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**Rail Freight Traffic:  
An Analysis to Better Understand the Industry  
and the Factors that Influence Traffic**

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**ABSTRACT**

Too often railroad industry officials and observers use aggregate measures and general statistics to draw conclusions about the railroad industry and public policy. A common claim by industry observers is to credit the Staggers Act of 1980, which deregulated the railroad industry, with the subsequent reduction in rail rates and the surge in traffic volumes. While the direct connection between deregulation and increased rail traffic is a commonly-held belief, this belief is based more upon conviction than analysis. The analysis presented in this paper starts with an overview of rail traffic volumes and then looks at each of the major freight commodities moved on the railroad. For the individual commodities, changes in market conditions and the response from the rail industry are examined in detail, showing a complex and more realistic picture of the industry performance since the passage of the Staggers Act. Contrary to the overall trends, the railroads have lost substantial traffic in many areas and are continuing to lose mode share with the truck.

In the two areas where railroads made their most substantial gains in traffic, namely coal and intermodal, exogenous factors related to the general economy, world trade, and the location of resources were major factors. For some commodities that remain very well suited to rail transport, notably metallic ores, rail traffic declined dramatically because domestic resources were exhausted. For many general commodities, traffic declined and railroads lost market share to trucks. In fact, most commodities in the general carload freight group saw a drastic drop in traffic after deregulation and relatively stable shipments throughout the 1990s and 2000s. These stable traffic volumes were during a period of rapid economic growth and population increases. Despite positive trends on the demand side, the railroad did not gain significant traffic due to pressures from modal competition.

The factors affecting rail traffic volume can be grouped into four interrelated categories: demand for commodities, production/supply of commodities, modal competition, and rail service. Of these four categories only service can be controlled by the railroad. The others are part of the broader marketplace and the railroad must cater to the market to attract traffic.

This paper demonstrates that many factors are involved in the market for rail transportation. From a public policy perspective it can be very misleading to use general statistics of traffic volumes and rate trends to support certain factors such as deregulation. The omission of these factors results in an incomplete and misleading analysis of the industry and in the future this may result in misinformed public policy decisions.

## INTRODUCTION

This paper provides a detailed insight to rail freight traffic over the past 30 years. There is a lack of finer detail in many rail traffic studies, which has led to misrepresentative conclusions. In an era of increasing congestion, fuel prices, and cost of road maintenance, elected officials and the general public are very interested in diverting truck traffic to the railroad. Making informed decisions regarding the freight network will be very important when addressing freight policy with increasing population and economic activity. More detailed analysis and thus more accurate conclusions can help shape better transportation policy decisions in the future.

Much of the recent analysis in the rail industry revolves around the effects of the Staggers Act and subsequent deregulation of the U.S. railroads with in 1980. Rail industry officials and observers have touted deregulation as the turning point in the industry that brought private sector efficiencies and boosted traffic. The Association of American Railroads, the industry's trade group, uses industry-wise statistics in support of deregulation:

*The Staggers Act has been a great success for railroads and their customers. It has allowed railroads to reinvest hundreds of billions of dollars back into their systems; greatly improve service and the safety of their operations; and increase traffic volumes, productivity, and profitability — while sharply lowering their rates.* (Association of American Railroads, 2008)

The statistics cited in this statement are true: the railroads reinvested, reduced rates, and total traffic figures increased. But this conclusion brings up important questions regarding whether all customers saw “improved service” and if the increased traffic volumes, productivity and profitability can all be attributed to deregulation. In addition to the industry, academic researchers and observers credit the Staggers Act as the key driver for increased traffic volumes. For example, José Gómez-Ibañez and Ginés de Rus explain the correlation:

*Deregulation brought about a remarkable revival of the US freight railroad industry. The average tariff per ton-mile dropped by roughly half in real terms, stimulating an increase in railroad traffic of all types.* (Gómez-Ibañez & de Rus, 2006)

Yet again there seems to be a lack of detailed information regarding the conclusion and brings to question whether “traffic of all types” actually increased. Would our interstate highways suffer from catastrophic congestion had it not been for deregulation?

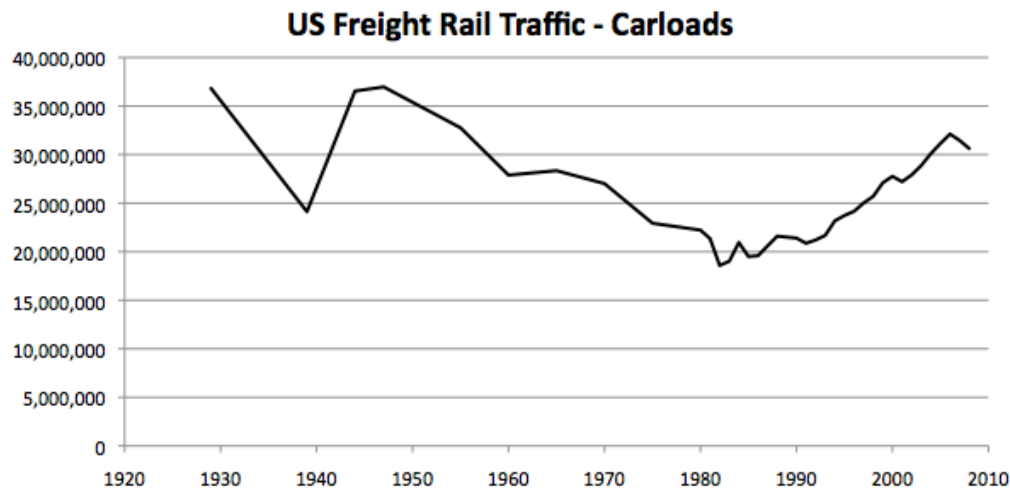
While the idea that deregulation stimulated traffic growth is a widely held belief, this paper will show it is a belief based more upon conviction than analysis. In the decades after the Staggers Act, average rail rates dropped and rail traffic increased, but these two trends did not result solely or even primarily from deregulation, nor did lower rates necessarily spur higher traffic volumes.

This paper looks specifically at the factors that affected railroad traffic volumes as a way to understand the changing demand for goods, changing supply and demand patterns, modal competition, and the impacts of rail services changes. A more disaggregate examination yields a better understanding of actual trends in demand for rail freight and the factors driving those trends because it uncovers more of the exogenous factors that affect demand for rail traffic.

While traffic has undisputedly increased, the reasons for the increase are not always obvious. Although certainly an important factor, deregulation is only a part of the story concerning the evolution of the railroad industry over the past 50 years. Changes in supply chains, competition, traffic demands, and service levels have all had a large impact on traffic volumes and the industry overall. The omission of these factors results in an incomplete and misleading analysis of the industry and in the future this may result in misinformed public policy decisions.

### **INDUSTRY OVERVIEW - THE NEED FOR MORE DETAIL**

This section will look at some of the overall metrics for freight traffic to show how they can be used to describe the railroad industry. Information from the Association of American Railroads (AAR, 1972-2007) is used to show the changes in traffic using different metrics from 1929 to 2008. The following covers annual totals of rail freight carloads, tons, ton-miles, and mode split for the Class I railroads in the United States.



*Figure 1: US Freight Rail Traffic in Carloads, 1929- 2009*

Figure 1 shows the railroad carloads over this period, painting expected traffic trend described by those that support deregulation. After the peak in traffic due to World War II, carloads started a strong downward trend, which reversed only after 1980. Carloads have strongly increased since then. However freight measured by tonnage shows a different development, as seen in Figure 2.

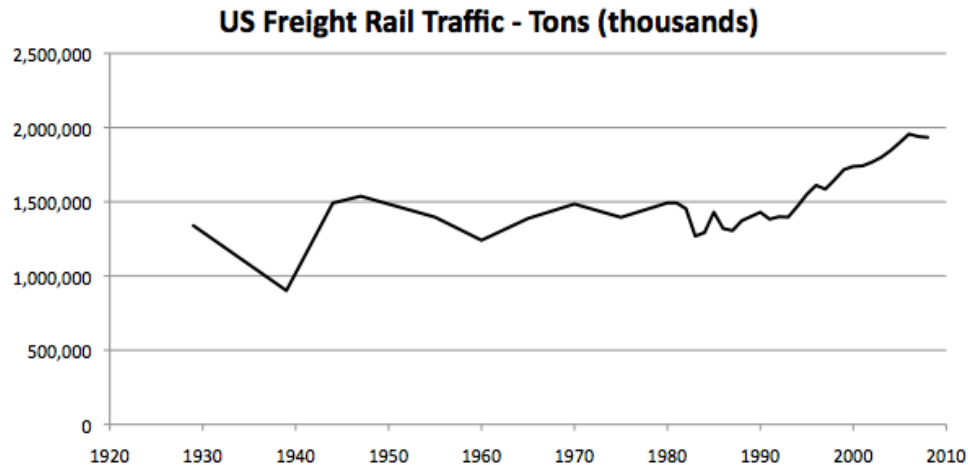


Figure 2: US Freight Rail Traffic in Tons, 1929- 2009

Instead of decreasing then increasing, the tonnage metric shows a rather stagnant industry over much of the past century. The tonnage moved on the US freight railroads has remained relatively stable since the 1940s with some fluctuations possibly due to economic cycles. It was not until after 2000 until tonnage increased significantly over the 1.5 billion ton mark.

Figure 3 shows the metric of ton-miles. Overall this is a very positive trend with ton-miles steadily increasing since the Great Depression. Even with the bankruptcies and stifling regulation in the 1960s and 1970s, ton-mile *increased* by 60% from 1960 to 1980. This is the same amount of increase in the two decades following deregulation (1980 – 2000).

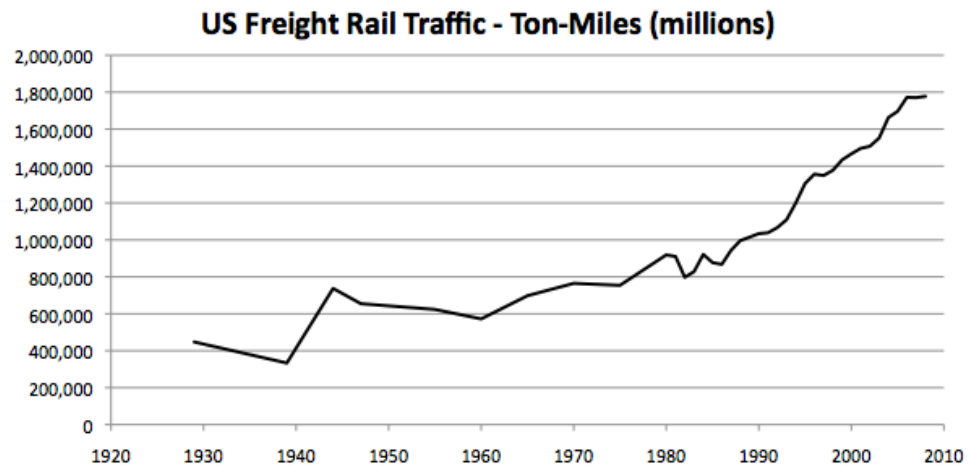


Figure 3: US Freight Rail Traffic in Ton-Miles, 1929- 2009

Figure 1, Figure 2, and Figure 3 all show very different trends in overall freight traffic, leaving questions as to how and why they can be so different. And it also leaves room for many analysts to draw misleading conclusions without a more detailed understanding of the factors influencing the movement of different commodities and the overall changes in the freight industry.

Another way to view the traffic is in the context of other modes. The loss of mode share in the decades preceding deregulation is another metric used to show how the industry suffered under regulation:

*The inefficiencies created by rail regulation put a stranglehold on the industry that prevented it from competing effectively. Rail’s share of freight traffic, which stood at nearly 70% of intercity ton-miles following World War II, fell to 37% in 1975. (Winston, 2006)*

This statement implies that regulation and its economic inefficiencies were responsible for this massive loss of market share. To be sure, the regulation did limit aspects of productivity and competitiveness but there were many other factors at play during this same period. One important point that Winston omits is that this loss of mode share also occurred alongside the rise of the trucking industry. Before the Great Depression, intercity freight was largely limited to the railroad or barge, as paved roads between cities were nearly nonexistent. But good new roads, inexpensive fuel, and a large supply of low-wage drivers created the rise of the trucking industry and thus a large diversion of traffic from the railroad. In fact the trucking industry managed to capture more than 20% of the total intercity ton-miles between the Great Depression and the 1960s, a period of very heavy truck regulation. Table 1 shows the US freight mode share since 1967.

<b>Mode</b>	<b>1967</b>	<b>1980</b>	<b>1990</b>	<b>1995</b>	<b>2003</b>	<b>2007</b>
Rail	41.4%	37.5%	37.7%	40.4%	39.3%	42.7%
Truck	22.0%	22.3%	25.4%	27.0%	31.0%	30.9%
Inland Waterway	16.0%	16.4%	16.4%	14.6%	14.9%	13.1%
Pipeline	20.5%	23.6%	20.2%	17.6%	14.5%	13.1%
Air	0.1%	0.2%	0.4%	0.4%	0.4%	0.4%
Total	100%	100%	100%	100%	100%	100%

*Table 1: Intercity Ton-Miles Mode Share. Source of data: AAR, Railroad Facts, various editions*

It is hard to imagine any industry, unregulated or otherwise, that could compete with the truck under those circumstances. Even with the low rates, improved service, and increased productivity resulting from deregulation, the freight railroad industry managed to increase their ton-mile mode share from 37% in 1980 to only 42% in 2007. This is a significant increase, but trucks increased ton-miles from 22% to 31% over the same period. The fact that truck ton-miles grew even faster than railroad ton-miles from 1980 – 2007 is remarkable given that the modes that lost mode share, the pipelines and the waterways, are more similar to freight railroads than the truck.

Another statement made by industry observers is the fact that the regulation stifled innovation. Again, this is true to an extent but it is unclear that regulation inhibited as much as is claimed. Winston (2006) states that because of the inefficiencies imposed by regulators railroads did not adopt basic improvements, specifically mentioning new car designs with high capacities, calling this “a classic example of how rail regulation stifled innovation.” However using the same tonnage and carload information he used to draw previous conclusions, Figure 4 shows how the average tons/carload changed over time.

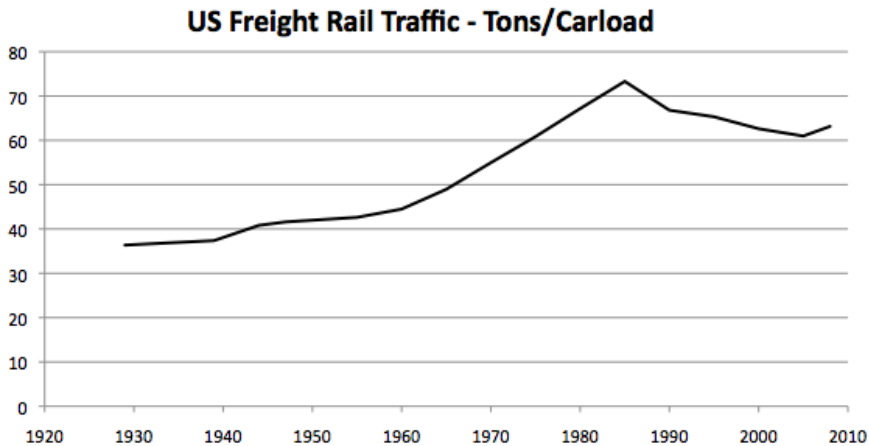


Figure 4: US Freight Rail Traffic in Tons/Carload, 1929- 2009

Based on Figure 4, all of the productivity improvements with respect to higher capacity car design happened before 1980, with a reduction in the tons/carload since deregulation. This simple graphic shows that, overall, the railroads were increasing the tonnage in their carloads even under regulated conditions. But the opposite is not true either: deregulation did not stop productivity. These basic, broad-brushed statistics simply do not show what is really happening with the traffic in the industry. As the next section demonstrates, looking at the traffic in more detail will provide a better insight as to where innovation, productivity, and growth have occurred.

## EXAMINING RAIL FREIGHT BY COMMODITY

In their heyday, the railroads held a virtual monopoly over intercity transport in the United States for both passenger and freight traffic. But the middle of the 20<sup>th</sup> century saw the entry of the highway and airport systems, which drastically changed the way society moved. The truck offered low cost movements for small (boxcar) shipments that were competitive, quicker, and more reliable. The inherent qualities of the trucking industry make it a fast door-to-door service that quickly captured a very large share of the railroad’s business. In addition to modal competition, other long term trends accounted for the competitiveness of the railroad, including network rationalization, technology improvements in operations and maintenance, labor negotiations, and the expansion of short line railroads (Martland 2012).

The dramatic changes in the freight industry did not make the train obsolete. Rather it helped improve efficiency and corner a market in the freight industry. These characteristics are important to consider when examining rail freight in detail because of the competition between various modes of transport. Railroads are inherently well suited to handle high volume, point-to-point traffic. For example moving coal from mine to power plant makes more sense with a small crew and a long train, instead of hundreds of individual trucks running the same route. Carload traffic, on the other hand, needs sorting many times on a railroad to complete the door-to-door journey – something that a truck can typically do faster and with more reliability. To maximize efficiencies railroads run unit trains, or long strings of cars directly from one origin to one destination.

The following sections examine the traffic by commodity group. The freight traffic is first divided into three categories based on their nature and the competitive structure.

- General freight – carload service that is typically well served by truck
- Bulk goods – heavy, long distance commodities like grain and coal
- Specialized freight – goods that have specialized equipment for the railroad such as automobiles and intermodal traffic

Each category is examined in terms of competing modes, supply and demand trends, public policy, and rail service. This will help explain which commodities have seen improvements and increases and which have not as well as identify key drivers of change in the movement of rail freight.

The railroad freight traffic data in this paper comes from the “Railroad Facts” booklets published annually by the Association of American Railroads (AAR). The analyses cover data points from the first five years of the deregulated era, selected years from 1985 – 1996 and annual data from 1997 to 2009.

## **GENERAL FREIGHT**

General freight, as defined in this paper, consists of commodities that typically cannot be shipped in unit train groupings but instead are usually shipped in boxcar, or carload-sized units. It tends to encompass higher-value, finished products rather than bulk raw materials. The overall size of each individual shipment is much smaller, so a general freight train will have many cars bound for many different destinations. Because of their relatively higher value, the goods tend to be more time-sensitive. General freight includes the following commodity categories:

- Metals & Products
- Food & Kindred Products
- Lumber & Wood Products
- Stone, Clay, & Glass
- Pulp, Paper, & Allied Products

Figure 5, Figure 6, and Figure 7 show the traffic trends for these five commodity groups. Each commodity saw a significant decline in traffic immediately following the deregulation of 1980, relatively stable traffic during the 1990s, and finally a drop in traffic from the 2008 recession. The carload statistics show a more drastic trend than the tons because each of these commodities had an increase in average tons/carload. In 1980 these five commodities made up over 26% of the railroads’ carloads. In 2007 it was only 12%.



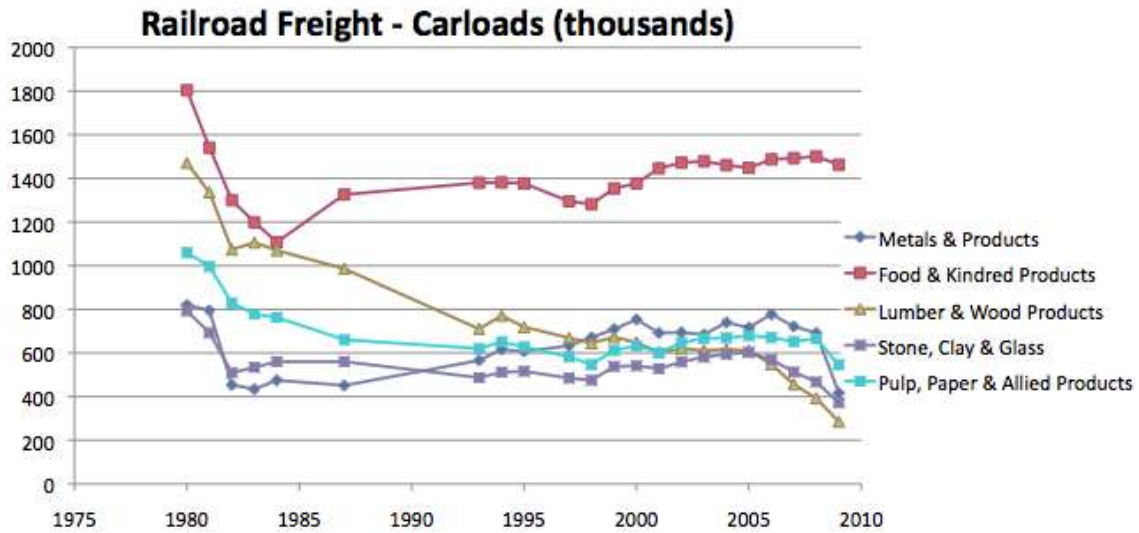


Figure 5: US Freight Rail General Freight, Carloads (thousands)

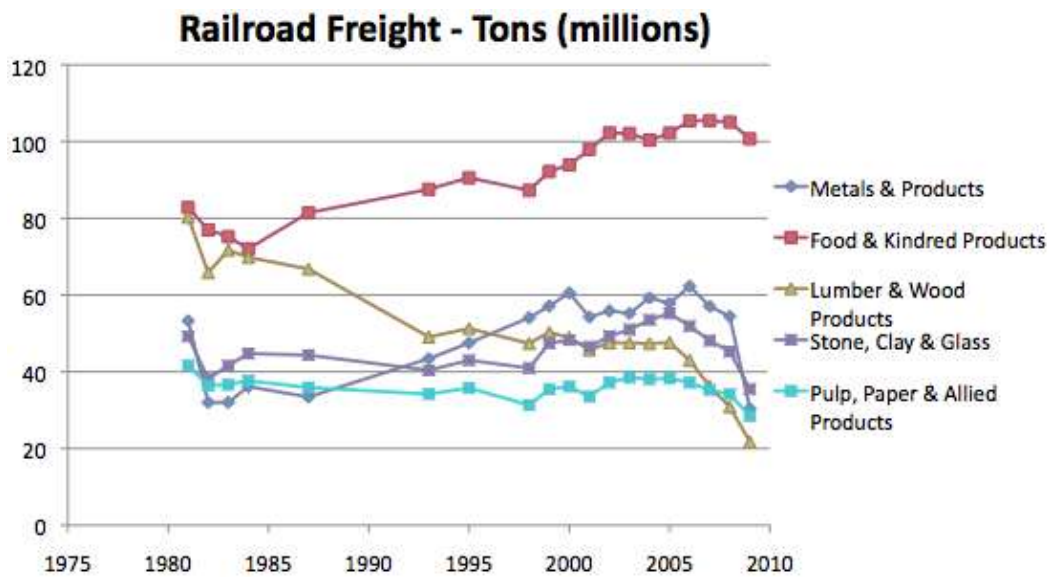


Figure 6: US Freight Rail General Freight, Tons (millions)

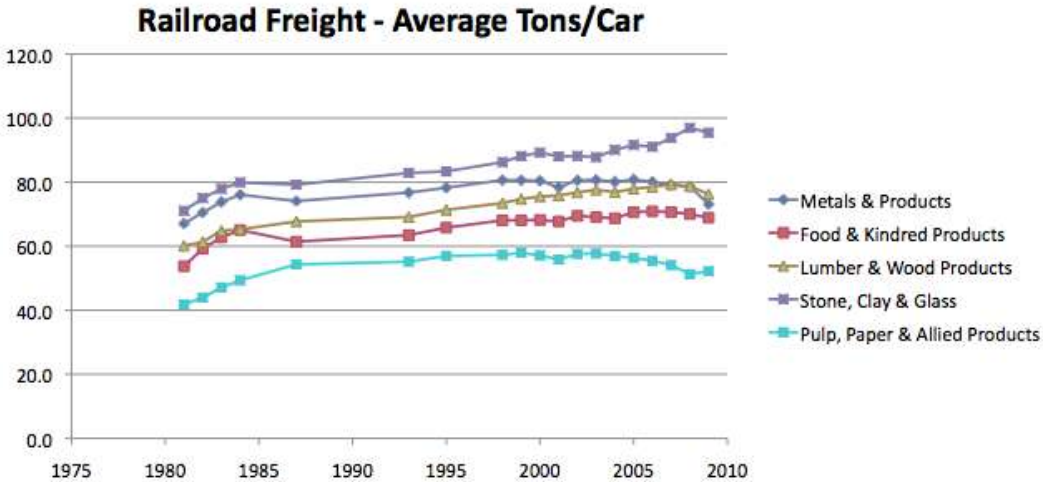


Figure 7: US Freight Rail General Freight, Average Tons/Car

While the average inflation-adjusted railroad rates decreased and the market demand increased, one would expect higher traffic levels for the railroads. Nevertheless the railroads struggled to maintain traffic levels for these traffic types as much of the general freight traffic was lost to truck. General freight is often the costly for railroads to move because it involves organizing and switching individual cars. Demand analysis for these goods shows an increasing market over the past 30 years as economic activity and population increased in the United States. Instead of capturing increased demand, the trucking industry gained significant market share. What was once an important and dominant sector of rail traffic is now a much smaller portion of the overall mix.

The Food & Kindred Products group highlight how the railroads have not succeeded in increasing traffic. While traffic has slightly increased in this sector, the US population grew 33% from 1980 to 2007 and the per capita food consumption also grew by 9% over the same period, giving an increase in demand for food of 36% (US Census Bureau, 2011). Other factors that would favor rail included significant increases in the average distance that food is shipped since 1980 (Halweil, 2002). But the truck, the main competitor in this category, was able to provide better service and this traffic moved to the highways.

## BULK GOODS

Bulk commodities include heavy, lower value goods where the railroad provides an inexpensive and efficient alternative to the truck. The following sections will look at coal, farm products, and metallic ores to identify the trends and factors that have attributed to the levels of traffic.

### Coal

Coal is the largest commodity of the railroads in terms of tonnage and revenue, representing 44% of the tonnage and 21% of the railroad revenue in 2007, up from 38% of total tonnage in 1983. Coal has always been a large commodity for the railroads but its nature and its importance to the business have changed dramatically over the past few decades. Because of its dominance in the industry it is important to detail the changes in the market and the factors that influenced the

traffic gain. Figure 8, Figure 9, and Figure 10 show the trends in coal traffic over the past 30 years.

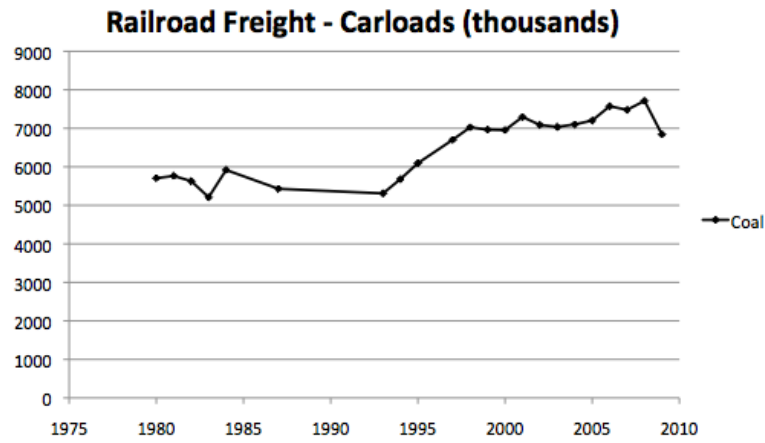


Figure 8: US Freight Rail Coal, Carloads (thousands)

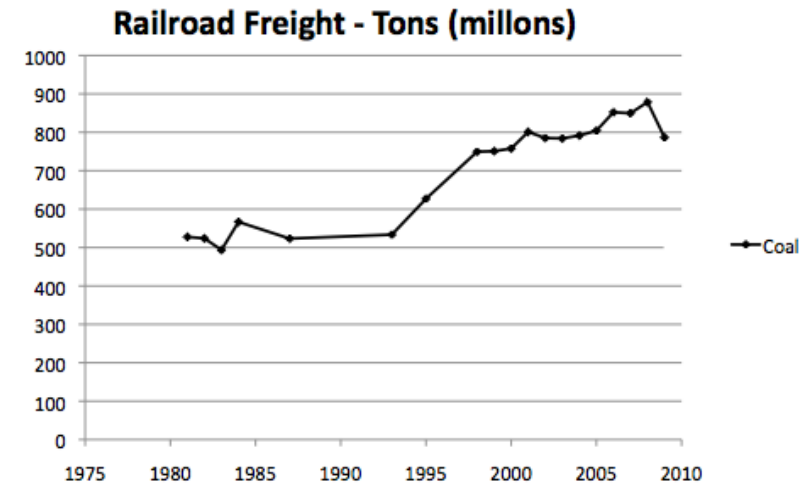


Figure 9: US Freight Rail Coal, Tons (millions)

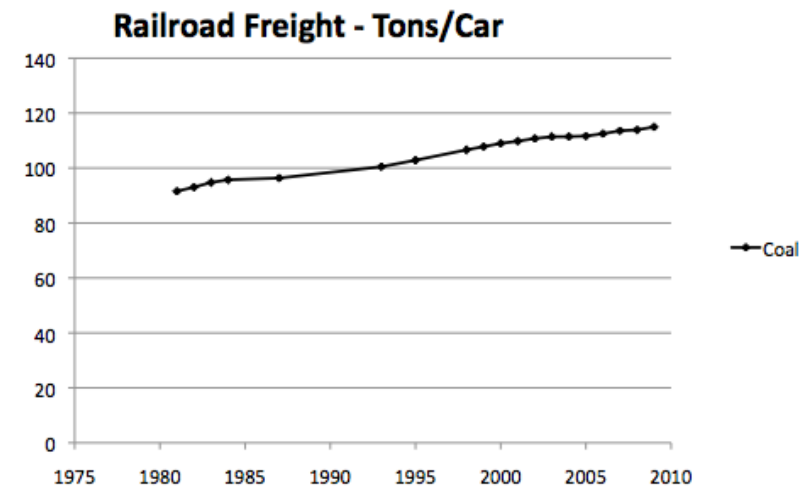


Figure 10: US Freight Rail Coal, Average Tons/Car

From 1980 to 2008, the increase in the shipped tonnage of coal has been more than 60%. Ton-miles of coal have increased even more during that period as coal is being shipped in larger quantities and over much longer distances. Figure 10 shows that there has been a consistent growth in tons/carload reflecting the shift from 70-ton to 100-ton coal cars that began in the 1960s and continued into the 1980s, followed by the further increases that began in the 1990s.

But it is not only the increase in productivity and significant reduction in rates that drove the increase in traffic. At one time coal had a myriad of uses including power for rail locomotives and home heating, accounting for many smaller shipments unable to be served by unit trains. A fundamental change in the coal market has taken place and now 94% of coal in the United States goes to power generation (EIA, 2010), consisting almost exclusively of very long unit trains from a mine directly to electric power plants. In addition, there has been a steady increase in demand for coal as shown in Figure 11 shows the production and consumption of coal in the United States, with most of the production used in domestic consumption.

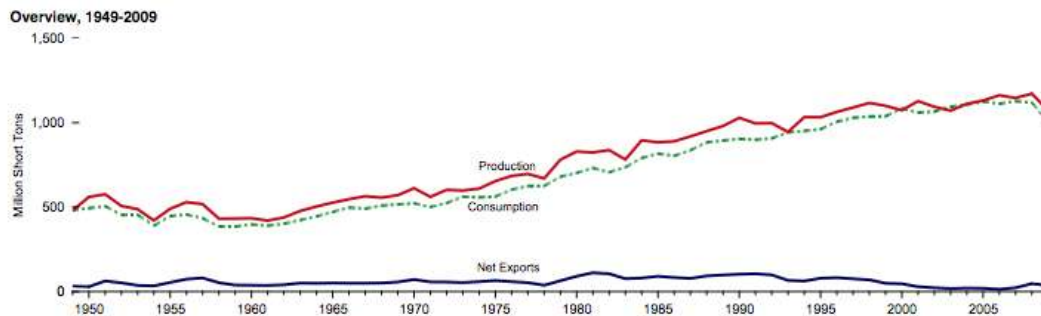


Figure 11: US Coal Production and Consumption 1949 – 2009 (U.S. Energy Information Administration, 2010)

Coupled with the demand increase was a dramatic shift in the coal supply. Before 1970 almost all of the coal in the United States came from mines in the Appalachian region and other areas in the eastern US. The Clean Air Act of 1970 and subsequent amendments put restriction on coal emissions, most notably sulfur, starting a movement of production from the Appalachian Region to the Powder River Basin (PRB) in Wyoming where there are large coalfields with significantly lower sulfur content, as shown in Figure 12.

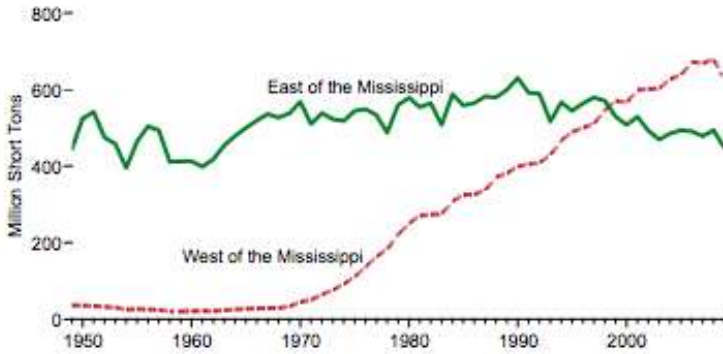


Figure 12: Coal Production by Location, 1949-2009 (U.S. Energy Information Administration, 2010)

The increase in demand and the shift in production region are both positive market changes for the railroad. Almost all of the coal from the PRB is transported to coal power plants in the Midwest and thus requires longer distance to travel than the Appalachian coal (Menke 2011). Almost all coal is transported by barge or railroad because of the high weight and low value of the commodity. It would be impractical to send coal in 30-ton truckloads when a single train or barge can move many thousands of tons. Even more, the Wyoming coal region is not close to any major water route, leaving the railroad as the only practical option for moving the coal. Therefore almost all of the new production from the PRB is moved by rail.

Coal shipments are very telling of the impacts of deregulation on the railroads. The railroads have benefited from increased coal traffic and shippers have benefited from lower railroad rates made possible by productivity improvements. But even in this successful sector of rail freight it is hard to argue that deregulation was the root cause of the traffic increase. In fact, it is increased regulation, namely in the Clean Air Act, that spurred the opening of PRB coal and proved to be a major source of traffic growth in the industry.

### Grain and Other Farm Products

Like coal, grain is a bulk good that can easily be shipped in unit trains. Grain has long been an important part of the railroad's traffic, especially in rural areas of the Midwest and the Great Plains. In 1983, farm products represented 11% of the railroads tonnage. Over the next 25 years carloads and tonnage remained stable (Figure 13 and Figure 14) and average loading hovered around 90 tons/car. While the railroad traffic remained stable, the US saw a very large increase in grain production (Figure 15).

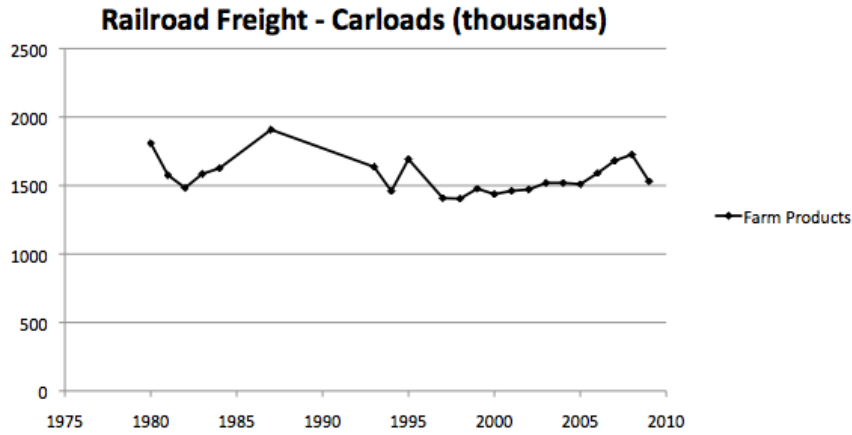


Figure 13: US Freight Rail Farm Products, Carloads (thousands)

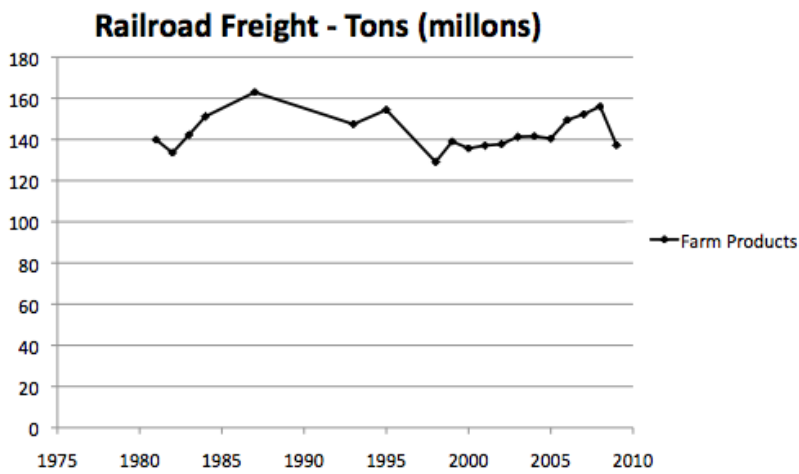


Figure 14: US Freight Rail Farm Products, Tons (millions)

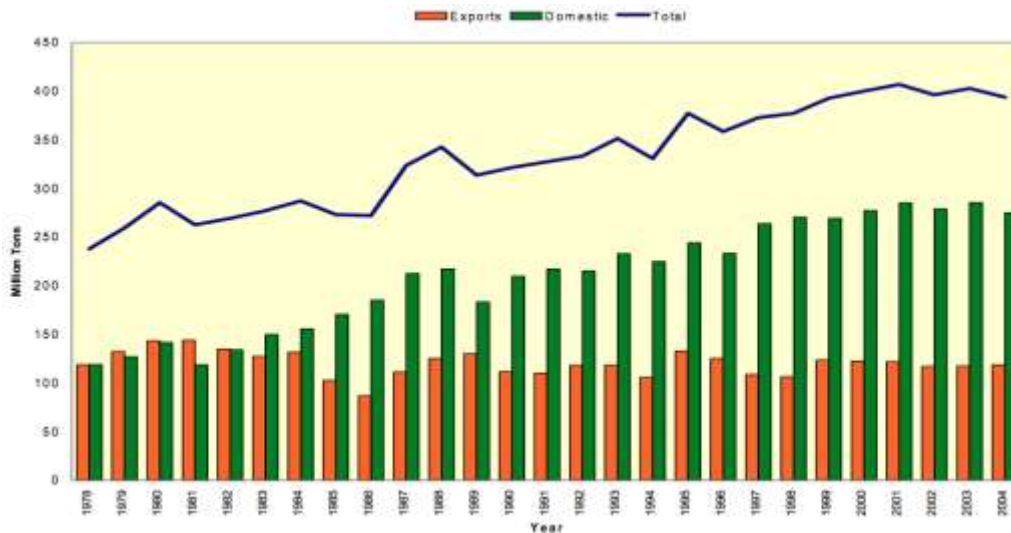


Figure 15: US Grain Production 1978-2004 (USDA, 2006)

The relationship between the growth in grain production and the inability for rail to capture all of this market is explained by a few factors. First, new production is mostly for domestic consumption, not longer-haul exports, and this favors the truck because of the shorter distances (USDA, 2006). Second, farm consolidation and rail network consolidation has eliminated many smaller grain elevators and branch lines. Grain farmers rely more on trucks to deliver grain to the larger elevators (Fittelli, 2005). Although the railroad may seem well suited to transport a bulk good like grain, the consolidation of farms, increase in domestic demand, and the reduction of the rail network in rural areas has hindered the railroads' ability to capture more of the market.

### Metallic Ores

Metallic ores, which are bulk and of low value, are ideal for the railroad because they can be shipped in efficiently unit trains from a mine directly to a steel or metal mill. But the traffic statistics in Figure 16 and Figure 17 show a significant reduction in ore shipments by rail.

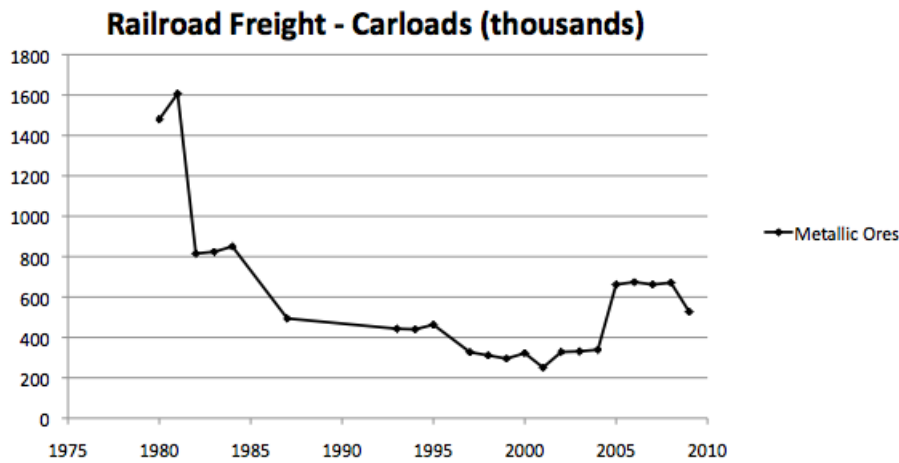


Figure 16: US Freight Rail Metallic Ores, Carloads (thousands)

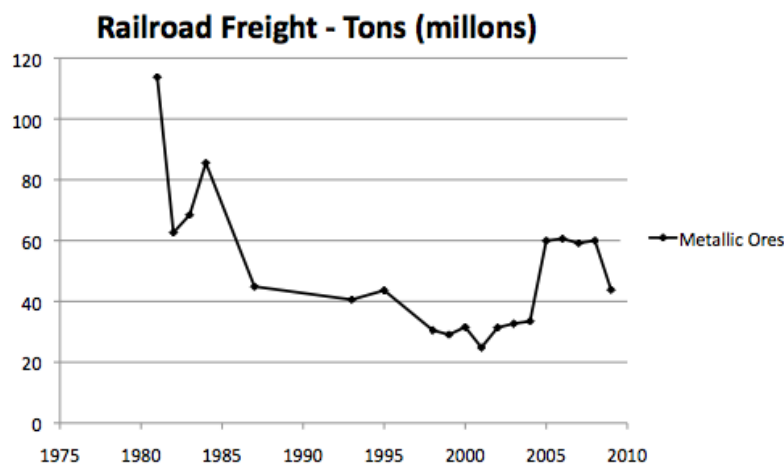


Figure 17: US Freight Rail Metallic Ores, Tons (millions)

The reduction in metallic ore shipments has to do more with outside factors than with the shipping rates and productivity of the railroad. As the easily accessible ore fields have been mostly depleted and the production of metals has moved overseas, the demand for ore transportation in the US has dropped significantly. The USGS statistics on ore production show production of iron ore peaking around 1950 then dropping significantly over the following decades. From 1980 to 2009 there was a reduction of 62% in tonnage mined in the US (while global production has since been increasing).

The reduction in this commodity for the railroads is not a fault in the industry but rather a consequence of the overall market trends. This is a striking example that shows that shipping rate reductions and increased productivity do not necessarily have any control over traffic volumes.

## SPECIALIZED TRANSPORTATION

Although the railroad industry has had mixed success with general freight traffic, they have done well where they provide specialized equipment that is well suited to specific types of high value commodities. The specialized goods consist of the three following commodity groups: Motor Vehicles, Chemicals, and Intermodal.

### Motor Vehicles

Railroads use specialized equipment designed to carry finished automobiles, called “autoracks.” These cars have two or three levels for the vehicles and can have metal sheeting along the outside to protect the products from vandalism. The autoracks are often formed into unit trains or into large blocks of cars that make transportation from origin to destination more efficient. Figure 18 and Figure 19 show the traffic trends for this commodity.

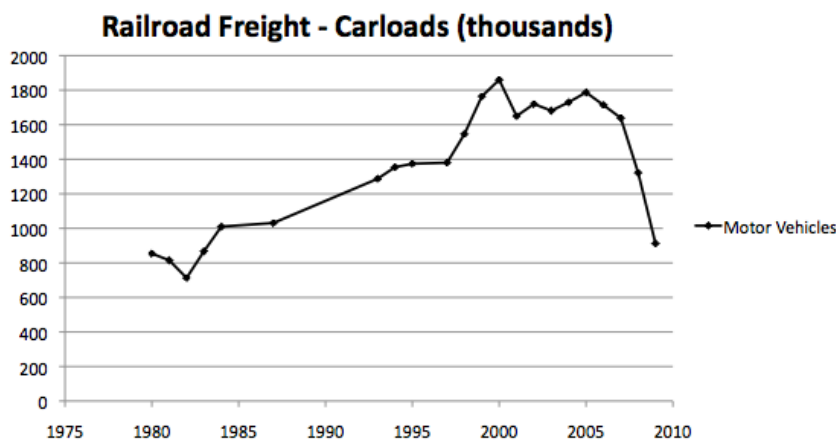


Figure 18: US Freight Rail Motor Vehicles, Carloads (thousands)



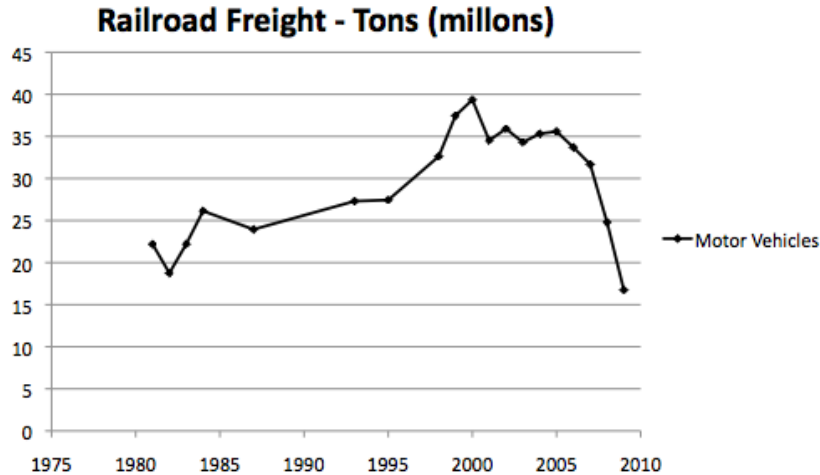


Figure 19: US Freight Rail Motor Vehicles, Tons (millions)

There was a 42 % increase in annual tonnage and a 100% increase in carloads of motor vehicles moved on the railroad from 1981 to 2007 before the very sharp decline due to the recent recession. The long term increase coincides with an increase in automobile purchase and automobile ownership in the US. The industry has taken important steps to maintain the mode share in a competitive market and growing economy. The decrease in average tons/car, which occurred steadily over the past 30 years, does not represent negative productivity but instead is likely the result of lighter, smaller cars in the market.

The ability for the railroad to capture the market for specialized products is an integral part of the business. In 2006, motor vehicles represented 5.3% of the total carloads and 1.7% of the tonnage moved on all US freight railroads. However the revenue from this small portion of the traffic amounted to over \$4 billion, or 7.6% of the total revenue.

### Chemicals & Allied Products

Chemical shipments are another specialized segment of railroad goods and it is important to highlight this segment of rail traffic to show an area of significant increase. Although graphs are not presented here, the railroads responded well to market trends and traffic increased. This shows that the railroad has the ability to provide a safe and inexpensive alternative to competing modes and has managed to capture a significant portion of the market. Chemicals represented 6.1% of the carloads and 11.6% of the total revenue in 2008. Chemical shipments increased substantially from 1980 – 2007, with a 47% increase in carloads and a 68% increase in tonnage.

### Intermodal

Intermodal traffic is a rapidly growing and vital sector of railroad freight traffic. It is important to highlight intermodal as a valuable part of the rail market because trends show increasing future volumes and railroads have invested in intermodal facilities.

Intermodal traffic is either classified as container on flat car (COFC) or trailer on flat car (TOFC). It is deemed “intermodal” because this traffic uses two or more modes to reach its final destination. Originally intermodal consisted of TOFC, a combination of truck and train where

truck trailers were placed on top of flat cars (“piggyback”) and were moved on rail for the long haul portion of the trip. Recent growth has seen a large increase of COFC, or container traffic, where the containers are designed to fit on to large ships for international trade. Once arriving in a port the containers are loaded onto trucks or rail cars and distributed across the country.

Neither tons nor carloads are a good proxy for intermodal traffic because of the diverse types of specialized rail equipment used and the wide range of commodities that move within the intermodal services. A carload of intermodal traffic might be a single trailer on the back of a flat car or it could be a six-bay double stack container car capable of carrying 12 containers. An intermodal container may contain boxes of lightweight but high value electronics or may be simply filled with scrap metal or grain. Therefore it is best to consider the volumes of containers and trailers, as shown in Figure 20.

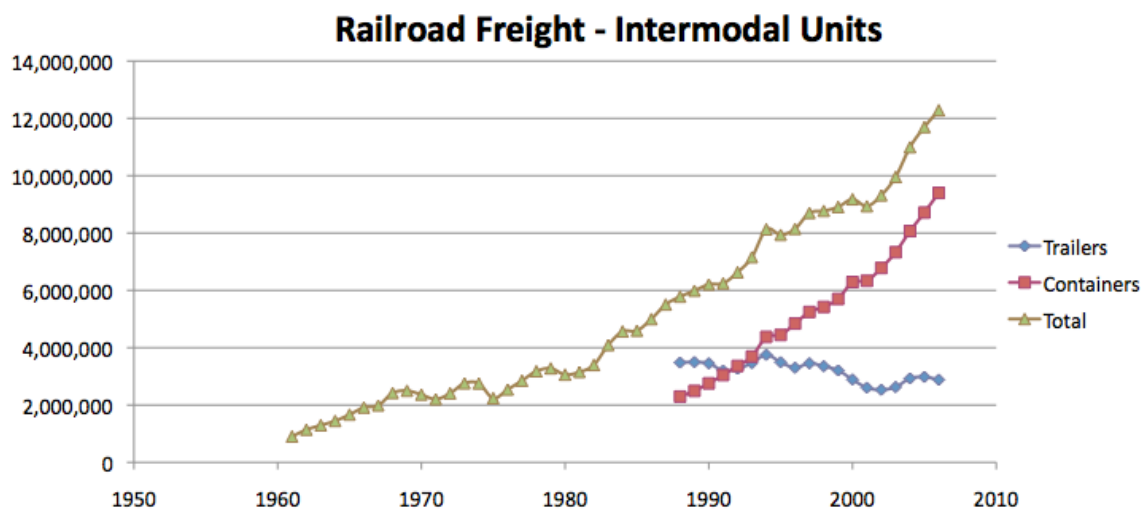


Figure 20: Railroad TOFC and COFC Shipments (AAR, 1972-2007)

Figure 20 shows the intermodal shipments increasing from 3 million to 12 million units from 1980 to 2007, extending a trend that started in the 1950s. The container has been the driver of recent intermodal growth for both domestic and international movements while the trailer has been decreasing. There has also been an increase in domestic containers, likely taking advantage of the high volumes produced by international trade and shipping across the country on the established system.

According to the Intermodal Association of North America (IATA), international shipments make up 54% of the intermodal shipments on rail. The remaining 46% of intermodal traffic is domestic shipments, including the TOFC as well as the remaining containers (IATA, 2011). However the intermodal market is much larger than what the railroad has managed to capture. In 2006, US container trade was nearly 28 million units, of which the railroad transported 9 million, or less than a third (Hoel, Giuliano, and Meyer 2010). Intermodal shipments may be a way for the railroads to gain back lost traffic in the general freight and other categories, and therefore should be considered when developing policy decisions for the future.

Intermodal traffic has by far been the fastest growing segment of rail traffic and trends project it to continue growing into the future. In fact, in 2002 intermodal car loadings surpassed coal

carloads as the largest commodity group moved by the railroad. Coal is still larger in terms of weight and revenue, but the fast pace and large proportion of intermodal car loadings in the rail freight industry indicate continuation of these trends in the future.

## CONCLUSIONS

The overall increased volume of rail shipments since deregulation in 1980 cannot be attributed to the decline in rail rates alone. The analysis presented in this paper shows that the factors affecting the market for rail services are much more complex and are in some cases counterintuitive. For some commodities that are well-suited for rail traffic, notably metallic ores, rail traffic declined due to exhausted domestic resources. For many general commodities rail traffic did not keep up with the overall economic growth, thus losing significant mode share to trucks. Despite positive trends on the demand side, the railroad industry did not gain significant traffic in many commodities.

In areas where the railroad did make substantial gains in traffic, notably coal and intermodal, exogenous factors related to the general economy, world trade, and resource location were major factors in driving traffic growth. In the specialized equipment sector, motor vehicles, chemicals, and intermodal traffic all saw significant increases that kept pace with economic trends. This shows how a railroad can retain traffic even in markets that are competitive with the truck. Demand increased for all of these categories and the railroads responded with fast, reliable, safe, and inexpensive service.

The factors affecting rail traffic volume can be grouped into four interrelated categories: demand, production/supply, modal competition, and rail service. Of these four categories only service can be controlled by the railroad. The others are part of the broader marketplace and the railroad must cater to the market to attract traffic.

Although much of the recent literature in the railroad industry discusses a positive relationship between deregulation and traffic volumes, the industry and industry observers were once well aware of downward trends for certain commodities in the face of competition. Reflecting on the first ten years under deregulation, *Traffic World* cited these trends in 1991:

*The railroad's own figures illustrate the magnitude of their problem: between 1980 and 1989, U.S. inter-city freight revenues grew from \$122 billion to \$182 billion while rail revenues rose from \$28 billion to just \$30 billion. A study conducted by the Association of American Railroad's Intermodal Policy Division notes the rail share of ton mileage fell in every one of the major rail-truck battlegrounds that constituted at least 1 percent of both rail and truck long-haul traffic in 1982. (Rosenfeld 1991)*

While deregulation played a role in restoring profitability and stability for the railroad industry, to credit this change as the principal driving factor in traffic growth over the past 30 years is overly simplistic. As demonstrated, the railroads have focused on growing traffic in only a few commodity groups and this shows that levels of certain traffic could be decreased if exogenous factors reduce the demand, not matter how low the price or high the productivity. When considering public policy for the future, a detailed examination of the major trends in rail traffic

is very useful in understanding the actual impacts of important policy changes such as deregulation.

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