

Rail Rates

Chapter 7

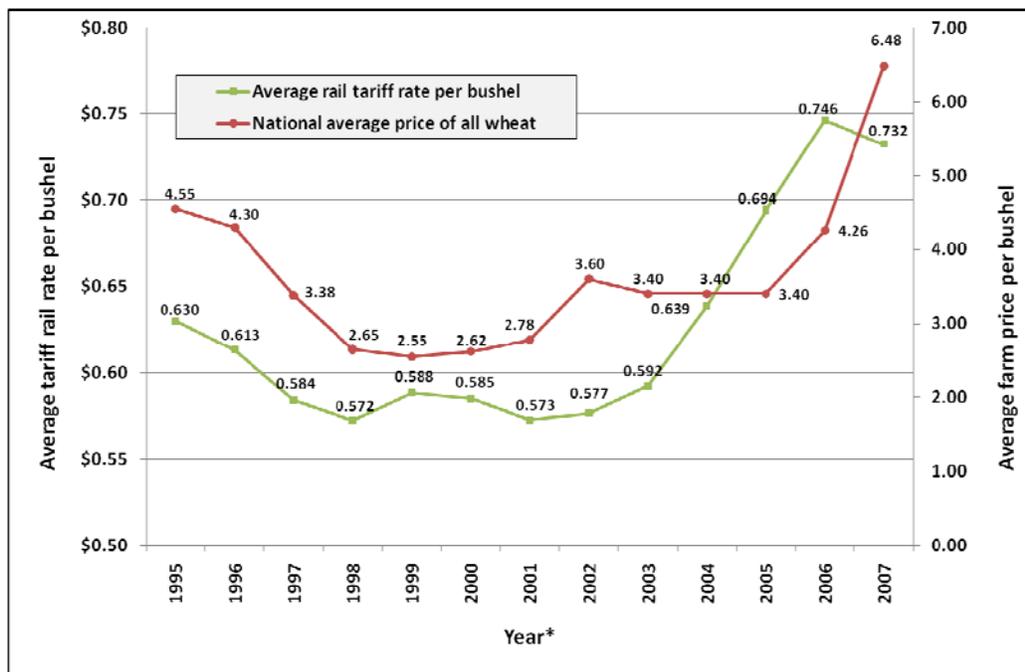
Chapter 7: Rail Rates

An examination of the effects of deregulation and the performance of the Surface Transportation Board (STB) under that deregulation usually includes an analysis of rail rates that have evolved since implementation of the *Staggers Act of 1980* (Staggers Act). This chapter looks at the rail rate structure for agricultural commodities and compares it to rates for other commodities. Changes in agricultural rail rates are evaluated against shipment size and distance shipped to understand how they affect agricultural shippers. Railroads transferred costs to agricultural shippers and over-recovered fuel costs with surcharges. Shippers question the reasonableness of rail rates in the light of railroad revenue adequacy and rail costs, and of bottleneck rates.

Importance of Reasonable Rail Rates

Because grain and oilseeds are bulk commodities with a low value in proportion to their weight, the costs of rail transportation to market represent a significant percentage of the average on-farm price of the commodities (Figure 7-1). For example, average rail tariff rates as a percent of the farm price of wheat have varied from 11.3 percent in 2007, when wheat prices were high, to 23.1 percent in 1999, when wheat prices were low. Rail transportation costs for individual movements of agricultural products have been as much as 40 percent of the delivered price.¹⁴⁶

Figure 7-1: Wheat—average rail tariff compared to average farm price



* Marketing year ending May 31

Sources: AMS, Rail Tariff Data: STB Waybill Samples, 1995-2007; Average Farm Price: USDA/NASS, Crop Value Summary

Agricultural producers are “price takers” rather than “price makers,” with little control over the price they receive for their products. They are unable to pass cost increases on to customers, and must absorb them because of their lack of market power. Consequently, increases in transportation costs result in decreased producer profit. For agricultural shippers with no cost-effective alternative to rail, and located far from markets, rail is the only transportation available. The rail rate determines the net price the producer receives.

Lower prices and incomes hinder farmers from borrowing funds to purchase fertilizer, seed, and machinery, reducing economic prosperity in rural areas. Higher transportation costs also affect the competitive position of U.S. agricultural products in highly competitive export markets. The rates agricultural shippers pay for rail transportation can facilitate or inhibit American competitiveness in world agricultural markets.

Despite these concerns, rates for land transportation of agricultural commodities in the United States remain among the lowest in the world. Although rail rates for agricultural commodities have not fallen as much as rates for some other products (such as coal), Figure 7-1 shows that the rail transportation cost during 2007, as a percentage of the price of a bushel of wheat, was at a 13-year low. Agricultural shippers have had some legitimate complaints about rail rates—and especially rail service quality—following some of the large rail mergers of the 1990s. However, service has improved in recent years; in fact, the rail share of agricultural exports has actually increased over the last 2 decades. This is probably the result of several factors:

- Following the merger-related service disruptions of the 1990s, rail service quality recovered.
- Although rail rates have risen, truck rates have risen even faster over the last several years.
- The STB took action to restrain railroad fuel surcharges.
- Railroad grain car capacity and productivity increased.

Rates and Railroad Deregulation

For nearly 100 years, the performance of railroads reflected the constraints put on them by Federal regulation. The *Interstate Commerce Commission Act of 1887* (ICC Act) created the Interstate Commerce Commission (ICC). ICC implemented the provisions of the ICC Act, working for “just and reasonable” rates without price discrimination. The regulatory environment created by the ICC Act and subsequent statutes required railroads to employ cost-of-service pricing and to price at average cost, with some variation usually allowed by commodity and length of haul. Cost-of-service pricing at average cost caused movements to be lost to competitive transportation modes in many corridors.

Pervasive regulation interfered with the ability of railroads to react to competitive situations and efficiently manage their firms. Rate adjustments were slow, innovations were stymied, and rationalization of rail infrastructure was expensive and time-consuming. The unwieldy regulatory framework, along with increased competition from other modes—in part due to government promotion of competing transportation modes—led to a loss of market share of intercity freight and the attendant revenue. The railroads were unable to maintain their infrastructure, were close to bankruptcy, and were not competitive.

Regulatory reform happened slowly. The most important legislation was the Staggers Act of 1980. Railroads seized on their new regulatory freedom to actively pursue profits and return on investment, using differential pricing, cost efficiencies, abandonment of un-remunerative rail lines, mergers with other railroads, and the rate innovations of contracts and multiple-car pricing.

Railroads have also successfully controlled and reduced costs by abandoning rail lines, creating short line railroads, reducing labor in operations and administration, making longer hauls, increasing traffic density on rail lines, and using new technologies imaginatively. Increasing shipment and car sizes, running directionally, and sharing dispatching have also contributed to efficiency.

Railroads adopted differential pricing to use their capacity efficiently and recover their high fixed and common costs. If a railroad charged the same prices to all shippers, some shippers would find it more profitable to ship by another mode. As these shippers withdrew, the railroad would have to raise prices on its remaining customers to cover its fixed costs. Differential pricing also gives railroads the flexibility to react to differences in modal competition.

Consequently, the variable cost of providing rail transportation serves only as a floor below which rates should not go and bears little relationship to individual rail rates. Instead, rail rates are based on the price and service characteristics of competing transportation modes.

Figure 7-2: Differential pricing means that rail shippers with fewer choices pay more or service.



Source: Jeremy Lasater <www.wheatfarm.com>

With differential pricing, shippers are charged different rates for the same service based on the shipper's dependence upon rail service. Differential pricing results in unequal rates and revenue-to-variable cost ratios for different commodities, geographical locations, and producers, even in similar circumstances. Consequently, with differential pricing, captive shippers bear a higher proportion of a railroad's fixed and common costs than non-captive shippers.

The Staggers Act relies on competition to limit rail rates, but includes rate appeal procedures to limit the rates railroads could charge captive shippers (who have no competitive choice). A shipper must meet three conditions to appeal rail rates:

- Shippers may appeal only tariff rates. The STB has no jurisdiction over contract rates and rates for exempt movements.*
- The movement must have a revenue-to-variable cost ratio that exceeds 180 percent.
- The shipper must show that the railroad has market dominance, which is the lack of effective intermodal and rail-to-rail competition.

Although differential pricing offers shippers the benefit of having viable and stable rail service, reaction to rail deregulation from shippers has not been all positive. Shippers feel responsiveness to shipper needs has been lost, rail costs have been shifted to the shipper, overall rail service and capacity have decreased, rates are generally increasing, and rates have been “unfair and inequitable” in some corridors and for some commodities. Such shippers often charge that railroads unreasonably raise their rates to levels that are far beyond those that should be charged.

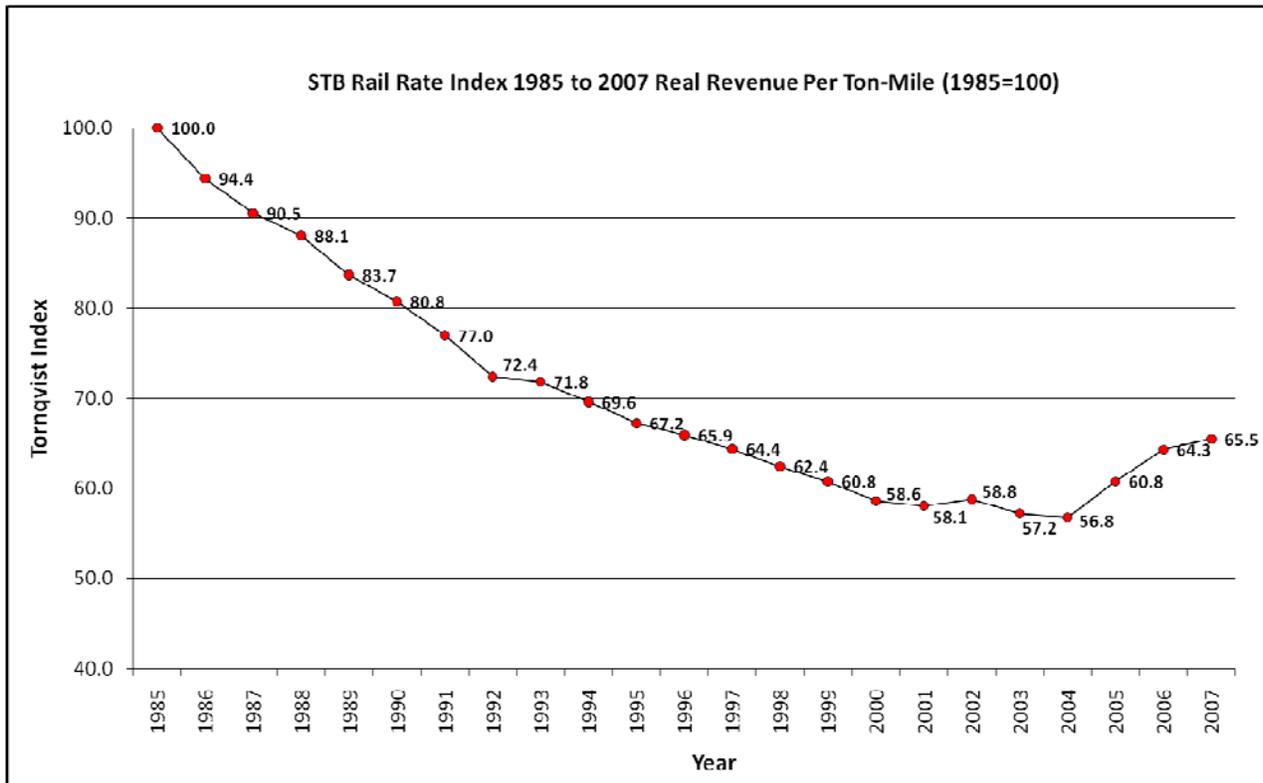
Shippers fully understand that under the Staggers Act and the differential pricing policy established by Congress they are required to pay higher rail rates if they have few or no transportation options. However, they balk at excessive rates that are well in excess of the regulatory threshold of STB review. Shippers have also expressed concern about the cost-effectiveness of the rate appeals processes. Chapter 6 examined in detail the impact of competitive conditions on rail pricing.

Recent Rail Rate Levels

STB waybill rate data are used in Figure 7-3 to examine the real revenue per ton-mile for the period 1985 to 2007. STB uses the Tornqvist Index to track rail rates. The Tornqvist index measures the change in prices in categories and assigns a percentage weight to each category based on its share of total revenue. The index is essentially the weighted average of price changes within the various categories. Both the prices within the various categories and the weights assigned to each category can vary.

* Some movements have enough competition to limit rail rates and are exempt from regulation. Exemption of particular movements or exempt commodities can be appealed before the STB, and the STB may remove the exemption if competition no longer adequately constrains rates.

Figure 7-3: STB rail rate index



Source: STB, Study of Railroad Rates: 1985-2007

The downward pressure on rates identified above as a result of railroad efficiency improvements and competitive pricing is evident. From 1985 to 2004 the rail rate index fell almost continuously, with only a slight increase being noted in 2002. However, as frequently stated to the STB by shippers, the years since 2004 have seen rapidly increasing rates for shippers. Starting in 1985, rail rates dropped about 10 percent in the first two years, continued dropping at nearly that rate through 1992, and then declined at a slower rate during the period between 1992 and 2000. Over the next few years, the rates hovered in a narrow range, varying both positively and negatively until 2004. From 2004 to 2007, the rate index has increased nearly 12 percent, from 56.8 to 65.5.

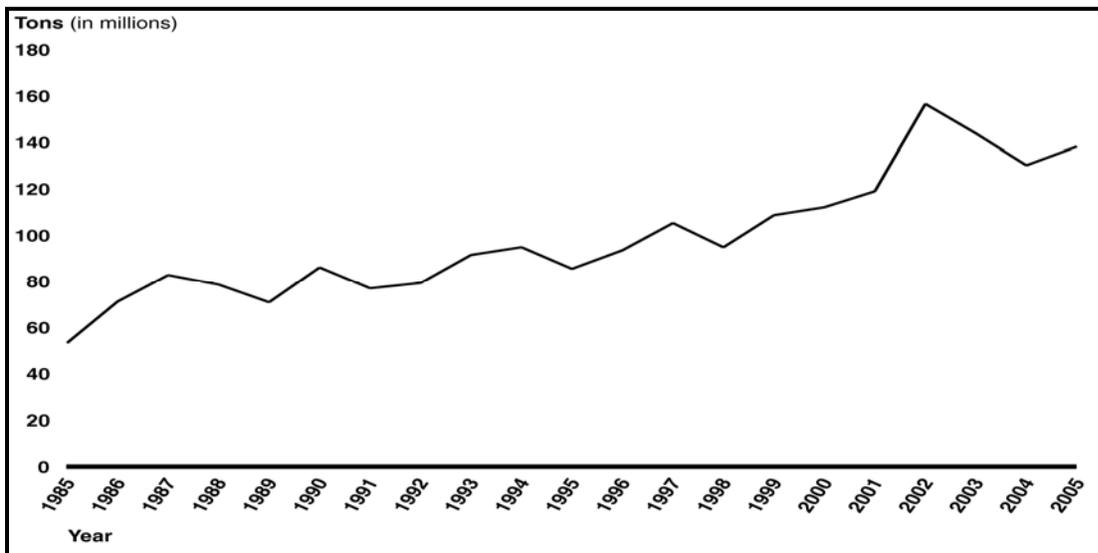
Various studies have agreed with the findings that overall rail rates decreased substantially from the mid-1980s to the early 2000s. The causes of the decrease included:

- The rationalization of the rail network, with abandonments and creations of short line or regional railroads decreasing costs while maintaining much of the original traffic.
- The ability of railroads and shippers to engage in long-term contracting as provided by the Staggers Act of 1980.
- The increase in trainload shipments.
- The shifts to larger-capacity rail cars and technology innovations.

The recent STB study of railroad rates from 1985 to 2007 found that “inflation-adjusted rates” increased from 2005 to 2007. STB wrote: “This represents a significant change from prior years, given that inflation-adjusted rail rates declined in every year but one from 1985 through 2004.” STB further elaborated “In fact, adjusting for the purchasing power of the dollar, shippers spent \$7.8 billion more in 2007 than they would have if the rate levels of 2004 had remained in place.” The STB rate study further points out that well over half the increase in rail rates between 2004 and 2007 could be attributed to higher fuel costs. Yet, even after consideration of fuel costs, railroad rates have been steadily increasing during the last few years.¹⁴⁷

The Government Accountability Office (GAO) has reported that the percentage of traffic in tons traveling at rates above a revenue-to-variable cost ratio (R/VC) of 300, which is substantially above the statutory level of 180, has generally increased from 1985 through 2005.¹⁴⁸ Figure 7-4 shows that, although the tonnage of such traffic decreased during 2003 and 2004, it increased again in 2005. The share of tonnage traveling at rates over 300 percent R/VC increased from 6.1 percent in 2004 to 6.4 percent in 2005.

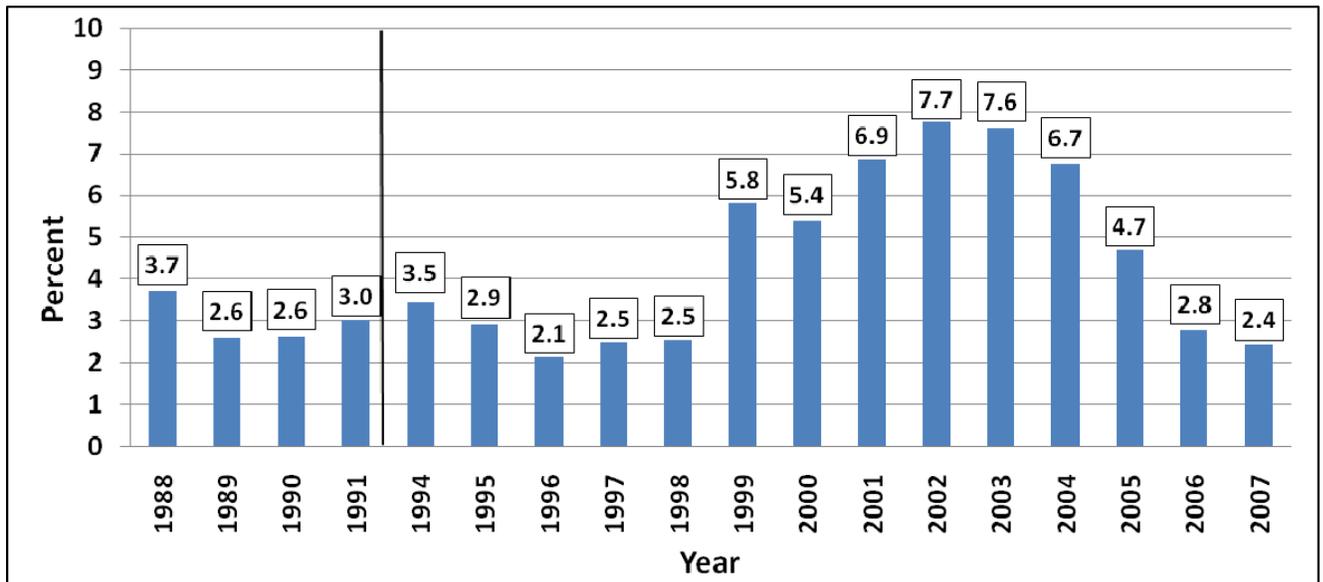
Figure 7-4: Tonnage traveling at rates over 300 percent R/VC, 1985-2005



Source: GAO analysis of STB data

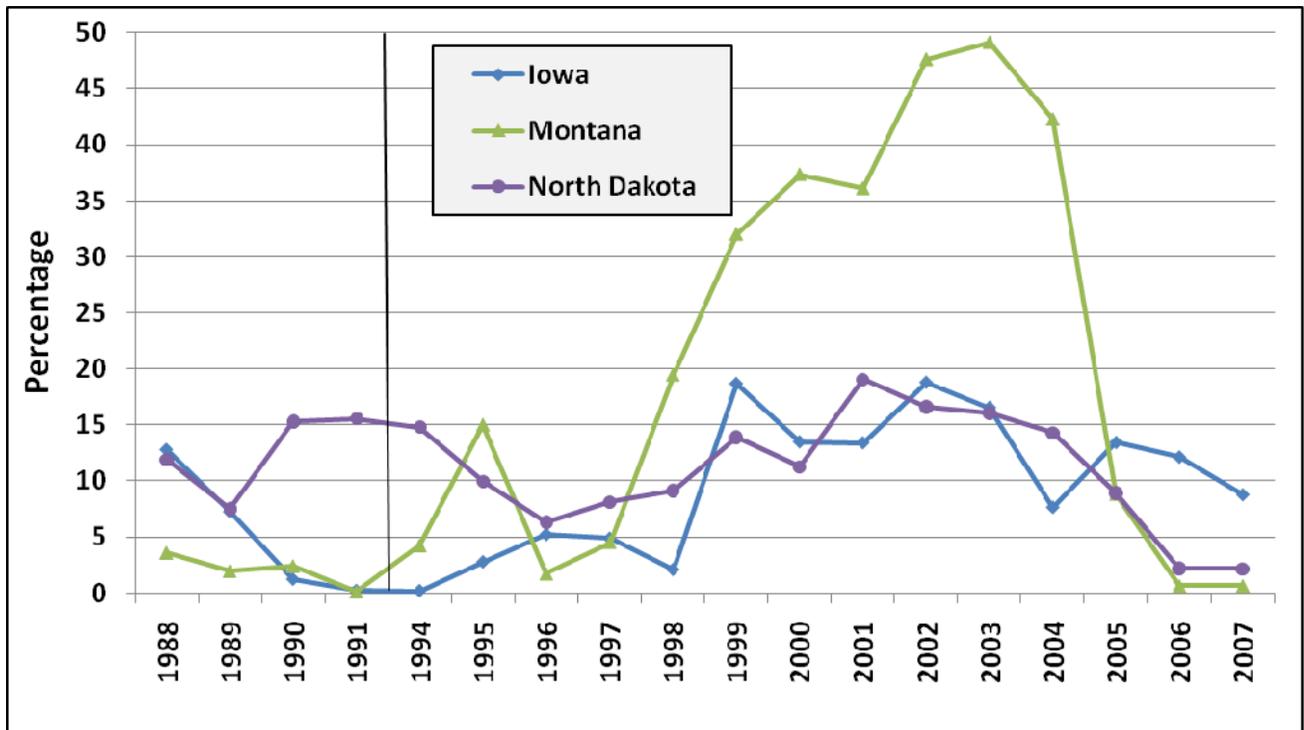
Figure 7-5 shows a slight downward trend from 1988 to 1998 in the percent of grain and oilseed tonnage traveling above an R/VC of 300 percent. The increase in the percentage of tons moving at R/VC greater than 300 percent began in 1999 and peaked at 7.7 percent in 2002, then decreased to 2.8 percent in 2006 and to 2.4 percent in 2007. In some States, however, a much greater percentage of grain and oilseed tonnage moves at R/VC ratios greater than 300 percent (Figure 7-6). These States include Iowa, Montana, and North Dakota.

Figure 7-5: Percent of grain and oilseed tons (tariff only) moved at R/VC over 300 percent



Source: Surface Transportation Board, Confidential Waybill Samples

Figure 7-6: Selected States with higher percentages of grain and oilseeds moving at R/VC over 300 percent

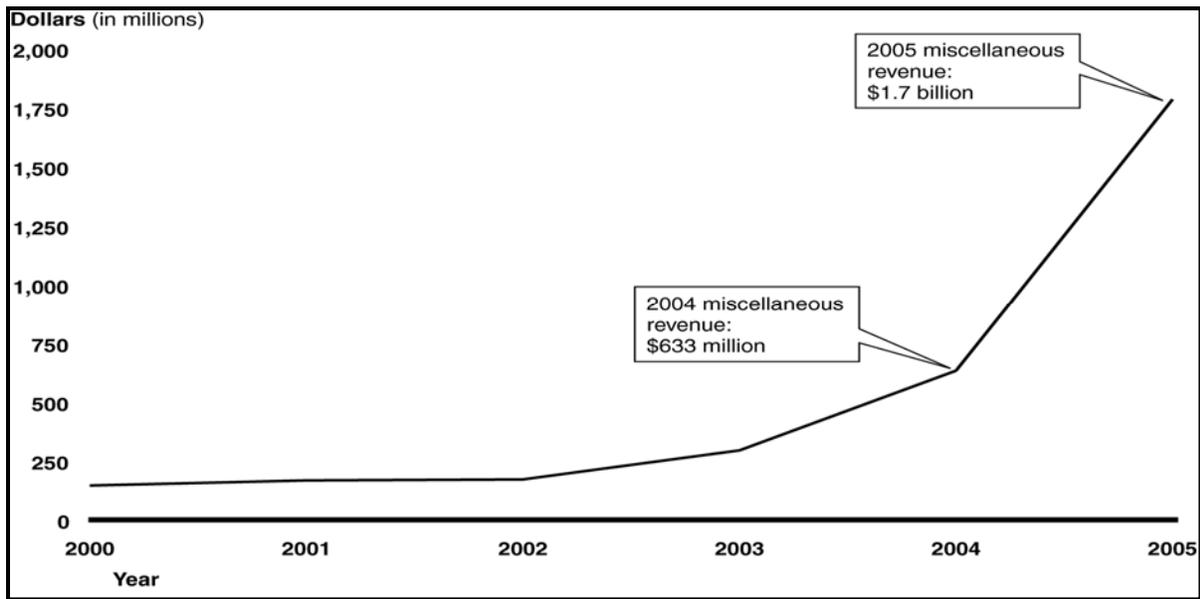


Source: Surface Transportation Board, Confidential Waybill Samples

As discussed in Chapter 6, the USDA analysis was limited to tariff rates, since contract rates are confidential and unregulated. However, several limitations in Waybill Sample data mean that tariff rates should be used with some caution. Volume discounts and rebates for use of non-railroad equipment are not included in tariff rates. Fees for guaranteeing delivery of rail equipment on specific dates, or “certificates of transportation” payments, are not included. Also, in some instances contract rates can differ substantially from tariff rates, while in other instances there can be little if any difference between contract and tariff rates. Thus, the use of Waybill Sample tariff data and costs for the calculation of R/VC ratios can provide a misleading picture for some comparisons. Rates and R/VC ratios for movements of agricultural commodities can differ from State to State for numerous reasons, and can change significantly from year to year, as Figure 7-6 shows. While these anomalies can distort the R/VC calculations for some comparisons, the results presented in the rate analysis for this chapter are thought to be generally representative of rate trends over the period.

In Figure 7-7, GAO reports that the railroad industry revenue reported as miscellaneous income during 2005 increased tenfold from 2000, rising from \$141 million to over \$1.7 billion. This revenue includes some fuel surcharges, congestion fees, and revenue derived from railcar auctions. These revenue streams are in addition to rate increases.

Figure 7-7: Miscellaneous revenue in waybill sample, 2000-2005

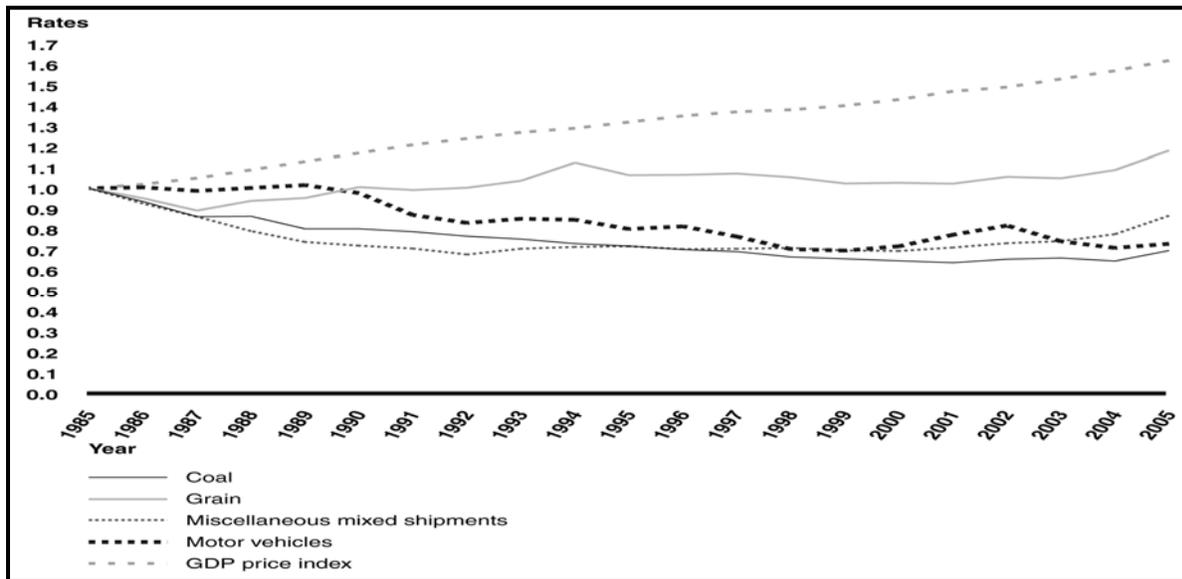


Source: GAO analysis of STB data

Agriculture Rates are Higher Than Those of Other Commodities

In an October 2006 study, the GAO found that “although rates have declined since 1985, they have not done so uniformly, and rates for some commodities are significantly higher than rates for others.”¹⁴⁹ (Figure 7-8). Specifically, GAO found that “grain rates declined from 1985 through 1987, but then diverged from the other commodity trends and increased, resulting in a net 9 percent increase by 2004.”¹⁵⁰ In 2005, rates for all commodities increased by 9 percent over 2004 rates, the largest annual increase in twenty years. Rail rates for grain increased 8.5 percent over 2004.¹⁵¹

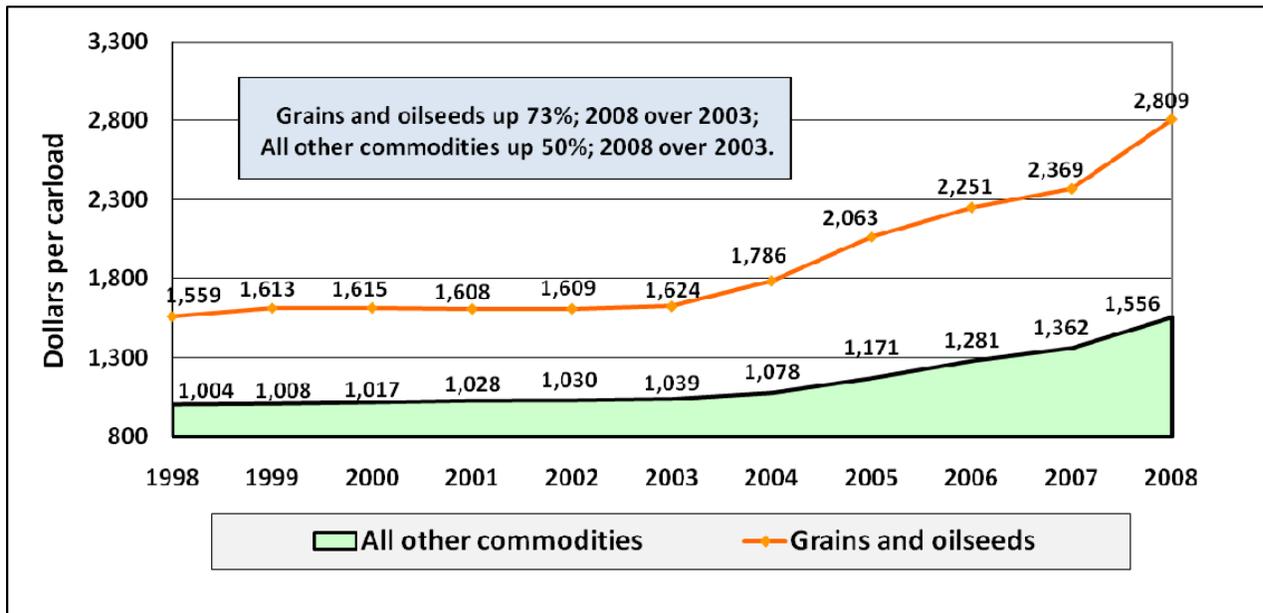
Figure 7-8: Rate changes for coal, grain, mixed shipments, and motor vehicles



Source: GAO analysis of STB data

According to the AAR Freight Commodity Statistics, agricultural rates not only are higher than those of other commodities, but also have increased more rapidly (see Figure 7-9). For instance, rail rates for grain and oilseeds increased to \$2,809 per carload in 2008, up 73 percent from 2003; rates for all other commodities increased to \$1,556 per carload, up 50 percent. In addition, grain and oilseed rates during 2008 were 81 percent higher than those paid by all other commodities, compared to 50 percent higher in 1997.

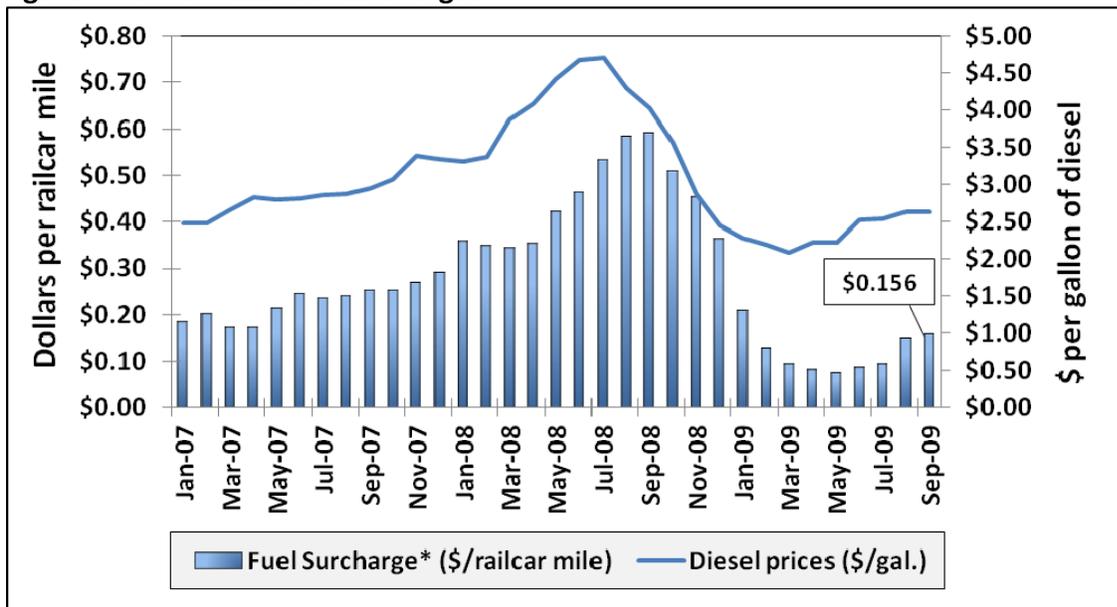
Figure 7-9: Average freight revenue per grains and oilseeds carload



Source: Association of American Railroads, Freight Commodity Statistics

Rail rates have increased rapidly since 2003 due to rail congestion and high fuel costs. Figure 7-10 shows that fuel surcharge rates have gone down, but these changes—both up and down—usually lag the price of fuel by two months.

Figure 7-10: Railroad fuel surcharges[†]



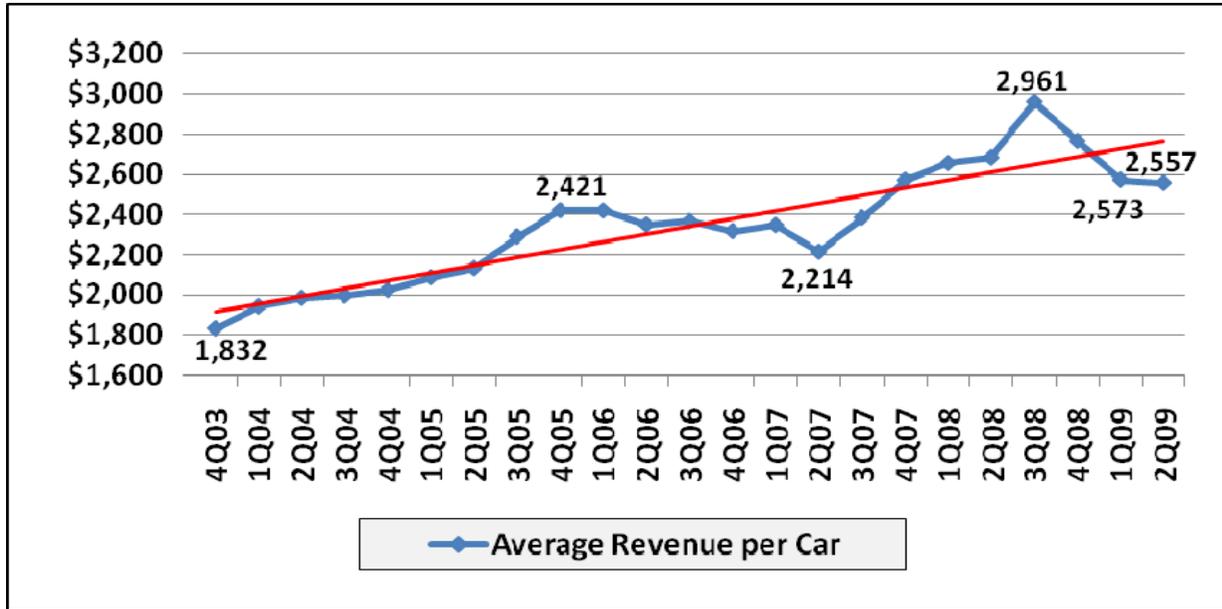
[†] Weighted by each Class I railroad's proportion of grain traffic for the prior year.

* Mileage-based fuel surcharges for March and April 2007 are estimated. Beginning January 2009, the Canadian Pacific fuel surcharge is computed by a monthly average of the bi-weekly fuel surcharge.

Sources: Data collected from the websites of the Class I railroads and <www.eia.doe.gov>

Although the recession has generated substantial unused rail capacity, rail tariff rates have increased slightly, even though fuel surcharge decreases have resulted in lower overall rail rates. Figure 7-11 shows that average revenues per carload of wheat have decreased from a high of \$2,961 during the third quarter of 2008 to \$2,573 during the first quarter of 2009, a decrease of \$388. However, based upon a 2004-06 average length of haul for wheat of 968 miles, fuel surcharges should have decreased the overall rail rate by \$412 for the same period. Thus the average tariff rates increased \$24 per carload during this period.

Figure 7-11: Average quarterly revenue per railcar for wheat

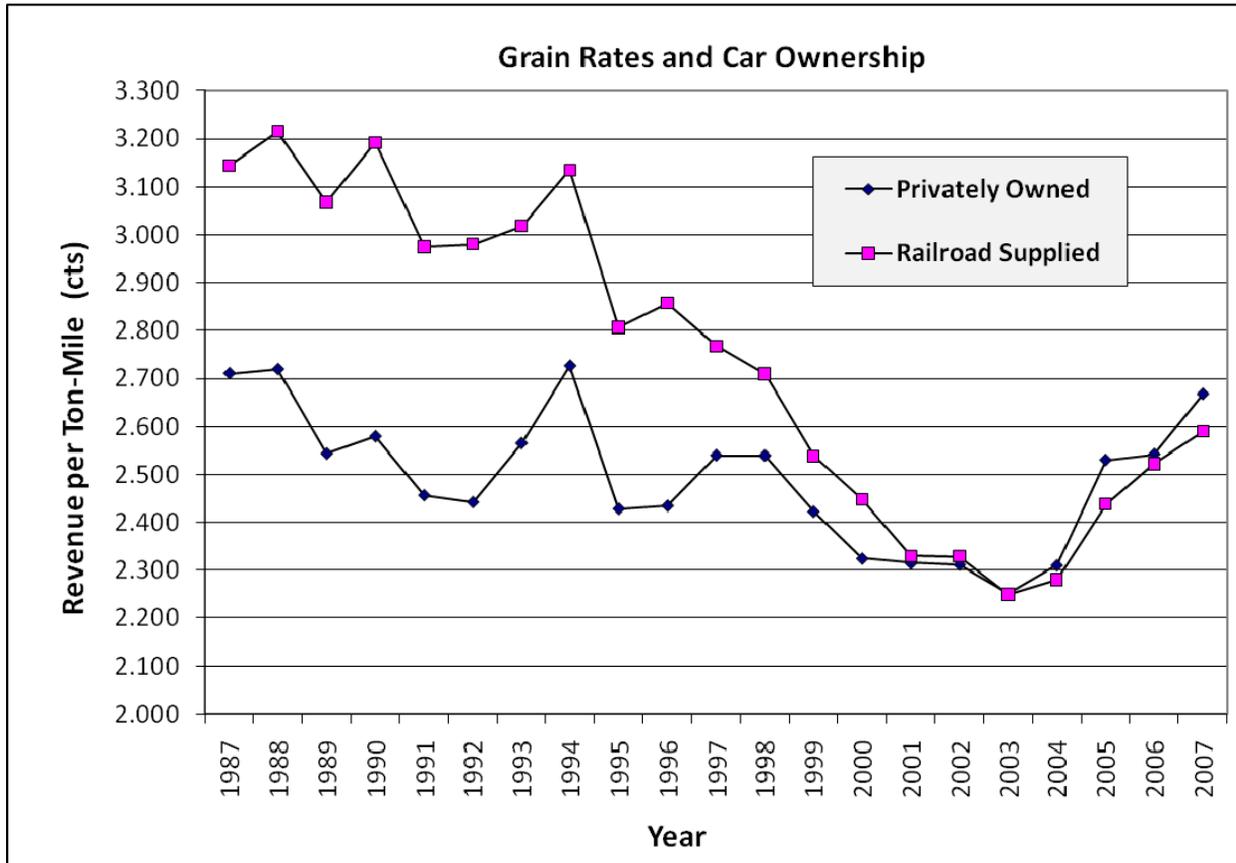


Source: STB, Quarterly Freight Commodity Statistics

Grain Rates and Railcar Ownership

An analysis of the Waybill sample shows the discount for shippers that provided their own railcars disappeared in 2003.¹⁵² Figure 7-12 shows that from 1987 through 1996, this discount was generally from 14 to 15 percent. In 1997, however, the rate differential declined to 8 percent, by 2001, it was only 1 percent and, since 2004, grain shipped in privately-owned railcars has paid a rate *premium* ranging from 0.8 percent to 3.8 percent. Normally, this situation could arise in times of low demand because railroads want to reward shippers for moving grain in railroad-owned cars, keeping their fleet busy and decreasing the use of shipper-provided cars. This time, however, it occurred during a period of high grain car demand.

Figure 7-12: Grain rates and car ownership



Source: Surface Transportation Board

It is important to recognize, however, that volume discounts paid later in the year, after the bill is paid, are not captured by the Waybill sample. In addition, privately-owned grain cars receive a per-diem fee for their use, which is based upon the time used and the miles traveled. This per-diem fee, however, may not be compensatory because it is set by the Class I railroads with no meaningful shipper input or negotiations.

Coal shippers supplying their own railcars, by comparison, have paid rates 35 to 40 percent less than coal shippers using railroad-supplied cars since 1987. Part of the differential in rates may reflect the fact that railcars owned by coal shippers are used almost exclusively in shuttle train service between one destination and one origin; shuttle trains move at lower rates. In addition, coal has different shipping characteristics than grain. Privately-owned grain cars, although used often in shuttle service between one origin and many destinations, also move smaller shipments, which have higher rail rates than shuttle movements.

Nevertheless, the loss of the rate discount on privately-owned grain cars may reflect the market power of railroads over grain shippers for the following reasons:

- Grain shippers and receivers are smaller and more numerous than coal shippers, and the tonnage of coal moved in 2007 was 5.5 times that of grain,¹⁵³ giving grain shippers much less market power than coal shippers.
- Grain cars are substantially less productive than coal cars. A typical grain hopper makes 12 to 15 round trips per year on single car movements, and up to 36 round trips per year for shuttle movements. A coal hopper shuttle may make 50 or more annual round trips.
- Coal shippers often use the costly Stand Alone Cost rate appeals procedures for large volumes shipped between one origin and one destination. Grain shippers, due to the dispersion of shippers and the multitude of origin-destination pairs, cannot cost-effectively use Stand Alone Cost procedures. Even after the STB modified the small-rate appeals procedures, no grain shipper has used the less costly rate appeals procedure because the benefits may not outweigh the costs.
- Coal shippers not only own nearly all the railcars they utilize but also often own the entire train set, including the locomotives.

Comparison of Rates by Shipment Size and Distance Shipped

The STB waybill sample allows specific analysis of grains and oilseeds, which is presented in detail in the following section. Figures showing the rates per ton-mile for grain products, food products, and fertilizers may be found in Appendix 7-1: Rail Revenues for Agricultural Products.

USDA did not have access to the unmasked confidential waybill data, which report the rail rates for contract movements as well as for tariff movements. Consequently, only tariff rail rates are analyzed in this section. In addition, samples with fewer than 30 observations are not included in the figures to increase the statistical reliability of the analysis.

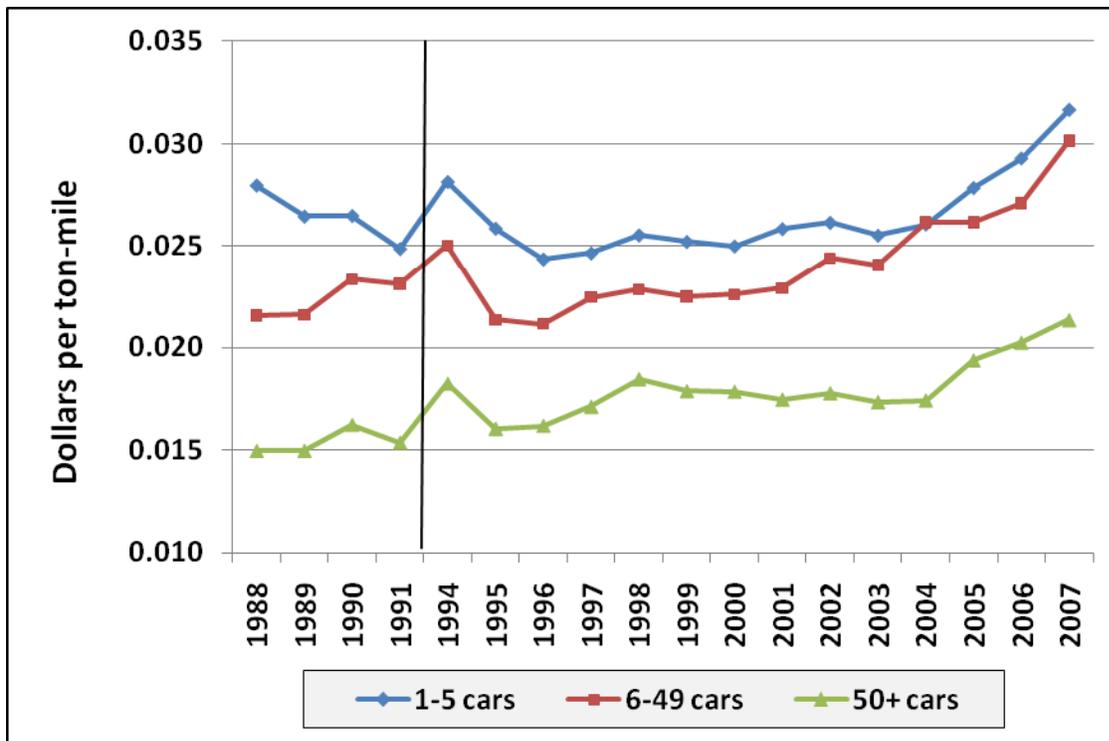
As discussed in other chapters of this report, shippers believe they have been called upon to provide railcars, assemble large movements, and incur costs that previously were borne by the railroads, with the effect that costs have been shifted from the rail carrier to the shipper. Also, the STB has noted that “grain shippers have also alleged that certain longer-haul shipments are charged a lower rate than shipments that move a shorter distance on the railroad.”¹⁵⁴ For that reason the following analysis examines shipment size and distance of haul in nominal rates to learn how these shipment characteristics cause differences among commodities.

Grain and Oilseeds

The rates for grain and oilseeds reflect a significant advantage for large trainload shipments. As can be seen in Figure 7-13, rates for all shipment sizes have risen steadily and rapidly since 2003. The rates for the smallest shipment size have increased 21 percent since 2003, compared to 25 and 23 percent, respectively, for 6–49 car and 50+ car shipments, keeping the relative relationships between shipment size categories about the same over the last 5 years analyzed. However, since 1988, the rates for the smallest shipment sizes have increased by only 13 percent, while the rates for 6–49 car shipments and 50+ car shipments have increased by 40 percent and 43 percent, respectively. This shows that the rates for larger sized shipments have increased relatively more than for smaller shipments over the entire period.

Rates for large shipments are nearly 2.1 cents per ton-mile, contrasted to about 3.0 cents for smaller movements. Rates for large shipments are about 1 cent—33 percent—lower than the smallest shipment size. In 1988, though, large shipments were 46 percent less than small shipments. The discount for medium-size shipments relative to small shipments has decreased substantially—from 23 percent in 1988 to only 5 percent in 2007.

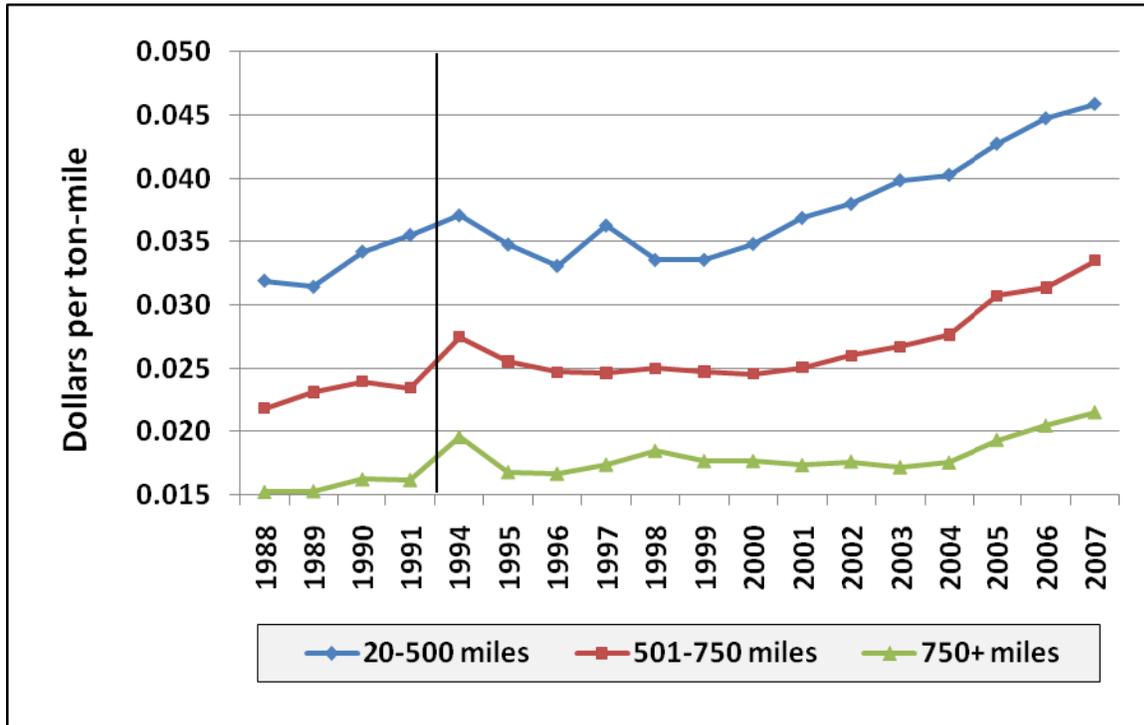
Figure 7-13: Grain and oilseeds tariff revenue (current \$) per ton-mile by shipment size



Source: Surface Transportation Board, Confidential Waybill Samples

A similar situation holds for shorter movements, whose rates are consistently about double the rates for movements over 751 miles in length—4.6 cents versus 2.15 cents per ton-mile in 2007. Rates for short hauls started increasing in 2000, but longer hauls didn't see sharp increases until the last four years (see Figure 7-14 below).

Figure 7-14: Grains and oilseeds revenue (current \$'s) per ton-mile by shipment distance



Source: Surface Transportation Board, Confidential Waybill Samples

General Agricultural Rates

This detailed examination of the grain and oilseeds commodity group shows the effect of distance on railroad rates. As railroads seek to increase the usage and revenue generation of their rolling stock, it is often in their best interest to give price/rate incentives to shippers with long hauls. Also, the cost disadvantages in equipment utilization make the short hauls more expensive for the carriers.

It is widely acknowledged that railroads have used trainload or multiple car rates to encourage shippers to consolidate shipments, thereby increasing the efficiency of the capital stock, power, and labor. The analyses above demonstrate that the longer the movement, the lower the rate charged by the railroads. However, the analysis does not consider the costs that have been shifted to the shipper so they could access these rates.

The same progression in rates identified in other studies is found in this analysis. Rates decreased until about 1998–2000, when they began to increase. The last four years have seen dramatic increases in rates for grains and oilseed.

Transfer of Railroad Costs to Shippers

Rail rates have decreased since deregulation in the early 1980's. Inflation-adjusted rates have decreased by slightly over 30 percent since 1985. However, a broad and consistent increase in rail rates over at least the last 4 years—and for some commodities the last 7 years—indicates the railroads have used rates to achieve profit levels previously unseen in the industry.

Moreover, the overall decrease in revenue per ton-mile for railroads does not reflect the actual impact on shippers. The logistical cost to shippers—and to the public—has increased over that time.

The Christensen study defined cost-shifting as additional costs incurred by shippers as a result of changes in railroad operations. Examples of cost-shifting identified in that study include:¹⁵⁵

- A shift in railcar ownership and its associated expenses, such as maintenance and insurance, from railroads to shippers or other private firms.
- Increased railcar maintenance standards being required by railroads as necessary to maintain service and capacity.
- Increases in and additions to accessorial charges, such as finance charges, “no bill” charges, charges for faxing versus electronic transmission, higher demurrage charges, private car storage charges, and car cleaning charges.
- Deterioration in railroad service, causing the increased use of shipper labor to monitor railroad performance or to unload railcars.
- The use of trucking to transport goods to distant terminals to access multiple-car rates.
- Increased highway congestion and maintenance because of the increased use of trucking.

The average rate per ton-mile has decreased because all shippers—and especially grain shippers—are assuming greater responsibility for car supply and other functions that railroads have traditionally provided. Many shippers, in times of short railcar supply, use guaranteed rail-ordering systems, paying fees in addition to tariff rates to guarantee car delivery within a specified time period rather than risking a delay in receiving railcars on a first-come-first-served basis.¹⁵⁶

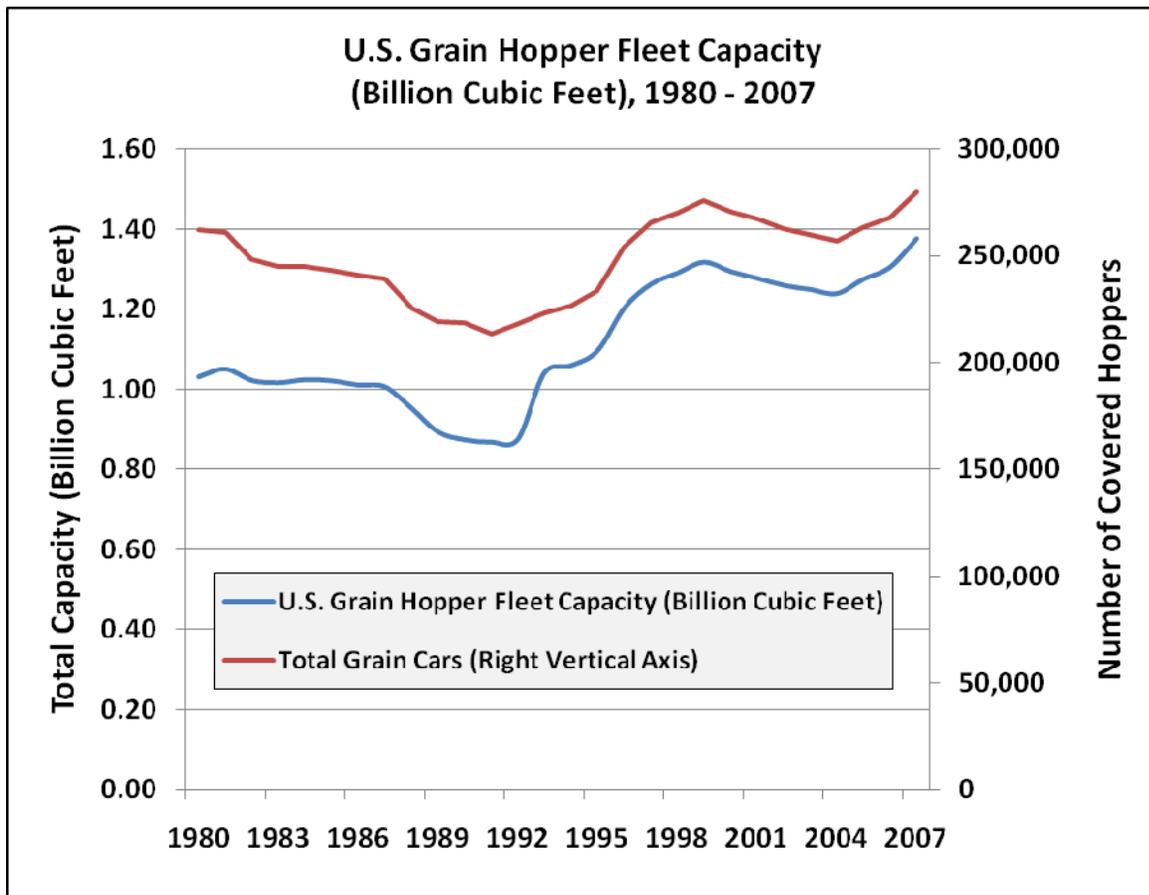
The attractiveness of unit and shuttle trains due to the railroad's rate structure has caused shippers to invest in sidings, inventory, storage capacity, and loading facilities to access these more cost-effective rail services. Shippers note that, after investing in equipment to handle 50–54-rail-car shipments, the railroads have changed some rate structures to emphasize 100–110-car shipments, requiring further investments.

The costs of railcar ownership have shifted from railroads to shippers, adding further to costs not reflected in tariff rates. Figure 7-15 below indicates the growth in overall grain hopper fleet capacity and in the number of cars. Both measures declined steadily until about 1992, then

increased until around 1999. From 1999 to 2005, the number of covered hopper cars for grain again decreased to 256,648 cars. The last two years in the figure show a 9 -percent increase in the number of covered hopper cars dedicated to the grain fleet.

For the entire covered hopper railcar fleet, the number of cars has increased from 377,055 in 2004 to 411,503 in 2007, an increase of 34,448 cars. The private sector contributed 37,870 new cars to this increase; the number of Class I railroad cars stayed about the same, with a net increase of 30 cars; and smaller railroads lost 3,452 cars.

Figure 7-15: U.S. grain hopper car fleet capacity



Source: AAR, Rail Transportation of Grain

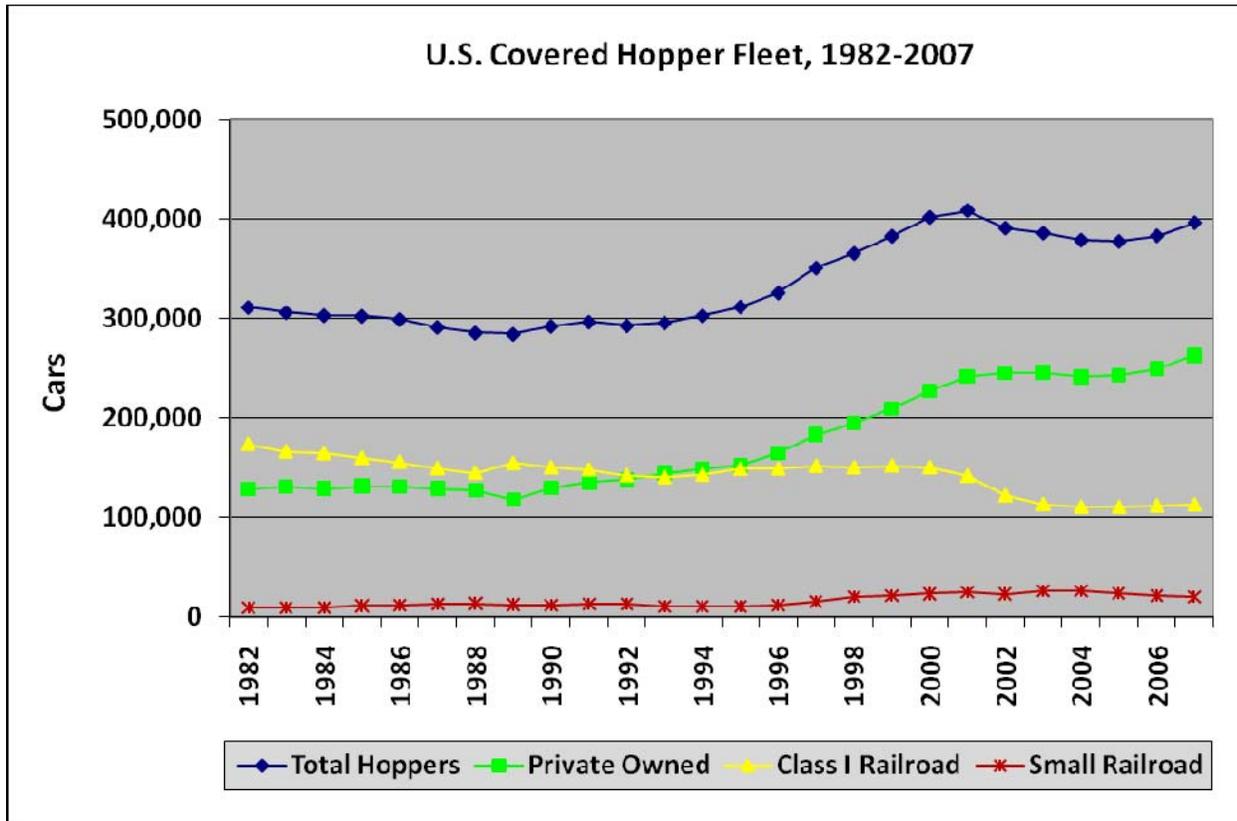
The ownership and investment in railcar capacity is a critical issue. As can be seen in Table 7-1 and Figure 7-16, private ownership has been the source, in a steady increase, of new covered hopper railcar capacity. In 1981, private ownership accounted for 41 percent of the total covered hopper cars, with the Class I railroads providing 56 percent and the smaller railroads contributing 3 percent of the capacity. By 2007, hopper car ownership was 68 percent private, 27 percent Class I railroad and 5 percent smaller railroads. Another way of looking at rail car ownership is to see that from 1981 to 2007 privately owned cars increased from 128,394 to 280,630, or 119 percent, as Class I railroads decreased their ownership by 36 percent. The costs of car ownership have been shifted to the shippers or their agents.

Table 7-1: U.S. covered hopper car fleet

Year	Total Covered Hoppers	Privately Owned	Class I Owned	Small Railroad Owned
1978	246,087			
1979	268,919			
1980	299,986			
1981	311,378	128,394	173,628	9,356
1982	306,222	130,736	166,150	9,336
1983	303,172	129,074	164,466	9,632
1984	302,522	131,421	159,686	11,415
1985	299,172	131,279	155,594	12,299
1986	291,489	129,187	149,407	12,895
1987	285,822	127,344	144,864	13,614
1988	284,566	117,659	154,514	12,393
1989	292,430	130,019	150,233	12,178
1990	296,635	135,454	148,072	13,109
1991	292,935	137,711	142,340	12,884
1992	295,728	144,850	140,403	10,475
1993	302,903	148,904	142,993	11,006
1994	311,910	152,223	148,611	11,076
1995	325,882	164,980	148,860	12,042
1996	350,611	183,143	151,583	15,885
1997	365,196	194,820	150,121	20,255
1998	382,316	208,990	151,879	21,447
1999	401,217	227,436	150,156	23,625
2000	408,106	241,343	141,636	25,127
2001	390,444	245,029	122,067	23,348
2002	385,461	245,804	113,157	26,500
2003	378,354	241,182	110,527	26,645
2004	377,055	242,760	110,330	23,965
2005	382,779	249,308	111,797	21,674
2006	395,843	262,879	112,773	20,191
2007	411,503	280,630	110,360	20,513

Source: AAR Railroad Equipment Report

Figure 7-16: U.S. covered hopper car fleet



Source: AAR, Railroad Equipment Report

Fuel Surcharges versus Fuel Prices

Rates per-ton-mile decreased from the time of deregulation until around 2002. Over the last four years, these rates have significantly increased. Recently, railroad fuel charges have added to the shipper's cost burden. These surcharges are designed to allow railroad firms to recover from shippers the impact on costs caused by abnormally high fuel prices. Basic fuel charges have always been included in rail rate determination but the recent spikes and variation in fuel prices caused railroads to search for ways of recapturing these costs in the near term.

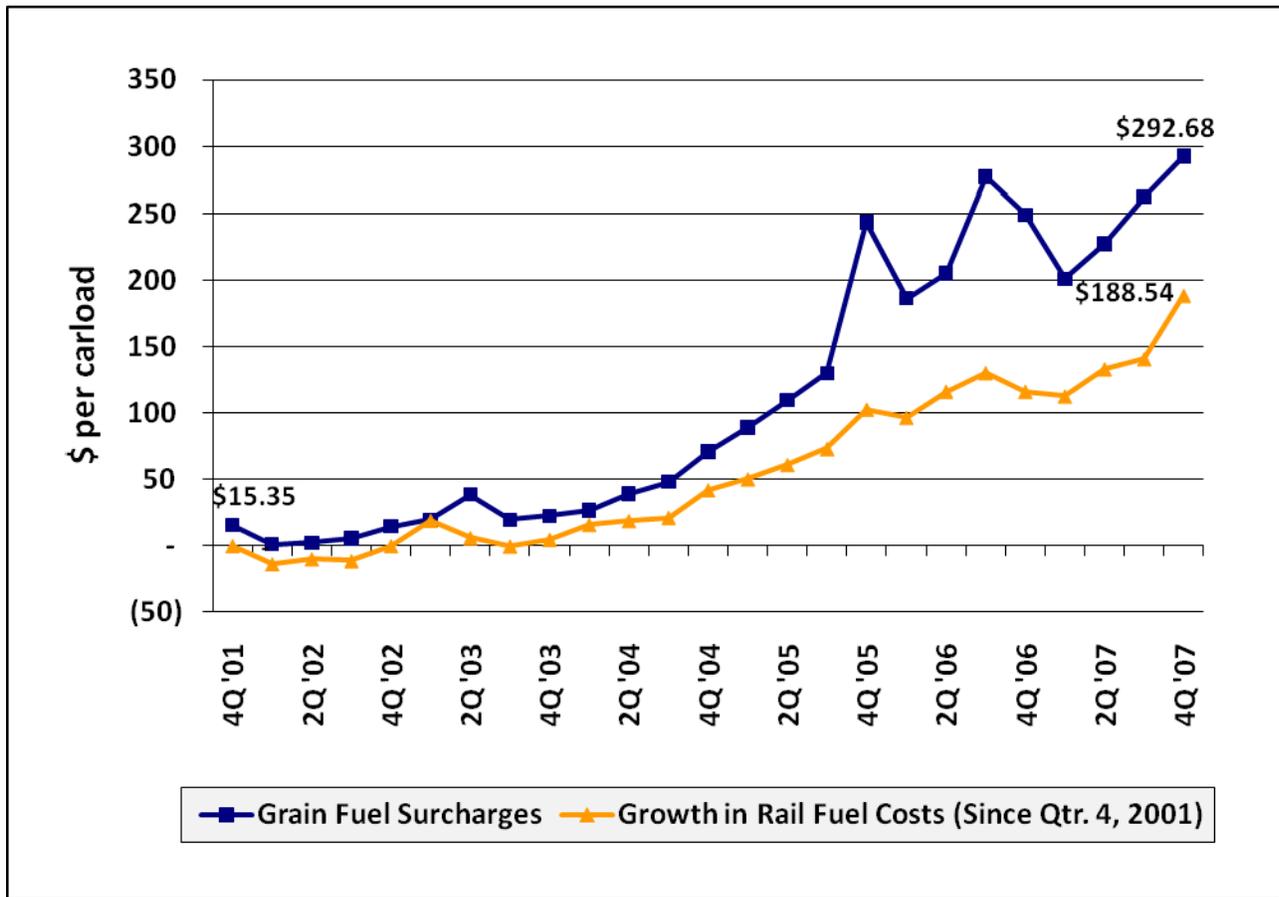
The fuel cost increases were first estimated as a percentage of tariff rates, but shippers felt any errors in estimation were on the side of the railroad carrier. As fuel prices and the attendant fuel surcharges were implemented, shippers felt that carriers were using these surcharges as profit centers, whether the fuel costs were going up or down. They also believed that rate-based fuel surcharges did not fairly apportion the additional cost of the fuel among shippers. Reports by financial analysts that railroad net income benefitted from fuel surcharges added to shipper concerns. Subsequent to a regulatory proceeding on rail fuel surcharges, the Surface Transportation Board (STB) on January 25, 2007, ruled that:

- Computing rail fuel surcharges as a percentage of a base rate is an unreasonable business practice because rail rates do not accurately reflect the additional cost of fuel used in individual movements. STB reasoned that a rate-based fuel surcharge would result in shippers who pay higher rail rates also paying higher fuel surcharges.
- The fact that a railroad may not be able to recover its increased fuel costs from some of its traffic does not provide a reasonable basis for shifting those costs onto other traffic.
- Railroads are prohibited from “double dipping”—charging a fuel surcharge in addition to increasing rates using an index that includes fuel costs as a component.
- Railroads operating in the United States had until April 26, 2007, to change their fuel surcharge programs to comply with the STB ruling.

When examining the performance of fuel surcharges in recovering fuel cost increases, wide differences among fuel surcharge rates cause concern about the accuracy of surcharge formulas. For instance, during September 2008, when surcharges peaked, they varied among railroads from 46.58 cents to 87 cents per car mile, a difference of nearly 87 percent. The weighted average surcharge was 59 cents per car mile or \$590 for a car moving 1,000 miles.

Shippers contend that fuel surcharges should reimburse railroads for only the incremental increase in fuel costs and not the base, since the base fuel costs are already in the rate. The average fuel surcharge per grain carload during the 4th quarter of 2007 was \$292.68, contrasted to the growth in railroad fuel costs from 2001 till 2007 of \$188.54, a difference of 55 percent over the incremental increase in the cost of fuel (see Figure 7-17). Figure 7-18 shows that the percentage by which grain fuel surcharges exceed the growth in railroad fuel costs since 2004 ranges from 55 percent to 137 percent.

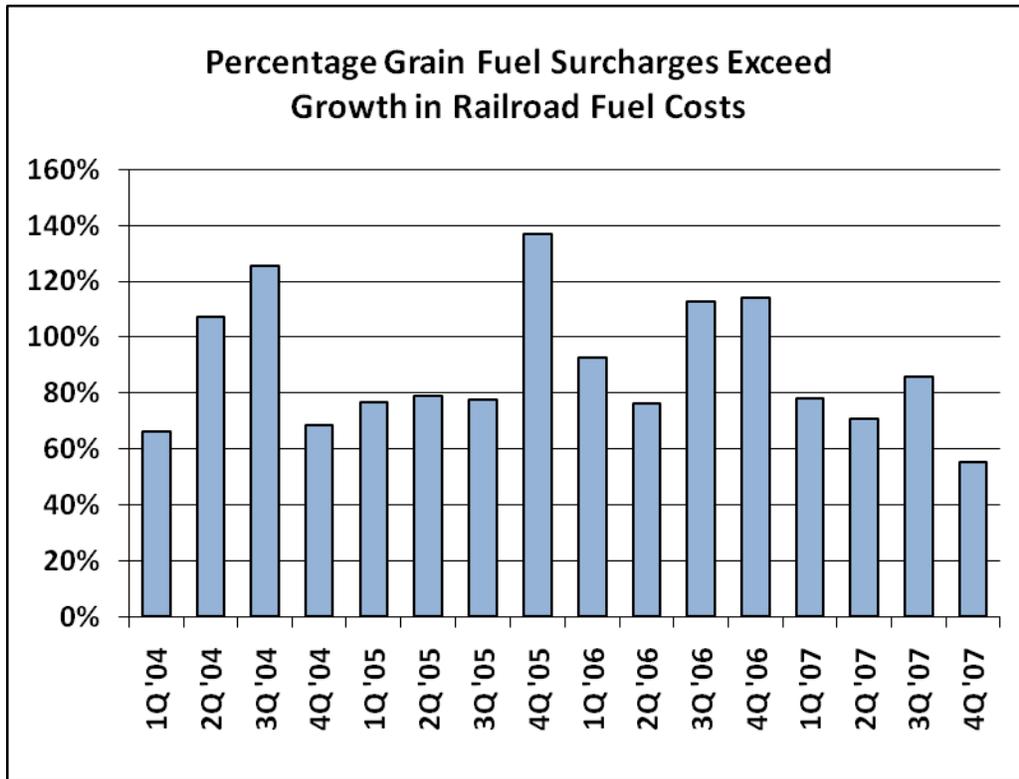
Figure 7-17: Railroad fuel surcharges for grain by quarter*



* For the 7 Class I railroads operating in the United States. Weighted average fuel surcharges per carload were estimated by multiplying the average length of haul for grain by the quarterly weighted average fuel surcharge per carload mile. Weighted average fuel surcharge per carload mile prior to 2Q '06 was estimated using mileage-based fuel surcharge formulas for individual railroads.

Source: Class I Railroad quarterly filings to the Security and Exchange Commission

Figure 7-18: Comparison of grain fuel surcharges to railroad fuel costs



Source: AMS

Railroad Revenue Adequacy

An evaluation of railroad rate reasonableness requires consideration of both the relative profitability and costs of railroads. Such an evaluation must also consider merger premiums and how they relate to STB revenue adequacy measures, and the revenue adequacy and profitability of Class I railroads over time.

Merger Premiums and STB Revenue Adequacy

The STB annually measures the revenue earned from the rate structure against the adequacy of that revenue stream to infuse capital into the industry. To determine the annual revenue adequacy, the carrier's return on net investment (ROI) is compared to the rail industry's after-tax cost of capital for that year. If ROI is greater than the cost of capital, revenue is determined to be adequate.

ROI is normally determined by dividing net income from railroad operations by the depreciated original cost, or book value, of the railroads' assets. This ROI is then compared with the railroad industry cost of capital. The STB seeks to ensure that a railroad has the capability to invest in its infrastructure and provide a reasonable return to its investors.

The costs to be included in determining the critical ROI have been examined in various proceedings and shipper testimonies. If the depreciated book value, or original cost, is increased, then calculated ROI decreases and revenue adequacy is negatively affected, allowing railroads to charge higher rates. Shippers and shipper representatives have become concerned about the premiums being paid to newly formed railroads when a merger is granted. The ICC/STB has been consistent in allowing such premiums, usually above the current stock or book price prior to the merger, to be included in the depreciated cost figure. Shippers have argued that railroads should not be allowed to pay acquisition premiums if these costs are then used to decrease the railroad firm ROI, which is used for revenue adequacy determination. This can result in the railroads being allowed to charge higher rates than would have been possible if the premiums had not been paid, resulting in economic impact and harm to the shippers.

The extent of these premiums is difficult to determine, but some information is available. As Tables 7-2, 7-3, and 7-4 below indicate, merger detail shows several recent significant premiums paid by the merging railroads. These estimated premiums range from \$1.4 billion for the UP purchase of CNW in 1996 to \$2.7 billion for the ATSF/BN merger in 1995 and \$3.7 billion for UP's purchase of SP in 1996. Consultants estimate that the premium paid for Conrail by NS and CSX was about \$6.9 billion.

Table 7-2: Merger of Atchison, Topeka & Santa Fe with Burlington Northern

ATSF/BN Merger (implemented Sept. 22, 1995)				
Balance sheet values December 31, 1994 (million \$)				
	ATSF	BN	As % of Both Assets	As % of Both Net Equities
Net Asset Values	5,742.40	7,088.20		
Net Equity	2,544.10	2,953.00		
Premium added to URCS*		4,393.70		
Less: Deferred Taxes		1,665.00		
Net Premium included in URCS		2,728.70	21.30%	49.60%

Source: Personal communication, Tom Crowley, L.E. Peabody & Co.

* URCS stands for Uniform Rail Costing System, which is a STB accounting method.

Table 7-3: Union Pacific purchase of Southern Pacific

UP Purchase of SP (implemented 12/31/1996)						
Balance sheet values December 31, 1996 (million \$)						
	SP	UP	As % of SP Assets	As % of SP Net Equity	As % of Both Assets	As % of Both Net Equities
Net Asset Values	6,255.90	16,949.50				
Net Equity	2,247.10	5,622.70				
Premium added to URCS*				4,404.10		
Less: Deferred Taxes				751.2		
Net Premium included in URCS			58.40%	162.60%	15.70%	46.40%

Source: Personal communication, Tom Crowley, L.E. Peabody & Co.

Table 7-4: Union Pacific Purchase of Chicago Northwestern (CNW)

UP Purchase of CNW (implemented 4/27/1995)						
Balance sheet values December 31, 1994						
	CNW	UP	As % of CNW Assets	As % of CNW Net Equity	As % of Both Assets	As % of Both Net Equities
Net Asset Values	1,848.70	10,907.80				
Net Equity	187.7	4,995.70				
Premium added to URCS*				2118.4		
Less: Deferred Taxes				695.3		
Net Premium included in URCS			77.00%	758.20%	11.20%	27.50%

Source: Personal communication, Tom Crowley, L.E. Peabody & Co.

Other estimates also have been generated, but the relevant point is that these premiums, if added to the book value of the merger, affect the ROI value used for revenue adequacy purposes.

The railroad industry and the STB are the only industry and regulator that use book value for determining ROI and add merger premiums into the rate base. For example, the Federal Energy Regulatory Commission will not allow regulated entities to pass through to the customer acquisition or merger premiums unless the effect of the transaction has a net benefit (typically, a rate reduction) to the customers of the acquired entity. If it does permit the pass-through, it does so because the overall impact of its approval is to protect the customers, who had nothing

to do with choosing to pay a premium or determining its amount, from being required to pay higher rates because of the premium. The net result is that this approach discourages the payment of large premiums because they are not likely to be permitted to be passed through to customers.

The net effect of merger premiums, which increase both variable and fixed costs of the railroads, is that some rates that would have been above 180 percent of variable costs might no longer meet that criterion and would no longer be subject to STB regulation.

A contrasting opinion on the ROI calculation is offered by the railroad industry and the AAR. The railroads, through the AAR, have argued that the ROI calculation should be based not on depreciated value but on the replacement cost of the rail assets used to provide transportation. This would, of course, have the effect of decreasing ROI.

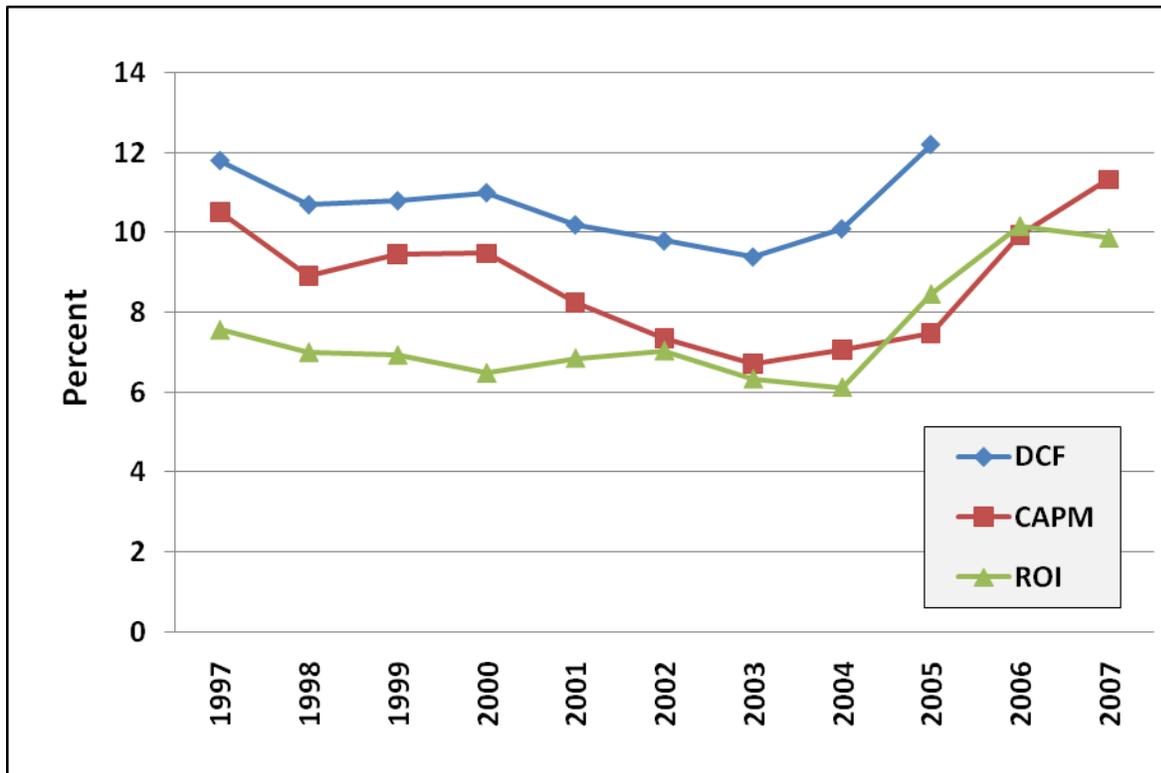
STB Measures of Rail Revenue Adequacy

Class I railroad revenue adequacy is determined by comparing the ROI to the cost of capital. The STB determines the cost of capital for each year and determines which Class I railroads are revenue adequate. STB used a simple discounted cash flow (DCF) method to determine the industry's weighted average cost of capital through 2005. After shippers requested public hearings to examine the methodology, STB then changed to a capital asset pricing model (CAPM) for the years 2006 and 2007. After another public hearing, STB decided to use a simple average of CAPM and a multi-stage discounted cash flow model (MSDCF) in 2008.

Since the Staggers Act, the ROI for the railroad industry has increased from an average of 2.5 percent during the 1970s to an average of 10 percent during 2006 and 2007.

Based upon the CAPM methodology, Figure 7-19 shows that the Class I railroads have been revenue adequate during 2005 and 2006 and nearly revenue adequate for the other years since 2002. In contrast, the Christensen study, which used return on equity, found that the Class I railroads could be considered revenue adequate since 2001.

Figure 7-19: Class I railroad cost of capital and return on net investment, 1997-2007



Source: AAR, Railroad Facts; Surface Transportation Board

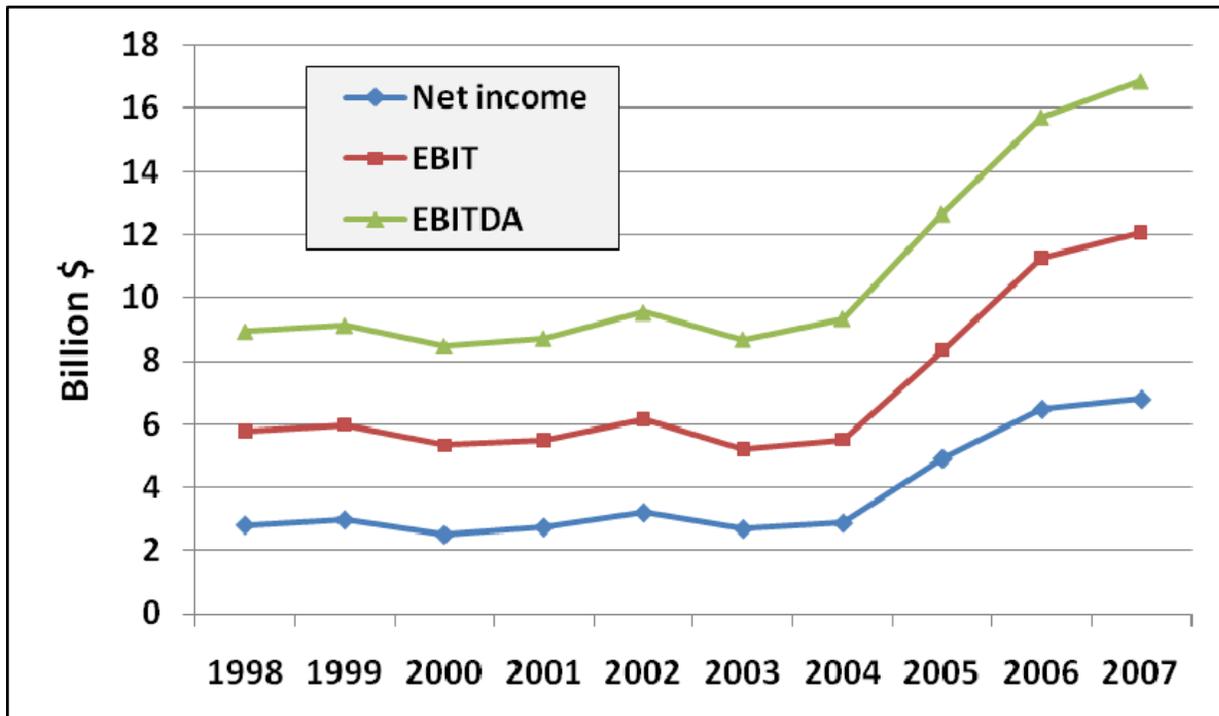
Financial Measures of Railroad Profitability

Whether measured by commonly used financial measures or by STB-determined revenue adequacy standards, the profitability of the railroad industry has improved considerably since deregulation. The Christensen study used various measures of profitability to compare the railroad industry with other industries and with the Standard & Poor's 500. Since 2004, railroad profitability was found to be comparable to that of most other industries.¹⁵⁷

The rapid increase in rail rates since 2004 contributed to the surge in railroad profitability at that time. The increase in rail rates is the result of aggressive pricing as rail capacity constraints appeared, and the over-recovery of fuel costs. The higher rail rates also reflect higher rail costs since 2004 (Figure 7-20).

Railroad financial measures of profitability increased at a moderate rate through 2004, and then surged from 2005 through 2007. Net profit, earnings before interest and taxes (EBIT), and earnings before interest, taxes, depreciation, and amortization (EBITDA) are commonly used financial measures of profitability. Net profit, EBIT, and EBITDA changed 2, -5, and 5 percent, respectively, over the 6-year period from 1998 to 2004. Over the 3-year period from 2004 to 2007, net profit, EBIT, and EBITDA increased 137, 119, and 81 percent, respectively.

Figure 7-20: Class I railroad profitability, 1998-2007



Source: AAR, Analysis of Class I Railroads

Factors Affecting Railroad Industry Costs

Several factors affecting railroad costs are often overlooked when analyzing those costs. Railroad management decisions affect some of these factors, which include merger premiums, size of operation, traffic density, amount invested in capacity, and successful integration of operations during mergers. Other factors, such as unusually high fuel costs and extreme weather events, are factors that railroad management are unable to control.

As discussed in an earlier section, merger premiums can add substantially to the average fixed and variable costs* of the new railroad firm. The effects of these mergers—including increased costs due to merger implementation difficulties—are visible in Figure 7-21, showing average railroad industry costs. Variable costs for the railroad industry increased from 1997 through 2000 and fixed costs increased from 1995 through 1997.

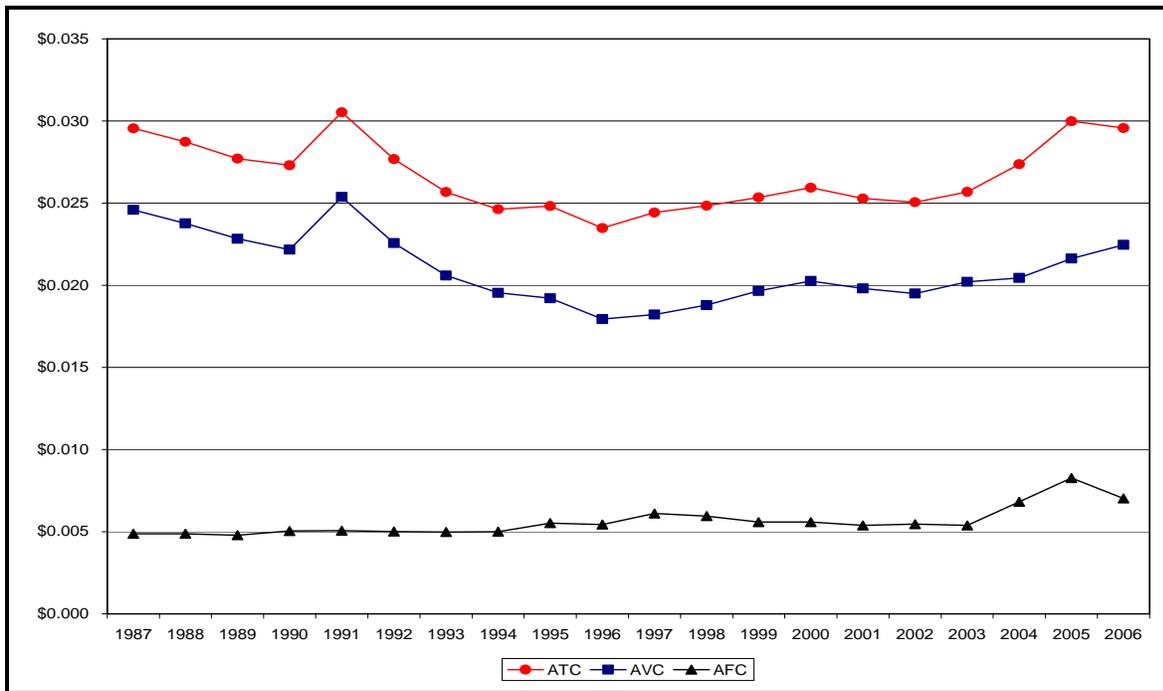
* Merger premiums add to variable costs when the premiums are paid on assets included in the calculation of variable costs.

Variable and total costs for the merged railroads increased after each of these major rail mergers or acquisitions:

- The merger of the Atcheson, Topeka, & Santa Fe with the Burlington Northern (September 1995)
- The Union Pacific with the Southern Pacific (implemented December 1996)
- The split of Conrail between CSXT and Norfolk Southern (June 1999)

In each of these mergers the railroads had difficulties merging operating systems and lines, resulting in congestion that drove up average total and variable costs for the merging railroads.

Figure 7-21: Railroad industry average cost, variable cost, and fixed cost in dollars per ton-mile (adjusted for inflation in 2000 dollars)¹⁵⁸



Source: Laurits Christensen Associates

A recent study of railroad cost curves concluded that four of the Class I railroads—BNSF, CSXT, NS, and UP—may have surpassed the optimal size of operation and may be experiencing diseconomies of scale.¹⁵⁹ This means that the average costs for those railroads are higher than they would be if the firms were smaller. Based upon 2005 data, the optimal size of a railroad was estimated to be slightly less than 21,000 route miles. BNSF and UP operate more than 32,000 route miles, while CSXT and NS operate more than 21,000 route miles. The three smaller Class I railroads, Kansas City Southern, Canadian National, and Canadian Pacific, all appear to be operating with constant or increasing returns to scale.

Excess traffic density on the railroad also affects railroad average costs by slowing train speeds and increasing terminal dwell times. The slower train speeds and reduced terminal efficiency further reduce the effective capacity of the railroad, compounding the problem. When a railroad has excess capacity, fixed costs are higher than necessary. As railroads near capacity and capacity constraints appear, variable costs increase. The effects of railroad capacity constraints—beginning in 2005—are also visible in the above figure, which shows average railroad industry costs.

Another factor affecting average railroad fixed and variable costs is the amount the railroad industry invests in rail capacity. From 2004 through 2006, the railroad industry invested heavily in capacity, which is shown in the average cost data in Figure 7-22 as increased fixed costs for the industry after 2004. As capacity bottlenecks are removed, however, variable costs should be reduced by these investments.

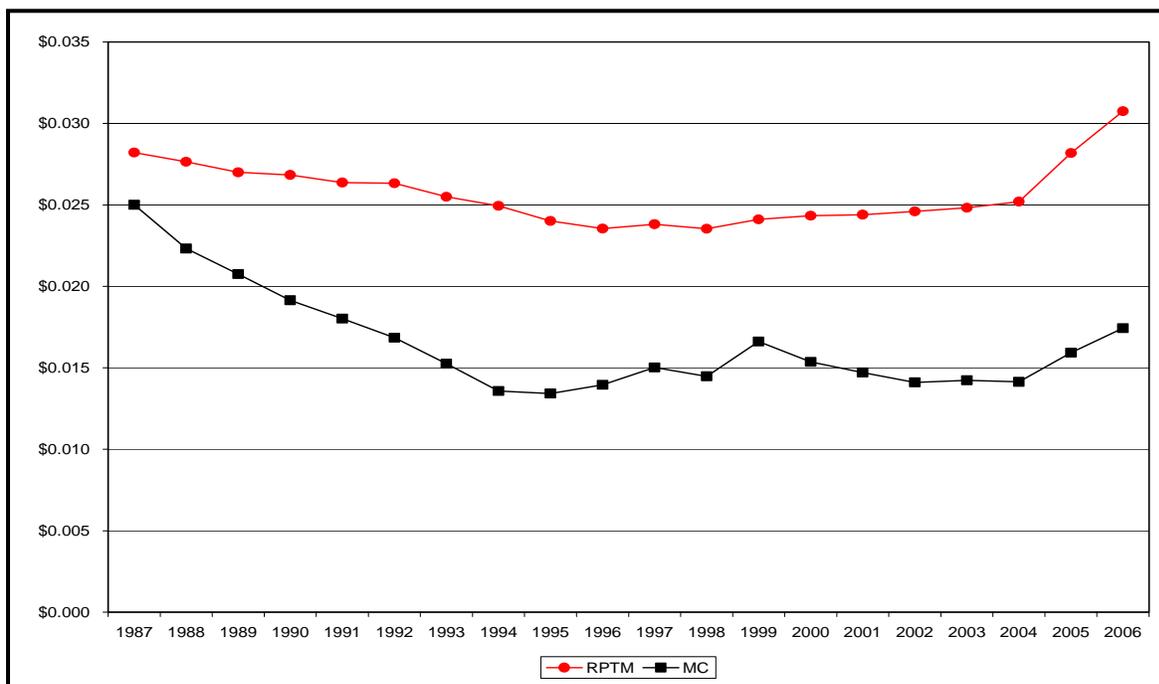
Unusually high fuel costs occurred from 2004, peaking in September of 2008. Fuel is a major component of railroad costs, so high fuel costs result in increased operating costs. This can be seen in the figure above, where high fuel costs and capacity constraints resulted in rapidly increasing variable costs in 2005 and 2006.

Extreme weather events can also increase railroad industry costs by adding the costs of repair and rerouting traffic. For instance, Hurricanes Katrina and Rita resulted in substantial damage to the rail network in Louisiana and Mississippi. Damages to the CSX coastal line, which had the most damage, required nearly \$250 million to repair. Likewise, a massive mudslide on the UP line between Klamath Falls and Eugene, OR, swept track, ties, and ballast halfway down the mountain and buried over 3,000 feet of mainline track in 20 feet of mud, snow, and downed trees.

Railroad Industry Revenue Compared to Marginal Costs

Railroad industry revenue per ton-mile decreased slowly through 1996, rose slowly through 2004, and then increased rapidly in 2005 and 2006. Marginal costs (i.e., the addition to total cost attributable to the addition of one ton-mile) rapidly increased in 2005 and 2006, probably due to rail congestion as capacity constraints in the rail network and higher fuel costs drove marginal costs up (see Figure 7-22). Average revenue increased more rapidly than marginal costs in 2005 and 2006, indicating aggressive pricing due to capacity constraints and over recovery of fuel costs.

Figure 7-22: Railroad industry average revenue and marginal costs



Source: Laurits Christensen Associates

Bottleneck Rates and Rules

When the railroad industry was deregulated by the Staggers Rail Act it was expected that competitive markets would serve as the effective alternative to rate and route regulations. The rate structure was to generate enough return so railroads could improve and invest in infrastructure, thereby providing capacity to meet the demands of shippers. Expectations that some captive shippers would exist were inherent in that regulatory change. The regulatory power of the ICC/STB was designed to examine and evaluate such rates under a fairness criterion, having jurisdiction only on those rates having an R/VC ratio above 180 percent.

Railroads prefer long hauls that generate high traffic densities because they increase revenue. The effort to increase long hauls on their own lines has generated one of the more controversial rate issues—bottleneck rates.

Bottleneck rates, in contrast to physical bottlenecks that result in congestion and delays, occur because of an STB ruling that restricts the ability of a shipper or receiver served by only one railroad to use that rail line serving its plant or warehouse to reach competitive services offered by other railroads.¹⁶⁰ The GAO states, “Some shippers have more than one railroad serving 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.”¹⁶¹ This portion is referred to as the “bottleneck segment” and the rate for the bottleneck portion is referred to as the “bottleneck rate.”

The STB interpreted the statute and case law as not requiring railroads to quote bottleneck rates except where the non-bottleneck railroad has provided the shipper a contract for its portion of the movement. Since the legality of bottleneck practices has been upheld by the courts, the STB has consistently ruled that a railroad cannot be compelled to participate in a routing that runs contrary to its long-haul preference unless the shipper first obtains a contract over the alternative route from the non-bottleneck railroad. Nelson points out that the STB's interpretation makes no mention of various provisions that explicitly permit the STB to shorten a carrier's length of haul to promote efficiency or if it is in the public interest to do so.¹⁶² Shippers seldom attempt to utilize competitive access procedures to mitigate routing inefficiencies resulting from the bottleneck rule, and have not been successful when they do.

This rule has grown more important as rail carriers have increased their length of haul, used mergers and abandonments to decrease the number of competitive railroads, and as rail traffic has increased.¹⁶³ Bottlenecks result in the loss of competition, hence an increase in rates and decrease in service. Economic efficiency also may be decreased because longer routes may be used and more fuel consumed.

Since the 1996 bottleneck decision, discussion has focused on differential pricing, protection for captive shippers, and the financial health of the railroads.¹⁶⁴ Nelson further found that "the bottleneck rule fosters conduct that is supportive of the perceived short-term economic self-interests of individual railroads, but is inconsistent with economic efficiency and the public interest. The conduct is detrimental to captive and competitive shippers as well as to the longer-term interests of railroads." An estimated efficiency loss of at least \$1.3 billion is suggested in that study, with an extra consumption of over 103 million gallons of fuel per year, along with the associated carbon emissions, and the impacts on environmental, national energy policy, and security issues.

Most of the examinations of the effects of these rates have dealt with coal, but agricultural traffic also is affected. Coal movements from the Powder River Basin were examined by Nelson to show the effects of bottleneck constraints on efficiency, shipper transportation bills, and market share.¹⁶⁵ Other estimates note that Dairyland Electric cooperative experienced a 13 percent shortfall of scheduled shipments and a rate increase of 23 percent the following year, resulting in a \$3 million annual increase in costs for one shipper.¹⁶⁶

Agricultural grain shippers note that the bottleneck rule affects competition and creates inefficiencies in these cases:

- BNSF, UP, and KCS all have routes leading to Mexico. BNSF and UP will not allow cars to be switched to the KCS at Kansas City, even though KCS's rates from Kansas City are competitive.
- No switch-offs are allowed between BNSF and UP for grain going to the West Coast.
- Short line railroads are kept from serving customers who have expressed interest in being served.
- Some shippers have indicated that quoted rates are so high they force traffic back onto the road.
- Also, because coal movements are not allowed efficient routing, captive grain shippers also will be denied the efficient routing that would reduce transport costs.

Relief from this monopoly power would occur if a rule was instituted requiring a railroad to establish a rate providing service between any two points on the railroad's system where traffic originates, terminates, or can be interchanged. Such a rule would give shippers access to a second railroad, even if a single railroad was the only railroad at its origin and/or destination points. Such competition could lead to greater efficiencies and lower rates.

The AAR maintains that forcing rates on bottleneck segments would cause the total rate for through movements to be below the costs of operation on that movement. This could, according to the AAR, lead to a net revenue loss of several billion dollars a year.

Conclusions

Captive shippers have carried a large part of railroad fixed and common costs since railroads were deregulated, and expected their rates to drop as railroads gained economically stability, but that has not happened. Because individual farmers cannot raise the prices of their commodities to reflect rising costs, any increase in costs reduces their profit. High rail rates damage the economic health of the farming sector and rural communities, and also make it more difficult for America to compete in export markets.

Not only are rail rates for agricultural products higher than those for other commodities, but the rates have increased more rapidly from 2004 to 2007.

Railroad rate structures favor large movements. There is a significant rate advantage for the largest trainload shipments of grain and oilseeds. Rates are 30 percent lower for shipments of more than 50 cars. Rates for long hauls have a similar structure; movements less than 500 miles are about twice the rates for movements over 751 miles.

Shippers bear increasing responsibility for car supply and other functions historically provided by the railroads. Car ownership by Class I railroads has decreased from 56 percent in 1981 to 27 percent in 2007.

Rail rates have increased rapidly since 2004 resulting in a surge of railroad profitability. The increase reflects not only increased rail costs, but aggressive pricing and over-recovery of fuel costs. Fuel surcharges seemingly should reimburse railroads for the increase in fuel costs, not be sources of additional revenue. Fuel surcharges per grain carload in 2007 were 55 percent higher than the incremental increase in the cost of fuel.

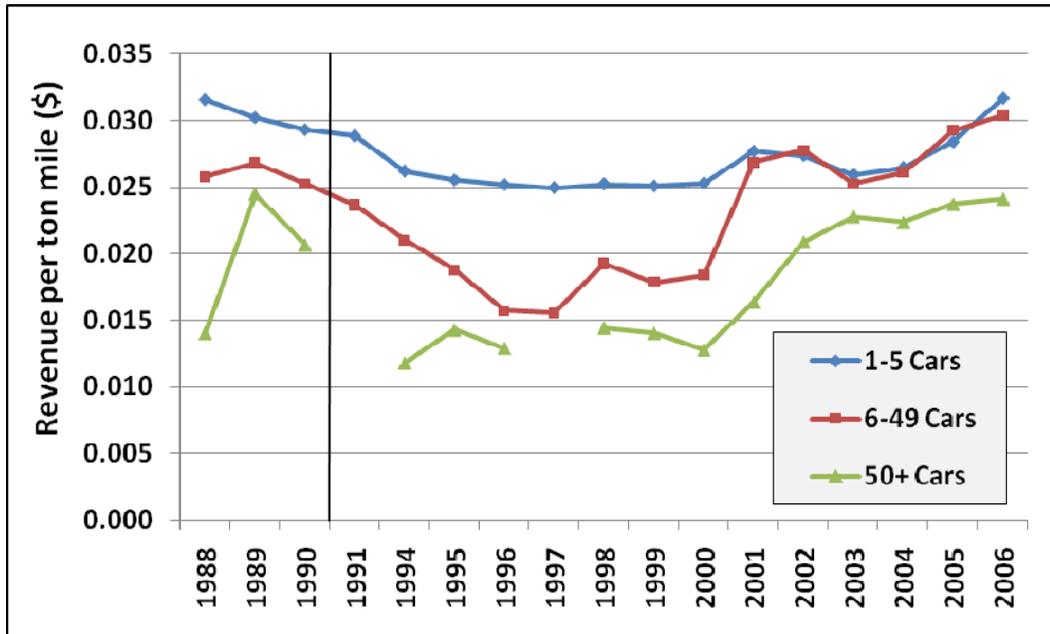
Billions of dollars in premiums paid as part of mergers are included in the determination of railroad revenue adequacy, resulting in higher rail rates for shippers than otherwise would be the case.

Bottleneck rates place an artificial limit on options open to shippers, increasing the number of captive shippers and increasing railroads' monopoly power. Economic efficiency is sacrificed, shipper costs are increased and fuel consumption is increased under bottleneck situations. Mandating that rates for bottleneck segments be provided and subjecting them to appeal would make the market more competitive.

However, despite the cost increases and shifting of costs to shippers, the rail share of grain and oilseed exports has risen over the last 2 decades.

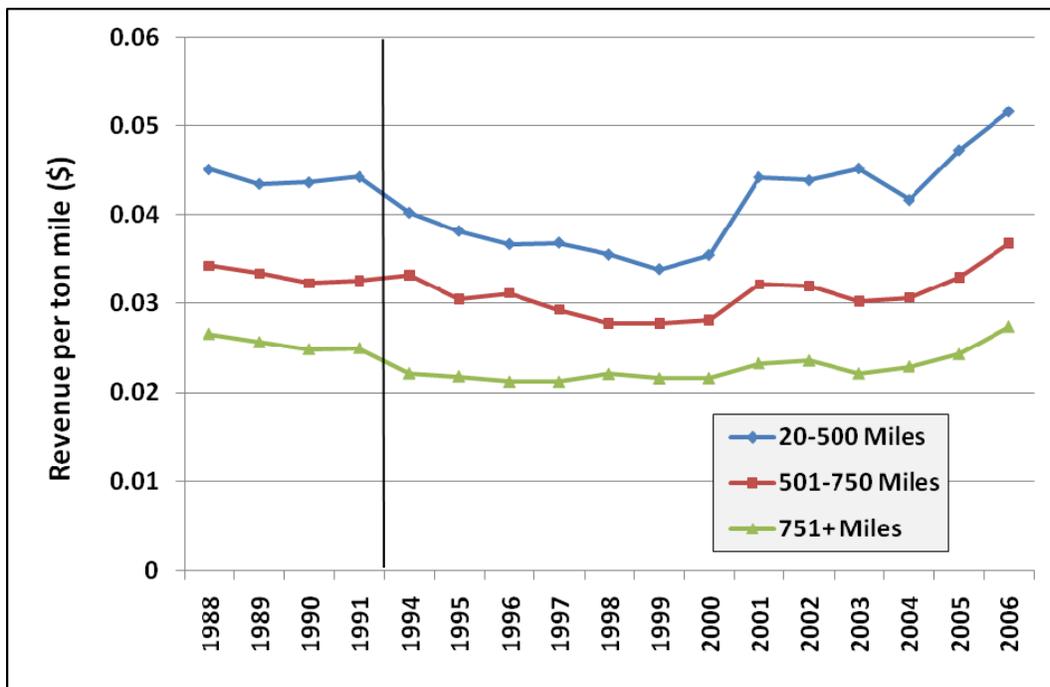
Appendix 7-1: Rail Revenues for Agricultural Products

Figure 7-23: Grain products revenue (current \$) per ton-mile by shipment size



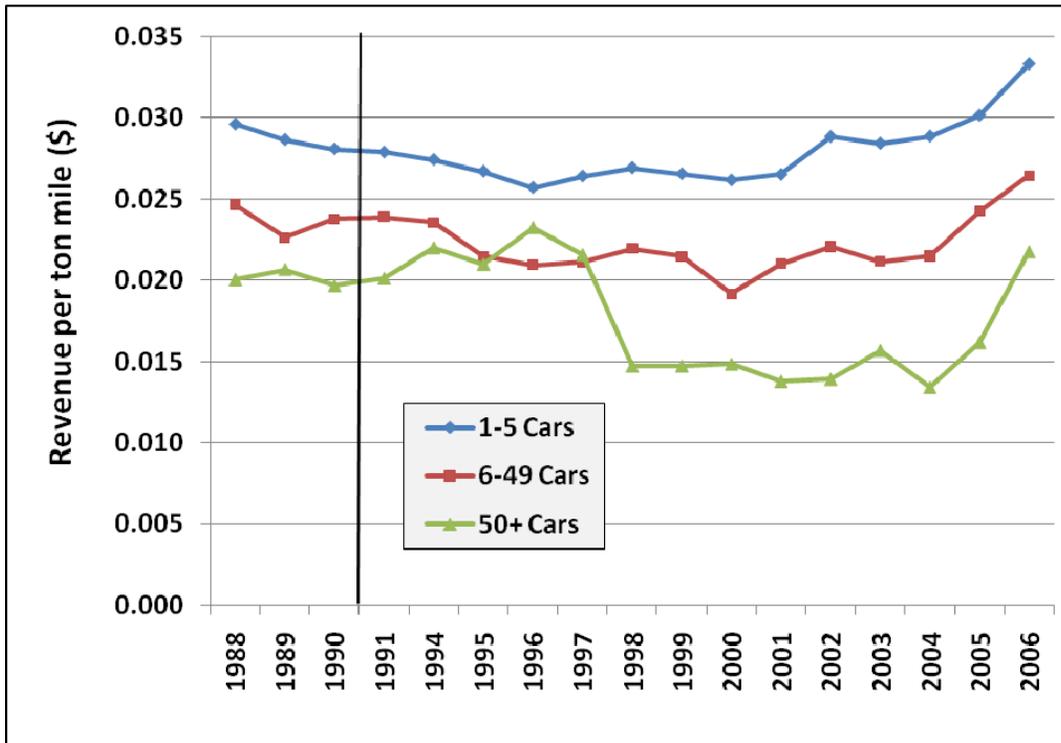
Source: Surface Transportation Board, Confidential Waybill Samples

Figure 7-24: Grain products revenue (current \$) per ton-mile by shipment distance



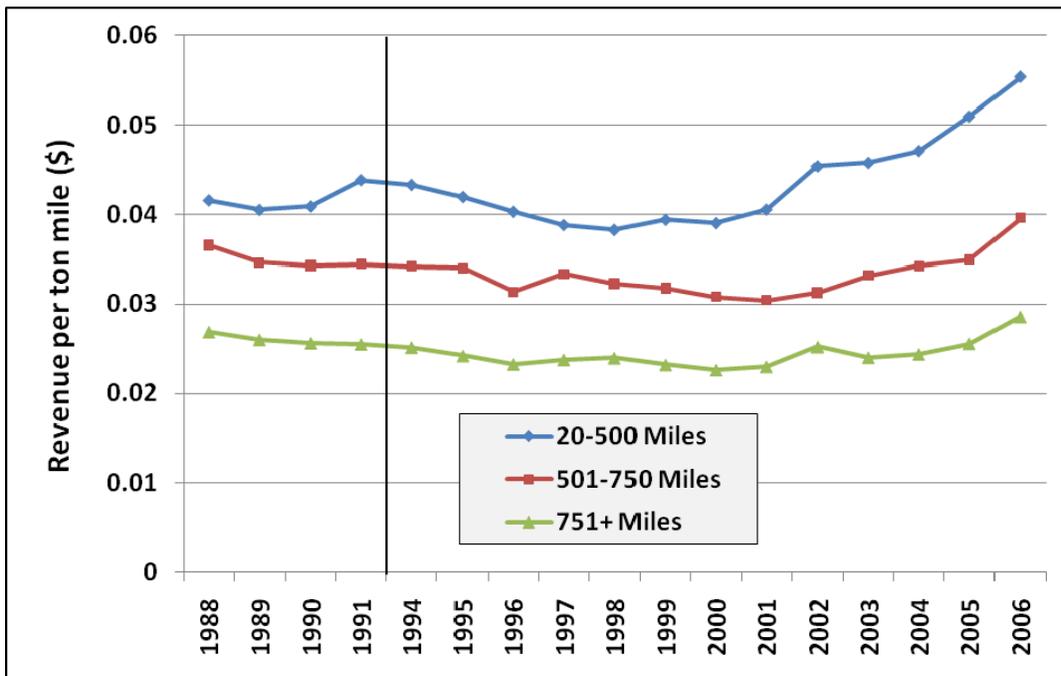
Source: Surface Transportation Board, Confidential Waybill Samples

Figure 7-25: Food products revenue (current \$) per ton-mile by shipment size



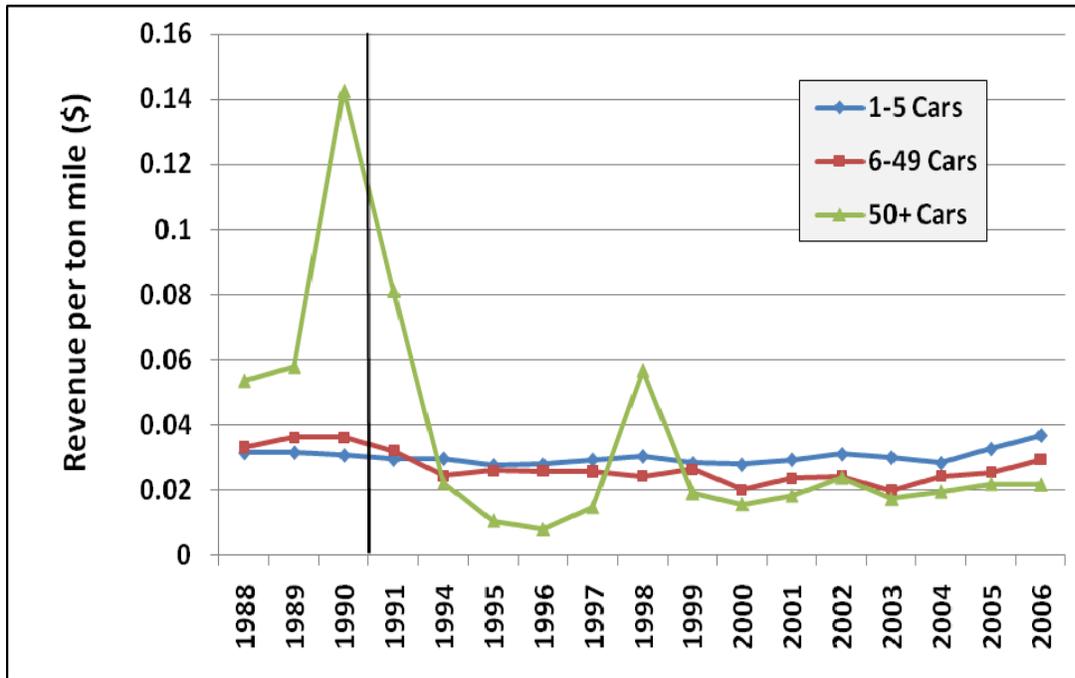
Source: Surface Transportation Board, Confidential Waybill Samples

Figure 7-26: Food products revenue (current \$) per ton-mile by shipment distance



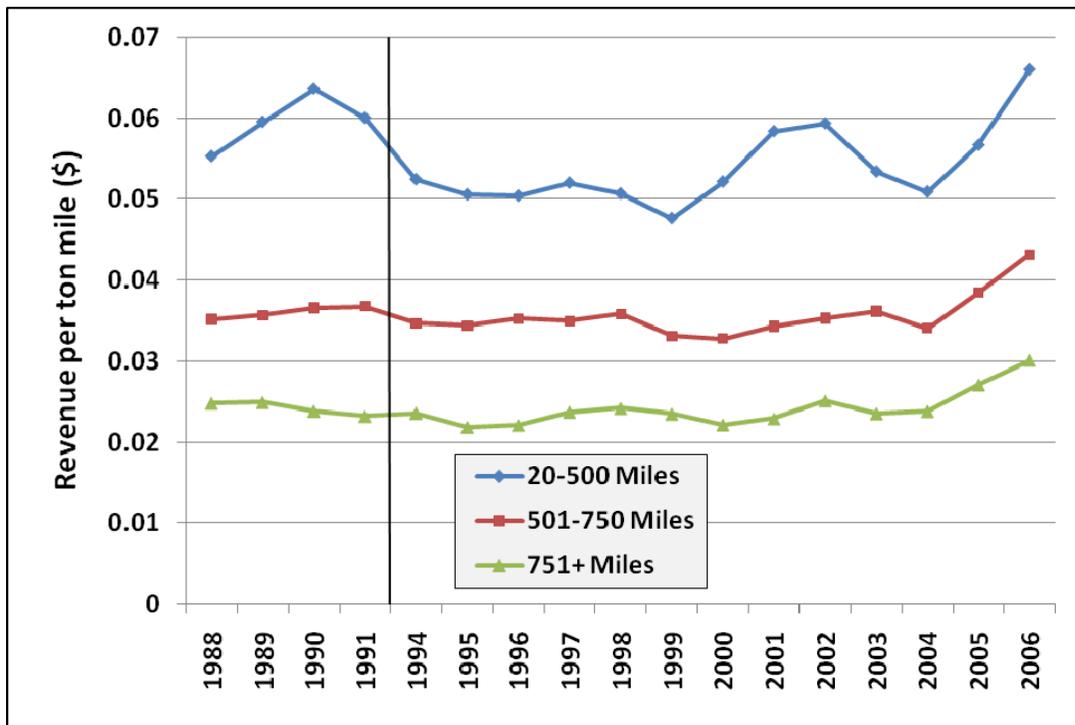
Source: Surface Transportation Board, Confidential Waybill Samples

Figure 7-27: Fertilizer revenue (current \$) per ton-mile by shipment size



Source: Surface Transportation Board, Confidential Waybill Samples

Figure 7-28: Fertilizer revenue (current \$) per ton-mile by shipment distance



Source: Surface Transportation Board, Confidential Waybill Samples

