BEFORE THE

SURFACE TRANSPORTATION BOARD

Ex Parte No. 722

Railroad Revenue Adequacy

Consolidated Hearing Testimony of

Jeffrey O. Moreno
Paul M. Donovan
Dr. Kevin W. Caves
Thomas D. Crowley
Henry J. Roman

On Behalf of

Concerned Shipper Associations

Dated: July 20, 2015

Filing Contains Color Images

Contents

I. INTRODUCTION AND EXECUTIVE SUMMARY

This narrative provides an overview and supporting citations for the consolidated testimony by witnesses for the Concerned Shipper Associations ("CSA")[1] at the hearing scheduled in this proceeding for July 22-23, 2015. The witnesses on behalf of the CSA are Jeffrey O. Moreno, Paul M. Donovan, Dr. Kevin W. Caves, Thomas D. Crowley, and Henry J. Roman.

The primary focus of this testimony is upon the subject matter relevant to the EP 722 proceeding, and more specifically: (1) the critical role of the revenue adequacy constraint in implementing Ramsey pricing; (2) the proper time period for measuring revenue adequacy; (3) potential approaches for implementing the revenue adequacy constraint, including a benchmark method, a rebate method, and a rate increase cap; (4) the most appropriate indicators of revenue adequacy; and (5) the impact of revenue adequacy upon rail service and investment. This testimony addresses these topics from both economic and legal perspectives, working within the constraints of the existing statutory framework.

The key points made by this testimony are:

- Stand Alone Cost is not the "gold standard" for determining the reasonableness of freight rail rates. In fact, the revenue adequacy standard is superior for providing meaningful and economically justified rate relief.
- Our testimony demonstrates how a revenue adequacy standard can be applied in a way that is practical, effective, economically supportable, and consistent with the STB's Congressional mandate.
- The testimony presents three potential methodologies for applying the revenue adequacy standard in STB rate reviews.
    - The Benchmark approach uses statistical methods to compare a rail rate paid by a captive shipper to rates for similar shipments in competitive markets. The

[1] The Concerned Shipper Associations are the American Chemistry Council, the Chlorine Institute, The Fertilizer Institute, and the National Industrial Transportation League.

Transportation Research Board recently endorsed this approach and constructed a model demonstrating how it could be used in practice.

  - The rebate approach would adjust rates for a shipper that brings a successful complaint, based on a calculation of the "excess" revenue[2] (over and above revenue adequacy) from the captive routes on the railroad's network.
  - An additional methodology could be used limit the ability for a railroad that was already revenue adequate to further increase rates on a captive shipper.

- The railroads' robust financial performance during and since the "Great Recession" demonstrates their long-term financial viability and their ability to attract ample investment capital. Yet the STB's own revenue adequacy determinations, until recently, consistently found carriers to be revenue inadequate. This is a strong indicator that the STB's current approach to assessing revenue adequacy sets a conservatively high bar, perhaps too high.
- The proposed approaches would not adversely impact rail service and investment. By definition, the revenue adequacy standard protects a railroad's ability to be profitable and attract investment. Rates in competitive markets would remain outside of STB oversight and there would be no ceiling on a railroad's overall profitability.
- The alternative – a failure to implement an effective revenue adequacy standard – would allow railroads to earn excess returns on captive shippers in perpetuity by charging economically inefficient rates.

II. REVENUE ADEQUACY IS SUPERIOR TO SAC FOR SUPPORTING EFFICIENT PRICING STRUCTURES AND MEANINGFUL RATE RELIEF

A. SAC Is Not the "Gold-Standard" of Economically Efficient Pricing

Throughout their comments in this proceeding, the rail industry has argued that a revenue adequacy rate constraint is economically unjustified and that Stand-Alone Cost ("SAC") is the "gold standard" for regulating captive shipper rates. As Dr. Caves explained in his Verified Statement, SAC does not produce the most economically efficient pricing, and revenue adequacy is superior to SAC for that purpose.[3] The SAC of a given service (or group of

---

[2] Throughout this testimony, the terms "surplus" and "surplus revenue," as well as "excess revenue" and "excess profit," are used to refer to revenues or profits earned by a railroad beyond the level required to cover its cost of capital.

[3] Verified Statement of Kevin Caves and Hal Singer *STB Ex Parte No. 722 (Railroad Revenue Adequacy), Reply Comments of Concerned Shipper Associations* – Appendix B (November 4, 2014), Part I.B; Part II.B.

services) is defined as the cost that a firm would incur if it were to provide the service on its own, without offering any additional services provided by the enterprise.[4] If a multi-product firm charges a price equal to SAC, then by definition, it is failing to pass on efficiencies to its customers.[5]

The underlying justifications of the SAC test, to prevent entry from inefficient competitors and to prevent cross subsidies in a fully regulated industry constrained to earn zero economic profit, are not applicable to railroad rate regulation. Consequently, the adoption and application of the SAC test in the railroad industry has "only a tenuous connection with its claimed intellectual foundations."[6] Therefore, it is both reasonable and necessary for the Board to implement revenue adequacy as an alternative rate constraint to SAC.

B. The Revenue Adequacy Concept Underlies More Efficient Pricing Structures

The Board correctly declared, in *Coal Rate Guidelines*, that revenue adequacy is "the logical first constraint on a carrier's pricing."[7] Dr. Caves has explained how more efficient pricing structures can be realized by applying the economic principles underlying Ramsey pricing to the rates paid by captive shippers. The Ramsey approach permits sufficient markups over an efficient incumbent's incremental costs such that the excess revenues permit the incumbent to recover the actual fixed costs of the efficient integrated network costs (as opposed to the hypothetical costs of a less-efficient competitor), as well as reasonable returns to

---

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

[5] Verified Statement of Gerald Faulhaber, Sept. 5 2014 at 8 ("[I]f a particular service is priced exactly at stand-alone cost, then by definition, it is sharing *none* of the benefits of scale and scope.")

[6] Pittman, *supra*, at 313.

[7] *Coal Rate Guidelines, Nationwide*, 1 I.C.C.2d 520, 534 (1985).

investment.[8] More efficient pricing structures can be implemented under very general conditions, even when it is infeasible to implement Ramsey pricing precisely. Indeed, *any* adjustment that moves rates closer to incremental costs—while still satisfying revenue adequacy—will result in a more efficient pricing structure.[9]

Ramsey pricing principles attempt to minimize the inefficiency that inevitably results when prices diverge from incremental costs, subject to the constraint that a firm must earn sufficient revenue to cover all of its costs (including fixed costs, incremental costs, and the cost of attracting sufficient investment). The concept of revenue adequacy is integral to the Ramsey framework, defining the most relevant constraint to a more economically efficient pricing structure.[10] The *Coal Rate Guidelines* articulate a revenue adequacy standard grounded in the basic economic principle that the railroad industry must ultimately cover its costs and deliver sufficient returns to attract and retain investment over the long run,[11] while also recognizing an upper limit to the rates that should be paid by captive shippers.[12]

---

[8] Caves & Singer, *supra,* at 5; Part II.B; Part III.B; see also JEAN-JACQUES LAFFONT & JEAN TIROLE, A THEORY OF INCENTIVES IN PROCUREMENT AND REGULATION 200 (MIT Press 1993); see also *Economists' Statement in Support of the Staggers Act*, (February 25, 1985) ("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.")

[9] Caves & Singer, *supra*, Part III.B; Figure 1.

[10] *Coal Rate Guidelines* at 526-27 ("Under Ramsey pricing, each price or rate contains a mark-up above *the long-run marginal cost* of the product or service to cover a portion of the unattributable costs. The unattributable costs are allocated among the purchasers or users in inverse relation to their demand elasticity. Thus, in market [sic] where shippers are very sensitive to price changes, a highly elastic market, the mark-up would be smaller than in a market where shippers are less price sensitive. The sum of the mark-ups equals the *unattributable costs of an efficient producer*. Applied to the railroad industry, Ramsey pricing would permit an efficient carrier to cover all of its costs (including the cost of capital) and thus become *revenue adequate*.")

[11] *Coal Rate Guidelines* at 535. ("If railroads cannot earn the fair market rate of return, their ability both to retain existing investments and obtain new capital will be impaired, because both the existing and prospective funds could be invested elsewhere at a more attractive rate of return.")

[12] *Coal Rate Guidelines* at 535-36 ("captive shippers should not be required to continue to pay differentially higher rates than other shippers when some or all of that differential is no longer necessary to ensure a financially sound carrier capable of meeting its current and future service needs.")

III. IMPLEMENTING REVENUE ADEQUACY

The Concerned Shippers and their economic experts have given detailed consideration to how the revenue adequacy constraint can be applied in a manner that is practical, effective, economically supportable, and within existing statutory parameters. Dr. Caves addresses the proper time period for measuring revenue adequacy and Mr. Crowley illustrates how to calculate the excess revenue earned above a revenue adequate level over the relevant time period. Both witnesses also present three potential methodologies for applying the revenue adequacy constraint to regulate captive shipper rates: a "Yardstick" or "Benchmark" approach; two variations upon a "Rebate" approach; and a rate increase constraint.

A. A Proper Time Period For Measuring Revenue Adequacy

If economic conditions were invariant over time, profits in any single year could perfectly predict profits in any subsequent year. In reality, firms (and their investors) tend to earn higher profits towards the peak of the business cycle and lower profits towards the trough of a business cycle, when the economy is in recession. Information on profitability from one randomly selected year out of the business cycle may not be representative of long-run profitability in a firm or an industry, and may therefore be less accurate in predicting future returns, which is what investors care about.

One can more accurately gauge long-run profitability (and thus expected future profitability) by assessing economic performance over the course of a multi-year business cycle. The ICC was on the right track when it suggested that a business cycle could be appropriate in *Coal Rate Guidelines*.[13]

---

[13] *Coal Rate Guidelines* at 536 ("We emphasize that revenue adequacy is a long-term concept that calls for a company, *over time*, to average return on investment equal to its cost of capital. In any industry there are business cycles producing years during which earnings exceed projections and years when they fall short of the target.").

Although it is not possible for investors to know the duration of future business cycles with certainty, a reasonable estimate of the expected duration is the average length of previous business cycles. According to the National Bureau of Economic Research (NBER), the average business cycle length in the post-World War II period (eleven cycles) is approximately 69 months.[14] Accordingly, it is reasonable to measure revenue adequacy over a period of approximately six years.

Notably, the most recent US business cycle includes the severe economic downturn of 2007 – 2009 commonly referred to as the "Great Recession," which is universally recognized by economists as significantly longer and significantly more severe (as measured by losses in both employment and output) than any other recession in the post-World War II period.[15] The railroads' robust financial performance during and since the Great Recession is powerful evidence of their long-term financial viability, and of their ability to compete in the equity markets for investment capital with other industries.[16]

Applying this logic to the STB's existing revenue adequacy framework implies that a railroad generating tax-adjusted revenues sufficient to meet or exceed the railroad industry cost of capital over a six-year period should be deemed revenue adequate. Such an approach for

---

[14] http://www.nber.org/cycles.html.

[15] See, e.g., Federal Reserve Bank of Minneapolis, The Recession and Recovery in Perspective, *available at* https://www.minneapolisfed.org/publications/special-studies/rip/recession-in-perspective.

[16] See *The Current Financial State of the Class I Freight Rail Industry,* Report of Office of Oversight and Investigations, U.S. Senate Committee on Commerce, Science and Transportation (September 15, 2010), at 5- 6 ("In fact, the railroads' growth in earnings and profitability has outpaced almost all of the other large industries it competes with for capital in the equity markets. Over the last decade, the large railroad companies have reported higher revenues and stable or only slowly-growing expenses, even during the recent economic recession. This relationship between operating expenses and revenues is known as the "operating ratio" and is an important indicator of financial performance in many transportation sectors, including the rail and trucking industries.") See also *Update on the Financial State of the Class I Freight Rail Industry,* Report of the Office of Oversight and Investigations, U.S. Senate Committee on Commerce, Science and Transportation (November 21, 2013), at i (noting that Class I railroad financial performance "is at its strongest since the passage of the Staggers Act. The positive financial trends identified in the 2010 Staff Report have continued in the most recent years, and the railroads appear confident they will continue for the foreseeable future.")

defining revenue adequacy makes intuitive sense. A railroad with an average return on investment ("ROI") higher than the STB's current cost of capital means that the railroad's revenues are sufficiently high to cover its operating expenses,[17] while allowing for a sufficient risk-adjusted return to capital holders.

In Attachment No. 1, Mr. Crowley has applied the above criteria to the Union Pacific Railroad Company ("UP") over the 2009 to 2014 business cycle to demonstrate that UP is revenue adequate. Attachment No. 1, Column (2) identifies the STB's determination of the railroad industry cost of capital over the six-year period 2009 to 2014.[18] Attachment No. 1, Column (3) shows the UP's tax-adjusted revenue shortfalls and surpluses, by year, over the same time period as determined by the STB in its calculation of UP's Revenue Shortfall Allocation Method ("RSAM") ratios.[19] The data in Attachment No. 1, Column (3) shows that UP has generated tax-adjusted surpluses every year, except for 2009, when the country experienced the largest economic downturn in the post-World War II period.

Simply comparing shortfalls and surpluses over time does not in itself indicate whether a railroad is revenue adequate. This is due to the time value of money and the opportunity cost of investment. For a railroad to be considered revenue adequate, it must generate sufficient

---

[17] The STB's revenue adequacy methodology calculates return on investment by dividing Net Railway Operating Income ("NROI") by the average net investment base. A railroad's NROI is equal to its railroad operating revenues less its operating expenses. Therefore, any positive NROI indicates the railroad is generating sufficient revenues to recover its operating expenses.

[18] Since the STB has not issued its 2014 cost of capital decision, Mr. Crowley has used the AAR's estimate of the 2014 railroad cost of capital. See "Comments of the Association of American Railroads and Its Member Railroads" in Ex Parte No. 558 (Sub-No. 18), *Railroad Cost of Capital – 2014*, filed April 20, 2015.

[19] As with the 2014 cost of capital, the STB has not yet calculated the UP's 2014 RSAM ratio. However, the data required to calculate UP's 2014 tax-adjusted revenue shortfall or surplus are available. Specifically, the UP's 2014 Schedule 250 data provides the railroad's average net investment base and NROI for the year, while the AAR's filings in Ex Parte No. 682 (Sub-No. 6) *Annual Submission of State Tax Information for Use in the Revenue Shortfall Allocation Method (2014),* and Ex Parte No. 558 (Sub-No. 18), *Railroad Cost of Capital- 2014*, provide the UP's weighted average state tax rate and railroad industry cost of capital, respectively.

revenues over the business cycle on a common dollar basis to cover all operating and capital costs. Attachment No. 1, Column (4) shows this to be the case for UP. Column (4) calculates the value of each year's surpluses or shortfalls in 2014 dollars using the railroad cost of capital to calculate each value.[20] Next, the present value of the annual shortfalls and surpluses are summed over the six-year period, showing that even on a present value basis, UP generated a net surplus over the annual six-year business cycle. This net surplus means that UP generated more than sufficient revenues, after accounting for taxes at statutory levels, to recover its operating costs and to generate a return on its investment sufficient to cover its cost of capital over a six-year business cycle.

B. Yardstick (or "Benchmark") Method

1. Conceptual Explanation

As Dr. Caves noted in his Verified Statement, one potential solution for bringing rates closer to economically efficient levels is to use statistical methods to predict the rate that a captive shipper would pay if its shipments were subject to more intense competition.[21] Given a sample of competitive shipments, and given relevant characteristics of those shipments (such as distance moved, car type, commodity, shipment size, etc.), a statistical model can be constructed to quantify the relationship between shipment characteristics and competitive rates.

Once the model has been built, shippers in captive markets could use the model to compare the rates that they actually pay to the rates paid by shippers of similar shipments in

---

[20] This present value calculation is essentially the same approach the STB uses in its Discounted Cash Flow ("DCF") models in stand-alone cost ("SAC") cases to determine the present value of expected future overpayments, except for dividing the future overpayments by the compounded railroad cost of capital, this approach multiples the historic surpluses by the compounded railroad cost of capital.

[21] Caves & Singer, *supra*, at 20-23.

competitive markets.[22] In essence, a captive shipper would submit the characteristics of his shipment to the model (perhaps through an interactive website); the model would then report the predicted competitive rate for such a shipment. The more the shipper's actual rate exceeds the predicted rate, the more likely it would be that the differential is attributable to the exercise of market power.

To illustrate, consider a simplified regression model of the form below. $Actual\_Rate_i$ represents the actual rate (measured in cents per ton-mile) paid for competitive shipment i, while $Distance_i$ represents the distance traveled (measured in miles). The coefficient β_1 is expected to be negative; shipments over greater distances tend to charge lower prices per ton-mile.[23] The term ε_i represents random statistical noise. For ease in exposition, it is assumed for purposes of this example that rates are not systematically affected by any variable other than distance. (In practice, many other explanatory variables would be added).

$$Actual\_Rate_i = \beta_0 + \beta_1 Distance_i + \varepsilon_i$$

Once the regression model has been estimated, one can generate an estimate of the competitive rate that should be paid for a shipment over any given distance. For instance, suppose that shipper A wants to challenge its rate, denoted $Actual\_Rate_A$, paid for a shipment over some distance, denoted $Distance_A$. The predicted competitive rate for the shipment is given by the prediction equation below.[24]

$$Predicted\_Rate_A = \beta_0 + \beta_1 Distance_A$$

---

[22] If necessary, this could be done with more recent data than were used to estimate the model—effectively using stable pricing patterns from prior years to estimate competitive prices in current and future years. For example, the illustrative model constructed by the TRB utilized CWS data for 2000 – 2013, which were considered "reflective of industry circumstances today and relevant for current policy assessment." See TRB Report at 28.

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

[24] The coefficients in the prediction equation stand for econometric estimates of β_0 and β_1.

The ratio R of the shipment's actual rate to its predicted competitive rate can be computed as follows:

$$R = (Actual\_Rate_A)/(Predicted\_Rate_A)$$

If R were found to be close to one (or less than one), the shipper would have no basis for a challenge. But if R were calculated to be sufficiently greater than one—in particular, if R exceeded some predetermined R_{MAX}, with $R_{MAX} > 1$— the shipper's rates would "pass the screen," and could be judged unreasonable. In this case, the STB would need to determine the extent to which the shipper's rates should be reduced. In principle, the STB could adjust rates downward until $R = 1$. However, a more conservative approach would adjust the shipper's rate downward until $R = R_{MAX}$. This would preserve the railroad's ability to set differential prices to captive shippers, while granting coherent, consistent, and transparent rate relief to those shippers.

As the Transportation Research Board ("TRB") observes, the benchmark method "should not threaten revenue adequacy because regulators would be able to set the strictness of the screen—that is, the amount by which a rate can exceed its predicted competitive level before being subject to challenge."[25] Whatever the results of the regression model ultimately adopted by the STB, R_{MAX} could always be calibrated to target rate relief to the subset of captive shippers that is most likely subject to unreasonably high rates, without jeopardizing a railroad's revenue adequacy.

---

[25] TRB Report at 4.

2. The Benchmark Method is Implementable Using the CWS, Supplemented With Obtainable Data

Implementation of the benchmark method is one of the TRB's primary recommendations.[26] The TRB constructed a prototype for such a model, and demonstrated how it could be used in practice to identify rates that are unusually high compared with rates for comparable traffic subject to competition.[27] The TRB's example shows how data already available in the CWS, supplemented with data measuring the availability of competing transportation modes, can be used to construct the type of regression models that would underlie the benchmark method.[28]

The TRB constructed its illustrative model using CWS data sets spanning 2000 – 2013, based on the view that rates for this period are "considered to be reflective of industry circumstances today and relevant for current policy assessment."[29] The TRB selected the explanatory variables used in its model based on prior econometric studies measuring the statistical relationship between rail rates and shipment characteristics.[30] The specific explanatory variables used in the TRB's model are:

1. Shipment distance (in miles)
2. Shipment size (in carloads)
3. The number of railroads involved in the movement
4. Whether the cars used in the shipment are owned privately or by a railroad
5. Number of Class I railroads within 10 miles of the origin

---

[26] TRB Report at 3.

[27] TRB Report at Appendix B.

[28] TRB proposes to use the benchmark method as a substitute for the statutory jurisdictional threshold test of 180% R/VC, and to replace the STB's rate reasonableness hearings with arbitration procedures. TRB Report at 3 - 5. This proposal is obviously outside the scope of the existing statutory framework and therefore outside the scope of this testimony. In any case, it is straightforward to use benchmark method determine a reasonable rate based on revenue adequacy, as explained by Dr. Caves above.

[29] TRB Report at 28.

[30] TRB Report at 153.

6. Number of Class I railroads within 10 miles of the destination
7. The presence of a water port within 50 miles of the origin
8. The presence of a water port within 50 miles of the destination
9. Distance from origin to nearest water port (in miles)
10. Distance from destination to nearest water port (in miles)

The first four items on the list are either directly measured by the CWS or were constructed using only the CWS data fields.[31] The remaining items were constructed by linking the CWS to external sources, such as the Association of American Railroads' Centralized Station Master ("CSM"), which is used to assign latitude and longitude values to each shipment's origin and destination.[32]

The shipments used in the regression sample must be limited to those that face meaningful competition. This presents the most complex and challenging aspect of the Benchmark approach. To identify competitive shipments for its illustrative models, the TRB relied upon its estimates of the proximity of rail and water competition, summarized in items (5) – (10) above.[33] When the Benchmark model is put into practice, the set of variables used to implement the benchmark model would almost certainly be modified and expanded. Nevertheless, it is clear that the CWS already contains many of the data fields that would be used to implement such a model; and the STB also could expand existing CSW data collection procedures to capture additional indicators of effective competition. Furthermore, it is clear that there are data sources available that can be linked with the CWS to measure the competitive alternatives available to shippers.

Finally, the STB would have the option of supplementing this competitive data by conducting its own studies (most likely by commodity), which could be updated periodically.

---

[31] TRB Report at 154.

[32] TRB Report at 150-151.

[33] TRB Report at 150.

Such studies, for example, might entail formal proceedings to identify the attributes of effective competition for specific commodities that could be applied in an objective manner to determine the probability that a particular movement in the CWS is competitive. This proceeding would have characteristics of both a market dominance and a commodity exemption determination. Although development of the Benchmark method would require a substantial initial investment of time and resources by both the agency and its stakeholders, the process would be relatively easy to implement and update thereafter.

3. The Benchmark Method is Inherently Conservative

The Benchmark method, despite being predicated upon comparisons to competitive rates, is an inherently conservative approach that is unlikely to adversely impact railroad revenue adequacy through differential pricing. First and foremost, as discussed above, whatever the results of the regression model, the STB can calibrate R_{MAX} to minimize the degree of differential prices paid by captive shippers without jeopardizing a railroad's revenue adequacy. There are compelling reasons, however, as to why even the predicted R_{MAX} rate would be inherently conservative.

Even movements potentially classified as "competitive" generally face only limited competition, and may therefore significantly exceed effectively competitive levels. For example, those few shippers not captive to a single railroad rarely have access to more than two carriers by virtue of the fact that there are primarily just two Class I railroads serving points east or west of the Mississippi River. A market served by a duopoly exhibits a Herfindahl-Hirschman Index ("HHI") of at least 5,000—more than twice the threshold considered "highly concentrated" by US antitrust agencies, and presumed likely to reflect the exercise of significant

market power.[34] Indeed, many shippers with two-carrier access recently have testified to the Board that whatever competition once existed has substantially dissipated.[35] Furthermore, two-railroad competition loses whatever effectiveness it has if either carrier possesses a bottleneck at any point along the route, or if one carrier's route is far more circuitous.

Intermodal options may often fail to provide fully effective competition. Trucks, for example, may be physically viable options, but they are much less efficient for larger volumes and longer distances, and hence may fail to impose the pricing discipline that an equally efficient rival would. In addition to being less efficient, rail-to-truck transloading around bottleneck segments in duopoly rail markets may suffer from a reluctance among duopolists to poach the other's customers at one location for fear of retaliation at another location.

In this very proceeding, railroads have testified that the ability to raise rates on competitive traffic has been a major factor in their ability to achieve revenue adequacy, which indicates that a benchmark derived from ostensibly competitive rates is consistent with revenue adequacy.[36] Finally, the statutory rate floor of 180%, calculated using unadjusted Phase III URCS variable costs, places an additional constraint on the extent to which rates can be reduced effectively to competitive levels under the Benchmark approach.

---

[34] Federal Trade Commission and Department of Justice, *Horizontal Merger Guidelines* (Issued April 2, 1992; revised August 2010), §5.3. The Guidelines define a "highly concentrated" market as one with a HHI of 2,500 or higher. The HHI is computed by squaring the market share of each firm and then summing the total across all firms in the market. For a duopoly, the HHI is therefore $S^2 + (100 - S^2)$, where S is the market share of one duopolist and $(1 - S)$ is, by definition, the market share of the other. The smallest possible HHI for a duopoly occurs when the duopolists split the market evenly, yielding an HHI of 5,000 (equal to $50^2 + (100 - 50^2)$).

[35] *See, e.g.*, Joint Initial Comments of Omaha Public Power District, The AES Corporation, Oklahoma Gas & Electric Company and Colorado Springs Utilities, STB Ex Parte No. 705, *Competition In The Railroad Industry* (filed April 12, 2011).

[36] Opening Comments of Union Pacific Railroad, pp. 22-23 (filed Sept. 5, 2014).

C. Rebate Approach

A Rebate approach offers an alternative to the Benchmark method for implementing the revenue adequacy constraint. Dr. Caves and Mr. Crowley address the conceptual underpinnings of the Rebate approach and illustrate two potential procedures for implementation that are based upon methodologies that are familiar to the Board and have withstood judicial scrutiny.

1. Conceptual Explanation

In *Coal Rate Guidelines*, the ICC explained the objective of the revenue adequacy constraint to be that "a railroad not use differential pricing to consistently earn, over time, a return on investment above the cost of capital" because "captive shippers should not be required to continue to pay differentially higher rates than other shippers when some or all of that differential is no longer necessary to ensure a financially sound carrier capable of meeting its current and future service needs."[37] Therefore, to the extent that a railroad is receiving revenues above what is needed to earn the industry cost of capital, that railroad's ability to differentially price its captive traffic above competitive levels should be reduced by the revenue adequacy constraint.

The rebate approach is designed to combine "the efficiency properties of differential pricing with some limitation on the railroad's ability to exploit its monopoly position vis-à-vis particular shippers."[38] Specifically, the rebate approach returns some portion of the surplus revenue earned on captive routes by reducing the rates of captive shippers that bring successful complaints, without reducing the rates charged on competitive shipments. (Here, a competitive

---

[37] *Coal Rate Guidelines*, at 535-36.

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

shipment is either (1) a shipment with an R/VC ratio less than 180 percent; or (2) a shipment for which market dominance cannot be demonstrated).

The Rebate approach first requires a calculation of the railroad's revenue surplus over the preceding six years, which Dr. Caves previously testified has been the average length of post-World War II business cycles. The Rebate approach next would involve a hypothetical calculation distributing any net-surplus (surpluses less shortfalls) on a present value, pro-rata, or average basis over the coming six-year period. This would mean that, if the railroad were found to be revenue adequate over a six-year business cycle, then the rate reduction would be applied over the length of the next business cycle. The hypothetical rebates implied by this calculation would, in practice, be available only to captive shippers that bring successful complaints demonstrating market dominance.

Mr. Crowley has illustrated how to calculate the revenue surplus in Attachment No. 1, using actual UP revenues for the most recent six years of available data. As shown in Attachment No. 1, UP is revenue adequate over the 2009 to 2014 period by approximately $7.6 billion on a 2014 dollar basis. Dividing this amount by six (6) results in a pro-rata revenue surplus of $1.3 billion per year over the subsequent six (6) years. The distribution of this net surplus then can be accomplished by applying either a Proportional Reduction Approach or a Maximum Markup Method ("MMM"). While the proportional approach adheres more closely to Ramsey pricing, the MMM approach is more consistent with the Long-Cannon factors in the Staggers Rail Act of 1980,[39] while still remaining consistent with Ramsey pricing principles. Each methodology is discussed below.

---

[39] *Major Issues in Rail Rate Cases*, STB Ex Parte No. 657 (Sub-No. 1), at 16-19 (served Oct. 30, 2006), *aff'd sub nom. BNSF v. STB*, 526 F.3d 770 (D.C.Cir. 2008).

One additional adjustment is necessary in order to protect the contribution made to revenue adequacy by presumptively competitive traffic (i.e. below 180% R/VC). Instead of distributing the whole surplus to the potentially captive traffic, the Rebate approach would distribute only an allocated portion of the surplus to the above 180% traffic. The allocation would be based on the net earnings above total cost per movement produced by potentially captive shippers (the above 180% traffic) relative to the net earnings above total cost per movement produced by the presumptively competitive shippers (the below 180% traffic), and developed from the either the Board's CWS data or the railroad's detailed traffic and revenue data.[40] To determine the allocation:

- Traffic and revenue data will be arrayed based on each movement's R/VC and separated into potentially captive and presumptively competitive groups.
- Using an URCS-based costing approach, the railroad's fixed costs[41] will then be allocated to each movement to develop a total cost per movement (e.g., the calculated variable costs plus the allocated fixed costs).
- For each individual movement, net earnings above total cost will next be developed by subtracting each movement's total cost from its revenue; the individual values will then be summed across the presumptively competitive and potentially captive groups to calculate aggregate net earnings above total costs for the two groups.
- The potentially captive excess return share will then be calculated by dividing the potentially captive shippers' aggregate net earnings above total costs by the sum of the aggregate net earnings above total costs for both the potentially captive and presumptively competitive groups.
- This potentially captive excess returns share will then be applied to the railroad's average revenue surplus across the business cycle to determine the surplus available to the potentially captive shippers as part of the Rebate approach.

---

[40] As explained in Part III.C.2, the Rebate approach is implementable using either the CWS or the railroad's detailed traffic and revenue data.

[41] A railroad's fixed costs will be determined using the same approach used to calculate the aggregate fixed costs under the Board's Average Total Cost divisions approach used in SAC cases.

The Concerned Shipper Associations advocate this approach because one would expect an above 180% movement to make greater a greater contribution towards revenue adequacy than a below 180% movement.

a. Proportional Reduction Method

The Proportional Reduction Approach, as introduced by Dr. Caves,[42] uses observed price-cost margins to gauge demand elasticities.[43] A shipment's "price-cost margin" is equal to the pre-reduction price (rate) less the variable cost divided by the price (rate), or (P – VC)/ P. The Proportional Reduction Approach allows for reductions in rates paid by potentially captive shippers (i.e., those shippers with R/VC ratios above 180%) such that the relative price-cost margins between the shippers remain the same, while the absolute price-cost margins decline. Each movement's price-cost margin is (hypothetically) adjusted downward by the same percentage factor until the surplus revenue available to potentially captive shippers is exhausted. In reality, only the rates of complaining shippers capable of demonstrating market dominance would be adjusted.

Attachment No. 2 is an illustrative example of the Proportional Reduction Approach using UP 2014 railroad operating revenues and the average UP surplus over the 2009 to 2014 business cycle.

- Line 1 shows UP's 2014 revenue.
- Line 2 shows the average net surplus revenue generated over the 2009 to 2014 business cycle from Attachment No. 1, Line 8.

---

[42] *See* the Verified Statement of Dr. Caves and Dr. Singer in the Reply Comments submitted by Concerned Shipper Associations in Ex Parte No. 772, *Railroad Revenue Adequacy*, filed November 4, 2014 at Appendix B.

[43] All else equal, shipments with lower demand elasticities will tend to have higher markups of price over variable cost.

- Line 3 contains the assumed potentially captive excess returns share discussed above. Line 4 calculates the portion of surplus revenue in Line 2 that is attributed to potentially captive traffic by use of the excess return share from Line 3, and thus is subject to rebate to captive shippers through rate reductions.

- Line 5 is the difference between Line 1 and Line 4, which reflects UP's revenue adequacy target revenues after rebating excess revenue generated by potentially captive traffic. Note that this is higher than UP's actual revenue adequacy target revenue, which is the difference between Line 1 and Line 2, in order to allow UP to retain surplus revenue generated from presumptively competitive traffic, i.e. below 180% R/VC.

To reach the Line 5 target revenues, each base price-cost margin for each movement with an R/VC above 180% is hypothetically adjusted by a margin adjustment factor shown in Line 6. The margin adjustment factor is calculated using an iterative process which reduces all of the rates above 180% in relative proportion until aggregate UP revenues shown on Line 14, Column (11) equal UP target revenue levels shown on Line 5. In this example, the margin adjustment factor equals 95.1 percent.

For purposes of this illustrative example, Mr. Crowley assumed that seven (7) shippers (Shipper A through Shipper G in Column (1)) make-up the universe of UP shippers. He also assumed that Shipper A is the complaining shipper requesting relief under the revenue adequacy constraint.

For each shipper identified in Attachment No. 2, Column (1), Mr. Crowley assumed the rate level, variable cost and annual volume (Column (2) through Column (4)). The total revenues, R/VC ratios and price-cost margin ratios (Column (5) through Column (7) are calculations explained in the Attachment No. 2 footnotes) represent the remaining base calculations needed to apply the Proportional Reduction Approach.

The first adjustment is made to the price-cost margin ratios through application of the Margin Adjustment Factor appearing on Line 6. The Margin Adjustment Factor reduces the base price-cost margin (Column (7)) to the adjusted price-cost margin (Column (8)). By

applying the same margin adjustment factor to all above 180% shippers, the price-cost margins remain in relative proportion to each other. For example, before adjusting the price-cost margins in Column (7), Shipper A's price-cost margin was 4.8% larger than Shipper B's margin.[44] After the adjustment, the price-cost margin for Shipper A shown in Column (8) is still in the same relative proportion, 4.8 percent larger than Shipper B's adjusted margin.[45] The same is true of Shipper A compared to Shippers C and D, i.e., pre- and post-adjustment margins maintain the same relative proportion of (4.8) percent and 21.2 percent, respectively. No adjustment is made for Shippers E, F and G because their R/VC ratios are below the statutory threshold of 180 percent.

Once the adjusted price-cost margins are identified, the adjusted rates, R/VC ratios and total revenues can be calculated (as shown in Column (9), Column (10) and Column (11), respectively).

As noted above, Shipper A is the complaining shipper and therefore the only movement whose rate is subject to relief. This is reflected in Column (13), where only the revenue from Shipper A is less than the revenue in Column (5). Stated differently, application of the Proportional Reduction Approach to the Shipper A movement does not exhaust the entire annualized UP surplus but rather a small portion of that value as shown on Attachment No. 2, Column (13).

The surplus revenue subject to rebate (Line 4) would be exhausted only if Shippers B, C and D also filed complaints and could prove market dominance. Otherwise, UP would retain that revenue for itself. In addition, UP retains all of the surplus revenue attributed to the below

---

[44] (57.1429% ÷ 54.5455%) -1 = 4.7619%.

[45] (54.3488% ÷ 51.8784%) -1 = 4.7619%.

180% traffic (Shippers E, F and G), which means that UP's revenue would never be capped at the revenue adequacy level, which is Line 1 minus Line 3.

The Proportional Approach suffers from a potentially fatal flaw, however, that must be addressed before it can be seriously considered. It is too easy for a railroad to "game" this approach, in much the same way that the Board concluded a railroad could game the percent reduction approach in SAC cases.[46] When contract negotiations falter and the shipper requests a tariff rate that it can challenge, the RR can calculate the percent reduction that would be applied under the Proportional Approach and set the tariff rate at a sufficiently high level so that that the rate reduction would end up at precisely the contract rate offer. To avoid gaming, the Board thus cannot use the challenged tariff rate as the base for rebating the surplus revenue to the complaining shipper. Some alternative source pre-dating the challenge, such as actual market rates for similar commodities or a prior rate paid by or offered to the complainant, would be essential to avoid such manipulation.

b. Maximum Markup Reduction Method

The STB also could use the MMM approach to adjust rates under the Rebate method. This is similar to the MMM approach that replaced the percent reduction approach in SAC cases due to "gaming" concerns. Like the MMM approach used in SAC cases, this MMM approach to revenue adequacy would determine each movement's maximum contribution or markup. However, instead of determining the level of revenue needed to cover the SAC of a hypothetical railroad, the MMM in a revenue adequacy maximum rate calculation would determine the maximum markup required for the railroad to reach its adequate revenue level.

---

[46] *Major Issues in Rail Rate Cases*, STB Ex Parte No. 657 (Sub-No. 1), at 16-19 (served Oct. 30, 2006), *aff'd sub nom. BNSF v. STB*, 526 F.3d 770 (D.C.Cir. 2008).

Attachment No. 3 illustrates how the MMM approach could be applied in a revenue adequacy rate challenge. As with the Proportional Reduction example shown in Attachment No. 2:

- Line 1 shows UP's 2014 revenue.
- Line 2 shows the average net surplus revenue generated over the 2009 to 2014 business cycle from Attachment No. 1, Line 8.
- Line 3 contains the assumed potentially captive excess returns share discussed above. Line 4 calculates the portion of surplus revenue in Line 2 that is attributed to potentially captive traffic, and thus is subject to rebate to captive shippers through rate reductions.
- Line 5 is the difference between Line 1 and Line 4, which reflects the UP's revenue adequacy target revenues after rebating excess revenue generated by potentially captive traffic. Note that his is higher than UP's actual revenue adequacy target revenue, which is the difference between Line 1 and Line 2, in order to allow UP to retain surplus revenue generated from presumptively competitive traffic, i.e. below 180% R/VC.

At this point, the MMM approach deviates from the proportional reduction approach. Line 6 identifies the average MMM R/VC necessary for the adjusted aggregate UP revenues to equal the revenue adequacy required revenue levels when the MMM R/VC is applied to movements with an above average base R/VC. As shown on Line 14, Column (9), setting the MMM R/VC ratio to 218.1 percent in this illustrative example causes the adjusted aggregate UP revenues to equal the target revenue adequacy levels shown on Line 5.

For purposes of this illustration, Mr. Crowley again assumed that seven (7) shippers (Shipper A through Shipper G in Column (1)) make-up the universe of UP shippers. He also assumed that Shipper A is the complaining shipper requesting relief under the revenue adequacy constraint.

For each shipper identified in Column (1), Mr. Crowley assumed the rate level, variable cost and annual volume (Column (2) through Column (4)). The total revenues and R/VC ratios

(Column (5) and Column (6) are calculations explained in the Attachment No. 3 footnotes) represent the remaining base calculations needed to apply the MMM Approach.

The MMM approach reduces aggregate revenues by adjusting movements with high R/VC ratios through an iterative process. The adjusted R/VC ratios (Column (7)) are the result of reducing the base R/VC ratios to a level that will produce aggregate revenues (Line 14, Column (9)) equal to required revenues (Line 5), such that each movement's R/VC ratio is the lesser of the MMM R/VC ratio shown in Line 6 or the movement's base R/VC ratio from Column (6). Once the adjusted R/VC ratios are identified, the adjusted rates and total revenues can be calculated (as shown in Column (8) and Column (9), respectively).

As noted above, Shipper A is the complaining shipper and therefore the only movement whose rate is subject to actual reduction. Stated differently, application of the MMM Approach to the Shipper A movement does not exhaust the entire annualized UP surplus but rather allocates a small portion of that value as shown on Attachment No. 3, Column (11).

The surplus revenue subject to rebate (Line 4) would be exhausted only if Shippers B and C also filed complaints and could prove market dominance. Otherwise, UP would retain that revenue for itself. Although Shipper D has an R/VC above 180%, it would not receive any rate reduction because its R/VC of 188.9% is below the MMM R/VC ratio of 218.1%. In addition, UP retains all of the surplus revenue attributed to the below 180% traffic (Shippers E, F and G), which means that UP's revenue would never be capped at the revenue adequacy level, which is Line 1 minus Line 2.

2. The Rebate Approach Is Implementable Using Either the CWS or the Railroad's Detailed Traffic and Revenue Data

To implement the Rebate approach, the shipper would require either the railroad's detailed traffic and revenue data for the year under review or the most recently available CWS.

The shipper would use this information to generate or estimate the net revenues for each movement on the railroad, and to develop the operating statistics necessary to calculate the URCS Phase III variable costs, which are used in both approaches. This may seem daunting on the surface, particularly if detailed traffic and revenue data are used, but one must recognize that recent SAC cases have used data sets that comprised nearly all of the incumbent railroads' systems. Expanding the data sets to the full systems would not require much more effort. More importantly, unlike SAC cases, the shipper would not need to develop much of the time consuming evidence, including, but not limited to, revenue division calculations, stand-alone railroad operating simulations, stand-alone railroad operating cost estimates, and investment cost estimates. Once the traffic and cost data have been developed, implementing the Rebate method would be a straightforward process that could be calculated in either a spreadsheet or a database format.

3. The Rebate Approach Is Inherently Conservative

Despite railroad claims in this proceeding that a revenue adequacy constraint is a form of rate of return regulation, the Rebate approach (as noted above), is explicitly designed to rebate only the portion of surplus revenue that can be attributed to potentially captive shipments. Further, any rate reductions implied by the Rebate approach would remain purely hypothetical unless and until a shipper successfully brought a case before the STB. As the examples in Attachment Nos. 2 and 3 demonstrate although both methodologies (Proportional Adjustment and MMM) apply hypothetically to all potentially captive movements on the UP's system, Shipper A would be the only shipper to receive actual relief. The practical impact would be that UP's revenues would not be reduced to the revenue adequacy revenue level shown on Line 3 of Attachment Nos. 2 and. 3, but rather UP's revenues would be reduced for the Shipper A traffic only.

Furthermore, even if all of the other shippers were to file their own complaints, each would still have to prove market dominance to be eligible for their share of the rate reductions shown in Attachment Nos. 2 and 3; otherwise the railroad would retain the revenue reduction allocated to those movements. In addition, as just discussed, both approaches only rebate the surplus contribution attributable to traffic with R/VC ratios above 180%, which allows the railroad to retain the surplus from below 180% traffic. Thus, to the extent a railroad is earning excess revenue from its competitive traffic and not through differential pricing, it is likely to retain that revenue under either application of the Rebate Approach.

D. Rate Increase Limits

As an additional remedy under the revenue adequacy constraint to either the Benchmark or Rebate approach, the Concerned Shipper Associations have advocated that the Board permit captive shippers to challenge a rate increase, as opposed to the overall rate level. For example, if a railroad was revenue adequate under a rate charged prior to implementing a rate increase, a captive shipper could challenge the rate increase as an unwarranted escalation of differential pricing and have its rate rolled back to the prior level. Future rate increases would be limited to a pre-determined level, such as changes in the RCAF-A or the *OGE*[47] standards. The cap leaves in place the current level of differential pricing for the movement, but prevents the carrier from earning even more revenue through greater differential pricing that is not needed to maintain revenue adequacy, while still protecting the carrier from cost increases that could degrade its differential pricing over time. Logically, such a cap should remain in place so long as the

[47] *See* STB Docket No. 42111, *Oklahoma Gas & Electric Company v. Union Pacific Railroad Company* (served July 24, 2009).

railroad remains revenue adequate over a rolling six-year period or until the railroad can demonstrate that the capped rate would fall below comparable competitive traffic rates.

The Board has asked whether such a limit upon rate increases would be consistent with the law. The statute requires the Board to consider the three so-called "Long-Cannon" factors when determining if a rate is reasonable. 49 U.S.C. 10701(d)(2). Those factors are directed at the concepts of revenue adequacy and differential pricing. Once a carrier has attained revenue adequacy, its need to charge captive traffic higher rates than competitive traffic should be presumed to be exhausted. The burden of proof still lies with the shipper to establish the railroad's market dominance over the traffic, and thus its ability to engage in differential pricing, followed by proof that the railroad is revenue adequate. Once the shipper carries that burden, it is reasonable for the Board to determine that any further rate increases on such captive traffic are presumptively unreasonable, absent a showing by the carrier that the Long-Cannon factors have changed in a manner and to a degree that rate increase restrictions are detrimental to its revenue adequacy.

IV. Measuring Revenue Adequacy

The Board has asked whether it should consider adjusting how it determines Return on Investment by using replacement costs, instead of book value, as the rail industry has urged. Although the Concerned Shipper Associations have focused their resources on issues surrounding implementation of the revenue adequacy constraint, they strongly object to the use of replacement costs and support the positions advocated by the Western Coal Traffic League.

For the purpose of this hearing, these Associations note that financial market metrics are the best overall measure of the ability to attract financial capital. Revenue advocacy determinations require a broad assessment based on a variety of widely used financial metrics. Because no single metric is infallible, economists have greater confidence in a conclusion when

different analytical methods reach the same qualitative result. For the same basic reason, financial analysts do not restrict themselves to a single metric when assessing investment prospects of a given company or industry, and may disagree as to which metrics are most informative in any given instance.[48] The value of a broad assessment is also reflected in the TRB's recommendation for the use of "more varied data and analytic techniques"[49] to assess economic and competitive conditions in the industry.

Broad financial market measures indicate that the railroads are fully capable of competing for investment in the capital markets, and have been for many years.[50] Yet the STB's own revenue adequacy determinations, until recently, consistently found carriers to be revenue inadequate.[51] This is a strong indicator that the STB's current approach to assessing revenue adequacy sets a conservatively high bar, perhaps too high. This reinforces the conservative nature of a revenue adequacy constraint based upon the Rebate approach because that approach likely understates the surplus revenue and thus overstates the level of appropriate differential pricing.

V. IMPACT OF REVENUE ADEQUACY ON RAIL SERVICE AND INVESTMENT

A. A Properly Applied Constraint Would Not Have Any Adverse Impact

The Board has asked parties to address the impact that their revenue adequacy proposals would have on the ability of railroads to invest in their networks and expand capacity. The short answer is that there should not be any impact at all. A finding of revenue adequacy means that a railroad is earning sufficient returns to attract the capital that it needs to make

---

[48] See, e.g., http://www.mckinsey.com/insights/strategy/the_new_metrics_of_corporate_performance_profit_per_employee

[49] TRB Report at 138.

[50] See 2010 Senate Report, *supra*; see also 2013 Senate Report, *supra*.

[51] 2013 Senate Report, *supra*, Table IV; Figure 1.

investments. None of the approaches discussed here would reduce a railroad's revenue below this level.

Railroad comments in this proceeding that warn of disincentives to invest are misleadingly predicated upon the false presumption that a revenue adequacy constraint equates to rate-of-return regulation. The revenue adequacy constraint, which imposes limits upon differential pricing of captive traffic, explicitly allows railroads to retain surplus revenue attributable to competitive traffic, as explained above.

As Dr. Caves explained in his Verified Statement, so long as revenue adequacy is properly calibrated, incumbents' incentives to invest will be maintained.[52] The Benchmark and Rebate approaches for implementing the revenue adequacy constraint are conservatively calibrated to protect railroad incentives to invest because:

- The STB's revenue adequacy determinations are themselves conservative, in relation to broad financial metrics;
- A RR must be shown to be revenue adequate based on a long-term (6 year) measure of revenue adequacy, based upon the average duration of a business cycle;
- The STB can adjust the Benchmark screen (R_{MAX}) to further ensure that revenue adequacy is not jeopardized;
- Under the Rebate method, the RR automatically retains all surplus revenue attributable to presumptively competitive (i.e., below 180%) traffic;
- Shippers with R/VC < 180 are ineligible for rate relief by statute;
- Shippers with R/VC > 180 are also ineligible for rate relief unless dominance can be shown

[52] Caves & Singer, *supra*, at 13-14.

- Captive traffic that is not subject to a rate challenge is also ineligible for rate relief.[53]

Furthermore, as noted above, railroad testimony in this proceeding claims that their much-improved financial condition is attributable in significant part to their success in competitive markets.[54] Taking these claims at face value, these carriers still could earn returns above their cost of capital even after applying the revenue adequacy constraints proposed by the Concerned Shipper Associations.

For all of these reasons, it is unreasonable to expect that the railroads' incentives to invest would be distorted. The alternative—abandonment of any effective revenue adequacy standard—would allow railroads to charge economically inefficient rates to captive shippers in perpetuity.[55] The agency must find an approach that balances these objectives.

B. Any Current Service And Investment Deficiencies Are Not Attributable To Revenue Shortfalls

Henry J. Roman has assembled and analyzed the Form 10K and 10Q filings of the four major Class I railroads for the years 2005 through and including 2014, and data published by the AAR in its Railroad Facts for the years 2005 through and including 2013.[56] These results are contained in Attachment No. 4 to this testimony. These data reveal the following: (1) during the ten year period, the Big 4 Railroads[57] generated $157.3 billion in operating profits; and (2) over that same period, those same Big 4 Railroads distributed to their owners and stockholders

---

[53] This includes both captive rates that the shipper elects not to challenge and contract rates that are not subject to STB jurisdiction. Captive shippers may choose to enter into transportation contracts due to factors other than rate levels even when doing so forecloses their access to regulatory rate protection, such as performance benchmarks or other service guarantees.

[54] UP Op. Comments, pp. 22-39; BNSF Op. Comments, pp. 4-5, 6-8; NS Op. Comments, p. 22.

[55] Caves & Singer, *supra*, at 14.

[56] The AAR 2014 publication (covering up to 2013) is the latest data available to Mr. Roman.

[57] The "Big 4" railroads are BNSF, CSXT, NS and UP.

$68.1 billion of those operating profits. Every dollar of profit generated by the Big 4 went either to maintain their systems at current levels of capacity, or to increase their stock prices by distributing those profits to their owners and stockholders.

In 2005, the Big 4 handled 34.7 million carloads of freight.[58] In 2014, that number had declined to 34.5 million carloads. At the same time the average train speed went from 21.4 mph in 2005 to 21.7 mph in 2014 and average dwell time deteriorated from 26.4 hours in 2005 to 28.1 hours in 2014. Most significantly, the railroad track miles owned have decreased since 2005 as they went from 164,000 in 2005 to 162,000 in 2013.[59] In short, the rail system of the U.S. freight railroads was virtually the same in 2014 as it had been in 2005.

While the freight rail system has remained as it was in 2005, the Big 4 railroads' operating revenues have changed dramatically. Average revenue per car increased 65.1% from $1,255 per car in 2005 to $2,073 per car in 2014; operating profits increased 173.2% from $8.4 billion in 2005 to $23,08 billion in 2014; stock dividends, stock repurchases and distributions to BNSF's owner increased 530% from $1.67 billion in 2005 to $10.51 billion in 2014; and the Big 4 railroads' average stock prices (excluding the privately owned BNSF) increased 168% from $50 in 2005 to $134 in 2014.

There are a limited number of things that a highly profitable company can do with its excess profits: (1) it can reinvest those profits to expand the size of its business and/or increase in research and development to improve its productivity and increase its capacity; (2) it can repurchase or retire debt; or (3) it can repurchase its stock or otherwise distribute the excess

---

[58] Source: Big 4 railroads' annual 10K reports.

[59] Values for owned miles of track are for all Class I railroads based on the AAR's 2014 publication of "Railroad Facts." These values are only available through 2013. Changes, therefore, are calculated between 2005 and 2013.

profits to its stockholders or owners to prevent it from pursuing growth and size at the expense of profitability. Plainly, the Big 4 have chosen the latter course.

It must be remembered, of course, that for companies to repurchase stock or increase dividends, they must have excess cash. The fact that the Big 4 have distributed $68.1 billion in excess cash to their owners and shareholders in the past ten years bears compelling witness to their profitability and revenue adequacy. At the same time, the fact that the freight rail system dominated by the Big 4 has remained static condemns that system to chronic service disruptions as the rail carriers seek to maintain the minimum capacity to meet their anticipated requirements. As the Transportation Research Board pointed out in its recent Report:

> Railroads maintain that service disturbances do not indicate chronic underinvestment in capacity. Instead, they are a temporary phenomenon arising from a short-term inability to adjust to supply, which can cause traffic to move slowly and some normally profitable traffic to go unserved...A profit-maximizing railroad that can access credit markets (i.e., that is revenue adequate) and can price according to its customers' willingness to pay should generally have the ability and incentive to deploy and invest in the capacity required to move all profit-generating traffic. The profit incentive should oppose any large and protracted capacity shortfalls.[60]

Plainly, the only thing that is preventing the Class I railroads from providing adequate service today, and from investing in the capacity it will require to provide adequate service in the future is its collective decision not to invest its excess profits in expanding the rail freight system, but rather to distribute those excess profits to their owners and shareholders for reasons best known to themselves.

---

[60] TRB Report at 63

ATTACHMENT
No. 1

Union Pacific Net Revenue Adequacy -- 2009 to 2014 Business Cycle

(Dollars in 000s)

	Year	Cost of Capital 1/	Tax Adjusted (Shortfall)/ Surplus 2/	Present Value of Tax Adjusted (Shortfall)/Surplus 3/
	(1)	(2)	(3)	(4)
1.	2009	10.43%	-$767,046	-$1,259,671
2.	2010	11.03%	219,718	333,908
3.	2011	11.57%	682,782	948,254
4.	2012	11.12%	1,638,241	2,022,844
5.	2013	11.32%	2,027,153	2,256,626
6.	2014	10.65%	3,336,358	3,336,358
7.	Totals 4/	xxx	$7,137,206	$7,638,319
8.	Average 5/	xxx	xxx	$1,273,053

1/ Annual current cost of capital based on the STB Ex Parte No. 558, *Railroad Cost of Capital* decisions and filings.

2/ For Years 2009 to 2013, UP tax adjusted revenue shortfalls and surpluses from the Board's Revenue Shortfall Allocation Method ("RSAM") calculations. 2014 based on UP's 2014 Schedule 250, Line 13 average Net Investment Base ([$29,488,430 + $31,421,908] ÷ 2 = $30,455,169), UP's 2014 Schedule 250, Line 5 Net Railway Operating Income ($5,284,484), the AAR's estimate of the 2014 railroad cost of capital (10.65%), the AAR's calculation of the UP's 2014 weighted average state tax rate (5.885%), and the statutory Federal Tax rate of 35%. The specific calculation is as follows: [$5,284,484 - ($30,455,169 x 10.65%)] ÷ { 1 - [5.885% + (1-5.885%) x 35%]} = $3,336, 358.

3/ Column (3) compounded to 2014 price levels based on Column (1) year and Column (2) costs of capital. Specifically, Column (3) x [(1 + Column (2) cost of capital)^(2014 - Column (1) year)].

4/ Sum of Lines 1 to 6.

5/ Simple average of Lines 1 to 6.

ATTACHMENT

No. 2

Rebate Reduction Approach Based On Price-Cost Margins For UP Based on 2009 to 2014 Business Cycle

1.	**UP 2014 Revenues (000s) 1/**	$23,876,553
2.	**Average Surplus (000s) 2/**	1,273,053
3.	**Potentially Captive Excess Return Share 3/**	90%
4.	**Surplus Available to Potentially Captive Shippers 4/**	1,145,748
5.	**UP Required Revenues (000s) 5/**	$22,730,805
6.	**Margin Adjustment Factor 6/**	95.1%

		Base						Adjusted				Actual Adjustments	
	Shipper	Rates 7/	Costs 7/	Tons (000s) 7/	Total Revenue (000s) 8/	R/VC Ratio 9/	Price-Cost Margin 10/	Price-Cost Margin 11/	Rates 12/	R/VC Ratio 13/	Total Revenue (000s) 14/	R/VC Ratio	Total Revenue (000s)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
7.	A	$7.00	$3.00	1,000,000	$7,000,000	233.3%	57.143%	54.349%	$6.57	219.1%	$6,571,562	219.1%	$6,571,562 17/
8.	B	$11.00	$5.00	500,000	$5,500,000	220.0%	54.545%	51.878%	$10.39	207.8%	$5,195,167	220.0%	$5,500,000
9.	C	$10.00	$4.00	500,000	$5,000,000	250.0%	60.000%	57.066%	$9.32	232.9%	$4,658,334	250.0%	$5,000,000
10.	D	$8.50	$4.50	200,000	$1,700,000	188.9%	47.059%	44.758%	$8.15	181.0%	$1,629,189	188.9%	$1,700,000
11.	E	$8.00	$6.00	100,000	$800,000	133.3%	25.000%	25.000%	$8.00	133.3%	$800,000	133.3%	$800,000
12.	F	$8.00	$7.00	100,000	$800,000	114.3%	12.500%	12.500%	$8.00	114.3%	$800,000	114.3%	$800,000
13.	G	$3.23	$7.00	952,888	$3,076,553	46.1%	-116.808%	-116.808%	$3.23	46.1%	$3,076,553	46.1%	$3,076,553
14.	**Total 15/**	xxx	xxx	3,352,888	$23,876,553	xxx	xxx	xxx	xxx	xxx	$22,730,805	xxx	$23,448,115
15.	**Difference 16/**	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	$0	xxx	$717,310

1/ UP 2014 Annual Report R-1, Schedule 210, Line 10(b).
2/ Attachment No. 1, Column (4), Line 8
3/ Assumed percentage of aggregate excess returns provided by potentially captive shippers.
4/ Line 2 x Line 3.
5/ Line 1 - Line 4.
6/ Adjusts potentially captive shippers' price-cost margins, hypothetically allocating the available surplus in Line 4 across all potentially captive shippers.
7/ Assumed values.
8/ Column (2) x Column (4).
9/ Column (2) ÷ Column (3).
10/ 1- [Column (3) ÷ Column (2)].
11/ If Column (6) is greater than 180%, then Column (7) x Line 6, else Column (7).
12/ Column (3) ÷ [1 - Column (8)].
13/ Column (9) ÷ Column (3).
14/ Column (9) x Column (4).
15/ Sum of Lines 7 to 13.
16/ Line 14, Columns (11) and (13) - Line 5, respectively.
17/ Assuming Shipper A is the complaining shipper, its revenue is equal to the adjusted revenue from Column (11). All other shipper revenue remains the same as shown in Column (5).

ATTACHMENT

No. 3

Rebate Reduction Approach Based On Maximum Markup Methodology For UP Based on 2009 to 2014 Business Cycle

1.	**UP 2014 Revenues (000s) 1/**	$23,876,553
2.	**Average Surplus (000s) 2**	1,273,053
3.	**Potentially Captive Excess Return Share 3/**	90%
4.	**Surplus Available to Potentially Captive Shippers 4/**	1,145,748
5.	**UP Required Revenues (000s) 5/**	$22,730,805
6.	**MMM R/VC 6/**	218.1%

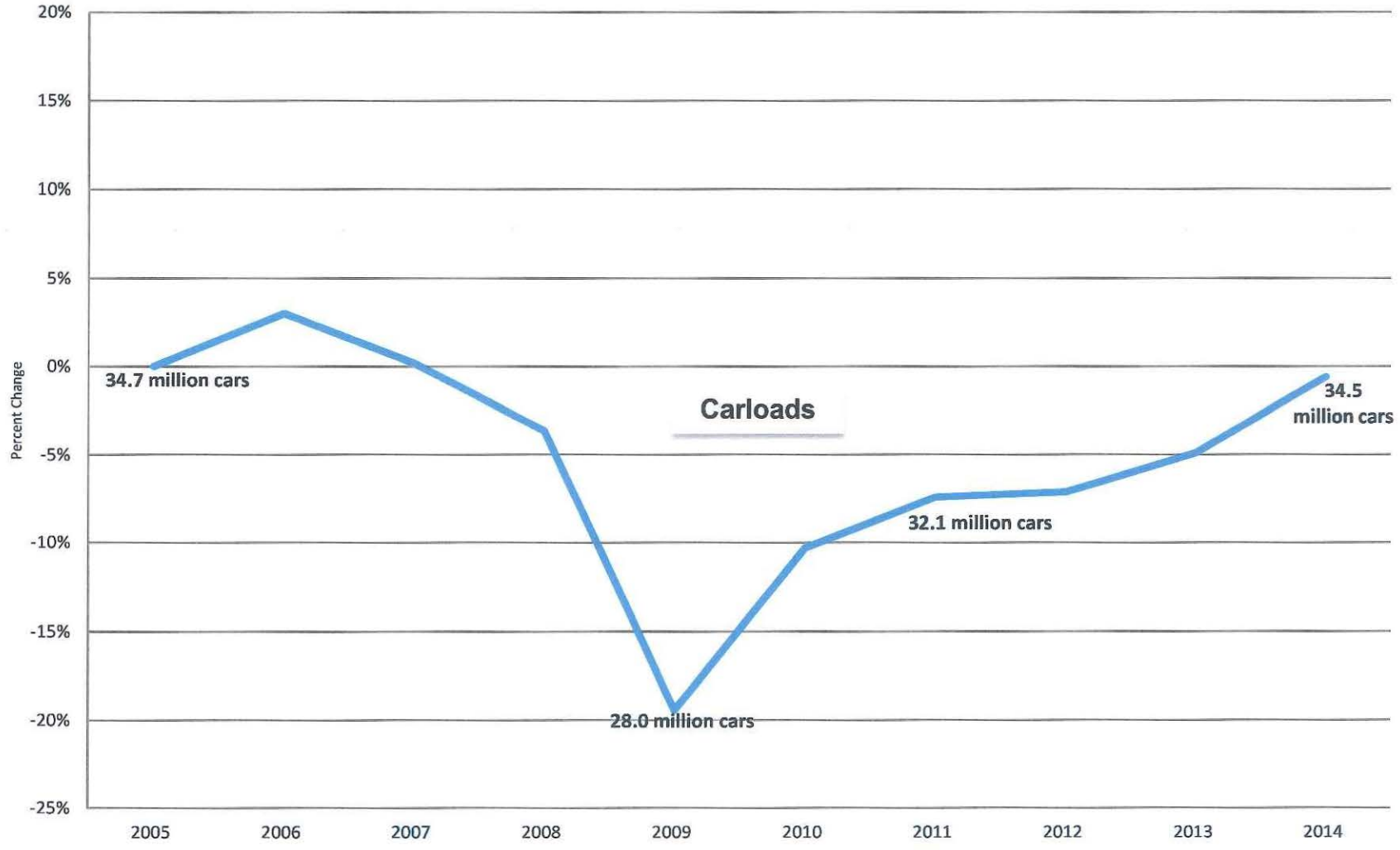
		Base					Adjusted			Actual Adjustments	
	Shipper 5(a)/	Rates 7/	Costs 7/	Tons (000s) 7/	Total Revenue (000s) 8/	R/VC Ratio 9/	R/VC Ratio 10/	Rates 11/	Total Revenue (000s) 12/	R/VC Ratio	Total Revenue (000s)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
7.	A	$7.00	$3.00	1,000,000	$7,000,000	233.3%	218.1%	$6.54	$6,541,701	218.1%	$6,541,701 15/
8.	B	$11.00	$5.00	500,000	$5,500,000	220.0%	218.1%	$10.90	$5,451,417	220.0%	$5,500,000
9.	C	$10.00	$4.00	500,000	$5,000,000	250.0%	218.1%	$8.72	$4,361,134	250.0%	$5,000,000
10.	D	$8.50	$4.50	200,000	$1,700,000	188.9%	188.9%	$8.50	$1,700,000	188.9%	$1,700,000
11.	E	$8.00	$6.00	100,000	$800,000	133.3%	133.3%	$8.00	$800,000	133.3%	$800,000
12.	F	$8.00	$7.00	100,000	$800,000	114.3%	114.3%	$8.00	$800,000	114.3%	$800,000
13.	G	$3.23	$7.00	952,888	$3,076,553	46.1%	46.1%	$3.23	$3,076,553	46.1%	$3,076,553
14.	**Total 13/**	xxx	xxx	3,352,888	$23,876,553	xxx	xxx	xxx	$22,730,805	xxx	$23,418,254
15.	**Difference 14/**	xxx	xxx	xxx	xxx	xxx	xxx	xxx	$0	xxx	$687,449

1/ UP 2014 Annual Report R-1, Schedule 210, Line 10(b).
2/ Attachment No. 1, Column (4), Line 8
3/ Assumed percentage of aggregate excess returns provided by potentially captive shippers.
4/ Line 2 x Line 3.
5/ Line 1 - Line 4.
6/ MMM average R/VC. The ratio is developed through an iterative process such that each movement's R/VC is equal to the lower of the MMM R/VC or the movement's actual R/VC and the UP Required Revenue from Line 5 equals the Total Adjusted Revenue From Line 14, Column (9).
7/ Assumed values.
8/ Column (2) x Column (4).
9/ [Column (2) ÷ Column (3)] x 100.
10/ The lower of the MMM R/VC from Line 6 or each movement's R/VC from Column (6).
11/ Column (3) x Column (7).
12/ Column (4) x Column (8).
13/ Sum of Lines 7 to 13.
14/ Line 14, Columns (9) and (11) - Line 5, respectively.
15/ Assuming Shipper A is the complaining shipper, its revenue is equal to the adjusted revenue from Column (9). All other shipper revenue remains the same as shown in Column (5).

ATTACHMENT

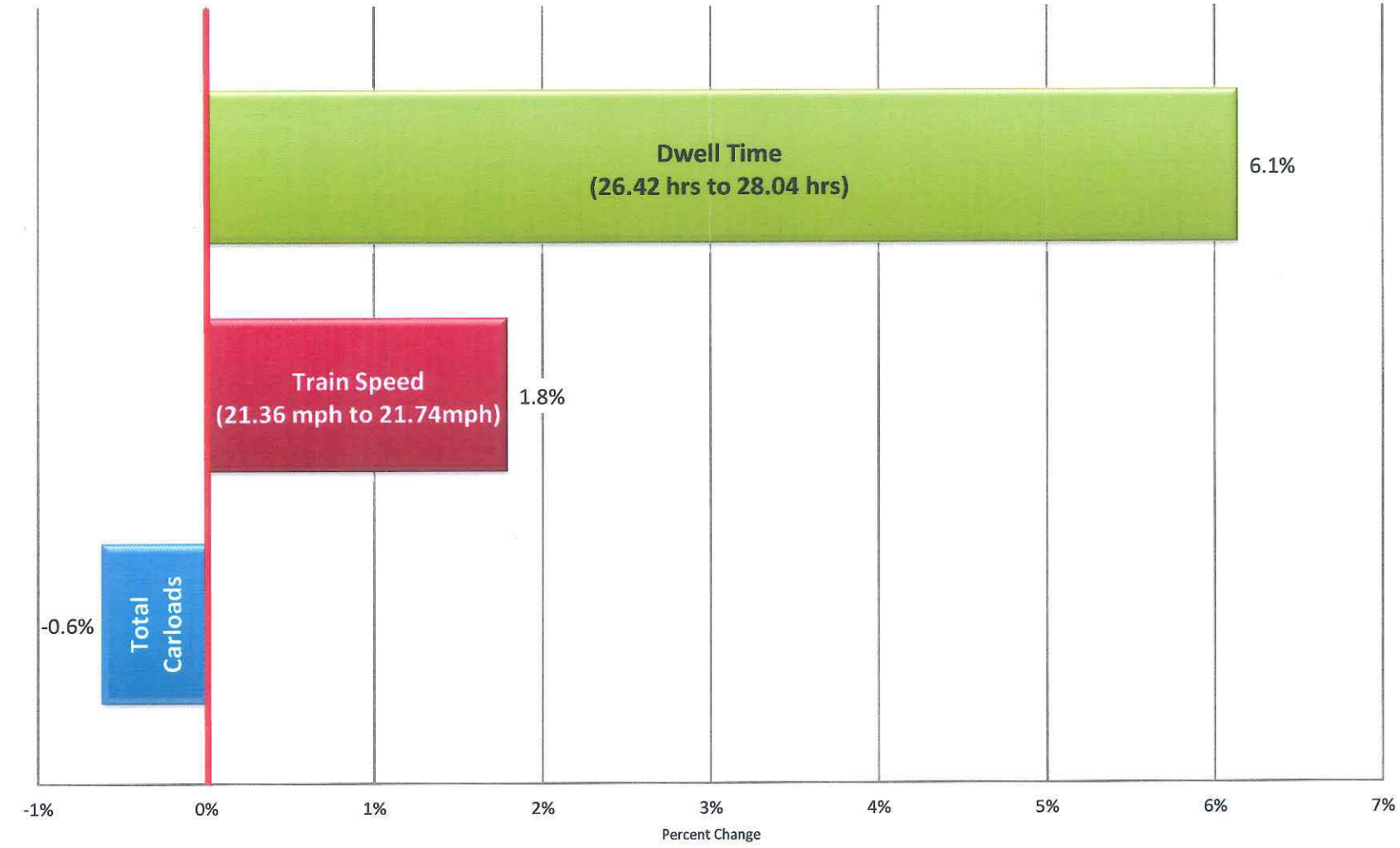
No. 4

The Four Major Railroads Consistantly Carried Fewer Carloads Between 2005 and 2014



Source: Railroads' annual SEC filings for BNSF, CSXT, NS and UP.

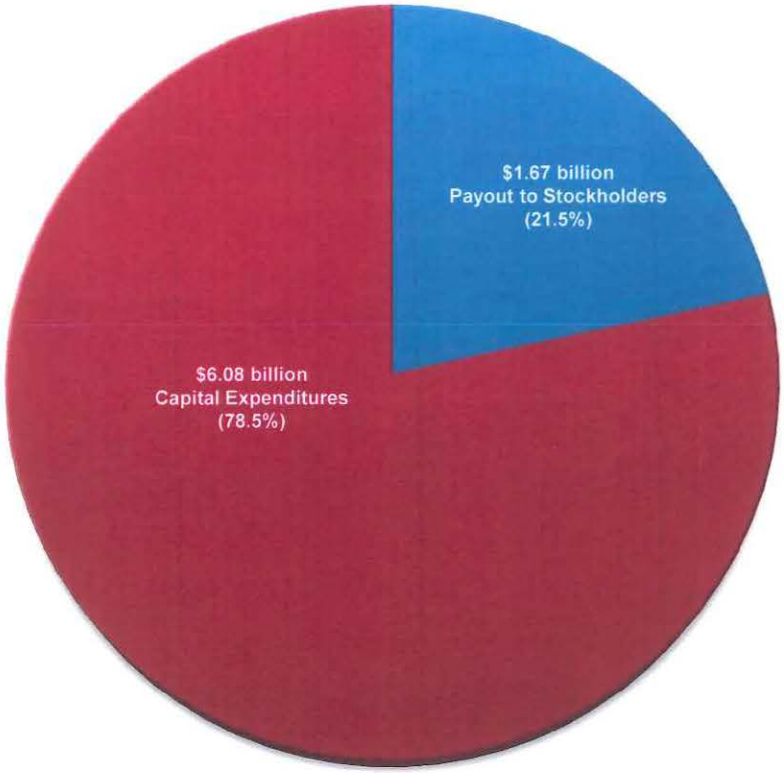
Operations on the Four Major Railroads Have Not Improved Between 2005 and 2014



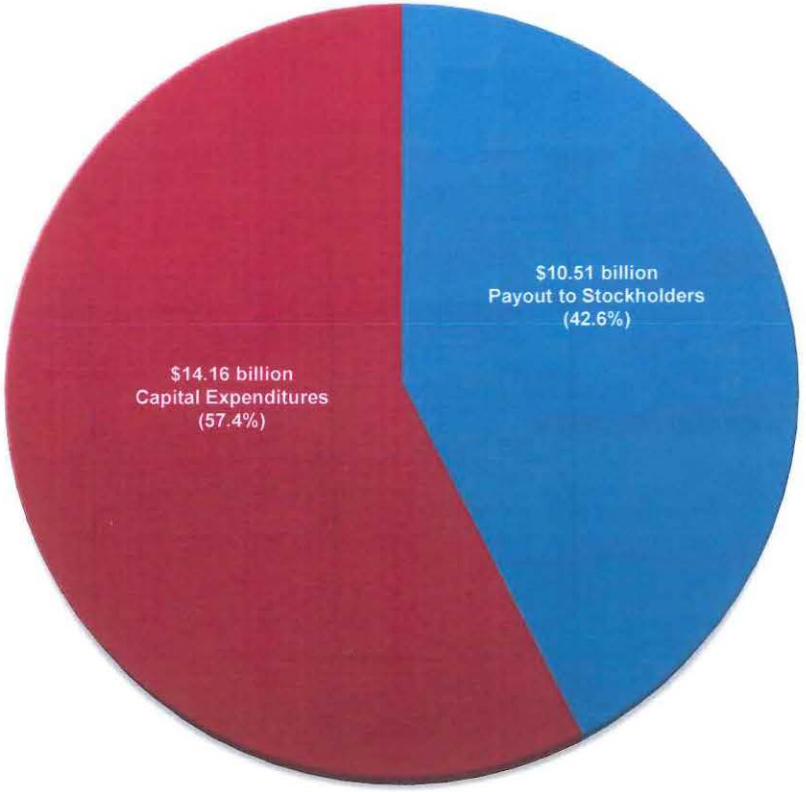
Source: Average Train Speed and Dwell Time are from the AAR's weekly Performance Measure filings for BNSF, CSXT, NS and UP.
Carloads are from BNSF, CSXT, NS and UP annual SEC filings.

The Four Major Railroads' Primary Use of Operating Profit has Changed

2005 CapEx and Payout to Stockholders = $7.75 billion



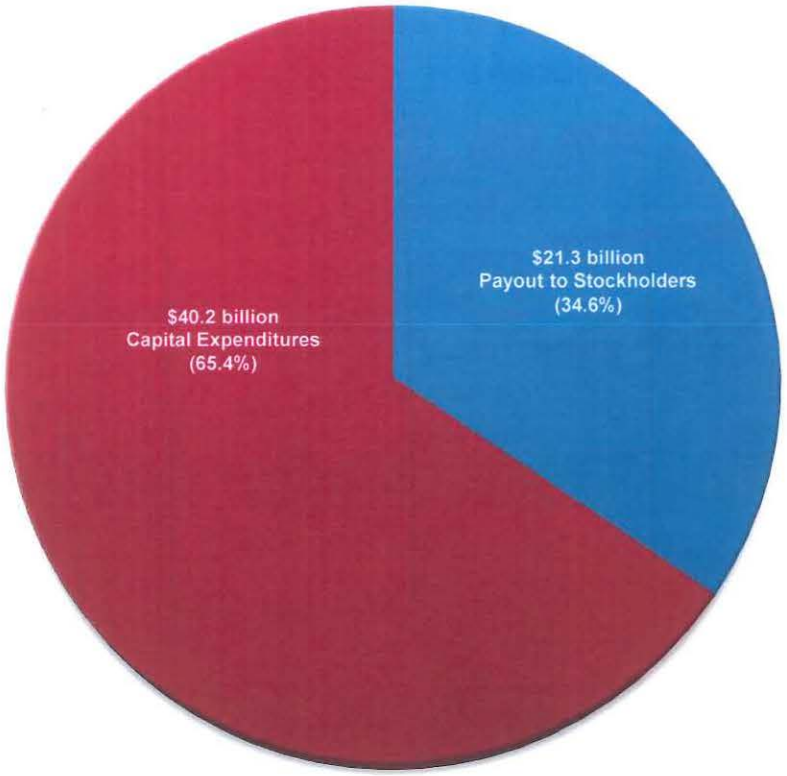
2014 CapEx and Payout to Stockholders = $24.67 billion



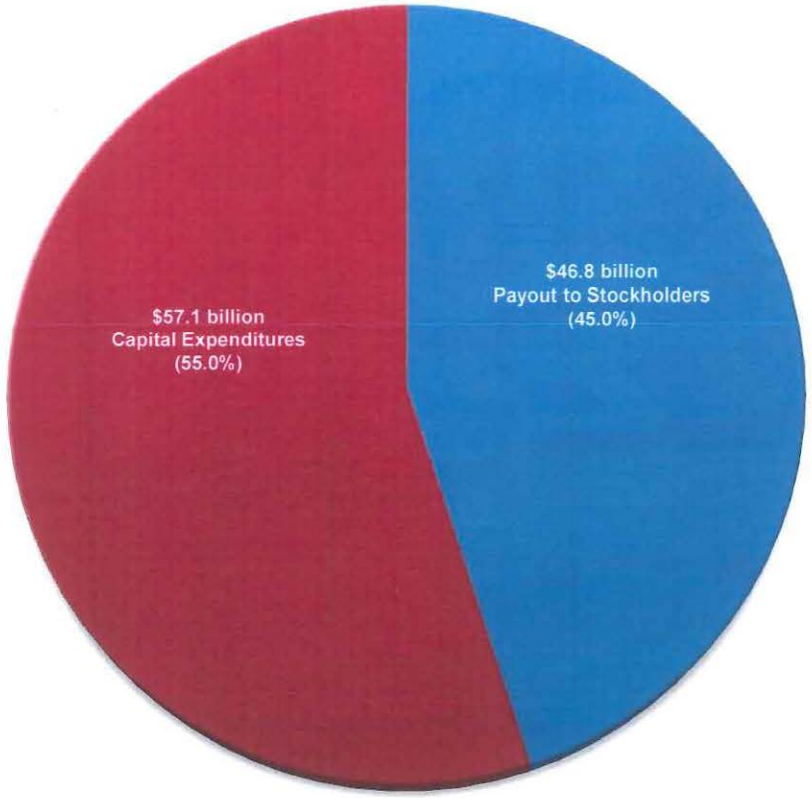
Source: The BNSF, CSXT, NS and UP railroads' annual SEC filings.

The Four Major Railroads' Primary Use of Operating Profit has Changed

2005-2009 CapEx and Payout to Stockholders = $61.5 billion



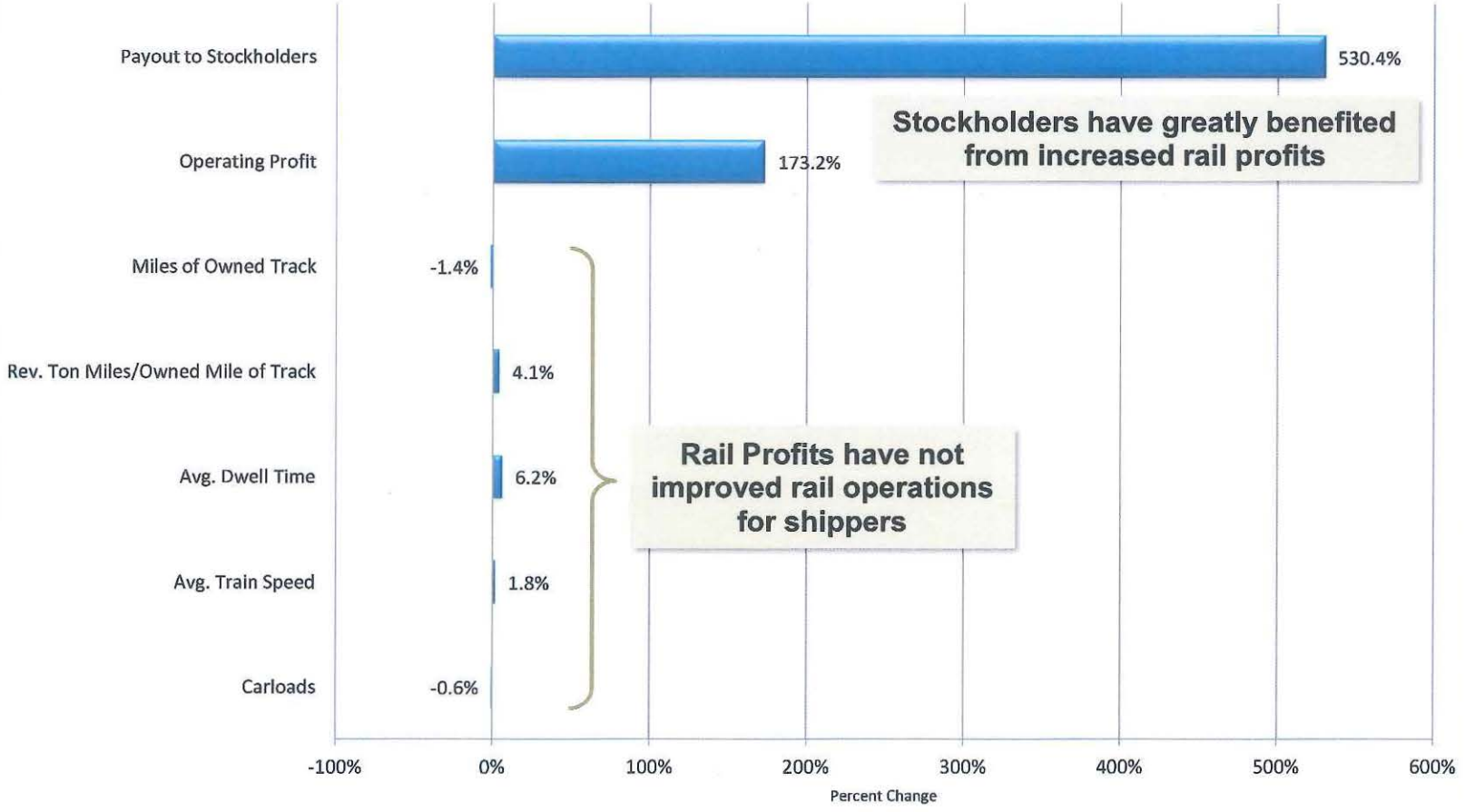
2010-2014 CapEx and Payout to Stockholders = $103.9 billion



Source: The BNSF, CSXT, NS and UP railroads' annual SEC filings.

Capital Expenditures Have Not Increased Rail Capacity

Operational versus Commercial Changes of the Four Major Railroads Between 2005 and 2014



Source: Carloads, Operating Profit and Payout to Stockholders are from railroads' SEC filings, Train Speed and Dwell Time are from the railroads' weekly filings to the AAR. The percent change in Owned Miles of Track and Millions of Revenue Ton Miles Per Owned Mile of Track are between 2005 and 2013 as these are AAR values for all Class I railroads and are only available through 2013.

Summary of Big 4 US Railroads' Operational and Commercial Changes Between 2005 and 2014

Operational Changes	2005	2014		Difference	Percent Change
Carloads (000)	34,705	34,497		-208	-0.6%
Avg. Train Speed (mph)	21.4	21.7		0.4	1.8%
Avg. Dwell Time (hours)	26.42	28.04		1.62	6.1%
Miles of Owned Track *	164,291	161,980		-2,311	-1.4%
Millions of Rev. Ton Miles Per Owned Mile of Track *	10.33	10.75		0.42	4.1%

Commercial Changes	2005	2014		Difference	Percent Change	Total $ 2005-2014
Operating Profit (millions)	$8,401	$22,954		$14,553	173.2%	$157,320
Payout to Stockholders (millions)	$1,667	$10,508		$8,841	530.4%	$68,152
Capital Expenditures (millions)	$6,080	$14,156		$8,076	132.8%	$88,995
Operating Revenue (millions)	$43,569	$71,520		$27,951	64.2%	$571,888
Average Revenue Per Car	$1,255	$2,073		$818	65.1%	$1,735
Average Stock Price	$50	$134		$84	167.6%	$75

All values are for the combination of BNSF, CSXT, NS and UP except for miles of Track Owned and Ton Miles Per Owned Mile of Track which are AAR values published for all Class I railroads.

Commercial changes are taken from the BNSF, CSXT, NS and UP annual reports (10K's) along with annual carloads. Annual Average Train Speed and Dwell Time are taken from the AAR's weekly Performance Measure filings and an average is calculated for each year.

Average Stock Price is the average for the CSXT, NS and UP.

* Values for Owned Miles of Track and Millions of Revenue Ton Miles Per Owned Mile of Track are for all Class I railroads and are only available from the AAR through 2013. These changes are, therefore, between 2005 and 2013.

STATEMENT OF QUALIFICATIONS

FOR

KEVIN W. CAVES

KEVIN W. CAVES

Office Address

Economists Incorporated
2121 K Street, NW
Suite 1100
Washington, DC 20037
Direct Dial: (202) 833-5222
Mobile: (301) 787-6781
caves.k@ei.com

Education

Ph.D. Economics, University of California at Los Angeles, December 2005
Fields of Study: Industrial Organization, Applied Econometrics

M.A. Economics, University of California at Los Angeles, May 2002

B.A. *Magna cum laude*, Departmental Honors in Economics, Haverford College, May 1998

Current Position

Senior Economist, Economists Incorporated

Employment History

Director, Navigant Economics, March 2011 to December 2013

Associate Director, Navigant Economics, February 2010 to March 2011

Vice President, Empiris LLC, September 2008 to February 2010

Senior Economist, Criterion Economics LLC, October 2006 to September 2008

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

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

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

Publications and Research Papers

Identification Properties of Recent Production Function Estimators, ECONOMETRICA (Forthcoming), co-authored with Daniel Ackerberg and Garth Frazer.

On the Utility of Surrogates for Rule of Reason Cases, COMPETITION POLICY INTERNATIONAL (May 2015), co-authored with Hal J. Singer.

Analyzing High-Tech Employee: The Dos and Don'ts of Proving (and Disproving) Classwide Antitrust Impact in Wage Suppression Cases, THE ANTITRUST SOURCE (February 2015), co-authored with Hal J. Singer.

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

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

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

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

Assessing Bundled and Share-Based Loyalty Rebates: Application to the Pharmaceutical Industry, 8 JOURNAL OF COMPETITION LAW & ECONOMICS 889-913 (2012), co-authored with Hal J. Singer.

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

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

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

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

"What a Nobel-Prize Winning Economist Can Teach Us About Obamacare," *The Atlantic* (May 23, 2012), co-authored with Einer Elhauge. Reprinted in EINER ELHAUGE, OBAMACARE ON TRIAL (August 2012).

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

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

Expert Reports and Filings

STB Ex Parte No. 722 (Railroad Revenue Adequacy), Reply Comments of Concerned Shipper Associations – Appendix B Verified Statement of Kevin Caves and Hal Singer, Surface Transportation Board (November 4, 2014).

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

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

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

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

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

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

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

White Papers

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

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

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

The Impact of Liberalizing Price Controls on Local Telephone Service: An Empirical Analysis (prepared with support from Verizon Communications, co-authored with Jeffrey A. Eisenach, February 2012).

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

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

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

Modeling the Welfare Effects of Net Neutrality Regulation: A Comment on Economides and Tåg (prepared with support from Verizon Communications, April 2010).

Retransmission Consent and Economic Welfare: A Reply to Compass-Lexecon (prepared with support from The National Association of Broadcasters, co-authored with Jeffrey A. Eisenach, April 2010).

The Benefits and Costs of Implementing "Return-Free" Tax Filing in the U.S. (prepared with support from The Computer & Communications Industry Association, co-authored with Jeffrey A. Eisenach & Robert E. Litan, March 2010).

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

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

Speaking Engagements

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

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

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

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

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

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

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

Reviewer

Review of Network Economics

International Journal of the Economics of Business

Honors and Awards

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

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

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

STATEMENT OF QUALIFICATIONS

FOR

THOMAS D. CROWLEY

THOMAS D. CROWLEY
STATEMENT OF QUALIFICATIONS

My name is Thomas D. Crowley. I am an economist and President of the economic consulting firm of L. E. Peabody & Associates, Inc. The firm's offices are located at 1501 Duke Street, Suite 200, Alexandria, Virginia 22314, 760 E. Pusch View Lane, Suite 150, Tucson, Arizona 85737, and 7 Horicon Avenue, Glens Falls, New York 12801.

I am a graduate of the University of Maine from which I obtained a Bachelor of Science degree in Economics. I have also taken graduate courses in transportation at George Washington University in Washington, D.C. I spent three years in the United States Army and since February 1971 have been employed by L. E. Peabody & Associates, Inc.

I am a member of the American Economic Association, the Transportation Research Forum, and the American Railway Engineering and Maintenance-of-Way Association.

The firm of L. E. Peabody & Associates, Inc. specializes in analyzing matters related to the rail transportation of all commodities. As a result of my extensive economic consulting practice since 1971 and my participation in maximum-rate, rail merger, service disputes and rule-making proceedings before various government and private governing bodies, I have become thoroughly familiar with the rail carriers that move coal over the major coal routes in the United States. This familiarity extends to subjects of railroad service, costs and profitability, cost of capital, railroad capacity, railroad traffic prioritization and the structure and operation of the various contracts and tariffs that historically have governed the movement of traffic by rail.

THOMAS D. CROWLEY
STATEMENT OF QUALIFICATIONS

As an economic consultant, I have organized and directed economic studies and prepared reports for railroads, freight forwarders and other carriers, for shippers, for associations and for state governments and other public bodies dealing with transportation and related economic problems. Examples of studies I have participated in include organizing and directing traffic, operational and cost analyses in connection with multiple car movements, unit train operations for coal and other commodities, freight forwarder facilities, TOFC/COFC rail facilities, divisions of through rail rates, operating commuter passenger service, and other studies dealing with markets and the transportation by different modes of various commodities from both eastern and western origins to various destinations in the United States. The nature of these studies enabled me to become familiar with the operating practices and accounting procedures utilized by railroads in the normal course of business.

Additionally, I have inspected and studied both railroad terminal and line-haul facilities used in handling various commodities, including unit train coal movements from coal mine origins in the Powder River Basin and in Colorado to various utility destinations in the eastern, mid-western and western portions of the United States and from the Eastern coal fields to various destinations in the Mid-Atlantic, northeastern, southeastern and mid-western portions of the United States. These operational reviews and studies were used as a basis for the determination of the traffic and operating characteristics for specific movements of numerous commodities handled by rail.

THOMAS D. CROWLEY
STATEMENT OF QUALIFICATIONS

I have frequently been called upon to develop and coordinate economic and operational studies relative to the rail transportation of various commodities. My responsibilities in these undertakings included the analyses of rail routes, rail operations and an assessment of the relative efficiency and costs of railroad operations over those routes. I have also analyzed and made recommendations regarding the acquisition of railcars according to the specific needs of various shippers. The results of these analyses have been employed in order to assist shippers in the development and negotiation of rail transportation contracts which optimize operational efficiency and cost effectiveness.

I have developed property and business valuations of privately held freight and passenger railroads for use in regulatory, litigation and commercial settings. These valuation assignments required me to develop company and/or industry specific costs of debt, preferred equity and common equity, as well as target and actual capital structures. I am also well acquainted with and have used the commonly accepted models for determining a company's cost of common equity, including the Discounted Cash Flow Model ("DCF"), Capital Asset Pricing Model ("CAPM"), and the Farma-French Three Factor Model.

Moreover, I have developed numerous variable cost calculations utilizing the various formulas employed by the Interstate Commerce Commission ("ICC") and the Surface Transportation Board ("STB") for the development of variable costs for common carriers, with particular emphasis on the basis and use of the Uniform Railroad Costing System ("URCS") and its predecessor, Rail Form A. I have utilized URCS/Rail form A

THOMAS D. CROWLEY
STATEMENT OF QUALIFICATIONS

costing principles since the beginning of my career with L. E. Peabody & Associates Inc. in 1971.

I have frequently presented both oral and written testimony before the ICC, STB, Federal Energy Regulatory Commission, Railroad Accounting Principles Board, Postal Rate Commission and numerous state regulatory commissions, federal courts and state courts. This testimony was generally related to the development of variable cost of service calculations, rail traffic and operating patterns, fuel supply economics, contract interpretations, economic principles concerning the maximum level of rates, implementation of maximum rate principles, and calculation of reparations or damages, including interest. I presented testimony before the Congress of the United States, Committee on Transportation and Infrastructure on the status of rail competition in the western United States. I have also presented expert testimony in a number of court and arbitration proceedings concerning the level of rates, rate adjustment procedures, service, capacity, costing, rail operating procedures and other economic components of specific contracts.

Since the implementation of the *Staggers Rail Act of 1980*, which clarified that rail carriers could enter into transportation contracts with shippers, I have been actively involved in negotiating transportation contracts on behalf of shippers. Specifically, I have advised shippers concerning transportation rates based on market conditions and carrier competition, movement specific service commitments, specific cost-based rate adjustment provisions, contract reopeners that recognize changes in productivity and cost-based ancillary charges.

THOMAS D. CROWLEY
STATEMENT OF QUALIFICATIONS

I have been actively engaged in negotiating coal supply contracts for various users throughout the United States. In addition, I have analyzed the economic impact of buying out, brokering, and modifying existing coal supply agreements. My coal supply assignments have encompassed analyzing alternative coals to determine the impact on the delivered price of operating and maintenance costs, unloading costs, shrinkage factor and by-product savings.

I have developed different economic analyses regarding rail transportation matters for over sixty (60) electric utility companies located in all parts of the United States, and for major associations, including American Paper Institute, American Petroleum Institute, Chemical Manufacturers Association, Coal Exporters Association, Edison Electric Institute, Mail Order Association of America, National Coal Association, National Industrial Transportation League, North America Freight Car Association, the Fertilizer Institute and Western Coal Traffic League. In addition, I have assisted numerous government agencies, major industries and major railroad companies in solving various transportation-related problems.

In the two Western rail mergers that resulted in the creation of the present BNSF Railway Company and Union Pacific Railroad Company and in the acquisition of Conrail by Norfolk Southern Railway Company and CSX Transportation, Inc., I reviewed the railroads' applications including their supporting traffic, cost and operating data and provided detailed evidence supporting requests for conditions designed to maintain the competitive rail environment that existed before the proposed mergers and acquisition.

THOMAS D. CROWLEY
STATEMENT OF QUALIFICATIONS

In these proceedings, I represented shipper interests, including plastic, chemical, coal, paper and steel shippers.

I have participated in various proceedings involved with the division of through rail rates. For example, I participated in ICC Docket No. 35585, *Akron, Canton & Youngstown Railroad Company, et al. v. Aberdeen and Rockfish Railroad Company, et al.* which was a complaint filed by the northern and mid-western rail lines to change the primary north-south divisions. I was personally involved in all traffic, operating and cost aspects of this proceeding on behalf of the northern and mid-western rail lines. I was the lead witness on behalf of the Long Island Rail Road in ICC Docket No. 36874, *Notice of Intent to File Division Complaint by the Long Island Rail Road Company.*

STATEMENT OF QUALIFICATIONS

FOR

HENRY JULIAN ROMAN

Curriculum Vitae

Henry Julian Roman (Jay Roman)

Jay Roman is the President of Escalation Consultants, Inc. A consulting firm engaged in economic analysis and consultation related to prices and price movement in rail transportation contracts. His business address is 4 Professional Drive, Suite 129, Gaithersburg, MD 20879. Since founding Escalation Consultants in 1979, Mr. Roman has assisted a large number of companies in controlling prices in rail transportation agreements and on an annual basis he is involved with billions of dollars in rail spend.

Rail Rate Analysis - Mr. Roman regularly performs studies of rail rates for major companies with movements in the U.S. and Canada. Some of the industries he works with are: coal, chemical, petroleum, automobile, grain, steel, fertilizer, farm products and forest product industries. The studies provide rate information for key products, which enables companies to better structure their negotiations with railroads.

Rail Databases - Mr. Roman is the owner and developer of Rail Rate Checker which is a very large database that contains data on rail rates, rate changes, rail costs, volumes and rail profit by commodity group. A large number of companies subscribe to this database to assist in determining what reasonable rates are for their rail movements and to determine opportunities for controlling rail expenses.

Rail Bid Evaluations - Mr. Roman is the owner and developer of the Optimized Rail Bid Evaluation (ORBE) program. The ORBE program is the only computer program that automatically determines shipper's least spend from rail bids, while uncovering win/win opportunities between shippers and railroads.

Seminars on Rail Contracting - Mr. Roman conducts the most attended and recommended rail negotiation seminar, which is held twice a year. His seminars have been attended by thousands of people in the U.S. and Canada and virtually all industries that ship by rail have participated in his rail contracting seminars.

Expert Witness Testimony - Mr. Roman has testified as an expert on pricing issues involving coal and rail transportation before the Federal Energy Regulatory Commission, in federal and state courts, before the National Energy Board of Canada, as well as in arbitration cases in the U.S. and Canada. He has also testified before the Surface Transportation Board.

Strategic Planning and Rail Negotiations – Escalation Consultants is actively involved in bid evaluations, strategic planning and rail negotiations totaling several billion dollars a year in rail spend with rail shippers.

Rail Fuel Surcharge Analysis – Mr. Roman performed the economic analysis of railroad fuel surcharges jointly for the National Industrial Transportation League and the National Grain and Feed associations when the railroad fuel surcharge programs first started. He testified twice in the 2006 STB Fuel Surcharge Hearing.

Escalation Consultants Represents the Rail Community in Many Projects. A few examples of recent projects Mr. Roman has been involved with are as follows:

- Escalation Consultants determined the cost of rail as an alternative to pipeline Crude Oil. The results were the only rail rate benchmarks presented to the National Energy Board of Canada

- Escalation Consultants analyzed all rates and volumes on the entire U.S. rail system to determine the impact of increased competitive access on railroads and shippers. The results were submitted to the Surface Transportation Board to support the National Industrial Transportation League's (NITL) competitive switching proposal

- Escalation Consultants determined the cost of non-competitive rates for all commodities shipped by rail. Results were summarized in total, as well as, for sub-categories down to the five-digit commodity code level.

- Escalation Consultants determined the competitive status of all rail stations in the U.S. and summarized the degree of captivity by state and Congressional District. The results of the rail study were sent to the President by a sitting member of Congress.

Publications - Mr. Roman is the publisher of the *Rail Price Advisor* newsletter, a monthly newsletter dealing with issues related to railroad costs, revenue, rail rates, escalation and what shippers are doing to improve service and rail rates.

Education - B.S. Major in Accounting, University of Maryland, 1973.