



**Consumer Federation of America**

**BULK COMMODITIES AND THE RAILS:  
STILL CRAZY AFTER ALL THESE YEARS**

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## **EXECUTIVE SUMMARY**

This report examines the freight rail industry's impact on the price of goods and services by analyzing the structure, conduct and performance of the freight rail industry since the passage of the Staggers Rail Act of 1980, which deregulated the railroads and sparked an era of mergers and acquisitions. The Consumer Federation of America, publisher of the report, is a non-profit association of over 300 consumer organizations with a combined membership of over 50 million Americans that has been involved in public policy affecting the rail sector for almost thirty years. CFA has taken up this issue because consumers shoulder the burden of excessive rail rates in the price of goods and services they consume, particularly electricity. Two thirds of the coal shipped by rail is captive to a single railroad and excessive coal rates are passed through directly into the electricity bills consumers pay every month. Moreover, excessive rail rates paid by captive shippers in other sectors, like agriculture and chemicals, also distort the economy, lowering output and employment.

This market power has proven profitable for the railroads, as demonstrated by their strong performance on Wall Street in recent years. Unfortunately, shippers that seek rate relief through regulatory channels have found that the STB uses a flawed approach to evaluate railroad profits, making it virtually impossible for rail customers to receive meaningful rate relief. This report addresses the failure of regulators to implement the captive shipper protections in the Staggers Act, and the regulators' overprotection of the railroads at the expense of captive shippers.

### **THE CURRENT ABUSE OF MARKET POWER IN THE RAIL INDUSTRY**

Our analysis shows that excessive consolidation in the freight rail industry and lax oversight of anticompetitive business practices has given the railroads an immense amount of market power. With only a handful of companies providing freight rail service, many rail customers have access to just one railroad and are, therefore, "captive" to that railroad. This enables the railroads to set prices well above costs, essentially extracting monopoly rents from shippers, and creates little incentive for railroads to provide consistent and reliable service.

- Captive shippers pay a premium of 75 to 100 percent compared to similar movements in competitive markets, and the cost of captivity has been rising substantially in the past five years.
- In fact, handling captive shippers rail traffic represent less than one-fifth of total costs to railroads but provides two-thirds of their profits.
- Excessive fuel surcharges and other add-ons have also skyrocketed in recent years, and have become a major component of the rising cost of rail service. Studies have shown that more than half of recent railroad fuel surcharges were unwarranted and charged at the expense of shippers and ultimately consumers.

- Although the Surface Transportation Board (STB), which oversees the rail sector, sets the standard for a fair return on investment by railroads far above what Wall Street deems necessary, several railroads exceed that level, resulting in excess profits of over a billion dollars.
- Over one quarter of all rail traffic is shipped at rates that are below costs. Captive shippers pay higher rates to subsidize this below-cost traffic. This practice burdens captive shippers and creates a cross-subsidy of over \$2 billion per year.

Abuse of market power sustains \$3 billion per year of excess profits and costs srocc-subsidies, cost that fall on the shoulders of captive shippers.

### **ABANDONING COMPETITION**

The STB and its predecessor agency, the Interstate Commerce Commission (ICC), allowed a merger wave to engulf the industry, reducing it from a state of vigorous competition, to a state of near monopoly. While some consolidation in the rail industry was certainly necessary, by the mid-1990s, the benefits of consolidation had been captured. Over the opposition of the Department of Justice, the STB allowed mega-mergers to take place in the mid-1990s that rendered much of the nation captive to, at best, duopolies in the east and west. Vast swaths of America's heavy industries, raw materials and agricultural heartland are now captive to one or two railroads.

The ICC/STB failed to implement the most fundamental principles of antitrust in connection with essential or bottleneck facilities. Captive shippers, who are within a few miles of a competitive alternative, are denied access to competition by the refusal of the railroads to allow movement of traffic across short monopoly stretches of road.

To add insult to injury, the STB has allowed the railroads to erect paper barriers to competition. As the mega-mergers were taking place, the dominant freight roads, desiring to specialize in the long haul transport of bulk commodities, found it convenient to spin-off short lines to service individual facilities or local areas. However, in order to ensure that the long haul freight railroads would be able to exploit their newly minted market power, the dominant railroads forced the new short lines to sign contracts that said in essence, "thou shalt not compete or do anything that promotes competition."

### **THE FAILURE TO PROTECT CAPTIVE SHIPPERS FROM COMPETITIVE ABUSE**

Having allowed the railroads to consolidate so dramatically, captive shippers implored the STB to exercise its regulatory authority to prevent the abuse of market power, but the STB turned a deaf ear.

First, the STB clings to a rate threshold that allows the railroads to charge up to what it would cost for the shipper to build a stand-alone railroad, exactly what the monopolist would charge. No other regulatory agency in American history has ever adopted this

standard. To make matters worse, the burden is on the shipper to calculate the standalone cost in a proceeding that can take years and cost millions of dollars.

Second, the STB has taken an approach to the calculation of the rate of return necessary for revenue adequacy that vastly overstates the railroads' need for revenue. The STB's weighted average cost of capital is one-fifth higher than the cost of capital calculated by Wall Street analysts. This allows railroads to increase charges on their captives in pursuit of an absurdly high revenue target.

Third, the STB has failed to require that the railroads operate their business in an efficient manner. More than a quarter of a century after the passage of the Staggers Act, one fifth of all rail traffic does not cover its variable cost. If the railroads shed this traffic, their costs would go down by \$2 billion. If they raised their rates to compensatory levels, their revenues would go up by \$2 billion. In either case, the railroads would be shown to be more than revenue adequate and, in theory, captive shipper rates would come down.

## **POLICY RECOMMENDATIONS**

The extent of monopoly power abuse identified in our study highlights the need for urgent action to protect freight rail customers and consumers. Legislation is necessary because the regulators have failed to properly implement the provisions of the Staggers Act for a quarter of a century. The regulatory oversight over rail market power should be strengthened.

### **Removing Barriers to Competition**

First, since competition is the best form of consumer protection, we begin by describing the policy changes necessary to reinvigorate rail-to-tail competition. After a quarter of a century in which competition has shriveled in the industry, the exemption from the antitrust laws that Congress granted to the railroads in the Staggers Act should be eliminated. Lifting the exemption from the antitrust laws will immediately expose the most blatantly anticompetitive practices, like paper barriers, to pressures for their elimination. The permanent structural barriers to competition posed by terminal and bottleneck facilities will also come under pressure.

### **Preventing the Abuse of Endemic Market Power**

Second, policy makers should be under no illusions that antitrust can eliminate the pervasive market power in the consolidated rail industry. The highly concentrated market structure and substantial physical barrier to entry mean that even where the artificial, conduct-based impediments to competition are removed, there will be a great deal of market power remaining in the sector. Thus, regulatory oversight to effectively protect captive shippers from abuse will still be necessary.

No other regulatory agency uses the “stand-alone cost” (SAC) test, which allows the railroads to charge what an unregulated monopolist would charge. The SAC test was adopted in 1985 to permit railroads to charge the highest rates economists could justify, due to the rails’ then-revenue inadequacy and then-excess capacity. Those justifications no longer apply, so there is no justification for the SAC test, if there ever was. It should be repealed. The STB should return to a rate standard based on cost plus a reasonable return. The railroads should bear the burden of proving that rates above the threshold of 180 percent of variable cost are reasonable, including a showing that all traffic is compensatory.

The STB has consistently overstated the cost of capital, allowing the rails to abuse their market power and earn excess profits. The STB must use the cost of capital used by other regulatory agencies and Wall Street.

**PART I:**  
**INTRODUCTION AND OVERVIEW**



## I. PURPOSE, OUTLINE AND SUMMARY

This paper presents an analysis of the nature and extent of the abuse of market power by American railroads and its impact on consumers. Where there is a lack of competition, i.e. where shippers are captive to a railroad, the railroad can set prices far above costs, extracting monopoly rents from shippers and ultimately consumers, or delivering poor service, which imposes costs on shippers, consumers and the nation.

The problem facing consumers is particularly acute in the electricity sector. About half of all electricity generated in the U.S. is produced from coal and electricity is sold to consumers by franchise monopolies or with little competition.<sup>1</sup> Almost 70 percent of coal used in the U.S. is transported by rail and it is a commodity over which the rails have a great deal of market power.<sup>2</sup> Two-thirds of coal deliveries are to facilities that are served by only one railroad.<sup>3</sup> Thus, excessive rail rates appear directly in consumer utility bills. For individual utilities dependent on monopoly rail service, the excess charges can cost consumers as much as \$100 per year per household.<sup>4</sup>

Because of these consumer impacts, consumer advocates have a long history of involvement in efforts to secure better oversight over abusive practices in the rail sector. In a series of congressional testimonies<sup>5</sup> and reports<sup>6</sup> the Consumer Federation of America called on congress to require rail regulators to protect consumers from the abuse of market power. As the Staggers Rail Act of 1980 was being considered by Congress, consumer groups expressed their concern that they would directly bear a significant part of the burden caused by the abuse of market power as consumers when prices are increased to reflect excessive rails rates. Even where costs increases are not passed through directly to consumers, the public should be concerned because excessive rail rates distort economic activity, reducing

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<sup>1</sup> Generation figures are available at [http://www.eia.doe.gov/cneaf/electricity/epm/table1\\_1.html](http://www.eia.doe.gov/cneaf/electricity/epm/table1_1.html); Restructured states can be found at [http://www.eia.doe.gov/cneaf/electricity/page/restructuring/restructure\\_elect.html](http://www.eia.doe.gov/cneaf/electricity/page/restructuring/restructure_elect.html). Consumption in individual states can be found at <http://www.eia.doe.gov/fuelelectric.html>. Sales in non-restructured states represent over two-thirds of total sales and there is considerable doubt about the extent of competition in many of the restructured states.

<sup>2</sup> Data available at; <http://www.eia.doe.gov/cneaf/coal/ctrdb/tab31.html>

<sup>3</sup> Surface Transportation Board, *A Study of Competition in the U.S. Freight Railroad Industry and Analysis of Proposals that Might Enhance Competition*, pp. 18-15 n. 13, 18-14 n. 15.

<sup>4</sup> "Testimony of Terry Huval, Director Lafayette Utility Systems, *House Judiciary Committee, Hearing on Railroad Antitrust Enforcement Act* February 25, 2008.

<sup>5</sup> "The Staggers Rail Act of 1980," before the Subcommittee on Commerce, Transportation and Tourism of the Committee on Energy and Commerce, United States House of Representatives, July 27, 1983; "Oversight Hearings on the Staggers Rail Act of 1980," before the Subcommittee on Surface Transportation of the Committee on Commerce, Science and Transportation, United States Senate, July 26-27, 1983; "The Consumer Impact of the Proposed Norfolk Southern/Conrail Merger," before the Subcommittee on Commerce, Transportation and Tourism of the Energy and Commerce Committee, U.S. House of Representatives, July 10, 1985; "The Consumer Impact of the Unregulated Railroad Monopoly in Coal Transportation," before the Subcommittee on Monopolies and Commercial Law of the Judiciary Committee, U.S. House of Representatives, June 27, 1985; "Railroad Antimonopoly Act of 1986," before the Subcommittee on Commerce, Transportation and Tourism of the Energy and Commerce Committee, U.S. House of Representatives, June 5, 1986

<sup>6</sup> Cooper, Mark, 1985b, *Industrial Organization and Market Performance in the Transportation and Communications Industries*, July 1985; *The Great Train Robbery: Electric Utility Consumers and the Unregulated Rail Monopoly Over Coal Transportation*, Overview, *The Rail Monopoly Over Bulk Commodities*, A Continuing Dilemma for Public Policy, August 1985c; Maark Cooper, 1987, *Bulk Commodities and the Railroads After the Staggers Act: Freight Rates, Operating Costs and Market Power*, October 1987.

the efficiency of the economy, shifting jobs, and increasing the number of heavy trucks on the roads, which causes congestion and wear-and-tear on infrastructure.<sup>7</sup>

The level of consumer involvement has reflected the level of abuse in the industry. As described in the next chapter abuse was high in the years immediately following the passage of the Staggers Act, moderated for a decade, but was reignited by a wave of mega-mergers in the 1990s. Recent developments in the industry, including a shortage of capacity and rising energy prices have opened the door to a dramatic uptick in the abuse of market power.<sup>8</sup> In reaction, consumers and shippers have increased their efforts to convince policy makers to restore the consumer protections that Congress intended be provided by the Staggers Act. This paper makes the case that the abuse of market power has increased in recent years and that the need for reforms to rein in this abuse has become urgent.

## **WHY CONSUMERS CARE ABOUT RAILROAD MONOPOLY POWER**

The underlying cause of the current problems is the poor design and lax implementation of railroad deregulation under the Staggers Rail Act of 1980. There is no doubt that the railroads were in bad shape in the 1960s and 1970s and in desperate need of economic rationalization. In the decade after the Staggers Act was signed into law, railroads made great strides in reducing costs, abandoning or shifting track to small rails, and restoring their financial health.<sup>9</sup> Unfortunately, as frequently happened in the deregulation process of the 1980s and 1990s, the legislation went too far and the regulators did not provide effective oversight. Excesses soon set in that regulators failed to prevent.

The Staggers Act created a large group of captive shippers, shippers who lacked competitive alternatives (either rail-on-rail (intramodal) or truck/barge-on-rail (intermodal) competition). Since these shippers would not be protected from abuse by competitive market forces, the Staggers Act included captive shipper protections. The protections were weak and the regulators who implemented them, first the Interstate Commerce Commission (ICC) and its later replacement the Surface Transportation Board (STB), failed to effectively protect captive shippers from abuse. These agencies not only failed to restrain rate increases on captive traffic, but they made matters worse by approving a string of mergers that dramatically reduced competition in the industry.<sup>10</sup> To add insult to injury, the regulators failed to prevent anticompetitive pricing, routing, and contracting practices that shut the door on competition. Two decades after the passage of the Staggers Act, four railroads (two in the east and two in the west) accounted for over 90 percent of rail traffic and much of that traffic is vulnerable to the abuse of market power because the industry was allowed to become too concentrated.

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<sup>7</sup> Testimony of George Spitzer, Vice President DuPont Chemical Solutions Enterprise,” *House Transportation and Infrastructure Committee, September 25, 2070, pp. 9-10*; “Testimony of Susan M Diehl, Senior Vice President of Logistics and Supply Chain Management, Holcim, *House Transportation and Infrastructure Committee, September 25, 2070, p. 7*.

<sup>8</sup> Morgan Stanley, *Transportation: Initiation of Coverage: Rails Have More Room to Run on Pricing*, May 7, 2007

<sup>9</sup> GAO *Freight Railroads: Industry Health Has Improved, but Concerns About Competition and Capacity Should be Addressed*, October 2006.

<sup>10</sup> The concentration of the national market increased from an HHI of 500 to an HHI of well over 200, indicating a shift from being highly competitive to highly concentrated. Transportation Research Board, *Research to Enhance Rail Network Performance* (Washington, D.C.: 2007), p. 68. The four firm concentration ratio increase from about 40 percent to about 80 percent. Regional and local markets have become even more highly concentrated.

Captive shippers, including those who had competitive alternatives but lost those alternatives as a result of mergers, found themselves worse off under the Staggers Act. They had argued in Congress before passage of the Staggers Act and in regulatory proceedings at the ICC after its enactment that economic efficiency should not be confused with the abuse of market power. They sought additional protections that would rein in the abuse, but to no avail. By the mid-1990s, analysts began to find that abuse of market power was growing and consolidation in the industry was excessive.<sup>11</sup> But the ICC and the STB did little to prevent the resulting abuse.

The commodities most affected by the change in rail industry structure and conduct are bulk commodities (especially coal, chemicals, grain, forestry products). These are heavy, low-value commodities that are transported in large volumes and at long distances. Their economic characteristics generally make transport by truck prohibitively expensive, so effective competition is limited to rail and water. With barge transport restricted to major rivers and bodies of water and trucks far too expensive, bulk shippers are frequently dependent on the rails to move their products. For example, truck and water transport each account for about ten percent of coal produced in the U.S., whereas rail accounts for 71 percent.<sup>12</sup>

Where head-to-head rail competition is lacking, shippers pay the price of captivity. Where the ultimate burden of excessive rail rates falls depends on the nature of the market into which the captive shippers sell their products, but in all cases the abuse of market power has a negative impact. Where markets for end-products are competitive, shippers will bear the burden. Placed at a competitive disadvantage vis-à-vis shippers who have competitive alternatives, the shipper will lose sales, or be forced to shift production to facilities that are not captive, either in the U.S. or abroad. Industrial shippers, particularly chemicals, fall into this category. The shippers and the economy bear the cost of the distortion introduced by the abuse of rail market power.

Where markets for end-products are not competitive, the excessive rail rates will be passed through to consumers. Here the only constraint will be the market elasticity of demand. Coal, which is predominantly used to generate electricity, is the primary example and concern here. Although efforts have been made to introduce competition into electricity markets, the majority of markets are monopoly franchise markets and even where competition has been introduced, it is feeble at best. Thus, electricity consumers are the captives of utilities, who are the captive of the railroads. Electricity also has a low market elasticity of demand. Thus, the costs imposed by excessive rail rates are passed through directly to consumers.

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<sup>11</sup> Chapin, Alison and Stephen Schmidt, "Do Mergers Improve Efficiency? Evidence from Deregulated Rail Freight," *Journal of transportation Economics and Policy*, 33 part 2; argues that the second round of mergers were about market power, not efficiency. Christopher Velluto, et Al. *Deregulation, Merges and Cost Savings in Class I U.S. Railroads, 1974-1986*, March 23, 1992, p. 1' find that "firms that were not engaged in significant merger activities experienced similar cost differentials due to changes in operating characteristics and labor force utilization... We conclude that although mergers did confer some benefits on the participating firms, they were not a prerequisite for railroads being able to achieve substantial cost savings during the post Staggers period;" Charles H. White, Jr., "The Merger Movement and the Functional Change of the U.S. Railroad Industry," *The Voyager: The TRANSLOG International News Journal for the 21<sup>st</sup> Century*, October-December, 2004.

<sup>12</sup> Data available at: <http://www.eia.doe.gov/cneaf/coal/ctrdb/tab31.html>

These are the two extreme conditions and both result in economic distortions. In the competition case, it is the supply side of the shipper market where efficiencies and jobs are lost. In the monopoly case, end-use consumers bear the burden. Some commodities, like agricultural commodities, exhibit a mix of these characteristics. Transportation costs affect the price of food paid by consumers in domestic markets. Farmers bear the burden of excessive rail rates for agricultural commodities that are exported for sale in world markets.

Electricity is a consumer necessity that significantly affects household budgets. Because coal, which is a primary victim of the abuse of rail market power, is the dominant source of power to generate electricity, consumer groups pressed policy makers to address the problem of the unconstrained exercise of market power by the railroads throughout the 1980s.

When the effort to secure legislation to protect consumers stalled, two decades of regulatory skirmishes took place at the ICC/STB, but shippers and consumers have not fared well. The agencies with oversight authority imposed little restraint on rates, allowed mergers to dramatically consolidate the industry, and failed to prohibit anticompetitive practices that undermined competition.

Recently, the effort to protect captive shippers and consumers from the abuse of market power by the railroads has ramped up again, driven by two factors – rising costs imposed on the public and the increasing financial health of the railroads.

In the past half-decade the costs imposed on captive shippers have increased as a result of mergers and consolidation in the rail industry, which increased the market power of the railroads. At the same time, the rise in commodity prices has spurred the rails to try to capture more rent from shippers. Thus, the ability and opportunity to raise shipper costs increased dramatically. As a result, rail profitability has improved dramatically with several railroads achieving or approaching revenue adequacy. Revenue adequacy should trigger greater constraint on rail pricing. Not surprisingly, with revenue adequacy looming the railroads asked the STB to dramatically change the rules of the revenue adequacy proceedings and apply a new replacement-cost methodology that would suddenly show that railroads are not revenue adequate.<sup>13</sup> This would make it more difficult for the STB to impose restraints on rail rate increases. Fortunately, the STB rejected the railroad's petition. Still there is no relief in sight from the relentless abuse of rail market power; railroad rate increases continue unabated.<sup>14</sup> Recently, for example, Seminole Electric Cooperative experienced an increase of 100 percent in its rail rate from CSX and Oklahoma Gas and Electric experienced a large increase from Union Pacific, both of which have been the subject of complaints filed at the STB. US Magnesium and DuPont have also filed rate complaints at the STB, after experiencing substantial rate increases.

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<sup>13</sup> "Petition of the Association of American Railroads to Institute a Rule Making Proceeding to Adopt a Replacement Cost Methodology to Determine Railroad Revenue Adequacy, Ma 1, 2008. Table 1, shows that the new methodology Return on investment by would slash the estimated return on investment.

<sup>14</sup> *Ex Parte* No. 679, served October 24, 2008

The Staggers Rail Act allowed the railroads to engage in differential pricing – to charge some shippers higher rates than others – in order to achieve revenue adequacy. In economic terms, this represents the exercise of market power, which is generally frowned upon in a competitive, capitalist economy. It is necessary in the case of the railroads because the railroads have high fixed costs and exhibit economies of density. Congress knew that captive shippers would bear the burden of differential pricing because competitive market forces are inadequate to protect them, so the Staggers Act set limits on the exercise of market power. The ICC/STB was supposed to ensure that railroads did not earn excess profits and that all traffic made the maximum contribution it could to revenue adequacy. This would ensure that the railroads were run as efficiently as possible and that captive shippers would be treated as fairly as possible. The law allowed the use of market power, but sought to prevent the abuse of market power.

Our analysis shows that regulators have failed in this fundamental task. After more than a quarter of century, neither efficiency nor equity has been achieved.

## **FINDINGS**

We find that excessive consolidation resulting from mergers and lax oversight of anticompetitive business practices have given the railroads an immense amount of market power.

- The dramatic decline in the number of Class I railroads from almost 40 to 7, with two geographic duopolies dividing the country – one in the East and one in the West – has carried consolidation far beyond anything that could have been justified on efficiency grounds. The level of concentration in railroad market is extremely high by any standard.
- The market power of the railroads was reinforced by the failure of the ICC/STB to prevent railroad conduct that undermined competition. The anticompetitive practices have been well documented for years, including practices such as paper barriers, cancellation of interconnection agreements, and refusal to quote bottleneck rates or to allow access to bottleneck facilities.
- As a result, a significant part of bulk commodities have been rendered substantially captive to the rails. Coal is by far the most captive commodity with as much as two-thirds captive to a single railroad. Other commodities that have high levels of captivity are chemicals and agricultural commodities.

Failing to implement the captive shipper protections of the Staggers Act, the ICC/STB has allowed the railroads to abuse this market power.

- Profits of railroads that carry more than half the traffic in the U.S. exceed their cost of capital. This means that shippers are being overcharged by \$1 billion per year.

- The excess profits have existed for several years on specific railroads and are the result of pricing power exercised by the rails.
- Wall Street analysts project that the pricing power will persist and drive up prices and earnings over the next several years.

Significant quantities of traffic are carried by the rails at non-compensatory rates, violating the Staggers Act and increasing the burden on captive shippers.

- Approximately one-fifth of all traffic does not cover its variable costs, resulting in a cross-subsidy from captive shippers of over \$2 billion per year.
- This increases the burden on captive shippers because it distorts the revenue adequacy status of the railroads.

As a result of the excessive profits and non-compensatory traffic, rates for captive shippers are higher than they should be about \$3 billion per year. The productive and allocative inefficiency in the rail sector imposes inefficiencies on the broader economy because rail service is an infrastructural service on which other economic sectors are dependent. Inefficiency in the rail sector distorts shipper decisions about which fuels to burn and which plants to operate, which raises costs and reduces employment. It drives some freight traffic onto the highways, adding to congestion and wear-and-tear on the roads.

## **THE STB COMPETITION ANALYSIS**

The recent STB report, entitled *A Study of Competition in the U.S. Freight Railroad Industry and Analysis of Proposals that Might Enhance Competition*, is a stark reminder that captive shippers cannot expect a fair and balanced hearing from the STB. The analysis suffers from a series of flaws and blind spots.

The report fails to analyze the nature and extent of captivity that exists in the rail industry.

- For example, in an almost thousand-page document, the most important facts with respect to competition – that two-thirds (66 percent) of coal carried by the rails, over half of all corn (53 percent) and one-third (33 percent) of chemical shipments are delivered to facilities that are served by only on railroad – are buried in a footnote half way through the text. There is a high probability that these shipments are captive, but the study provides no analysis of them and fails to define the geographic level properly for competitive analysis.
- The rates charged on captive traffic in comparison to non-captive shipments are not discussed.

- The status of competition at the origin of these shipments is never analyzed, nor is the extent of captivity at origins discussed in detail.

Although the pricing analysis presented deals with comparisons between hypothetical competitive situations, it still shows that captive shippers pay much higher rates than shippers who enjoy competitive alternatives.

- Coal delivered to facilities in counties that are served by only one railroad pay about 32 percent more than shippers in counties where two railroads deliver equal amounts of coal to the facility and 59 percent more than shippers in counties where there are three shippers delivering equal quantities of coal to the facility.
- Captivity on the originating end had less of an impact – with shippers in counties served by one railroad paying 6 percent more than origins served by two railroads of equal market shares and 10 percent more than origins with three railroads having equal market shares.

The study locates the vast majority of its analysis at the wrong level. The key policy questions before the STB and the Congress involve specific commodities in specific markets served by specific commodities, specific markets or specific railroads. The competition study devotes most of its attention to the industry as a whole, rather than specific commodities, specific markets or specific railroads. This is a classic case where the average for the industry thoroughly misleads the policy maker. For example, the study concludes that “Rates on average need to be marked up over marginal cost by about 70 percent to achieve revenues sufficient to cover cost” (p. 18-35). Even with this figure that is based on a methodology that overstates the cost of capital substantially,

- Two of the major national railroads (the Burlington Northern (BNSF) and the Norfolk Southern (NS) are well above that figure.
- The same two railroads have had a return on equity that far exceeded their cost of capital as calculated by the STB in 2005. For the BN, the return on equity was almost twice the cost of capital, while for the NS it was almost 1.5 times the cost of capital.

The study also shows that a large amount of traffic carried by the rails – one fifth – does not cover its variable cost. This means that if this traffic were shed, the profit of the railroads would increase. This represents a substantial inefficiency that suppresses the income of the railroads and increases the burden on captive shippers, in violation of the explicit language of the Staggers Act.

- The railroads that are not revenue-adequate might be so, if they shed this non-compensatory traffic or raised the rates it pays. Those that are exceeding their

cost of capital would do so by an even larger margin if they shed this non-compensatory traffic or raised the rates that it pays.

- Differential pricing in excess of what is necessary has resulted in excess profits and massive cross-subsidies, which means captive shippers are being abused. The report glosses over the central reality of the rail industry.
- Captive shippers are forced to suffer higher rates because of the persistent inefficiency embodied in this traffic. Justice delayed is justice denied. More than a quarter of a century after the passage of the Staggers Act, captive shippers have a right to demand that regulators no longer allow this inefficiency to burden traffic captive shippers. The STB has failed to address this problem, in violation of the Staggers Act, and its competition analysis ignores this problem entirely,

The discussion of revenue adequacy is inadequate in other ways. The STB has adopted a definition of revenue adequacy after years of controversy.

- The study also cites a single 2004 Wall Street analysis that notes that the rails had just reached an adequate return, but makes no effort to look at more recent years, yet if several railroads were at or above revenue adequacy in 2005, they were likely well above it in the last couple of years because prices and profits have been rising sharply.
- There are numerous other Wall Street analyses that show that in recent years rail returns have exceeded their cost of capital and that rates continue to rise rapidly.
- These Wall Street analyses project that rates are likely to continue to rise as a result of the pricing power the railroads have achieved through mergers and the elimination of spare capacity.

Our analysis, designed to give a balanced view of the structure, conduct and performance of the rail industry since the passage of the Staggers Act fills many of the holes in the STB analysis.

## **POLICY RECOMMENDATIONS**

This review of the state of the rail freight industry demonstrates that the mergers of the mid-1990s have created a highly concentrated market structure in which neither intramodal competitive forces within the rail sector nor intermodal competition from trucks and water transport is sufficient to discipline the abuse of market power. Anticompetitive conduct has further weakened competition by undermining interline traffic. The STB has done little, if anything, to prevent or diminish this abuse. With captive shipper rates and rail



profits escalating rapidly the harm to consumers, shippers and the economy is mounting rapidly. The need to address this growing national problem is urgent.

The STB has failed to implement the captive shipper and procompetitive provisions of the Stagger Act to protect the public. We identified this central problem over a quarter of a century ago. It has festered ever since and, as we show in this analysis, now costs consumers billions of dollars per year.

The consumer protection and pro-competitive provisions of the Staggers Act, which the STB has failed to implement properly, should be brought back to life with legislation to fill their proper function. Legislation is necessary because the regulators have failed to properly implement these provisions for a quarter of a century. There is no prospect that the STB is willing or able to correct the problem on its own.

### **Removing Barriers to Competition**

First, since competition is the best form of consumer protection, we begin by describing the policy changes necessary to reinvigorate rail-to-tail competition. After a quarter of a century in which competition has shriveled in the industry, the provisions of existing law that protect the railroads from vigorous antitrust enforcement must be eliminated.

**Antitrust Law:** Lifting the exemption from the antitrust laws will immediately expose the most blatantly anticompetitive practices, like paper barriers to pressures for their elimination. These artificial barriers to competition, imposed by the railroads to ensure they would be able to exercise the market power accumulated through mergers, should fall by the wayside quickly. The permanent structural barriers to competition posed by terminal and bottleneck facilities will also come under scrutiny, but these are likely best dealt with under a repaired regulatory structure at the STB.

**Stagger Act Access to Bottlenecks:** The existing statute provides for terminal trackage rights without showing “competitive abuse.” The ICC invented the “competitive abuse” and shifted the emphasis away from promoting competition, which was the intention of the act statute. That test should be eliminated, so that Congressional intent to promote a competitive and efficient rail industry is fostered.

The STB created a statutory concept out of whole cloth, ruling that rails do not have to quote “bottleneck rates” unless a shipper has a contract from a railroad that could serve the shipper if the shipper is quoted the “bottleneck rate.” Of course, shippers universally cannot get such contracts, so the STB’s ruling stifled competition and produced inefficiency. In essence the STB rule reinforced the incentive to refuse to quote competitive rates and became an ideal tool to implement parallel, anticompetitive action. The STB’s ruling should be overturned by requiring rails to quote “bottleneck rates.”

## Preventing the Abuse of Endemic Market Power

Second, policy makers should be under no illusions about the pervasiveness of market power. The highly concentrated market structure and substantial physical barrier to entry mean that even where the artificial, conduct-based impediments to competition are removed, there will be a great deal of market power remaining in the sector. Thus, regulatory oversight to effectively protect captive shippers from abuse will still be necessary.

**Rate Threshold:** No other regulatory agency uses the “stand-alone cost” test. It is ludicrous that a captive shipper should have to pay several millions of dollars just to challenge a rail rate, and that a railroad has to spend several millions of dollars to defend the rate. The SAC test was adopted in 1985 to permit railroads to charge the highest rates economists could justify, due to the rails’ then-revenue inadequacy and then-excess capacity. Those justifications no longer apply, so there is no justification for the SAC test, if there ever was. It should be repealed. With unchallenged market power and enduring captivity, the STB should return to a rate standard based on cost plus a reasonable return. The railroads should bear the burden of proving that rates above the threshold of 180 percent of variable cost are reasonable, including a showing that all traffic is compensatory.

**Cost of Capital:** The STB has consistently overstated the cost of capital, allowing the rails to abuse their market power and earn excess profits. The STB did adopt new cost-of-capital rules to rely on the so-called “CAPM” methodology, rather than the largely discredited discounted cash flow (“DCF”) methodology, to measure the railroads’ cost of capital. It then almost immediately backtracked, adopting a revised formula using 50 percent CAPM and 50 percent DCF to determine the cost of capital. Still, the new rules demonstrate that the STB’s old methodology of using only the DCF measure of the cost of capital substantially overstated the railroads’ cost of capital and therefore led to the unwarranted conclusion that virtually no railroads were revenue-adequate for most of the last 30 years. The STB did reject the railroads’ petition to adopt a replacement-cost methodology rather than a net-investment methodology for determining the asset base for revenue-adequacy determinations, but the railroads continue to advocate for replacement costs at both the STB and before Congress. No regulatory agency in the United States, for any regulated industry, uses a replacement-cost methodology to determine either revenue adequacy or maximum reasonable rates. The STB should use the CAPM model and Congress will have to be vigilant to prevent the use of replacement costs to determine either revenue adequacy or a maximum reasonable rail rate.

**Small Shippers:** Also, the STB’s “small-shipment” rate-challenge rules – to be used when the SAC test is not available (due to the absence of sufficient volumes to allow it to work -- have artificial limits on relief (\$1 million over 5 years, or \$5 million over 5 years, depending on whether the “three-benchmark” methodology, or the so-called “simplified stand-alone cost” methodology, is used). There is no justification for those artificial limits on relief. Those limits appear to have limited the number of cases filed to two (by DuPont and US Magnesium). Small shippers apparently cannot justify the large transaction costs (hundreds of thousands, perhaps 500 hundred thousand, dollars) just to present such a case.

With the prospect of, at most, only \$1 million in relief over 5 years, that is too risky to justify. Apparently, no one really knows how the so-called “small-shipment” rate-case guideline would work, or if it would work, so no shipper has filed a case under that test. So, the STB “small-shipment” rate-case guidelines appear largely unavailable and too expensive to produce meaningful relief.

Once the statute is amended to compel the STB to provide captive shippers the protections that the Staggers Act intended, the agency will require adequate funding and staff to implement those protections effectively.

## **OUTLINE**

The remainder of Part I describes the structure, conduct, performance approach to the analysis of industrial organization, which is used in this analysis. This paradigm has been the dominant approach to analysis of industrial organization for almost a century and it pinpoints the key issues in the rail industry.

Part II discusses the structure and conduct of the rail industry since the passage of the Staggers Act. Section III describes the sweeping changes in rail market structure and conduct that have taken place in the past two decades. Section IV discusses basic conditions that have created the opportunity for the railroads to increase the exercise of their market power. These recent rail market developments have triggered the growing calls to rein in rail abuse.

Part III examines the performance of the rail industry in the past decade. Section V examines broad patterns of price increases at the national level, which provide evidence of the abuse of market power. Section VI shows that these abuses are even more pronounced when examined in specific product and geographic markets. Section VII reviews quality of service issues. Section VIII shows that the railroads are not only revenue adequate, but are earning excessive returns and engaging in substantial cross subsidization. Section IX discusses policies to correct the problem.

## II. ANALYTIC FRAMEWORK

### DEFINITIONS AND CONCEPTS

This analysis relies on the structure, conduct performance (SCP) view of industrial organization and economic activity, which “provides a useful framework for organizing and discussing a number of important concepts.”<sup>15</sup> It has been the dominant public policy paradigm in the United States for the better part of a century.<sup>16</sup> Figure II-1 present two graphic representation of the SCP framework from two prominent economic texts. The key elements of the paradigm that will be discussed below are highlighted in both of the Figures.

The central concern in the paradigm is with market performance, since that is the outcome that affects consumers most directly. The concept of performance is multifaceted. It includes, among other factors, productive and allocative efficiency, progress, and fairness.<sup>17</sup> The measures of performance to which we traditionally look are pricing and profits. They are the most direct measure of how society’s wealth is being allocated and distributed.<sup>18</sup>

The performance of industries is determined by a number of factors, most directly the conduct of market participants.<sup>19</sup> Do they compete? What legal (or illegal) tactics do they employ? How do they advertise and price their products? The fact that conduct is only part of the overall analytic paradigm is important to keep in mind.

Conduct is primarily a product of other factors.<sup>20</sup> Conduct is affected and circumscribed by market structure. Here we look at the number and size of the firms in the

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<sup>15</sup> Viscusi, Kip, W. John M. Vernon and Joseph E. Harrington, Jr., *Economics of Regulation and Antitrust* (Cambridge: MIT Press, 2001), p. 62.

<sup>16</sup> Scherer and Ross 1990, p. 4: We seek to identify sets of attributes or variables that influence economic performance and to build theories detailing the nature of the links between these attributes and end performance. The broad descriptive model of these relationships used in most industrial organization studies was conceived by Edward S. Mason at Harvard during the 1930s and extended by numerous scholars.

<sup>17</sup> F. M Scherer and David Ross, *Industrial Market Structure and Economic Performance* (Houghton Miffling: Boston, 1990) (hereafter Scherer and Ross), p. 4.

<sup>18</sup> Scherer and Ross 1990, p. 4: We begin with the fundamental proposition that what society wants from producers of goods and services is good performance. Good performance is multidimensional... Decisions as to what, how much and how to produce should be efficient in two respects: Scarce resources should not be wasted, and production decisions should be responsive qualitatively and quantitatively to consumer demands.

The operations of producers should be progressive, taking advantage of opportunities opened up by science and technology to increase output per unit of input and to provide consumers with superior new products, in both ways contributing to the long-run growth of real income per person. The operation of producers should facilitate stable full employment of resources... The distribution of income should be equitable. Equity is notoriously difficult to define, but it implies at least that producers do not secure rewards in excess of what is needed to call forth the amount of services supplied.

<sup>19</sup> Scherer and Ross 1990 p. 4: Performance in particular industries or markets is said to depend upon the conduct of sellers and buyers in such matters as pricing policies and practices, overt and taciturn interfirm cooperation, product line and advertising strategies, research and development commitments, investment in production facilities, legal tactics (e. g. enforcing patent rights), and so on.

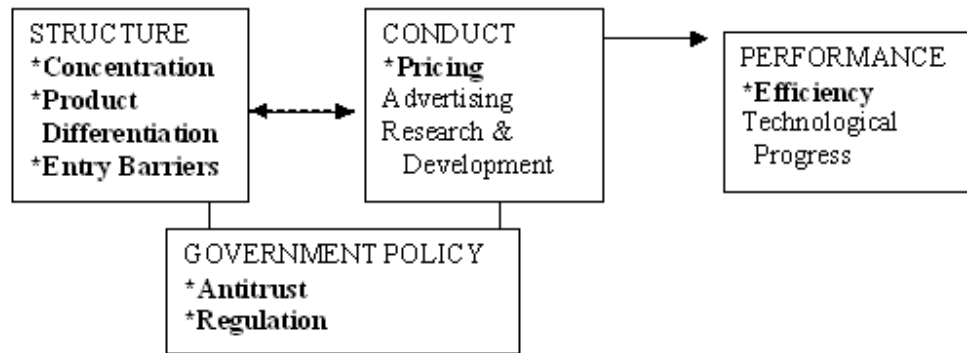
<sup>20</sup> Scherer and Ross 1990, p. 5: Conduct depends in turn upon the structure of the relevant market, embracing such features as the number and size distribution of buyers and sellers, the degree of physical or subjective differentiation prevailing among competing seller's products, the presence or absence of barriers to entry of new firms, the ratio of fixed to total costs in the short run for a typical firm, the degree to which firms are vertically integrated from raw material production to retail distribution and the amount of diversity or conglomerateness characterizing individual firms' product lines.

Market structure and conduct are also influenced by various basic conditions. For example, on the supply side, basic conditions include the location and ownership of essential raw materials; the characteristics of the available technology (e.g. batch versus continuous process productions or high versus low elasticity of input substitution); the degree of work force unionization; the durability of the product; the time pattern of production (e.g. whether goods are produced to order or delivered from inventory); the value/weight characteristics of the product and so on. A list of significant basic conditions on the demand side must include at least the price elasticity of demand at various prices; the availability of (and cross elasticity of demand for) substitute products; the rate of growth and variability over time

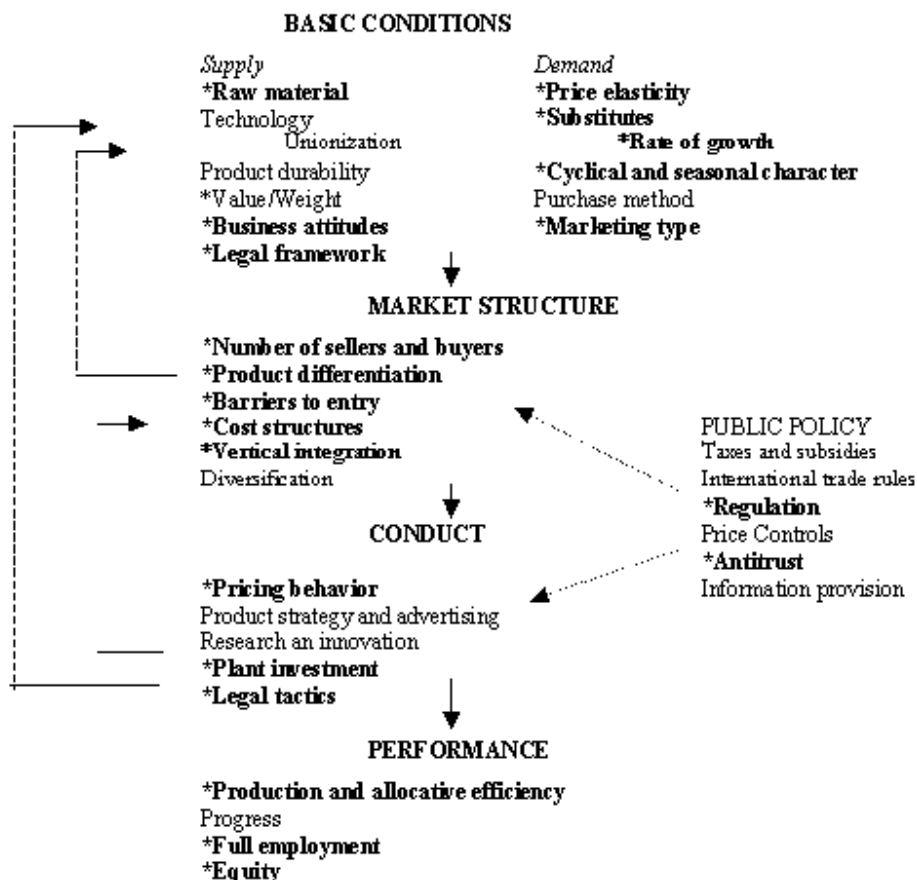
industry, their cost characteristics and barriers to entry, as well as the basic conditions of supply and demand.

**Figure II-1: The Structure-Conduct-Performance Model of Industrial Organization**

Viscusi, Kip, W. John M. Vernon and Joseph E. Harrington, Jr., *Economics of Regulation and Antitrust* (Cambridge: MIT Press, 2001), p. 62.



F. M. Scherer and David Ross, *Industrial Market Structure and Economic Performance* (Houghton Miffling: Boston, 1990) (hereafter Scherer and Ross), p. 5.



of demand; the method employed by buyers in purchasing (e.g. acceptance of list prices as given versus solicitation of sealed bids versus haggling); and the marketing characteristics of the product sold (e.g. specialty versus convenience shopping method).

Regardless of how much weight one gives to the causal assumptions of the paradigm, the list of variables is important. These are the factors that taken together determine whether markets work or fail.<sup>21</sup> Also note that the paradigm contemplates the possibility that structure and behaviors affect basic conditions.<sup>22</sup> There are feedback effects in the model and policy plays a key role in the paradigm. Antitrust and regulation are central factors.

The theoretical concepts in the framework are challenging empirically. Pure and perfect competition is rare, but the competitive goal is important.<sup>23</sup> Therefore, a great deal of attention has been focused on the relative competitiveness of markets and conditions that make markets more competitive or workably competitive. Summarizing an “explosion of articles on workable competition” Scherer and Ross developed a list of “the criteria of workability suggested especially frequently by diverse writers [that] can be divided into structural, conduct and performance categories.”<sup>24</sup> The list is presented in Figure II-2, verbatim from the text. Again, the items that will be discussed below are highlighted.

As we shall see, the number of rails has shrunk and their size has grown so large that it is doubtful that the first structural condition on minimum efficient scale is being met. There is a clear and growing pattern of artificial inhibitions on mobility and entry, in addition to natural barriers to entry that are huge. Thus the second structural condition is being violated. The conduct conditions for workable competition are also widely violated. Participants in the industry have begun to signal their pricing intentions with published tariffs to diminish price competition and there is a pervasive pattern of exclusionary tactics and harmful price discrimination. In the performance area, there is substantial inefficiency, poor service quality and excess profits, as well as a lack of responsiveness to consumer demand.

## Efficiency

The efficiency outcome is so central to the paradigm that it deserves more detailed discussion. The focal point of market structure analysis is to assess the ability of markets to support competition, which “has long been viewed as a force that leads to an ideal solution of the economic performance problem, and monopoly has been condemned.”<sup>25</sup> The predominant reason for the preference for competitive markets reflects the economic performance they generate, although there are political reasons to prefer competitive markets as well.<sup>26</sup> In particular, competition fosters efficient allocation of resources, absence

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<sup>21</sup> Scherer and Ross 1990, p. 6.

<sup>22</sup> Scherer and Ross, p. 6: As the solid arrows of Figure 1.1 suggest, we shall be concerned mainly with causal flows running from market structure and/or basic conditions to conduct and performance. That is, we seek theories that permit us to predict ultimate market performance from market structure, basic conditions, and conduct...

There are also important feedback effects (dashed arrows in Figure 1.1). For instance, vigorous research and development efforts can alter an industry’s technology, and hence its cost conditions and/or the degree of physical production differentiation. Or sellers’ pricing policies may either encourage or discourage entry or drive firms out of the market, thereby transforming the dimension of market structure. In this sense, both basic conditions and market structure variables are *endogenous*, that is determined within the whole system of relationships and not fixed by outside forces

<sup>23</sup> Scherer and Ross 1990, p. 16-17.

<sup>24</sup> Scherer and Ross 1990, p. 53.

<sup>25</sup> Scherer and Ross 1990, p. 15.

<sup>26</sup> Scherer and Ross 1990, p. 18.

of excess profit, lowest cost production and provides a strong incentive to innovate.<sup>27</sup> Where competition breaks down, firms are said to have market power and the market falls short of the desired efficient results.<sup>28</sup>

### ***Figure II-2: Criteria of Workable Competition***

#### **STRUCTURAL CRITERIA**

**\*The number of traders should be at least as large as scale economies permit.**

**\*There should be no artificial inhibitions on mobility and entry.**

There should be moderate and price-sensitive quality differentials in products offered.

#### **CONDUCT CRITERIA**

**\*Some uncertainty should exist in minds of rivals as to whether price initiatives will be followed.**

Firms should strive to attain their goals independently, without collusion.

**\*There should be no unfair, exclusionary, predatory, or coercive tactics.**

**\* Inefficient suppliers and customers should not be shielded permanently.**

Sales promotions should be informative, or at least not misleading.

**\*There should be no persistent, harmful price discrimination.**

#### **PERFORMANCE CRITERIA**

**\* Firms' production and distribution operations should be efficient and not wasteful of resources.**

**\*Output levels and product quality (that is variety, durability, safety, reliability, and so forth) should be responsive to consumer demands.**

**\*Profits should be at levels just sufficient to reward investment, efficiency, and innovation.**

**\*Prices should encourage rational choice, guide markets toward equilibrium, and not intensify cyclical instability.**

Opportunities for introducing technically superior new products and processes should be exploited.

Promotional expenses should not be excessive.

Success should accrue to sellers who best serve consumer wants

**Source: F. M Scherer and David Ross, *Industrial Market Structure and Economic Performance* (Houghton Miffling: Boston, 1990) (hereafter Scherer and Ross), p. 53-54).**

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<sup>27</sup> Scherer and Ross 1990, p. 4, 20.

<sup>28</sup> Scherer and Ross 1990, p. 17-18.

In modern economic theory, a market is said to be competitive (or more precisely purely competitive) when the number of firms selling a homogeneous commodity is so large, and each individual firm's share of the market is so small, that no individual firm finds itself able to influence appreciably the commodity price by varying the quantity of output it sells.... Pure monopolists, oligopolists, and monopolistic competitors share a common characteristic: each recognizes that its output decision have a perceptible influence on price, or in other words, each can increase the quantity of output it sells under given demand conditions only by reducing its price. All three types possess some degree of power over price, and so we say that they possess *monopoly power* or *market power*.

Homogeneity of the product and insignificant size of individual seller and buyers relative to their market (that is *atomistic* market structure) are sufficient conditions for the existence of pure competition... Several additional structural conditions are added to make competition in economic theory not only "pure" but "perfect." The most important is the absence of barriers to entry of new firms, combined with mobility of resources employed.<sup>29</sup>

The competitive marketplace exhibits three desirable economic efficiency characteristics.

The long-run equilibrium state of a competitive industry has three general properties with important normative implications: The cost of producing the last unit of output—is equal to the price paid by consumers for the unit... With price equal to average total cost for the representative firm, economic (that is, supra-normal) normal profits are absent... In the long-run equilibrium, each firm is producing its output at the minimum point on its average total cost curve.<sup>30</sup>

The discussion of efficiency criteria can be related directly to the rail industry. Because the railroad industry has high fixed costs, the first condition, analyzed as marginal cost equals price, cannot hold if the industry is to be economically viable. The prices it charges must not only cover (equal) marginal (or variable) costs, they must also cover the capital costs to deploy and maintain the physical plant necessary to provide the service. There must be a mark-up of prices above marginal costs. Price should equal average total cost, which is higher than marginal cost in the case of the rail industry. In practical terms, the revenue-to-variable cost ratio ( $R/VC$ ) must be greater than 1.

While the first condition needs to be framed properly for the rail industry, the second and third conditions can apply directly. The second condition, the mark-up of prices above costs, should allow the railroads to earn a normal return on capital without including any

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<sup>29</sup> Scherer and Ross, 1990, 15, 16, 17.

<sup>30</sup> Scherer and Ross, 1990, 20.



supra normal profits. Here the rail industry goes astray. It is generally agreed that the railroads must mark up prices by 30 to 50 percent above variable costs to cover their cost of capital. In other words, the second condition is met when  $R/VC = 1.3$  to  $1.5$  (when the proper cost of capital is used, as opposed to the STB's inflated cost of capital). The revenue-to-variable cost ratios for several of the railroads exceed the level necessary to cover cost. We can observe directly whether railroads are earning supra-normal (or excess profits) by comparing their return on equity to the market cost of equity capital.

The third condition can also be met. A railroad can operate at a point where average total costs are minimized and all traffic covers its marginal cost. If the railroad is operating at a level above the average total cost minimum in a range where average total costs are greater than marginal costs, it should lower prices and expand output. If the railroad is operating in an area where average total costs are above the minimum in a range where marginal costs are above average costs, it should raise prices and lower output. Here too, the railroads have missed the mark to the detriment of captive shippers. Railroads are cross-subsidizing competitive traffic and failing to maximize contribution to fixed costs on this traffic as required by the Staggers Act.

Given that the railroads carry a mix of traffic that has various costs and face different levels of competition, we would expect to see different movements with different revenue-to-variable cost ratios. Differential pricing is inevitable. However, these three conditions combine to define a clear performance outcome that is efficient. Where the firm does not earn excess profits and all traffic is compensatory, the revenue-to-variable cost ratio on captive traffic will not be excessive. This will not happen as a result of market forces, however. Where market power exists, railroads have incentives to increase rates on captive traffic to increase profits and under some circumstances cross-subsidize more competitive traffic. Regulation is supposed to prevent this outcome, which is both inefficient and inequitable.

Lax regulation has allowed the contemporary rail industry to violate both the excess profit and the total cost conditions. Some railroads are earning a return on equity that is above the market return on equity capital and they are carrying a substantial amount of traffic that does not cover its marginal cost. In other words, the railroads are overcharging some (captive) shippers and undercharging other shippers. The burden falls on captive shippers who are paying rates that are on average almost 30 percent higher than they should be.

The analysis of efficiency should not only focus on efficiency within the rail sector. Because transportation is an infrastructural service, a vital input that affects a broad range of economic activity, distortions within the rail sector affect the economic activities that rely on it.<sup>31</sup> CFA identified this problem with respect to the electricity sector early in the debate over abuse of market power by the rails.

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<sup>31</sup> Alfred E. Kahn, *The Economics of Regulation: Principles and Institutions* (Cambridge: MIT Press) p. 11.

Inefficiency in railroad operations is sustained and supported by the unrestrained ability to exercise monopoly power. Choices about generating capacity and sources of energy may be distorted by the distortions of transportation costs. Inefficient allocation of resources within the economy results from the transfer of wealth from consumers to rail stockholders.<sup>32</sup>

Recent theoretical analysis confirms that this broader perspective must be brought to bear on the issue.

The purpose of this paper is to study how the deregulation of the transport sector affects social welfare once it is recognized that firms and mobile agents are free to relocate in the long-run response to permanent changes in freight rates and consumer prices. Our key result is to show that *there is a trade-off between short run benefits and long run losses; in the short run, transport deregulation reduces static deadweight losses arising from market power in both the transport and manufacturing sector; but in the long run, it generates deadweight losses because of sub-optimal redistribution of industrial activity across regions.*<sup>33</sup>

Recent empirical evidence suggests that the problem persists and has spread to other sectors as railroad abuse of market power had increased. There is a range of distortions beyond the shift of resources from consumers and captive shippers to rail owners, including shifts in fuel choices, transportation sources used, and decisions about plant location.

## **ANALYZING MARKET STRUCTURE: MEASURING MARKET CONCENTRATION**

With the efficient results created by competition as the focal point of the overall analysis, it is natural that the central concern in describing markets is to analyze the state of competition. The number and size of firms in the market becomes the launch point for much analysis in an effort to ascertain whether a small number or an “individual firm finds itself able to influence appreciably the commodity price by varying the quantity of output it sells.”

Measuring concentration for purposes of market structure analysis has received a great deal of attention. Market structure analysis is used to identify situations where a small number of firms control a sufficiently large part of the market as to make coordinated or reinforcing activities feasible. Where monopoly exists, the ability to influence price is likely present, especially for commodities that have few substitutes. Monopoly is not the only circumstance under which power over price can exist. Through various implicit and explicit mechanisms, a small number of firms can reinforce each other's behavior, rather than

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<sup>32</sup> Cooper, Mark. 1985a. The Consumer Impact of the Unregulated Railroad Monopoly in Coal Transportation. *Subcommittee on Monopolies and Commercial Law of the Judiciary Committee, U.S. House of Representatives*, June 27, p. 4.

<sup>33</sup> Behrens, Kristian, Gaigne, Carl and Thisse, Jacques-François, 2007, *Is the Regulation of the Transport Sector Always Detrimental to Consumers?*. Center for Economic Policy Research, Discussion Paper No. DP6185, March

Available at SSRN: <http://ssrn.com/abstract=1133829>

compete.<sup>34</sup> The opening section of the Department of Justice Merger Guidelines states the issue as follows:

Market power to a seller is the ability profitably to maintain prices above competitive levels for a significant period of time.<sup>\*/</sup> In some circumstances, a sole seller (a "monopolist") of a product with no good substitutes can maintain a selling price that is above the level that would prevail if the market were competitive. Similarly, in some circumstances, where only a few firms account for most of the sales of a product, those firms can exercise market power, perhaps even approximating the performance of a monopolist, by either explicitly or implicitly coordinating their actions. Circumstances also may permit a single firm, not a monopolist, to exercise market power through unilateral or non-coordinated conduct – conduct the success of which does not rely on the concurrence of other firms in the market or on coordinated responses by those firms. In any case, the result of the exercise of market power is a transfer of wealth from buyers to sellers or a misallocation of resources.

<sup>\*/</sup> Sellers with market power also may lessen competition on dimensions other than price, such as product quality, service or innovation.<sup>35</sup>

Identification of when a small number of firms can exercise market power is not a precise science. Generally, however, when the number of significant firms falls into the single digits, there is cause for concern.

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<sup>34</sup> Lawrence Sullivan and Warren S. Grimes, *The Law of Antitrust: An Integrated Handbook*, Hornbook Series (West Group, St. Paul, 2000), at 596-597: The coordination that can produce adverse effects can be either tacit or express. And such coordination need not be unlawful in and of itself. According to the 1992 Guidelines, to coordinate successfully, firms must reach terms of interaction that are profitable to the firms involved and be able to detect and punish deviations. The conditions likely to facilitate these two elements are discussed separately, although they frequently overlap.

In discussing how firms might reach terms for profitable coordination, the Guidelines avoid using the term "agreement," probably because no agreement or conspiracy within the meaning of Section 1 of the Sherman Act is necessary for the profitable interaction to occur. As examples of such profitable coordination, the Guidelines list "common price, fixed price differentials, stable market shares, or customer or territorial restrictions." Sometimes the facilitating device may be as simple as a tradition or convention in an industry.

The rule of thumb reflected in all iterations of the Merger Guidelines is that the more concentrated an industry, the more likely is oligopolistic behavior by that industry... Still, the inference that higher concentration increases the risks of oligopolistic conduct seems well grounded. As the number of industry participants becomes smaller, the task of coordinating industry behavior becomes easier. For example, a ten-firm industry is more likely to require some sort of coordination to maintain prices at an oligopoly level, whereas the three-firm industry might more easily maintain prices through parallel behavior without express coordination.

Oligopoly conditions may or may not require collusion that would independently violate Section 1 of the Sherman Act. A supracompetitive price level may be maintained through price leadership (usually the leader is the largest firm), through observance of a well-established trade rule (e.g., a convention of a 50 percent markup in price among competing retailers), or through strategic discipline of nonconforming members of the industry. The most common form of such disciplining action is the price war, instituted to prevent any member from gaining market share at the expense of the others. An industry characterized by two-level pricing—a higher level of pricing that normally prevails but is interrupted by occasional price wars—may be exercising this oligopolistic behavior. The price war is aimed at discouraging industry participants from abandoning price discipline.

<sup>35</sup> U.S. Department of Justice 1997, section 0.1.

Where is the line to be drawn between oligopoly and competition? At what number do we draw the line between few and many? In principle, competition applies when the number of competing firms is infinite; at the same time, the textbooks usually say that a market is competitive if the cross effects between firms are negligible. For up to six firms one has oligopoly, and with fifty firms or more of roughly equal size one has competition; however, for sizes in between it may be difficult to say. The answer is not a matter of principle but rather an empirical matter.<sup>36</sup>

The clear danger of a market with a structure equivalent to only six equal-sized firms was recognized by the Department of Justice in its Merger Guidelines. These guidelines were defined in terms of the Herfindahl-Hirschman Index (HHI). This measure takes the market share of each firm, squares it, sums the result and multiplies by 10,000.<sup>37</sup>

A market with six equal-sized firms would have an HHI of 1667. The Department declared any market with an HHI above 1800 to be highly concentrated. Thus, the key threshold is at about the equivalent of six or fewer firms (see Figure II-3).

Another way that economists look at a market at this level of concentration is to consider the market share of the largest four firms (called the 4-Firm concentration ratio). In a market with six equal sized firms, the 4-Firm concentration would be 67 percent. The reason that this is considered an oligopoly is that with a small number of firms controlling that large a market share, their ability to avoid competing with each other is clear.

Shepherd describes this threshold as follows: “Tight Oligopoly: The leading four firms combined have 60-100 percent of the market; collusion among them is relatively easy” (Shepherd, 1985, p. 4).

While six is a clear danger sign, theoretical and empirical evidence indicates that many more than six firms are necessary for atomistic competition – perhaps as many as fifty firms are necessary. Reflecting this basic observation, the Department of Justice established a

<sup>36</sup> Friedman, J.W. 1983. *Oligopoly Theory*. Cambridge: Cambridge University Press, p. 8-9

<sup>37</sup> Shepherd 1985, p. 389, gives the following formulas for the Herfindahl-Hirschman Index (HHI) and the four Firm Concentration Ratio (CR4):

$$H = \sum_{i=1}^n S_i^2$$

$$CR4 = \sum_{i=1}^{n=4} S_i$$

where

n = the number of firms

S<sub>i</sub> = the share of the ith firm.

**Figure II-3: Describing Market Structures**

Department of Justice Merger Guidelines Concentration	Type of Market	Equivalents In Terms of Equal Sized Firms	Typical HHI in Media Markets	4-Firm Share
	Monopoly	1 <sup>a</sup>	5300+	~100
	Duopoly	2 <sup>b</sup>	3000 - 5000	~100
	Dominant Firm	4<5	>2500 2000 1800 1667	80 60 67
High	Tight Oligopoly			60
Moderate	Unconcentrated			
	Loose Oligopoly	10	1000	40 <sup>c</sup>
	Monopolistic Competition			
	Atomistic Competition	50	200	8 <sup>c</sup>

a = Antitrust practice finds monopoly firms with market share in the 65% to 75% range. Thus, HHIs in “monopoly markets can be as low as 4200.

b = Duopolies need not be a perfect 50/50 split. Duopolies with a 60/40 split would have a higher HHI.

c = Value falls as the number of firms increases.

**Sources:** U.S. Department of Justice, *Horizontal Merger Guidelines*, revised April 8, 1997, for a discussion of the HHI thresholds; William G. Shepherd, *The Economics of Industrial Organization* (Englewood Cliffs, NJ: Prentice Hall, 1985), for a discussion of four firm concentration ratios. J. W. Friedman, 1983. *Oligopoly Theory*. Cambridge: Cambridge University Press.

second threshold to identify a moderately concentrated market. This market was defined by an HHI of 1000, which is equivalent to a market made up of 10 equal sized firms. In this market, the 4-Firm concentration ratio would be 40 percent.

Shepherd describes this threshold as follows: “Loose Oligopoly: The leading four firms, combined, have 40 percent or less of the market; collusion among them to fix prices is virtually impossible” (Shepherd, 1985, p. 4).

Shepherd also notes that a dominant firm – “one firm has 50-100 percent of the market and no close rival” – is even more of a concern (Shepherd, 1985, p. 4).

Even the moderately concentrated threshold of the Merger Guidelines barely begins to move down the danger zone of concentration from 6 to 50 equal sized firms. Mergers between firms that result in markets that are moderately or highly concentrated raise concerns.

b) Post-Merger HHI Between 1000 and 1800. The Agency regards markets in this region to be moderately concentrated... Mergers producing an increase in the HHI of more than 100 points in moderately concentrated markets post-merger potentially raise significant competitive concerns depending on the factors set forth in Sections 2-5 of the Guidelines.

c) Post-Merger HHI Above 1800. The Agency regards markets in this region to be highly concentrated.... Mergers producing an increase in the HHI of more than 50 points in highly concentrated markets post-merger potentially raise significant competitive concerns.... it will be presumed that mergers producing an increase in the HHI of more than 100 points are likely to create or enhance market power or facilitate its exercise.<sup>38</sup>

These thresholds have been chosen based on theory, empirical evidence and experience with the exercise of market power. In a seminal 1981 *Harvard Law Review* article, William Landes and Richard Posner, two of the leading Chicago School law and economics practitioners, argued that antitrust authorities should take market fundamentals into account. In assessing the potential impact of market power, “the proper measure will attempt to capture the influence of market demand and supply elasticity on market power” (Landes and Posner 1981, p. 947). Landes and Posner focus on the most common indicator of market power, the Lerner index, which measures the extent to which prices are marked up over costs. “We point out that the Lerner index provides a precise economic definition of market power, and we demonstrate the functional relationship between market power on the one hand and market share, market elasticity of demand, and supply elasticity of fringe competitors on the other.”<sup>39</sup>

The Lerner Index measures the first efficiency condition discussed above – the mark-up of price over cost.

$$L = \frac{(P - C)}{P}$$

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<sup>38</sup> DOJ, Merger Guidelines, Section 1.5.

<sup>39</sup> Richard Schmalensee, *Another Look At Market Power* 95 HARV. L. REV. 1789, 1797 (1982); p. 938

[T]he *Lerner Index* [is] defined as: “[L] = (Price – Marginal Cost)/ Price...Its merit is that it directly reflects the allocatively inefficient departure of price from marginal cost associated with monopoly. Under pure competition, [L]=0. The more a firm’s pricing departs from the competitive norm, the higher the associated Lerner Index value. A related performance-oriented approach focuses on some measure of the net profits realized by firms or industries.”<sup>40</sup>

The Lerner Index is frequently expressed as the inverse of the elasticity of demand:

$$L = \frac{(P - C)}{P} = \frac{1}{E^d}$$

where:

$e_m^d$  = elasticity of demand in the market

An improvement was suggested in which the Lerner index was related to a measure of the overall market concentration – the HHI.<sup>41</sup> Importantly, the Lerner Index is equal to the HHI divided by the elasticity of demand.

$$L = \frac{HHI}{E_d} = \frac{S_j^2}{E_d}$$

$e_j^s$  = elasticity of supply of the competitive fringe

$s_i$  = market share of the fringe.

The HHI uses the market shares of all participants in the numerator of the fraction since oligopolists may not “compete.”<sup>42</sup> This observation provides the explicit theoretical link between the HHI-based market structure analysis and the efficiency outcomes in which we are most concerned in the following discussion – mark-ups of price over cost and excess profits.

Landes and Posner rendered Lerner index in a somewhat different formulation.

$$L = \frac{(P - C)}{P} = \frac{1}{E^d} = \frac{S_i}{e_m^d + e_j^s (1 - S_i)}$$

where:

$S_d$  = the market share of the dominant firm

<sup>40</sup> Scherer and Ross 1990, pp. 70-71.

<sup>41</sup> A series of responses to the Landes and Posner article, were published in the *Harvard Law Review* the following year (Landes, William & Richard A. Posner, *Market Power in Anti-trust Cases*, 94 HARV. L. REV. 937, 953: (1981). These responses suggested limitations and improvements to the Landes and Posner approach. One of the main criticisms was that the authors were analyzing only the dominant firm market share in the numerator, when oligopolies are a more typical situation Janusz A. Ordover, Alan O. Sykes & Robert D. Willig, *Herfindahl Concentration, Rivalry, and Mergers*, 95 HARV. L. REV. 1863-1867 (1982).

<sup>42</sup> Other scholars argue that the formulation assumes Cournot oligopoly behavior. W. Kip Viscusi, John M. Vernon and Joseph E. Harrington, Jr., *Economics of Regulation and Antitrust* at 149. (2000).

$e_m^d$  = elasticity of demand in the market

$e_j^s$  = elasticity of supply of the competitive fringe

$s_i$  = market share of the fringe

In other words, this formula says that the markup of price over cost will be directly related to the market share of the dominant firm and inversely related to the ability of consumers to reduce consumption (the elasticity of demand) and the ability of other firms (the competitive fringe) to increase output (the elasticity of supply.)

Because Landes and Posner were arguing against a simplistic and mechanical focus on market share in market power analysis, they noted that their own formula should not be applied mechanically. They incorporated a number of traditional concerns by arguing that each of the terms in the equation should be defined to reflect other market characteristics in specific applications. Thus excess capacity, rather than simple market shares, barriers to entry, and long distance transport (such as a broad market definition), among other factors, should inform the analysis. On the demand side, substitutability (product definition) should be carefully examined. As discussed below, these four factors all point in the direction of greater abuse of market power in the rail industry.

Over the years, the competitive thresholds used by the DOJ/FTC have been debated. Some have argued that the thresholds are too strict. There is a thread in the literature that concludes that “four is few and six is many.” Some even go farther, arguing that four is many. The rail industry is so highly concentrated that the debate between four and six firms as a threshold is largely irrelevant. For large segments of the rail industry, the number of options is considerably less than four.

## **REGULATION WHERE MARKET POWER IS ENDEMIC**

Notwithstanding the aspiration for competition and the intention of merger policy to protect competition, there are situations where monopoly or concentrated markets exist and public policy attempts to ensure that the resulting market power is not abused to the detriment of the public and the economy. In the case of “natural” monopolies – like electric utilities – where it is believed that economies of scale will support only one firm or a very small number of firms and competition will not be vigorous, there is generally regulation of prices and service.

Even where regulation is in place, policies are frequently adopted that seek to promote competition in those elements of the service that do not exhibit large economies of scale. Such policies require nondiscriminatory interconnection and carriage and access to bottleneck facilities. Electricity and telecommunications are two network industries that exhibit this mix of regulation of monopoly services and policies to promote competition around the monopoly core of the sector.



Monopolies can also come into existence through the working of the marketplace. It is not illegal to win a monopoly through fair and open competition. It is, however, illegal to obtain a monopoly through anticompetitive behavior or mergers (except where the Congress permits that outcome by suspending the antitrust laws, as has been the case in the rail sector). Even where a monopoly is obtained through legal means, once it exists, its behavior is closely scrutinized. It is illegal to do things that unfairly preserve the monopoly or to use the market power of the monopoly to raise prices or reduce service quality.

In essence, the accumulation of market power is deemed such an important economic problem that there are two broad sets of policy tools that seek to control and eliminate its harms – antitrust and regulation. Because of the aspiration for competition, the two main thrusts of economic policy often overlap where markets are highly concentrated and deliver vital infrastructural services. Market power is deemed so pervasive that regulation is necessary, but public policy recognizes that regulation is inevitably imperfect and may miss opportunities to promote competition. Thus, both regulation and the antitrust laws apply.

For the past 30 years as a practical matter, railroad market power has been excused from both aspects of this oversight. Claiming (hoping) that competition could be unleashed in the rail industry, Congress largely deregulated the key aspects of rail operations – pricing and abandonment of service. It preserved rate regulation only where “captive” could be proven but the ICC/STB has implemented this in a manner that favors railroads at the expense of shippers and undermines competition between railroads.

The Staggers Act also continued and expanded rail industry exemptions from the full force of the antitrust laws. In addition to explicit exemptions, the Act also put the ICC/STB in charge of overseeing rail mergers, which confused the regulatory and antitrust roles. As a result, the industry has been allowed to become extremely concentrated and exhibit widespread anticompetitive practices and the abuse of market power, but shippers receive little regulatory protection from that abuse. Both regulation and antitrust have failed to do their jobs in the rail industry, in part because Congress was too exuberant about competition, in part because the regulators have been too protective of the railroads at the expense of captive shippers. After more than a quarter of a century, it is time to correct the mistakes.

**PART II:**  
**STRUCTURE AND CONDUCT: RAILROAD MARKET POWER**

### **III. MARKET STRUCTURE, CONDUCT AND BASIC CONDITIONS IN THE RAIL INDUSTRY SINCE THE PASSAGE OF THE STAGGERS ACT**

Economic theory predicts and empirical evidence confirms that the existence of market power in the rail industry, created by a series of mergers and anticompetitive practices, resulted in abusive pricing of rail services. While it was recognized that certain commodities would have to bear a larger share of the cost burden in order for the railroads to be economically viable, it was also acknowledged that the exercise of market power could be abusive.

The exercise of market power and the expression of discontent by captive shippers have been uneven across time, but it is particularly intense at present. The historical pattern of rail behavior and the explanations for it help to explain why the issue is now on the front burner.

In this chapter we review the broad patterns of change in rail market structure and conduct since the passage of the Staggers Act that have led to the repeated complaints of abuse of market power. The chapter begins where the discussion of the analytic framework left off, with the increases in market concentration as the foundation for the abuse of market power.

#### **MERGERS CREATE A HIGHLY CONCENTRATED TIGHT OLIGOPOLY IN THE RAIL SECTOR**

After the passage of the Staggers Act, the easy way to increase profitability was to exercise market power and raise prices where possible and seek to increase market power through mergers and anticompetitive behaviors. Rationalization of rail service, through abandonment of track and reduction in labor cost were initiated as well, but they take longer to produce results for the bottom line. Thus, in the mid-1980s captive shippers and consumers were concerned about rate increases and anticompetitive conduct. CFA pointed to the mergers and the anticompetitive practices as a problem.

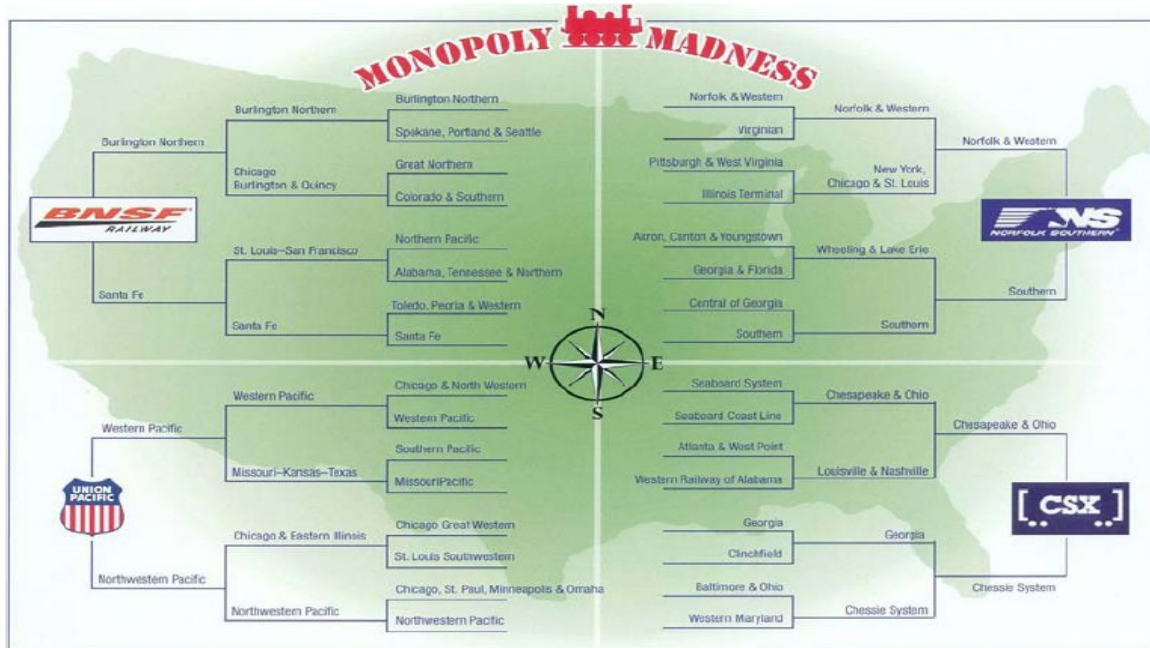
Approximately one out of four miles of merged track since the passage of the Staggers Act has meant the elimination of competition and parallel routes. The academic analyses of potential mergers has uniformly cautioned against parallel mergers because the increase in market power can offset efficiency gains...

Similar concerns must be expressed over foreclosure of competitive options through cancellation or overpricing of joint rates, reciprocal switching, and other arrangements that facilitate access to competing rail carriers. Since the

passage of the Staggers Act, the dominant railroads have used their increased flexibility to close out movements that involve competing carriers.<sup>43</sup>

Figure III-1 summarizes the dramatic shrinkage of the number of Class I railroads from over 30 to four dominant railroads.

**Figure III-1: Rail Mergers Since the Passage of the Staggers Act**

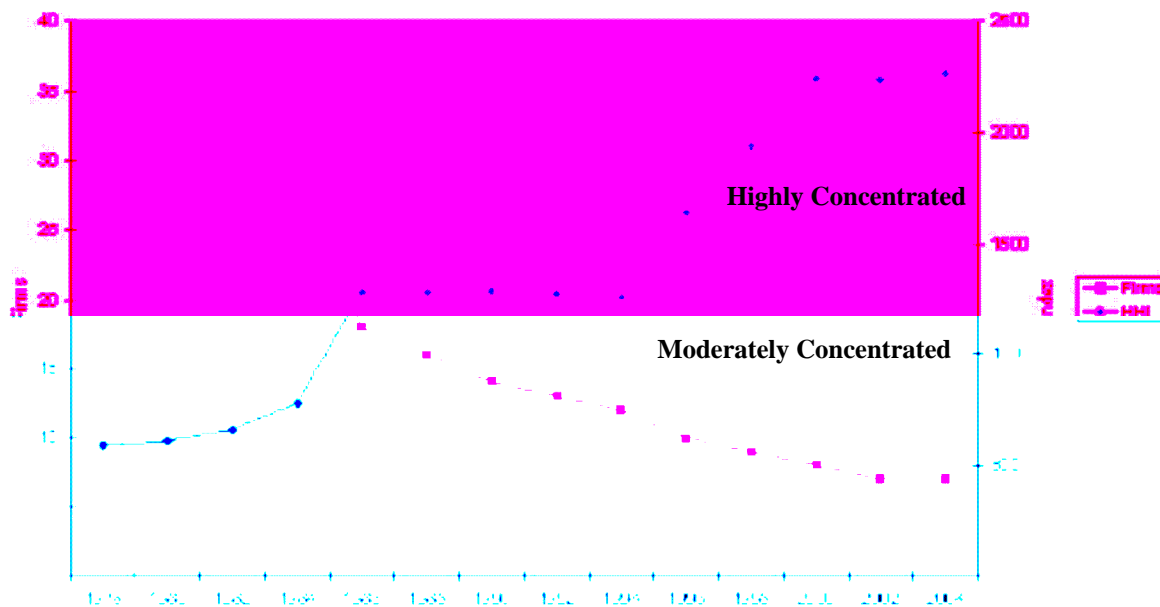


Source: “Testimony of David Cleavinger, President National Association of Wheat Growers, *House Committee on Small Business, Hearing to Review Rail Competition and Service*, May 1, 2008, p. 2.

The timing of the mergers and their impact on market structure is even more revealing, as shown in Figures III-2 and III-3. In spite of the fact that the rail services are a local or regional market, which is more concentrated than the national market, the national figures tell an interesting story. The early post-Staggers Act mergers moved the national industry from the competitive range – an HHI below 1000 and a four-firm concentration ratio of around 40 percent – into the concentrated range. There ensued a period of stable market concentration.

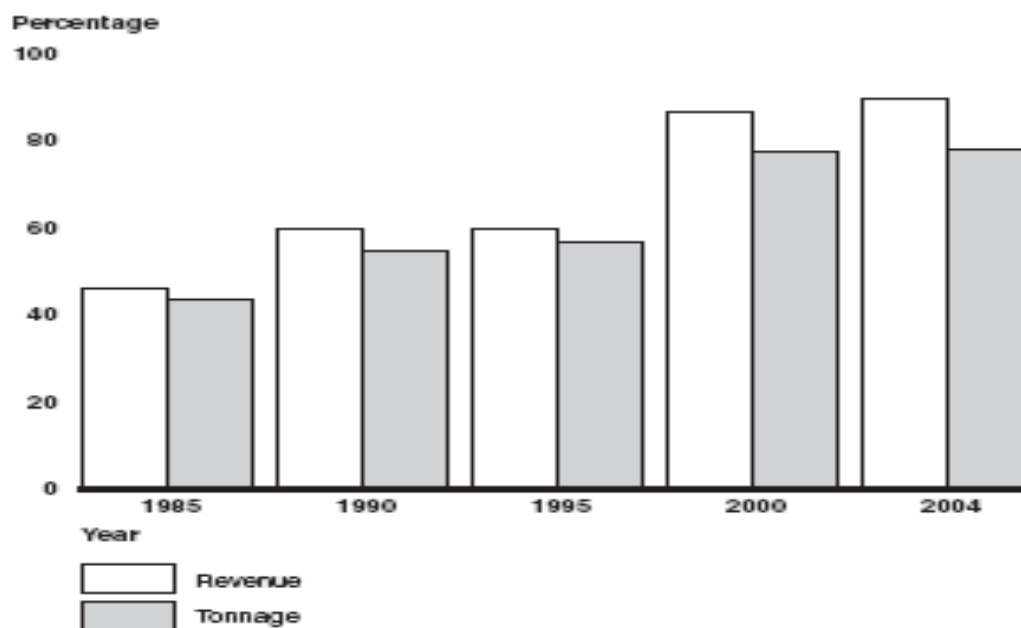
<sup>43</sup> Consumer Federation of America 1985b: 9, “Mergers have eliminated much rail-to-rail competition. Traditional measures of concentration, such as the four-firm concentration ratio or Herfindahl indices indicate large increases in concentration since mid-1980.... The cancellation of joint rates and reciprocal switching agreements – the traditional arrangements by which freight moves between rail systems – has shut down many inter-rail movements, rendering many more shippers captive to a single railroad. Mergers and cancellation of interline movements go hand in hand. (Cooper, Mark. 1987. *Bulk Commodities and the Railroads After the Staggers Act: Freight Rates, Operating Costs and Market Power*. Washington, D.C.: Coalition for Rail Fairness and Competition. October, p. 25).

**Figure III-2: The Increase of Concentration Since the Staggers Act Measured by the HHI**



Source: Transportation Research Board, *Research to Enhance Rail Network Performance* (Washington, D.C.: 2007), p. 68.

**Figure III-3: The Increase of Concentration Since the Staggers Act Measured by the Four Firm Concentration Ratio**



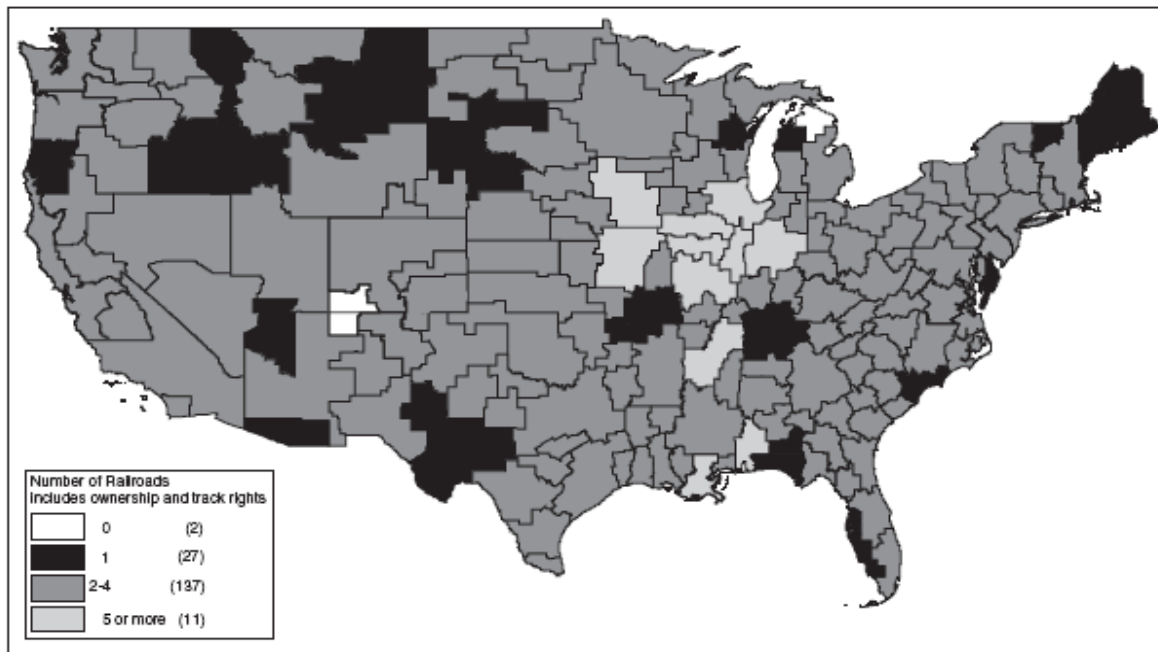
Source: GAO analysis of STB data.

Source: U. S. Government Accountability Office, *Freight Railroads: Preliminary Observations on Rates, Competition, and Capacity Issues*, June 21, 2006, p. 12

The mega-mergers of the 1990s set the foundation for the current round of complaints from shippers. There was a huge jump in concentration – a 1000-point increase in the HHI to 2200 and a 30-percentage point jump in the four-firm concentration ratio to 90 percent. Even at the national level, the railroad industry was well above the highly concentrated level. While the national level is relevant for identifying the pool of firms that are likely to enter local markets, the local market is the proper unit of analysis.

At the local level the market structure is of much greater concern, as shown in Figure III-4. The GAO recently did a study using the Bureau of Economic Analysis Economic Areas as the unit of analysis to assess the state of competition. While we believe that this overestimates the extent of competition because many of the economic areas are so large that the railroads identified in each area may be too far apart to provide effective competition for many shippers, clearly this is a more appropriate unit of analysis than the national level. With this unit of analysis, only 6 percent of the Economic Areas have five or more shippers. Thus, 94 percent of the Economic Areas were tight oligopolies. Fifteen percent of the areas had only one railroad. Over three-quarters of the markets defined as BEA areas had 2 or fewer railroads. They are very tight oligopolies. Unfortunately, the GAO did not disaggregate the 2-4 category. This is important because the literature finds a big difference in terms of market power between 2 and 4 railroads serving an area. To say that the rail industry is highly concentrated is an understatement.

**Figure III-4: Number of Class I Railroads Service Economic Areas**



Source: GAO analysis of BEA and GIS data.

Source: U. S. Government Accountability Office, *Freight Railroads: Preliminary Observations on Rates, Competition, and Capacity Issues*, June 21, 2006, p. 14.

## MERGER, PRODUCTIVITY AND MARKET POWER

Econometric studies of the impact of mergers and changes in competition in this early period support the general conclusion that market power is a concern.

These author's results seem to indicate that there was a large reaction to the new deregulated environment, but once that was achieved, the productivity and cost improvements slowed down considerably.

These studies of the effects of the Staggers Act on competition and rates in the rail industry reveal three cautionary warnings about the impact of deregulation on rates. First, the more recent evidence reveals a threat to the benefits of deregulation, as firms have consolidated their market power and experienced service problems. Second, the benefits of deregulation have not been equally shared among shippers. Those beholden to one railroad have typically experienced higher rates than shippers with competitive choices. Finally, if these and other rate studies rely on revenue per ton-mile without controlling for the characteristics of the shipments, then the resulting conclusions on price will be influenced by these other factors.<sup>44</sup>

While some studies find that mergers increased efficiency, the effect of mergers is small. In general, it is clear mergers were not essential to the productivity gains the industry made and the anticompetitive effects became apparent and may outweigh efficiency gains.

The overall effect of mergers can be to reduce total efficiency if scale economies are the dominant effect in the merger. Mergers have not had any effect on the efficiency of shipping operations since deregulation; there has been a general improvement since deregulation in the efficiency at this stage of production, but firms which merged have not improved any more than firms which did not merge. ...

If mergers do not increase efficiency, why have there been so many mergers in the industry? Our results are consistent with earlier research suggesting that mergers may enhance market power, due to the presence of fewer, larger firms serving the market. These large firms then price above cost, increasing rail profits but causing deadweight loss.<sup>a/</sup> In particular, the result that scale efficiencies in track networks can be reduced by mergers producing larger than efficient firms is potentially troubling. Since track is a very expensive sunk asset, not transferable to other markets or other uses, it can act as an entry barrier that protects incumbents against entry and allows them to earn excess profits.<sup>b/</sup> We conclude that pending and future mergers should be closely scrutinized to make sure that claimed efficiency improvements from the merger generally do exist, are not offset by increases in scale beyond efficient

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<sup>44</sup> Tye, William B. and John Horn, "Transportation Mergers: The Case of the U.S. Railroads," in K.J. Burton and D.A. Henser (Eds.), *Handbook of Transport Strategy, Policy and Institutions* (Elsevier), p. 465.

market sizes, and are not smaller than deadweight loss inefficiencies caused by increases in prices as a result of those mergers.

a/ Pittman finds evidence of such deadweight loss in post-merger pricing in the case of the ATSF merger.

b/ This finding is consistent with that of Friedlander et al. (1992) which shows substantial rises in profitability since deregulation. Schmidt (1999) discusses the sunk nature of track at greater length and gives some price-based evidence that market power is a problem in markets served by a small number of carriers.<sup>45</sup>

The observation on the importance of track as a barrier to entry and the role it plays in creating market power as a result of mergers underscores the importance of refusals to deal and the hostility to interline movements that have afflicted the rail industry. The spin-off of large quantities of track into short lines could well be an effort to reduce the inefficiencies of becoming too large, but the anticompetitive conditions placed on the new short lines erode competition and enable the merging roads to pocket the gains and not share them with consumers as would happen in competitive markets. In this sense, the mega-mergers of the mid 1990s clearly seem to have violated the primary structural condition for efficiency. The conduct of the railroads compounds the problem when they get too big and spin off short lines, but then undermine competition with contracts that foreclose markets.

#### **STIFLING COMPETITION THROUGH FORECLOSURE**

Creating small railroads might provide interline movements to competitors that could undermine the accumulation of market power that results from mergers and increasing size. The trunk lines were determined to prevent this competitive threat from materializing. They ensured the market power created by the mega mergers could be preserved by encumbering the transfer of the track to the more efficient short lines. The analysis of these encumbrances suggests that shippers are, on balance, not better off and likely worse off. Thus, railroad behaviors that prevent shippers from having competitive alternatives in an increasingly concentrated market become the focal point of attention.

A theory was offered to justify clearly anticompetitive conduct that foreclosed competition. The theory claims that the shipper is either better off being captive to one monopolist or that it makes no difference that an interline movement with a competitive link is foreclosed. The claim is that there is one monopoly rent that will be captured by whichever entity has market power. This theory has been challenged and disproven across a wide range of contexts, including the rail industry (Massa, 2001).

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<sup>45</sup> Chapin, Alison and Stephen Schmidt, "Do Mergers Improve Efficiency? Evidence from Deregulated Rail Freight," *Journal of transportation Economics and Policy*, 33 part 2, pp.158-159.



A sample of agricultural railroad movements is used to compare rates on traffic between markets where there is, and is not, a potential for such pricing behavior. The results strongly support the hypothesis that vertical exclusion pricing exists and varies across commodities with effects ranging from 6 to 24 percent...

In our model service differentials can provide a situation when railroads find it profitable to exclude upstream/downstream barge competition despite the fact that the railroad has higher operational costs. Further, the incentive to exclude barge is greater if the railroad operates with economies in production. Within the context of rail-barge competition, this strategy dictates that the railroad price over the rail-only leg of a potential intermodal routing will be higher than the optimal prices observed on similar non-intermodal routings. This is precisely what we observe in the pattern of railroad prices for the movement of grain. Consequently, we find evidence supporting the argument that vertical exclusion aimed at precluding barge participation in potential intermodal movements exists as a railroad pricing practice. Because this practice diminishes, or eliminates, the presence of one transportation mode in a variety of markets, the tendency may be regarded as anticompetitive.<sup>46</sup>

It is clear that, to the extent interline competitors are eliminated by vertical integration (or tied sales), a welfare loss to shippers will result; if interline competition is promoted; there will be a welfare gain. The possibility of foreclosure arises in a number of related rail-policy issues: end-to-end mergers, route cancellations, and access to facilities.<sup>47</sup>

There is little cooperation among mainline railroads to manage the rail network as an integrated system. Individual railroads manage their own networks to maximize their revenue; in so doing, they may ration capacity or allocate traffic for some kinds of freight over others, thereby degrading the whole system's performance, participants claimed.<sup>48</sup>

A clear refutation of the theory occurred when competition for coal hauling entered the Powder River basin. Theory would have predicted that as rates declined due to competition at the origin of movements in the Powder River Basin, monopoly railroads at the destination would have increased their rates to capture the one monopoly rent (the "one-lump" theory) that was available. Apparently, this did not happen. Utilities that were not captive to any railroad on the destination side experienced substantial rate reductions when competition occurred on the origin side, which is expected, but utilities that were captive on the destination side also enjoyed rate reductions, contrary to the theoretical prediction.

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<sup>46</sup> Burton and Wilson, "Network Pricing: Service Differentials, Scale Economies, and Vertical Exclusion in Railroad Markets," *Journal of Transport Economics and Policy*, 40: 2006, pp. 255, 275-176.

<sup>47</sup> Grimm, Curtis M., Clifford Winston, and Carol A. Evans, 1992, "Foreclosure of Railroad Markets: A Test of Chicago Leverage Theory," *The Journal of Law and Economics*, 35(October), p. 305

<sup>48</sup> Ortiz, David, S., Brian Weatherford, Henry Willis, Myles Collins, Naveen Mandova, and Chris Ordwich. 2007. Santa Monica. Rand. p. 2

But even many utilities whose plants could be served by only one carrier saw their coal transportation rates go down significantly, provided the delivery carrier was “neutral” (that is, not aligned with either BN or CNW/UP). Such shippers were still able to solicit bids from both BN and CNW/UP for the right to originate their traffic (such bids were in most cases submitted as part of alternative joint rates with the neutral delivery carrier). The resulting through bids were typically much lower than the joint rates such shippers had paid before CNW/UP’s entry into the PRB.<sup>a/</sup>

<sup>a/</sup>How and why such shippers seemed to benefit from the new origin competition, despite remaining captive at the destination, has been the subject of much debate... Notwithstanding the one-lump theory, however, many representative of destination-captive coal shipper testified to the savings they achieved when they began to play the origin carriers off against one another in competitive bidding. Seeking to explain this phenomenon, some experts have suggested that the answer may lie in the nuances of inter-carrier relations (for example, the destination carrier might wish to remain on good terms with both origin competitors, and therefore not wish to be seen as too greedy or favoring one over the other, leading it to give each origin carrier the same “revenue requirement” for its delivery service, which in turn would allow the competing carriers’ price cuts to pass through to the shipper).<sup>49</sup>

The key observation in this example is that the overall competitive fabric of the industry is extremely important. As long as there is a complex set of multimarket contacts between competing lines, they may not find it in their interest to extract the rents in individual origin cases, for fear of triggering retaliation in many other cases. This is particularly important for short lines, which are dependent on trunk lines for the origination of traffic. This observation underscores the threat of a highly consolidated industry that is also insulated regionally. As two railroads each come to dominate separate regions of the nation, the competitive market structure is simplified, making the anticompetitive extraction of rents easier.

The dramatic foreclosure of competition on short lines, many of which were created through spin-offs from mergers, becomes a particularly important competitive issue. The creation of paper barriers – contract conditions that preclude competition through interline movements involving the short lines – is the quintessential “artificial inhibition on entry.” If efficiency gains can be achieved by breaking up the one monopoly, which appears to be the motivation for the spin off of short lines, then cost declines may result in quality improvement or rate reductions. Encumbering short line segments that link to potentially competitive interconnection points with anticompetitive conditions can have negative long-term effects, keeping rivals out of the market, increasing costs if there are diseconomies of scale, and preventing or distorting the location of new facilities. In the case of short lines in the U.S. these negative outcomes are distinct possibilities. There are significant amounts of

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<sup>49</sup> Avery and Ericson, 2004, p. 6

track involved (almost one-third of total U.S. plant), large quantities of traffic are exchanged with trunk lines (as much as two thirds of short line traffic), and significant price increases resulting from the anticompetitive practices that competitive interline movements could address.

The exact magnitude of the competitive benefits from removing paper barriers is difficult to quantify, but the circumstantial evidence suggests that the benefits may be significant. As this article has noted, many regional and short lines are restricted in their ability to interchange traffic with another carrier. Moreover, a large volume of regional and short line traffic is interchanged with another carrier. A recent survey of 170 regional and short line railroads shows that 66 percent of the survey respondents' traffic is interlined with another carrier. According to the former president of a regional and short line trade group, trunk lines earn 4 billion of revenues from interchanging cars with regional and short line annually. He also claimed that shippers may pay as much 25 percent more for rail service because of paper barriers.<sup>50</sup>

"Paper barriers" are additional short-line railroad problem vis-à-vis Class I railroads. These result when the selling Class I railroad, as a condition of sale, insists that the purchasing carrier will only interline with the selling railroad, even if other short-lines of Class I carriers have trackage that connects to the purchasing short-line. The result is that the acquiring railroad has much less bargaining power with the Class I carrier, because it can only use one railroad to interline traffic.<sup>51</sup>

Yet another Class I related problem is that the large railroads sometimes try to convince shippers to establish their new facilities directly on the Class I's trackage, as opposed to locating on the short-line carriers trackage. Another conundrum for short-line carriers is when Class I railroads try to persuade shippers to truck their freight directly to the Class I's trackage. This is done so the railroad will not have to split the rail revenue with the short-line carriers.<sup>52</sup>

Given that the various behaviors to foreclose competition conflicted with the stated purpose of the Staggers Act to promote competition and the evidence that this conduct has undermined competition and harmed shippers, it is not surprising to find that these issues have received a great deal of attention throughout the post-Staggers period. A variety of actions by the railroads to foreclose competition have been identified by shippers,<sup>53</sup> but the STB has failed to take action to stop their practices. The list is long. The GAO identified

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<sup>50</sup> Massa, Salvatore, "A Tale of Two Monopolies: Why Removing Paper Barriers is a Good Idea," (2001) *Transportation Journal*, Winter Spring, p. 55

<sup>51</sup> Johnson, James C., Diane J. McClure, Kenneth C. Schneider and Donald F. Wood. 2004. "Short-line Railroad Managers Discuss Their Industry." *Transportation*. 31, p. 101

<sup>52</sup> Johnson, et al. 2004: 101

<sup>53</sup> House Judiciary Committee Antitrust Task Force on Antitrust and Competition Policy, *Hearing on H.R. 1650 The Railroad Antitrust Enforcement Act of 2007*, February 25, 2008; GAO, October 2008.

four major areas shipper demanded action to counter the anticompetitive conduct of the railroads.

*Reciprocal switching:* This approach would allow STB to require railroads serving shippers that are close to another railroad to transport cars of a competing railroad for a fee. The shippers would then have access to railroads that do not reach their facilities...

*Terminal agreements:* This approach would require one railroad to grant access to its terminal facilities or tracks to another railroad, enabling both railroads to interchange traffic or gain access to traffic coming from shippers off the other railroad's lines for a fee...

*Trackage rights:* This approach would require one railroad to grant access to its tracks to another railroad, enabling railroads to interchange traffic beyond terminal facilities for a fee...

*"Bottleneck" rates:* This approach would require a railroad to establish a rate, and thereby offer to provide service, for any two points on the railroad's system where traffic originates, terminates, or can be interchanged. Some shippers have more than one railroad that serves them at their origin and/or destination points, but have at least one portion of a rail movement for which no alternative rail route is available. This portion is referred to as the "bottleneck segment"...

*Paper barriers:* This approach would prevent or put a time limit on paper barriers, which are contractual agreements that can occur when a Class I railroad either sells or leases long term some of its track to other railroads (typically a short-line railroad and/or regional railroad). These agreements stipulate that virtually all traffic that originates on that line must interchange with the Class I railroad that originally leased the tracks or pay a penalty.<sup>54</sup>

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<sup>54</sup> GAO, Freight Railroads: Industry Health Has Improved, but Concerns about Competition and Capacity Should be Addressed, October 2006, pp. 44-50.

#### **IV. MARKET CONDITIONS AND MARKET POWER**

Market power gives the railroads the ability to increase prices, but other factors affect the opportunity to exercise it. The exercise of market power is an effort to charge whatever the market will bear. What the market can bear reflects conditions on both the supply-side and the demand side. On the supply-side the question is “if prices are increased can competitors increase their output while charging lower prices, to steal customers?” On the demand side the question is, “what alternatives do consumers have that can substitute for the product whose price is being increased?”

The economic environment of the past half-decade or so has raised the ability of the railroads to increase prices. In addition to concentration that has reduced head-to-head rail competition and anticompetitive practices that have further dampened the competitiveness of the sector, there are several key economic conditions that have enabled the railroads to intensify their abuse of market power.

##### **INADEQUATE CAPACITY**

Inadequate capacity has diminished the incentive and ability for railroads to compete on price. The impact of capacity shortages in an oligopoly market structure raises concerns because it increases the likely abuse of market power. Lacking spare capacity, railroads do not feel pressures to lower prices in order to increase traffic. Not facing vigorous competition, they do not feel threatened by others increasing capacity or pressure to increase their own capacity.

In a truly competitive market, competition ultimately would decrease rates over time as additional capacity enters the marketplace either from existing or new railroads.

Therefore, one might contend that currently high rail rates simply reflect the competitive marketplace at work. When demand increases, prices rise in order to efficiently distribute existing capacity and to encourage the addition of new capacity...

But if the market is not truly competitive, this constant gravitation towards equilibrium does not occur. Supply remains artificially constrained, which keeps prices artificially high. This is an alternative explanation for what is occurring in the rail industry today.

After a century of operating with excess capacity, the rail industry finally appears to have exhausted much of its capacity through a combination of abandonments, mergers and growing demand. There appears to be little incentive, however, for existing railroads to increase their own capacity levels needed to satisfy demand for rail service, and it is highly improbable that new

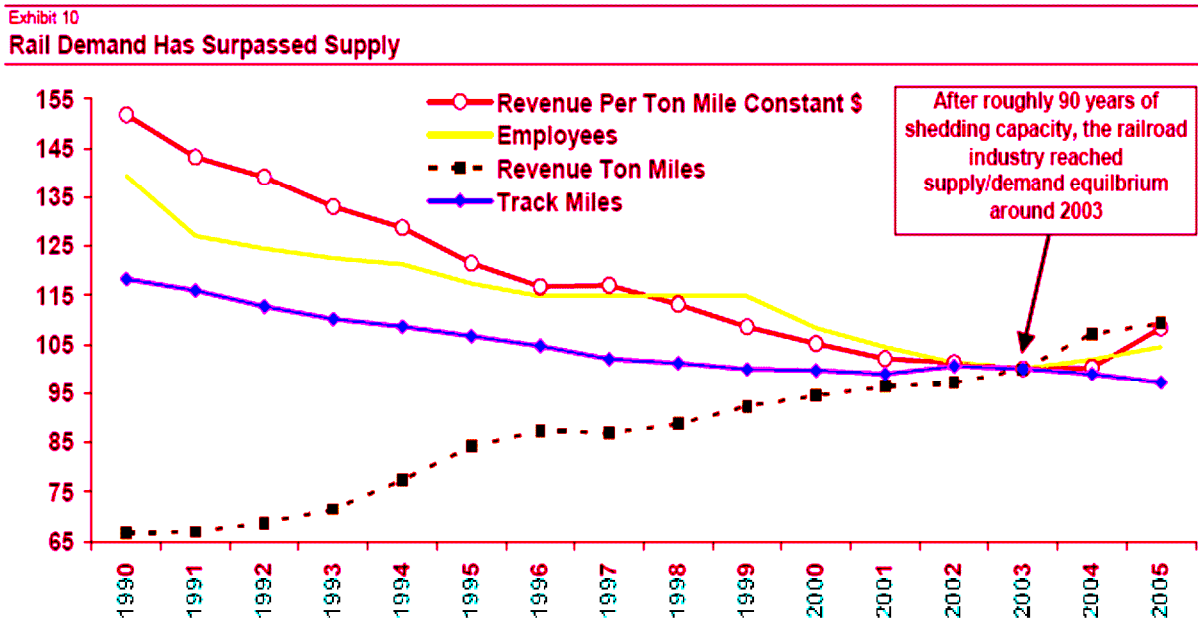
railroads could enter the market with sufficient new capacity due to substantial barriers to entry.

A series of rail merger over the past 25 years has created a highly concentrated industry, resulting in rail duopolies in the eastern and western halves of the country. Even in markets that continue to be served by two railroads, there is little incentive to compete for business that the other is unable or unwilling to handle, when both railroads have tight capacity constraints.

This capacity shortage has provided railroads with unprecedented pricing leverage over their customers. As duopolists, it is easy for the railroads to maintain this leverage by adding capacity only at the margins, rather than to meet total demand. This is consistent with rational monopoly behavior that increases prices by keeping capacity below competitive market levels, resulting an inefficient marketplace. As a consequence, supply shortages, in the form of capacity constraints, become endemic and rates remain perpetually higher than they would be in a truly competitive market. (Ficker, 2006, 290-291).

As Morgan Stanley sees it, supply equaled demand in 2003 in terms of track and revenue ton miles (see Figure IV-1). By 2005, demand exceeded supply in the Morgan Stanley analysis. Since then the trend has continued. Since 2003, there has also been a sustained increase in rates.

**Figure IV-1: Rail Demand Exceeds Supply**



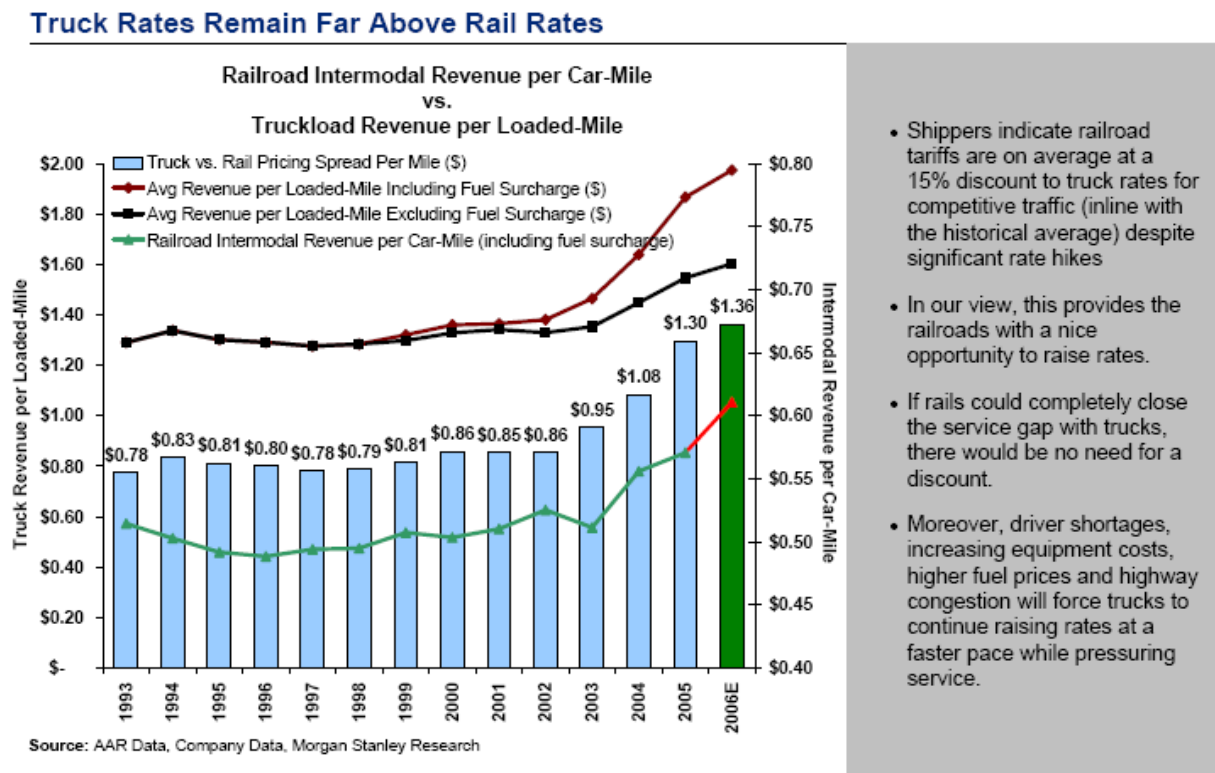
Source: AAR Data, Morgan Stanley Research

Source: Morgan Stanley, *Transportation: Initiation of Coverage: Rails Have More Room to Run on Pricing*, May 7, 2007, p. 6.

## ENERGY PRICES

Rising energy prices have expanded the opportunity for railroads to increase prices on both the supply-side and the demand side. On the supply side, rising fuel prices hurt trucks much more than railroads (see Figure IV-2). This enables the rails to increase prices and still not lose traffic to trucks.

*Figure IV-2: Truck v. Rail rates*



Source: Morgan Stanley, *Transportation: Initiation of Coverage: Rails Have More Room to Run on Pricing*, May 7, 2007, slides, p. 9.

As Morgan Stanley put it:

**Beyond re-pricing, we believe rail rates remain far below those of competing trucking.** Truckload (TL) carriers continue to face significant cost pressures from driver turnover, rising fuel prices, new engine purchase requirements, and highway congestions. None of these cost pressures appear to be abating. As such, we believe TL carrier will continue to push, when possible, on rates. This should give rails ample opportunity to raise prices on truck-competitive business (which we estimate is only 20-30% of the volume), as average rail intermodal rates remain 65% below average truck rates on a

per-loaded-mile basis and 15% per load in comparable lanes. Moreover, rail shipping is roughly five times more fuel-efficient than truckload on a ton-mile basis. If fuel prices continue rising, the impact of fuel surcharges from trucks should make rail an even more competition option for shipper.<sup>55</sup>

On the demand side, rising energy prices increase the cost of alternative fuels, fuels not delivered by rail, to utilities. The railroads have more headroom to extract higher prices. Because the trucking industry and the coal industry are more competitive than the rail industry, they have less ability to capture the rents. They would compete the prices down and consumers would not have had to pay them. When the rail industry uses its market power to capture the rents, it imposes an additional burden on the public that, absent the exercises of rail market power, the public would not be forced to bear.

At the same time, higher natural gas prices increased demand for utility coal, giving us higher volumes and more pricing power. In general merchandise as well, higher demand for our transportation services, along with our continuing efforts to improve service, have provided growth opportunities.

It is a good time to be in the railroad business, as revenues reflect. The financial markets also have noticed, with rails considerably outperforming the Standard & Poor's averages. Obviously, the state of the industry is robust, and we have every reason to be optimistic about the future. At the same time, we continue to face challenges, some driven by our own success. They include capacity constraints, the need to improve service reliability and consistency, the threat of re-regulation, and the handling of highly hazardous materials.<sup>56</sup>

Figure IV-3 shows monthly refiner acquisition costs of crude oil over the period from 1974 to 2008. We take the natural log of the price to show the rate of growth of oil prices. Just prior to the passage of the Staggers Act prices spiked giving railroads their first opportunity to capture rents from coal by increasing prices. In the half-decade since 2002 we again see a dramatic increase in energy prices. The availability of rents triggers price increases on captive traffic.

The rail industry has also come to benefit from being insulated from the business cycle.

Railroads will be less impacted by economic trends than other freight transportation companies (parcel and trucking). Recall that roughly one-third of the railroads' volumes are commodities with low GDP sensitivity, such as

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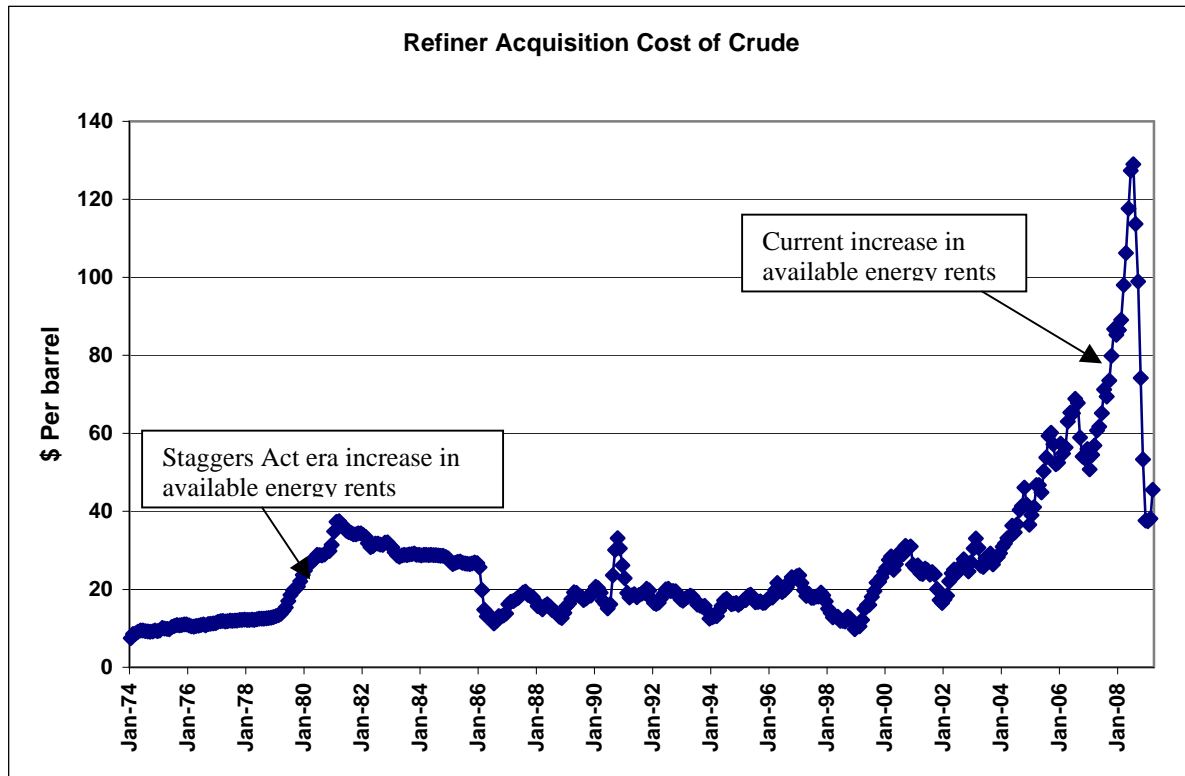
<sup>55</sup> Morgan Stanley, 2007 p. 7.

<sup>56</sup> Moorman, Charles E. 2007. Freight Rail Perspective on Capacity Issues. *Research to Enhance Performance*. Washington, D.C.: Transportation Research Board, p. 38



grain and coal. As such we believe railroads can be a good defensive play into a downturn, while offering growth outside of the economic cycle.<sup>57</sup>

**Figure IV-3: Rising Energy Prices Trigger Rent Seeks by Railroads**



Source: Energy Information Administration, *Refiner Acquisition Costs*, Petroleum Prices database.

## THE DECLINE OF COMPETITIVE RIVALRY

Market power, tight capacity, available rents, and insulation from the business cycle combine to change the fundamental competitive behavior in the industry. A tight oligopoly at the national level, a duopoly in the two major regions in the country and a monopoly in many markets at the local level makes it more likely that the recognition of mutual interest in avoiding competition will prevail in price setting. With duopolies in the east and west, the rails learn how to reduce competitive rivalry.

Evidence was also found that once deregulation occurred, market-share instability began to decrease exponentially, suggesting that railroads were learning to avoid competition in the new regulatory environment. While this

<sup>57</sup> Morgan Stanley, 2007, p. 4.

interpretation is supported by the regression results, another interpretation is possible. It is possible that the increase in market share instability following deregulation may not be an event distinct from the process of learning how to avoid competition. The post-deregulation increase in instability may, in fact, be part of an adjustment process that brings about more stability.

But regardless of which interpretation is correct, the regression results suggest that as experience with deregulation grows, competition in the railroad industry will again approach levels experienced prior to deregulation and that examples of competitive performance in the early years of deregulation will become less and less frequent. If this suggestion is correct and can be generalized, the further implication is that when industry structure approximates classic oligopoly, as the railroad industry does, a procompetitive government policy does not imply absence of a role for government but, instead, increases the responsibility of government to enforce vigorously antitrust policy, that collection of statutes, administrative law, and judicial ruling developed to insure competition in industries not subject to economic regulation.<sup>58</sup>

Wall Street sees the current economic circumstances as inviting for such behavior.

[O]ur analysis of railroad revenue and contracts, combined with our shipper survey (to be published later this week), gives us confidence that pricing well above inflation is sustainable through 2010. In addition, we believe that a new generation of post-deregulation management may avoid the competitive excesses that pressured railroads pricing in the past.<sup>59</sup>

Mgmt. affirmed that it will not sacrifice price to get back vol. And suggested that the sweet spot for UNP was perhaps with even fewer vols. Still, pricing remains firm and UNP has the biggest opportunity among the rails to reprice its legacy contracts. We believe UNP also has significant productivity/margin upside from reducing re-crew costs, increasing train lengths and managing corporate expense.

In addition, management made it clear that some of the softness in rail volumes is clearly market share losses as the rails focus more on margins and returns are willing to price some business off the rails that probably never belonged on the rails to begin with (i.e. some short-haul intermodal and rocks business as examples). This issue has been compounded in the near term by excess truck capacity and negative y-o-y trucking rates. Management also made it clear that over the next few years investors should be prepared for the

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<sup>58</sup> Fitzsimmons, Edward, and James Knudsen. 1991. Market Share Instability among Class I Railroads and the Impact of Deregulation. *Quarterly Review of Economics and Business*. 32:2. Summer.

<sup>59</sup> Morgan Stanley, 2007, p. 5.

possibility that UNP walks away from some large contracts that are set to re-price, if they cannot agree upon an acceptable return.

The focus will be on pricing and margins, which we believe should drive UNP beyond its mid-70's operating ratio target by 2010.<sup>60</sup>

Phrases like “avoiding competitive excess,” “not sacrifice price to get back vol.” are euphemisms for the existence of market power.

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<sup>60</sup> Bear Sterns, *Union Pacific*, September 10, 2007, pp. 1, 2, 4.

**PART III: PERFORMANCE:**  
**THE ABUSE OF MARKET POWER IN THE RAIL INDUSTRY**

## V. THE IMPACT OF MARKET STRUCTURE: PRICES

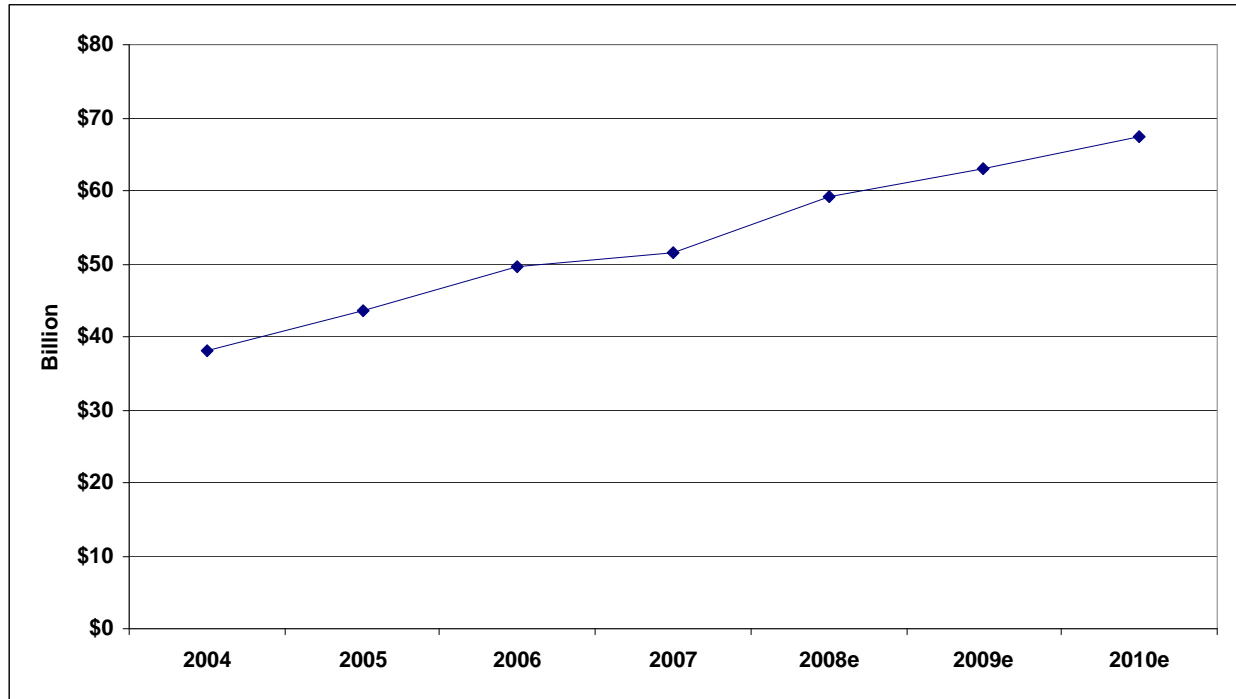
### NATIONAL RATE INCREASES

After the mega-mergers were completed, a significant period of service disruptions occurred that occupied the attention of the rails, shippers and regulators. When the service problems moderated, rates for the most captive traffic began to rise. When rail capacity became tight and energy price rose, the increase in price accelerated.

At the national level this can be seen in the uptick in the amount of freight that was charged over 300 percent of variable cost, but the data compiled by the GAO ends where the largest price increases were just beginning.<sup>61</sup> Unfortunately, the most recent publicly data available from the STB only extends to 2005. While it suggests a sharp increase in rates for captive traffic, it too misses the large run up in prices in recent years (Surface Transportation Board, *Commodity Revenue Stratification Report* various years)

For more recent years we must turn to private sector sources. Annual reports from the railroads and Wall Street projections indicate rapidly rising revenues. As shown in Figure V-1, revenues are growing rapidly.

Figure V-1: Revenue of the Four Major Freight Railroads (BNSF, CSX, NS, UP)



Source: Actual 2004-2007, Annual Reports; Estimated 2008-2010, Goldman Sachs, *Americas: Transportation: Railroads*, September 23, 2008

<sup>61</sup> GAO Freight Railroads, *Preliminary Observations on Rates, Competition and Capacity Issues*, June 21, 2006, p. 16.

Although revenues are not a perfect indicator of rates, we do know that over the period covered in Figure V-1 volume growth has been sluggish.<sup>62</sup> Clearly, a large part of the increase in revenues has come from rate increases. There is little wonder that Wall Street is bullish on rail pricing power.

To review the background, In the 20+ years after deregulation, railroads shed unprofitable lines, reduced capacity, eliminated excess headcount and consolidated from 39 large railroads to 7 today. These decade-long changes brought rail capacity in line with demand for rail transportation by roughly 2003-04, such that pricing reversed its seemingly endless downward march. At first, the industry took slight increases in rates on certain merchandise traffic as capacity began to limit the railroads' ability to grow volume. As these yield initiatives succeeded, the railroads began the process of re-pricing their oldest legacy contracts, which were established well before 2004 when rails needed volume. With their networks now full, rails began to move the legacy contracts up to market and price on a fully-allocated basis (i.e. including the cost of capital). *In some case, this resulted in rate increases of 30%+ for shippers...*

**Repricing of legacy contracts isn't finished.** Based on our latest rail shipper survey, we estimate that 20% of the business on the rails today is still moving under legacy contracts that have yet to be re-priced. Specifically, international intermodal and utility coal still have a number of long-term contracts below market (especially at the Western railroads). Although days of 6-8%+ pricing on a quarterly basis may be behind the rails, we see rail pricing continuing to rise 3.5%-6% (depending on the company) for at least the next 3 years. In fact, a number of railroads claim they did not find the point of price elasticity during the first round of renewals, which implies there may be further rate hikes as these contracts come up for renewal a second time.<sup>63</sup>

Morgan Stanley projects double digit increases in legacy contract (as shown in Figure V-2).

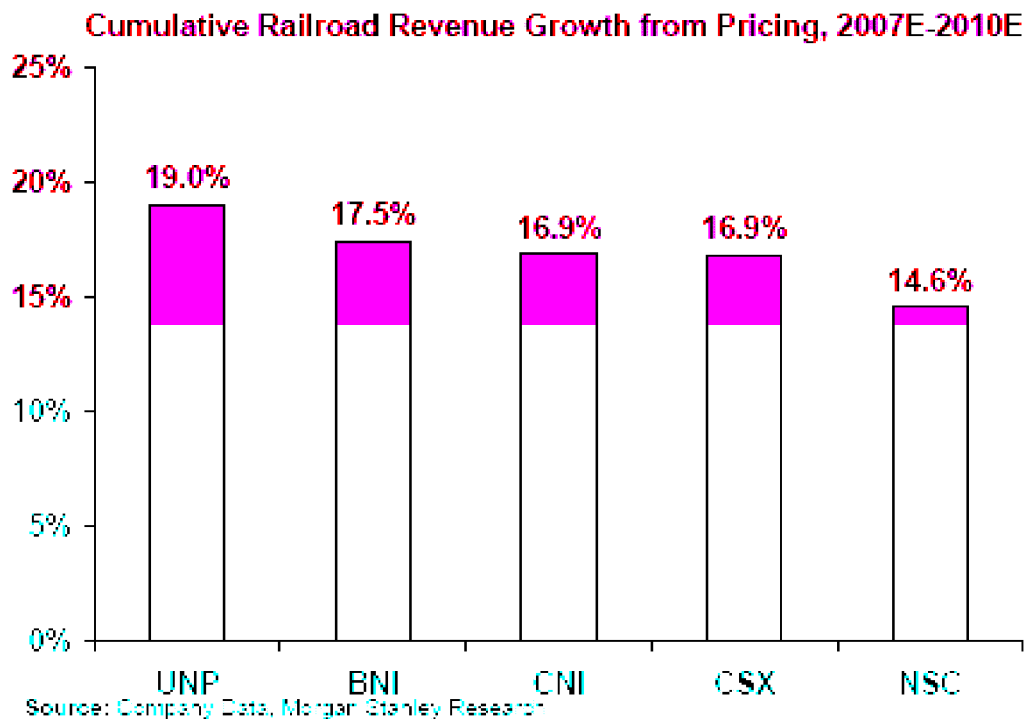
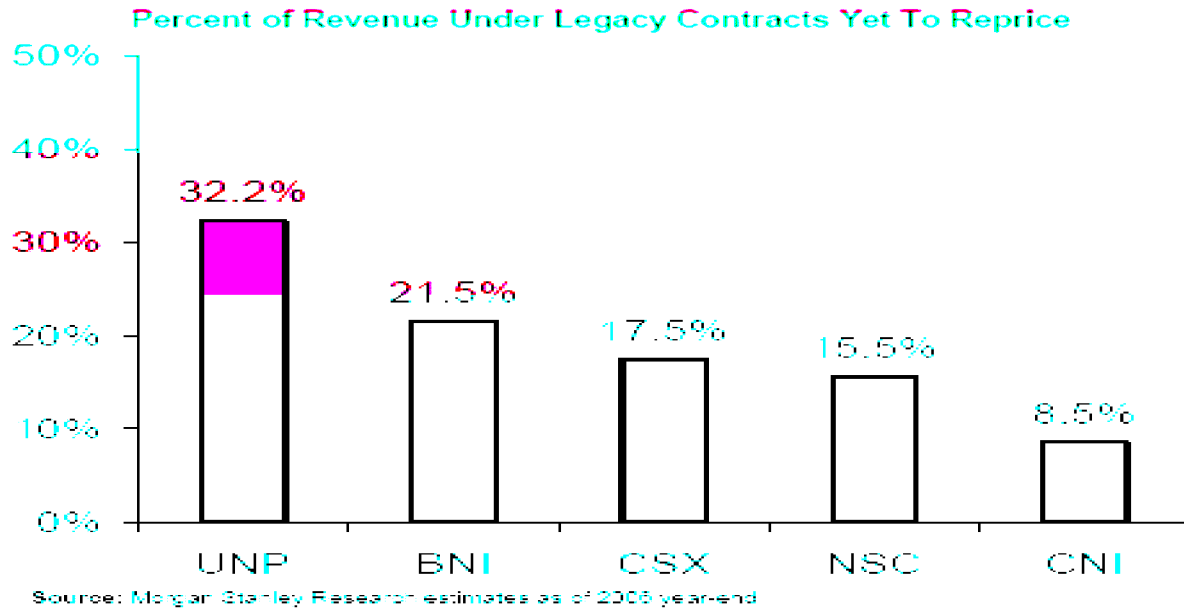
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<sup>62</sup> Morgan Stanley, 2007, p. 14.

<sup>63</sup> Morgan Stanley, 2007: 5.

**Figure V- 2: Pricing Power and Revenue Growth**

**Still a Fair Amount of Legacy Contract Repricing to Go**



Source: Morgan Stanley, *Transportation: Initiation of Coverage: Rails Have More Room to Run on Pricing*, May 7, 2007, Slides, pp. 6-10.

In spite of the looming recession, Wall Street remains bullish on the rails for the three reasons identified in the last section.

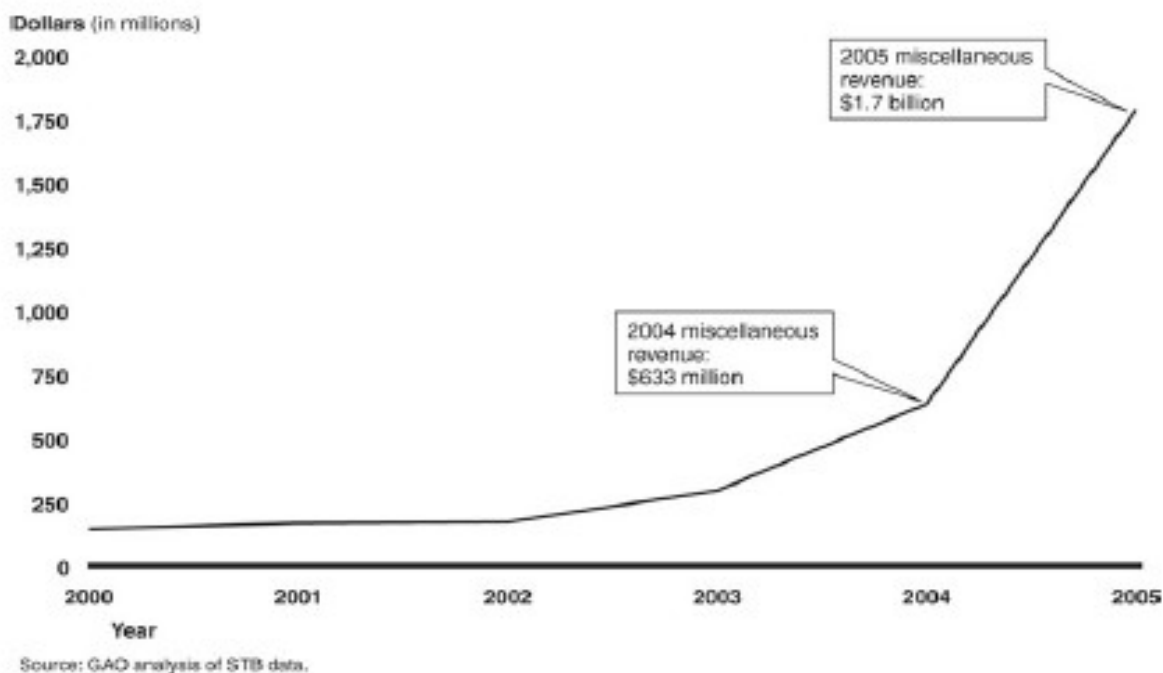
The long-term outlook for US railroads remains very favorable due to continued pricing power, relatively steady end-market conditions, and a competitive fuel efficiency advantage over other forms of commercial transportation.<sup>64</sup>

## SURCHARGES

The rates discussed above do not include fuel surcharges and other add-ons that have skyrocketed in recent years. As Figure V-3 shows, these surcharges increase eightfold between 2002 and 2005 and they have continued to mount since then.

**Figure V-3: Miscellaneous Revenues**

**Figure 4: Miscellaneous Revenue Tracked in Carload Waybill Sample, 2000-2005**



Source: U.S. Government Accountability Office, *Freight Railroads: Updated Information on Rates and Competition Issues*, September 25, 2007, p. 11.

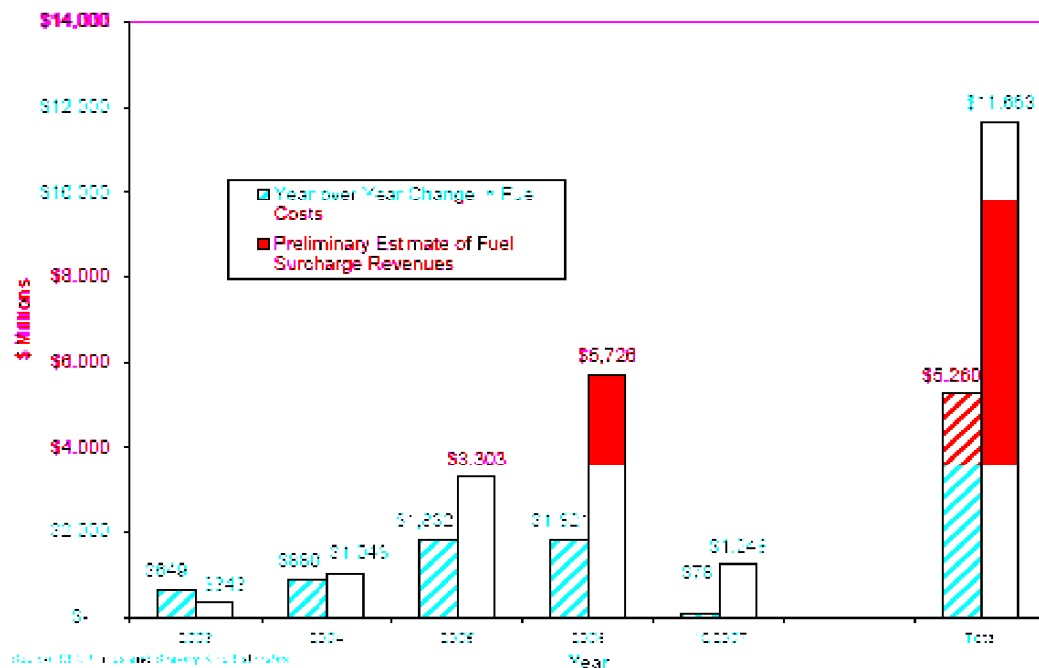
<sup>64</sup> Goldman Sachs, *Americas: Transportation: Railroads*, September 23, 2008, p. 1



Fuel surcharges, in particular, have become a major source of price increases for the rails and are likely to remain so, as Morgan Stanley put it “**we believe more of the future pricing upside will come from rate escalators embedded in new contracts that ensure the rails will see price increase every year** across most of the portfolio.”<sup>65</sup> A study for the American Chemistry Council argues that between 2004 and 2007 more than half of the fuel surcharges collected were actually an over-recovery (see Exhibits V-4).

**Figure V-4: The Growing Importance of Fuel Surcharges as a Rail Profit Center**

**Year over Year Change in Fuel Cost and Preliminary Estimate of Fuel Surcharge Revenue (\$ Millions)**

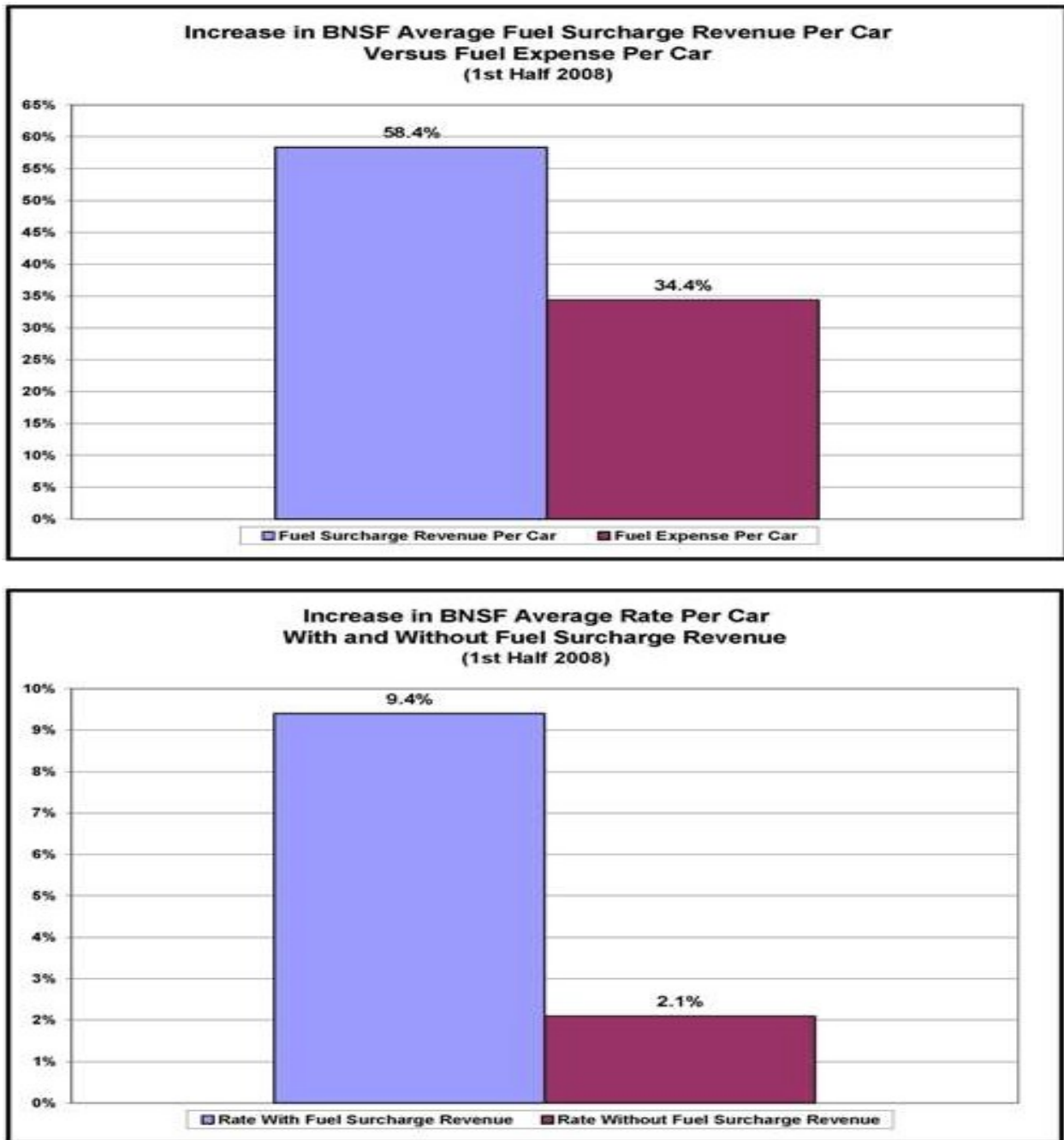


Source: Snively, King, Majoros O'Connor & Lee, *Analysis of Rail Fuel Surcharges During the Period 2003-2007*, Washington, D.C.: July 25, p. 9.

More recent data for the beginning of 2008 indicates that the trend has continued. Excessive fuel surcharges have become a major component of the rising cost of rail service, as shown in Figure V-5.

<sup>65</sup> Morgan Stanley 2007 p. 6.

*Figure V-5: Fuel Surcharges Become a Profit Center*



Source: Escalation Consultants.

## **VI. THE IMPORTANCE OF COMPETITION: PRICE INCREASES IN LOCAL MARKETS FOR SPECIFIC COMMODITIES**

In the discussion of market structure we showed that the national figures obscure much larger problems because rail markets are local or regional and different products have very different characteristics, making product markets very distinct. The local product and geographic markets are more concentrated than the national market. Therefore, we would expect that the pricing impacts of market structure are more pronounced in specific product and geographic markets.

### **GEOGRAPHIC AND PRODUCT MARKETS**

We can begin with the GAO analysis that looked at the overlap of local market structures and the amount of traffic moving at rates above the captive threshold of an RVC ratio of 180 percent. The GAO focused primarily on the monopoly situations, rather than the broader issue of lack of competition and found that:

Our analysis shows that some areas of the country with access to only one Class I railroad have higher levels of traffic traveling at rates over the statutory threshold for rate relief. This situation may reflect reasonable economic practices by railroads in an environment of excess demand, or it may represent the abuse of market power.... When combined with comments from participants and our expert panel and interviews with shipper and railroad groups, the results of our analysis suggest that shippers in selected markets may be paying excessive rates, meriting further inquiry and analysis.<sup>66</sup>

The suggestion that either a capacity shortfall (excess demand) or abuse of market power may be the cause of the problem points to a market structural problem in both cases. The lack of competition has allowed to the rail industry to shrink capacity to the point where it can exercise market power. There are other observations that can be offered by expanding the consideration of market structure.<sup>67</sup>

- Those areas served by five or more railroads tend to have lower rates.
- Those areas served by one Class I railroad that are close to water tend also to have lower rates. In other words, the lack of competition results in higher prices.

This conclusion is reaffirmed when we examine the difference between rates paid for commodities that are shipped under different competitive circumstances. Figure VI-1 compares the rates paid for captive and non-captive shipments of specific classes of commodities on the four major freight railroads.

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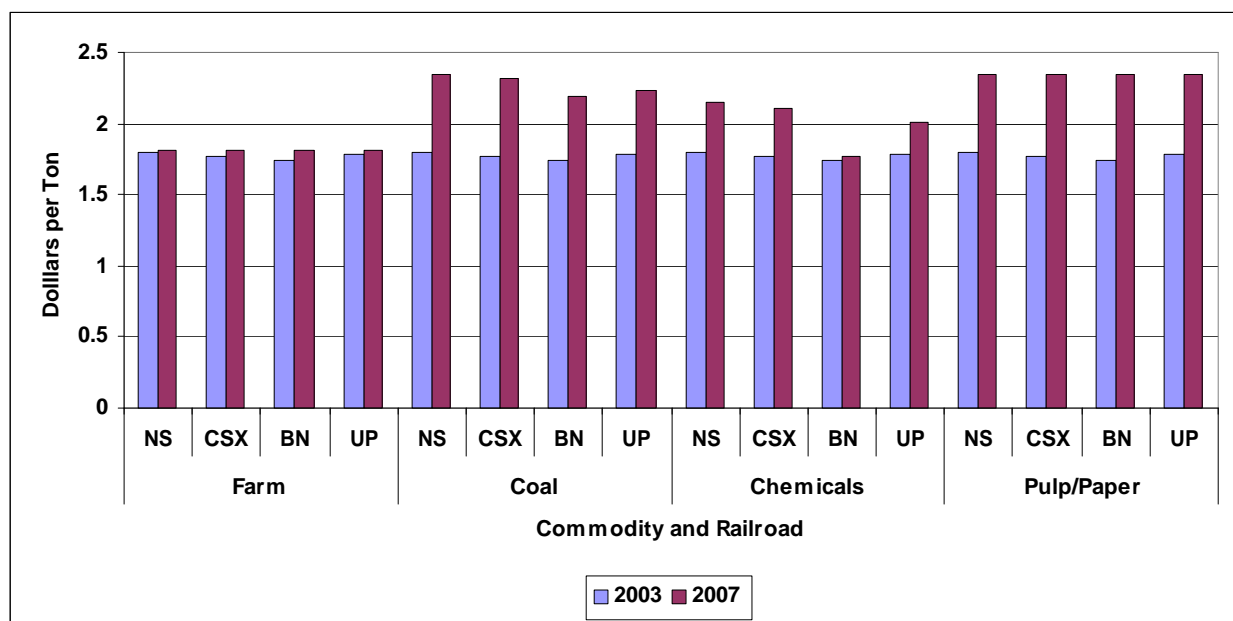
<sup>66</sup> GAO, October, 2006, pp. 37-38.

<sup>67</sup> GAO October 2006, pp. 14, 37.

The ratio of captive to competitive rates for four commodities that are frequently captive are shown for 2003 and 2007. There are two important points.

- First, in 2003 captive traffic was charged about 75 percent more than competitive traffic.
- Second, for three of the four commodities captive traffic rates increased much more than competitive rates by 2007. The tightening of capacity and rising energy prices combined with rail market power to increase rates on captive commodities.

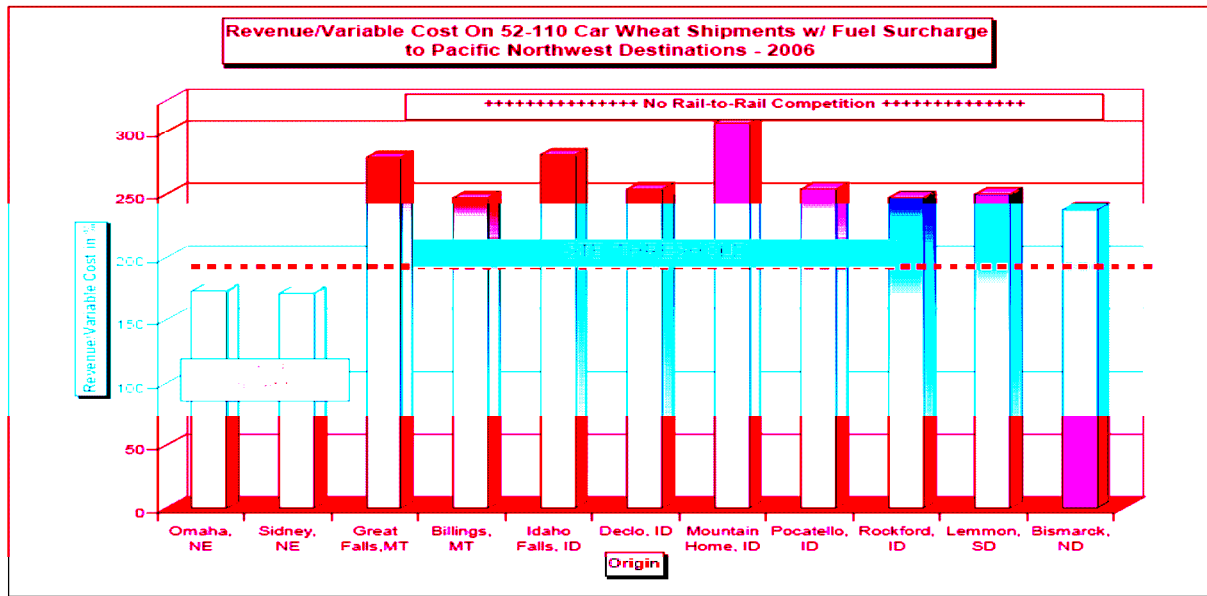
**Figure VI-1: Cost of Captivity 2003:2007: Ratio of Captive Rate to Non-competitive Rates**



Source: Escalation Consultants, Waybill Sample.

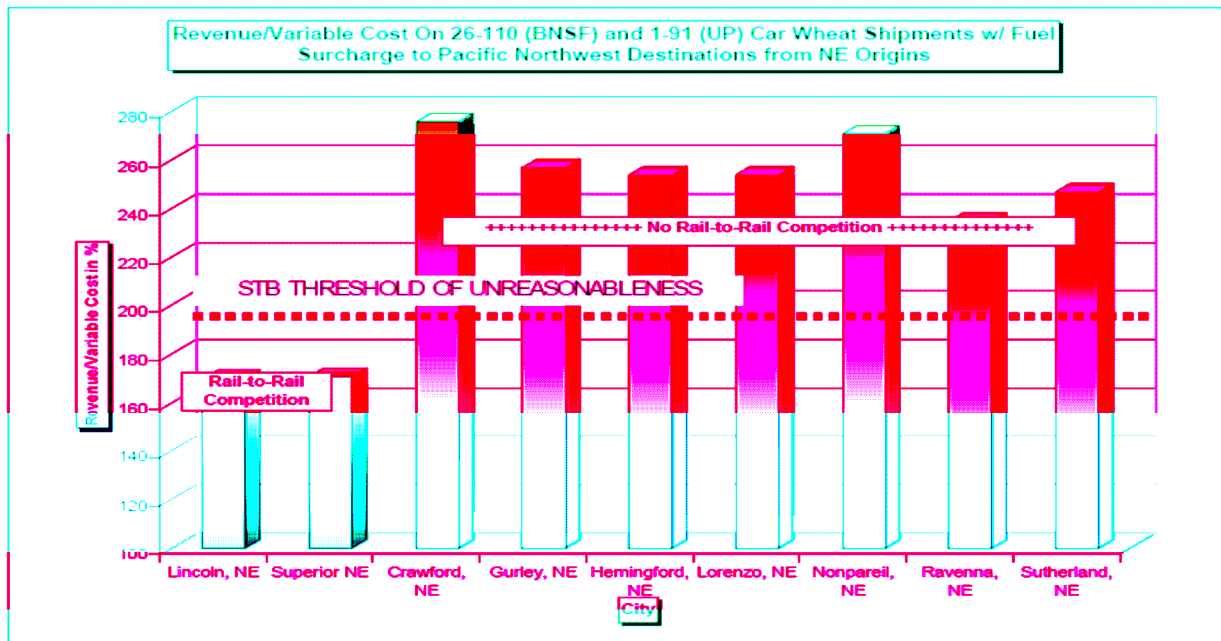
Having observed the impact of captivity separately in geographic and product markets separately, when we examine specific product and geographic markets we find very large differences in matched comparisons of movements of specific commodities on specific routes (See Figures VI-2, VI-3, and VI-4 ). Captive shippers pay a heavy premium. The most striking effects can be seen in rates on routes for captive commodities that lost competition during the wave of mega-mergers. On the four routes shown, mergers eliminated competition in the mid-1990s. The share of traffic where rates exceed 300 percent of variable costs skyrocketed after the mega-mergers of the 1990s, affirming the earlier findings.

**Figure VI-2: RVC Ratios for Pacific Northwest Wheat Shipments**



Source: “Testimony of Wayne Hurst, National Association of Wheat Growers,” *House Committee on Transportation and Infrastructure, Hearing to Review Rail Competition and Service*, September 25, 2007, p. 8.

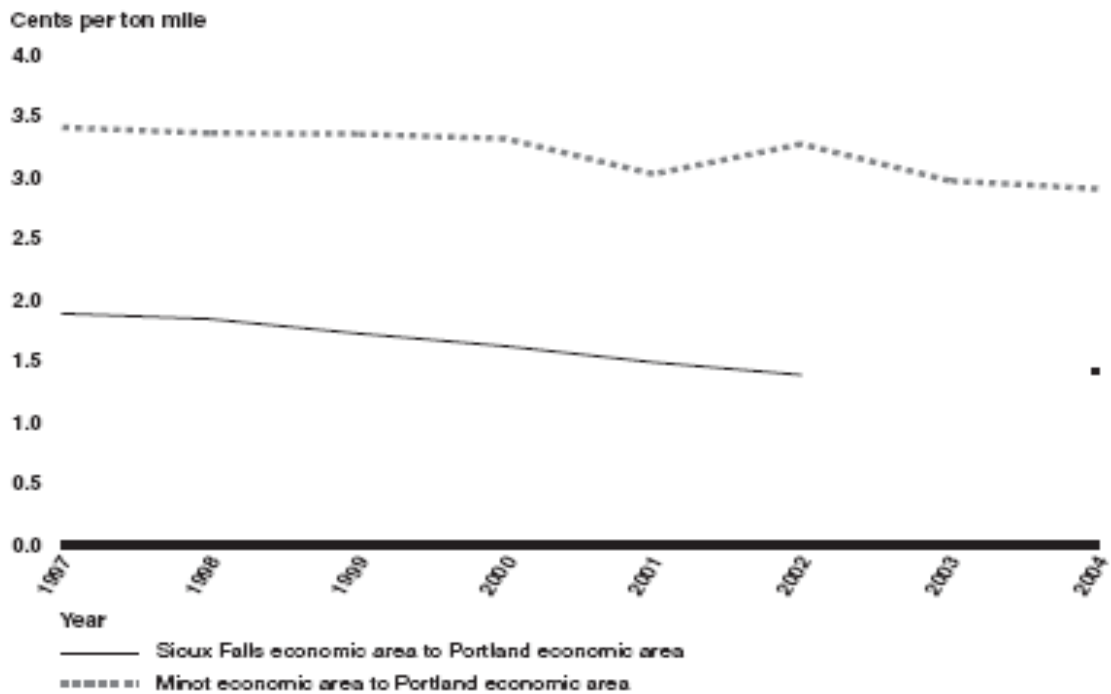
**Figure VI-3: RVC Wheat Shipments Nebraska – Pacific Northwest**



Source: “Testimony of Wayne Hurst, National Association of Wheat Growers,” *House Committee on Transportation and Infrastructure, Hearing to Review Rail Competition and Service*, September 25, 2007, p 12.

**Figure VI-4: Upper Midwest Grain Shipments**

**Figure 9: Comparison of Rates Charged on Long-distance Grain Routes, 1997-2004**

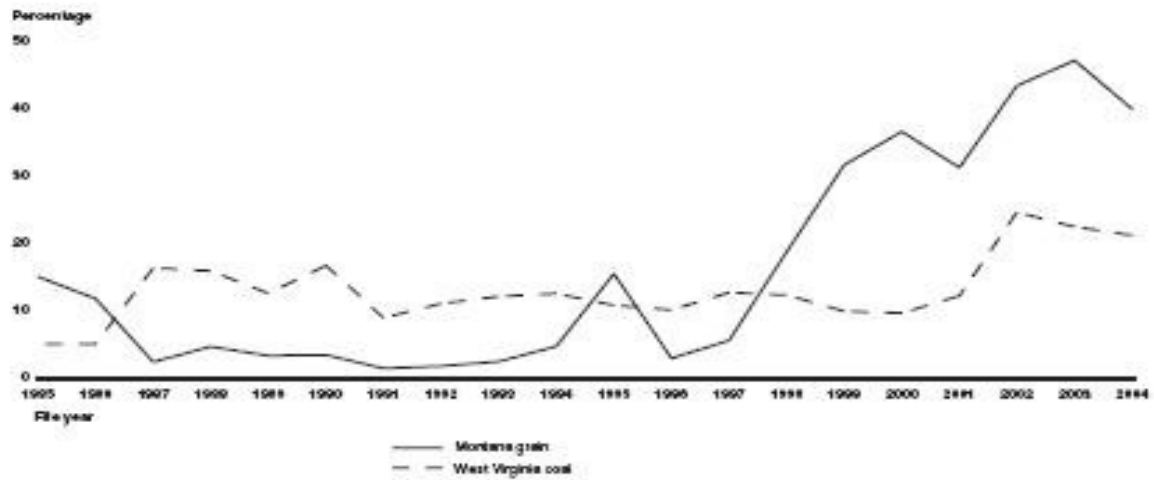


Source: U.S. Government Accountability Office, *Freight Railroads: Industry Health Has Improved, But Concerns about Competition and Capacity Should be Addressed*, October 2006, pp. 24.

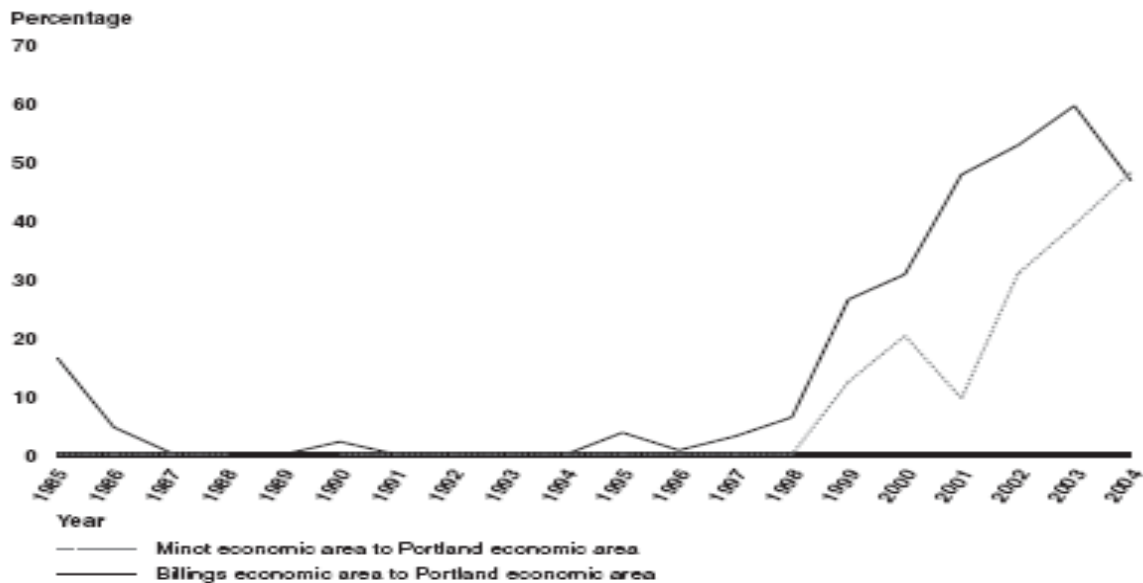
As shown in Figure VI-5 Prior to the mega-merger there was little, if any traffic that moves at an R/VC of 300 percent. After the mergers, almost half moved at that level. In an industry where an average R/VC ratio of 130 to 150 percent is what is needed to achieve revenue adequacy, rates at 300 percent are excessive.

**Figure VI-5: Post Merger Rate Increases on Individual Routes**

**Figure 8: Percent of Tonnage Traveling Over 300 Percent R/VC, 1985-2004**



**Figure 19: Long-distance Grain Route Changes in Percentage of Tonnage Traveling at Rates over 300 Percent R/VC, 1985-2004**



Source: GAO analysis of STB data.

Source: U.S. Government Accountability Office, *Freight Railroads: Industry Health Has Improved, But Concerns about Competition and Capacity Should be Addressed*, October 2006, pp. 18, 23.

## THE IMPORTANCE OF COMPETITION

The previous discussion highlights the importance of competition in ensuring reasonable rates by highlighting the exit of a competitor from the market. We observe a similar effect with entry of a rail competitor. As Figure VI-6 shows, rates fell by 50 percent in one of the rare instances where there was new entry of competition.

*Figure VI-6: Entry of Competitive Rail*

**Figure 10: Rate Changes after the Introduction of a Second Carrier**

Cents per ton mile—masked

8x

6x

4x

2x

0x

Earlier to later

— Railroad 1—rates

..... Railroad 2—rates

Source: GAO analysis of STB data.

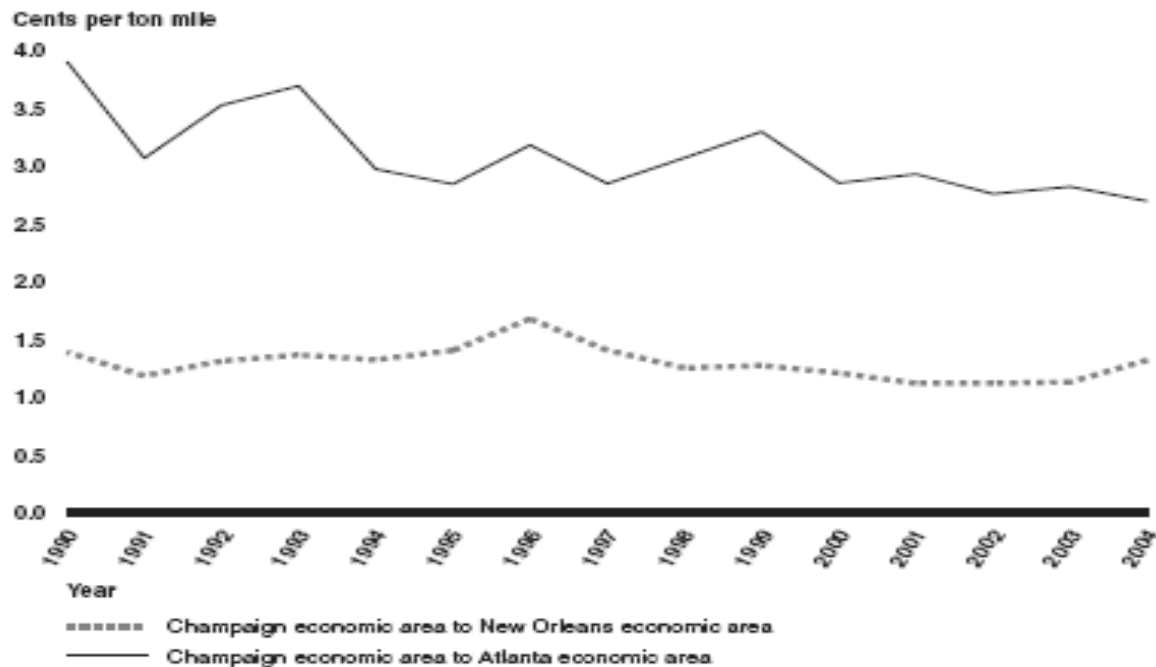
Source: U.S. Government Accountability Office, *Freight Railroads: Industry Health Has Improved, But Concerns about Competition and Capacity Should be Addressed*, October 2006, p. 23.

Most of the previous examples involve rail-to-rail competition. The beneficial effect of competition is evident in those instances where water-to-rail competition exists, as shown in Figure VI-7.



## Figure VI-7: Water-Rail Competition

**Figure 11: Comparison of Rate Changes from Champaign, Illinois, Economic Area to New Orleans, Louisiana, Economic Area and Champaign, Illinois, Economic Area to Atlanta, Georgia, Economic Area, 1990-2004**



Source: GAO analysis of STB data.

Source: U.S. Government Accountability Office, *Freight Railroads: Industry Health Has Improved, But Concerns about Competition and Capacity Should be Addressed*, October 2006, p. 24.

The experience in the past decade suggests that the presence of competition results in rates that are substantially lower. Captive shippers pay a premium 75 to 100 percent compared to similar movements in competitive markets and the cost of captivity has been rising substantially in the past half decade.

## SERVICE QUALITY

The second area where we would expect to see performance effects of an imperfect market structure is in the realm of service quality. In one respect the negative effects of mergers were clear. The initial complaint about the mega-mergers of the 1990s focused on serious service quality problems that occurred when the huge new railroads had severe difficulty integrating their operations.

The three mega-mergers of the 1990s have all been plagued with problems. It took BNSF much longer than expected to operationally merge the two railroads...

By 1998, two economists estimated that the Union Pacific/Southern Pacific merger had already cost American shippers \$2 billion.<sup>68</sup>

As background, UNP, historically considered a service leader, has struggled to regain its former glory from a service and operational standpoint ever since the SP merger. However, the Unified Plan has now been in place for roughly two years (the general timeframe before we saw a step changed in operations from operating plans at other railroads), and we believe operations are showing significant progress.<sup>69</sup>

The service quality problem is not restricted to the post merger period. It is chronic. While there is no doubt that service quality improved after Staggers, it is also clear that current levels of quality leave a great deal to be desired.

Rail on-time service is still rated poorly by shippers (relative to other modes). If there is an Achilles' heel to the pricing story, it is that rail service, which has improved from the terrible levels we witnessed following the mega-mergers in the 1990s, is still quite poor when compared to other freight transport modes. Parcel and truck service levels are perceived to be far better than what the rails deliver. In fact, CSX noted on its conference call with analysts that on-time performance has improved to 64% for the past 13 weeks. While this is up from the very poor 46% on-time arrivals for CSX's shipments in 1Q06, we would be hard-pressed to describe a service where 36% of shipments arrive late as "good." By comparison, UPS and FedEx post on-time delivery metrics above 90% consistently.<sup>70</sup>

The freight transport system is operating at full capacity for much of the year. Operating at capacity makes maintenance and expansion of the system difficult and leads to chronic delays in the shipment and receipt of goods. Freight rail capacity in the United States and Canada is limited and rail system performance is deteriorating... Despite poor performance, fuel surcharges and increased freight demand have allowed U.S. Class I railroads to continue to raise prices<sup>71</sup>

Even under normal circumstances, it appears that railroads are not able to manage reliability well. While the timing and speed of trains are centrally controlled, the fact that most freight trains do not run a fixed schedule means

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<sup>68</sup> Larson and Spraggins 2000: 36) Larson, Paul, D. and H. Barry Spraggins. 2000. The American Railroad Industry: Twenty Years After Staggers. *Transportation Quarterly*. 5, p. 2.

<sup>69</sup> Morgan Stanley, 2007, p. 55.

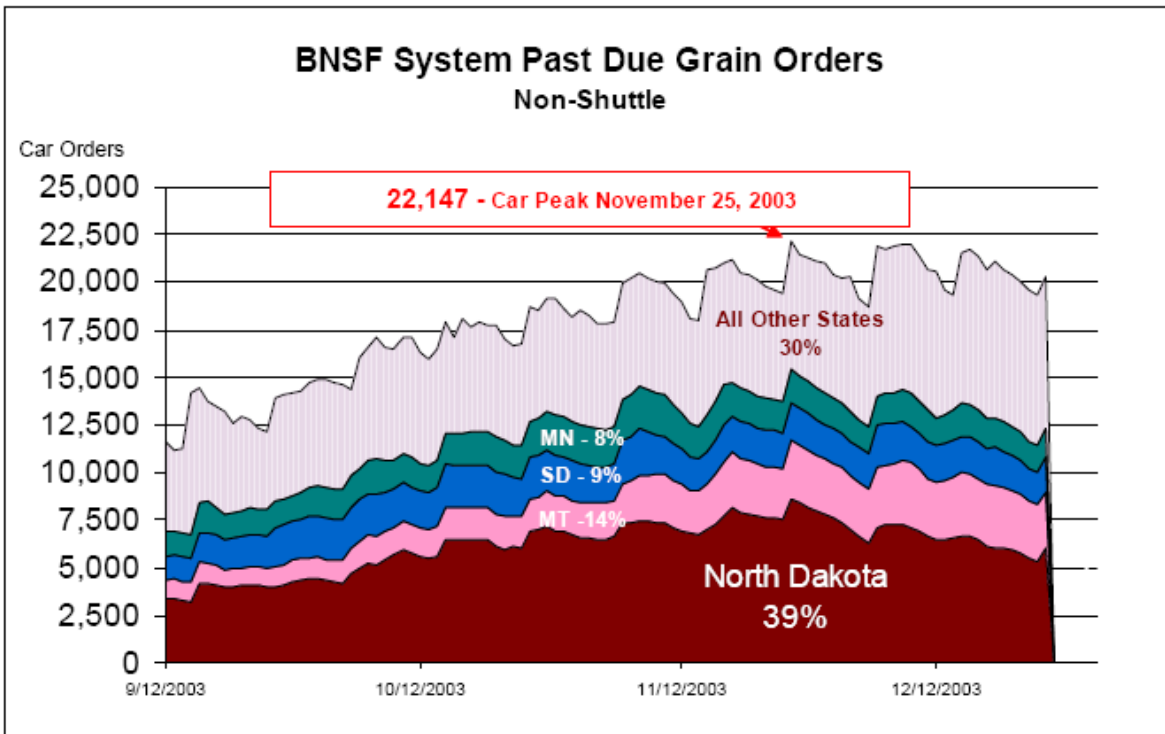
<sup>70</sup> Morgan Stanley, UPS, 2007, p. 15

<sup>71</sup> Ortiz, et al 2007: p. 2

that many shippers do not know when their freight will leave the terminal and arrive at its destination. Shippers have complained to STB about a general lack of reliability and that their freight sometimes gets lost.<sup>72</sup>

Shippers offer evidence that service quality problems are more likely to occur on captive traffic (see Figure VI-8).

**Figure VII-8: Past Due Grain Orders**



Source: “Testimony of Wayne Hurst, National Association of Wheat Growers” before the *House Committee on Transportation and Infrastructure, Hearing to Review Rail Competition and Service*, September 25, 2007, p. 3.

Poor service has an impact not only on the functioning of the railroads, but also on the broader economy. When capacity is inadequate, short lines and shippers are placed at a disadvantage and the economy suffers.

The last problem involving Class I carriers is that when their service levels are deficient, it affects short-line carriers. Thus, shippers become so frustrated

<sup>72</sup> Weatherford 2008, p. 33.

that they stop shipping on rail and switch to truck. In some cases, this business is permanently lost to the rail industry. This was the situation immediately after the merger between the Union Pacific and the Southern Pacific. Other shippers contend that rail service is habitually sub-standard.<sup>73</sup>

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<sup>73</sup> Johnson, et al. 2004, p. 1020.

## VII. PROFITS, EXCESS PROFITS AND CROSS-SUBSIDIES

### PROFITABILITY

While profitability is only one of the indicators of market performance, it receives and deserves a great deal of attention. In the rail sector it takes on particular importance because the issue of revenue adequacy was built into the statute and plays a key role in triggering regulatory protection for captive shippers. Throughout the Staggers era revenue adequacy has been highly controversial.

The insistence by the ICC that virtually no railroads in the industry are revenue adequate, even though they are generating the billions of dollars in liquid assets to fund large acquisitions only reinforces our conviction that proper regulatory oversight is lacking. No single fact better underscores the failure of the ICC to properly execute its responsibility than the completely contradictory conclusion about the financial health of the railroads recently reached by the ICC and the Department of Transportation (DOT) (Cooper 1985a, p. 3).

Railroads ought to be able to cover total operating expenses, to earn a reasonable return on their capital and to cover the costs of inflation to pay for new and old capital, as well as to provide a sound means of transportation for the nation. However, there is no economic rationale for allowing railroads to extract monopoly rents from captive shippers. By vastly overstating the revenue needs of railroads, the Commission has literally written the ticket that will allow the railroads to do just that. A proper evaluation of adequacy must be made which will distinguish between railroads which are truly inadequate and those which are simply deemed inadequate by a faulty definition.<sup>74</sup>

The dramatic rise in prices in the past half-decade was not driven by cost increases. As a result, the net income of the railroads has skyrocketed, more than doubling in a mere four years (see Figure VII-1). Return on invested capital has almost doubled over that period.

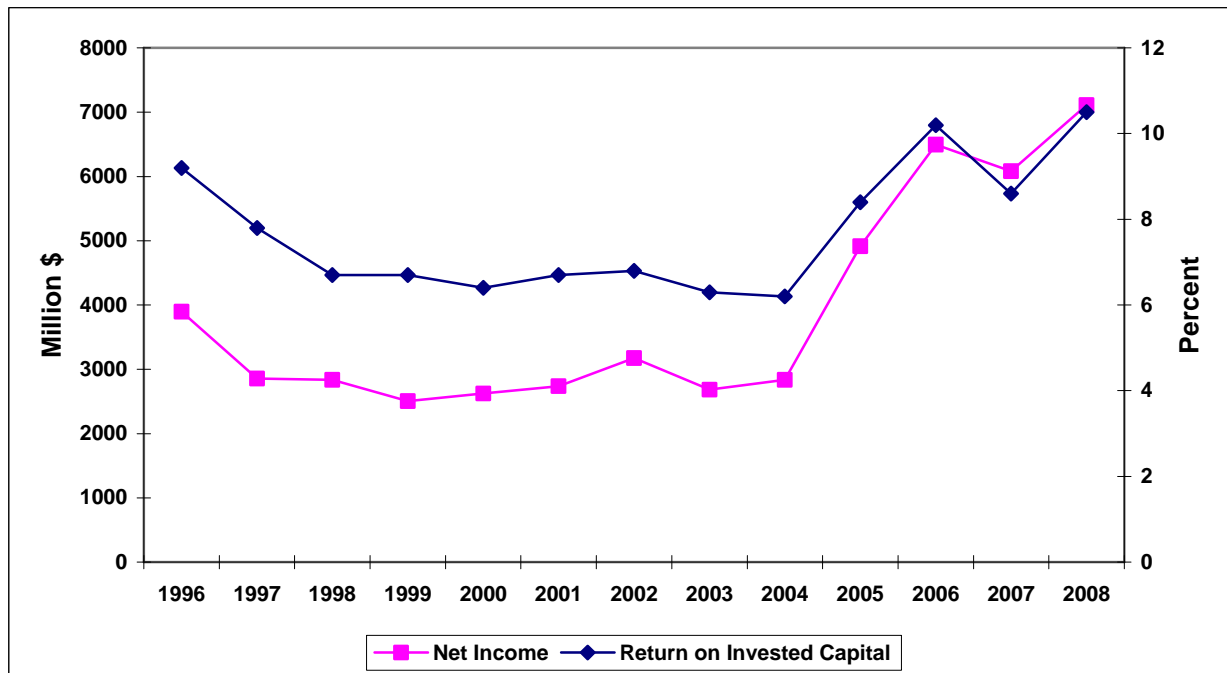
Earnings per share have increased even faster and Wall Street expects the trend to continue (see Figure VII-2). Through the first three quarters of 2008, “rail stocks are up 0.6% YTD on average, outperforming the broader S&P 500 Index by 3,225 basis points.”<sup>75</sup>

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<sup>74</sup> Cooper, Mark. 1986. Railroad Antimonopoly Act of 1986. *Subcommittee on Commerce, Transportation and Tourism of the Energy and Commerce Committee*. U.S. House of Representatives. June 5., p. 4

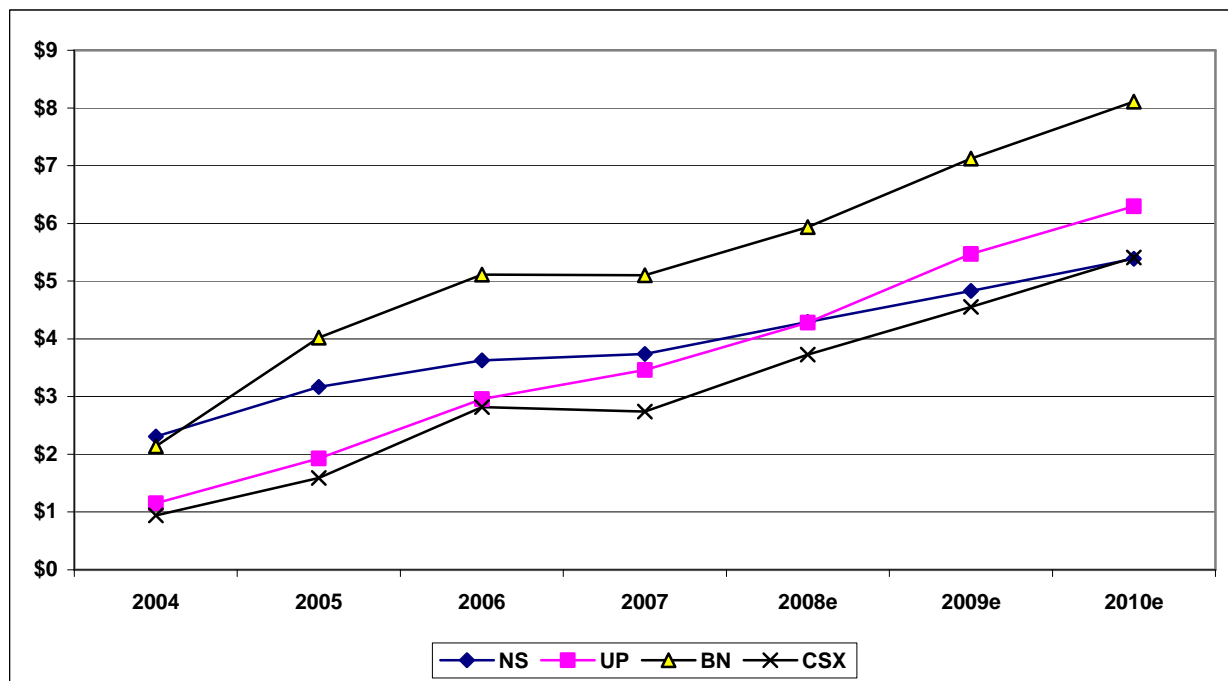
<sup>75</sup> Goldman Sachs, 2008, p. 1.

**Figure VII-1: Net Income and Return on Investment**



Source: Surface Transportation Board, *Class I Freight Railroads – Selected Earnings Data*, 2008 is last 12 months.

**Figure VII-2: Earnings Per Share**

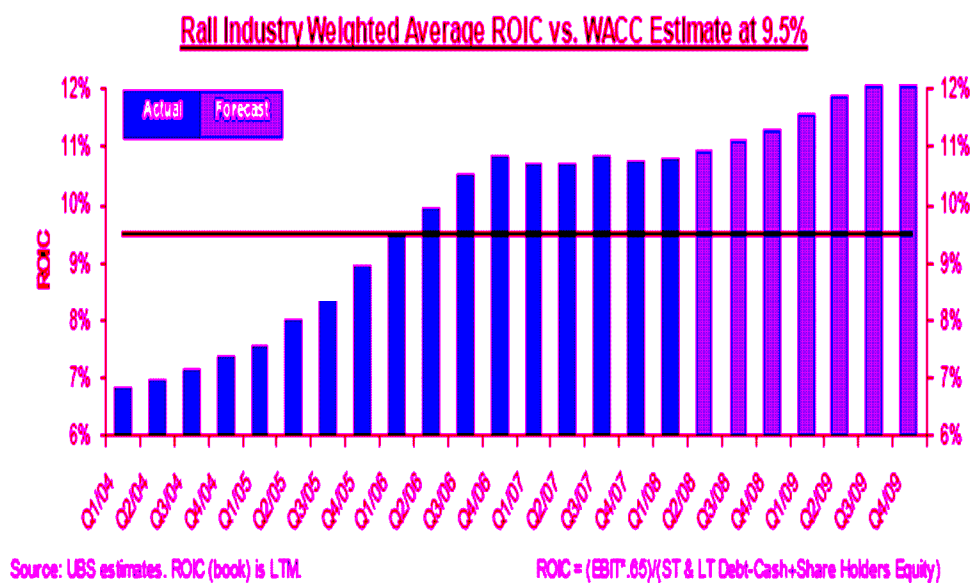


Source: Actual 2004-2007, Annual Reports; Estimated 2008-2010, Goldman Sachs, *Americas: Transportation: Railroads*, September 23, 2008

The dramatic improvement in profitability in the rail industry is obvious to knowledgeable observers. As Morgan Stanley noted “The outsized growth in railroad profitability over the past few years has given management less leverage in the current ongoing negotiations with labor.”<sup>76</sup>

What goes on in the real world, however, bears little relationship to what goes on at the STB. In spite of the strong performance on Wall Street, the STB still concludes that the railroads are overwhelmingly revenue inadequate. The mistaken conclusions reached by the STB reflect the long-standing flaws in its approach. While the rails are deemed to be revenue inadequate at the STB, on Wall Street they are earning their cost of capital and then some, as shown in Figure VII-3.

**Figure VII-3: Rail Industry Cost of Capital and Return on Investment**



UBS, *Greasing the Wheels*, May 28, 2008, p. 3.

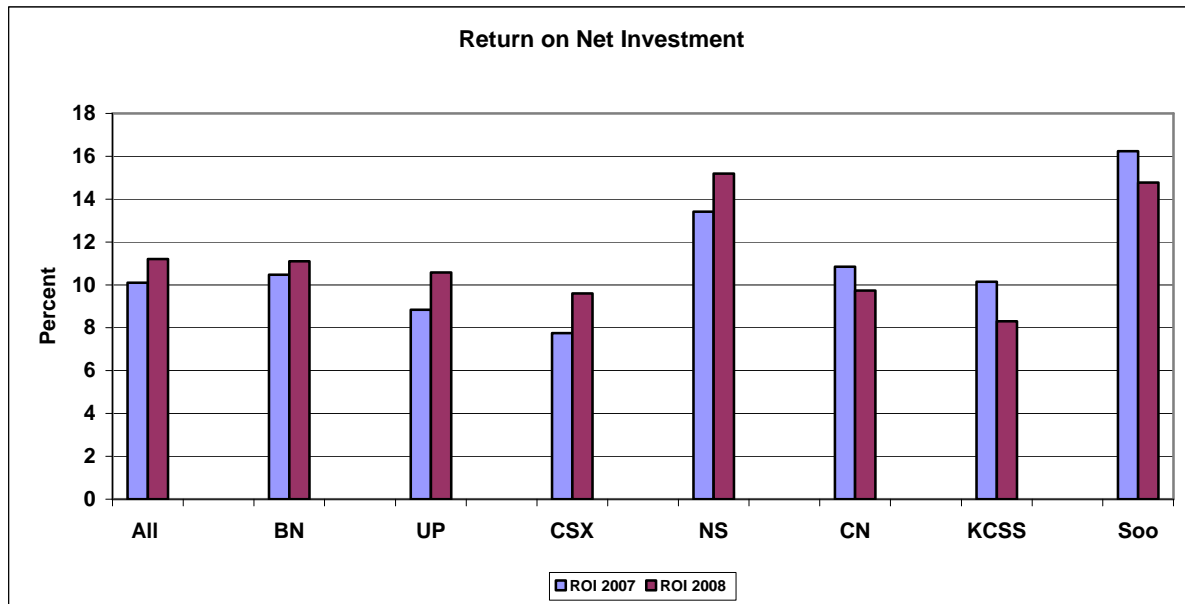
UBS predicted continuing increase in the railroad rate of return through 2008 based on the pricing power that the railroads enjoy, in spite of the weakening economy. We now know that the economy was in recession for the entire year. Notwithstanding the recession, as Figure VII-4 shows, the rail industry exceeded the UBS forecast. The increase in net income and return on investment was driven by price increases. Revenue ton-miles were up a meager .7 percent, but rail revenues were up 12 percent and net income was up by 20 percent. At the UBS weighted average cost of capital of 9.5 percent, all four the major

<sup>76</sup> Morgan Stanley, 2007, p. 15.

railroads had a return on investment that exceeded the cost of capital, and six of the seven freight railroads did. The STB uses a higher figure for the revenue adequacy threshold, but even at the STB estimate two of the major freight railroads were at or above revenue adequacy. If the STB used a reasonable cost of capital, the excess profits in the rail industry would equal about \$1 billion in 2008.



**Figure VII-4: Return on Net Investment 2007-2008**



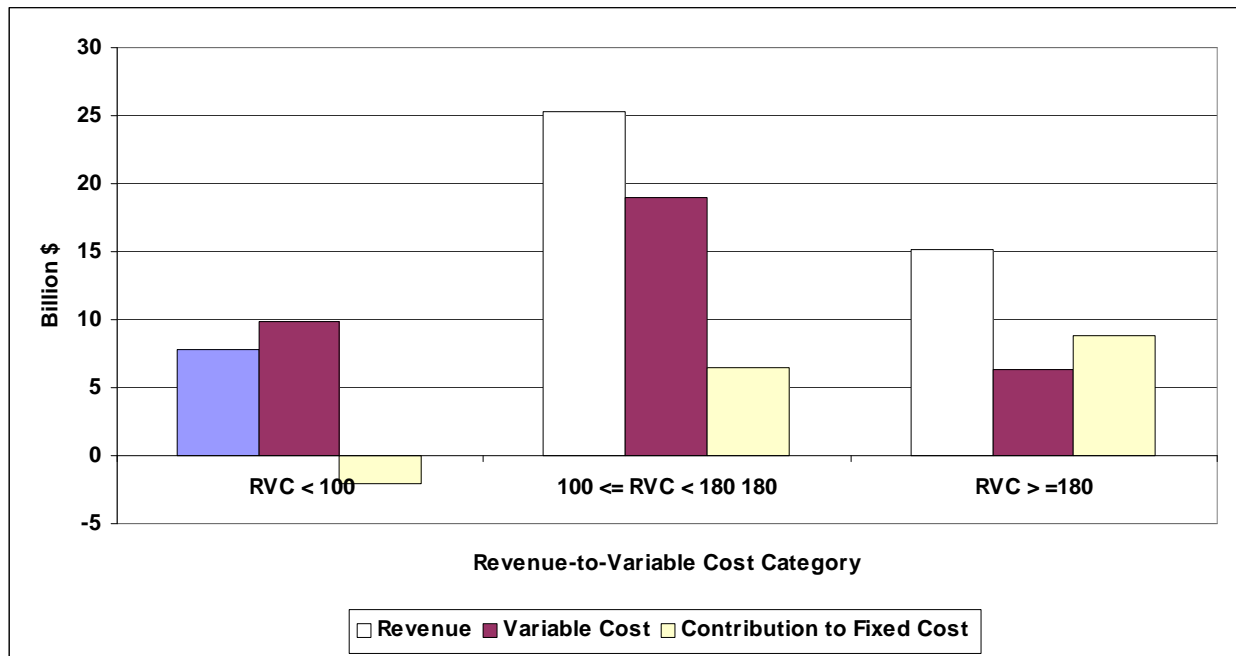
Surface Transportation Board, Class I Railroads – Selected Earnings Data.

#### REVENUE-TO-VARIABLE COST RATIOS

Embedded in these income and profitability numbers is an important and troubling aspect of rail traffic and revenues. It is remarkable to find that more than a quarter of a century after the passage of the Staggers Act over one-quarter of the traffic carried by the rails (as measured by variable cost) is non-compensatory. The most recent data, which are for 2005, show that 28 percent of the traffic carried by the freight railroads does not cover its variable costs (See Figure VII-5). The losses on this traffic equal \$2.1 billion or 14 percent of the gains on the compensatory traffic. This is a very substantial drag on the bottom line.

The share of non-compensatory traffic is larger than the share of captive traffic (RVC > 180). Traffic above 180 percent is about 18 percent of the total (measured by cost). However, captive traffic accounts for about two-thirds of contributions to fixed costs (revenues above variable costs). Captive shippers represent less than one-fifth of total costs but provide two-thirds of the profit. The average revenue-to-variable cost ratio for captive traffic is 239 percent. Captive coal and chemicals traffic account for about 35% of all profits even though they account for only 14% of total revenues.

**Figure VII-5: 2005 Revenue and Variable Costs**



Source Surface Transportation Board, *Commodity Revenue Stratification Report for 2005*

If the drag on rail income caused by non-compensatory traffic were eliminated (either by raising rates to a compensatory level or shedding the traffic) and the reduction of that burden were used to alleviate the burden borne by captive traffic, the revenue-to-variable cost ratio on captive traffic would decline to 205 percent.

Estimating the impact of excessive returns is a more complex task. There are two major components of excessive returns, both subject to debate. How much should railroads earn is one major issue. A second issue is how assets should be divided between equity and debt. By relying on expensive equity, the railroads increase their cost of capital. Morgan Stanley believes that the railroads are under leveraged and can increase borrowing to buy back stock and increase shareholder value.

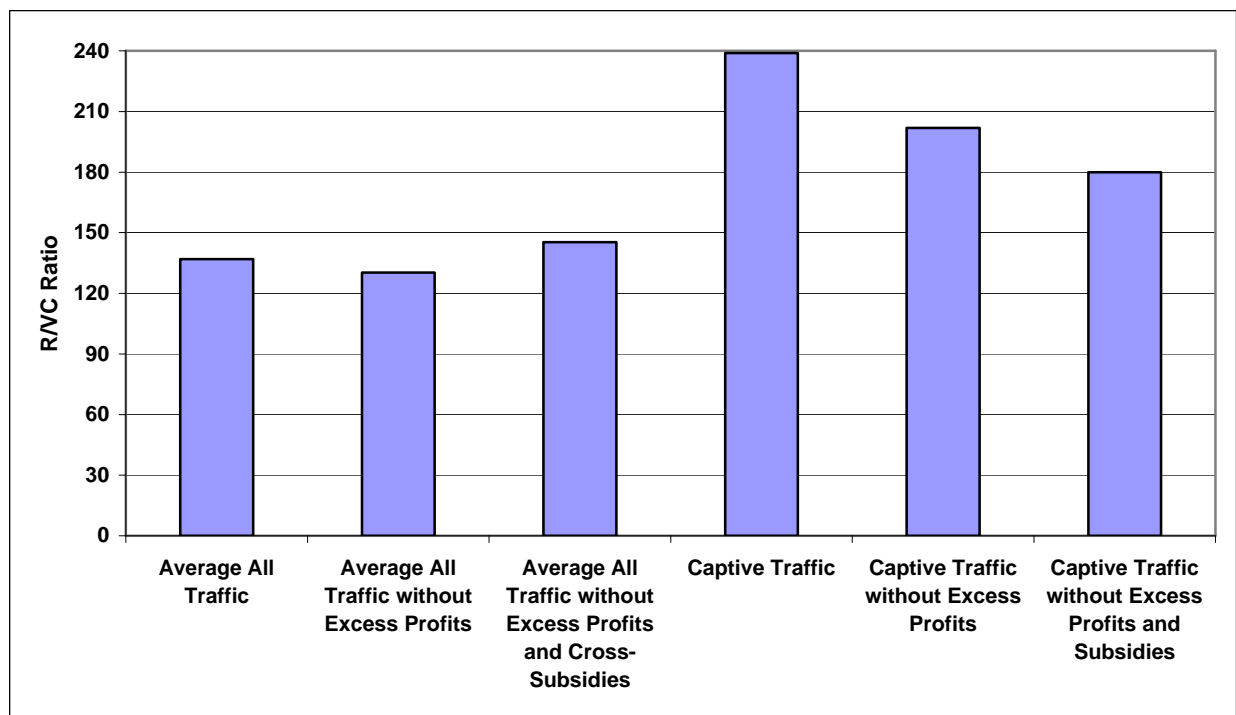
For example, on an after tax basis, rails can borrow at roughly 4% today. Given our views that the pricing story is secular and durable for years, railroads that are disciplined in allocating capital to new projects should have plenty of balance sheet capacity to leverage up and buy back shares. If each of the rails issued debt to repurchase shares to the point where debt-to-total capital ratios equaled 60% (today they stand at 40-50%) in each of the next three years, we estimate that the companies could buy back 5-20% of their market capitalizations at today's prices. The implication of a buy-back of this

magnitude at today's prices is significant, especially if you believe such actions would lead to substantial multiple expansion.<sup>77</sup>

The UBS weighted average cost of capital is almost two percentage points lower than the STB calculated weighted-average cost of capital. For 2007, UBS shows rails exceeded their cost of capital by a full percentage point. Comparing the STB's return on net investment to the UBS cost of capital, the industry as a whole exceeded its cost of capital by 0.6 percent in 2007 and 1.7 percent in 2008. For 2008 this is more than \$1 billion. Increasing the debt ratio as suggested by Morgan Stanley would lower the cost of capital by almost another percentage point, almost doubling the excessive returns. In total, the railroads would have over \$2 billion in profit above their cost of capital.

If oversight of the industry were to eliminate excess profits and cross subsidies, the industry would be revenue adequate at a revenue-to-variable cost ratio of just under 150 percent (see Figure VII-6). The revenue-to-variable cost ratio on captive traffic would fall from just under 240 percent to 180 percent.

**Figure VII-6: Revenue to Variable Cost Ratios**



Source Surface Transportation Board, *Commodity Revenue Stratification Report for 2005* for R/VC ratios; excess profits calculated as achieved return minus CAPM cost of capital.

<sup>77</sup> Morgan Stanley 2007, pp. 8-9, Morgan Stanley calculates the asset base and return on invested capital differently in arriving at the estimate of debt and equity.

## VIII. CONCLUSION

This review of the state of the rail freight industry demonstrates that the mergers of the mid-1990s have created a highly concentrated market structure in which neither intramodal competitive forces within the rail sector nor intermodal competition from trucks and water transport is sufficient to discipline the abuse of market power. Anticompetitive conduct has further weakened competition by undermining interline traffic. The STB has done little, if anything, to prevent or diminish this abuse. With captive shipper rates and rail profits escalating rapidly the harm to consumers, shippers and the economy is mounting rapidly. The need to address this growing national problem is urgent.

The STB has failed to implement the captive shipper and procompetitive provisions of the Staggers Act to protect the public. We identified this central problem a quarter of a century ago. It has festered ever since and, as we have shown in the above analysis, now costs consumers billions of dollars per year.

The captive shipper provisions in the Staggers Act were intended to ensure that the creation of a financially viable and economically sound rail network is achieved in an equitable and efficient manner. The Act identifies revenue adequacy as a primary goal and allows differential pricing – price discrimination – in pursuit of that goal. However, neither the revenue adequacy principle nor differential pricing was intended to be a blank check. Congress expected that some price discrimination would exist in the railroad industry by setting a high jurisdictional threshold, but it also intended to restrain price discrimination.

It allowed for flexible jurisdictional thresholds.

It stipulated that management had to be honest, economic and efficient.

It required the maximization of revenues from competitive traffic.

It stated that even in the quest for revenue adequacy the burden placed on captive commodities, such as coal, should not be onerous (Cooper 1986, p. 9).

Section 203 of the Staggers Act, the “Long-Cannon Amendment, the essential compromise that led to the passage of the Staggers Act in 1980, states that...

(c) In determining whether a rate is reasonable, the Commission shall consider, among other factors, evidence of the following:

- (i) the amount of traffic which is transported at revenues which do not contribute to going concern value and efforts made to minimize such traffic:

- (ii) the amount of traffic which contributes only marginally to fixed costs and the extent to which, if any, rates on such traffic can be changed to maximize the revenues from such traffic; and
- (iii) The carrier's mix of rail traffic to determine whether one commodity is paying an unreasonable share of the carrier's overall revenues.

Unfortunately, the ICC has robbed consumers of these protections by ignoring their provisions and abusing its discretionary authority under the Act. Instead of balancing the interests of railroads and consumers, the ICC has decided virtually every issue in favor of the railroads, creating an environment in which regulation no longer restrains monopoly power. Under current administrative procedure the ICC has built such a massive regulatory framework and publicly embraced such a strident economic theory that it is virtually impossible for maximum rate regulation to be changed without congressional action (Cooper 1985a, p. 5).

As outlined in the policy recommendations section in the Introduction, Congress should address three broad areas.

First, it should restore antitrust oversight over the rails.

Second, it should reform the regulation of captive shipper rates by mandating captive shipper thresholds be set at a RVC ratio of 180 with cost plus a reasonable rate of return as the guiding principle and rate of return set by the CAPM model; shifting the burden to the railroads and reforming the small shipper complaint methodology.

Third, it should ensure the STB has the resources and manpower to effectively implement these captive ratepayer protections.