads are earning excessive profits and enjoy monopolistic power are baseless. It makes no sense for the U.S. freight industry to be the "largest, safest, and most

¹⁵¹ See *Murphy & Zmijewski V.S.* ¶ 56.

¹⁵² *Omaha Public Power Dist.*, 3 I.C.C.2d at 147.

cost-efficient freight system in the world”¹⁵³ and yet also have monopoly problems.

Indeed, as various experts have explained to the Board, the data does not support

Shipper Commenters’ claims:

- “[T]he return[s] ... achieved by railroads is definitively low compared to all relevant benchmarks”¹⁵⁴;
- “[C]laims ... that railroads are earning outsized returns ... are inaccurate”¹⁵⁵;
- The claim that “freight firms are permitted ‘to charge near-monopoly prices to captive shippers’ ... is patently false”¹⁵⁶;
- “Studies of pricing and costs in the U.S. rail freight industry ... provide no evidence that the improved financial health of the industry is the result of an increase in the exercise of market power”;¹⁵⁷
- “[I]ncreased profitability in recent years [in the freight rail industry] ... reflects increased, not reduced, competition and benefits for shippers, contrary to what some shippers may contend.”¹⁵⁸

While the number of Class I railroads has declined over the years, the vast majority of freight rail traffic remains subject to vigorous competition—from head-to-head rail competition to truck, barge, intermodal, and product and geographic competition.¹⁵⁹ The procompetitive nature of railroad returns are supported by data

¹⁵³ *The Freight Rail Network*, U.S. DEPT OF TRANSP., FED. R.R. ADMIN., <https://railroads.dot.gov/rail-network-development/freight-rail-overview> (last visited Aug. 16, 2021).

¹⁵⁴ Brinner EP 722 Sept. 5, 2014 V.S. at 6 (emphasis in original omitted).

¹⁵⁵ Willner EP 722 Sept. 5, 2014 V.S. at 2.

¹⁵⁶ Willig EP 722 Nov. 4, 2014 V.S. at 3 (citation omitted).

¹⁵⁷ Kalt EP 722 Sept. 5, 2014 V.S. at 34.

¹⁵⁸ Murphy EP 722 Sept. 5, 2014 V.S. at 7.

¹⁵⁹ See Kalt EP 722 Sept. 5, 2014 V.S. at 6 (“Board policy has consistently recognized that rail service is subject to very potent competition in numerous markets, as railroads do confront other railroads and other modes of freight

and multiple expert verified statements, which explain that Class I railroad returns are normal for competitive markets and restrained by the natural competitive pressures of the marketplace.¹⁶⁰ And even if a railroad has market power over a customer, the Board's existing tools for regulating rates are effective at protecting shippers (despite purely anecdotal claims to the contrary).¹⁶¹ Indeed, if the STB were to look at the relevant data, it would see important facts that directly undermine the Shipper Commenters' narratives about railroads earning excessive profits or engaging in abuses of market power.

Finally, Shipper Commenters assert that if the Board accurately measures revenue adequacy based on an economic ROIC - COC, railroads will be "allowed to

transportation across wide swaths of their systems. These rivals, as well as the flexibility of many customers in their geographic sourcing and location decisions, bring the disciplining force of competition to bear on railroads."); *id.* at 26 ("any presumption that the railroad industry is a 'natural monopoly' capable of always generating above-competitive returns is inapplicable to today's rail markets").

¹⁶⁰ See *supra* notes 1544–158; Murphy & Zmijewski V.S. ¶ 83 ("Our benchmarking analyses show that the financial performance of the railroad industry as a whole and each of the seven railroads was well below the financial performance of companies operating in competitive (unregulated) markets"); Kalt EP 722 Sept. 5, 2014 V.S. at 34 ("Studies of pricing and costs in the U.S. rail freight industry ... provide no evidence that the improved financial health of the industry is the result of an increase in the exercise of market power"); Willner EP 722 Sept. 5, 2014 V.S. at 12 ("the financial performance of [Class I] ... railroads does not reflect excessive returns").

¹⁶¹ See Sappington EP 722 Sept. 5, 2014 V.S. at 2 ("The Board's regulation presently provides strong protection to shippers that lack effective competition, and can reasonably be viewed as replicating the disciplining forces of competition"); Kalt EP 722 Nov. 4, 2014 V.S. at 27 (there is "no evidence to support the notion that the [Board's] current approach [to regulating freight rail rates] is failing"); Cornell EP 722 Sept. 5, 2014 V.S. at 8 ("... Simplified-SAC provides an effective tool to protect shippers that may lack effective transportation alternatives").

earn” more money from “their differential pricing of captive traffic.”¹⁶² This claim, too, is baseless. The vast majority of freight rail traffic is unregulated.¹⁶³ In other words, railroads make their profits from winning highly competitive traffic, not from abusing market power over a handful of captive shippers. Indeed, the data shows that railroads are financially outperformed by the same shipper groups clamoring for the Board to authorize wealth transfers from the railroads to shippers without having to prove a rate is actually anticompetitive.¹⁶⁴

Ultimately, the Board’s decisions must be data-driven because, as an agency tasked with a *deregulatory* mission, it is particularly vulnerable to the classic problem of “regulation of a sitting duck,” explained by Dr. Joseph Kalt in Ex Parte 722: “[b]ecause of its extremely long life capital[,] the [freight rail] industry is a sitting duck for policies in which myopically self-interested parties gradually eat away at the system with destructive policies whose disastrous consequences do not show up for years or decades.”¹⁶⁵ It is precisely the “myopically self-interested” claims made by Shipper Commenters about excessive profitability and abuses of market power by railroads that will “eat away” at the Board’s world-class

¹⁶² Joint Shippers Comments at 3.

¹⁶³ See *Western Coal Traffic League—Pet. for Decl. Order*, STB Docket No. FD 35506 (STB served July 25, 2013), slip op. at 16 (“The 4R Act largely deregulated railroad rates ... [and] [i]n ICCTA, Congress continued the national policy allowing competition and the demand for service to set rates to the maximum extent possible”).

¹⁶⁴ See *supra* Figure 1; Murphy & Zmijewski V.S. at Tables 3 and 6.

¹⁶⁵ Hearing Transcript, *Railroad Revenue Adequacy*, STB Docket No. EP 722 (July 22, 2015), at 113:20–114:4.

regulatory policies. Indeed, Shipper Commenters are the “[i]ndividual users of the network [who] can privately benefit from uneconomic and distortive rate policies without, themselves, bearing the costs in the short- or long-run.”¹⁶⁶ Thus, the Board should stay alert and reject baseless narratives about the freight industry becoming more monopolistic and instead “focus[] on sustaining adequate revenues for carriers.”¹⁶⁷

CONCLUSION

Joint Carriers’ proposed benchmarking approach is the only option on record that satisfies § 10704(a)(2). Rather than propose any refinements or alternatives to the benchmarking approach, Shipper Commenters simply opposed any attempt to place railroad financial performance into helpful context. Shipper Commenters offer no plausible explanation as to how the Board’s current methodology measures “a reasonable and economic profit or return (or both).” 49 U.S.C. § 10704(a)(2). Because the Board’s dated methodology fails to measure an *economic* ROIC - COC or capture a reasonable and economic profit, the Board, carriers, and rail customers

¹⁶⁶ Comments of the Association of American Railroads, *Railroad Revenue Adequacy*, STB Docket No. EP 722 (filed Nov. 26, 2019), Verified Statement of Joseph P. Kalt (“Kalt EP 722 Nov. 26, 2019 V.S.”) ¶ 12.

¹⁶⁷ Kalt EP 722 Nov. 26, 2019 V.S. ¶ 12; *see* Willner EP 722 Sept. 5, 2014 V.S. at 2 (“Based on my analysis, the [STB] should actually be more concerned that the returns on investment earned by [Class I] railroads are low when compared to returns earned by comparable companies. These low returns impact the railroads’ ability to attract capital from the capital markets, thus potentially limiting their ability to continue investing in innovation and growth.”).

would all benefit from the use of modern tools and best practices to better monitor the financial health of the railroad industry.

Respectfully submitted,

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August 16, 2021

EXHIBIT 1

**Reply Verified Statement of
Professor Kevin M. Murphy and
Professor Mark E. Zmijewski**

**BEFORE THE
SURFACE TRANSPORTATION BOARD**

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

**REPLY VERIFIED STATEMENT OF
PROFESSOR KEVIN M. MURPHY AND
PROFESSOR MARK E. ZMIJEWSKI**

AUGUST 16, 2021

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I. INTRODUCTION AND SUMMARY

1. On September 1, 2020, we submitted a verified statement (“M&Z Verified Statement”) in connection with the Joint Petition for Rulemaking to Modernize Annual Revenue Adequacy Determinations (“Joint Petition”) filed by Canadian National, Norfolk Southern, and Union Pacific (collectively, “Joint Petitioners”)¹ before the Surface Transportation Board (“Board” or “STB”).² Subsequently, we submitted two additional verified statements (collectively, “M&Z Supplemental Verified Statements”) to supplement our original statement and respond to comments from shippers on our original submission.³ (We refer to our Verified Statements collectively as the “M&Z Verified Statements.”)

2. On December 30, 2020, the Board opened a rulemaking proceeding to consider the Joint Petition, seeking “public comment on the petition and several specific related issues.”⁴ On May

¹ Joint Petition for Rulemaking to Modernize Annual Revenue Adequacy Determinations, Ex Parte No. 766 (filed Sept. 1, 2020).

² Verified Statement of Professor Kevin M. Murphy and Professor Mark E. Zmijewski, Ex Parte No. 766 (filed Sept. 1, 2020 and updated February 8, 2021). See that submission for more detailed discussion of the credentials of Professors Murphy and Zmijewski. Professor Murphy is the George J. Stigler Distinguished Service Professor of Economics in the Booth School of Business and the Department of Economics at The University of Chicago, where he has taught since 1983. Professor Mark E. Zmijewski is Professor Emeritus at The University of Chicago Booth School of Business and previously held the Charles T. Horngren Professorship and the Leon Carroll Marshall Professorship in his 30-year career at Chicago Booth; he specializes in the areas of accounting, economics, and finance as they relate to valuation, financial analysis, and security analysis, more generally, financial economics.

³ On October 13, 2020, we also submitted a Supplemental Verified Statement in Ex Parte 766 in which we responded to comments submitted by two groups in response to the initial Joint Petition. Supplemental Verified Statement of Professor Kevin M. Murphy and Professor Mark E. Zmijewski, Ex Parte No. 766 (filed Oct. 13, 2020). We subsequently made one additional related submissions to the Board on October 21, 2020 in which we updated our analysis using data from the Board’s 2019 Cost of Capital Decision and its 2019 Revenue Adequacy Determination (Railroad Cost of Capital—2019, Ex Parte No. 558 (Sub-No. 23), and Railroad Revenue Adequacy—2019 Determination, Ex Parte 552 (Sub-No. 24), respectively). Although the Board concluded that BNSF Railroad Company, CSX Transportation, Inc., Norfolk Southern Combined Railroad Subsidiaries, Soo Line Corporation, and Union Pacific Railroad Company were revenue adequate in 2019, we showed that the methodology we proposed in the Murphy & Zmijewski VS supported the conclusion that the financial performance of the railroad industry and each of the seven Class I Railroads in 2019 remained well below the median of the financial performance of the S&P 500 benchmarking group. All capitalized terms in the M&Z Verified Statement and Supplemental Verified Statements retain their meaning in this verified statement.

⁴ Surface Transportation Board Decision, Ex Parte 766, December 30, 2020.

17, 2021, interested parties filed comments in response to the Board’s request for public comments. One set of comments was submitted by Western Coal Traffic League and Seminole Electric Cooperative, Inc. (collectively, “WCTL Comments”), attaching a Verified Statement of James E. Hodder (“Hodder VS”) responding, in part, to our previous submissions to the Board.⁵ Another set of comments submitted by The American Chemistry Council, American Fuel & Petrochemical Manufacturers, The Chlorine Institute, Corn Refiners Association, The Fertilizer Institute, National Grain and Feed Association, and The National Industrial Transportation League (collectively, “Joint Shippers Comments”), attaching a Verified Statement of Bennett Stewart (“Stewart VS”), also responded to our previous submissions to the Board.⁶ We refer to the WCTL and Joint Shippers as “Shippers” and refer to Shippers’ submissions along with the Hodder and Stewart Verified Statements, collectively, as the “Shipper Submissions.”

3. Counsel for Joint Petitioners has asked us to review the Shipper Submissions and to respond to Shippers’ critiques of the analyses and opinions in the M&Z Verified Statements. As summarized below, the Shipper Submissions make the following unsupported and erroneous claims as we explain below:

- a. The Shipper Submissions incorrectly claim that our analysis and opinions rely on an invalid economic interpretation of the statutory requirements in 49 U.S.C. § 10704(a)(2) for measuring revenue adequacy.⁷ To the contrary, the M&Z

⁵ Opening Comments of the Western Coal Traffic League and Seminole Electric Cooperative, Inc., Ex Parte 766, May 17, 2021, including Attachment 2, Verified Statement of James E. Hodder dated May 13, 2021.

⁶ Opening Comments of Joint Shippers, Ex Parte 766, May 17, 2021, including Verified Statement of Bennett Stewart dated May 17, 2021.

⁷ For example, WCTL Comments, p. 9 (“‘[R]easonable economic profit or return’ is fairly read as referring to earning its cost of capital on its investments, in addition to covering its operating costs and expenses” (citing in footnote 7 a finding of the Railroad Accounting Principles Board that “[r]elying on embedded/GAAP costs and the current cost of capital provides a level of financial return sufficient to attract and retain capital”); Joint Shippers Comments, p. 33 (“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”); Stewart VS, Section II, (“THE

Verified Statements and this submission provide a proper economic interpretation of the statutory requirement that a railroad is not revenue adequate unless it has the ability to earn a “reasonable and economic profit or return” on capital invested in its railroad operations:

- i. The measurement of annual “economic profit” in the Shipper Submissions⁸ is inconsistent with economic principles and accepted economic literature.
 - ii. Claims in the Shipper Submissions that replacement cost is not an appropriate basis for evaluating the financial performance of the railroads is incorrect and inconsistent with basic economic principles and the definition of economic profit.⁹
 - iii. The Shipper Submissions conflate a railroad’s willingness to make incremental investments to maintain productivity of its existing assets with its willingness to invest to improve and expand its network.¹⁰
 - iv. The Shipper Submissions wrongly claim that we concluded that railroads must earn a premium over their cost of capital (“COC”) to attract capital.¹¹
- b. The Shipper Submissions acknowledge that accounting-based ROICs are not accurate measures of economic rates of return for non-railroads,¹² but then

STATUTORY DEFINITION OF REVENUE ADEQUACY IS CONSISTENT WITH MAINTAINING ROI = COC”).

⁸ For example, Stewart VS, p. 8 (“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” (citing in footnote 3 *A Dictionary of Economics* definition that “[a]n economic profit is the difference between the revenue a business has received from its outputs and the opportunity costs of its inputs”)); WCTL Comments, p. 9 (“[R]easonable economic profit or return’ is fairly read as referring to earning its cost of capital on its investments, in addition to covering its operating costs and expenses” (citing in footnote 7 a finding of the Railroad Accounting Principles Board that “[r]elying on embedded/GAAP costs and the current cost of capital provides a level of financial return sufficient to attract and retain capital.”)).

⁹ For example, Stewart VS, Section III (“REPLACEMENT COSTS ARE NEITHER NECESSARY NOR APPROPRIATE TO THE CALCULATION OF ROI”).

¹⁰ For example, Stewart VS, Section V.A, “Raising and Investing Capital Is a Sign of Financial Health;” WCTL Comments, Section C.5 (“THE RAILROADS HAVE HAD NO DIFFICULTY ATTRACTING CAPITAL FROM SOPHISTICATED INVESTORS”).

¹¹ For example, Hodder VS, pp. 4 – 5 (“The Railroad Proposal’s idea that firms need to earn a premium over their cost of capital in order to attract funds for capital investments is seriously misguided.”); Hodder VS, p. 37 (“I was also taken aback by the suggestion that a return premium (a substantial one in the Railroad Proposal) above a firm’s cost of capital was necessary to have access to adequate funding.”).

¹² For example, Stewart VS, p. 44 (“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”); Hodder VS, p. 36 (“It does demonstrate that the Board’s ROI estimation procedure doesn’t work well in many non-railroad situations.”).

assume, without support, that these inaccuracies do not apply to railroads,¹³ and they subsequently ignore these inaccuracies when they rely on the Board's accounting-based ROIC as a measure of *actual* economic return.¹⁴ In this Verified Statement, we present an example that illustrates the measurement errors (inaccuracies) that result when using an accounting-based ROIC to evaluate revenue adequacy and demonstrates why many of the claims in the Shipper Submissions are incorrect and unreliable, including:

- i. Their claim that “[a]s a purely mathematical matter” a company with an accounting-based ROIC equal to its cost of capital will be able to “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.”¹⁵
- ii. Their claim that “[t]he investment in, and returns due to, fully depreciated assets are fully realized in prior periods.”¹⁶
- iii. Their discussion of an increase in a company's market value as corroborative evidence that the company has earned an economic return on its invested capital equal to or greater than its cost of capital.¹⁷
- iv. Their discussion of a company making distributions to its shareholders as corroborative evidence that a company must be earning an economic return on its invested capital equal to or greater than its cost of capital.¹⁸

¹³ An exception is the Hodder VS, p. 37 (“Improving the Board's current procedures (WACC and ROI calculation approaches) to provide better estimates of a railroad's cost of capital and economic earnings rate may well be possible.”).

¹⁴ For example, Stewart VS Sections II-III present several examples calculated on the basis of accounting data.

¹⁵ Stewart VS, p. 6.

¹⁶ Stewart VS, p. 23.

¹⁷ For example, Stewart VS, Section V.B (“Stock Prices and Shareholder Returns Are Valid Supplemental Indicators of Revenue Adequacy”); WCTL Comments, p. 19 (“A firm that enjoys or is expected to enjoy a premium return over its cost of capital likely is to [sic] command a premium valuation in the marketplace”); Hodder VS, p. 5 (“If it appears the firm will earn more than (previously) expected, its stock price should increase *ceteris paribus* (other things unchanged) until the return on its now larger market value matches its cost of capital. That gain in market value benefits shareholders, and perhaps employees with incentive compensation tied to the firm's share price or a related proxy for market value. It is in no sense necessary for a firm to attract and retain adequate capital.” (reference omitted)).

¹⁸ For example, Stewart VS, Section V.C (“Cash Distributions Are a Reliable Indicator Once Put in Context”); WCTL Comments, p. 11 (footnote 8) (“The Class I railroads have not issued new equity in decades, and most have instead been engaged in buying back substantial portions of their own shares, in addition to paying dividends” offering this observations as support for their claim that railroads have not had difficulty “retaining the capital reasonably needed for [their] operations”).

- v. Their claim that a railroad that can raise capital for an incremental investment must be earning an economic return on its invested capital equal to or greater than its cost of capital.¹⁹
- c. The Shipper Submissions' critiques of the need for and selection of benchmarking groups are incorrect because:
 - i. Given widely-known inaccuracies and limitations of accounting-based ROIC as an estimate of economic rates of return, the claims in the Shipper Submissions that using our proposed benchmarking methodology is unnecessary or inferior to analyzing the railroads' ROIC – COC in isolation is unjustified.²⁰
 - ii. The claims in the Shipper Submissions that our proposed benchmarking methodology is uninformative because no other companies are comparable to the railroads are unfounded and contrary to widely-accepted and standard ways that investors evaluate companies' financial performance.²¹ The Shipper Submissions ignore widely-known inaccuracies and limitations of using accounting-based ROIC to estimate economic rates of return and thus wrongly conclude that evaluating the railroads in isolation is more informative than using the benchmarking methodology.

¹⁹ For example, Stewart VS, Section V.A, ("Raising and Investing Capital Is a Sign of Financial Health"); WCTL Comments, p. 11 ("A firm that is able to earn its cost of capital on a long-term basis should have no difficulties attracting or, in the railroads' case, retaining the capital reasonably needed for its operations").

²⁰ For example, Stewart VS, Section 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"); Hodder VS, p. 38 ("One of the Board's questions asks about using a premium based on the median estimate of ROI - WACC as opposed to another percentile for the comparison set of S&P 500 firms. As indicated in Section II above, the relevant benchmark is the firm's own cost of capital (estimated by the Board using a WACC). A firm's cost of capital is determined by that firm's characteristics and the characteristics of financial markets generally (a much broader universe than the S&P 500). In the Railroad Proposal, the ROI estimates for the non-railroads contain so many implausible values that the accuracy of whatever percentile is dubious; and those estimates should be discarded.") and p. 36 ("I have identified several reasons why the Board's approach for estimating a railroad's ROI does not fit many non-railroad firms.").

²¹ For example, Stewart VS, pp. 4-5 ("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") and Section 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"); Hodder VS, p. 36 ("I have identified several reasons why the Board's approach for estimating a railroad's ROI does not fit many non-railroad firms.").

- iii. The assertion in the Shipper Submissions²² that the existence of outliers in the distribution of ROICs of the S&P 500 comparison invalidates the proposed benchmarking methodology is incorrect because using the median (instead of the average) or another percentile in the distribution mitigates the effects of outliers.
- iv. The claims in the Shipper Submissions that accounting-based ROICs are plausible for some S&P 500 companies, including the railroads, but implausible for others²³ do not change our conclusions that it is improper to ignore the harm to railroads and shippers from using accounting-based ROICs that might seem “plausible” but are inaccurate when evaluating revenue adequacy and making regulatory decisions.

4. In addition, we were asked to respond to the Shippers’ claims and the Board’s questions regarding (a) whether the changing composition of the S&P 500 Index over time (“S&P 500 Changing Composition”) affects conclusions from the benchmarking methodology;²⁴ (b) if the utility method is required by generally accepted accounting principles (“GAAP”);²⁵ and (c) the

²² For example, Hodder VS, p. 36 (“I have shown how a poor fit [of the Board’s approach for estimating railroad ROIs for many non-railroad firms] can result in calculating an incredibly high and implausible ROI value. Poor fit can also cause more moderate ROI values to be substantially different from they would be with procedures more appropriate to that firm.”).

²³ For example, Hodder VS, p. 36 (“the Board’s ROI estimation procedure doesn’t work well in many non-railroad situations. That is not surprising and could have been illustrated with a couple examples. In any case, that exercise does not address accuracy of the Board’s ROI calculation procedure for a railroad or whether/how it could be improved.”).

²⁴ Stewart VS, Section IV.A, “The S&P 500 Is a Culled Group of the Most Profitable and Valuable Companies;” WCTL Comments, Section E, “THE CHANGING COMPOSITION OF THE S&P 500 EMPHASIZES THE FLAWS IN THE COMPARISON PROPOSAL” “See also Surface Transportation Board Decision, Ex Parte 766, December 30, 2020. p. 4 (“A company is typically removed from the S&P 500 index if its market capitalization falls below a certain threshold. Does the changing constituency of the index pose a problem with respect to the Joint Carriers’ proposed methodology?”).

²⁵ WCTL Comments, Section F, “THE BOARD’S CURRENT TREATMENT OF DEFERRED TAXES FOR REVENUE ADEQUACY PURPOSES REMAINS VALID;” Hodder VS, pp. 34-35. See also Surface Transportation Board Decision, Ex Parte 766, December 30, 2020. p. 5 (“Does the ICC’s reasoning for adopting the utility method remain valid, specifically with respect to analogizing captive shippers to utility customers, determining whether the utility method continues to conform with GAAP today, and finding that the utility method led to a more accurate representation of railroad profitability?”).

appropriate treatment of deferred income taxes when calculating accounting-based ROIC for measuring revenue adequacy.²⁶ Based on our analyses, we have concluded the following:

- a. The S&P 500 Changing Composition does not affect the opinions we presented in the M&Z Verified Statement and the M&Z Supplemental Verified Statements.
- b. GAAP does not cover how to measure ROIC. The utility method is not required by GAAP and the measure of invested capital (denominator) used in the utility method is not a GAAP measure of invested capital.
- c. We believe that the most appropriate treatment of deferred income taxes in the calculation of the Board's accounting-based ROIC is to extract the effects of deferred income taxes in the provision for income taxes (income tax expense) in the numerator (earnings) and not adjust for net deferred income tax liabilities in the denominator (invested capital).²⁷

5. Based on our previous submissions, our review of and consideration of the Shipper Submissions, and the new analysis that we present in this submission, we reaffirm our original opinion that the current method by which the Board makes its annual revenue adequacy determination is uninformative and potentially harmful to both railroads and shippers compared with the benchmarking methodology we propose because:

- a. Railroads were deregulated so that they could operate (without public funding) as private firms responsible for purchasing, operating, and maintaining the infrastructure and equipment needed to serve their customers well. To do so, they must compete for necessary capital with the vast number of other firms, not just in the United States but worldwide.²⁸

²⁶ WCTL Comments, Section F, "THE BOARD'S CURRENT TREATMENT OF DEFERRED TAXES FOR REVENUE ADEQUACY PURPOSES REMAINS VALID;" Hodder VS, pp. 34-35. See also Surface Transportation Board Decision, Ex Parte 766, December 30, 2020, p. 5 ("Does the ICC's reasoning for adopting the utility method remain valid, specifically with respect to analogizing captive shippers to utility customers, determining whether the utility method continues to conform with GAAP today, and finding that the utility method led to a more accurate representation of railroad profitability?").

²⁷ This approach is essentially equivalent to the "flow through" method that was explored by the Interstate Commerce Commission ("ICC") in the 1980s (Standard For Revenue Adequacy, Ex Parte 393, December 16, 1986, p. 269).

²⁸ M&Z Verified Statement, ¶11. We note that the Shipper Submissions agree with M&Z Verified Statement. See, for example, Stewart VS, Section IV.A.1 ("Railroads Must Compete for Capital Against All Firms"); Hodder VS p. 6 ("The set of alternative potential investments is global and vast.").

- b. Regulation of railroad rates will be misguided if it is based on a misleading measurement of railroads' rate of return and a misinterpretation of what that measurement implies about a railroad's competitiveness. Such ill-informed regulation could lead to the classic problems of rate of return regulation and endanger the industry's success.²⁹
- c. Well-established economic principles and decades of economic research have shown that limitations and inaccuracies of accounting-based ROIC make it difficult, possibly impossible, to infer economic rates of return from accounting-based ROIC.³⁰
- d. Even if a railroad's historical (backward-looking) economic earnings were greater than its cost of capital over some finite time period, that does not mean that the railroad's prices should be regulated. Economic efficiency requires that railroads be able to aim for an economic rate of return greater than their cost of capital. Operational and investment decisions—e.g., lowering operating costs, investing in high-return projects, developing new services valued by shippers, changing management—can enable a railroad to earn a rate of return that exceeds its cost of capital for extended periods of time, an outcome that benefits its customers and should be encouraged by the Board.³¹
- e. An assessment of whether a railroad is earning an economic return greater than its cost of capital based on a comparison of accounting-based ROIC to the cost of capital ("COC") cannot be informative without using the widely-accepted and standard benchmarking methodology to compare the railroads' financial performance to the financial performance of companies operating in competitive (unregulated) markets.³²
- f. The S&P 500 (exclusive of any railroad companies, financial institutions, and real estate companies) provides an informative benchmark for evaluating whether revenue adequacy measures using accounting data indicate that railroads are

²⁹ M&Z Verified Statement, ¶11.

³⁰ M&Z Verified Statement, ¶48. We note that the Shipper Submissions do not disagree with the need for the Board to have an accurate measure of the railroads' true economic earnings to assess the financial performance of the railroads (Hodder VS, p. 37 ("The key issues in assessing revenue adequacy for a railroad are accurately estimating the railroad's cost of capital and its economic earnings rate. Improving the Board's current procedures (WACC and ROI calculation approaches) to provide better estimates of a railroad's cost of capital and economic earnings rate may well be possible"))).

³¹ M&Z Verified Statement, ¶11 and Section II.C. We note that the Shipper Submissions agree (Stewart VS, p. 13 ("Finally, judging that revenues are adequate if ROI = COC is not the same as mandating that railroad returns be regulated. Railroads could earn ROI > COC if that is the result of innovation and productivity gains, ..."))).

³² M&Z Verified Statement, ¶11 and ¶52.

unusually profitable. Using this methodology, we show that, in each year from 2006 through 2019, the financial performance (ROIC minus COC) of each of the seven Class I Railroads and the railroad industry as a whole was well below the median, and closer to the 25th percentile, financial performance of the S&P 500 benchmarking groups.³³

6. In conclusion, the well-known and undisputed measurement errors in the accounting-based measures of financial performance used by the Board to assess revenue adequacy can result in unnecessary and potentially harmful regulatory actions.³⁴ Thus, we recommend that the Board uses the standard benchmarking methodology we proposed in the M&Z Verified Statements, which continues to rely on accounting-based ROIC but recognizes that companies often earn an accounting-based ROIC that exceeds their cost of capital. We believe this approach is both more informative about the economic performance of the railroads and practicable to implement because both ROIC and the cost of capital are relatively easy to calculate using data available from public sources. The S&P 500 companies are a natural benchmarking (comparison) group given that railroads compete for capital with these companies. As our research demonstrated, determining the railroads' positions (e.g., their percentile in the distribution of this comparison group) and changes in the railroads' positions in the distribution of S&P 500 companies over a reasonably long period is practicable and will provide railroads and shippers with reliable guidance for making future investment and operating decisions.

³³ Our conclusions were unchanged regardless of which accounting rate of return measure we used (the STB ROIC minus COC or our proposed Adjusted ROIC minus COC), and regardless of which benchmarking group we used (S&P 500 companies excluding financial institutions and real estate companies, S&P 500 companies including financial institutions and real estate companies, or S&P 500 Industrial companies). See M&Z Verified Statement, including footnote 59.

³⁴ For example, using an absolute numeric benchmark (such as a rate of return no more than x percentage points above the cost of capital) that does not vary with the overall economy penalizes railroads when their rate of return improves due to macroeconomic or other improvements in market-wide returns. It could also harm railroads and shippers by reducing railroads' incentives to increase efficiency, because increasing efficiency would, in turn, improve the railroads' financial performance and subject them to potentially harmful regulatory actions.

7. Shipper Submissions challenge both the general usefulness of the benchmarking approach and the benchmark groups offered in our prior statements. We disagree. Congress charged the Board with the challenging task of monitoring the financial health of the freight rail industry. We understand that, to fulfill its responsibility, the Board must estimate economic returns (not accounting returns), and then assess whether the estimated economic return is reasonable. Benchmarking is a widely-accepted tool of economic and financial analysis that, if employed, would allow the Board to use accounting measures of returns while also putting the railroads' financial performance into the necessary context for evaluating "adequacy." In contrast, the Shipper Submissions offer the Board no way to address the clear measurement errors and noise in its current annual assessments.

8. We reiterate our conclusion in the M&Z Verified Statement that, regardless of the "bright line" benchmark of S&P 500 companies selected by the Board for its revenue adequacy inquiry, the Board should not mechanically conclude that railroad returns above the Board's chosen "bright line" benchmark indicate a market or regulatory failure.³⁵ The railroad industry could be outperforming its peers for entirely procompetitive reasons. If the railroad industry's ROIC exceeds the threshold percentile of the benchmarking group that the Board selects for its annual revenue adequacy determination, the Board should not take any regulatory actions before investigating whether the railroads are above the threshold within the benchmarking group for procompetitive reasons – greater efficiency, benefits from risky investments, increases in demand that exceeded expectations etc. If, after such investigation, the Board can rule out such procompetitive reasons and concludes that there might be a lack of competition in serving some shippers or some geographic areas, the Board should look to use its existing tools more

³⁵ M&Z Verified Statement, ¶84.

effectively and perhaps to make it easier for shippers to challenge specific rates where there may be noncompetitive pricing.³⁶

9. The remainder of this submission is organized as follows. In Section II, we explain that the Shipper Submissions' claims that our analyses are not relevant to the statutory requirements of 49 U.S.C. § 10704(a)(2) are based on a mischaracterization of the analyses and opinions we offered in the M&Z Verified Statement. In Section III, we explain why the examples in the Shipper Submissions do not support the opinions in those submissions or refute our opinions. In Section IV, we explain why the Shipper Submissions wrongly critique our proposal to use the S&P 500 companies as a benchmark group for evaluating railroads' financial performance. Lastly, in Sections V and VI, we respond to the Shippers' claims and the Board's questions regarding the changing composition of the S&P 500 (Section V) and the "utility method" and treatment of deferred income taxes for calculating accounting-based ROIC for measuring revenue adequacy (Section VI).

II. THE SHIPPER SUBMISSIONS' CLAIM THAT OUR ANALYSES AND OPINIONS ARE NOT RELEVANT TO THE BOARD'S STATUTORY DUTY MISCHARACTERIZES THE ANALYSES AND OPINIONS IN THE M&Z VERIFIED STATEMENTS

10. The Shipper Submissions incorrectly claim that our conclusions, including the supporting economic and empirical analyses, of the Board's current revenue adequacy methodology are inconsistent with an economic interpretation of the statutory requirements to which the Board must adhere.³⁷ The M&Z Verified Statement and this submission provide a proper economic

³⁶ M&Z Verified Statement, ¶84.

³⁷ For example, the *Opening Comments of Joint Shippers* (p. 4) claim that "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

interpretation of the Board's statutory requirement that, among other metrics, a finding of revenue adequacy requires that a railroad has the ability to earn a "reasonable and economic profit or return" on capital invested in its railroad operations.³⁸ We understand that "reasonable and economic profit or return" is not defined with specificity in statute or precedent, and thus that the Board is seeking comments on the proper interpretation of and potential revision to its historical approach to making this annual determination.

11. In this section, we explain that the Shipper Submissions (a) do not use an appropriate measurement of "economic profit," (b) wrongly conclude that replacement cost should not be used to measure accounting-based ROIC, (c) ignore that a railroad's willingness to invest to assure productivity of its existing assets does not mean it will invest to improve and expand its network, (d) ignore evidence that replacement costs of railroads' assets far exceed those assets' book values, and (e) wrongly claim that our previous submissions opined that the railroads' expected economic return should exceed their cost of capital.

A. The Shipper Submissions Do Not Use an Economic Definition of "Economic Profit"

12. As a matter of economics, "reasonable economic profit" is not the same as zero accounting profit. The current Board methodology is purely accounting based – it uses accounting data and accounting methodology to calculate a rate of return, then subtracts a formulaic "cost of capital" from that rate of return, and finds a value of zero or more to be "revenue adequate." In contrast, "economic profit" reflects expected return on incremental

transportation system" (reference omitted). However, we explained why proper economic interpretation of these statutory requirements requires use of our proposed benchmarking methodology.

³⁸ M&Z Verified Statement, Section II.

investment. For example, as explained by Dennis Carlton and Jeffrey Perloff in their widely used textbook:

economic profit . . . is revenue minus opportunity cost, not accounting profit (which is measured by accountants, using standard accounting principles) . . .

There are several important distinctions between economic and accounting profits. The main distinction concerns long-lived capital assets, like plant and equipment. Economic profit equals revenue minus labor, material, and an appropriate measure of capital cost. Measuring revenue, labor cost, and material cost is generally easy. The problem is measuring annual capital cost, which equals annual rental fees if all the capital assets were rented. The total rental fees equal the rental rate per unit times the number of units of capital. That is, the appropriate cost measure of capital is a flow (the price of renting capital per time period) and not a stock (the cost of capital, such as a machine, which lasts for many periods). If well-developed rental markets exist—for example, for used equipment—it is easy to calculate the relevant rental rate on capital and economic profits. When rental rates are not readily available, the economist must implicitly calculate a rental rate before calculating economic profit.

In the calculation of the implicit rental rate of capital used to determine long-run economic profits, *capital assets should be valued at replacement cost*, which is the long-run cost of buying a comparable-quality asset. *If capital is valued at its replacement cost, then a low rate of return is a signal that no new capital should enter the industry.* It does not mean that the firm should shut down or that it made an error in its past investment decisions. For example, a firm that bought machinery when it was cheap could earn a low rate of return based on the replacement cost and still have enjoyed a huge profit on its initial purchase. A high rate of return is a signal that new capital should enter the industry.³⁹

13. This economic treatise identifies two important and related features of economic profits that are not reflected in accounting profits: (1) economic profits reflect revenue net of

³⁹ Carlton and Perloff at 271 (emphasis added).

opportunity cost,⁴⁰ and (2) capital assets must be evaluated at replacement cost, not book value. Otherwise, capital will flow into other industries.

14. The Shipper Submissions do not adopt the proper definition of economic profit. Indeed, the Stewart VS asserts that book value is *better* for purposes of calculating ROI and determining revenue adequacy than is replacement cost.⁴¹ As we have explained, and as we further explain below, Mr. Stewart's opinion is inconsistent with finance and economics, counter to the principles the Board applies in evaluating some rate reasonableness complaints, and would result in underinvestment in railroads to the detriment of shippers.

B. Economic Profit on Replacement Cost Is the Relevant Economic Measure

15. We explained in a previous submission to the Board that

[t]he concept of evaluating the long-run financial health of railroad assets based on the cost to replace the assets that it is efficient to replace is embodied in the stand-alone cost ("SAC") methodology that the Board uses to evaluate shippers' rate complaints. For the same reason that the current value of a railroad's assets is used to determine whether the hypothetical stand-alone railroad would earn enough to cover its cost of capital and earn a competitive return, the current value of the railroad's assets and the investments necessary to replace and expand those assets should factor into the Board's determination of whether the railroad as a whole can attract capital need to assure its long-run financial health.⁴²

The Board uses the current value of a railroad's assets in the SAC test even if the incumbent railroad's assets were acquired long ago and fully depreciated and have book value far below replacement value. This is because the Board recognizes that rates charged by an incumbent are

⁴⁰ The Stewart VS, p. 11 agrees with this concept: "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, ...".

⁴¹ For example, Stewart VS, p. 3 ("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.").

⁴² Verified Statement of Professor Kevin M. Murphy, September 5, 2014, in Railroad Revenue Adequacy Docket No. EP 722 at 23 (internal citation omitted).

competitive if they are reasonable based on what it would cost a hypothetical standalone railroad to offer the same service and earn a competitive return today, not on whether those rates allow an existing railroad to recover its historical costs.

16. The claim in the Stewart VS that “replacement costs are not required to attract new investment” ignores how regulation affects a firm’s ability to recover its expected investment costs as illustrated with the following example:⁴³

- a. In period $T = 0$, an investor buys a factory for \$100 that produces 10 units of output per period. Based on alternative uses of capital, the investor requires an economic return of 10%. If all prices are expected to stay constant, then the competitive output price is \$1, and the firm earns \$10, which is a normal return.
- b. In period $T=1$, the replacement cost of the factory (and price to build an additional factory with the same capacity of 10 units of output per period) rises to \$110. Demand doubles, so there is need for the additional factory. The competitive price for all output is now \$11, which is the price required to induce the *additional* investment. At that competitive price, the firm will make the required investment since $\$11 = \$1.10 \times 10 = 10\% \times \110 . Thus, again the investor earns a 10 percent rate of return on the required investment. In this case, \$1.10 is the competitive market price (which will be the same for all units under competition) and is the price necessary to obtain supply of the additional 10 units of output demanded by the market (i.e., the price needed to cover the incremental or marginal cost of the required additional capacity).
- c. Now assume that a regulator sets a price of \$1.00 per unit based on historical cost ($\$1.00 = \$100 \times 10\% / 10$), rather than allowing price to rise to the competitive level of \$1.10. The expected return on the additional \$110 investment is now \$100, and the firm will not invest.
- d. Even if the regulator sets a price of \$1.05 based on the average of the initial \$100 cost and the required \$110 additional cost to expand capacity ($(\$100 + \$110) \times 10\% / 20 = \1.05), the firm will not invest because $\$10.50 < 10\% \times \110 . New investment decisions are forward, not backward, looking and the cost of prior investments has no economic relevance to current and future investment decisions, contrary to Mr. Stewart’s claim.

⁴³ Stewart VS, p. 3.

- e. Only the competitive price of \$1.10 (or higher) will induce the firm to make the required investment. Firms make investment decisions based on the expected output price and replacement costs. In a competitive market where firms are actively investing in capacity, the market price must be sufficiently high to generate a competitive return on replacement costs since replacement cost is relevant for creating the incremental capacity demanded by the marketplace.
- f. Mr. Stewart's claim that "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"⁴⁴ is equally flawed. In the example above, the investor has no incentive to replace its fully productive initial factory (which it built for \$100) with a new factory at a cost of \$110; it makes greater profit by earning \$11 using its initial asset than it would if it incurred an additional \$110 cost to needlessly replace its existing (and productive) asset.

17. Thus, needed new investments will be made only if the expected return *on those investments* exceeds the cost of capital, contrary to the claim of the Stewart VS.

C. The Burlington Northern Santa Fe Corporation Acquisition Provides Evidence That Replacement Cost Far Exceeds Book Values

18. In this section, we discuss book values and replacement cost in the context of the Burlington Northern Santa Fe Corporation ("BNSF") acquisition by Berkshire Hathaway in 2010. Empirical evidence shows that the book value of railroad assets can be far below the assets' replacement costs, thus causing a railroad's ROIC to be far higher than its economic profitability.

19. On February 12, 2010, BNSF was acquired by Berkshire at a total purchase price, including the portion of BNSF already owned by Berkshire, of \$34.5 billion.⁴⁵ In connection

⁴⁴ Stewart VS, p. 3.

⁴⁵ Burlington Northern Santa Fe, LLC Form 10-K for the fiscal year ended December 31, 2010 ("2010 BNSF 10-K"), p. 25.

with the acquisition, BNSF was required to revalue its balance sheet to reflect the fair value of assets and liabilities as of the acquisition date.⁴⁶

20. In Table 1 below, we summarize the value of BNSF assets (excluding cash) at their pre-transaction book values and after revaluation at fair value as of February 13, 2010.^{47, 48} As shown in this table, overall, the total book value of \$38.5 billion is far below (slightly more than half) the fair market value of \$65.7 billion.⁴⁹

Table 1: Summary of Value of BNSF ASSETS

<i>values in millions</i>	Book Value	Fair Value	Change	% Change
Current Assets	3,099	2,763	-336	-10.8%
Property and equipment	32,238	43,987	11,749	36.4%
Goodwill	0	14,803	14,803	n/a
Intangible assets	0	2,025	2,025	n/a
Other assets	3,125	2,095	-1,030	-33.0%
Total Assets	38,462	65,673	27,211	70.7%
Goodwill	0	-14,803		
Total Assets (excluding goodwill)	38,462	50,870	12,408	32.3%

Source: Burlington Northern Santa Fe, LLC Form 10-K for the fiscal year ended December 31, 2010, pp. 18, 19, 25.

21. The value of property and equipment increased from \$32.2 billion (book value) to \$44.0 billion (fair value), an increase of 36.4%. Thus, it is clear from the BNSF acquisition that

⁴⁶ 2010 BNSF 10-K, p. 25 (“The Merger was accounted for using the acquisition method under Accounting Standards Codification (ASC) Topic 805, Business Combinations. Under the acquisition method, the purchase price was allocated to the underlying tangible and intangible assets acquired and liabilities assumed based on their respective fair values, with the remainder allocated to goodwill. None of the goodwill recorded in connection with the Merger will be deductible for income tax purposes.”).

⁴⁷ The value of cash is the same before and after the revaluation.

⁴⁸ While BNSF provided a revalued balance sheet as of February 13, 2010 (2010 BNSF 10-K, p. 25), its last pre-revaluation balance sheet is dated December 31, 2009. In order to create a pre-revaluation balance sheet as of February 13, 2010, we adjust the December 31, 2009 balance sheet using the data in the statement of cash flows for the period of January 1, 2010 through February 12, 2010, which is calculated on a pre-revision basis (see 2010 BNSF 10-K, pp. 18-19). We assume all changes to deferred taxes are non-current.

⁴⁹ Total assets excluding goodwill increased from \$38.5 billion to \$50.9 billion (32.3%).

replacement cost of the railroads assets far exceeds their book values, and the Board's current methodology for measuring revenue adequacy overstates railroad economic returns.

22. The difference between the replacement cost of the railroad assets and their book values has been addressed in prior submissions to the Board. For example, Dr. Robert Brinner ("Dr. Brinner") explained that "rail returns are further overstated, both in absolute terms and relative to other industries, by the convention of using historic cost accounting rather than current cost accounting for depreciation."⁵⁰ Dr. Brinner explained that the use of book value (which he refers to as the "historic-cost depreciation method") systematically overstates the rate of return of railroads compared to an alternative method that values capital at current prices (which he refers to as "the current-cost depreciation method").⁵¹ Dr. Brinner uses official Bureau of Economic Analysis ("BEA") data to compare the effect of using the historic-cost depreciation method and the current-cost depreciation method.⁵² Each year the BEA publishes data that compare the historic, depreciated book value of railroad assets with the current values.⁵³ Dr. Brinner states that "[w]hile the BEA data are therefore not directly comparable to the STB data, the BEA data allow me to show that the use of current cost valuation of assets has a very large impact on the

⁵⁰ Verified Statement of Roger Brinner, Ph.D., Opening Comments of the Association of American Railroads, *Railroad Revenue Adequacy*, STB Docket No. EP 722, filed September 5, 2004 ("Brinner VS"), Section 3.2.

⁵¹ Brinner VS, p. 20.

⁵² Brinner VS, p. 20.

⁵³ Reply Evidence of CSX Transportation, Inc. Narrative Sections III-E Through V (Vol. 3 of 4), *Consumers Energy Company v. CSX Transportation, Inc.*, STB Docket No. NOR 42142 (filed Mar. 7, 2016), at p. IV-21. It further explains, "BEA is one of the world's leading statistical agencies. Although it is a relatively small agency, BEA produces closely watched economic statistics that influence the decisions made by government officials, business people, households, and individuals. BEA's economic statistics, which provide a comprehensive, up-to-date picture of the U.S. economy, are key ingredients in critical decisions affecting monetary policy, tax and budget projections, and business investment plans. BEA produces economic accounts statistics that enable government and business decision-makers, researchers, and the American public to follow and understand the performance of the Nation's economy."

measurement of the rate of return and that the impact of using current costs is particularly large in an industry like the railroad industry with long-lived assets.”⁵⁴ He concludes that his “BEA-based calculations provide quantitative support for the argument that returns based on replacement costs of assets for firms generally, and for railroads in particular, are much lower than returns based on historic costs.”⁵⁵

23. The Reply Evidence of CSX Transportation, Inc. Narrative Sections III-E Through V, dated March 7, 2016 (“Reply Evidence of CSX III-E Through V”) similarly agrees with Dr. Brinner’s conclusion that the most effective way to transform “unreliable accounting values into current replacement costs” is to use data provided by the BEA.⁵⁶ The Reply Evidence of CSX III-E Through V concludes that, while the BEA data “will not be perfect...[it] may provide the Board a feasible, if not perfect, solution to assure that carriers can attract and retain capital by providing returns based on the real value of property.”⁵⁷

D. The Shipper Submissions Ignore That a Railroad’s Willingness to Invest to Assure Productivity of its Existing Assets Does Not Mean It Will Invest to Improve and Expand its Network

24. Railroads are network industries, which means that the productivity of each part of the network depends not only on investments in and maintenance of that part, but also on productivity of other interconnecting portions of the network. For example, many spurs feed into

⁵⁴ Brinner VS, p. 21.

⁵⁵ Brinner VS, p. 26. Dr. Brinner further states that, “While it may take some effort to implement rules based on current-cost due to difficulties of calculation, the Board risks damaging consequences if it imposes rate regulations based upon flawed historic-cost calculations that suggest a bloated rate of return for railroads exceeding the cost of capital.”

⁵⁶ Reply Evidence of CSX Transportation, Inc. Narrative Sections III-E Through V (Vol. 3 of 4), *Consumers Energy Company v. CSX Transportation, Inc.*, STB Docket No. NOR 42142 (filed Mar. 7, 2016), at p. IV-21.

⁵⁷ Reply Evidence of CSX Transportation, Inc. Narrative Sections III-E Through V (Vol. 3 of 4), *Consumers Energy Company v. CSX Transportation, Inc.*, STB Docket No. NOR 42142 (filed Mar. 7, 2016), at p. IV-22.

major multi-state trunk lines, with railcars connecting into longer trains at terminals and switching yards. Many railroad assets are shared by many different customers that ship a variety of different products in different types of railcars.

25. Given the large number of shared assets, railroads will invest to maintain their existing infrastructure if the profits lost but for such investments warrant doing so. For example, assume that maintaining efficient operation of a terminal that was built 20 years ago at a cost of \$100 requires an additional investment of \$150 and that, but for that investment, the railroad's profits would be reduced by \$1 on each of 200 units of output. Clearly, that investment is worth making to preserve the current level of profitability. However, if the same \$150 investment is required to expand capacity to serve an additional 100 units that would each provide \$1 in profit, then the railroad will not be willing to make the \$150 investment (its return would be only $\$1 \times 100 = \100). Thus, observing that the railroad will replace and upgrade current assets in order to maintain existing traffic or make its operations more efficient does not provide evidence that it would be willing to expand to serve new traffic. Measuring the required return on incremental traffic based on an original investment of \$100 (and capping price at \$1) will result in underinvestment by the railroad and failure to serve shippers willing to pay for the incremental investment if traffic was priced competitively.

E. Contrary to Claims in the Shipper Submissions, the M&Z Verified Statements Do Not Conclude That the Railroads' Expected Economic Return Should Exceed Their Cost of Capital

26. Contrary to the Shipper Submissions, we did not opine in the M&Z Verified Statements that the railroads' expected economic return should exceed their cost of capital. We distinguished the expected economic return that motivates investment decisions from the Board's assessment of the railroads' revenue adequacy, which provides a different measurement. We

explained that economic (future) return, not an accounting-based (historic) return, determines willingness to make new investments.⁵⁸ We explained how expected future returns determine investors' decisions about where to invest their capital and business executives' decisions about how to allocate their scarce resources—they look for opportunities that generate the greatest return on incremental investment, and not to the average return on all invested capital.⁵⁹ We also explained why the railroads must have the opportunity to aim for returns above their cost of capital, even over a period of many years, because a railroad cannot earn its cost of capital if it must endure periods when its economic return is below the competitive level, yet it is denied the prospect of earning a return above its cost of capital at other times.⁶⁰

27. The economic return earned by firms in a competitive market will differ from their cost of capital for several reasons. First, when market conditions turn out more favorably than expected, firms will tend to earn above their cost of capital, while poorer market conditions will often lead to the opposite. Second, when firms have comparative advantages (and disadvantages), average economic returns for firms that survive in the marketplace will tend to exceed their opportunity costs since the marginal market participants will, on average, earn their costs of capital while the infra-marginal firms (those with greater comparative advantage) earn economic returns above their opportunity cost. Since the industry will consist of a mix of marginal and infra-marginal firms, the average economic return for the industry as a whole will

⁵⁸ The M&Z Verified Statement summarizes the decades of economic research that showed that accounting-based ROIC, including those used by the Board, do not reliably measure the economic return, and that measurement error varies across companies based on a complex set of interrelated factors. In theory, one could develop an empirical model that eliminates the distortions in accounting-based ROIC as a measure of the economic return, but decades of economic research have not been able to develop either a theoretical or empirical model that captures the set of interrelated factors, some of which are not observable (e.g., market value of investments relative to the book value, expected cash flow patterns). See, M&Z Verified Statement, ¶¶44-49.

⁵⁹ M&Z Verified Statement, ¶¶22-23.

⁶⁰ M&Z Verified Statement, ¶33.

tend to exceed the average opportunity cost. Finally, most industries and firms have valuable assets that are not measured on their balance sheets (brand value, reputation, etc.), so measured returns will on average be above true economic returns because the asset base is understated from an economic perspective.

III. THE SHIPPER SUBMISSIONS OFFER EXAMPLES THAT DO NOT SUPPORT THEIR OPINIONS

28. The Shipper Submissions present flawed analyses in an attempt to rebut our evidence that accounting-based ROICs provide an inaccurate measure of economic returns. While the Shipper Submissions acknowledge that there can be inaccuracies in accounting-based ROICs,⁶¹ they then use various examples to try to justify continued reliance on the Board's current methodology by ignoring differences between accounting-based measures of earnings, invested capital, and ROICs and distorting and downplaying the harmful impact on railroads and customers if regulators rely on inaccurate accounting-based ROICs.⁶²

29. In this section, we provide a simple example which demonstrates how accounting-based ROICs can lead to the incorrect conclusion that a company's economic return exceeds its cost of capital, which then can lead to harmful regulatory actions.⁶³ In this example, as in the real world, accounting amortization does not equal economic amortization, thereby causing accounting earnings and accounting-based ROIC to differ from their respective economic

⁶¹ Hodder VS, p. 3 ("a large portion of the accounting return estimates over 2006-2019 introduced to support the Railroad Proposal are implausibly high.").

⁶² See, the examples in the Stewart VS in Section II and Sections III.B and III.C and the example in the Hodder VS in Section II.

⁶³ Our example assumes that one of the company's investments is amortized faster than the investment's economic amortization. However, this is only one situation in which accounting-based ROICs provide incorrect and unreliable conclusions regarding economic rates of return. The economic literature discussed in the M&Z Verified Statement describes many such situations (factors). (See, for example, M&Z Verified Statement, Section III).

counterparts. If regulators ignore this difference, they could act in ways that prevent the firm from earning a competitive return on its investments.

30. Assume that, at the end of Year 0, a company with a cost of capital of 10% makes two investments: \$600 in Investment A and \$400 in Investment B. Investment A has a one-year economic life, so the company must make the same \$600 investment annually. Investment B has an infinite economic life and constant productive capacity, and thus zero economic amortization.⁶⁴ The company requires both investments to operate and expects to make no investments, other than Investments A and B, in the future. Thus, the company's economic invested capital is equal to \$1,000 in perpetuity.⁶⁵ Assume that the company's economic earnings (and free cash flows) are expected to be constant (no growth) in the future (constant prices, zero inflation).⁶⁶

31. While annual economic amortization of Investment A is 100 percent and economic amortization of Investment B is zero, we assume that accounting amortization for both investments is immediate.⁶⁷ In other words, we assume that both investments are treated for accounting purposes as if they are annual expenses, not investments that can be productive beyond the year in which the investment is made. We use this example to present three scenarios

⁶⁴ We use the infinite life assumption for Investment B to simplify the calculations, but the same conclusions result from assuming a finite life. We assume zero income taxes or that the company will pay a fixed percentage of its economic earnings in income taxes regardless of the accounting rules used to measure accounting earnings.

⁶⁵ Depending on the scenario, the assumptions in this example imply a firm value to invested capital ratio above 1.0 but well below 2.0. The enterprise value to invested capital ratio for the four publicly traded railroads over the last ten years range from 1.5 to 3.9 (S&P Capital IQ).

⁶⁶ Because all prices are constant, initial invested capital minus economic amortization is equal to replacement cost in all years.

⁶⁷ Immediate accounting amortization for Investment B is essentially equivalent to not capitalizing the expenditure for Investment B but expensing it. Thus, this example assumes accounting amortization is faster than economic life. We use immediate accounting amortization and infinite economic life / no economic amortization to simplify the calculations. Other differences between accounting amortization and economic amortization also result in accounting-based ROIC inaccurately measuring the economic return.

that differ by subsequent events once the initial investments have been made: in Scenario 1, the expected economic return when the investment is made and in subsequent periods is equal to the cost of capital, 10%; in Scenario 2, the expected economic return when the investment is made is equal to the cost of capital, 10%, but immediately drops below the cost of capital to 7%; in Scenario 3, the expected economic return when the investment is made is equal to the cost of capital, 10%, but immediately drops below the cost of capital to 9%. We summarize these three scenarios in Table 2 below and provide a more detailed explanation and the underlying calculations in the Appendix.

Table 2: Summary of Three Scenarios

	Scenario 1 Economic Rate of Return Equals Cost of Capital	Scenario 2 Economic Rate of Return Is Less Than Cost of Capital	Scenario 3 Economic Rate of Return Is Less Than Cost of Capital
Panel A: Underlying Economics of the Investment (All Years):			
Cost of Capital (COC)	10.0%	10.0%	10.0%
Economic Rate of Return	10.0%	7.0%	9.0%
Economic Rate of Return - COC	0%	-3%	-1%
Economic Invested Capital	\$1,000	\$1,000	\$1,000
Value of Investment	\$1,000	\$700	\$900
Economic Earnings = Free Cash Flow	\$100	\$70	\$90
Will the Company Expand Its Operations?	YES	NO	NO
Will the Company Make Incremental Investments?	YES	YES	YES
Panel B: Accounting Amortization Faster Than Economic Amortization:			
Panel B-1: Year 1 (Accounting Amortization Greater Than Economic Amortization)			
Accounting Earnings	-\$300	-\$330	-\$310
Accounting Invested Capital	\$1,000	\$1,000	\$1,000
Accounting Rate of Return (ROIC)	-30.0%	-33.0%	-31.0%
ROIC - COC	-40.0%	-43.0%	-41.0%
Panel B-2: Years 2 Onward (Accounting Amortization Less Than or Equal to Economic Amortization)			
Accounting Earnings	\$100	\$70	\$90
Accounting Invested Capital	\$600	\$600	\$600
Accounting Rate of Return (ROIC)	16.7%	11.7%	15.0%
ROIC - COC	6.7%	1.7%	5.0%

Source: See Appendix.

32. Panel A in the above table summarizes the underlying economics for each of the three scenarios. In all three scenarios, the cost of capital is 10%, but the economic return is 10% only in Scenario 1. In Scenarios 2 and 3, the economic return is 7% and 9%, respectively – below the company’s cost of capital of 10%.⁶⁸ As a consequence, the company’s economic return minus its cost of capital is 0% in Scenario 1, but -3% and -1% in Scenarios 2 and 3, respectively.

33. The company’s economic earnings are equal to its economic return multiplied by economic invested capital, and free cash flow is equal to economic earnings: \$100 in Scenario 1 ($0.10 \times \$1,000$) and \$70 ($0.07 \times \$1,000$) and \$90 ($0.09 \times \$1,000$) in Scenarios 2 and 3, respectively. Because the economic return equals the cost of capital in Scenario 1, the value of

⁶⁸ Of course, the company would not make an investment if its expected economic return is less than its cost of capital. In Scenarios 2 and 3, we assume that the company made the investment expecting an economic return at least equal to its cost of capital but that, immediately after making the investment, the expected economic return decreased to the expected economic return in Scenarios 2 and 3.

the company equals the value of invested capital, \$1,000 (free cash flow divided by the cost of capital, $\$100/0.10$). However, in the other two scenarios, the economic return is less than the cost of capital and the company's value is less than its initial investment: \$700 ($\$70/0.10$) in Scenario 2 and \$900 ($\$90/0.10$) in Scenario 3. Thus, the company would not expand its operations in Scenarios 2 and 3 because expansion requires making both Investments A and B, which generate an economic return (7% in Scenario 2 and 9% in Scenario 3) less than the 10% cost of capital. However, because the company requires both investments to operate, it will continue to make the ongoing incremental investments in Investment A in Scenarios 2 and 3 to maintain its existing productive capacity even though the economic return on the company's investment capital (\$1,000) is less than the cost of capital.⁶⁹ Lastly, all three scenarios have positive free cash flows to distribute to investors.⁷⁰

34. Although Panel B shows that the company's economic return minus its cost of capital is not positive in any of the three scenarios because accounting amortization is faster than economic amortization, the company's accounting-based ROIC minus its cost of capital is positive once the accounting amortization catches up with the economic amortization. This provides the false impression that the company is earning more than its cost of capital. In Panel B, we summarize the company's accounting earnings, accounting invested capital, and

⁶⁹ If the company does not make the \$600 incremental investment in Investment A, the company's free cash flows fall to \$0; however, if the company's makes the \$600 incremental investment in Investment A, the company generates incremental cash flows of \$70 in Scenario 2 and \$90 in Scenario 3, which have an economic return greater than the 10% cost of capital.

⁷⁰ Free cash flows are the cash flows that the company generates after paying all expenses and after making all necessary investments to implement its business strategy, but without consideration of the taxes saved from any interest expense that arises from debt in its capital structure; thus, they are the cash flows that can be distributed to all of the company's investors after implementing its business strategy. See, for example, Robert W. Holthausen and Mark E. Zmijewski, *Corporate Valuation: Theory, Evidence and Practice*, Second Edition, Cambridge Business Publishers, 2020 ("Holthausen and Zmijewski"), Chapter 3.

accounting-based ROIC in the three scenarios.⁷¹ Panel B has two subpanels: in Panel B-1, accounting amortization exceeds economic amortization (Year 1 in this example), while in Panel B-2 accounting amortization catches up to economic amortization (Year 2 onward in this example). Free cash flows and the underlying value of the company are the same as in Panel A, since these are not affected by accounting amortization.⁷²

35. When accounting amortization is greater than economic amortization in Year 1 (Panel B-1), accounting earnings, accounting-based ROIC, and accounting-based ROIC – COC are lower than their economic counterparts in all three scenarios. In subsequent years (Panel B-2), even though accounting amortization equals economic amortization, accounting invested capital is lower than economic invested capital and thus accounting-based ROIC exceeds the economic return. In fact, in this example, accounting-based ROIC – COC is positive in all three scenarios after Year 1, even though the company is earning less than its cost of capital in Scenarios 2 and 3 and thus is not earning an adequate economic return on its investments. The misleading conclusions from, and potentially harmful regulatory actions taken when, interpreting accounting-based ROICs as a measure of economic returns are ignored in the Shipper Submissions:

- a. The Shipper Submissions present various examples with flawed analyses in an attempt to justify continued reliance on the Board's current methodology. Their examples ignore differences between accounting-based measures of earnings, invested capital, and ROICs and distort and downplay the harmful impact on railroads and customers if regulators rely on inaccurate accounting-based ROICs.

⁷¹ Accounting earnings is equal to economic earnings minus the difference between economic amortization and accounting amortization. Accounting invested capital is equal to economic invested capital minus the difference between economic amortization and accounting amortization. Accounting-based ROIC is equal to accounting earnings divided by accounting invested capital.

⁷² Accounting amortization (and all accounting accruals) are non-cash expenses and thus do not affect free cash flows or the value of the company. We assume income taxes are unaffected by the difference between accounting accruals and their economic counterparts.

This example demonstrates that because, in the real world, accounting amortization does not equal economic amortization,⁷³ accounting-based ROIC is an inaccurate measure of economic returns: A company with an economic return on its invested capital equal to or even less than its cost of capital can have an accounting-based ROIC that is greater than its cost of capital.

- b. One cannot assume that a company with an accounting-based ROIC equal to its cost of capital can “cover all its costs”⁷⁴ or that “investment in, and returns due to, fully depreciated assets are fully realized in prior periods.”⁷⁵
- c. The Shipper Submission assert that a company’s accounting-based ROIC (and accounting-based measures of economic earnings) will result in an increase in the company’s market value.⁷⁶ However, they ignore the well-accepted valuation principle in economics and finance that a change in accounting-based ROIC (and accounting-based measures of economic earnings) only results in a change in value if caused by a change in expected cash flows and not a change in non-cash flow accruals. All three scenarios show that changes in accounting-based ROICs (and accounting-based measures of economic earnings) from Year 1 to Year 2 caused by a change in accounting amortization do not affect the company’s value.
- d. A company making distributions to its shareholders may not be earning an adequate economic return.⁷⁷ In Scenarios 2 and 3, a company earning less than its cost of capital on its investment can generate positive free cash flows that can be distributed to all of the company’s investors without affecting the implementation of its business strategy.

⁷³ We note that our simple example demonstrates the effect of measurement error in ROIC as a measure of economic return when accounting amortization does not equal economic amortization. In the M&Z Verified Statement (Section III), we summarize the peer-reviewed economic literature from the last 50 years that has identified the well-known limitations and inaccuracies of accounting rates of return as measures of financial performance.

⁷⁴ Stewart VS, Section II.A.

⁷⁵ Stewart VS, Section III.C. An example of Shippers’ error is when the accounting rules for capitalizing and expensing cash expenditures require expensing an expenditure over a shorter-period than its economic life. Stewart VS, Section III. C, pp. 23-25.

⁷⁶ For example, the example in the Hodder VS (Section II, pp. 9 – 10) states, “A firm’s value depends on how its expected annual earnings as a percentage of invested capital compares with its cost of capital. If the expected annual earnings rate exceeds the cost of capital, the firm’s value rises immediately. Furthermore, a modest difference between the expected annual earnings percentage and the cost of capital (5% in our example) can have a large impact on the firm’s value if that percentage difference is expected to last a long time.” (Note, “expected annual earnings as a percentage of invested capital” is equivalent to ROIC.)

⁷⁷ Stewart VS, Section V.C., p. 54 (“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.”).

- e. A company's ability to raise capital for certain incremental investments does not prove that the company has earned an actual economic return on its invested capital equal to or greater than its cost of capital.⁷⁸ As we show in Scenarios 2 and 3, a company with an economic return on its invested capital that is less than its cost of capital can have positive expected free cash flows, which it can use to repay its debt and make distributions to its other investors. In addition, because market prices of the company's stock adjust to changes in expectations, investors' expected economic return is equal to the company's cost of capital even if the company's economic return on its invested capital is less than its cost of capital.
- f. An increase in a company's market value does not show that it is earning an adequate economic return.⁷⁹ A comparison of the company's value in Scenarios 2 and 3 shows that the value increased by 29% because the company's economic return increased from 7% to 9%, but the company is still earning less than its cost of capital on its invested capital.

IV. SHIPPER SUBMISSIONS WRONGLY CRITIQUE OUR PROPOSAL TO USE THE S&P 500 COMPANIES AS A BENCHMARK GROUP FOR EVALUATING RAILROADS' FINANCIAL PERFORMANCE

36. To assess whether the railroads are revenue adequate, the Board has used the difference between a measure of the railroads' accounting-based ROIC and the railroad industry's cost of capital (ROIC minus COC). The Board uses a "bright line" difference between a railroad's ROIC and COC of zero over some time period to determine whether the railroad is revenue adequate. Our research shows that a threshold of zero cannot inform the Board about whether a railroad's (or any company's) *economic* return is above its cost of capital, which is the relevant question given the statute. We also showed that a benchmarking methodology that compares the railroads' financial performance based on accounting values to that of a group of companies with which the railroads compete for capital can be an informative way to evaluate the railroads'

⁷⁸ Stewart VS, p. 52 ("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.").

⁷⁹ Stewart VS, Section V.B; WCTL Comments, Section C.2; Hodder VS, Section II.

economic return. By comparing the railroads' accounting-based ROIC minus COC with that of companies in a broad set of unregulated and competitive industries, the Board would be able to reach a more meaningful assessment of the railroads' financial performance.

37. Shipper Submissions offer several critiques of our recommendation of the S&P 500 as a benchmark group, none of which are valid as we now explain.

A. The Shipper Submissions Wrongly Claim That the Benchmarking Methodology Is Uninformative Because No Companies in the S&P 500 Are Comparable to the Railroads

38. The Shipper Submissions claim that no companies in the S&P 500 are comparable to the railroads and that the benchmarking methodology we proposed to the Board is uninformative and economically invalid.⁸⁰ Thus, the Shipper Submissions are essentially taking the extreme view that the Board can better assess the financial performance of the railroads using accounting-based ROIC minus COC in isolation, that is, without taking into account the empirically established inaccuracies of accounting-based measures of financial performance when used to estimate actual economic performance. We have explained why this claim is unjustified, which we do not repeat here,⁸¹ and the Shipper Submissions provide no basis to reconsider our conclusions.

⁸⁰ Stewart VS, Section IV; Hodder VS, Sections IV and V (for example, "A small to modest PPE/Total Asset percentage seems to be a major reason why the Board's approach for measuring a railroad's ROI does not fit the structure of many other firms." (Hodder VS, p. 32); "I have identified several reasons why the Board's approach for estimating a railroad's ROI does not fit many non-railroad firms." (Hodder, p. 36); "Generating over 5000 mostly inaccurate ROI estimates seems like a major waste of time. It does demonstrate that the Board's ROI estimation procedure doesn't work well in many non-railroad situations. That is not surprising and could have been illustrated with a couple examples." (Hodder VS, p. 36).).

⁸¹ M&Z Verified Statement, Sections III and V.

B. The Benchmarking Methodology Is Informative and an Important Tool for the Board to Assess Revenue Adequacy Even if Accounting-Based ROICs for Some Companies Are “Implausible”

39. The Shipper Submissions claim that accounting-based ROICs are “plausible” for some S&P 500 companies, including the railroads, but are “implausible” for other S&P 500 companies.⁸² They claim that these various purported implausible “outliers” make our analyses uninformative.⁸³ Their claims are wrong.

40. First, Shipper Submissions claims have no foundation and only speculate that the Board’s ROIC is “plausible” for purposes of comparison with the railroads’ cost of capital.

41. Second, while a “plausible” ROIC suggests less inaccuracy as a measure of economic return than an “implausible” ROIC, a purportedly “plausible” ROIC remains an inaccurate way to measure revenue adequacy and thus can result in harmful regulatory action when analyzed in isolation as the Shipper Submissions propose. In contrast, the benchmarking methodology proposed in the M&Z Verified Statement provides an additional perspective on the railroads’ financial performance that mitigates the inaccuracies of using the accounting-based ROIC minus COC for measuring revenue adequacy.

42. Third, the existence of outliers in the distribution of ROICs for some companies in the S&P 500 Index and the S&P 500 Industrials Index does not provide any reason to dismiss the benchmarking approach. The Shipper Submissions analyze the S&P 500 Benchmarking Group

⁸² Hodder VS, Sections III and IV (e.g., “Looking at estimates of WACC and ROI values in the “Supporting Spreadsheet” for the Railroad Proposal, one can use an eyeball test to see that the WACC estimates are at least roughly plausible, but many of the ROI estimates are not.” (p. 12)).

⁸³ Hodder VS, Section IV; Stewart VS, Section IV (e.g., “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.” (p. 26, emphasis omitted)).

in terms of average ROICs across companies and years arguing that the high average ROIC values (and not the median ROIC referenced in the M&Z Verified Statements) suggest implausibility of the sample.⁸⁴ The Shipper Submissions speculate, without offering any systematic analysis, that “having a very large portion of inaccurate estimates in the sample suggests that the median is also not reliable.”⁸⁵

43. In its Table 1, the Hodder VS ignores the outlier issue in accounting-based ROICs and uses the average annual STB ROIC to examine the “implied value growth and payouts for a hypothetical average firm from the sample.”⁸⁶ The M&Z Verified Statement acknowledges that there are outliers, and instead uses the median and not the average ROIC to eliminate the impact of these atypical values. In Tables 3A (top) and 3B (bottom) below, we present the average and median Adjusted STB ROIC (Table 3A) and the STB ROIC (Table 3B) for the S&P 500 companies in the M&Z Verified Statement. The Hodder VS presents only the average for the STB ROIC (red bars in Table 3B) and not the median (gold bars in Table 3B) used in the M&Z Verified Statement. The Hodder VS also does not analyze the Adjusted STB ROIC (Table 3A). The charts in Tables 3A and 3B demonstrate how use of the median rather than the average reduces the summary value, with an especially large reduction when using the median of the unadjusted STB ROIC. Thus, the analysis in the Shipper Submissions does not refute the rationale for using the S&P 500 companies as the benchmarking group as discussed in the M&Z Verified Statement.⁸⁷

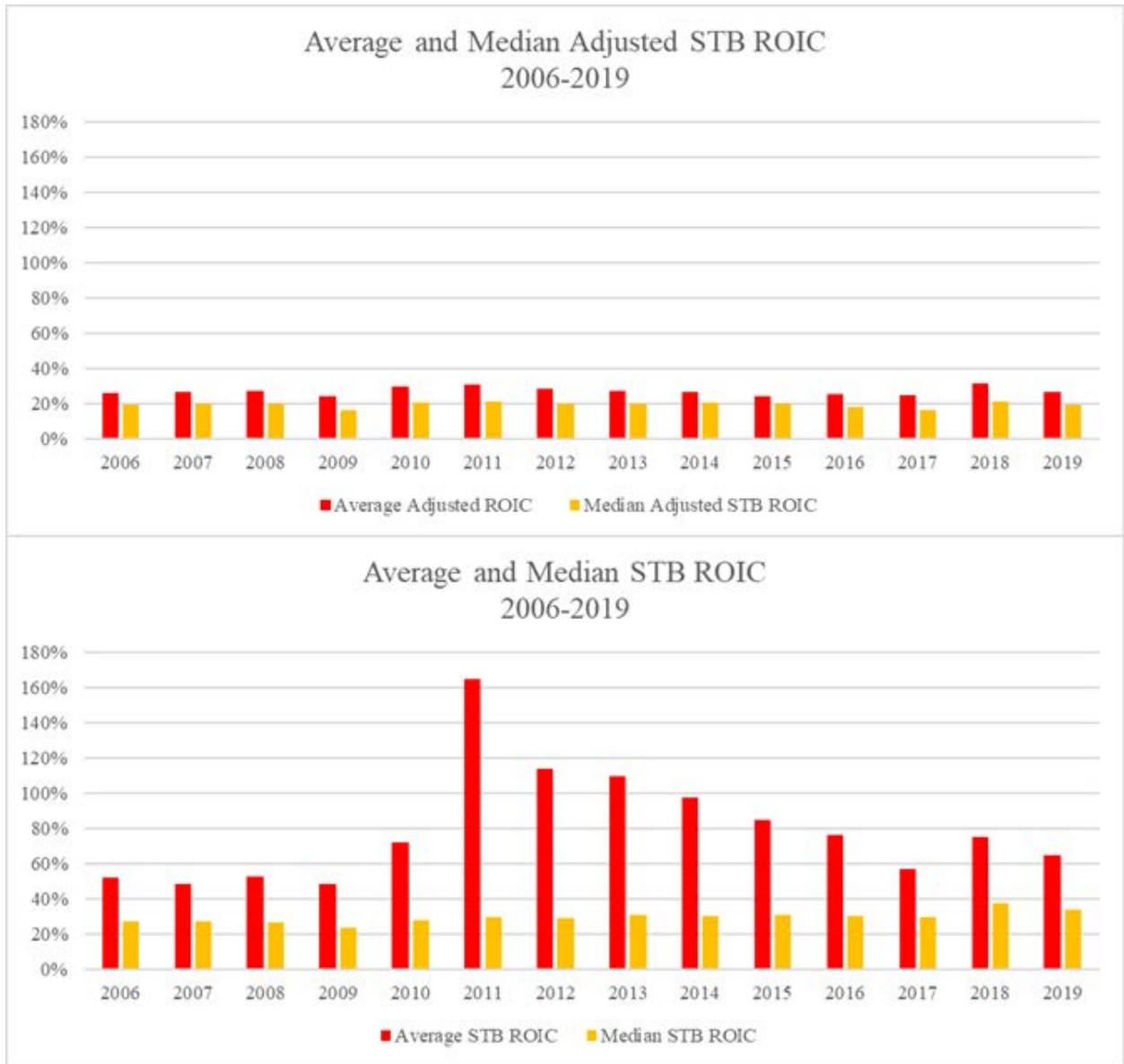
⁸⁴ Hodder VS, Section III and Table 1.

⁸⁵ Hodder VS, footnote 28.

⁸⁶ Hodder VS, pp. 16 – 17.

⁸⁷ For example, see M&Z Verified Statement, Section IV.

Tables 3A and 3B: Average and Median (Adjusted) STB ROIC



C. Conclusions

44. In this section, we show that the Shipper Submissions' critiques of our proposed benchmarking methodology and our recommendation of the S&P 500 as a benchmark group lack foundation and are not valid. To the contrary, our research shows that (a) using zero as the bright line cannot inform the Board of whether a railroad's (or any company's) *economic* return is above its cost of capital, but (b) a benchmarking methodology can be an informative way to

evaluate the railroads' economic return by putting the accounting-based ROIC minus COC used by the Board in the context of companies in competitive industries that compete with railroads for capital; and (c) the S&P 500 companies provide an informative and appropriate benchmarking group for purposes of evaluating revenue adequacy of the railroads. Our proposed benchmarking methodology is an important tool to prevent false conclusions based on accounting-based ROIC and thereby mitigates, and hopefully prevents, regulating and penalizing the railroads for reasons unrelated to noncompetitive pricing to shippers.⁸⁸

45. Measurement error in the accounting-based measures of financial performance used by the Board to assess revenue adequacy can result in unnecessary and potentially harmful regulatory actions.⁸⁹ Thus, we recommend that the Board use the standard benchmarking methodology we proposed in the M&Z Verified Statements, which continues to rely on accounting-based ROIC to assess revenue adequacy but recognizes that, based on accounting-based ROIC, companies often earn more than their cost of capital. We believe this approach is both informative about the economic performance of the railroads and practicable to implement, because both ROIC and the cost of capital are relatively easy to calculate using data available from public sources. The S&P 500 companies are a natural benchmarking (comparison) group given that railroads compete for capital with these companies. As our research demonstrated, determining the railroads' positions (e.g., their percentile in the distribution of this comparison

⁸⁸ Railroads are not protected by regulatory intervention from losses or weak performance caused by macroeconomic conditions, structural problems or their competitive failures. This means that, to compete for capital to serve shippers efficiently and competitively, railroads must have the same potential as other companies operating in unregulated markets to earn above average returns when macroeconomic conditions are favorable, or when they have unusual competitive success, such as becoming more efficient.

⁸⁹ For example, using an absolute numeric benchmark (such as a rate of return no more than x percentage points above the cost of capital) that does not vary with the overall economy penalizes railroads when their rate of return improves due to macroeconomic or other improvements in market-wide returns. And it could harm railroads and shippers by reducing railroads' incentives to increase efficiency, because increasing efficiency would, in turn, improve the railroads' financial performance and subject them to potentially harmful regulatory actions.

group) and changes in the railroads' positions in the distribution of S&P 500 companies over a reasonably long period is practicable and will provide railroads and shippers with reliable guidance for making future investment and operating decisions.

46. Shipper Submissions challenge the usefulness of placing the accounting returns of the railroad industry into context, both in general and with regard to the benchmarking groups offered in our prior statements. We strongly disagree. The Board is charged by Congress with a challenging task—to monitor the financial health of the freight rail industry. We understand that part of that statutory charge includes estimating a reasonable economic return, which means that not only is the Board's task complicated by the need to estimate economic rather than accounting returns, but it also needs to gauge what is a "reasonable" economic return. Using benchmarking is a powerful modern financial practice that permits the STB to continue to use accounting measures of returns, but to place that data into a context that is informative about the economic returns of the rail industry.

47. We reiterate our conclusion in the M&Z Verified Statement that, regardless of the "bright line" benchmark of S&P 500 companies selected by the Board for its revenue adequacy inquiry, the Board should not mechanically conclude that railroad returns above the Board's chosen "bright line" benchmark indicate a market or regulatory failure.⁹⁰ The railroad industry could be outperforming its peers for entirely pro-competitive reasons. The Board should therefore first investigate whether the railroads are above the "bright line" benchmark of S&P 500 companies selected by the Board for its revenue adequacy inquiry for procompetitive reasons – greater efficiency, benefits from risky investments, increases in demand that exceeded expectations etc. if the railroads surpass the threshold. If, after such investigation, the STB can rule out such

⁹⁰ M&Z Verified Statement, ¶¶84-85.

procompetitive reasons, and the STB concludes that there is a basis for concern that there is a lack of competition in serving some shippers or some geographic areas, then the STB should look to use its existing tools to more effectively evaluate challenges of specific rates by shippers alleging noncompetitive pricing.

V. ANY SURVIVORSHIP BIAS IN THE S&P 500 INDEX DOES NOT AFFECT THE CONCLUSIONS IN THE M&Z VERIFIED STATEMENTS

48. We were asked to respond to the claims by the Shippers that the changing composition of the S&P 500 Index over time (due to the exclusion of companies when their market capitalization falls below a certain threshold) poses a problem with respect to the proposed benchmarking methodology (“S&P 500 Changing Composition”).⁹¹ In this section, we show that S&P 500 Changing Composition does not qualitatively affect our analyses or conclusions in our previous submissions.

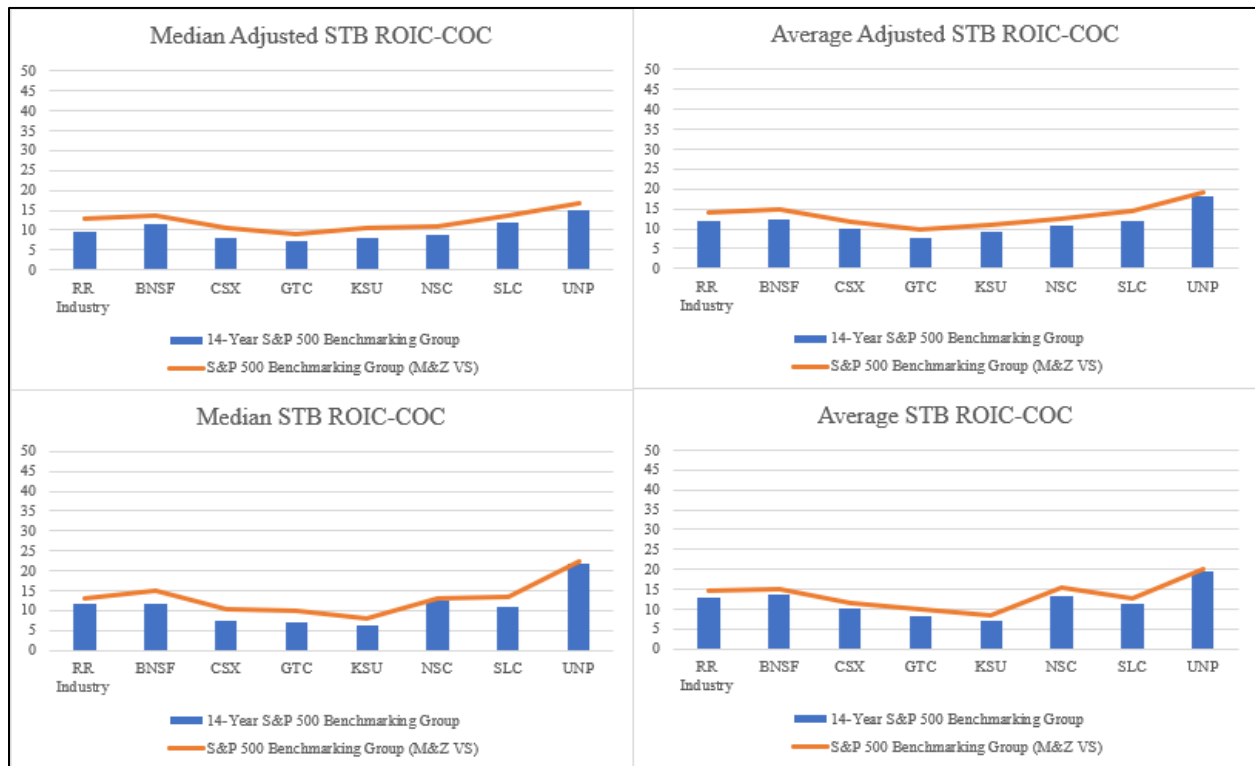
49. We calculate the median and average percentile of the Adjusted STB ROIC – COC and STB ROIC – COC for each of the railroads in the following two subgroups of the S&P 500 Benchmarking Group: (i) companies included in all 14 years 2006-2019 (“14-Year S&P 500 Benchmarking Group”); and (ii) companies that dropped out of the S&P 500 (“S&P 500 Benchmarking Group Dropouts”) during that period.⁹² The 14-Year S&P 500 Benchmarking Group includes 215 companies, and the S&P 500 Benchmarking Group Dropouts includes 264 companies.

⁹¹ Stewart VS, Section IV.A, “The S&P 500 Is a Culled Group of the Most Profitable and Valuable Companies;” WCTL Comments, Section E, “THE CHANGING COMPOSITION OF THE S&P 500 EMPHASIZES THE FLAWS IN THE COMPARISON PROPOSAL” “See also Surface Transportation Board Decision, Ex Parte 766, December 30, 2020. p. 4.

⁹² The observations in the S&P 500 Benchmarking Group Dropouts sample in each year consist of the companies that drop out of the S&P 500 Benchmarking Group in the following year. In other words, the observations in each year are the last-year observations before a company is excluded from the S&P 500. For both benchmarking groups, S&P 500 membership is determined according to Exhibit A1 of the M&Z Verified Statement.

50. In Table 4 below, we show the median (top left) and average (top right) Adjusted STB ROIC – COC percentile and the median (bottom left) and average (bottom right) STB ROIC – COC percentile for the 14-Year S&P 500 Benchmarking Group compared to the S&P 500 Benchmarking Group. The blue bars in the chart present the percentiles within the 14-Year S&P 500 Benchmarking Group, and the solid line presents the percentiles within the entire S&P 500 Benchmarking Group. The charts show that the median and average percentiles for each of the railroads within the 14-Year S&P 500 Benchmarking Group are within a few percentiles of the entire S&P 500 Benchmarking Group.

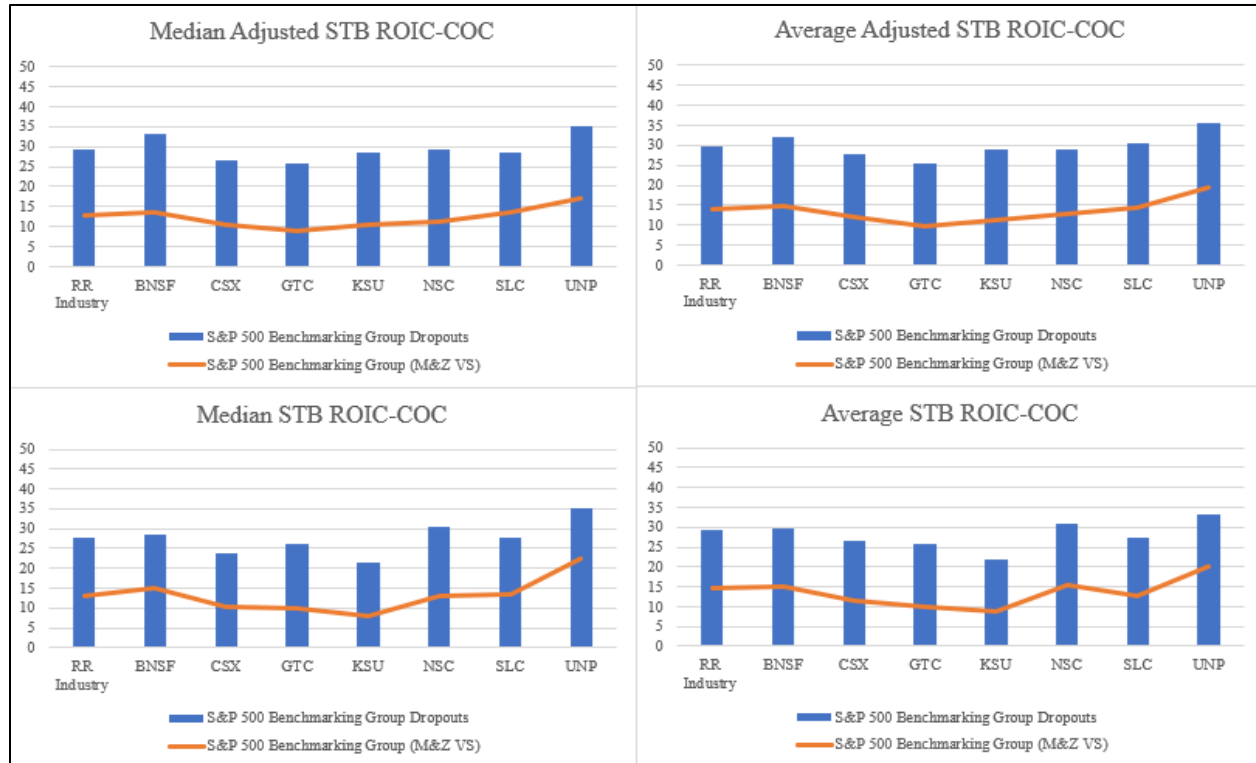
Table 4: STB ROIC - COC



51. Next, in Table 5, we present the same charts but compare the S&P 500 Benchmarking Group Dropouts to the S&P 500 Benchmarking Group. Recall that the S&P 500 Benchmarking Group Dropouts consists of last-year observations of companies that were dropped from the S&P 500 the following year. As one would expect, the percentiles of the railroad industry and each of

the railroads are higher within the S&P 500 Benchmarking Group Dropouts than within the S&P 500 Benchmarking Group. However, the average percentiles for the industry and each of the railroad is roughly around the 30th percentile (i.e., the bottom third of the distribution).

Table 5: STB ROIC - COC



52. In sum, our analysis shows that any survivorship bias in the S&P 500 does not qualitatively change our conclusions in our previous submissions.

VI. COMMENTS ON THE UTILITY METHOD, FLOW THROUGH METHOD AND THE TREATMENT OF DEFERRED INCOME TAXES

53. We also were asked to respond to the Shippers' claims and the Board's questions regarding the utility method and the treatment of deferred income tax in the calculation of the

Board's accounting-based ROIC.⁹³ First, we were asked to assess whether the utility method is consistent with GAAP (generally accepted accounting principles). Second, we were asked to provide our view on the best way to treat deferred income taxes in the Board's calculation of ROIC for purposes of comparing railroads' accounting-based ROIC to the cost of capital.

54. The Board's predecessor, the Interstates Commerce Commission ("ICC"), considered at least three alternatives for measuring the accounting-based ROIC to use in determining revenue adequacy: the "utility method;" the "flow through method;" and a hybrid method.⁹⁴ All three methods calculate ROIC by dividing a measure of the company's Net Railway Operating Income by a measure of the company's balance of invested capital (Net Investment Base). The differences between the methods result from different treatments or adjustments for deferred income taxes to either Net Railway Operating Income or Net Investment Base. Before we respond to the Shippers' claims and the Board's questions, we first provide a brief overview of the above three methods for calculating accounting-based ROIC, followed by an overview of deferred income taxes.

A. Overview of the Utility, Flow Through, and Hybrid Methods

55. Differences between the utility, flow through and hybrid methods result from different treatments or adjustments for deferred income taxes to either Net Railway Operating Income, Net Investment Base or both. Under the utility method, ROIC equals Net Railway Operating

⁹³ WCTL Comments, Section F, "THE BOARD'S CURRENT TREATMENT OF DEFERRED TAXES FOR REVENUE ADEQUACY PURPOSES REMAINS VALID;" Hodder VS, pp. 34-35. See also Surface Transportation Board Decision, Ex Parte 766, December 30, 2020, p. 5 ("Does the ICC's reasoning for adopting the utility method remain valid, specifically with respect to analogizing captive shippers to utility customers, determining whether the utility method continues to conform with GAAP today, and finding that the utility method led to a more accurate representation of railroad profitability?").

⁹⁴ Standard For Revenue Adequacy, Ex Parte 393, December 16, 1986, p. 269.

Income divided by a Net Investment Base that is net of the deferred income taxes on the balance sheet. The hybrid method makes no adjustment for deferred income taxes when calculating Net Railway Operating Income or Net Investment Base.⁹⁵ In the flow-through method, ROIC equals Net Railway Operating Income that is net of the deferred income taxes included in income tax expense, divided by Net Investment Base with no adjustment for deferred income taxes.

56. The utility and flow through methods differ in two ways. First, they differ in the calculation of the Net Investment Base because the utility method deducts deferred income taxes on the balance sheet when calculating the value of the Net Investment Base, which converts the GAAP-based valuation of the Net Investment Base, which is used in the flow-through method, to a valuation based on tax regulations and law (the tax basis of Net Investment Base). Second, they differ in how they are affected by changes in income tax rates. Even though the revaluation of deferred income tax liabilities from a change in income tax rates is not a cash flow, it affects income (numerator in accounting-based ROIC measures). In the utility method, a reduction in income tax rates will increase Net Railway Operating Income in a way essentially equal to the revaluation of deferred income taxes on the balance sheet.⁹⁶ Because the flow-through method eliminates deferred income taxes in Net Railway Operating Income (essentially using cash income taxes) and does not deduct deferred income taxes on the balance sheet to measure Net

⁹⁵ Rather, the hybrid method considers the effect of deferred taxes in the calculation of COC.

⁹⁶ Thus, the revaluation of deferred taxes will increase the utility method ROIC with a decrease in tax rates and decrease the utility method ROIC with an increase in tax rates. The effect on the utility method ROIC can be large when tax rates change, creating an even larger measurement error issue for ROIC. This was the situation resulting from the Tax Cuts and Jobs Act of 2017, which decreased the federal statutory income tax rate from 35% to 21%. The Board recognized this measurement error issue for ROIC and adopted a one-time adjustment to 2017 revenue adequacy calculations to remove the additional measurement error in the utility method ROIC caused by the change in tax rates. The Board's one-time adjustment was consistent with the flow-through method because it did not deduct the deferred taxes in the calculation of the 2017 Net Operating Income or adjust the 2017 Net Investment Base for the revaluation of deferred income taxes. See, M&Z Verified Statement, footnote 83.

Investment Base, the flow through ROIC is affected only by the revaluation of deferred income taxes on the balance sheet.

B. Overview of Deferred Income Taxes

57. A company's provision for income tax expense on its income statement does not equal the income taxes on its tax forms, which are the income taxes currently payable to various governments (essentially cash income taxes). Why doesn't income tax expense equal cash income taxes? Because, in the United States, and in many other countries, GAAP, which is used to prepare a company's financial statements, including its income statement (book accounting), is not the same as the accounting rules embedded in the tax laws used to calculate taxable income and income taxes payable to the government (tax accounting). The differences in GAAP and the accounting rules embedded in the tax laws can result in temporary (as well as permanent) differences between a company's financial statement net income and taxable income.⁹⁷

58. Temporary differences between a company's financial statement net income and taxable income arise when the revenues and/or expenses on the tax records are temporarily different from the revenues and/or expenses in the financial statements. These temporary differences between the book and tax records eventually reverse so that the cumulative expenses or revenues are equal over the life of the firm. Deferred income tax assets or liabilities arise from temporary differences when the values of the assets and liabilities on a company's financial statements (the

⁹⁷ Permanent differences between income reported on a company's financial statements and taxable income reported on the company's tax returns occur because certain revenues or expenses are recognized for financial reporting purposes that differ from the revenues and expenses recognized for income tax purposes. Permanent differences are not relevant to the issues related to measuring ROIC and we do not discuss them in this submission.

book value of its assets and liabilities) do not equal the values in its income tax records (the tax basis of the assets and liabilities).⁹⁸

59. More specifically, a deferred income tax liability results whenever the book value of an asset is greater than the tax basis of that asset, or when the book value of a liability is less than the tax basis of that liability.⁹⁹ This difference occurs when the cumulative expenses deducted for tax purposes are greater than the cumulative expenses deducted for accounting purposes. A common example of a deferred income tax liability is when a company uses an accelerated method of depreciation for its property, plant and equipment for income tax purposes and uses a straight-line method of depreciation for its accounting statements. Because of accelerated depreciation, a company will expense the asset faster for income tax purposes than it is expensed on its accounting statements.

60. In the early years, tax depreciation will be larger than book depreciation but in the later years, the book depreciation will be larger than the tax depreciation, and eventually the cumulative tax and book depreciation will be equal. Although the reversal of the timing differences occurs for individual assets, as long as the company is growing and adding more assets or it is in steady state, the deferred income tax liability does not reverse at the company

⁹⁸ If it is more likely than not that the company will not be able to capture the benefit of a deferred income tax asset, accounting rules require companies to offset (reduce) the balance of a deferred income tax asset using a separate valuation allowance account. In other words, if management does not expect to be able to capture the benefits of a deferred income tax asset, the company reduces the value of its deferred income tax asset for the amount of the asset that it may not be able to capture. A valuation allowance is a contra-asset account and essentially records the reduction in the deferred income tax assets in such circumstances.

⁹⁹ Conversely, a deferred income tax asset results whenever the book value of an asset is less than the tax basis of that asset, or when the book value of a liability is greater than the tax basis of that liability. This difference occurs when the cumulative expenses deducted for tax purposes are less than the cumulative expenses deducted for accounting purposes.

level (across all assets). Thus, the book value of an asset minus the deferred income tax liabilities related to that asset is equal to the tax basis of that asset.

61. It is well-known and accepted that the value of the firm is equal to the present value of the free cash flows the company is expected to generate.¹⁰⁰ When calculating free cash flows, we use cash income taxes, not the provision for income taxes (income tax expense) on the income statement. The provision for income taxes reported on the company's income statement is equal to the sum of the income tax on the company's income tax returns (essentially cash income taxes) plus the change in deferred income taxes on the balance sheet. Thus, deducting the change in deferred income taxes on the balance sheet from income tax expense, we essentially calculate cash income taxes.

62. We calculate income tax on the company's income tax returns (essentially cash income taxes) by reversing the adjustments for deferred income taxes. The balance of a company's net deferred income taxes (that is, the net of the company's deferred income tax assets and deferred tax liabilities) is essentially equal to the difference between the book value and tax basis of the company's assets and liabilities, multiplied by the appropriate tax rate. Deferred income tax assets and liabilities are not measured on a present value basis; in other words, regardless when an asset's deferred income tax will reverse, its value is measured as if it will reverse immediately. The amount of deferred income tax included in income tax expense on the financial statements is equal to the change in deferred income tax assets and liabilities.

63. Lastly, it is useful to understand how changes in income tax rates affect deferred income taxes (balance sheet and income statement effects). The recent Tax Cuts and Jobs Act of 2017 reduced the U.S. federal statutory income tax rate from 35% to 21%. This reduction in the tax

¹⁰⁰ Holthausen and Zmijewski, p. 10, Chapter 3.

rate reduced the deferred income tax on a company's balance sheet by 40% ($1 - 0.21/0.35$). Companies with a net deferred income tax liability position on their balance sheets recorded a reduction of that liability, which reduced the provision for income taxes (income tax expense) and thus, increased net income in 2017. The revaluation of deferred income tax liabilities resulted in a change in the value of shareholders' equity (retained earnings) but it had no effect on the value of the company's assets. The revaluation of deferred income taxes on the balance sheet also had no effect on a company's cash flows. The effect on the company's cash flows from a tax rate change occurs in the future when income taxes are paid based on the new tax rate.

C. The "Utility" Method Is Not a GAAP Measure

64. The ICC stated that "the flow-through approach does not conform to GAAP. Although the Commission is under no obligation to abide by GAAP in a regulatory proceeding, we do believe that conformity with GAAP should be a goal where possible."¹⁰¹ The ICC did not explain in either its June 1986 or December 1986 decisions¹⁰² why the flow-through method does not conform to GAAP. As we explain below, the utility method does not conform to GAAP either. Moreover, no accounting-based ROIC is a GAAP measure, because GAAP does not cover, and it appears never to have covered, how to measure ROIC. Companies that present

¹⁰¹ Regarding accuracy, it appears the ICC did not perform an empirical analysis of accuracy of the deferred income tax adjustment alternatives under the utility method and the flow-through method discussed in the Standard. Rather, ICC observed that, since the enactment of the Staggers Act in 1980 and through the mid-1980s, the railroad performance, as measured by the revenue adequacy formula without any adjustments for deferred income taxes, is "moving further away from revenue adequacy when we would expect improvements resulting from the numerous Staggers Act reforms." ICC attributed the movement away from revenue adequacy during this period to how it treated deferred income taxes ("We believe that one of the major reasons for this discrepancy is our treatment of the deferred income tax issue."). Standard For Revenue Adequacy, Ex Parte 393, December 16, 1986, pp. 272-274.

¹⁰² Standard For Revenue Adequacy, Ex Parte 393, December 16, 1986; Standard For Revenue Adequacy, Ex Parte 393, May 30, 1986. Service Date was June 5, 1986.

ROIC in their financial statements are required to disclose that ROIC is considered a non-GAAP financial measure by SEC Regulation G and Item 10 of SEC Regulation S- K.¹⁰³

65. Under GAAP, deferred income tax assets and liabilities are included as assets and liabilities in a GAAP balance sheet. Deferred income tax expense is included in the provision for income taxes (tax expense) and, therefore, it is included in the calculation of GAAP earnings (net income). The utility method excludes deferred income taxes on the balance sheet from invested capital, which deviates from how GAAP measures assets (invested capital) on the balance sheet; thus, the utility method Net Investment Base is not a GAAP measure of invested capital. The flow through method excludes deferred income taxes in the provision for income taxes (income tax expense), and thus, the flow through method Net Railway Operating Income is not a GAAP measure of unlevered earnings. The hybrid method makes no adjustment to the numerator or denominator and thus, uses both a GAAP measure for Railway Operating Income and Net Investment Base. That said, however, we see no reason why using GAAP-based measures of Net Railway Operating Income and Net Investment Base is an important consideration for calculating the Board's ROIC.

D. Treatment of Deferred Income Taxes in Calculating Accounting-Based ROIC

66. We were asked to provide our view on the best way to treat deferred income taxes in the Board's calculation of ROIC so that, when compared to the industry cost of capital, the Board's ROIC measure of Net Railway Operating Income and Net Investment Base best reflect the

¹⁰³ See, for example, Union Pacific Corporation Form 10-K for the fiscal year ended December 31, 2019, p. 32: "ROIC is considered a non-GAAP financial measure by SEC Regulation G and Item 10 of SEC Regulation S-K, and may not be defined and calculated by other companies in the same manner." SEC Regulation G and Item 10 of SEC Regulation S-K are accessible at <https://www.sec.gov/rules/final/33-8176.htm> and <https://www.ecfr.gov/cgi-bin/text-idx?amp;node=17:3.0.1.1.11&rgn=div5>, respectively.

economics underlying the cost of capital.¹⁰⁴ As we discussed above, deferred income tax adjustments can be used to adjust both the numerator (Net Railway Operating Income) and the denominator (Net Investment Base) of ROIC. As we explain below, although we would not limit the adjustments to the Board's ROIC calculation to deferred income tax considerations, our view on how to treat deferred income taxes when measuring the Board's ROIC is equivalent to the flow through method.¹⁰⁵

67. In the M&Z Verified Statement, we proposed that the calculation of Net Railway Operating Income should deduct (eliminate) deferred income taxes in the Provision of Income Taxes. We believe this adjustment is consistent with the Board's use of ROIC (comparing it to the cost of capital) and basic valuation principles, which measure the value of a company as the discounted value of the cash flows the company is expected to generate for its investors.¹⁰⁶ Eliminating the effect of deferred income taxes in the Provision of Income Taxes is one of the required adjustments to measure a company's cash flows in order to align the company's operating income with the economic concept used in measuring a company's economic profit.¹⁰⁷

68. In the M&Z Verified Statement, we also proposed that the calculation of Net Investment Base should not be net of deferred income taxes on the balance sheet. As we explain above, an asset's book value minus the deferred income tax liabilities related to that asset equals the asset's

¹⁰⁴ We note that the treatment of deferred income taxes would be irrelevant if the Board used replacement cost to calculate accounting-based ROIC because a valuation based on replacement cost is independent of deferred income taxes.

¹⁰⁵ We discuss these adjustments in the M&Z Verified Statement, Section IV.B. We note that the Stewart VS does not directly address the treatment of deferred taxes, but implicitly agrees with our adjustments by a reference to a McKinsey methodology that Stewart VS cites (Stewart VS, footnotes 16 and 26). The Hodder VS does not opine on our adjustments but acknowledges that improvements to the Board's calculation of ROIC should be made. (WCTL Comments, Section B; Hodder VS, Section V).

¹⁰⁶ Holthausen and Zmijewski, Chapters 3 – 6.

¹⁰⁷ Holthausen and Zmijewski, Chapter 3, p. 92.

tax basis. Thus, deducting deferred income taxes on the balance sheet when calculating the value of the Net Investment Base in the utility method converts the Net Investment Base from a valuation based on GAAP to a valuation based on tax regulations and law (the tax basis of Net Investment Base).

69. The utility method converts a GAAP-based valuation of Net Investment Base to a tax-based valuation of Net Investment Base (a valuation based on tax laws and regulations). Net Investment Base should equal the original investment minus cumulative economic depreciation. Tax regulations and laws for measuring tax deductible depreciation (and other components that result in deferred tax liabilities) are not intended, and do not purport, to estimate economic depreciation or other types of expenses. The basic concept of economic depreciation (Hotelling (1925)¹⁰⁸ or replacement cost as proxy) indicates that accelerated depreciation used to measure taxable income is not a better estimate of economic depreciation. Thus, we see no reason to deduct deferred income taxes on the balance sheet to calculate Net Investment Base.

70. In sum, our view on how to treat deferred income taxes to calculate the Board's ROIC measure – given the Board's use of ROIC (comparing it to the cost of capital of the railroads), and assuming the Board will not use replacement cost to measure invested capital – is to extract the effects of deferred income taxes in the provision for income taxes (income tax expense) in the calculation of Net Railway Income (essentially using cash taxes), and make no adjustment for net deferred income tax liabilities in the calculation of Net Investment Base. This approach

¹⁰⁸ Hotelling, H., "A General Mathematical Theory of Depreciation," *Journal of the American Statistical Association*, September 1925, 20, pp. 340 – 353.

is essentially equivalent to the flow through method that was explored by the ICC in the 1980s and recommended by the U.S. Department of Transportation.¹⁰⁹

E. Conclusions

71. First, our opinions regarding the utility method and GAAP are that (a) accounting-based ROIC is not covered by GAAP (it is not a GAAP measure and companies who report ROIC or other accounting-based ROIC in their financial statements must disclose that these estimates are not GAAP measures; and (b) the utility method's adjustment to the denominator (invested capital) excluding deferred income taxes on the balance sheet deviates from how GAAP measures a company's assets (invested capital).

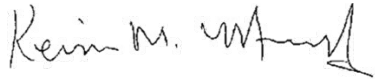
72. Second, we recommend that the Board should extract the effects of deferred income taxes in the provision for income taxes (income tax expense) in the calculation of Net Railway Income (essentially using cash taxes) and make no adjustment for net deferred income tax liabilities in the calculation of Net Investment Base, which is essentially equivalent to the flow through method.¹¹⁰

¹⁰⁹ Standards for Railroad Revenue Adequacy, decided December 16, 1986, Ex Parte No. 393 (Sub-No. 1), 3 I.C.C. 2d, pp. 269-275 ("DOT argues for the flow-through approach." (p. 270)).

¹¹⁰ We understand that the utility method was adopted in the 1980s because the financial performance of the railroads was declining based on the ROIC formula used at that time, even though the financial performance and health of the railroads was improving. We understand that changes in the tax regulations and law resulted in an increase in deferred income taxes, which had the effect of reducing the railroads financial performance. Although the utility method attempted to address this issue by decreasing the Net Investment Base by deducting deferred income taxes on the balance sheet, we explain in this submission that adopting the utility method created other measurement error issues. By using cash income taxes (measured by deducting deferred income tax expense included in the provision for income taxes), the flow through method would have also addressed this issue without causing the measurement error issues caused by adopting the utility method. See, *Standards for Railroad Revenue Adequacy*, decided December 16, 1986, Ex Parte No. 393 (Sub-No. 1), 3 I.C.C. 2d, pp. 261-322.

VERIFICATION

I, Kevin M. Murphy, 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, appearing to read "Kevin M. Murphy". The signature is written in a cursive style with a large, stylized "K" and "M".

Kevin M. Murphy

Date: 8/16/2021

I, Mark E. Zmijewski, 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, appearing to read "Mark E. Zmijewski". The signature is written in a cursive style with a large, stylized "M" and "Z".

Mark E. Zmijewski

Date: 8/16/2021

APPENDIX

Calculations Underpinning the Example

73. This appendix provides a more detailed discussion and shows the underlying calculations of the example in the body of the report, which is based on the following assumptions:

- a. At the end of Year 0, a company with a cost of capital of 10%, makes two investments: \$600 in Investment A and \$400 in Investment B.
- b. Investment A has a one-year economic life, so the company must make the same \$600 investment annually.
- c. Investment B has an infinite economic life and constant productive capacity, and thus zero economic amortization.¹¹¹
- d. The company makes no other investments and does not expect to do so in the future.
- e. The company's economic earnings (and free cash flows) are expected to be constant (no growth) in the future, all prices are assumed to remain constant (zero inflation).

74. The company's economic invested capital is equal to \$1,000 in all years (in perpetuity).

Economic earnings and free cash flows are equal to the economic return multiplied by the beginning balance of economic-based invested capital.¹¹² Accounting-based earnings, on the other hand, equal the company's economic income minus any accounting-based amortization greater than economic-based amortization; and the accounting-based ROIC is equal to accounting-based earnings divided by beginning balance of accounting-based invested capital.

75. While annual economic amortization of Investment A is 100 percent in Year 1 and economic amortization of Investment B is zero in perpetuity, we assume that accounting

¹¹¹ We use the infinite life assumption for Investment B to simplify the calculations, but the same conclusions result from assuming a finite life. We assume zero income taxes or that company will pay a fixed percentage of its economic earnings in income taxes regardless of the accounting rules used to measure accounting earnings.

¹¹² Because prices are constant (no inflation), initial invested capital minus economic amortization is equal to replacement cost in all years.

amortization for both investments is 100% in Year 1.¹¹³ In other words, we assume that both investments are treated for accounting purposes as if they are essentially expensed in Year 1. As we now illustrate, this difference between accounting amortization and economic amortization (as well as other types of differences between accounting accruals and the underlying economics) leads to false conclusions and thus, potential harmful regulatory actions when an accounting-based ROIC is used to measure economic return. We use this example to present three scenarios that differ by subsequent events once the initial investments have been made: (i) Scenario 1, in which the expected economic return at the time when the investment is made and in the subsequent periods is equal to the cost of capital, 10%; (ii) Scenario 2, in which the expected economic return at the time when the investment is made is equal to the cost of capital, 10%, but immediately drops below the cost of capital to 7%; and (iii) Scenario 3, in which the expected economic return at the time when the investment is made is equal to the cost of capital, 10%, but immediately drops below the cost of capital to 9%.

76. To summarize, assume, at the end of Year 0 a company: invests \$600 in Investment A; invests \$400 in Investment B; has no other investments and does not expect to have any other investments; its economic earnings (and free cash flows¹¹⁴) are constant (no growth);¹¹⁵ and it has a cost of capital of 10%. Assume Investment A has a one-year economic life, the company

¹¹³ Immediate accounting amortization for Investment B is essentially equivalent to not capitalizing the expenditure for Investment B but expensing it. Thus, this example assumes accounting amortization is faster than economic life. We use immediate accounting amortization and infinite economic life / no economic amortization to simplify the calculations. Other differences between accounting amortization and economic amortization also result in accounting-based ROIC inaccurately measuring the economic return.

¹¹⁴ Free cash flows are the cash flows that could be distributed to all of the company's investors after it makes all necessary investments, but without consideration of the taxes saved from any interest expense that arises from debt in its capital structure. They are the free cash flows of the company if it were entirely equity financed. See, for example, Holthausen and Zmijewski, Chapter 3.

¹¹⁵ The example also assumes all prices are constant (no inflation), thus, initial invested capital minus total economic amortization is equal to replacement cost in all years.

reinvests \$600 in Investment A annually, and Investment B has an infinite economic life (no economic amortization). Given these assumptions, the company's economic invested capital is equal to \$1,000 in all years (in perpetuity).¹¹⁶ Note that expected economic earnings are equal to the economic return multiplied by the beginning balance of economic-based invested capital; and accounting-based earnings equal the company's economic income minus any accounting-based amortization greater than economic-based amortization; and the accounting-based ROIC is equal to accounting-based earnings divided by beginning balance of accounting-based invested capital.

1. Economic Return = Cost of Capital

77. In this scenario, assume the company's expected economic return is 10%, which is equal to the company's cost of capital, and expected economic earnings equal the economic return, 10%, multiplied by the beginning balance of economic-based invested capital, \$1,000, or \$100. For Investment A, the accounting-based amortization assumption is the same as the economic-based amortization assumption, i.e. Investment A is amortized in one year. Because the company reinvests \$600 in Investment A each year, the accounting amortization for Investment A equals the economic amortization for Investment A and the company's capital expenditures. For Investment B, we use two alternative accounting amortization assumptions: (a) no accounting amortization, which is the same as the economic amortization (no economic amortization); and (b) 100% accounting amortization in Year 1, which is essentially equivalent to not capitalizing the expenditure but expensing it.

¹¹⁶ We use the infinite life assumption for Investment B to simplify the calculations, but the same conclusions result from assuming a finite life. We assume zero income taxes or that the company will pay a fixed percentage of its economic earnings in income taxes regardless of the accounting rules used to measure accounting earnings.

78. In Table 6 below, we present various economics-based and accounting-based financial performance and valuation measures. On the left side of the table, we present the financial performance and valuation measures assuming no accounting amortization for Investment B, which is the same as the economic amortization (no economic amortization). The first two rows of the table show the beginning economic invested capital, \$1,000, and the economic return, 10%, and the third row shows economic earnings, \$100 ($10\% \times \$1,000$). Economic amortization equals the entire investment in Investment A, \$600, because Investment A has a one-year useful life. The next three rows present the company's cash flows: cash flow from operations (row 5) equals the economic earnings plus economic amortization, \$700 ($\$100 + \600) because amortization is the only non-cash expense; capital expenditures (the reinvestment of \$600 in Investment A) equal economic amortization, \$600; and free cash flow equals cash flow from operations minus capital expenditures, \$100 ($\$700 - \600). In rows 9 through 14, we show the accounting-based measures.¹¹⁷ Because, in this part of the example, the accounting amortization equal the economic amortization, the invested capital, accounting amortization, accounting earnings, accounting rate of return are the same as the corresponding economic-based measures. Note, assuming the company has the opportunity to expand its operations, the company will expand its operations in this scenario, which requires making both Investments A and B, because the economic return on the expansion equals the cost of capital.

¹¹⁷ As a simplifying assumption, this example assumes there are no accruals of income or expenses.

Table 6: Scenario 1

		Accounting Amortization Same as Economic Amortization	Accounting Amortization Faster Than Economic Amortization	
		All Years	Year 1	All Future Years
1	Beginning Economic Invested Capital (EI)	\$1,000	\$1,000	\$1,000
2	Economic Rate of Return (EROIC)	10.0%	10.0%	10.0%
3	Economic Earnings (EE = EROIC × EI)	\$100	\$100	\$100
4	Economic Amortization (EAmz)	\$600	\$600	\$600
5	Cash Flow From Operations (CFO = EE + EAmz)	\$700	\$700	\$700
6	Capital Expenditures (CAPEX = EAmz)	\$600	\$600	\$600
7	Free Cash Flow (FCF = CFO - CAPEX = EE)	\$100	\$100	\$100
8	Economic Return minus COC	0.0%	0.0%	0.0%
9	Beginning Accounting Invested Capital (AI)	\$1,000	\$1,000	\$600
10	Accounting Amortization (AAmz)	\$600	\$1,000	\$600
11	Accounting Earnings (AE = CFO - AAmz)	\$100	-\$300	\$100
12	Accounting Rate of Return (ROIC = AE/AI)	10.0%	-30.0%	16.7%
13	Economic Value Added (EVA = AE - COC × AI)	\$0	-\$400	\$40
14	ROIC minus COC (%)	0.0%	-40.0%	6.7%
15	Value at end of Year 0	\$1,000		\$1,000
16	Net Present Value of Investment	\$0		\$0
17	Internal Rate of Return (FCF / EI)	10.0%		10.0%

79. The company has a value equal to the value of the initial investment of \$1,000 ($\$100/0.1$) and thus, a net present value (value minus initial investment) equal to \$0, because the economic return equals the cost of capital.¹¹⁸ The assumptions for the accounting rules are such that accounting rules mirror the underlying economics, and as a result, the accounting-based ROIC, 10% ($\$100/\$1,000$) equal the economic return, 10%. However, this is not the result that occurs when the accounting rules do not mirror the underlying economics, which we show on the right side of Table 6 above.

80. On the right side of Table 6, we present the financial performance and valuation measures assuming the accounting amortization for Investment B is not \$0 but the amortization for Investment B is immediate (100% of the investment is amortized the day after the investment

¹¹⁸ We also present economic value added (“EVA”) because the Stewart VS discusses EVA. EVA is equal to accounting earnings minus the cost of capital multiplied by beginning invested capital, \$0 ($\$100 - 10\% \times \$1,000$). The value of the company using EVA is equal to the present value of EVA plus beginning invested capital, \$1,000 ($\$0/0.1 + \$1,000$). See Holthausen and Zmijewski, Chapter 7, for details on EVA and valuing a company using EVA.

or the first day of Year 1), which is essentially equivalent to not capitalizing the expenditure but expensing it.¹¹⁹ The economic-based financial performance measures (rows 1 through 9) are unaffected by the change in the accounting amortization because accounting rules for (non-cash) accruals do not affect the company's free cash flows, economic amortization, or valuation. The value of the company is still \$1,000 ($\$100/0.1$).¹²⁰

81. However, because of the different accounting amortization in Year 1, the accounting-based financial performance measures differ in Year 1 from all of the future years. As seen on the right side of Table 6, the accounting-based financial performance measures present a false conclusion that the company earns an economic return less than its cost of capital in Year 1, and more than its cost of capital in all subsequent years after Year 1. In Year 1, the company's accounting amortization is \$1,000 because it amortized 100% of both Investments A and B, even though the economic amortization is \$600, and accounting earnings are lower than economic earnings by the amount of the additional accounting amortization above the economic amortization, \$400 ($\$1,000 - \600). Accounting earnings equal -\$300 instead of \$100, the accounting rate of return is -30% ($-\$300/\$1,000$) instead of 10%, and the accounting rate of return minus the cost of capital is -40% instead of 10%.

82. In all future years, the company's accounting earnings equal its economic earnings, \$100, because the company no longer amortizes Investment B, however, because the accounting-based invested capital was reduced by the accounting amortization of Investment B, the invested

¹¹⁹ A value of \$1,000 and invested capital of \$600 implies a market value to book value of 1.67 after Year 1 ($\$1,000/\600). Depending on the scenario, the assumptions in this example imply a firm value to invested capital ratio above 1.0 but well below 2.0 after Year 1. The enterprise value to invested capital ratios for the four publicly traded railroads over the last ten years range from 1.5x to 3.9 (S&P Capital IQ).

¹²⁰ As noted above, the value of the company, which includes valuing the company using excess earnings or EVA, is unaffected by a company's accounting rules. For this example, EVA in Year 1 is -\$400 ($-\$300 - 10\% \times \$1,000$) and \$40 in all future years ($\$100 - 10\% \times \600); and the value of the company using EVA is still \$1,000 ($-\$400/1.1 + \$40/0.1/1.1 + \$1,000$).

capital as of the end of Year 1 is only \$600, and the accounting-based ROIC is 16.7% (\$100/\$600). The accounting rate of return minus the cost of capital is 6.7% instead of 0%. As shown in this example, even though the company's economic return equals its cost of capital, the inaccurate accounting-based ROIC falsely concludes that the company's economic return is 6.7% greater than its cost of capital after Year 1, when, in fact, the company's economic return equals its cost of capital in all years.

83. In sum, this example shows how accounting-based ROIC can provide false conclusions that a company's economic return is greater than its cost of capital when in reality it is not. The Shipper Submissions implicitly assume that regulators ignore the false conclusions from the inaccurate accounting-based financial performance measures and do not adjust the company's "prices" sometime after Year 1 to reduce its false and overstated accounting-based ROIC to its cost of capital. Contrary to the Shipper Submissions, because of harmful regulatory effects that can result from using inaccurate accounting-based ROIC as a measure of economic return, the claims in the Shipper Submissions that if a company's accounting-based ROIC equals its cost of capital it will be able to "cover all its costs" and "the investment in, and returns due to, fully depreciated assets are fully realized in prior periods," are unsupported and erroneous. Lastly, this example also shows that the company does not need to earn an economic return above its cost of capital to generate cash flows to distribute to its investors. To the contrary, companies earning an economic return equal to, even less than,¹²¹ its cost of capital generates substantial free cash flows (which are the cash flows after deducting capital expenditures) to distribute to its investors (for example, dividends and stock repurchases).

¹²¹ See the next two scenarios.

84. Next, we extend the example to have the company's expected economic return drop from 10% to 7% and show how accounting-based ROIC can provide false conclusions that a company's economic return is greater than its cost of capital, even when the company's economic return is less than its cost of capital.

2. Economic Return < Cost of Capital

85. The only change in this example is that, instantaneously after the company makes Investment A and B, its expected economic return decreases from 10% to 7%, or 3% below the company's cost of capital of 10%. Naturally, the company's free cash flows and its value will drop. The company's free cash flows drop from \$100 to \$70 and the company's value drops from \$1,000 to \$700 (a decrease of 30%). Note, the company would not expand its operations in this scenario because expansion requires making both Investments A and B, which generate an economic return of 7%, which is less than the 10% cost of capital. However, because the company requires both investments to operate, it will continue to make the ongoing incremental investments in Investment A to maintain its existing productive capacity even though the economic return on the company's total investment capital (\$1,000) is less than the cost of capital.¹²²

86. On the left side of Table 7, we re-calculate all of the economic-based and accounting-based financial performance and valuation measures based on a 7% expected economic return and a 10% cost of capital. Because the company has accounting amortization that is the same as its economic amortization, the accounting-based financial performance measures are consistent

¹²² If the company does not make the \$600 incremental investment in Investment A, the company's free cash flows fall to \$0; however, if the company's makes the \$600 incremental investment in Investment A, the company generates incremental cash flows of \$70, which has an economic return greater than the 10% cost of capital.

with the economic-based financial performance measures; for example, the accounting-based ROIC is also 7%.¹²³

Table 7: Scenario 2

		Accounting Amortization Same as Economic Amortization	Accounting Amortization Faster Than Economic Amortization	
		All Years	Year 1	All Future Years
1	Beginning Economic Invested Capital (EI)	\$1,000	\$1,000	\$1,000
2	Economic Rate of Return (EROIC)	7.0%	7.0%	7.0%
3	Economic Earnings (EE = EROIC × EI)	\$70	\$70	\$70
4	Economic Amortization (EAmz)	\$600	\$600	\$600
5	Cash Flow From Operations (CFO = EE + EAmz)	\$670	\$670	\$670
6	Capital Expenditures (CAPEX = EAmz)	\$600	\$600	\$600
7	Free Cash Flow (FCF = CFO - CAPEX = EE)	\$70	\$70	\$70
8	Economic Return minus COC	-3.0%	-3.0%	-3.0%
9	Beginning Accounting Invested Capital (AI)	\$1,000	\$1,000	\$600
10	Accounting Amortization (AAmz)	\$600	\$1,000	\$600
11	Accounting Earnings (AE = CFO - AAmz)	\$70	-\$330	\$70
12	Accounting Rate of Return (ROIC = AE/AI)	7.0%	-33.0%	11.7%
13	Economic Value Added (EVA = AE - COC × AI)	-\$30	-\$430	\$10
14	ROIC minus COC (%)	-3.0%	-43.0%	1.7%
15	Value at end of Year 0	\$700		\$700
16	Net Present Value of Investment	-\$300		-\$300
17	Internal Rate of Return (FCF / EI)	7.0%		7.0%

87. This is not the case when accounting amortization is not the same as the economic amortization. On the right side of Table 7, we present the financial performance and valuation measures assuming the accounting amortization for Investment B is immediate. As shown in Table 7, even though the company's economic return is less than the cost of capital, the accounting-based financial performance measures still present a false conclusion that the company has an economic return greater than its cost of capital in all subsequent years after Year 1. In Year 1, the company's accounting-based ROIC is -33%, and in all future years, its accounting-based ROIC is 11.7% (\$70/\$600).¹²⁴ The accounting-based ROIC minus the cost of

¹²³ For this example, EVA is -\$30 (\$70– 10% x \$1,000) in all years, and the value of the company using EVA is \$700 (-\$30/0.1 + \$1,000).

¹²⁴ In Year 1, the company's accounting earnings is equal to -\$330 instead of \$70, the accounting rate of return is -33% (-\$330/\$1,000) instead of 7%, and the accounting-based ROIC minus the cost of capital is -43% instead of -3%. In all future years, the company's accounting earnings is equal to its economic earnings, \$70; however,

capital is 1.7% instead of -3.0%, leading to the false conclusion that the company's economic return is 1.7% greater than its cost of capital.¹²⁵

88. In sum, this example shows (a) that accounting-based ROIC can provide false conclusions that a company's economic return is greater than its cost of capital, even when the company's economic return is less than its cost of capital, and (b) that even a company earning an economic rate of return less than its cost of capital generates substantial free cash flows (which are the cash flows after deducting capital expenditures) to distribute to its investors (for example, dividends and stock repurchases).

89. In the next (and last) extension of the example, the company's expected economic return recovers from 7% to 9%, which shows that an increase in the value of the company does not lead to the conclusion that the company's economic return is greater than its cost of capital.

3. Economic Return Partially Recovers but Remains < Cost of Capital

90. The only change in this example is that, instantaneously after the company's expected economic return decreased to 7%, it instantaneously recovered to 9%, which is 1% lower than the company's 10% cost of capital. Naturally, the company's free cash flows and its value will increase. The company's free cash flows increase from \$70 to \$90, and the company's value increases from \$700 to \$900 (+29%). Note, the company would also not expand its operations in this scenario because expansion requires making both Investments A and B, which generate an economic return of 9%, which is less than the 10% cost of capital. However, because the

because the accounting-based invested capital was reduced by the accounting amortization of Investment B, the invested capital as of the end of Year 1 is only \$600, and the accounting-based ROIC is 11.7% (\$70/\$600).

¹²⁵ For this example, EVA in Year 1 is -\$430 ($-\$330 - 10\% \times \$1,000$) and \$10 in all future years ($\$70 - 10\% \times \600); and the value of the company using EVA is \$700 ($-\$430/1.1 + \$10/0.1/1.1 + \$1,000$).

company requires both investments to operate, it will continue to make the ongoing incremental investments in Investment A to maintain its existing productive capacity even though the economic return on the company's total investment capital (\$1,000) is less than the cost of capital.¹²⁶

91. On the left side of Table 8, we re-calculate all of the economic-based and accounting-based financial performance and valuation measures based on a 9% expected economic return and a 10% cost of capital. Because the company has the accounting amortization that is the same as its economic amortization, the accounting-based financial performance measures are consistent with the economic-based financial performance measures; for example, the accounting-based ROIC is also 9%.¹²⁷

¹²⁶ If the company does not make the \$600 incremental investment in Investment A, the company's free cash flows fall to \$0; however, if the company's makes the \$600 incremental investment in Investment A, the company generates incremental cash flows of \$90, which has an economic return greater than the 10% cost of capital.

¹²⁷ For this example, EVA is -\$10 ($\$90 - 10\% \times \$1,000$) in all years, and the value of the company using EVA is \$900 ($-\$10/0.1 + \$1,000$).

Table 8: Scenario 3

		Accounting Amortization Same as Economic Amortization	Accounting Amortization Faster Than Economic Amortization	
		All Years	Year 1	All Future Years
1	Beginning Economic Invested Capital (EI)	\$1,000	\$1,000	\$1,000
2	Economic Rate of Return (EROIC)	9.0%	9.0%	9.0%
3	Economic Earnings (EE = EROIC × EI)	\$90	\$90	\$90
4	Economic Amortization (EAmz)	\$600	\$600	\$600
5	Cash Flow From Operations (CFO = EE + EAmz)	\$690	\$690	\$690
6	Capital Expenditures (CAPEX = EAmz)	\$600	\$600	\$600
7	Free Cash Flow (FCF = CFO - CAPEX = EE)	\$90	\$90	\$90
8	Economic Return minus COC	-1.0%	-1.0%	-1.0%
9	Beginning Accounting Invested Capital (AI)	\$1,000	\$1,000	\$600
10	Accounting Amortization (AAmz)	\$600	\$1,000	\$600
11	Accounting Earnings (AE = CFO - AAmz)	\$90	-\$310	\$90
12	Accounting Rate of Return (ROIC = AE/AI)	9.0%	-31.0%	15.0%
13	Economic Value Added (EVA = AE - COC × AI)	-\$10	-\$410	\$30
14	ROIC minus COC (%)	-1.0%	-41.0%	5.0%
15	Value at end of Year 0	\$900		\$900
16	Net Present Value of Investment	-\$100		-\$100
17	Internal Rate of Return (FCF / EI)	9.0%		9.0%

92. Again, this is not the case when accounting amortization is not the same as the economic amortization. On the right side of the table, we present the financial performance and valuation measures assuming the accounting amortization for Investment B is immediate. As shown in the table, even though the company's economic return is less than the cost of capital, the accounting-based financial performance measures still present a false conclusion that the company has an economic return greater than its cost of capital in all subsequent years after Year 1. In Year 1, the company's accounting-based ROIC is -31%, and in all future years, its accounting-based ROIC is 15.0% (\$90/\$600).¹²⁸ The accounting-based ROIC minus the cost of capital is 5.0% instead of -1.0%, leading to the false conclusion that the company's economic return is 5.0% greater than its cost of capital.¹²⁹

¹²⁸ In Year 1, the company's accounting earnings is equal to -\$310 instead of \$90, the accounting rate of return is -31% (-\$310/\$1,000) instead of 9%, and the accounting-based ROIC minus the cost of capital is -41% instead of 9%. In all future years, the company's accounting earnings is equal to its economic earnings, \$90, however, because the accounting-based invested capital was reduced by the accounting amortization of Investment B, the invested capital as of the end of Year 1 is only \$600, and the accounting-based ROIC is 15.0% (\$90/\$600).

¹²⁹ For this example, EVA in Year 1 is -\$410 (-\$310 - 10% × \$1,000) and \$30 in all future years (\$90 - 10% × \$600); and the value of the company using EVA is \$900 (-\$410/1.1 + \$30/0.1/1.1 + \$1,000).

93. In sum, this extension of the example shows that even though the company has an economic return less than its cost of capital, it can have a substantial, 29%, increase in value, thus, an increase in the value of the company does not lead to the conclusion that the company's economic return is greater than its cost of capital.

EXHIBIT 2

**Economists' Statement in Support of
the Staggers Act, *Coal Rate
Guidelines, Nationwide*, ICC Docket
No. EP 347 (Sub-No. 1) (filed Feb. 25,
1985)**

February 25, 1985

Economists' Statement in Support of
the Staggers Act

We, the undersigned economists, understand that in the ninety-ninth Congress, amendments are likely to be proposed that would substantially alter major provisions of the Staggers Rail Act of 1980, with the general effect of reducing the freedom of individual railroads to set their rates in accordance with market forces and lessening railroads' opportunity to earn an adequate return on capital. Without commenting on the details of the Act or on the specifics of the Interstate Commerce Commission's implementation of it, we do express our judgement that, in its main thrust, the Staggers Act has brought about a regulatory regime much more attuned to the state of competition that now exists among the various modes of transportation.

The Staggers Rail Act of 1980 was part of a broad, long-term effort to eliminate inefficient economic regulation. That movement, with its enhanced reliance on market forces, has affected such diverse sectors of the economy as transportation, telecommunications and finance. It has its intellectual roots in economic analysis of recent decades which showed that economic regulation has often failed to serve the interest of the public at large; that effective competition serves as a better stimulant to economic efficiency than governmental intervention in the details of market activity and that many industries, including rail transportation, have faced greatly increased competition during the period since World War II.

Partly because of the failures of economic regulation, the railroads, during the years prior to the Staggers Act, deteriorated to a point where their ability efficiently to serve the transportation demands of the country had been severely impaired. Congress was unwilling to see further deterioration of the railroads so long as there was substantial demand for their services. Congress also rejected both railroad nationalization and major new direct rail subsidies, at taxpayers expense. Instead, it elected to provide the railroads greater opportunity to become self-sustaining, by increasing their freedom to price their services as warranted by conditions in the competitive markets they serve. At the same time, the Act provided for the identification of markets in which the railroads held excessive market power and provided for continuing regulation of prices in those markets.

In light of the fact that the Staggers Act stopped short of complete economic deregulation, a number of issues were raised and addressed in the Act and in its implementation, such as:

1. the level of revenues that railroads must be permitted to earn in order to build and maintain the capability to serve their markets.
2. the criteria on which to base a finding that competition is inadequate, i.e. that "market dominance" is present;
3. the criteria for setting rates, given market dominance.

We subscribe to the following principles in addressing these issues:

1. The appropriate standard for determining the adequacy of railroad revenues is a rate of return equal to the current cost of capital on the replacement value of all rail assets that are required to meet the demands for railroad service, regardless of the source of funds used in investing in those assets.

2. In determining whether a railroad faces adequate competition in a particular market, it is appropriate for the Interstate Commerce Commission to consider all sources of competition in that market, including: competition from other carriers moving a given product between the given points of origin and destination, competition arising from consignees' ability to obtain the same product from other sources and to obtain close substitute products from any source, and shippers' ability to sell in other markets.

3. In setting "reasonable rates", which we take to mean rates that encourage the efficient use of resources not only of the railroads and their customers but also of the entire economy, the following principles should apply:

- o Where marginal cost pricing produces total revenues that are less than total cost, some form of pricing that reflects the responsiveness of demand to price (Ramsey-like pricing) is economically efficient and, where returns are below the market cost of capital, is essential for railroad financial viability;

- o Rate prescriptions based on fully allocated cost or other ratios of rate to cost are, in such circumstances, arbitrary and inefficient;

o Defined as the cost a rail carrier would currently have to incur to furnish a particular service or group of services in isolation, "stand-alone" costs provide, in principle, an objective standard for setting the maximum price a railroad, whose revenues are inadequate, should be permitted to charge in markets where competition is not effective.

In summary, we believe that the Staggers Rail Act of 1980 to have been a substantial step toward rationalizing transportation policy and that continued pursuit of the principles stated above would serve the interests of the public at large.

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