

# Railroad Performance Under the Staggers Act

Deregulation revived the rail freight industry, with most of the gains going to shippers.

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On October 14, 1980, President Jimmy Carter signed the Staggers Act into law. In his accompanying Statement of Signing, President Carter wrote:

By stripping away needless and costly regulation in favor of marketplace forces wherever possible, this act will help assure a strong and healthy future for our Nation's railroads and the men and women who work for them. It will benefit shippers throughout the country by encouraging railroads to improve their equipment and better tailor their service to shipper needs. America's consumers will benefit, for rather than face the prospect of continuing deterioration of rail freight service, consumers can be assured of improved railroads delivering their goods with dispatch.

This was a statement of promise and potential. Thirty years have passed since the Staggers Act was signed and we can now take a fairly long measure of how well it has lived up to its promise. We can also venture some guesses as to what is in store for U.S. railroads and their shippers in the first half of the new century.

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## How We Got to Staggers

The Staggers Act was the culmination of a wave of reform in the U.S. railroad industry, and was the last of several pieces of legislation that largely deregulated the transportation sector of

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the U.S. economy. For decades prior to the Staggers Act, the railroads had been struggling for survival. In the 1940s and 1950s it became apparent that regulation had become a major factor in the railroad industry's ailments, but it was not until the 1970s that meaningful reform began to take shape in response to the extremely critical financial condition of the industry.

By 1970, several large freight railroads in the Northeast faced bankruptcy. Concerns about the railroads' situation led to the passage of the Regional Rail Reorganization Act of 1973. Under the legislation, the failing Northeast railroads were reorganized under federal control and became Consolidated Rail Corporation, better known as Conrail. Conrail was sold back into the private sector in 1987 and then broken up and absorbed into CSX and Norfolk Southern in the late 1990s.

Continued financial problems for railroads outside the Northeast resulted in the passage of the Railroad Revitalization and Regulatory Reform Act of 1976. The legislation allowed railroads flexibility in setting rates. In particular, it set the stage for the deregulation of rates by allowing railroads the freedom to set rates for traffic where there was competition.

Airlines and trucking were also being deregulated during this period. Airline deregulation, an objective of the Nixon, Ford, and Carter administrations, was achieved with the Airline Deregulation Act of 1978. The legislation called for elimination of regulatory restrictions on domestic routes and services within three years, and complete deregulation of domestic fares within five years. The Civil Aeronautics Board officially went out of existence on January 1, 1985; however, the bipartisan consensus in favor

of deregulation and Alfred Kahn's leadership of the CAB led to effective deregulation of airlines well before that deadline.

On July 1, 1980, the Motor Carrier Act of 1980 was signed into law by President Carter, deregulating trucking. The Motor Carrier Act eliminated most restrictions on entry, commodities carried, routes, and geographic zones. The Interstate Commerce Commission, under the leadership of Darius Gaskins, interpreted the act as largely removing the trucking industry from regulatory oversight.

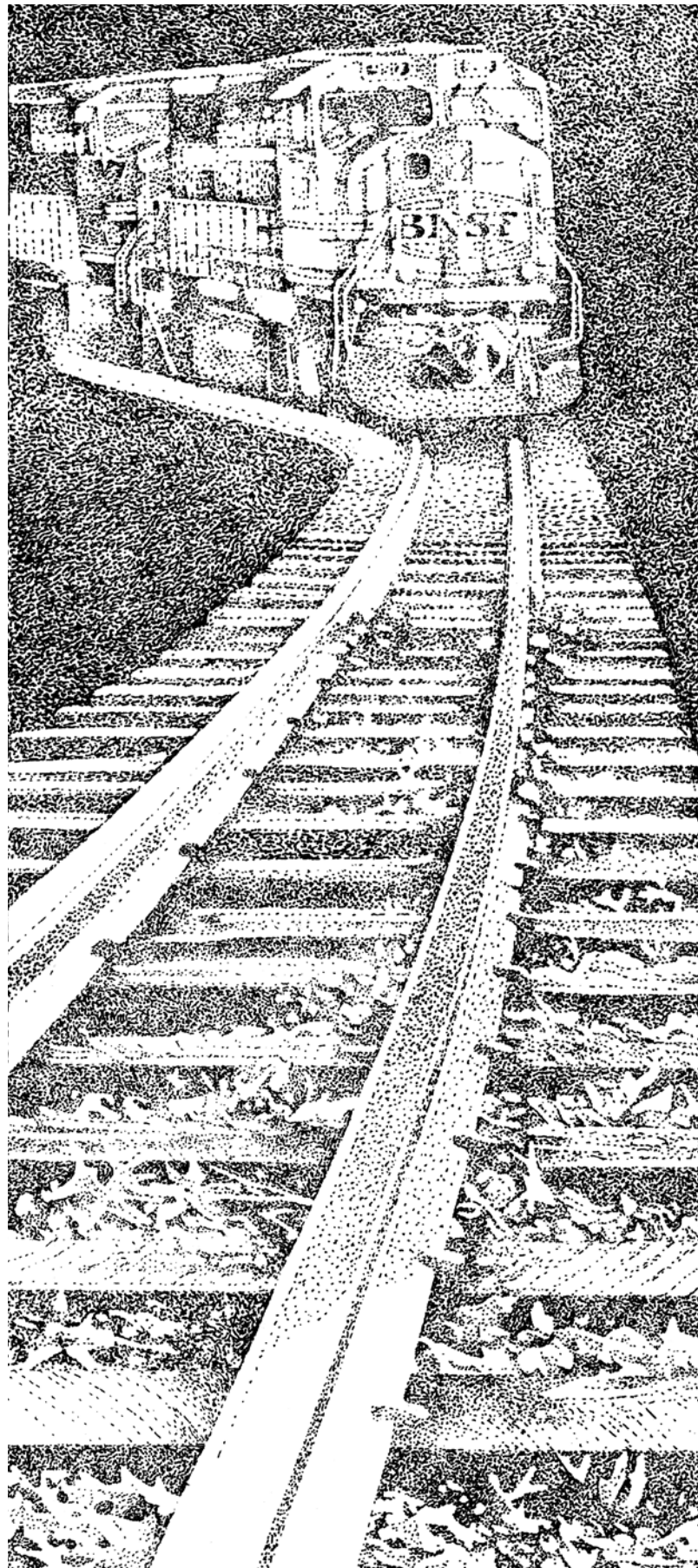
Thus, the Staggers Act was much more the crescendo of transportation industry deregulation, rather than a watershed event. Nevertheless, the legislation has become the marker of rail deregulation. But unlike the airline and trucking deregulation acts, the Staggers Act only partially deregulated the freight railroad industry. The act provided the railroads with a high level of freedom in setting rates, gave the railroads the right to negotiate private contracts with shippers, and made it easier for railroads to abandon unprofitable lines. However, two features distinguish the Staggers Act from the airline and trucking deregulation acts: First, the legislation makes explicit the goal of a financially stable industry. Second, the act maintains a regulatory backstop, as shippers can appeal for route/shipment-specific rate relief if, for that route/shipment, revenues are more than 180 percent of variable cost and the shipper does not have another railroad or alternative transportation mode for that shipment.

Only one major piece of rail legislation has been enacted since the Staggers Act. The ICC Termination Act of 1995 abolished the Interstate Commerce Commission and assigned regulatory authority for railroads to the Surface Transportation Board. Despite never having been reauthorized, the STB continues through annual funding in the federal budget and pursues the regulatory objectives of assuring revenue adequacy for the railroad industry, allowing the railroads pricing flexibility in responding to different market circumstances, and protecting shippers from the exercise of excessive market power by railroads.

### The Railroad Industry Then and Now

The Staggers Act was adopted amidst fundamental reorganization in the rail freight industry. Without the legislation, that reorganization would not have been so extensive or successful. Below is a brief overview of the change that occurred.

**Industry consolidation** | When the Staggers Act was passed, the railroad industry was already experiencing a wave of concentration as a result of the bankruptcies of many of the Class I railroads. Class I railroads, defined by meeting an inflation-adjusted annual revenue threshold, are the largest railroad freight carriers. (The Class I revenue threshold was approximately \$350 million in 2006.) In 1980 there were 39 Class I railroads, with a four-firm concentration ratio of 35 percent. The Staggers Act facilitated the exit of failing firms. By 1987, 17 Class I railroads remained, and the four-firm concentration had increased to 55 percent.





Mergers, declassification, and the Conrail breakup resulted in further industry consolidation in the 1990s. Three events in particular had the largest impact on industry concentration. In 1995, Burlington Northern merged with the Atchison, Topeka and Santa Fe Railway to form the BNSF Railway Company. In 1997, the Union Pacific and the Southern Pacific railroads, by then the second and third largest U.S. railroads, merged and kept the Union Pacific name. And in 1998 and 1999, Conrail was broken up into roughly equal parts and absorbed into the CSX and Norfolk Southern systems. Also, in 1998, the Canadian National Railway, which had been privatized in 1995, acquired the Illinois Central Railroad to obtain about a three percent share of the U.S. market.

By 2000, the industry was down to seven Class I railroads, with a four-firm concentration of about 90 percent. Taking geography into account, the industry had become a pair of regional duopolies, with the BNSF and Union Pacific being approximately equal-sized competitors in the western part of the country and similarly-sized CSX and Norfolk Southern competing in the east.

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## Industry consolidation, track abandonment, and growth of traffic volume all combined to produce a tremendous increase in traffic density on the railroad networks.

Three smaller firms — Canadian National, Kansas City Southern, and Canadian Pacific — also operate in the United States, along the seams of the duopolies. That industry structure has remained stable the last 10 years.

**Commodity and revenue mix** | The two big stories regarding rail traffic in the last 30 years are the growth of western coal and intermodal shipments. Over that time, the commodity mix of freight rail traffic has shifted toward coal, chemical, and intermodal shipments, and away from farm products and other commodities. As a result of the increase in western coal and intermodal traffic, the average length of haul has increased substantially. Over this period, chemical tonnage increased by about the same percentage as did coal tonnage, but the length of haul for chemical shipments did not change substantially.

The amount of western coal shipped on rails has increased tremendously in the last 30 years. Among the reasons for this were the Clean Air Act Amendments of 1990 that called for large reductions in sulfur dioxide. As a result, the demand for low-sulfur western coal, particularly coal from the Powder River Basin mines, increased. Also, trackage enhancements in the 1980s and 1990s greatly increased the amount of coal from those mines that railroads could handle. Consequently, by 2000, the ton-mileage of western coal shipped by rail was almost four times more than in 1979, and average distance shipped had increased by over 200 miles.

The percentage growth of intermodal rail traffic has greatly exceeded that of all other commodity groups. This reflects the growth of consumer good imports from Asia, as well as the shifting of the transport of domestic goods from the roads to the rails as fuel prices and highway congestion have increased. By the peak year of 2006, intermodal traffic was about 6 percent of the ton-miles, accounting for more than one-third of the car loadings and more than one-sixth of the railroads' revenues. However, the recent recession has shown the sensitivity of intermodal rail traffic to economic conditions. By 2009, intermodal carloadings and tonnage had declined by about 20 percent from 2006 levels.

**Density** | Industry consolidation, track abandonment, and growth of traffic volume all combined to produce a tremendous increase in traffic density on the railroad networks. Between 1980 and 2008, railroad freight tonnage grew by about 30 percent and the length of haul increased by 50 percent, largely reflecting the growth of coal and intermodal traffic. At the same time, the railroads consolidated networks through mergers and abandonments so that the miles of road and track each decreased by more than 40 percent. These structural changes combined to more than triple rail traffic density, as measured by the ratio of revenue ton-miles per mile of road.

Rail traffic density doubled between 1985 and 1995 as the revenue ton-miles increased by half and railroads shed a quarter of their miles of road. Since 1995, traffic density has continued to increase, but at only about half the earlier pace. Only in the last couple of years, reflective of the struggling economy, has rail traffic density substantially declined.

In 2007–08, the STB hired our firm to conduct an independent study on the state of competition in the U.S. freight railroad industry. We updated that study in 2009–10. Our econometric estimates of a Class I industry cost function confirmed that railroads exhibit economies of density. That is, we found that railroad costs go up proportionately less than traffic volume increases on a given network. Furthermore, we found strong economies of density for the industry in 1987, and that those economies have diminished over the years as traffic density has increased. Our subsequent work on railroad productivity growth identified increased traffic density as a leading driver of productivity gains.

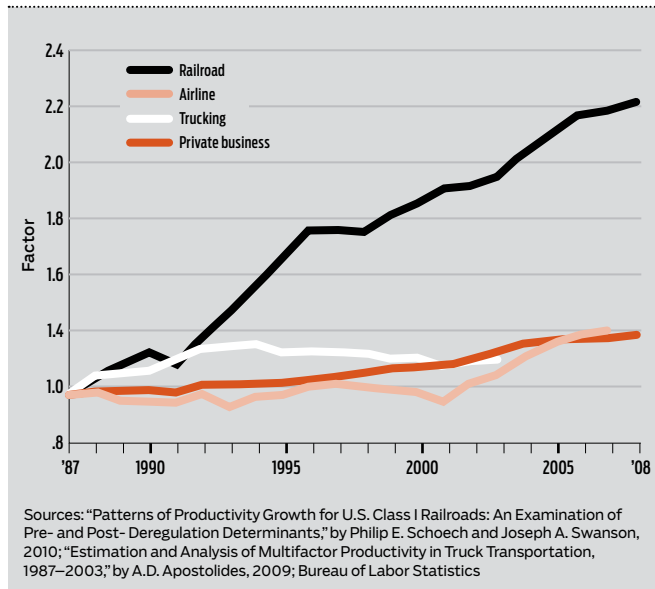
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### Railroad Industry Performance Post-Staggers

Class I railroads have performed well in the post-Staggers Act era. Productivity has greatly increased, inflation-adjusted rates to shippers have declined by a substantial amount, and the financial stability of the railroads has dramatically improved.

FIGURE 1

## Railroad, Airline, Trucking, and Private Business Total Factor Productivity 1987–2008



Those improvements began almost immediately after the legislation was enacted.

**Productivity and costs** | Class I railroads have exhibited tremendous productivity growth since the passage of the Staggers Act. According to research by Philip Schoech and Joseph Swanson, annual total factor productivity growth for the railroad industry averaged 3.7 percent between 1980 and 2008, which was about three-and-a-half times the productivity growth of the overall private business sector during the same period. As Figure 1 shows, railroad productivity growth also substantially outpaced the growth experienced by the other deregulated segments of the transportation sector. This suggests that, at the very least, the regulatory framework established by the Staggers Act has not obstructed productivity growth.

The growth in railroad productivity reflects the combination of high output growth and substantial reductions in inputs. Much of the output growth can be attributed to flexibilities conferred upon railroads by Staggers that allowed innovations in service offerings, contracting, and rate design. In addition, the development of the Powder River Basin coal reserves contributed significantly to railroad output, as did the expansion of intermodal services. On the input side, Staggers allowed railroads to rationalize their networks, as significant amounts of excess trackage and equipment were shed by the railroads. The total miles of road owned by Class I railroads, a measure of network size, decreased by 43 percent since 1980, while Class I trackage declined by 40 percent. Liberalized work rules, industry consolidation, and reductions in network size and trackage have led to even more dramatic reductions in labor employment such that the current railroad labor force is only about one-third what it

was in 1980. Other changes, such as increased locomotive efficiency, innovations in car design (including increased capacities), longer train lengths, improvements in operating practices, and technological innovations in train control, all contributed to the increase in railroad productivity.

Since 1996, however, there has been a marked slowdown in railroad productivity growth. Schoech and Swanson report that railroad total factor productivity growth averaged 4.8 percent per year between 1980 and 1996, but has since slowed to an average rate of 2.3 percent per year. In contrast, while still below railroad productivity growth, the rate of growth in U.S. private business sector productivity increased during this latter period. While annual railroad output growth remained relatively constant over these two periods, an increase in materials input and a slower reduction in labor inputs appear to be major culprits in the slowdown of productivity growth for the railroad industry.

Another factor contributing to the railroad productivity growth slowdown is the diminishing role of economies of density in propelling railroad productivity growth. Analysis by Kelly Eakin, Schoech, and Swanson shows that the marginal impact on productivity growth from increasing traffic volume is roughly proportional to the impact from decreasing network size. Furthermore, they find that these marginal impacts in 2008 are about half what they were in 1987.

The evidence indicates that economies of density are significantly less today than when the Staggers Act was first implemented and that the "immediate gains" from deregulation have been largely realized. Consequently, we believe that future railroad productivity growth will moderate and generally be more in line with that achieved in the economy overall.

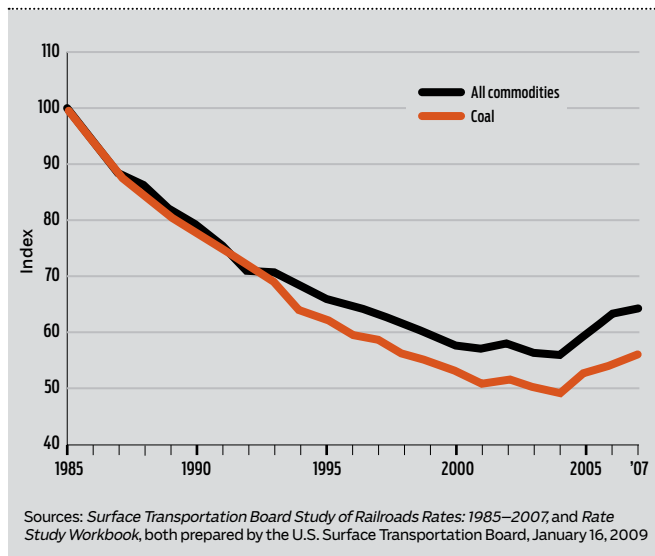
As Figure 1 indicates, very few periods of railroad productivity decline have occurred since the Staggers Act was signed. The declines that did occur happened around the economic recessions of 1982 and 1991. The atypically small productivity gain in 2001 was also in a recession year. The productivity pause from 1995 to 1997 likely reflects temporary disruptions resulting from the BNSF merger and then the Union Pacific merger. We expect that given its magnitude, the recent recession's impact on revenue ton-miles has further slowed railroad productivity.

The railroads' productivity gains have been translated into lower costs of producing freight transportation. In our studies for the STB, we found that the real average cost of a revenue ton-mile decreased by 31 percent between 1987 and 2008, even though the railroad cost recovery index (a measure of inflation for railroad inputs) had increased about twice as much as the producer price index over the period. However, the productivity slowdown and input price increases have resulted in fairly large increases in the railroads' marginal cost of a revenue ton-mile in recent years.

**Prices** | Shippers today enjoy substantially lower real rates for rail freight transportation than they did in 1980. Adjusted for inflation, rates for railroad freight services have decreased by about 40 percent since 1980. As shown in Figure 2, the freight rail rates, as reported by the 2010 STB rate study and adjusted

FIGURE 2

### Real Rate Indexes for Freight Rail Transportation 1985–2007

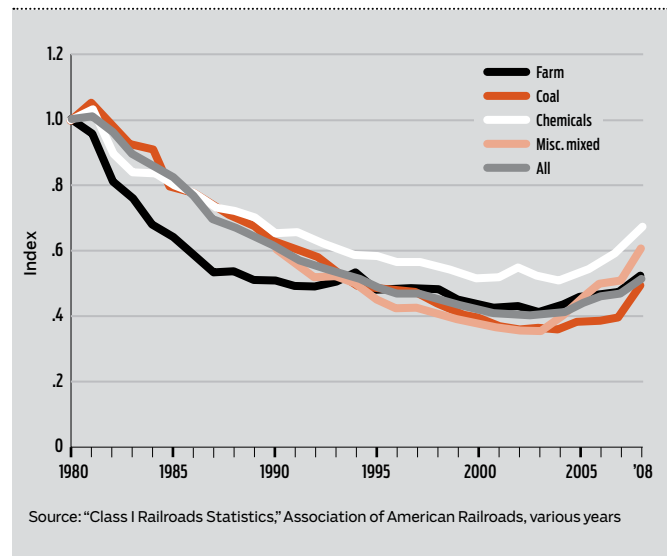


for inflation, generally declined through 2004. The STB data also show coal shippers accumulating noticeably greater rate reductions starting around 1993. Since 2004, real rail rates have been increasing, with rates to coal shippers increasing the most. Our calculations for 2008 show a sharp one-year increase in rates, with the overall real rate index increasing by about 13 percent. Even more dramatic, the real rate index for coal indicates a 25 percent increase in rates for these shippers. Because much of the coal traffic has been shipped under long-term contracts, those shippers with expiring contracts may actually be experiencing rate increases several times greater than the increase in the coal rate index. While all the data have not been finalized, the indications are that rates decreased in 2009.

A measure closely related to rates, and reported by commodity group, is revenue per ton-mile. Between 1980 and 2008, the real revenue per ton-mile decreased by almost 50 percent, with all commodity groups experiencing decreases of at least 30 percent. Figure 3 shows how the real revenue per ton-mile has changed since 1980 for coal, farm products, and chemical shipments. The figure also shows how the revenue per ton-mile has changed since 1990 for “miscellaneous mixed shipments,” the category that consists almost entirely of intermodal shipments. Adjusted for inflation, the prices that shippers of coal and farm products paid per ton-mile in 2008 were only about half what they paid in 1980. Chemical shippers have experienced a smaller decline, with the real price paid per ton-mile in 2008 being about two-thirds what they paid in 1980. The real revenue per ton-mile reported for the miscellaneous mixed shipments group has increased since 2004 back to its 1990 value. However, changes between 1990 and 2008 in the composition of intermodal shipments and in the quality of intermodal services (e.g., increased speed and reliability) make this comparison less meaningful.

FIGURE 3

### Real Revenue per Ton-Mile Indexes by Commodity 1980–2008



**Railroad financial stability** | The dire financial condition of the U.S. railroad industry was the motivating force behind the rail reforms of the 1970s, culminating in the passage of the Staggers Act. The explicit purpose of the legislation was to “provide for the restoration, maintenance, and improvement of the physical facilities and financial stability of the rail system of the United States.” The act was designed “to promote a safe and efficient rail transportation system by allowing rail carriers to earn adequate revenue, as determined by the Interstate Commerce Commission.”

The financial performance of the railroad industry has improved substantially in the past 30 years. The first few years after the Staggers Act saw considerable industry consolidation but little financial improvement. Between 1980 and 1985, the operating ratio (operating cost to revenues) decreased slightly but remained above 90 percent. Consequently, the return on investment and return on equity remained below market. Since 1985, however, the railroad industry has seen steady improvement on the financial front. Our study for the STB found that the industry appears approximately revenue sufficient since 2006.

**Distribution of the productivity gains** | The data show that railroad productivity gains in the post-Staggers era have been substantial and, in percentage terms, several times the gains achieved in the airline industry, the trucking industry, and the private business sector. How have those gains been divided between the railroads and shippers? Looking at changes in the ratio of industry revenues to industry cost over time allows us to answer this fundamental question. That is, the distribution of productivity gains can be separated into (1) improved margins for the railroads, and (2) mitigation of the cost-induced rate increases faced by shippers. Making this separation indi-

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cates that, from 1980 to 2008, slightly more than 80 percent of the productivity gains have gone to shippers in the form of lower rates and slightly less than 20 percent to railroads in the form of improved margins. This sharing has not been on a constant 80/20 basis. Instead, there appears to be distinct sub-periods. Between 1980 and 2000, as nominal rates were falling, all of the gains went to the shippers. But since 2000, as rates have been increasing, about 90 percent of the gains have gone to the railroads.

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### Current Legislative Initiatives

Calls for “re-regulation” of the rail industry were issued shortly after the Staggers Act was signed, and those calls persist to present day. Over the years, these initiatives have gathered little momentum, as consumers were the primary beneficiaries of railroad productivity growth. However, in recent years, as railroad productivity growth has slowed and the rates to shippers have increased, calls for new regulation have become more frequent and louder.

In late 2009, Senator Jay Rockefeller (D, WV) introduced legislation entitled “The Surface Transportation Board Reauthorization Act of 2009.” The bill would establish the STB as an independent agency, increase the board membership from three to five, give it more proactive powers, and provide greater shipper access to the STB. Among the important changes to policy contained in the bill is the requirement for railroads to offer “reasonable bottleneck and terminal switching rates” — i.e., rates must be quoted between any two points on a railroad’s network so that shippers have the ability to pick and choose segments of various railroads between origin and destination and not be dependent on a single railroad. With respect to mergers, the Rockefeller bill would revise the factors the STB must consider to include effects on public health, safety, and the environment as well as intercity commuter passenger transportation.

The bottleneck rate requirement is a significant reform worth singling out for mention. The bill directs the STB to include as part of a reasonable rate “a reasonable contribution ... to network infrastructure costs of the non-bottleneck segment.” One possible interpretation of this criterion would be along the lines of efficient component pricing with a contribution preserving implementation. In that case, “reasonable” bottleneck rates would have little financial impact on incumbent railroads and might not provide much relief to the affected shippers. Regardless, because density and length-of-haul economies work against splitting routes, we believe that shippers may be disappointed in the bottleneck rates offered and deemed reasonable if the legislation were to become law.

“The Railroad Antitrust Enforcement Act of 2009” has also

been introduced in both bodies of the current Congress. This legislation would extend the applicability to railroads of the federal antitrust laws and, in contrast to the Rockefeller bill, would restrict some of the authority of the STB. The proposed antitrust legislation would authorize the Federal Trade Commission to enforce certain provisions of the legislation against STB-approved agreements or combinations, including those related to rates. The act would also authorize FTC enforcement against rail carriers for unfair methods of competition. Under the bill, private parties could bring actions seeking injunctive relief against a rail carrier for a violation of the antitrust laws. The text of the legislation makes explicit that in any civil action against a rail common carrier, the “U.S. district court shall not be required to defer to the primary jurisdiction of the STB.”

STB reauthorization and railroad antitrust bills have been introduced in several previous congresses. Neither has ever gotten to a floor vote. In June 2009, the Senate version of the railroad antitrust bill was withdrawn by unanimous consent in an agreement between Senators Rockefeller and Herb Kohl (D, WI) to incorporate its reforms into the pending STB reauthorization act. Despite months of cooperative efforts between shipper groups

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and railroads in helping craft the STB reauthorization act, the bill is generally opposed by the railroads and supported by many shipper groups.

Given past history and the present political environment, it seems unlikely that the current STB reauthorization and railroad antitrust bills will reach a floor vote. But even if railroad legislation were to pass, we do not believe it would deliver much rate relief to shippers. Determining “reasonable rates” is not that simple a matter, and introduces some chance of reducing market-based incentives in favor of cost-based regulation. Furthermore, any relief resulting from legislative reforms could be part of a near zero-sum game. Given that the railroads are approximately revenue sufficient and that policy establishes a financially viable railroad industry as an important objective, any significant rate relief to one group of shippers might mean other shippers would pay more.

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### Conclusions

The recovery of the railroad industry has coincided with one of the more stable periods in U.S. economic history. One wonders the extent to which the stability and absence of severe economic downturns has contributed to the railroad industry’s phenomenal recovery. Counterfactually, would



there have been a railroad recovery had general economic conditions been worse?

Some might argue that the Staggers Act had little to do with the industry recovery as the economy would have generated the growth in traffic volumes regardless. We reject this view. Our reading of the evidence is that it was not volume growth per se, but rather increased traffic density, resulting from a combination of volume growth and network contraction, that underlies the railroad productivity story. The Staggers Act provided the industry the flexibility and latitude to make the most of the good times.

The recent recession that began in December 2007 and pos-

greater overhead burden on customers, and worsen the financial condition of the railroads.

There are future opportunities also. Increased highway congestion and rising fuel costs could allow rail freight to grow at the expense of trucking. Future rail productivity gains depend on how the challenges and opportunities balance out.

The STB also faces ongoing challenges in its oversight of the railroads. The regulatory framework established by the Staggers Act and implemented by the ICC and then the STB has allowed the industry wide latitude to respond to market conditions. Under the ICC and STB's watch, the post-Staggers Act gains have been substantial and have gone mostly to consumers while the

railroads have gained enough to become a financially viable industry. But in the process, the Class I railroad industry has become very concentrated, essentially resulting in a pair of duopolies with many shippers left captive to a single railroad. Thus it seems that the regula-

tory backstop established by the Staggers Act to protect captive customers is every bit as important today as it was in 1980. That is not to suggest that there needs to be a heavier hand of regulation, but instead that changes in industry structure, financial conditions, and other market dynamics may lead to more situations in which the backstop comes into play.

The Staggers Act has lived up to its promise, delivering early, substantially, and over a long period of time. As we pass into the second decade of the new century, the state of the freight railroad industry is sound. Railroad productivity growth in the years ahead will likely be less than what has been experienced, but enough to sustain the industry. And the struggle between the railroads and the shippers to capture those smaller gains may intensify. Such an outcome would further attest to the Staggers framework resulting in workable regulation. We are optimistic that the regulatory framework will continue to provide the market flexibility and the oversight that the freight railroad industry will need to address future challenges and opportunities. **R**

## Just as the industry's recovery can be largely attributed to the growth of coal and intermodal traffic, the railroads appear vulnerable to future structural shifts that could work to decrease traffic density.

sible ongoing economic sluggishness might be the biggest challenge the post-Staggers railroad industry has faced to date. How the industry weathers the current economic storms may reveal the extent that the Staggers Act provides flexibility to minimize the bad times.

But the challenges facing the railroad industry go beyond the recent economic downturn. We agree with the observation of our Christensen Associates colleagues in their article (p. 28) that "economies of density work both ways." Just as the industry's recovery can be largely attributed to the growth of coal and intermodal traffic, the railroads appear vulnerable to future structural shifts that could work to decrease traffic density. A plausible scenario would be a significant lessening of the social appetite for coal, which would diminish the industry's low-cost baseline load. Likewise, interruptions or contractions of international trade could substantially reduce the railroads' higher-margin intermodal traffic. Either scenario could reverse the productivity gains achieved from increased density, put a

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