



JOINT TRANSPORT RESEARCH CENTRE

*Discussion Paper No. 2009-20
December 2009*

*Lessons from the U.S.
Transport Deregulation
Experience for
Privatization*

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1. INTRODUCTION

Travelers throughout the world are generally dissatisfied with their country's transportation system because of the significant highway congestion, air travel delays, unreliable public transit service, and so on, which they are forced to endure. Public officials have sought to address such problems by increasing government spending on transportation; but it has become quite clear that most, if not all, countries cannot spend their way out of their transportation problems.

The failure of the public sector to manage and operate transportation systems efficiently has spurred some countries to explore whether expanding the role of the private sector could improve the performance of their transportation modes and infrastructure. Examples include privatized railroads in various countries in Europe, privatized subways in Tokyo and Hong Kong, privatized airports in London and Sydney, and privatized highways in a few parts of the United States.

Of course, the limited privatization of transportation that has occurred around the world is not pure privatization because governments have maintained a presence by instituting some form of regulation such as price caps and limits on entry. Thus, considerable uncertainty remains about the economic effects of privatizing and deregulating part of or an entire transportation system and how policymakers should manage the transition to privatization to maximize its effectiveness.

The purpose of this paper is to suggest how the U.S. experience with deregulating its intercity transportation system can identify important considerations for all countries that wish to pursue privatization. Transportation deregulation in the United States gave private railroad, trucking, bus, and airline companies the freedom to set prices, choose which markets to serve, and what level of service to provide. Because U.S. firms were saddled with inefficiencies that developed over decades of regulation, their adjustment to deregulation has been difficult and time consuming. Nonetheless, deregulation has succeeded to a notable extent in the short run and could provide even greater benefits in the long run.

Privatization would give companies that were formerly in the public sector, such as public buses, railways, airports, and highways, the freedom to set prices, raise capital, and offer service in a competitive environment. Based on the deregulation experience, privatization could generate large benefits by enabling transportation providers to develop efficient practices, to be more responsive to consumers' preference, and to implement new technologies in a timely fashion. At the same time, privatized firms would have to overcome inefficiencies that are even greater than those that deregulated firms had to overcome because they were managed and operated by the public sector. Policymakers should be aware of this fundamental challenge and, if possible, take steps to ameliorate the difficulties that privatized firms would inevitably encounter.

2. TRANSPORTATION DEREGULATION IN THE UNITED STATES

Privatization and deregulation are transformative policies where the government transfers (through a sale) the parts of the transportation system that it owns and operates to private firms and does not regulate those firms' prices, service, and expansion and contraction of their networks (entry and exit).¹

With the exception of transferring the northeast freight rail system, Conrail, back to the private sector, the United States has not had recent experience with privatizing any part of its transportation system; but its recent experience with partially deregulating intercity transportation—railroads, trucking, airlines, and buses—has given us an opportunity to accurately assess the economic effects of that policy and to identify some important issues related to privatization.² As indicated by the term partial deregulation, policymakers did not deregulate every aspect, economic and otherwise, of carrier operations. For example, freight railroads are still subject to maximum rate regulations. In addition, policymakers did not reform public infrastructure policies to ensure that each mode's infrastructure would be in accord with carriers' adjustments to deregulation. For example, airports did not introduce congestion pricing even though airlines' accelerated development of hub-and-spoke route structures increased the demand for scarce runway capacity during peak travel periods throughout the day.

Two important considerations should guide interpretations of the evidence from deregulating the U.S. intercity transportation system. First, because regulation and deregulation never occurred at the same time at the national level,³ the most accurate way to measure the economic effects of deregulating a transportation industry is a counterfactual analysis that estimates the price, cost, and service changes that are solely attributable to deregulation and thus *would not have occurred* had the industry still been regulated. Second, as noted, the intercity transportation industries are still subject to some government regulations and some, if not all, firms that were subject to regulation have not fully shed their regulatory bequeathed operating practices and capital structure.

It is therefore useful to distinguish between the short-run and long-run effects of deregulation on the performance of an intercity transportation industry. In the short run, the industry has not been completely deregulated and may be subject to other government policies that compromise its performance under (partial) deregulation. In addition, firms that existed in the industry prior to deregulation have not fully adjusted their operations and investments to the deregulated environment. In the long run, the industry is fully deregulated and firms have optimized their operations and investments to this environment.

¹ The government may retain some control over firms' exit through the application of bankruptcy and merger and acquisition laws.

² Recent leases of U.S. highway facilities to the private sector, which are subject to regulations, do not constitute privatization.

³ Regulation and deregulation have simultaneously occurred at the state level. Comparisons of prices and service across states with different regulatory policies have been used to predict and assess the effects of deregulation.

3. THE SHORT-RUN EFFECTS OF DEREGULATION

Beginning with the 1978 Airline Deregulation Act, prices, service, entry and exit in the intercity transportation industries were substantially deregulated. However, travelers are still experiencing the short-run effects of airline deregulation because carrier competition and operations have been constrained by the lack of available gates at some congested airports; inefficient airport pricing and investment have allowed travel delays to grow, especially at hub airports, which handle far more operations under deregulation than they did under regulation; various hearings on and potential regulatory interventions in airline service and competition have partly diverted managements' focus from improving carrier operations; and tensions between managers of legacy carriers and labor continue to exist because the "rent sharing" mentality that developed under regulation has persisted under deregulation.⁴

The nation is still experiencing the short-run effects of railroad deregulation because maximum rate guidelines have not resolved the captive shipper problem—that is, some shippers have access to only one railroad; the threat of some form of rate-regulation has, at times, diverted the attention of rail managers from improving carriers' operations; and railroads have not completed the task of optimizing their networks and realizing greater economies of density by abandoning and consolidating the extensive track network that was built under regulation and by building new lines to serve high-volume shippers. And the nation is still experiencing the short-run effects of trucking deregulation because inefficient highway pricing and investment has caused delivery times to become longer and less reliable, which makes it more difficult for truckers to provide high-quality service to facilitate shippers' just-in-time inventory policies.

Despite being adversely affected by the lingering effects of regulation and deficient infrastructure, the intercity transportation industries have significantly improved their efficiency under deregulation and benefited users by reducing prices and providing better service.⁵ The key steps in the industries' process of adjustment have been the entry of new firms and the expanded entry by incumbent firms that has increased competition, and the freedom and incentive to improve operations and service quality to users. Deregulation also has its critics who point to financial crises, losses to labor, degradations in service, and the like as indicative of its failings.

Entry and price changes. Intercity transportation firms compete at the market or route level. It is often thought that the number of firms in a market is the most accurate indication of the level of competition; but deregulation showed that the identity of the firms may be as, if not more, important than the number of firms in determining the intensity of competition.

Competition increased in the deregulated airline industry because more (equivalent-sized) carriers competed on airline routes over given distances and because of the growth of new low-cost (low-fare) carriers such as Southwest Airlines. Morrison and Winston (2000) found that Southwest sharply reduced

⁴ Carriers were able to earn excess profits because regulation elevated fares and prevented entry. Labor unions' wage and workrule demands reflected their desire to share in carriers' rents. Deregulation has made it much more difficult for carriers to earn excess profits, but labor and the legacy carriers still have an adversarial relationship that can be traced to their hard fought negotiations during regulation. Carriers that entered the airline industry after deregulation have had to contend much less with this history when they negotiate with labor.

⁵ Morrison and Winston (1999) summarize the empirical evidence on the economic effects of airline, railroad, and trucking deregulation. Borenstein and Rose (2007) and Winston (2006) provide recent surveys of the evidence for airlines and railroads, respectively. Much less empirical evidence is available for the economic effects of intercity bus transportation.

fares on routes that it serves, on routes that it could potentially serve (i.e., Southwest serves one or both of the airports on the route but not the route), and on routes where it supplies adjacent competition (i.e., Southwest serves origin and destination airports that are within say fifty miles of the origin and destination airports that make up a given route).

Competition increased in the deregulated LTL (less-than truckload) trucking industry because of the growth of low-cost (nonunion) regional carriers and because of increased competition from alternative small shipment carriers such as UPS and Federal Express. The TL (truckload) sector has always consisted of unregulated competitors in the form of private trucking. Still, competition in this sector intensified following deregulation because of the growth of national mega-carriers (also called advanced truckload carriers), such as Schneider National and Landstar, and because private carriers were given the opportunity to transport other firms' freight.

The railroad industry has not experienced entry of new carriers since deregulation. Nonetheless, railroads have had to contend with additional competition provided by advanced truckload carriers, and they have enhanced their own competitiveness by accelerating the development of intermodal (truck-rail) service. Moreover, competition among railroads has increased because a large fraction of deregulated rail traffic moves under contract rates, thereby enabling shippers in many instances to play one railroad off against another when they negotiate rates.

In the most intense case, two railroads compete directly for a shipper's traffic if their tracks traverse directly into the shipper's plant or if they have access to the shipper through reciprocal or terminal switching. As pointed out by Grimm and Winston (2000), shippers that are captive to one railroad may benefit from locational competition supplied by a nearby carrier. For example, a shipper may be served by Railroad A but could threaten to locate a new facility on or build a spur line to Railroad B as a bargaining chip to obtain a lower rate from Railroad A or to get Railroad B to commit to a reduced rate. Shippers could also stimulate railroad competition in some cases through product or geographic competition. For example, an industrial site served only by Railroad A in a given market may be able to use a substitute product shipped from a different origin by Railroad B, or the site could obtain the same product from an alternative origin served by Railroad B. Finally, small shippers that may not be able to get railroads to compete intensely for their traffic may improve their bargaining position by using third-party logistics firms, which achieve cost savings for shippers by leveraging the volumes of all their clients to obtain discounts from carriers.

Consumers benefited from lower prices generated by new sources of competition in the intercity transportation industries, including incumbent firms, new entrants, and alternative modes. And those gains were magnified because competition also caused firms to operate more efficiently and to pass on much of the cost savings to consumers in lower prices. Deregulated competition has been sufficiently intense to cause airline fares on low-traffic density (nonhub) routes to fall (Morrison and Winston (1997)) and to cause rail fares to approach long-run marginal cost in duopoly markets for coal transportation (Winston, Dennis, and Maheshri (2008)).

Improvements in operations and service. Deregulation enabled intercity transportation carriers to simultaneously improve the efficiency of their operations and their service to travelers and shippers. Freed from entry and exit regulations, airlines have accelerated the development of hub-and-spoke route networks that feed travelers from all directions into a major airport (hub) from which they take connecting flights to their destinations. Carriers use hub-and-spoke route systems to increase load factors and reduce average costs, and, by increasing the number of feasible flight alternatives, to offer travelers much greater service frequency. For example, an additional aircraft departure from a spoke airport to a hub airport can increase the number of flight alternatives on many connecting routes.

Railroads have improved the design of their networks to channel more traffic on a given route and have made greater use of double stack rail cars and intermodal operations to reduce costs and provide faster and more reliable service to shippers.⁶ Trucking firms have also improved the efficiency of their networks, reduced costs, and provided faster and more reliable service to shippers.

Carriers have also made much greater efforts, sometimes with the aid of advances in information technology, to tailor their services to travelers' and shippers' varied preferences. Airlines have developed revenue (yield) management systems, which have helped carriers increase load factors by offering travelers a wide range of fares from discount fares with various travel restrictions to much higher fares with no travel restrictions. Airlines' computer reservation systems have helped to improve scheduling and flight reservations. Travelers are able to access those systems on airlines' websites to book their travel, thereby obtaining the lowest discount fares, to print their boarding passes and avoid the check-in line at the airport, and to receive real-time schedule information.

Railroads and trucking firms have negotiated thousands of price-service contracts with shippers that align their services with shippers' production and inventory policies and that make more efficient use of their own capacity. For example, shippers can sharply reduce their rates by including backhaul shipments in their contracts. Third-party logistics firms analyze shipper distribution patterns and logistics costs and use sophisticated software to determine the lowest-cost routes and the carriers with the lowest rates. Trucks and railroads also use computer information systems to route their cargo more efficiently and to track shipments.

It could be argued that carriers' adoption of advances in information technology would have occurred regardless of deregulation. But the benefits from those advances were realized because deregulated firms had the financial incentive and operating freedom to design new networks and to engage with customers to determine their preferences. Under regulation, they had little financial incentive or competitive pressure to do so, and regulators certainly were not able to design regulations to stimulate innovative activity.

Criticisms of deregulation. Intercity transportation deregulation has attracted its share of critics—although generally not from academia—who allege that the benefits from the policy have not been widely shared and that the deregulated transportation industries have been subject to service meltdowns and financial crises, which raise questions about their long-term viability. In fact, the benefits from deregulation have been broadly shared among consumers, while the problems that firms have experienced are either part of their long-run adjustment or not attributable to deregulation.

Price regulation benefitted certain travelers by, for example, keeping airline fares below marginal cost on short-haul routes and cross-subsidizing them with fares above marginal cost on long-haul routes, and benefitted certain shippers by preventing railroads from raising rates on bulk commodities. Thus, if economic deregulation improved pricing efficiency, it was not expected to benefit every traveler and shipper. Surprisingly, in the process of improving the cost efficiency of the intercity transportation system, the benefits to consumers from deregulation have been more broadly distributed than expected. And for the most part, consumers' losses can be explained by economic rather than anti-competitive forces.

About 80 percent of airline passengers (accounting for 90 percent of passenger miles) fly on routes with lower average real fares since deregulation. Roughly 90 percent of the difference in the gains to travelers can be explained by the higher costs of serving travelers on low-density routes, where smaller planes have a higher cost per seat-mile and fly with lower load factors (Morrison and Winston (1999)). As

⁶ Bitzan and Keeler (2007) estimate that freight railroads have reduced annual costs by as much as \$10 billion from increased traffic densities attributable to deregulation.

noted, deregulation reduced railroad rates, on average, and some small shippers have been able to share in those benefits by using third-party logistics firms. All modes have improved their service quality in the deregulated environment except when their operations have been compromised by public infrastructure inadequacies (e.g., airline travel times have increased because of inefficient runway pricing and investment). Moreover, the benefits from deregulation have been achieved without compromising any mode's safety record (Savage (1999)).

Labor benefited from price and entry regulation because unions' wage demands were not tempered by market forces. However, consumers' gains from deregulation do not primarily consist of transfers from labor. Peoples (1998) concludes that deregulation of railroads, trucking, and airlines caused wages to fall in those industries and resulted in a \$10.3 billion (1991 dollars) welfare loss to labor, which amounts to roughly 20 percent of the gains to consumers.

A fundamental challenge facing the intercity transportation industries is to match their capacity with demand. The unpredictability of demand could be particularly problematic for an industry that must invest in capacity long before actual demand materializes. If demand is lower than expected, firms may have to significantly cut prices to fill the available capacity. If demand is higher than expected, firms with the greatest capacity are likely to gain market share. The airline industry has made capacity commitments roughly two years in advance because of the lead times needed to acquire aircraft. Railroads and trucking firms face much shorter lead times when they invest in capacity.

Since it was deregulated in 1978, the airline industry has suffered huge financial losses because of overcapacity that was attributable to the early 1980s and 1990s recessions and to the September 11, 2001 terrorist attacks. It has also suffered losses from the sharp increase in fuel prices in 2008 that substantially raised the cost of carrier capacity. Of course, macroeconomic contractions, terrorist attacks, and spikes in fuel prices are not attributable to deregulation. In fact, industry losses may have been greater if carriers did not have the flexibility to respond to those shocks by adjusting fares and capacity throughout their networks.

Railroads are able to contract with shippers to align their cars and equipment with shippers' demand and to reduce their vulnerability to financial problems caused by overcapacity. But railroad consolidations in the aftermath of deregulation, such as the Union Pacific and Southern Pacific merger and Norfolk Southern's and CSX's acquisition of Conrail, have resulted in service disruptions because the acquiring carrier did not effectively integrate the acquired carrier into its operations. Fortunately, rail operations have improved quickly after the service disruptions and shippers' rates were not elevated because network capacity was restored (Winston, Maheshri, and Dennis (2009)). In the future, railroads that are involved in consolidations will hopefully take measures to avoid such disruptions.⁷

Finally, airlines have been sharply criticized for their lengthy delays, and in some cases for holding their passengers "hostage" on a tarmac for several hours. But as noted, air travel delays reflect to a large extent inefficient pricing and investment policies, while extreme delays suggest that an airport is indifferent toward the quality of service that its users receive. In my view, a private commercial airport would seek to develop a reputation for safeguarding travelers and would find it in its interest to prevent airlines from forcing passengers to remain in their aircraft for an excessive period of time (e.g., more than an hour or so) before taking off. Public airports have little economic incentive to reduce travelers' delays and discomfort and are therefore bystanders while passengers are stuck on *their* infrastructure for hours.

⁷ Winston, Maheshri, and Dennis (2009) indicate that future consolidations may arise because the remaining major carriers in the west, Burlington Northern and Union Pacific, may merge with a major carrier in the east, CSX or Norfolk Southern, to form two transcontinental railroads.

4. THE LONG-RUN EFFECTS OF DEREGULATION

In the long run, the benefits to consumers from intercity transportation deregulation will increase as firms are no longer saddled by three short-run constraints: suboptimal public infrastructure, counterproductive residual regulations, and inefficient practices and investments developed during the regulatory environment. The transportation industries cannot address the first and second constraints on their own. Indeed, privatization could significantly ameliorate the first constraint. Unfortunately, even an optimistic assessment would conclude that it would take decades to do so; in other words, the full benefits of deregulation are many years away.

For their part, the intercity transportation industries continue to adjust to the deregulated environment and improve their operations and investments. Through its travails with exogenous economic and non-economic shocks, the airline industry has become more resilient and efficient. It is improving its ability to match capacity with demand under a variety of difficult circumstances. For example, during the past several years airlines have reduced overbooking and denied boarding to fewer passengers by charging higher fees to change flights. But despite some thirty years of deregulation, the industry has yet to be profitable during an economic downturn. In addition, its labor relations are still contentious and it is not well-positioned to compete as effectively as possible in a deregulated global airline market. When those problems are adequately addressed, the industry will, at long last, have shed the inefficiencies of regulation, fully adjusted its operations to the U.S. deregulated environment, and enhanced consumer welfare even further.

The railroad industry has greatly improved its financial performance under deregulation, but it has not earned a normal rate of return on its invested capital on a consistent basis.⁸ To achieve that goal, carriers are slowly modernizing their equipment and optimizing their plant size by pruning their networks of unprofitable markets and investing in potentially profitable ones.⁹ Rail will therefore continue to make progress in improving its service times and reliability, reducing its costs, and benefiting shippers. The industry's structure has also not fully adjusted to deregulation. It is possible that more rail mergers will be proposed until only two (highly efficient) Class I railroads remain in the industry. This end-to-end restructuring would create two transcontinental railroads, but still leave two large railroads in the East and two in the West, thereby having little effect on competition. Indeed, this may be the final equilibrium for the U.S. rail freight industry.

The trucking industry has alleviated the serious shortage of long-distance drivers by increasing the use of intermodal operations and increasing compensation. For-hire truckers have significantly reduced their empty mileage under deregulation and they can make further progress by continuing to consolidate loads and by attracting more traffic from private trucking.¹⁰

⁸ The railroad industry's profitability is a controversial issue. However, it does appear that the industry's returns on investment have been below its cost of capital (Grimm and Winston (2000)).

⁹ Daniel Machalaba, "New Era Dawns for Rail Building," *Wall Street Journal*, February 13, 2008 points out that for the first time in nearly a century, railroads are making large investments in their networks—adding sets of tracks, straightening curves that force engines to slow, and expanding tunnels for bigger trains.

¹⁰ There has been little analysis of the intercity bus industry's adjustment to deregulation. But as noted by Schwieterman (2007), the industry has started to assert itself some 25 years after being deregulated by expanding service in several national markets.

5. IMPLICATIONS FOR PRIVATIZATION

By relaxing the federal government's control over airlines', railroads', and truckers' pricing, entry, and exit decisions, deregulation has tried to improve social welfare by accomplishing three goals for consumers and firms: first, to enable them to behave more efficiently within the technological "frontier;" second, to enable them to behave more efficiently as firms innovate and expand the frontier; and third, to enable them to respond more effectively to external shocks to reduce their costs.

Deregulation of the intercity transportation system has accomplished the first goal to a significant extent as firms have improved their basic operations and reduced prices, while heterogeneous consumers have selected price-service packages that are aligned with their varying preferences. Deregulation has made some progress in accomplishing the second goal as firms have successfully implemented advances in information technology to improve their operations. And firms and consumers—in particular, airlines and air travelers—have adjusted their behavior to reduce the cost of economic shocks that have occurred since deregulation began.

Because deregulation is a long term process, firms and consumers have not completely adjusted to it. First, regulation constrained and strongly influenced firms' operations and technology. Economists and other observers have underestimated the time that firms have required to optimize their pricing and service decisions to unregulated competition, to learn how to adjust those decisions to changes in the business cycle, and to shed inefficient operating practices, technology, and counterproductive frictions with labor and their competitors that may seek to gain a political advantage. Firms that have never been regulated occasionally make erroneous and costly business decisions; not surprisingly, deregulated firms have made their share of mistakes and have required considerable time to learn from those mistakes and how to respond to changes in their competitive and macroeconomic environment.

Second, it has been argued that regulation stymies innovation and technological advance (e.g., Gallamore (1999)) and that deregulation provides greater incentives and opportunities for firms to innovate. At the same time, the timing and location of technological advances is difficult to predict. Intercity transportation technology has improved under deregulation; but even after decades of deregulation, it is likely that further innovations that would not occur under regulation await the future.

Finally, the government must adjust its actions in light of deregulation. Counterproductive residual regulations, the threat of re-regulation, and inefficient infrastructure policies have undermined the performance of the deregulated intercity transportation industries.

Similar to deregulation, privatization has the potential to improve the performance of transportation services and infrastructure that are provided in the public sector by giving private firms the opportunity to develop efficient operations and to introduce technological innovations in a timely fashion. In the process, consumers could reap substantial gains.

But privatization differs from deregulation in at least two important respects. First, it would enable private firms to provide transportation services that were formerly provided by the public sector, but unlike deregulated firms most of the private firms would have little, if any, experience competing in those services. Second, unlike deregulated firms, private firms would inherit to a large extent the public sector's highly inefficient operations, investments, and technology.

Thus, transportation firms in a privatized environment are likely to face even greater challenges and more uncertainties in their adjustment to unregulated competition than private deregulated firms may face

in their adjustment. Based on U.S. carriers' experience with intercity transportation deregulation, privatized firms' adjustment process would most certainly be time consuming and far from error free.

Policymakers who have an interest in pursuing privatization should appreciate the magnitude of the adjustment process that firms in their country would have to endure to become efficient competitors. Accordingly, they should not maintain or implement policies that may compromise adjustments. And they, as well as the public, must be patient while firms try to overcome mistakes and setbacks that are bound to occur. At the same time, the potential long-run benefits from privatization will hopefully justify the intervening struggle.

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