Paying the Toll

Economic Deregulation of the Trucking Industry

Michael H. Belzer

Economic Policy Institute

1730 Rhode Island Ave., NW, Suite 200, Washington, DC 20036

ISBN: 0-944826-27-X

Michael H. Belzer is senior research associate for the Institute of Collective Bargaining at the School of Industrial and Labor Relations at Cornell University. His other research on the trucking industry includes "The Motor Carrier Industry: Truckers and Teamsters Under Siege," in *Contemporary Collective Bargaining in the Private Sector* (1994). He also wrote "Strategic Bargaining and Information Exchange: An American Version of Co-Determination?" and "Gain Sharing, Profit Sharing, and Collective Bargaining in the Private Sector," both forthcoming briefing papers for Cornell's Institute of Collective Bargaining. He received his doctorate in industrial relations from Cornell University.

Acknowledgments

The author wishes to thank the Economic Policy Institute for primary funding for this project. He also wishes to thank the Institute of Collective Bargaining at Cornell University, which provided general support for this research. The following individuals provided lengthy and invaluable comments: Dr. Russell B. Capelle Jr. (president of the Transportation Research Forum and chief transportation planner for the Massachusetts Central Transportation Planning Staff and director of its Intermodal Management System Project), Steven V. Burks (doctoral candidate in the Economics Department of the University of Massachusetts), Dr. Stephen R. Sleigh (director of research for the International Brotherhood of Teamsters), and Dr. Paul Boldin (associate director of research for the Teamsters). The idea of a centralized rate database originally was suggested by Mr. Burks in his review comments.

This research is part of a larger research project studying the transformation of the trucking industry and its industrial relations over the past 15 years. Cornell Professors Harry C. Katz and Susan Christopherson provided insights and comments in early stages of this research. Finally, Eileen Appelbaum, associate research director of the Economic Policy Institute, read all drafts of this manuscript and offered an incisive critique that helped to better focus the text.

Library of Congress Number 94-071595
ISBN 0-944826-27-X

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Executive Summary

Regulatory restructuring of trucking, begun by the Interstate Commerce Commission (ICC) in 1977 and put into law with the Motor Carrier Act of 1980, fundamentally changed the industry. It formally removed most economic regulations by allowing existing firms to enter new markets, letting new firms enter markets of their choice, eliminating collective ratemaking (and ICC supervision of rates), and allowing carriers to discriminate in favor of large shippers.

However, economic deregulation did not remove all regulations from the trucking industry. On the contrary, a patchwork of social regulation including the commercial driver's license, drug and alcohol testing, new highway safety programs, extensive hazardous-materials-handling rules, and many other kinds of structures, was soon constructed to fill the void. The industry is still regulated, but the new structure is more unwieldy, more unfair, less transparent, and arguably less efficient than its predecessor.

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Economic deregulation left clear winners and losers. The winners include major manufacturing companies and other large shippers, whose costs have declined markedly, especially if they ship in truckload lots.

Thousands of bankrupt carriers are among the losers, but the biggest losers have been trucking employees. While the wages of nonsupervisory manufacturing and service employees declined an average of $1,900 (in 1982-84 dollars) between 1978 and 1990, nonsupervisory trucking employees' wages declined nearly $6,700 or 26.8%. In fact, 83% of the welfare gain from economic deregulation has resulted from transfers of wealth from trucking employees to manufacturers and shippers, not from any gains in efficiency.

Nonunion drivers absorbed the direct impact. The wage gap between union and nonunion workers nearly doubled in the first decade of economic deregulation. In addition, most nonunion truckload employees give away their loading and unloading time and waste many unpaid hours—even unpaid days—waiting to load or unload, waiting for dispatch, and waiting on equipment. Low pay, unpaid time, and unpaid labor cheat workers out of a decent living, but they also contribute to inefficiency and low productivity, since the carriers who employ these low-cost workers have little incentive to improve their management practices. Most of the

harm to Teamsters has been indirect—through the availability of low-wage, lower-quality nonunion drivers who have helped drive down wages of unionized drivers and reduced the threat of unionization elsewhere.

Policy Recommendations

While we cannot go back to the old regulatory system, we nevertheless need to address the unanticipated consequences of economic deregulation. A new, carefully considered regulatory framework could be established that would minimize the burdens on trucking companies, their employees, and consumers. Such a system would incorporate:

A new, carefully considered regulatory framework could be established that would minimize the burdens on trucking companies, their employees, and consumers.

- **New labor standards**, by extending the protection of the Fair Labor Standards Act to employees of trucking firms. Such a change would provide minimum wage protection, guarantee that employees are paid for all time worked, provide for overtime pay after 40 hours, and eliminate percentage pay for drivers and subcontracted owner-operators.
- **Hours-of-service rules**, aimed at maximizing the safety and health of truck drivers along with that of the motoring public. These rules would prohibit competition based on overwork and require firms to structure schedules to maximize driver alertness.
- **Labor law reform**, which would permit owner-operators to join a union, allow interstate truck drivers to vote for a union shop by majority rule in all states, and certify representation in interstate trucking by card check.
- **Institutional reform**, by strengthening the ICC and giving it a clear mission: to lower the transactions cost for the transportation of goods. A single centralized database of truckers and their rates would add both efficiency and equity by improving the exchange of information between service providers and consumers and discouraging below-cost rates. In implementing this database, the ICC would upgrade the quality and completeness of data collection; require interstate carriers to file tariffs electronically with the ICC; allow agents to access the ICC database and match shippers with truckers; prohibit volume, or "off bill" discounting, which allows a shipper to charge a customer one rate but pay the trucker a lower rate; properly classify carriers by market and operation, thereby obviating the need for gross deregulation just to correct for inadequate ICC administration; and extend the managed market information system to the states.

Introduction

Since the 1950s, academics and practitioners have debated the relative costs and benefits of transportation regulation. The debate has been between those who argue that economic regulation benefits the industry at the expense of consumers, and those who argue that regulation benefits consumers by ensuring stable, high-quality distribution. Opponents of economic regulation claim it stifles competition and innovation and encourages inefficiency. Supporters claim it provides a framework on which to base competitive business strategies that promote investment in new service capability.

Deregulation replaced one regulatory structure with another.

A major restructuring of transportation regulation occurred between 1977 and 1980. Who were the winners and who were the losers? Are consumers better off as a result? How has the transportation industry fared? What happened to the wages, employment security, and the safety of truck drivers? How did regulatory change affect the Teamsters Union?

This paper argues that limits to *laissez faire* exist in the trucking industry. In effect, deregulation replaced one regulatory structure with another. How does the new structure compare with the old? How has it affected industry operations, market structure, employment, productivity, and profitability? For employees, what has been the impact on wages, unionization, and collective-bargaining patterns?

While technological change has driven industrial restructuring in many industries, institutional change was the driving force changing the character of the motor-carrier industry. This is not to deny that new technology has had an impact. Larger and heavier trucks, fork trucks and drag lines on freight docks, instantaneous electronic transmission of freight bills, satellite tracking of trucks, and computerized costing and routing hardware and software have all raised the trucking industry's productivity. These changes would have improved the efficiency of trucking operations regardless of regulatory regime, and they were developing on their own by the late 1970s.

Yet regulatory decisions have driven much of the change since 1980 in market structure, profitability, and employment conditions. Made administratively or legislatively, these decisions have affected management, labor, and stockholders. Indeed, the trucking industry has lost a great deal

as a result of regulatory reform and risks greater losses caused by continuing institutional instability. Although losses are uneven, the hemorrhage of bankruptcies among a wide range of trucking carriers continues. And despite the promises of the deregulators, the investment rate in this industry continues to decline.

The public also has a stake in the restructuring of the motor carrier industry. Several studies have claimed that, because the nation's distribution costs have declined, regulatory restructuring caused a net social gain. However, regulatory reform may merely have transferred wealth from carriers to shippers, with uncertain net gain to consumers, while the public bears the costs in reduced safety or service. The millions of people who happen to work in the trucking industry are also part of the public. How have these policy changes affected them, and has the net result been to impoverish or enrich the nation? If the new economic order limits job creation in the trucking industry to low-wage, insecure positions, is the nation better off?

Regulatory reform may merely have transferred wealth from carriers to shippers, with uncertain net gain to consumers, while the public bears the costs in reduced safety or service.

While we cannot return to the pre-1980 regulatory era, the current framework is opaque, unwieldy, and less transparent than the old. The regulatory framework must continue to evolve. This study poses an alternative that simplifies and clarifies the rules that govern shippers and truckers.

The Nature of Regulation

What Is Regulation?

Regulation is a broad term for institutional rules governing mixed-market economies. Governments in these economies intervene to modify the market to achieve socially desirable ends. Intervention may range from simple information gathering to complete control of products and profits. In order to thoroughly and effectively analyze these regulations, policy makers must weigh benefits against costs on political, social, and economic dimensions. This paper will evaluate the results of restructuring trucking industry regulation along all three dimensions.

Markets are always regulated. In the most extreme interventions, the government may step in to regulate price, quantity, or quality within any given market. At a minimum, the government creates and enforces rules governing the structure and responsibilities of firms, as well as rules

to be followed when a firm becomes insolvent. Even in a relatively unregulated economy, the government may outlaw price-fixing conspiracies, define business practices that unlawfully restrain free trade, and forbid extortion and usury. Thus, the clamor to deregulate various markets really is nothing more than a demand to alter the existing form of regulation and replace it with another (Kane 1988).

Regulation's consequences have to be evaluated along multiple dimensions. One regulatory scheme might produce an efficient economic solution that destabilizes political forces and creates a threat to democratic civil society. Another regulatory scheme might protect the environment from a specific industrial depredation while unintentionally creating some other environmental hazard or risk that outweighs the original peril. A third set of regulations might ensure nondiscriminatory employment practices but be awkwardly written, making compliance so difficult that only lawyers may benefit. The rules governing bankruptcy shelter the property of creditors and protect viable companies while they restructure debt, but the regulations also may allow insolvent companies to compete unfairly against solvent companies, thereby distorting the market to the detriment of more efficient operators.

The clamor to deregulate various markets really is nothing more than a demand to alter the existing form of regulation and replace it with another.

There are two broad categories of regulation. Economic regulation defines the market environment within which industries operate and often establishes government agencies that authorize particular business operations. Economic regulation generally deals with such issues as price, entry, and rate of return. Social regulation bounds the market, establishes limits to competition, and provides social accountability for economic externalities created by the forces of private competition. Social regulation also encompasses attempts by political interest groups to achieve noneconomic goals through the imposition of controls on private enterprise (Reagan 1987; Swann 1989).

Whom Does Regulation Affect?

Economic and social regulation both have winners and losers. Licensing of medical professionals may create higher-quality health care, but it limits the market by specifying what constitutes a *bona fide* medical service. The national commercial driver's license (CDL) may raise and unify licensing standards for truck drivers, but it limits the labor market to

those who can read and write well enough to pass the written test and to those who have access to commercial vehicles for the road test. Pervasive and universal drug testing may reduce drug use among transportation personnel, but it limits the labor market to those who accept this invasion of privacy. Professional teacher certification may raise teacher effectiveness and standardize teacher qualifications, but it limits the ability of communities to employ those who do not meet these standards.

Both kinds of regulation have political origins and consequences, although policy makers typically cite the public interest as justification. For example, New York City licensed cartmen, operators of local for-hire horse teams, more than 200 years ago by fixing cart size; implementing speed, noise, and safety rules; and controlling entry and rates as well as industry structure (Leiter 1957, 16). City officials enacted these regulations to protect commerce from the extortive potential of organized cartmen and to protect the public from individual competitive actions. In a more recent example, Congress enacted the law requiring mandatory drug testing of truck drivers in the context of public hysteria over drug use in the 1980s, an issue inflamed for political reasons by the Reagan/Bush "war on drugs."

Once established, regulations develop a life of their own and are resistant to modification or elimination.

Legislators and agencies often take regulatory action after the public has become aroused by some abuse or catastrophe. Once established, regulations develop a life of their own and are resistant to modification or elimination.

The definition of "the public interest" is inherently political. Congress passed the Interstate Commerce Act of 1887 in response both to agrarian populist agitation for public controls over monopolistic practices by railroads and, paradoxically, to efforts by the established railroads to eliminate competitive threats from smaller upstarts. Originally supported by railroads threatened by trucker competition, the Motor Carrier Act of 1935 was eventually endorsed by most economists as an appropriate public response to destructive competition that appeared to be producing low profits and wages as well as inadequate and irregular service. The federal coordinator of transportation produced a report in 1934 recommending social and economic regulation of both common and contract motor carriers (Taff 1986, 350).

The states also actively supported transportation regulation because they saw unregulated trucking as bad for local business and dangerous to

the public. State governments agitated for federal legislation after the Supreme Court, in *Buck v. Kuykendall* (267 U. S. 307 [1925]), blocked state regulation of motor carriers engaged in interstate commerce (Dempsey and Thoms 1986, 17-20; Taff 1986, 350). Opposed at first by truckers, the Motor Carrier Act of 1935 eventually became the institutional foundation upon which industry structure and profitability rested.

From the Pure Food and Drug Act of 1906 to the Clean Air Act of 1990, political forces also have spawned social regulation to cope with the externalities of the competitive process. The private production process creates public goods that individual actions can devalue. An individual entrepreneur with a short time horizon can make money on a defective product until his reputation catches up with him. However, such practices can shake public confidence in an industry's products or services and harm the industry's reputation. In this instance, the individual's defective goods impose a negative externality on the marketplace that diminishes the value of the goods made by legitimate producers. Markets can be fragile, and the recent case of contaminated Jack-in-the-Box meat reminds us that quality standards create a public good—trust in the safety of the food supply—in an economy dependent on multiple private transactions.

Safety and health regulations aim to preserve a level playing field in transportation so that self-seeking individuals do not harm either the industry or public safety.

Highway safety is a public good consumed by all highway users, and irresponsible operators who violate safety rules in pursuit of private gain create a negative externality. Safety and health regulations, originally implemented by the Interstate Commerce Commission and later transferred to the Department of Transportation, aim to preserve a level playing field in transportation so that self-seeking individuals do not harm either the industry or public safety. Without regulations, individual operators might drive 1,000 miles per day and work around the clock, thereby creating market imperatives destructive of personal health and public safety. Before regulation, individuals and carriers drove themselves without limitation, at enormous risk to themselves and others (Childs 1985, 35-40). These and other social regulations affect the economic well-being of the trucking industry and therefore are part of the fabric of regulation that we must consider as we weigh the costs and benefits of regulation.

Trucking is a derived-demand industry, meaning that the demand for trucking is derived from the demand for goods. However, shippers of goods directly consume trucking services; end purchasers consume truck-

ing services indirectly. In fact, logistics and distribution, whether purchased or not, are integral to the production process. Therefore, the relative efficiency of the distribution process, and the costs added to the production of goods, has a significant effect on product marketability. Efficient regulation may enhance the economic distribution of goods, while inefficient regulation may add unnecessary costs.

The Regulation Debate

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The debate over regulative restructuring has been cast in a stark "good guys–bad guys" mold (Breyer 1982; Derthick and Quirk 1985; Robyn 1987). In this model, the good guys support free enterprise and the unregulated market ("procompetitive deregulation"), and the bad guys are those "special interests" in tasseled loafers who appropriate the political process for their own private ends ("anticompetitive regulation").[1] In fact, the issue is more complex.

The primary supporters of a reduction in economic regulation have been the nation's largest shippers of goods and their trade associations—two obvious special interests. For shippers, intensified competition means lower prices and more choices among transport modalities. Besides across-the-board declines in rates, large manufacturers expected that regulatory reduction would allow them to use the additional economic leverage of large-scale purchase of transportation service to drive down their particular cost structures.

This position was also supported by the nation's 200,000 owner-operators and their associations. Owner-drivers not only eyed high trucking rates, but also believed they had lower cost structures than their potential competitors, hampered by union-scale wages and costly investments in terminals, warehouses, and support employees. As individuals, however, they did not consider what it would mean if all of them entered the market, without rate and entry control, nor did they anticipate the growth in social regulation designed to curb abuses.

Finally, most microeconomists, who adhere to a theory of market economics uncomfortable with regulatory institutions, supported regulatory reduction. Many were certain the elimination of most economic regulation would be an unmitigated success (see Kahn 1988). However, at least one supporter of economic deregulation with a background in trans-

portation economics cautioned that the elimination of government regulation could seriously harm some sectors of the transportation industry (particularly trucking companies), and might cause the industry to concentrate and create multimodal transportation empires, potentially restricting competition in the long run (Friedlaender 1969, 153, 155-159, 165-168).

As expected, the opponents of regulatory restructuring were those who had a stake in the existing system. Trucking companies, with a collective $3 billion to $4 billion investment in operating authority required by the existing system of regulation (Snow and Sobotka 1977, 153), generally opposed economic deregulation, since they knew these rights would instantly become worthless. By 1980, however, some of these companies had adjusted successfully to administrative deregulation and figured they might ultimately benefit. In addition, since the Motor Carrier Act of 1980 (MCA of 1980) primarily codified the administrative deregulation enacted by the ICC over the previous three years (Pustay 1989, 244-246), the American Trucking Associations (ATA) came out in support of the act, believing its passage might shut the door on any further economic deregulation.

Organized labor was one of the main targets of the proponents of regulatory restructuring.

Organized labor was one of the main targets of the proponents of regulatory restructuring. Many economists reasoned that the Teamsters were the main beneficiaries of regulation because the union siphoned off economic rents for the workers it represented (Moore 1978; Rose 1985; Hirsch 1988, 1993). Rose claims unionized employees captured between two-thirds and three-quarters of regulatory rents (1987, 1175).

The Teamsters recognized that reduction of rate and entry control would mean the entry of thousands of new nonunion competitors and would greatly complicate collective bargaining in the trucking industry. Since the union was already beset with problems caused by the pernicious inflation of the 1970s, combined with economic stagnation that had already reduced tonnage, the Teamsters expected disastrous consequences from entry and rate decontrol.

Finally, many transportation economists opposed wholesale reduction of regulatory oversight. These economists did not think the unregulated market would be a panacea, and predicted that regulatory restructuring would produce market concentration and, some believed, destructive competition. They reasoned that the peculiar structure of the transporta-

tion industry would create a market in persistent crisis, with profits too low to support reinvestment and driving wages too low to support recruiting (Rakowski 1988; Glaskowsky 1990; Furlong 1992).

Although the policy debate was framed as a choice between regulation and deregulation, in practice, concern for the public good following economic deregulation led to the enactment of a patchwork of social regulation, thus replacing one regulatory framework with another. How do we evaluate the effectiveness of these frameworks?

Concern for the public good following economic deregulation led to the enactment of a patchwork of social regulation.

Institutions will remain with us as long as we retain civil society. Efficiency and equity in regulation must remain the dual goals of government policy. The following sections review the main features of economic regulation before and after passage of the Motor Carrier Act of 1980 as well as the growth of social regulation in the 1980s. This analysis addresses the effects of this change in regulatory regime on industry structure, market concentration, employment, and wages. Efficiency and equity elements of the new regime are evaluated and found inadequate. The paper concludes with proposals for policy changes that will strengthen the industry and improve outcomes for workers and consumers.

Economic Regulation of the Trucking Industry

Economic Regulation Before 1977

Strong competition among truckers developed during the 1920s and intensified during the Great Depression, bringing with it low rates and irregular service. Policy makers considered irregular service a threat to interstate commerce as well as to the budding motor trucking industry. The low rates also threatened the railroads, since intercity truck transport was invading the railroads' less-than-carload market (see Felton 1989a, 3-13).

Congress passed the Motor Carrier Act of 1935 (MCA of 1935) after 10 years of agitation by state regulatory agencies, the Interstate Commerce Commission, business, and labor (Taff 1986, 350; Childs 1985). Later incorporated as Part II of the Interstate Commerce Act of 1940, it followed the pattern set by the Interstate Commerce Act of 1877 in that it regulated interstate trucking for the benefit of the industry and the public good. Federal regulation, however, did not arise in a vacuum. Although

the commerce clause of the U.S. Constitution prohibited states from making regulations that affected interstate commerce, most states required carriers to obtain intrastate operating certificates based on a convenience and necessity standard. They also regulated carrier safety based on their ordinary police powers. As motor carriers of freight and passengers sought to extend their business to adjoining states, inconsistent state regulation and certification hampered them (Dempsey and Thoms 1986, 17-20; Childs 1985, 49-54).

Regulation as administered by the ICC closed the trucking industry to most new entrants. Existing carriers of most commodities had to apply to the ICC for certification, and new carriers had to establish, to the ICC's satisfaction, that there was a need for service that existing carriers could not meet. Carriers also had to meet fitness standards proving they were capable of meeting the demand for service and had to certify insurance coverage. Common carriers and contract carriers differed in that the former had to be available to serve the public based on publicly filed rates, while the latter limited themselves to serving individual shippers under rates determined by private contract. Finally, the law established value-of-service pricing as the legal standard, and rates had to be compensatory.[2]

The Motor Carrier Act of 1935 created a legal and structural taxonomy that remains fundamentally unchanged to this day.

The MCA of 1935 created a legal and structural taxonomy that remains fundamentally unchanged to this day. The act split for-hire trucking among three types of carriage: contract, common, and exempt. Common carriers hauled a wide range of commodities according to published tariffs filed with the ICC. They set tariffs collectively using rate bureaus or filed rates independently.[3] Common carriers made their services available to the public over regular or irregular routes on a scheduled or unscheduled basis. The act made common carriers liable for the full value of the freight they hauled, and their rates reflected that liability.

The act allowed for-hire contract carriers to haul a similar range of goods, but a private contract between the shipper and the trucker specified rates and services, generally for truckload shipments. Although contract carriers filed their rates with the ICC, they did not make their services available to the public through a posted tariff. Unlike common carriers, contract carriers ordinarily were not liable for the value of freight.

Following the MCA of 1935, the ICC sought to draw a line between common and contract carriage. While the ICC required common

carriers to meet strict standards of "convenience and necessity," availability, nondiscrimination, and load liability, it required contract carriers to serve a narrow niche. Contract carriers were subject to the rule of eight: carriers could be contracted (and dedicated) to a maximum of eight shippers. While common carriers set rates collectively and filed them with the ICC, contract carriers set rates within a private contract framework between shipper and trucker.

Exempt carriers included those that hauled commodities, including raw agricultural goods, newspapers, and several other specific products, that were free of federal regulation; operated within designated urban commercial zones; offered intrastate and local cartage; or shipped products that were part of continuous air-freight movements. Private carriers, which exist primarily for the transportation of goods or services produced or sold by non-transportation firms, were also exempt.

The issue of price is at the heart of transportation regulation, and it has long been a source of controversy.

The Transition: Between 1977 and 1980

The deregulation of the trucking industry began in 1977. Between that year and 1980, with the encouragement of the Carter Administration, the ICC used its administrative discretion to reduce its economic control incrementally (Harper and Johnson 1987). Annual operating authority applications dramatically increased as ICC approval rates increased to 98% in 1979. It allowed some carriers to transfer dormant authority even though the action harmed protesting carriers, eliminated gateways, allowed carriers to hold both contract and common carrier authority for the first time, and let the rule of eight lapse (Anderson and Huttsell 1989, 20). The commission even departed from the "convenience and necessity" standard that had applied to common carriers at least as early as 1877. It thereby permitted private carriers to act as for-hire carriers on the backhaul (to facilitate energy savings), and let private carriers set up separate transportation divisions that transported freight for an entire corporation and its related entities (Sweeney et al. 1986; Anderson and Huttsell 1989, 22). Perhaps most important, the ICC began to reduce the power of the rate bureaus (Anderson and Huttsell 1989, 37-41).

The issue of price is at the heart of transportation regulation, and it has long been a source of controversy. Should transportation rates be based on the cost of the service or on the value to the shipper of the service

demanded? Those who argue that the cost of service should determine rates claim that regulated value-of-service rates distort the market and cause allocative inefficiency. Kahn claims truck common carriers merely matched rail value-of-service rates and took the cream off the market. "Once the trucking alternative was available, defining value of service (or demand inelasticity) in terms of the value of the commodities being shipped became highly illogical" (Kahn 1988, Vol. 2, 14-15)[4]. According to the cost-of-service argument, unregulated competition will ensure that carriers base freight rates on the actual marginal cost of transportation.

Others argue that value-of-service pricing is a logical approach to pricing transportation services and that it is inherently efficient, since the demand for service determines rates. Locklin cites F. W. Taussig: "Ability to stand the transportation charge is the test of the utility of the carriage" (Locklin 1972, 10-11). Value-of-service theory contends that transportation-market efficiency will cause transporters to set rates according to the relative value to the shipper of moving the freight quickly. The law of supply and demand will force those with inelastic demand to pay higher rates and fully allocated costs, or more. Conversely, those with elastic demand will hold their goods and more likely pay the marginal cost of transportation, or less (Locklin 1972, 142-170).

Value-of-service theory contends that transportation-market efficiency will cause transporters to set rates according to the relative value to the shipper of moving the freight quickly.

According to this argument, value-of-service pricing is consistent with Marshall's laws for a derived demand. Competition will ensure that truckers base freight rates on the value to the shipper of moving any particular shipment of goods, and that value will relate directly to inventory cost (De Vany and Saving 1977, 592; Beilock 1985, 93). So, the elasticity of demand corresponds directly to the value of the goods transported. If value-of-service theory explains price, and the value of the service corresponds with the inventory cost, then the value of goods is a reasonable proxy with which to define freight rates.

In fact, cost-of-service pricing may not exist in the competitive market. The logistics strategies of shippers and the business strategies of carriers may tend to replicate "value-of-service" pricing even without regulation. For example, recent empirical research shows that value-of-service pricing determines rates in the never-regulated produce-hauling market (Beilock 1985).[5]

Many scholars give President Reagan credit (or blame) for regula-

tory restructuring (Noll 1988; Moore 1988; 1991). However, the Motor Carrier Act of 1980 was signed by President Carter, and it merely gave legislative sanction to the administrative deregulation of the late 1970s (Bohlander and Farris 1984, 225; Derthick and Quirk 1985, 6; Dempsey and Thoms 1986, 23; Khan and Reinsch 1989; Pustay 1989). While regulatory restructuring in trucking began as an incremental process, the passage of the MCA of 1980 legislatively legitimated it. However, legislative regulatory restructuring did not significantly extend beyond administrative deregulation, and arguably provided a fallback position, albeit a deep one, for the industry (Derthick and Quirk 1985, 164-174, 206, 242-244).

Legislation restructured regulation along several dimensions: on the economic side, the critical changes involved relaxation of industry- and market-entry rules and relaxation of controls over rates.

Economic Regulation After 1980

Although we commonly describe the change as deregulation, the trucking industry has not been deregulated. Legislation restructured regulation along several dimensions, increasing restrictions on some activities and decreasing them on others. On the economic side, the critical changes involved relaxation of industry- and market-entry rules and relaxation of controls over rates. On the other hand, the entry and rate-filing structures remain. All carriers must obtain authority, and common carriers must still file rates, although the ICC's lack of enthusiasm for rate filing has led to chaotic procedures and inconsistent law enforcement (Sweeney 1986).

The MCA of 1980 set the following key rules:

- Individuals or business seeking to enter the interstate trucking business "need only prove a 'useful public purpose' rather than public convenience and necessity." Carriers must apply for and receive operating authority, prove they are able to provide the service they plan to offer, and prove insurance coverage.
- The new regulations eliminated gateways and indirect routings through the cities for which carriers had authority, thereby allowing carriers to take the most direct route. The new rules supported ICC grants of blanket roundtrip authority and struck "unreasonable and excessively narrow territorial limitations."
- A "zone of rate freedom" authorized carriers' rates to vary within a specified range, without requiring the carrier to file a new tariff. New rules allowed released value rates that relieved common carriers of liability for the value of freight, if the tariff so specified it.

- New regulations limited rate bureau authority. The ICC phased out bureaus' single-line rates (the rate for a shipment on a single carrier) after January 1984 and eliminated antitrust immunity. Rate bureaus still function in a research and advisory capacity and in limited collective rate making. In the confusing environment that resulted, carriers collectively raise tariffs beyond the rate of inflation and then deeply discount those rates on an individual, shipper-by-shipper basis, a practice that produces sharp discrimination between large and small shippers. However, carriers must still file rates with the ICC. For years, carriers have filed rates for individual shippers using shipper codes that hid the name of the shipper, and filed range tariffs that hid the actual rate. The Negotiated Rates Act of 1993 (NRA of 1993) put an end to that controversy by making range tariffs illegal and requiring carriers to code tariffs with the name of the shipper (Cassidy 1994, 3).
- The new rules formally eliminated the rule of eight (which had limited contract carriers to eight shippers), thereby allowing carriers to hold both contract and common authority. Private carriers gained expanded hauling rights, and other rules were loosened (Bohlander and Farris 1984, 224-225; Sweeney 1986).

Social regulation—especially highway safety regulation—increased throughout the past decade, arguably making the trucking industry more regulated than ever.

By 1990, approximately 58% of all intercity ton-miles remained exempt from federal economic regulation, and exempt trucking accounted for 54% of all truck-freight revenue. Exempt carriers' share of tonnage increased 1.62% during the 1980s, while their share of revenue dropped 1.48% over the same period (Smith 1992, 8, 10).[6] While the extent of economic regulation has diminished for the regulated carriers, common carriers must still apply for certification and operate within its limits, provide proof of insurance, file tariffs,[7] charge according to filed tariffs, and keep and file specified financial and operating reports (Taff 1986, 355).

Social Regulation of the Trucking Industry

The restructuring of economic regulation reduced government economic controls but left social regulation intact. In fact, social regulation—especially highway safety regulation—increased throughout the past decade, arguably making the trucking industry more regulated than ever (U.S. Congress, Office of Technology Assessment 1988, 55).

Safety Regulation

Safety regulation originated with state police powers (Dempsey and Thoms 1986, 17). Forty-four states have established intrastate transportation regulatory agencies, and 23 states have their own departments of transportation (Taff 1986, 349)[8].

As the trucking industry expanded beyond local cartage into interstate commerce, single-state regulation became less effective, and the federal government stepped in to set national safety standards. The Motor Carrier Act of 1935 established economic and safety regulation on a national basis, and gave the authority to enforce both to the Interstate Commerce Commission. The ICC issued its first set of safety standards in 1940, applicable to common, contract, and private carriers (U.S. Congress, OTA 1988, 82). Authority for safety supervision further centralized following the 1956 establishment of the Highway Trust Fund, and the federal government standardized size and weight limits. States that did not conform to the new national standards risked losing federal highway aid. After 1956, this use of federal funds to leverage states' compliance with federally established standards became routine.

As the trucking industry expanded, single-state regulation became less effective, and the federal government stepped in to set national safety standards.

The Highway Safety Act of 1966 directed the secretary of commerce to set new standards for "driver education and licensing; vehicle registration, operations, and inspections; accident investigations and reporting; traffic control; and highway design and maintenance" (U.S. Congress, OTA 1988, 80). The National Traffic and Motor Vehicle Safety Act, also passed in 1966, created the National Traffic Safety Agency to develop new safety and performance standards. Later in 1966, Congress transferred safety regulation from the Commerce Department and the ICC to the newly created Department of Transportation (DOT).

The Federal Highway Administration (FHWA) within DOT took over administration of employee qualification, hours of service, operations, and truck safety (U.S. Congress, OTA 1988, 81-82). Within the FHWA, the Office of Motor Carriers (known until 1985 as the Bureau of Motor Carrier Safety, or BMCS [U.S. Congress, OTA 1988, 148]), administers motor carrier safety programs. The National Highway Traffic Safety Administration (NHTSA), created by the Federal-Aid Highway Act of 1970, has broader responsibility for highway, vehicle, driver, passenger, and pedestrian safety. The National Transportation Safety Board (NTSB), cre-

ated by the Department of Transportation Act of 1966, is an independent agency responsible for investigating transportation accidents and developing proposals designed to promote transportation safety (Taff 1986, 363-365; U.S. Congress, OTA 1988, 62, 82).

The nation's concern with high accident and fatality rates on the highways drove much of the national regulation in the 1960s and 1970s. To enforce these new regulations, Congress and the president enhanced the power of the purse. Between the 1950s and the 1970s, the tax and program burdens shifted to the federal government, and it forced states to comply with the new federal standards or risk losing valuable federal funds (U.S. Congress, OTA 1988, 55-82). By the 1970s, the dependence was complete, enabling President Nixon to force states to adopt the 55 mile-per-hour speed limit, in spite of great opposition, under the threat of losing federal highway funds.

Between the 1950s and the 1970s, the tax and program burdens shifted to the federal government, and it forced states to comply with the new federal standards or risk losing valuable federal funds.

Social regulation slowed following regulatory restructuring in 1980, but redoubled efforts to protect public safety, undertaken in the wake of economic deregulation, soon led to its intensification.

For example, extensive DOT studies on the nature of driver fatigue, its causes, and potential solutions led the BMCS to propose several possible changes in hours-of-service rules in 1978, but the Reagan Administration threw them out. A cost-benefit analysis, prepared by Booz, Allen & Hamilton, claimed the costs outweighed the benefits (U.S. Congress, OTA 1988, 147-152).

Despite this failure to revise hours-of-service rules first issued in 1937 and 1938, the federal government continued to pair highway funding and safety legislation (although it sometimes combined highway and safety funding with productivity enhancements for the industry that many safety advocates claimed posed safety risks). The Surface Transportation Assistance Act (STAA) of 1982 raised highway taxes while establishing uniform minimum size and weight limits on interstate highways and other interstate-quality highways that were part of the FHWA's "designated highway system" for STAA vehicles. Again, states that did not comply risked losing federal highway funds. This act also established the Motor Carrier Safety Assistance Program (MCSAP), designed to help states develop better and more extensive enforcement programs. These programs intensified enforcement of safety and hazardous materials regulations by implementing

training of roadside inspectors, audits of interstate carriers' terminals, and increased enforcement of the 55 mile-per-hour speed limit, and they provided special funding to help states develop programs to enforce federal motor carrier standards, including state standards that are at least as rigorous as the federal ones (Taff 1986, 366; U.S. Congress, OTA 1988, 55-57). Finally, the STAA protected drivers and other trucking employees from discipline or discharge for reporting a safety problem or for refusing to violate safety laws. However, the law charges the Occupational Safety and Health Administration (OSHA) with enforcement of this whistle-blower protection, and critics charge OSHA with failure to enforce the law (Teamsters for a Democratic Union 1989, 6-7).

The commercial driver's license requires all commercial drivers to have a special license appropriate to the equipment they drive and the loads they haul.

Still concerned about the safety problem, Congress passed the Motor Carrier Safety Act of 1984. This act gave the states five years to meet federal safety standards or risk federal preemption of state laws; directed DOT to establish more regulations to establish minimum vehicular and operational standards; increased fines and enforced standards administratively, avoiding the need to win criminal convictions in federal courts; and required states to conduct equipment inspections at least annually. The Tandem Truck Safety Act of 1984, part of the Motor Carrier Safety Act, allowed governors to ask DOT to prohibit larger trucks and doubles, generally permitted by the STAA of 1982, from specified highways, while it forced the states to permit STAA-allowed truck combinations "reasonable" access from interstate highways to truck terminals (Taff 1986, 366-367; U.S. Congress, OTA 1988, 57, 60, 68, 80).

Driver licensing has long been an issue of safety proponents. Truck drivers in some states could get a license by just passing a written chauffeur's test that covered all commercial drivers, from taxi to tractor-trailer drivers. Recordkeeping was also an issue: the length of time that detailed records were kept varied from state to state, and drivers with suspended or revoked licenses from one state could easily get another license elsewhere. In 1986 Congress passed another Motor Carrier Safety Act, which required commercial drivers to acquire a national driver's license and established nationwide certification and recordkeeping. The commercial driver's license, which became mandatory on April 1, 1992, requires all commercial drivers to have a special license appropriate to the equipment they drive and the loads they haul.

Congress has repeatedly modified the foregoing laws to further tighten the rules under which motor carriers operate. For example, the Motor Carrier Safety Act of 1990 specified civil and criminal penalties for failure to maintain records required by the MCA of 1984[9] and prohibited the operations of carriers that receive unsatisfactory safety ratings.[10] The Motor Carrier Act of 1991 forced the states to conform with national and international fuel tax and registration standards,[11] granted further funds to the states to develop motor carrier safety programs, and gave the secretary of transportation the authority to approve states' safety programs. The act attempts to ensure states' participation in the Commercial Vehicle Safety Alliance and SAFETYNET,[12] encourages private-sector development of training programs for entry-level drivers,[13] and directs the transportation secretary to require states to set up mandatory alcohol and drug testing programs.[14] The act funds up to 80% reimbursement for states' costs to implement these new federally mandated standards,[15] while providing that states that do not set up the mandated programs according to federal standards will have funds withheld.[16]

If the 1980s brought less economic regulation, intensified social regulation made trucking operations even more complicated and expensive.

Since January 1, 1992, DOT regulations have required all motor carriers to perform pre-employment, reasonable cause, and random periodic drug testing of all employees. DOT estimates that the regulation affects more than 200,000 trucking operations, employing approximately 3 million drivers, and the FHWA estimates it will cost government and industry $1.6 billion to implement. DOT requires that testing take place at a high enough rate that 50% of all employees will be spot-tested during any single year (Cassidy 1990; Cohan 1992). Further, new DOT rules resulting from the 1991 Omnibus Transportation Employee Testing Act will require alcohol breath-testing (including random testing of 25% of all employees annually) of 6.6 million truck and bus drivers, at a cost of $200 million per year.[17] Carriers with a 1% or greater failure rate will have to test 50% of employees randomly, while carriers with a failure rate of .05% annually will only have to test 10% of employees (Hamilton and Nall 1992; Ingersoll 1992; Nall 1992; Tolchin 1994). In sum, if the 1980s brought less economic regulation, intensified social regulation made trucking operations even more complicated and expensive.

While the trucking industry has worried about highway safety for many years, the intensely competitive environment associated with reduced

economic regulation may have exacerbated the safety problem. Since economic deregulation, hundreds of thousands of owner-operators and drivers working for many small, unregulated carriers have become harder to locate, supervise, train, and monitor, compared with drivers for certificated, regulated carriers. In addition, the highly competitive market fostered by regulatory restructuring provides a daily incentive to violate rules designed to encourage safe operations (U.S. Congress, OTA 1988, 143). Thus, economic deregulation may have compromised public safety even as social regulation made it more costly and complicated for carriers to comply with safety rules.

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Most carriers that are exempt from economic regulation still must comply with DOT safety regulations and come under the jurisdiction of these safety agencies. Control over these carriers, however, has become tenuous. In addition, the federal government constructed a mandate maze through which states must navigate to get their tax money returned to them as programs. The result, say many carrier executives, is a monumentally difficult business environment.

Regulation of Working Conditions

Unlike most other private-sector workers, maximum hour (overtime), minimum wage, and other pay provisions of the Fair Labor Standards Act of 1938 (FLSA) do not apply to employees of motor carriers subject to the Motor Carrier Acts of 1935 and 1980. The law exempts more than 1.3 million employees of these MCA-regulated carriers, whether these drivers are city or road drivers, helpers, platform workers, or mechanics. Given the public service nature of the industry, Congress created the exemption ostensibly to prevent jurisdictional conflict between the ICC[18] and the DOL .[19]

In 1981, the Minimum Wage Study Commission (MWSC) decided that this exemption was acceptable because union contracts covered 80% of all over-the-road drivers, and unionized city and road drivers benefited from standards that exceeded the FLSA. The commission considered complex contractual provisions for daily guarantees, pay for non-driving work, and trip *minima* as providing adequate protection (Fritsch 1981, 151-186).

Unfortunately, the MWSC based its report on pre-deregulation data that was between five and 15 years old at the time. The decline in union

coverage and the substantial growth of non-union truckload (TL) carriers during the late 1970s and after the MCA of 1980 created an environment in which wage and work-rule exploitation could thrive. New research has shown that the industry transformation created a new, low-wage sector in which road drivers for national TL carriers earn 58% of the average wage of drivers for national less-than-truckload (LTL) carriers (Belzer 1993, 142-147). Furthermore, while the MWSC report specifically notes drivers usually received pay for their nondriving labor because of collective bargaining contracts, TL and nonunion carriers now are significantly less likely to pay drivers for their nondriving labor time (Belzer 1993, 147-154).

The decline in union coverage and the substantial growth of non-union truckload carriers created an environment in which wage and work-rule exploitation could thrive.

Finally, this low-wage nonunion competition has forced concessions from many local unions. For example, during the 1980s, Chicago's powerful Local 705 agreed to allow carriers covered by the tank contract to break down the distinction between city and road seniority boards. This meant that once a driver had worked 40 hours locally at an hourly rate, the company could force him onto the road for the remaining 20-30 hours at a straight road rate. In addition, the contract raised city drivers' overtime standards from 8 hours per day to 45 hours per week.

Such concessions exist outside the tank contract. In many cities, nonunion competition has forced union drivers to accept percentage compensation. For example, intermodal (both piggyback and container) drivers frequently receive a percentage of revenue. Since the rate does not increase along with a driver's weekly hours, all driver compensation is on a straight piecework basis. In addition, if the rate falls, the driver's wage falls also. Drivers absorb all delay time at rail and container terminals, and percentage rates reduce shipper incentives to improve timeliness and productivity. Also, most piggyback or drayage carriers are local carriers, so they are not subject to DOT regulation. Drivers may work an unlimited number of hours each week. Thus, with the expansion of the TL sector and the resulting significant deunionization of the industry, many drivers earn very low wages, and some fall below the federal minimum, especially when unpaid waiting, loading, and unloading time and labor are counted in (Machalaba 1993).

Effects of the Changing Regulatory Framework

The new regulatory regime has changed the economic environment for both the industry and its employees. Bankruptcy is up; return on equity is down. Employees work longer hours for smaller paychecks. Industrial relations has faced crisis and conflict, as the Teamsters Union represents fewer workers and workplaces, and bargains within a lean environment.

The Industry

Following the change in regulatory structure, carriers specializing in TL shipments proliferated rapidly.

Trucking Operations and Market Structure

Shipment size exerts an important influence on the general freight industry. The Interstate Commerce Commission defines a truckload (TL) shipment as one weighing more than 10,000 pounds and a less-than-truckload (LTL) shipment as one weighing less than 10,000 pounds. Before deregulation, many full-service general freight carriers hauled a mix of TL and LTL freight, and they balanced the two to keep trucks fully loaded on all movements. For example, before deregulation, Yellow Freight carried a preponderance of truckload freight on eastward movements and more less-than-truckload freight going west (Filgas and Waters 1987).

LTL shipments are small: the average size is 1,260 pounds. TL shipments are large: an average shipment weighs approximately 26,600 pounds (Belzer 1990, 61). While previous regulations restricted carriers to the commodities, service areas, and routes for which they held certificates, current regulations allow anyone to compete in any market and to price according to the market. Following the change in regulatory structure, carriers specializing in TL shipments proliferated rapidly and prices declined.

To understand why such carriers gained a competitive advantage, one must understand the structure of the general freight industry. Companies specializing in LTL freight employ a sophisticated network of pickup-and-delivery (P&D) trucks that "peddle freight" on a local basis. Dispatched from a terminal with a load of small shipments to deliver, they deliver and pick up freight throughout the day, returning at the end of the day with a load of small shipments destined for locations throughout the carrier's network. Dockworkers unload these peddle trailers and distribute the freight to linehaul trailers heading to other terminals for subsequent delivery by peddle drivers in another city.

Many very large LTL carriers also have "break bulk" terminals in strategic locations throughout their systems. For these carriers, the originating city terminal may ship freight destined for widespread locations to a break bulk. Freight on one trailer may be destined for several cities in a distant region. Upon arrival at the break bulk, dockworkers unload the trailer and combine the freight with that from other city terminals, and linehaul drivers take the freight to its destination. Dockworkers might unload this trailer again at a city terminal and distribute the freight among several city peddle routes, where the pickup and delivery process begins again.

The elaborate system of terminals maintained by LTL carriers, akin to multiple hubs and spokes with multiple layers of centralization, is unnecessary for TL freight. The shipper typically loads truckload freight at its dock and the trucker delivers it directly to one or more consignees. While there are many variations in this procedure, the basic process is the same.

Deregulation abruptly discarded rigid entry and service requirements. What had been efficient under the original regulatory structure suddenly became inefficient.

The infrastructure requirements for the two types of shipment are different: TL carriers do not need to invest in the terminals and break bulks required to handle LTL freight.

To understand the significance of deregulation, however, one must recall that successful carriers originally built the industry around balanced freight movements. Since LTL and TL freight were symbiotic parts of the freight-movement process, terminals had to exist at both ends. Industrial relations practices and work rules that developed reflected the mixed nature of the industrial process as well as the job-control unionism prevalent within the U.S. industrial relations system (Kochan and Katz 1988, 36). City drivers picked up and delivered both LTL and TL shipments out of city terminals, while linehaul drivers performed intercity transport.

Deregulation abruptly discarded rigid entry and service requirements. What had been efficient under the original regulatory structure suddenly became inefficient. In addition, once the rules allowed carriers to discriminate in favor of large shippers, the business strategy of mixed freight became useless. As a result, carriers' carefully cultivated business bases, built over decades, abruptly vanished. The business strategies of the carriers now had to reflect the distinctly different capital requirements of LTL and TL operations, or the carriers went bankrupt quickly.

This regulatory change caused an instant transformation of the in-

dustry. Large carriers, especially ones with a wide geographic scope, had to restructure quickly as either LTL or TL carriers. Interlining—the sharing of freight and revenue between carriers that use each other's route structures to complete a shipment—became difficult in the unregulated environment. National network carriers no longer had a need to share freight revenue with other carriers to complete a transcontinental shipment. Regional carriers feared possible antitrust liability, since rate bureaus lost their antitrust immunity (Rakowski 1988, 19).

Pre-existing carriers were at a disadvantage because their experienced, unionized workforce could not accept declines in wages and conditions forced by the influx of pure TL carriers.

Consequently, carriers without a national infrastructure lost their interregional and national shipper clientele. The small special commodities section of the industry suddenly became part of the new TL core segment. New TL general freight carriers, now carrying both common (filed rate) and contract freight, quickly emerged without a developed pickup and delivery framework and used their low infrastructural base, low nonunion wages, and correspondingly low rates to take a large share of the original carriers' traditional freight base.

To some extent, pre-existing carriers were at a disadvantage because their experienced, unionized workforce could not accept declines in wages and conditions forced by the influx of pure TL carriers. Strategically, they were also at a disadvantage simply because operating rights, required under the regulated environment (and which were expensive to acquire) had become nearly worthless. Carriers had to write off as losses a large part of their value that was embedded in these operating rights, accumulated over decades, and for which they paid real money during the regulatory era (Felton 1989b, 158-161). Even worse for many carriers, existing terminal structures became an overhead for which markets offered no compensation. Terminal facilities rapidly became liabilities rather than assets.

Very large carriers already specializing in LTL freight had an advantage. A few carriers had become national or nearly national in scope by making aggressive acquisitions before deregulation. These carriers could pick up a large volume of small shipments and deliver them nationally. Some larger carriers were able to convert quickly to regional carriers, offering similar but expedited service on a regional basis. Many of those that failed to make the switch became dinosaurs overnight. Perfectly adapted to the pre-1980 system, they could not react quickly enough to the new

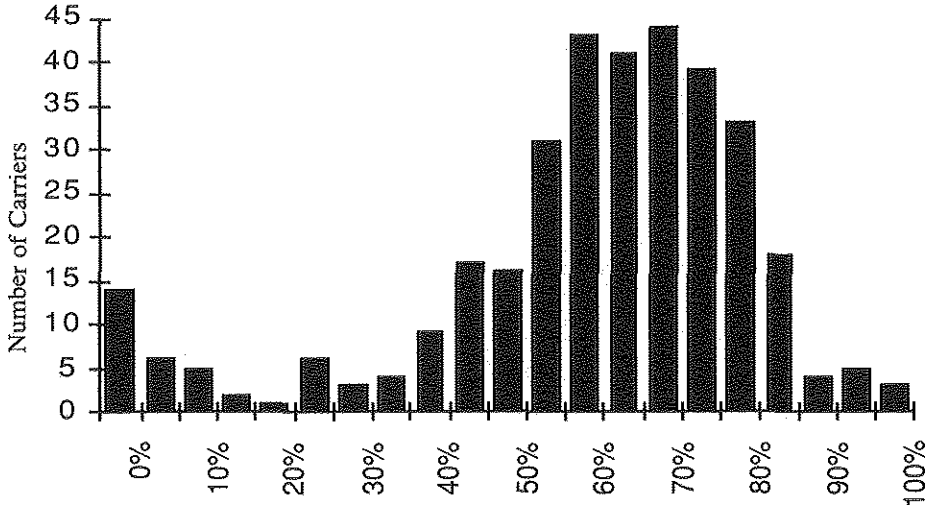
rules or did not have the management expertise or financial reserves to stave off destruction. Others continued to struggle, offering a mix of LTL and TL service on a regional or local basis.

Thus, deregulation fundamentally restructured the general freight industry. As **Figure 1** shows, before deregulation most carriers hauled a mix of truckload and less-than-truckload freight. After deregulation, however, the freight industry segmented into TL and LTL niches. As **Figure 2** shows, most carriers now haul either all LTL freight or all TL freight.

Deregulation fundamentally restructured the general freight industry.

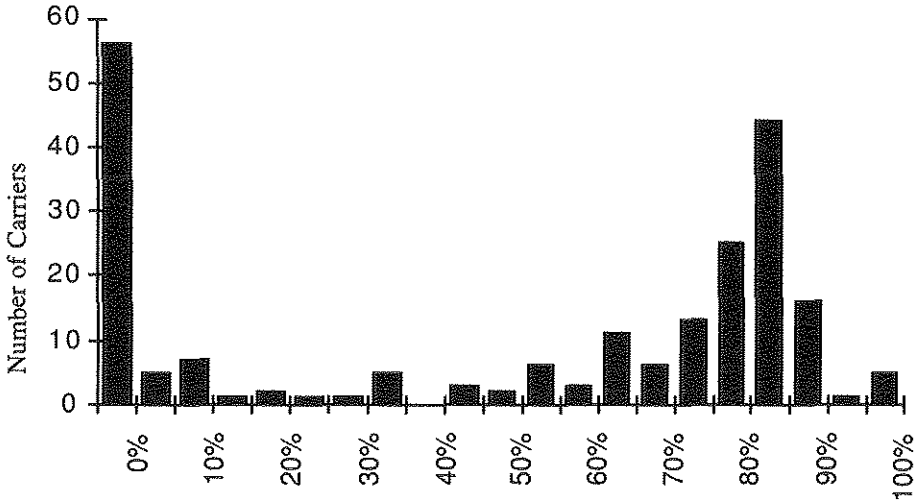
The general freight industry also segmented into national, regional, and local markets, as well as particular commodity markets, further narrowing market definition. Conventional market share estimates understate the concentration of competition because deregulation transformed the general freight industry into many niches. The market of a less-than-truckload specialist such as Yellow Freight System is entirely different from that of a truckload specialist such as J. B. Hunt; there is no direct competition between them.

Figure 1
1977 Class I General Freight Shipment Balance



Source: American Trucking Associations 1978.

Figure 2
1987 Class I General Freight Shipment Balance



Source: American Trucking Associations 1988.

The industry has become much more concentrated: the share of the market held by the four largest firms nearly doubled in the first decade of deregulation.

Market Concentration

Following deregulation, the number of ICC-certificated carriers tripled, from 16,606 in 1977 to 47,890 in 1991 (American Trucking Associations 1979, 38; 1993, 10). However, most of the new entrants are very small, so the number of the relatively large Class I and II carriers has declined.[20] In addition, the industry has become much more concentrated: the share of the market held by the four largest firms nearly doubled in the first decade of deregulation (**Table 1**).

Within market segments, the picture is more complex. **Table 2** shows that LTL carrier concentration has increased dramatically, while truckload concentration, as measured by the market shares of the top four or eight firms, has declined. The share of the top 20 TL firms, however, has increased, and the largest TL carriers, called advanced truck load firms, continue to grow in size and sophistication. Moreover, shippers have become more concerned about reliability of service and recently have acted to reduce their lists of carriers to the ones they know to be most efficient and dependable (the current "core carrier" practice of shippers), thereby further tightening the market (Enis and Morash 1987; Corsi and Stowers 1991).

Table 1
Market Concentration of Class I General Freight Carriers, Including UPS

Carrier	1977	1982	1987	1990
Roadway	4.9%	5.6%	6.5%	5.4%
Consolidated Freightways	4.0%	5.0%	6.4%	5.7%
Yellow	3.7%	4.4%	7.1%	6.2%
Total Big 3	12.6%	15.0%	20.0%	17.3%
United Parcel Service (UPS)	15.1%	23.7%	33.0%	31.9%*
4-Firm Concentration Ratio	27.7%	38.7%	53.0%	49.2%
Herfindahl-Hirschman Index	231.6	471.3	823.3	1,147.5
Total number of carriers	396	291	266	501

Source: Computer data files of 1977, 1982, 1987, and 1990 *Motor Carrier Annual Reports*, American Trucking Associations. Market includes all LTL and TL Class I general freight carriers as defined by the ICC and reported by the ATA. Definition of Class I changed between 1977 and 1982. ATA reclassified carriers in 1990, increasing the size of the market and reducing market shares from what they would have been using the 1987 definitions.

*UPS data missing for 1990; somewhat higher 1991 revenue used for calculation.

The data clearly show a dramatic increase in LTL concentration since economic deregulation.

Further separating concentration by market, transportation analyst Paul Roberts finds only six transcontinental LTL carriers,[21] giving that market a Herfindahl-Hirschman Index of 2359 and a four-firm concentration ratio of 80%. Regional LTL carriers replicate this market concentration. Identifying all carriers operating in the Southwest, Roberts computes a Herfindahl-Hirschman Index of 3059, with a four-firm concentration ratio of 100% (Roberts 1992, 6-8).[22]

Broad disagreement remains over whether economies of scale caused this concentration. Those who advocated rate and entry restructuring expected the industry to become characterized by small, competitive firms (Spady and Friedlaender 1978) without scale economies (Snow 1977, 37; Klem 1977), and believed regulation conferred an unfair advantage on large firms (Wilson 1980; Frew 1981). However, the data clearly show a dramatic increase in LTL concentration since economic deregulation.

While some scholars see the post-deregulation development of significant scale and scope economies (Keeler 1989; Kling 1990), others continue to claim "there is no evidence of scale economies in any of the industry segments" (Corsi and Stowers 1991, 26; see also Grimm, Corsi,

Table 2
Concentration in Main General Freight Market Segments, Excluding UPS

Segment		Share of Revenues Held by Top 4	Top 8	Top 20
LTL	1977	18.3	26.4	40.6
	1987	36.9	48.9	66.6
	% change	102.4	85.1	64.3
TL	1977	14.4	21.6	32.8
	1987	10.9	19.1	36.5
	% change	-23.9	-11.8	11.1

Source: Corsi and Stowers 1991; Table 2. Class I and II carriers.

The post-deregulation market puts small firms at a disadvantage.

and Jarrell 1989). However, in a recent review, Corsi notes that recent research indicates that size, combined with particular management strategies, does make a difference (Corsi 1993, 20-23). While his study shows medium-sized firms perform competitively with large firms, particularly combined with a market differentiation strategy (Corsi et al. 1991; Corsi et al. 1992), the connection between size and performance remains important. The post-deregulation market puts small firms at a disadvantage.

Roberts argues that economies of scale exist in both LTL and TL. The hub and spoke system, into which trucking and other transportation modes have organized, helps carriers build the kind of market density needed to compete efficiently. Ideally, carriers' markets eventually can become dense enough to support through shipments between two points, bypassing the hub.

Further, while this hub-and-spoke structure characterizes LTL carriers, it also applies to TL carriers. Larger truckload carriers can have more equipment available in any region to take advantage of business opportunities. Since the goal of any carrier is to reduce empty miles, the more trucks it can position in a revenue-producing region the shorter the deadhead mileage. This gives larger carriers considerable advantage (Roberts 1992).

In a study comparing cost functions of LTL and TL carriers, Harmatuck, using fitted prices to control for differences in service quality, found that it is more cost-effective for general freight carriers to specialize

in either LTL freight or TL freight, rather than for general freight carriers to haul both jointly. Recognizing that all carriers' outputs are not equal, he suggests that larger carriers provide higher-quality outputs at higher costs, thereby accounting for a significant share of these economies. Harmatuck claims "economies of specialization" (the combination of cost and quality) underlie the market segmentation of the freight industry, a finding that suggests that segmentation may be a more optimal structure than that which existed under the earlier regulatory regime (Harmatuck 1990). Since at least some of the service quality variables are endogenous to market structure (wide geographic scope, single-line service), this analysis also suggests reasons why the competitive market may lead to industry concentration.

However, if service quality (route breadth and density, frequency of service, overnight delivery, and other special handling services) is the basis for large LTL carriers' economic advantage, deregulation paradoxically may have led to the service inflation for which critics attacked the regulated trucking industry.[23]

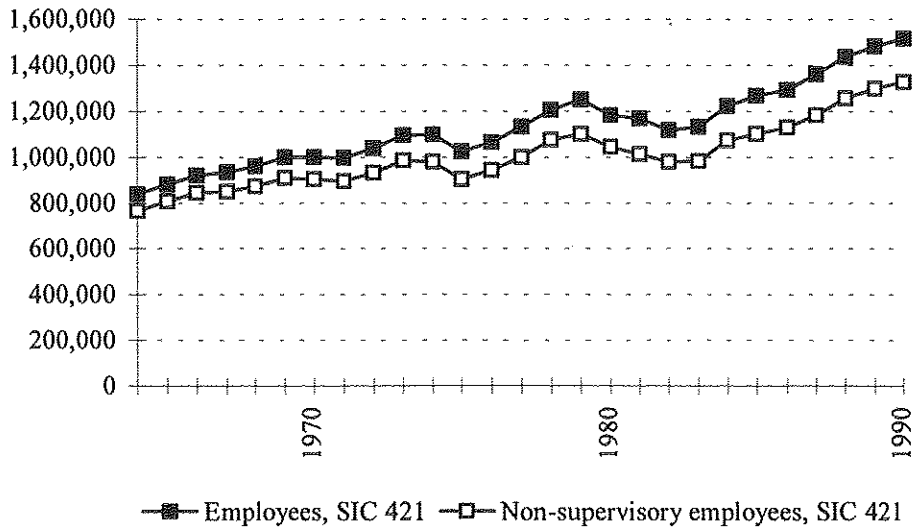
Deregulation paradoxically may have led to the service inflation for which critics attacked the regulated trucking industry.

Finally, Enis and Morash show a positive relationship between size and stock market performance since deregulation, a sign that the advantage large carriers had before regulatory reform has continued. Earnings-to-price ratios within the trucking industry, measuring stock risk, are stable before and after economic deregulation. Larger carriers retained "size-related advantages" in earnings per share, share price, return on assets, and investor perception of risk. These size advantages support those who contended that deregulation would cause industry concentration rather than atomization (Morash and Enis 1983; Enis and Morash 1987; see also Belzer 1993, 186).

Employment

As **Figure 3** indicates, data collected by the Bureau of Labor Statistics (BLS) show that employment in the trucking industry has continued to increase over the last three decades. It has increased at an average annual rate of 2.63% since 1947.[24] This increase reflects the continued shift of freight from railroads to trucking over the period, as well as the general increase in goods production. The oil crisis of 1973 and economic deregulation correspond with significant short-term employment declines. Since the recovery from the economic deregulation and recessionary shocks of the early 1980s, however, employment has increased 3.88% per year.

Figure 3
Employment, Trucking and Courier Services, Except Air, 1964-1990



Source: U.S. Department of Labor, Bureau of Labor Statistics 1991a; 1991b.

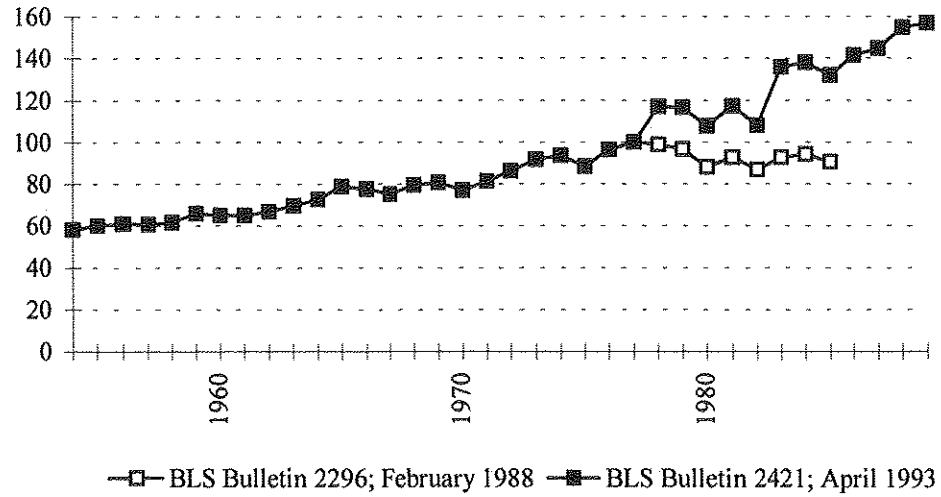
The Bureau of Labor Statistics expects employment growth in the truck-driver occupation to be very high through the end of the century.

The trucking industry continues to experience considerable growth, although growth is greater in some segments than in others. The Federal Highway Administration (FHWA) expects ton-miles to increase at an annual rate of 3.4% through the end of the century (Taff 1986, 61). Further, BLS expects employment growth in the truck-driver occupation (whether in the trucking industry or in other industries) to be very high through the end of the century, increasing by 26.1% between 1990 and 2005 (U.S. Department of Labor, BLS 1992a, 27). Like many service occupations, however, the BLS expects wages to remain no better than average and unemployment to be high (U.S. Department of Labor, BLS 1992a, 7). While the commercial driver's license or declining relative wages in this occupation may have reduced somewhat the number of truck drivers in the labor market, the demand for truck drivers will continue to grow as international trade increases.

Labor Productivity

The most recently published BLS data suggest labor productivity increased by 169% between 1954 and 1989 (**Figure 4**). During this pe-

Figure 4
Labor Productivity, Class I and II Common Carriers of General Freight, SIC 4213 part



Source: U.S. Department of Labor, Bureau of Labor Statistics, 1988, 1989.

[These data] suggest that deregulation resulted in significant annual labor productivity improvement; however, these measurements are flawed and unreliable.

riod, output per employee among Class I and II common and contract carriers increased steadily at an average of 3% per year (U.S. Department of Labor, BLS 1993, 80).

According to the April 1993 BLS data, the annual rate of increase in labor productivity since the shakeout of the early 1980s and the introduction of larger and heavier trucks is nearly 50% higher than it was before deregulation. If these data were true, they would suggest that deregulation resulted in significant annual labor productivity improvement.

However, these measurements are flawed and unreliable. First, while BLS measures labor productivity in most industries as both output per employee and output per employee-hour, it reports trucking labor productivity only as output per employee. This creates an analytical problem because most truck drivers do not log unpaid time. Since the shift from LTL to TL carriers after regulatory change corresponds also to a shift from union to nonunion carriers, it probably caused those affected drivers to log more work time as "off duty." If this were the case, and employee hours increased for the same output, then productivity declined. In any case, one cannot determine actual labor productivity from the BLS data.

Second, output per employee, as published before February 1989, shows post-deregulation labor productivity declining, while revised data published in February 1989 and after show a 48% to 57% increase over the same time period. (Figure 4 shows decreasing productivity reported in 1988 and increasing productivity reported in 1993.) Using the revised data, BLS most recently reports that general freight output is down more than 9% and employment is down 42% from its 1977 peak (U.S. Department of Labor, BLS 1993, 80).[25] In essence, the high labor productivity is the result of lower reported employment in the revised data. However, this finding conflicts dramatically with the BLS employment data for SIC 421, pictured in Figure 3, which draw from a different and more reliable source.

The conflicting data story highlights important underlying problems with data collection and reporting and with data interpretation that insufficiently accounts for structural changes within the industry.

The conflicting data story highlights important underlying problems with data collection and reporting and with data interpretation that insufficiently accounts for structural changes within the industry. Data for the employment, hours, and earnings series derives from the Current Employment Statistics program, known commonly as the establishment survey, while data for the labor productivity series derives from ICC Motor Carrier Annual Report data. Unfortunately, the quality of the latter data has declined significantly since regulatory restructuring in 1980.

Why the drop in data reliability? There are a number of causes:

- The ICC has failed to require carriers to report financial and operating statistics, and at least one carrier has refused to comply with legal orders to report. Furthermore, many carriers report too late for inclusion in ICC annual reports; the ICC grants reporting exemptions to carriers (one expert estimates current exemptions at 266); and reported data often are inaccurate and incomplete (by intention or by incompetence), thereby reducing the comprehensiveness of the data series.
- Each year the number of carriers required to report declines.
- The ICC has not required complete reporting. For example, most regional subsidiaries of Consolidated Freightways have not reported appropriately and have probably reduced the accuracy of parent company reports as well as the overall quality of the data series. Despite the good intentions of the American Trucking Associations, which cleans, error-checks, and distributes the data, the underlying data sources have reduced the quality of the data severely.

These flaws have led to alarmingly biased labor productivity infor-

mation. Before regulatory restructuring, the population of carriers was relatively consistent and reliable. BLS carefully collected ton-mile data within general freight, specialized freight, and household-goods carrier groups, then weighted these before aggregating them into a single output index. This procedure distinguishes labor productivity characteristics in general freight from those in specialized freight (heavy haulers of truckload shipments), and vice versa (Duke 1992, 11-12). The characteristics of the freight hauled have powerful effects on the measure of ton-miles per employee. For example, each truckload employee can haul much more freight, because average shipments are more than 20 times larger and are subject to much less physical handling.

After regulatory restructuring, freight characteristics changed dramatically from year to year.

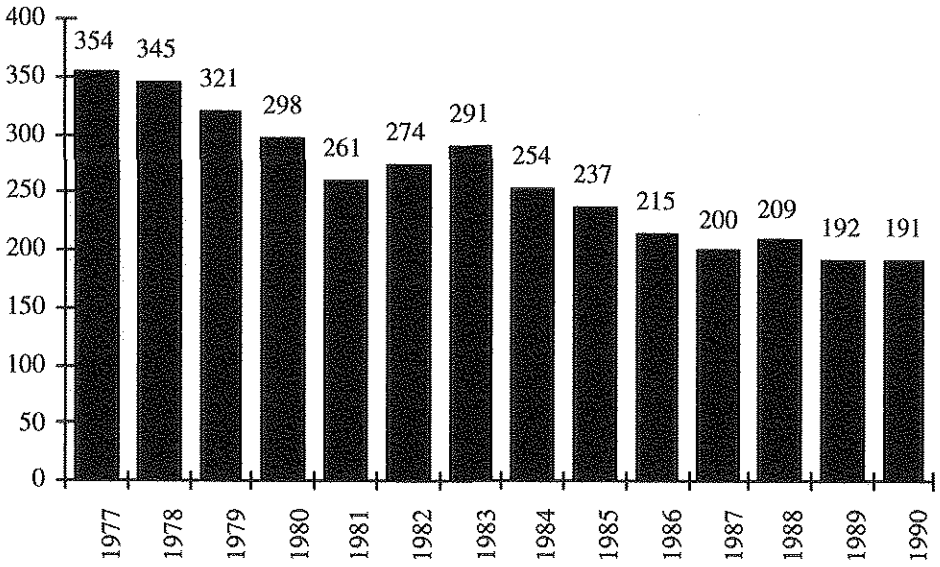
Common and contract carriers also tend to differ structurally, since shippers negotiate contracts for larger shipments or groups of shipments. Contract and common carriers therefore require separate analysis. Accordingly, BLS reported information for two groups: Class I and II intercity common and contract carriers (virtually the entire population of interstate for-hire carriers with more than $1 million in revenue), and Class I and II intercity common carriers of general freight.[26]

After regulatory restructuring, freight characteristics changed dramatically from year to year. Many general freight carriers operated more like specialized carriers, yet they retained their original classification. Thus, the general freight population's underlying characteristics changed.[27]

Figure 5 shows that the number of Class I general freight carriers, as defined and reported by the ICC, declined since deregulation, from a high of 354 in 1977 to a low of 191 in 1990 (ICC Bureau of Accounts 1977-1990). However, this decline is attributable not only to a shrinking number of carriers but also to the ICC's indifferent attitude toward data collection. Although the ICC reported only 191 Class I common carriers of general freight in *Transport Statistics in the United States*, the ATA classified 495 carriers as Class I general freight carriers on its 1990 data tapes.[28] While the ATA probably was justified in reclassifying carriers, its reclassification caused the general freight population to exhibit more TL characteristics than it did previously.[29]

Lack of confidence in this measure led the BLS Office of Productivity and Technology to stop issuing new estimates after 1989. It declared that it had "actually lost coverage in [its] labor productivity program for

Figure 5
Class I Common Carriers of General Freight Engaged in Intercity Service



Source: Interstate Commerce Commission, Bureau of Accounts, 1977-90 (individual years).

[Some analysts argue] that the regulatory framework established by the MCA of 1935 created an economic environment that did not use industry technology maximally.

the transportation sector due to the data problems..." with trucking and bus carrier industries (Duke 1992, 31).

Has Productivity Improved?

Friedlaender, Spady, and Wang Chiang argued that the regulatory framework established by the MCA of 1935 created an economic environment that did not use industry technology maximally. Specifically, they argued that deregulation would increase productivity by increasing average load (Friedlaender, Spady, and Wang Chiang 1981). Did productivity increase after regulatory restructuring? Did average loads increase?

Corsi and Stowers claim that productivity has improved since deregulation. Annual miles per truck and average haul (ton-miles per ton) have increased in both TL and LTL markets, and average load (ton-miles per mile) has increased in TL general freight. However, without an increase in average load, the increase in annual mileage per truck and average haul in LTL may actually indicate diminished efficiency. In addition, increased size and weight limits, rather than economic deregulation, may

cause increases in average load in TL. Corsi and Stowers plausibly suggest that economic deregulation caused the increase in average haul because it cut the use of interlining. They argue that the segmentation of the general freight industry may have led to more efficient use of LTL networks, because LTL carriers no longer use their resources on simpler TL freight movements (Corsi and Stowers 1991, 19-21).

In contrast, some analysts have argued that productivity has declined. Productivity, defined as the average load per dispatch, has dropped since 1980. Glaskowsky argues that these lower average loads mean higher costs of transportation per unit of goods shipped. Since intermediate goods may be shipped several times between the raw material and finished stage of production, the distribution process may add significant new production costs, thereby reducing the competitiveness of U.S. manufactured goods in the global market (Glaskowsky 1990, 30). This increased cost may reflect manufacturers' preferences for just-in-time inventory control, but this assumption is purely conjectural. It might just as easily reflect a hidden, increasing cost driven by the carriers' competition for freight.

While service competition gives each firm a competitive advantage, it can also lead to lower productivity.

While service competition gives each firm a competitive advantage, it can also lead to lower productivity. For example, more frequent and guaranteed on-time delivery may lead to lower load factors, as carriers dispatch lightly loaded equipment carrying freight that satisfies inflated service promises (see Harmatuck 1990, 34, 45). If load factors are down, it would cause a decline in productivity, measured as ton-miles per employee. (BLS productivity data showed this decline prior to the 1988 edition).

Bankruptcies

While the number of very small, Class III carriers increased greatly after 1977, the number of Class I and Class II carriers declined (Corsi and Stowers 1991, 9), and this group experienced a phenomenal bankruptcy rate. Failures among intercity carriers increased 1,280% between 1978 and 1985 (Harper and Johnson 1987, 140). Before the MCA of 1980, total failures of ICC-regulated carriers averaged between 200 and 250 per year. After regulatory restructuring, trucking failures boomed, reaching a peak of 2,297 in 1991 (American Trucking Associations 1993). The failure rate rose every year between 1977 and 1986, irrespective of the business cycle (Glaskowsky 1990, 7-9). Since then, failures appear to have become quite

cyclical; they increased drastically during the most recent recession.

The International Brotherhood of Teamsters claims that 140 Class I and II ICC-regulated general freight carriers, covered by the National Master Freight Agreement (NMFA) in 1980, have gone out of business. These carriers employed 175,022 workers and earned $8,182,300,000 in annual operating revenue in 1979 (current dollars). It is hard to equate historical with current data, but in 1979 these carriers accounted for 48% of the total employment and operating revenues of the entire regulated Class I and II general freight market. Adding at least two large non-Teamster general freight bankruptcies (Brown Transport [including Thurston Motor Lines] and Bowman Transportation), this figure rises to more than 187,300 employees and $8,512,200,000. One could add many more nonunion carriers to the list (Conyngham 1993).

Operating ratios have greatly fluctuated since deregulation.

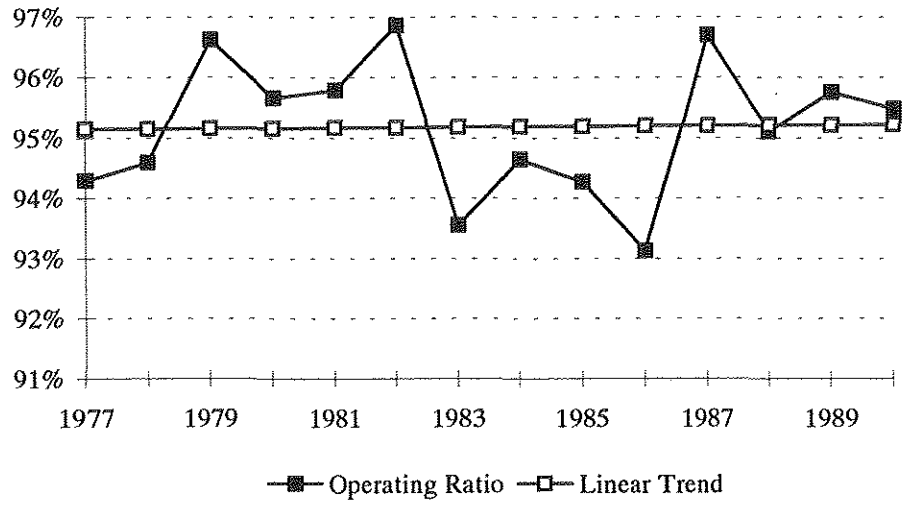
Profits

Economists use several methods to measure profitability. Under economic regulation, the ICC used an operating ratio standard for the trucking industry of total carrier operating expenses divided by total carrier operating revenue.

Trucking companies have low profit margins. Motor carriers have very high variable costs compared to fixed costs, and they convert a very small proportion of their operating revenue to return on equity. Consequently, even a short-run operating loss can overwhelm assets and quickly cause bankruptcy. Locklin argues that, for any carrier, "the margin of revenues over expenses required to pay a normal rate of return on capital invested [is] so small that a slight miscalculation of probable revenues or expenses could leave the carrier with revenues insufficient to pay operating expenses." Since very small perturbations in operating ratios can have disastrous consequences for operators, the ICC used operating ratio rather than return on investment as a regulatory standard (Locklin 1972, 709-712; Capelle 1988).[30]

Operating ratios have greatly fluctuated since deregulation. The ICC expected that an operating ratio of 93% would provide a healthy margin of gross profit with which carriers could afford to maintain their current level of investment. **Figure 6** shows average operating ratios for all Class I general freight carriers since deregulation. The linear trend is

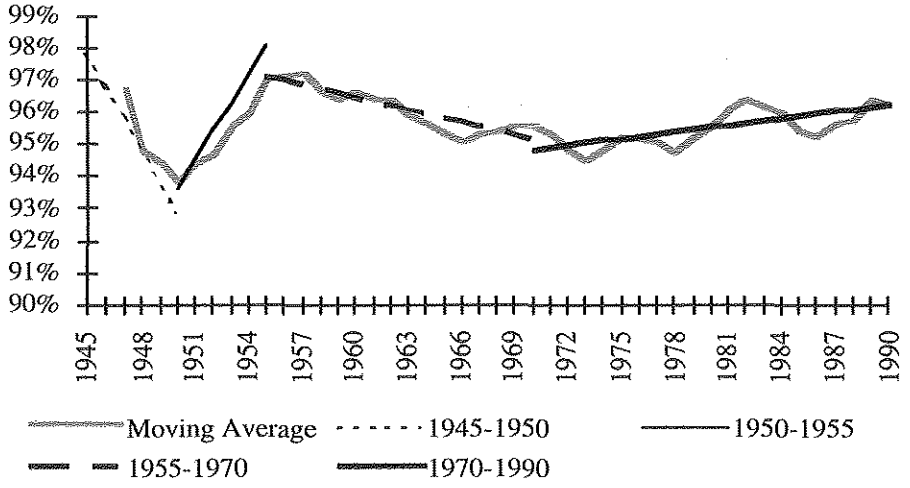
Figure 6
Average Operating Ratio, Class I General Freight Carriers



Operating Ratio = Total Carrier Operating Expenses/Total Carrier Operating Revenue

See Source, Figure 5.

Figure 7
Average Operating Ratio, All Class I and II Carriers



Operating Ratio = Total Carrier Operating Expenses/Total Carrier Operating Revenue

See Source, Figure 5.

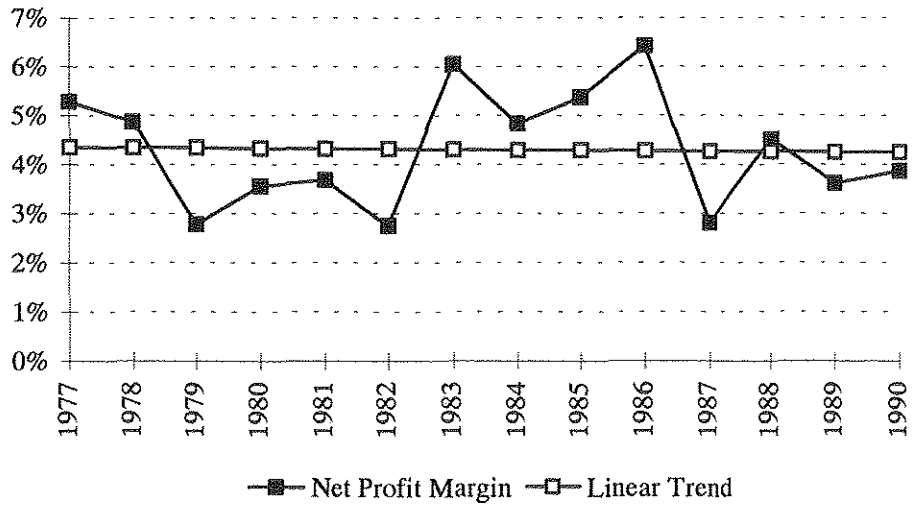
flat at 95%, rather than the 93% ICC standard. More broadly, **Figure 7** shows that the industry has never reached the 93% target for all Class I and II carriers during the past 45 years, and that operating ratios have worsened steadily since 1970.

Glaskowsky presents evidence that the average trucker's profit margin is about half that of the average manufacturer's margin (Glaskowsky 1990, 29). **Figure 8** shows that average net profit margins, like operating ratios, have fluctuated widely, but the long-term post-deregulation linear trend for Class I general freight carriers is flat at approximately 4.25 cents per dollar of revenue.

Average return on equity has declined 22% since the change in the regulatory framework.

The big concern is a long-term decline in return on equity (ROE). As **Figure 9** shows, the linear trend for ROE among Class I general freight motor carriers is definitely down. In fact, average return on equity has declined 22% since the change in the regulatory framework. This aggregate decline helps to explain the steady and alarming increase in bankruptcies, discussed above. As the aging of carrier equipment suggests

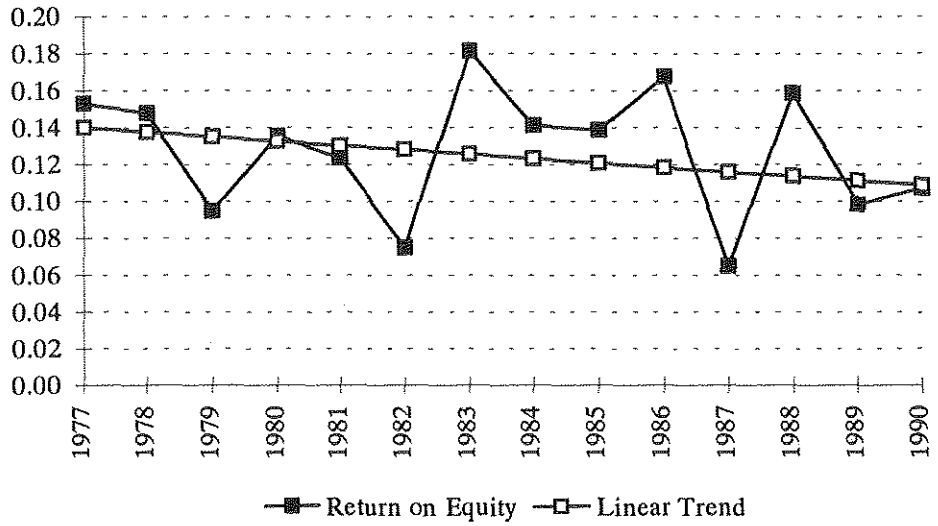
Figure 8
General Freight Net Profit Margin



Net profit margin = net income/gross freight revenues. (Net income is income before taxes, extraordinary items, prior period adjustments, income from equity in affiliates, and gain or loss on disposal of discontinued segments.)

See source, Figure 5.

Figure 9
General Freight Return on Equity



Return on equity = net income/equity. (Net income is income after taxes but before extraordinary items, prior period adjustments, income from equity in affiliates, and gain or loss on disposal of discontinued segments.)
Note: Total stockholders' equity changed to total owners' equity or capital in 1988.

See source, Figure 5.

Declining returns within an entire industry signal a public policy problem.

(Glaskowsky 1990, 41-45), truckers appear to have become unwilling or unable to make the kind of investment that can sustain profitability in the long run.

The stock market reflects this increased risk. Since the mid-1970s, motor-carrier stocks have declined compared to the Dow-Jones Composite and Standard and Poor 500 indices. A recent analysis by Donaldson, Lufkin & Jenrette rated most stocks of large LTL carriers neutral or unattractive (Schlesinger 1993); an analysis by Alex. Brown & Sons echoes this assessment (Boyle 1993). Declining returns within an entire industry signal a public policy problem.

Some transportation economists argue that the competitive market will drive every transportation producer to offer a large proportion of service at prices that may cover average variable cost but not average total cost, and this is a special problem in the trucking industry (Locklin 1972, 150-151, 312, 712-714). If a declining base of truckers' revenue-produc-

ing business pays fully allocated costs, they may earn insufficient revenue to maintain a healthy return on equity, and their businesses will eventually fail. In fact, ROE has declined because income from continuing operations after taxes has declined in real dollars since regulatory reform. Chronic bouts of low rates, excess capacity, and poor returns have plagued motor carriers (Harper and Johnson 1987, 140-141).

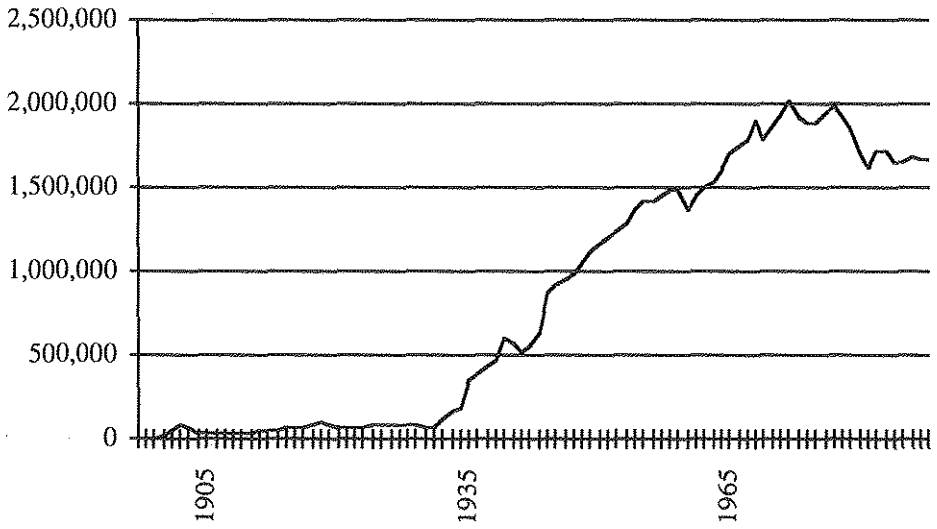
Industrial Relations

Chronic bouts of low rates, excess capacity, and poor returns have plagued motor carriers.

Unionization

Teamster membership levels have declined 17.8% since their 1974 high of 2,019,300. Most of this decline occurred from 1980 through 1986, during the severe shakeout period following economic deregulation of the trucking industry.[31] Although membership has remained stable since the late 1980s, it has not rebounded, and many new industry employees are nonunion, because many of the re-employed drivers work for new, non-union, truckload carriers.

Figure 10
U.S. and Canadian Teamster Membership



Sources: Troy and Sheflin 1985; U.S. Department of Labor 1984-1990; Bureau of Labour Information 1984-1990.

However, as in discussions of concentration, bankruptcies, and productivity, disaggregating by market segment gives a more accurate picture. A 1991 survey of Class I general freight showed that unionization had remained relatively stable within the LTL segment of the general freight industry.[32] Currently the Teamsters represent approximately 47% of all Class I general freight carriers; 51% are nonunion.[33] New truckload carriers that entered the market after regulatory restructuring employ mostly nonunion drivers. The union also lost strength at some unionized TL carriers (particularly Schneider), and was decertified at a few TL and LTL carriers following strikes involving permanent replacement workers. In short, most of the union's losses occurred as a result of changes in industry structure and bankruptcies caused by the new regulatory regime (Belzer 1993, 145-148).

Most of the union's losses occurred as a result of changes in industry structure and bankruptcies caused by the new regulatory regime.

The Research Department of the International Brotherhood of Teamsters reports that carriers employing 48% of all Class I and II general freight workers have gone out of business since the passage of the Motor Carrier Act of 1980 (Conyngham 1993). Most of these drivers and dockworkers were union members simply because the industry began the period heavily unionized. Hence, while the trucking industry's employees suffered drastic dislocative effects as carriers closed and thousands of union members lost their jobs, the Teamsters retained collective bargaining relationships with most of the surviving carriers with which they bargained before deregulation.

The Teamsters represents trucking employees in many occupations and industry segments, as well as thousands of other types of workers. In 1985, the Teamsters had 1.62 million U.S. members, of whom approximately 400,000 were truck drivers. Fewer than half of these worked under the National Master Freight Agreement (Methvin 1985, 2; Bureau of National Affairs 1985, A-8).

Union density varies greatly between market segments. As **Table 3** shows, slightly fewer than half of all Class I general-freight carriers were unionized in 1991. However, the union represented almost 70% of all Class I LTL carriers, compared with only 24% of all Class I TL carriers. Differences hold for firms operating at the national, subnational, and regional levels. The one exception may be TL/local, but there are only seven carriers in this category.

Table 3
Unionized Carriers by Segment, 1991

Segment:	Union	%	Nonunion	%	Chi Square
TL	24	24.2	75	75.8	26.27
TL/national	5	12.8	34	87.2	21.56
TL/subnational	19	31.7	41	68.3	8.07
TL/regional	14	26.4	39	73.6	11.79
TL/local	5	71.4	2	28.6	1.29
LTL	80	69	36	31	16.69
LTL/national	4	80	1	20	1.8
LTL/subnational	76	68.5	35	31.5	15.14
LTL/regional	63	67	31	33	10.89
LTL/local	13	76.5	4	23.5	4.77

Unionization here is defined as any presence of union within a carrier. Subnational carriers include interregional, regional, and local carriers. National LTL carriers include: Consolidated Freightways, Yellow, Overnite, Carolina, and ABF. Roadway and Watkins refused to respond to the survey. Overnite is classified as a national carrier because of the coordinated nature of its interregional operation, and because it operates nationwide. Northwest Transport is classified as a subnational, since its operations did not extend to the East or South at that time. Using Roberts' (1992) classifications, five national LTL carriers would be union and one, the second smallest, would be nonunion. Critical values of chi square, testing the statistical differences between cells: 3.841 (.05); 5.025 (.025).

Source: Derived from Belzer 1993.

The number of Teamsters employed by companies covered by the National Master Freight Agreement has dropped approximately 42% since deregulation.

Finally, **Table 4** shows changes in union density for the whole Class I General Freight segment. Two calculations are presented for comparison. Hirsch calculates union density using the Current Population Survey (CPS), the most commonly used method of assessing unionization in an industry. However, the CPS survey covers all truck drivers by occupation, whether or not they work in the trucking industry, and thus represents a very different sample of drivers than this study covers. Data from the CPS show union density declining to a very low level.

This study's unionization data, based on the *Motor Carrier Annual Report*, suggests modest union decline in general freight. The employment gain at large unionized LTL carriers (and especially at UPS) offsets much of the employment losses by unionized drivers caused by extensive bankruptcies.[34]

Bargaining Structure

The number of Teamsters employed by companies covered by the NMFA has dropped approximately 42% since deregulation. Before de-

Table 4
Union Density

Year	Hirsch A	N	Hirsch B	N	Belzer A	N	Belzer B	N
'73-'78	0.599	1,533						
1977					0.847	380	0.878	382
1978								
1979	0.566	175						
1980	0.564	94						
1981	0.607	84						
1982					0.804	278	0.861	280
1983	0.504	127	0.432	1,034				
1984	0.304	79	0.375	1,158				
1985	0.288	111	0.341	1,154				
1986			0.319	1,093				
1987			0.276	1,136	0.727	256	0.846	256
1988			0.300	1,161				
1989			0.269	1,166				
1990			0.241	1,264	0.476	189	0.651	190

Hirsch A uses only May public use CPS samples; N = number of drivers sampled in the for-hire sector. Hirsch B uses all 12 monthly CPS samples for each year; N is the same as Hirsch A. Hirsch analysis published in Hirsch 1993. Belzer A excludes United Parcel Service; N is the number of carriers analyzed. Belzer B includes United Parcel Service; N is the number of carriers analyzed.

Source: Derived from Belzer 1993; Hirsch 1993.

The post-1980 regulatory regime exacerbated differences among firms of different sizes and operating in different markets, and forced a change in the bargaining structure.

regulation, most general-freight common carriers belonged to carrier associations that bargained centrally, but such associations were not without internal conflict. Since common and contract carriers as well as long-, medium-, and short-haul carriers and large, medium, and small carriers all bargained together, the diversity of needs was tremendous. The post-1980 regulatory regime exacerbated differences among firms of different sizes and operating in different markets, and forced a change in the bargaining structure.

Regulatory restructuring was not the only source of tension. Trucking Employers Incorporated (TEI), an employers' federation, represented between 800 and 1,000 carriers in the mid-1970s. At its peak, the NMFA negotiated by TEI directly covered between 300,000 and 500,000 workers. Additionally, many non-TEI carriers followed the TEI lead and signed the NMFA contract or followed its pattern (Levinson 1980, 104-106).

The diversity of needs put a strain on TEI unity even before 1977. With the 1970 contract, the wage structure in master freight shifted higher costs to local carriers and carriers with extensive local operations. Since 65-75% of small carriers' costs are for local pickup and delivery, and only 25-35% of large carriers' costs are for local work, small carriers had a cost disadvantage (Levinson 1980, 124, 140). As a result, large long-haul carriers had an advantage over small short- and medium-haul operators. The gap between union and nonunion short- and medium-haul carriers also grew wider, giving nonunion carriers some advantage as well.

Centralized bargaining continued to erode during the height of the post-deregulation and recession shakeout.

This internal tension caused TEI to break up in September 1977. When carriers formed Trucking Management Incorporated (TMI) in April 1978, the breach temporarily healed. However, this association retained essentially the same representational structure as its predecessor (Levinson 1980, 139-144). It also retained its predecessor's diverse constituency and needs, as well as its inherent internal tensions.

By 1979, the NMFA was under pressure from several directions. From the employers' perspective, administrative deregulation and the stagflation crisis of the 1970s put extreme pressure on specialized, truckload, and local and regional carriers. From the employees' perspective, high inflation caused wage packages to deteriorate and heightened consumer uncertainty. Deteriorating real wages created political pressures within the union and put the heat on bargainers, who needed to respond to militants' charges that the union was returning weak contracts.

The wage bargain set by the 1979 NMFA was not extreme in historic perspective, but moderation was not enough to save many of the smaller carriers facing the rigors of both deregulation and recession, and membership in TMI began to erode. The new TMI that negotiated the 1979 contract represented only about 400 carriers. Centralized bargaining continued to erode during the height of the post-deregulation and recession shakeout, and by the 1982 negotiations TMI represented only 284 carriers (BNA 1985, A-8).

By the 1985 master freight negotiations, TMI represented only between 34 and 36 carriers. Consolidation in the LTL segment of the general-freight industry was so extensive, however, that both TMI and the union claimed this represented the same proportion of the industry's employees as before deregulation (BNA 1985, A-8). However, the contract

terms and grievance-panel representation incorporated in TMI-negotiated contracts still benefited the large carriers over the small ones, and caused more small carriers to defect from the pattern.

The 1985 NMFA negotiations involved three major employers' associations: TMI, the Motor Carriers Labor Advisory Council (MCLAC), and Regional Carriers Incorporated (RCI).[35] The bargaining with TMI, which represented employers of 90,000 working Teamsters, set the pattern.[36] Ultimately, the situation forced MCLAC, representing 115 carriers employing between 40,000 and 50,000 employees of smaller cartage carriers, to accept the TMI agreement, while RCI, representing only 20,000 employees, did not sign and left its members to negotiate independent settlements (Perry 1986, 105-110). This contract covered between 150,000 and 160,000 employees, although the union estimated that between 40,000 and 50,000 of these employees were on indefinite layoff (BNA 1985, A-8).

Centralized bargaining declined far more than did Teamster representation.

By 1988, bargaining representation had become even more decentralized. In that year, TMI retained its representation of the 34 largest carriers, while MCLAC represented only 50 carriers and RCI only 18. Published reports again claimed the NMFA included about 180,000 workers (BNA 1988, A-5), although the number was probably closer to the roughly 150,000 covered in 1985. By 1991, TMI had dwindled to 24 carriers, although it is likely that they still represented nearly as many workers as in previous years (BNA 1990), supporting the contention that consolidation in LTL continued to concentrate both freight and employees in the largest carriers. In 1994, NMFA bargaining represented 120,000 employees directly and 30,000 employees indirectly under related contracts (Teamsters for a Democratic Union 1994, 3).

In sum, while NMFA negotiations covered perhaps one-sixth as many carriers as they did before deregulation, by 1985 industry consolidation had increased the size of these firms, and negotiations represented about half as many employees as before 1980. In addition, the increasingly divergent needs of many carriers in newly defined markets caused truckers to negotiate with the Teamsters individually, rather than collectively. Thus, centralized bargaining declined far more than did Teamster representation.

Wages and Earnings

Many economists accept, virtually as an article of faith, that deregu-

lation saved the nation billions of dollars. In particular, several studies have claimed that the wage decline after the MCA of 1980 confirms the claim that the regulated trucking industry benefited from rents, and that labor captured between 66% and 75% of these rents in the form of inflated wages (Rose 1985; Rose 1987; Hirsch 1988).[37] In fact, real wages have declined steadily since the late 1970s among workers in many goods-producing industries, not just trucking.

Bureau of Labor Statistics earnings data show that nonsupervisory employee average annual earnings in the trucking industry declined 26.8% between 1978 and 1990.

BLS earnings data, reported in **Table 5**, show that nonsupervisory employee average annual earnings in the trucking industry declined 26.8% between 1978 and 1990, down nearly $6,700 in constant dollars. This compares with an average real wage decline of $1,900 for other manufacturing and service workers. As **Table 6** shows, between 1978 and 1990 the average cumulative loss for truckers was more than $54,000 in 1982-84 dollars.

Figure 11 shows wage trends, in both nominal and real dollar terms, over the past three decades. Real wages today have fallen back to their value in the early 1960s. **Figure 12** compares trucking-industry

Table 5
Annual Wage Loss per Employee

	Annual wage loss per non-supervisory trucking industry employee since 1978 (SIC 42)	Annual trucking employee wage loss minus annual manufacturing employee wage loss
1979	$1,303.91	$729.68
1980	$2,412.45	$791.14
1981	$2,841.58	$1,222.88
1982	$3,831.21	$1,848.85
1983	$4,007.26	$2,730.79
1984	$4,369.52	$3,464.03
1985	$5,173.74	$4,237.94
1986	$5,337.84	$4,557.23
1987	$5,723.04	$4,770.52
1988	$6,238.68	$5,129.94
1989	$6,346.33	$4,872.35
1990	$6,693.92	$4,801.43

SIC 42 is Trucking and Warehousing; 1982-84 dollars.

Source: U.S. Department of Labor, Bureau of Labor Statistics, 1991a; 1991b.

Table 6
Cumulative Wage Loss per Employee

	Cumulative loss/worker since 1978 (SIC 42)	Cumulative trucking employees' loss, less manufacturing employees' loss
1979	$1,303.91	$729.68
1980	$3,716.36	$1,520.82
1981	$6,557.94	$2,743.69
1982	$10,389.15	$4,592.54
1983	$14,396.41	$7,323.33
1984	$18,765.93	$10,787.36
1985	$23,939.67	$15,025.30
1986	$29,277.51	$19,582.53
1987	$35,000.56	$24,353.05
1988	$41,239.24	$29,482.99
1989	$47,585.56	$34,355.34
1990	$54,279.49	$39,156.77

SIC 42 is Trucking and Warehousing; 1982-84 dollars.

Source: U.S. Department of Labor, Bureau of Labor Statistics 1991a; 1991b.

Table 7
Aggregate Earnings Lost by All Trucking Employees Between 1979 and 1990 (SIC)

	Annual earnings loss	Cumulative earnings loss
1979	$1,746,453,531	$1,746,453,531
1980	$3,088,423,825	$4,834,877,357
1981	$3,568,456,179	$8,403,333,537
1982	$4,634,616,300	$13,037,949,837
1983	$4,876,031,766	$17,913,981,601
1984	$5,760,341,340	$23,674,322,943
1985	$7,050,768,495	$30,725,091,438
1986	$7,448,961,261	$38,174,052,699
1987	$8,379,105,235	$46,553,157,934
1988	$9,681,186,931	$56,234,344,866
1989	$10,152,851,831	$66,387,196,697
1990	$10,961,302,068	$77,348,498,764

SIC 42 is Trucking and Warehousing; 1982-84 dollars.

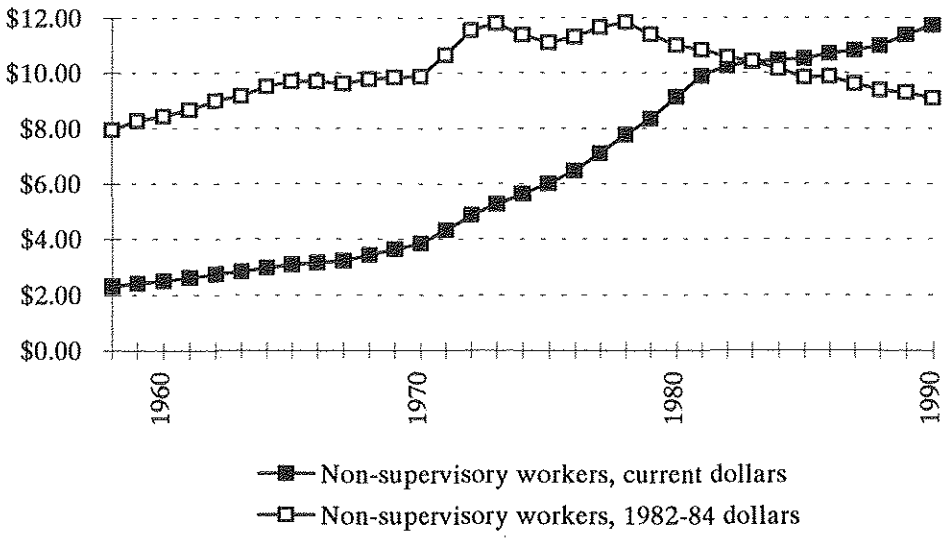
Source: U.S. Department of Labor, Bureau of Labor Statistics 1991a; 1991b.

wages with wages in other industries. In 1958, wages in trucking were comparable to those in durable-goods manufacturing. Trucking wages rose during the late 1950s and early 1960s, due in part to the successful development of centralized bargaining, culminating in the National Master Freight Agreement in 1964. By the mid-1960s, truckers' wages had become comparable with auto and steel workers' wages, and remained so until 1970. After 1970 real wages increased significantly in response to both the uncertainty produced by high inflation and the absence of the moderating influence of former Teamsters' President James R. Hoffa, who was in prison and out of the bargaining picture. The Teamster pattern was not substantially different, however, from steel or auto. After peaking at approximately $12.00 per hour (in real 1982-84 dollars), employee wages began the drop from which they have not recovered.

Trucking wages rose during the late 1950s and early 1960s, due in part to the successful development of centralized bargaining.

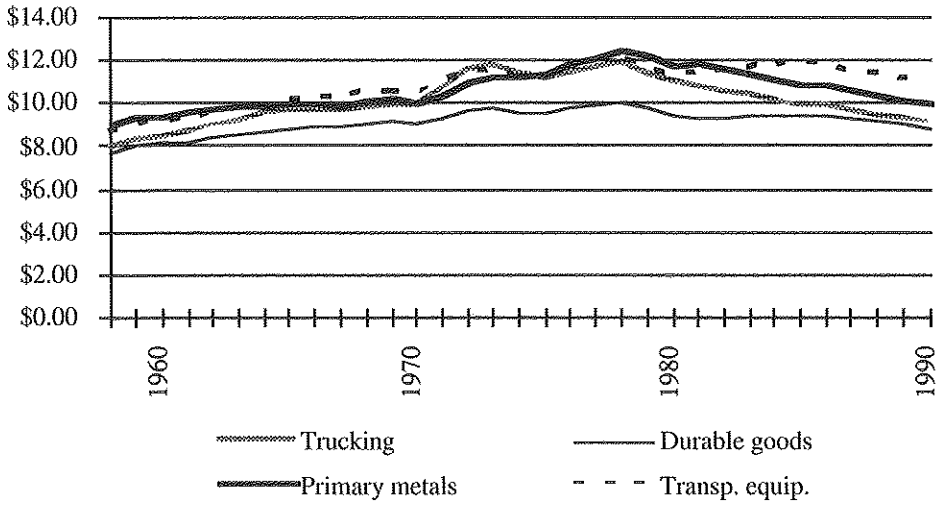
In a recent study of surface freight deregulation, a Brookings Institution study claimed that shippers' welfare resulting from motor carrier deregulation averaged $4.78 billion per year in 1977 dollars ($6.46 billion annually in 1982-84 dollars). Approximately 17% of that gain came from improvements in service time, and 83% from rate reductions (Winston et

Figure 11
Wages of Non-Supervisory Employees, SIC 42



Source: U.S. Department of Labor, Bureau of Labor Statistics 1991a; 1991b.

Figure 12
Interindustry Wage Comparison
1982-84 dollars



Source: U.S. Department of Labor, Bureau of Labor Statistics 1991a; 1991b.

Were these lost wages rents or compensating differentials for labor quality, risk, and inconvenience?

al. 1990, 28). Assuming that this figure is correct and that this average savings is constant over all years,[38] it suggests that 83% of the entire savings was a transfer of wealth from trucking employees to shippers. Over a 12-year period between 1978 and 1990, shippers have gained $94.384 billion (1982-84 dollars), while nonsupervisory employees have lost $77.348 billion (see Table 7).[39]

For economists, rents are unearned premiums resulting from market control. Monopolies earn rents by raising prices and keeping others out of the market through either market or political (regulatory) control. Unionized workers earn rents by raising wages while preventing other workers from competing for their jobs. In contrast, compensating differentials are premiums paid to companies for superior products and to workers for superior qualities.

Were these lost wages rents or compensating differentials for labor quality, risk, and inconvenience? If they were rents, we may be better off without them. If they were compensating differentials, declining labor quality behind the wheel may make us worse off. A recent study of current wages by Hirsch "suggests that a substantial proportion (half may be a

good guesstimate) of the [1983-1990] union-nonunion differential for truck drivers is a compensating quality premium" (Hirsch 1993, 294-295). As shown below, union wages remain considerably higher than nonunion wages, even after nearly 15 years of supercompetitive markets. One suspects that much of this aggregate earnings loss represents a decline in the quality of labor, especially in the nonunion firms. In fact, carrier executives claim labor quality has declined, particularly in the mostly nonunion truckload sector (Belzer 1993, 161-163). In sum, this and other research suggests that the higher wages paid to certain trucking employees are not rents but rather a premium to attract a higher-quality work force.

There are dramatic contrasts in wages by unionization and industry segment: while nonunion drivers average 24.3¢ per mile, Teamster drivers average 34.7¢.

Wage Differentiation

Wage scales narrowed during the period in which Hoffa built and consolidated centralized bargaining. Hoffa kept wages down in some regions and brought them up in others. The result was a national scale for truck-driver wages. Though not uniform, they fluctuated within a narrow range in general freight. In addition, wages among other Teamster truck drivers followed the freight pattern. These narrow wage differences meant that companies could not compete based on wage differentials but had to compete on the basis of efficiency and service quality (frequency of service, transit times, reliability, and the low incidence of damaged freight).

As post-deregulation wages declined, they began to differentiate along several dimensions. Wide variation in driver wages, (Belzer 1993), for example, followed the segmentation of the industry, and certain companies now compete based on low wages paid to employees.

The mean mileage rate in 1991 for the 132 general freight carriers that pay drivers by the mile was 29.5¢. This rate, including all types of Class I general freight carriers operating within the 48 contiguous states, varies from a minimum of 18¢ to a maximum of 42¢. There are two peaks at approximately 34¢ and 40¢, with another cluster near the lower end. Most of the carriers paying at either of the two higher peaks are both unionized and LTL. Most of the carriers in the bottom distribution are nonunion and TL.

As Table 8 shows, there are dramatic contrasts in wages by unionization and industry segment. While nonunion drivers average 24.3¢ per mile, Teamster drivers average 34.7¢.[40] However, industry segment pro-

Table 8
Mileage Rates, by Unionization, Segment, Regionalism

Type 1 Company	Rate 1	s.d.	Type 2 Company	Rate 2	s.d.	t-stat	signif.
union	34.7¢	5.3	Non-union	24.3¢	3.9	12.947	0.01
LTL	33.5¢	5.8	TL	23.8¢	4.2	10.96	0.01
National	25.1¢	6.6	Regional	31.0¢	6.6	-4.478	0.01
Union/LTL	35.8¢	4.1	Non-union/LTL	26.8¢	4.8	7.52	0.01
Union/LTL	35.8¢	4.1	Union/TL	28.4¢	7.4	2.763	0.05
Union/TL	28.4¢	7.4	Non-union/TL	23.1¢	2.8	2.008	10[.01][a]
Non-union/LTL	26.8¢	4.8	Union/TL	28.4¢	7.4	-0.571	
Non-union/LTL	26.8¢	4.8	Non-union/TL	23.1¢	2.8	3.147	0.01
Union/national	34.7¢	8.3	Non-union/national	23.1¢	3.7	3.353	0.05
Union/national	34.7¢	8.3	Union/regional	34.7¢	5	0.001	
Union/regional	34.7¢	5	Non-union/regional	25.0¢	3.9	10.764	0.01
Non-union/national	23.1¢	3.7	Non-union/regional	25.0¢	3.9	-2.033	0.05
LTL/national	38.9¢	2.7	TL/national	22.6¢	3	12.105	0.01
LTL/national	38.9¢	2.7	LTL/regional	33.1¢	5.8	4.147	0.01
LTL/regional	33.1¢	5.8	TL/regional	25.1¢	5	6.693	0.01
TL/national	22.6¢	3	TL/regional	25.1¢	5	-2.272	0.05
Union/LTL/national	40.1¢	0.2	Non-union/LTL/nat'l	34.0¢	n/a		[.01][b]
Union/LTL/regional	35.5¢	4	Non-union/LTL/reg'l	26.4¢	4.6	7.617	0.01
Union/TL/national	24.0¢	n/a	Non-union/TL/nat'l	22.7¢	3		[c]
Union/TL/regional	29.0¢	7.8	Non-union/TL/reg'l	23.7¢	2.5	1.757	[.01][d]

Significance based on critical values of t in two-tailed tests.
Union defined as more than 12.5% representational density.
[a] There are only eight union TL carriers and seven degrees of freedom. ANOVA on union/TL compares TL with and without union: F-ratio = 13.363 (p=.0006).
[b] There is only one national LTL nonunion carrier; no t-test can be conducted. ANOVA on union/LTL/national compares LTL/national with and without union: F-ratio = 968.04 (p=0.0001).
[c] There is only one national TL union carrier; no t-test can be conducted. ANOVA on nonunion/TL/national compares TL/national with and without union: F-ratio = O.23262 (p=0.6338).
[d] There are only seven union/TL/regional carriers and six degrees of freedom. ANOVA on union/TL/regional compares TL/regional with and without union: F-ratio = 7.1682 (p=0.0132).
Data and tests on national LTL carriers understate differences because one key union LTL firm, Roadway Express, refused to supply data.

Source: Derived from Belzer 1993.

vides a similarly graphic spread. The mean TL wage is 23.8¢, but the mean LTL wage is 33.5¢.

Among LTL carriers, the mean union wage is 35.8¢, while the mean nonunion wage is 26.8¢, only 74.9% as much. Nonunion TL drivers earn only 80% of the average TL union rate. Overall, the average non-union wage is 70% of the average union rate. In sum, even within market segments, the union premium remains between 20% and 25%.

An important confounding influence is the scope of the carrier, with

those hauling freight over longer distances paying much more in the LTL segment than in the TL segment. The average national carrier pays 25.1¢ per mile, while the average regional carrier pays 31.0¢ and the average local carrier 36.2¢. However, the scope effect for truckload is exactly the opposite of that for less-than-truckload. National LTL carriers pay 38.9¢ per mile, while national TL carriers pay only 22.6¢. Regional LTL carriers pay less than their national counterparts, while regional TL carriers pay more. Ironically, while the highest-paid LTL drivers work for national carriers, the lowest-paid drivers in the general-freight industry work for national truckload carriers. Long-haul truckload drivers earn only 58.1% as much per mile as do long-haul LTL drivers, and the latter are home much more often and have more regular schedules.

Membership in the Teamsters Union provides truck drivers with their best earnings opportunities.

In summary, membership in the Teamsters Union provides truck drivers with their best earnings opportunities. While the segment matters—drivers do best in LTL, especially with the national LTL carriers—union members do better than nonunion drivers across all sectors. While all truck drivers, including unionized drivers, have lost ground since economic deregulation, union members have lost the least and nonunion drivers the most. As a result, a significant union premium exists in all segments.

The Union Effect

As discussed above, many analysts claimed pre-1980 trucking industry regulation created rents for unionized workers (Moore 1978) and artificially enhanced the Teamsters' bargaining power (Rose 1985; 1987). The level of the union premium attributed by these scholars to regulation ranges from 30% to over 50%, depending on the study and calculation method. Hirsch claims that ICC regulation allowed the Teamsters to have greater bargaining power than they would have in a "more competitive" unregulated environment (Hirsch 1988). These scholars further claim that wage declines after deregulation prove the existence of rents in the regulated regime; wages now seek their appropriate market level. Assuming high wages could only result from unearned rents, these scholars conclude that the reduced wages prove that the Teamsters Union lost "much of its bargaining leverage" (its ability to capture the rent) as a result of regulatory restructuring (Pustay 1989, 252).

The evidence presented in Table 9, however, suggests that the Teamsters have retained considerable bargaining clout for their members within general freight. Although most observers thought deregulation would broadly weaken the bargaining power of the Teamsters, the actual outcome is more complicated. An earlier section discussed the paradox of high union density within the LTL sector, especially among the carriers that have gained market share throughout the decade, while at the same time a decline occurred in union coverage overall as the result of the proliferation of nonunion TL carriers. Moreover, while national LTL carriers have begun operating regional LTL carriers (many of them nonunion), most such carriers pay a wage that is nearly competitive with master freight, a practice suggesting that the union's threat effect remains potent in this segment. In the TL sector, however, the effect of the union threat has largely disappeared, leading to a pronounced decline in average real wages.

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To what extent has the union lost bargaining power since deregulation? Collective bargaining has become more difficult since regulatory restructuring, but for workers it also has become more important. While the earnings figures discussed above show that trucking employees on average lost earnings following regulatory restructuring, Table 9 also shows the difficulty of disentangling market and unionization effects.

Multiple regression analysis allows us to do that. The following analysis controls for industry segment, length of average haul, market share, profits, urbanization, and region. (Unfortunately, the data do not allow us to control for labor quality.) Table 9 presents the results.

It is an oversimplification to assert that the Teamsters Union has lost "much of its bargaining leverage," as claimed by Pustay and others (Pustay 1989, 252). Nonetheless, the union appears to have used its leverage mainly to minimize the fall of real wages among its members in the face of dramatic declines among nonunion workers elsewhere in the industry. Since the beginning of administrative deregulation in 1977, the union variable has had a strong and systematic positive effect on wage outcomes in general freight. Controlling for industry niche, scope, market share, net profit margin, urbanization, and region, the Teamsters Union has the largest effect on annual salaries and wages, raising earnings of union workers relative to those of nonunion workers.[41] The Teamster wage effect is significant in all years, and increases dramatically between 1977 and 1990.[42]

Table 9
Average Earnings Regression

	1977 coefficient (t-stat; prob) adj.partial R^2	1982 coefficient (t-stat; prob) adj.partial R^2	1987 coefficient (t-stat; prob) adj.partial R^2	1990A coefficient (t-stat; prob) adj.partial R^2	1990B coefficient (t-stat; prob) adj.partial R^2
Variable	Ave. earnings, all employees	Ave. earnings, all employees	Ave. earnings, all employees	Ave. earnings, all employees	Ave. driver earnings
Carriers	N=333	N=222	N=198	N=99	N=73
Constant	32054.6	16400.3	21807.5	24438.3	48968.1
Teamsters	2119.46 (4.22; <.0001) 7.5%	3884.95 (6.19; <.0001) 15.9%	3240.27 (5.71; <.0001) 14.1%	4876.32 (5.61; <.0001) 24.9%	7602.99 (5.18; <.0001) 29.3%
Truckload	-2854.03 (-3.67; .0003) 4.7%	-1837.86 (-2.34; .0424) 2.0%	-1463.40 (-2.20; .0287) 2.0%	-1131.15 (-1.20; .2320) 0.5%	-3779.78 (-2.02; .0480) 4.3%
Log of ave. haul	-2221.99 (-2.81; .0053) 2.1%	192.72 (0.186; .8522) -0.4%	-1106.01 (-1.27; .2039) 0.3%	1202.16 (1.30; .1973) 0.8%	-2589.79 (-1.47; .1474) 1.7%
Log of market share	2265.38 (4.11; <.0001) 2.9%	425.93 (0.666; .5061) -0.1%	1550.42 (2.89; .0042) 3.7%	2395.99 (3.14; .0023) 8.9%	6053.74 (4.74; .0001) 24.6%
Net profit margin	-7094.24 (-1.65; .0997) 1.4%	8208.69 (2.07; .0396) 1.6%	1754.50 (0.416; .6781) -0.4%	10343.0 (1.32; .1898) 0.9%	-12746.4 (-1.06; .2910) 0.3%
Urban	478.18 (1.09; .2767) 0.1%	1285.97 (2.28; .0234) 1.4%	258.98 (0.522; .6026) -0.4%	151.59 (0.210; .8345) -1.0%	989.52 (0.869; .3880) -0.2%
South/SE				-2738.19 (-3.11; .0025) 8.6%	-3016.53 (-2.02; .0467) 4.5%
R^2 adjusted	18.3%	23.4%	29.0%	54.5%	67.9%

Analysis utilizes complete population of Class I general-freight carriers. Class I carriers gross at least $5 million ($3 million before 1980) annually. This analysis is at the enterprise level: the motor carrier. Wages are expressed in 1982-84 dollars.

Source: American Trucking Associations, 1978; 1983; 1988; 1991; Belzer 1993.

Table 9 cont.
Definitions of Regression Indicators

Variable name	Type of variable	Meaning
Average wage	Continuous	Average annual salaries and wages of all carrier employees, in 1982 dollars, using GNP deflator
Average driver wage	Continuous	Average 1990 mileage driver salaries and wages in 1982 dollars, using GNP deflator
Teamsters	Categorical	Teamsters union present, regardless of density
Average Haul	Continuous; logged to base 10	Ton-miles per ton. A ton-mile is the transportation of one ton of freight the distance of one mile. Average haul is expressed in miles. It is a measure of weight and localism.
Market share	Continuous between 0 and 1; logged base 10	Share of general freight market excluding carriers not in analysis (excludes United Parcel Service)
Net profit margin	Continuous	Ordinary income (loss) from continuing operations before (NPM) taxes divided by freight operating revenues
TL	Categorical	Carriers which earn most of their revenue from shipments over 10,000 pounds; defined at 70% of revenue from TL freight in 1977 and 1982, and 95% of revenue from TL freight in 1987 and 1990
South/SE	Categorical	All or part of carrier operations are in South or Southeast states
Urban	Categorical	Carrier home office in city of 100,000 or larger
Operating ratio	Continuous	Total operating expenses divided by gross operating revenues

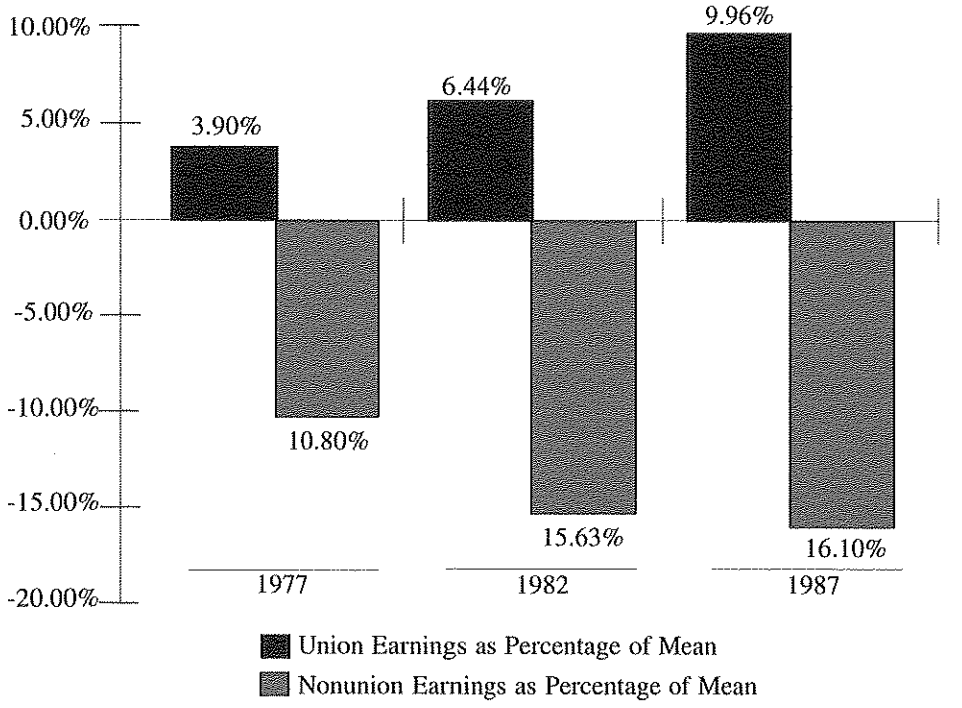
Among Class I general-freight carriers, the influence of the Teamsters on wages of unionized workers has increased significantly, slowing the decline of its members' real wages. On the other hand, its ability to draw nonunion wages up has fallen, reflecting employers' declining fear that the Teamsters will successfully organize them. The declining influence of the union threat effect has caused the increasing union-nonunion wage gap.

The overall earnings gap between employees of general-freight union and nonunion firms increased 34.7% between 1977 and 1987.[43] However, just as a rising tide lifts all boats, a falling tide beaches all boats. While **Figure 13** shows an increasing gap between union and nonunion employees, **Figure 14** demonstrates how the differential is based on declining earnings for all employees.

The influence of the Teamsters on wages of unionized workers has increased significantly, slowing the decline of its members' real wages.

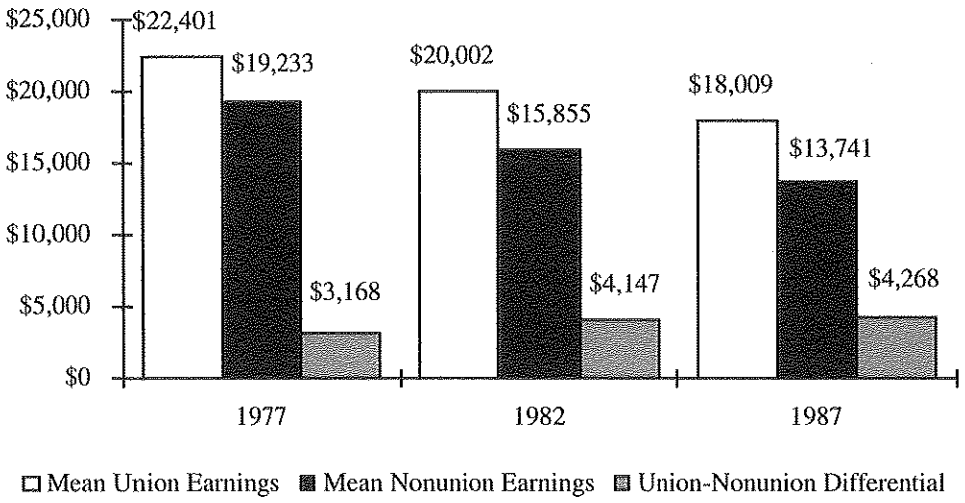
Mean earnings in general freight declined 24.0%. Union employees fared better: their earnings dropped by only $4,392, or 19.6%, compared with a drop of $5,492, or 28.6% (from a lower base) for nonunion employees.[44] Consequently, the union premium climbed from 14.1% in 1977 to 24.3% in 1990.

Figure 13
Union-Nonunion Wage Gap



Source: American Trucking Associations 1978; 1983; 1988; 1991; Belzer 1993.

Figure 14
Declining Wages for All



Source: American Trucking Associations 1978; 1983; 1991; Belzer 1993.

As the proportion of unionized carriers declines, nonunion wages may continue to decline, dragging unionized wages with them.

These data show that the Teamsters Union did a reasonably good job protecting the wages and working conditions of its members under very adverse circumstances. However, the data also show a dramatic deterioration of wages among the increasing number of employees of nonunion carriers. As the proportion of unionized carriers declines, nonunion wages may continue to decline, dragging unionized wages with them. The increasing union premium is small consolation for union drivers whose earnings have fallen.

While the steady erosion of Teamsters' wages presents a problem for policy makers who want to retain a broad middle class, the concomitant and more severe decline in nonunion wages has created a problem for the industry as well. Nonunion carriers, predominantly in truckload over-the-road operations, are experiencing "the first major, widespread labor shortage since the 1980s," according to Allen Sinai, chief economist for Lehman Brothers (Machalaba 1993, A1).

As discussed above, the problem is both low pay (or no pay) for work performed and no pay for forced waiting time. One former road driver realized that if he added up all of his work time, he was making less than

minimum wage (Machalaba 1993, A1). Combining low pay, the high cost of living on the road, and the stress on the family that results from the trucker's irregular lifestyle, the job will tend to attract fewer high-quality employees and put the least desirable workers behind the wheel. As the economy expands, the pinch will worsen and freight will not move.[45]

A central tenet of the pro-deregulationists was the claim that economies of scale in the trucking industry do not exist: there are no advantages to carrier size. Yet, controlling for other effects, larger carriers pay significantly higher wages than smaller firms, which suggests that industry consolidation has been beneficial for workers who work for larger firms. This effect is most dramatic on mileage driver wages, a category in which market share is almost as important as the influence of the Teamsters Union in explaining wages.

Larger carriers pay significantly higher wages than smaller firms, which suggests that industry consolidation has been beneficial for workers who work for larger firms.

Truckload drivers earn less annually, confirming the pay rate analysis in Table 8. The effect is most pronounced among long-distance TL drivers, as they earn lower wages than their LTL counterparts who perform similar work. Yet TL drivers' jobs are probably more difficult, as they frequently load and unload their trucks without pay, wait for loads and repairs without pay, and drive irregular routes over longer distances. Since much of this work is uncompensated, annual salaries are correspondingly lower.

Finally, all employees of Southern trucking firms earn significantly lower annual salaries, returning to the pattern of regional inequity that existed before the Master Freight Agreement. Although the road drivers' disadvantage is greater than that experienced by other carrier employees, it is notable that all employees of carriers with Southern operations experience low salary levels.[46]

Conclusions

The restructuring of the trucking industry presents a mixed story of success and failure. Whether public policy has been a success or a failure, however, depends on one's interest in the industry. Consumers want to pay low prices for the goods they buy, and shippers want to reduce their overhead; trucking costs are a significant part of each goal. Trucking companies want a stable business environment in which they can earn a return on their investment and manage their business with a minimum of

interference. Employees want jobs with decent pay and working conditions, career stability, and job security. The public wants safe highways and a reliable transportation system. Everyone, therefore, has a "special interest" in public policies that regulate motor carriers.

The change in the regulatory framework forced a major transformation of the transportation industry. The trucking industry became more concentrated, although this concentration is uneven, since LTL market concentration far outstrips that in the TL industry. (However, some indications suggest emergent concentration among truckload carriers as well.)

The bankruptcy rate among both union and nonunion carriers and in most industry sectors remains high.

The bankruptcy rate among both union and nonunion carriers and in most industry sectors remains high. As stock values indicate, the trucking industry generally offers a weak return on investment, particularly in the LTL sector, thus encouraging capital suppliers to invest their money elsewhere.

Job growth in the trucking industry has been a bright spot in the American economy since the mid-1980s, but these newly created jobs pay poorly, have no hours-of-work or minimum-wage protections, offer limited benefits, provide poor working conditions, have no union representation, and are insecure. These low-wage jobs reflect the low bargaining power of the individual truck driver and the decline of union representation in the newly created TL segment of general-freight trucking. While investors have evaluated the opportunity costs and shunned trucking's low returns, drivers with job-specific human capital have been stuck with the tab.

However, this combination of poor compensation, hard work, and long hours, along with the prospect of being away from home for days or weeks at a time, provide little incentive for workers looking for good careers. The driver shortage reported by truckload carriers attests to the unattractiveness of these jobs (Machalaba 1993; Larkin 1994) and to the imbalance of supply and demand at today's low wages. Market forces should raise wages and eliminate the driver shortage, although one trucker, M.S. Carriers, is currently attempting to circumvent the laws of supply and demand by seeking a waiver of U.S. law from the Department of Labor and the Immigration and Naturalization Service to hire British drivers (McNamara 1994). Such a policy, of course, would prevent the domestic market from correcting the problem through higher wages and better working conditions.

The most potent force for the maintenance of standards is the Teamsters Union. Regression analysis, which controls for other institutional and

market factors, shows that workers earn more money and have better working conditions where the union is present. Few other institutional brakes on exploitative practices exist in the trucking industry, as minimum wage and hour standards do not apply to workers in this industry.

In a recent study conducted by the Insurance Institute for Highway Safety, nearly three-quarters of all road drivers admitted violating DOT hours-of-service regulations, and two-thirds admitted doing so regularly (Braver, et al. 1992). Truck drivers working in unregulated intrastate commerce, out of the reach of the DOT, may have no standards at all. The Teamsters, which struggles to maintain wages and conditions, remains the only institution regulating employment conditions.

The most potent force for the maintenance of standards is the Teamsters Union.

Policy Recommendations

Institutional Reform: The Labor Market

Labor Standards. The protections most workers take for granted—the minimum wage, time-and-a-half for overtime, health and safety protection from the Occupational Safety and Health Act—do not apply to truck drivers and other employees of motor carriers engaged in interstate commerce. The Minimum Wage Study Commission concluded in 1981 that such protection was unnecessary because union protections made it redundant. However, regulatory reform has de-unionized significant sectors of the trucking industry, and employees have no other protection. Not only do truckload drivers earn very low mileage wages, they do not get paid for much of their loading, unloading, waiting, breakdown, and other nondriving time. Many drivers, dependent on load revenue for their pay, put in very long hours for alarmingly low wages (Belzer 1993, 139-157; Machalaba 1993).

To remedy these conditions, Congress should extend the protection of the Fair Labor Standards Act to employees of trucking firms engaged in interstate commerce. Specifically:

- Truck drivers and other employees of trucking companies should be covered by the minimum wage. Without collective bargaining, the government must set a floor.
- Carriers should pay employees for all time spent in service to the employer. This includes loading, unloading, waiting for loads, and breakdowns.
- Truck drivers should earn an overtime premium, thereby discouraging employers from forcing employees to work every hour permitted by

law or human endurance. Again, truck drivers deserve the same treatment as other nonsupervisory employees.

- Percentage pay should be eliminated for all but bona fide subcontractors. The percentage payment mechanism allows carriers to violate the FLSA and defeat the purpose of these reforms.

Drivers who do not get paid for nondriving time have an incentive to falsify their log books. Although they may be loading or unloading, standing on a dock waiting to pick up or deliver a load, repairing their trucks, or waiting for repairs, if they do not get paid they have a powerful incentive to log their time as "off duty." This unrecorded work time allows drivers to work longer hours than the law allows, contributing to unsafe highways and premature destruction of their health. The public pays for these abuses eventually, and the inability to measure them does not mean they do not exist.

Payment of drivers below minimum FLSA standards allows carriers to compete on the backs of their employees.

Payment of drivers below minimum FLSA standards allows carriers to compete on the backs of their employees. Such competition discourages carriers' investment in efficiency and productivity enhancements, since the drivers' donations of time camouflage sloppy operations management.

Admittedly, record keeping in this industry is difficult, and new methods are needed to keep track of hours of work. Enforcement of minimum standards of pay and maximum standards of work will require a creative effort. Truck drivers typically do not punch a clock, and they often are away from home for weeks. DOT must undertake the research required to develop an efficient, enforceable system.

Hours-of-Service. Rules regarding hours-of-service need to be re-examined and revised. Specifically, such rules should:

- prohibit competition among carriers that is based on overwork of human beings.
- structure work schedules to maximize the alertness of the drivers.
- structure work schedules to enhance the long-term health of employees.

As discussed above, studies were conducted during the 1970s to evaluate the effectiveness of current hours-of-service rules and to develop rules that reflect new learning on human health and safety. While this study does not take a position on the particular recommendations made by earlier

studies, a reevaluation is due. Work scheduling and limitations must reflect prevailing social standards as well as human health and endurance limits. The current regulations, which allow companies to dispatch drivers without notice on irregular schedules, are hazardous to commercial and private drivers alike.

Several studies have identified the fatigue problem as a significant contributor to safety problems. Excess work, irregular hours, and inadequate sleep clearly cause physical and psychological disorders that jeopardize the health of over-the-road drivers (U.S. Congress, OTA 1988, 147-152). We should review and update these studies, and restructure hours-of-service rules in a way that balances the industry's productivity needs and workers' health needs (see Griffin, Rodriguez, and Lantz 1993).

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Whether fatigue and stress lead to accidents or to the deteriorated health of drivers, motor carrier operations clearly have externalities that take their toll. While carriers pay the costs they incur when a driver has a truck wreck, they are less likely to pay the cost of long-term deteriorating health. The worst jobs have the highest turnover, and high turnover transfers the cost of deadly operations to others. Ultimately, society pays the tab for truck drivers' premature disability and mortality.

Hours-of-service rules have not been changed in over 50 years. They are antiquated and arguably both inefficient and ineffective. The original purpose of these rules was to put all carriers on the same footing while making the job less destructive to individuals. Yet trucks have become the rolling sweatshops of the 1990s, and the need to prevent companies from "sweating" labor in the pursuit of profits has not disappeared.

Labor Law Reform. Congress needs to change three labor law provisions, in place as a result of the Taft-Hartley Act and its successors, to give unions the ability to fairly conduct campaigns in the trucking industry.

- The prohibition of the secondary boycott should be reexamined.

Without the leverage of the boycott, it is unlikely that any union would ever have organized the trucking industry originally. While new law should discourage top-down organizing, it should permit union members to support their co-workers' efforts to organize and pressure their employees for better wages and working conditions.

- Section 14(b) of the Taft-Hartley Act should be amended to allow truck drivers to vote for a union shop.

In interstate trucking, employees and operations are spread over a wide geographic area and across state lines. Some carriers intentionally locate within mandatory open-shop states, so that they can prevent their drivers from organizing a union. Since interregional and national truckload carriers can locate their operations anywhere without significantly affecting their business, Section 14(b) gives them institutional protection that contravenes the stated purpose of the National Labor Relations Act.

- Selection of representation by card check, and thus bypassing the very difficult National Labor Relations Board election process, should be allowed.

Since truck drivers, especially in long-distance truckload operations, work all over the country, union advocates find it exceedingly difficult to organize them. While a majority may desire union representation, the inability to develop consistent communications frustrates their wishes. Authorization cards for this industry should clearly specify that the driver's signature constitutes a vote for representation, and the NLRB could certify a bargaining unit based on authorization cards signed by a 60% supermajority.

The bedrock of trucking labor-market self-regulation lies in the pervasive private-sector collective-bargaining relationships that have governed it for more than half a century.

Collective bargaining allows employers and employees to negotiate issues of equity and productivity in a private-sector setting. While employment law protects certain individuals' rights, such as the right to equal protection of the laws, it does not provide a mechanism to negotiate wages and working conditions. This study has shown that nonunion truck drivers, isolated from one another and vulnerable to abuses, have fared particularly poorly.

The bedrock of trucking labor-market self-regulation lies in the pervasive private-sector collective-bargaining relationships that have governed it for more than half a century. The emergence of the interstate general-freight industry mirrored the emergence of the Teamsters Union as a national force. Despite the Teamsters' retained strength in LTL freight and in many other specialized sectors, regulatory restructuring hurt collective bargaining. The Teamsters retain strong influence in the traditional crafts (milk, bread, beer, and some other local-product-delivery occupations) and in LTL freight, but they have lost influence in the emergent TL general- and

specialized-freight industries.

The trucking industry is hard to organize. Besides the usual economic, legal, and political pressures that make all union organizing difficult, truck drivers and their employers often are quite mobile. The proliferation of labor-leasing and truck-leasing operations, as well as the easy market entry by owner-operators, makes it even more difficult to conduct an organizing campaign at a truckload freight carrier.

Union representation becomes very difficult in an institutional environment that does not support the will of the majority. Truck drivers are by nature atomized and individualized, and a mechanism to represent their interests collectively will benefit both parties.

The costs of social regulation may be greater than the cost of the wages and working conditions that regulatory reform saved.

Employers individually are able to impose lower wages and conditions than is in their collective self-interest, a practice that makes truck driving a relatively undesirable occupation. Unless wages and working conditions improve, the current labor shortage will become chronic, and it will take many years to make the industry attractive again.

Finally, the costs of the social regulation designed to improve motor-carrier safety, required because of reduced labor quality caused by poor wages and conditions, may be greater than the cost of the wages and working conditions that regulatory reform saved. Better wages and conditions would attract a higher-quality workforce to the trucking industry, thereby reducing regulatory costs.

Institutional Reform: The Industry

Regulatory restructuring tore down a well-established, inefficiently administered regulatory mechanism and replaced it with market regulation. As externalities arose, Congress and government agencies created a huge patchwork of social regulations intended to ameliorate deregulation's negative side-effects. Thus, inefficient indirect social regulation replaced arguably inefficient direct economic regulation. This research suggests four avenues for policy adjustment that are designed to resolve some of the problems created by the regulatory reforms of the 1970s and 1980s. These reforms would improve access to information among market participants, set a floor for the labor market, and facilitate private-sector conflict resolution.

The Managed Market. An efficient market-clearing mechanism

needs to be established for the trucking industry. One of the biggest problems with today's regulatory system is the shipper's lack of information. Without an expensive, sophisticated traffic department, shippers have limited information on the availability of services and their appropriate market price. A database of tariffs, available to the public, would make it easy and efficient for shippers to locate truckers willing to provide service at published rates. How would such a database be organized and maintained?

First, it would require all interstate common carriers of property to file tariffs electronically with the Interstate Commerce Commission. With modern computer and telecommunications technology, a database system could receive and post entries automatically, with a minimum of technical staffing.

One of the biggest problems with today's regulatory system is the shipper's lack of information.

Second, private agents, as do travel agents, could access this ICC database and provide shippers with up-to-date information on available rates and services. On a fee-for-service basis, these agents could match shippers and truckers with each other, thus providing an efficient aid to market governance. To maintain the agency relationship between shipper and agent, the agent should charge the shipper a competitive fee for this service. As any number of agents could enter this market, competitive forces should keep the fees at a reasonable level.

Third, common carriers' rates would be allowed to vary continuously, reflecting the market's demand for their services. However, the rules should permit volume discounting only at the time the shipper purchases service, and should not be extended over several weeks or months. For example, a trucker can offer a lower per-shipment price to a shipper who tenders several separate shipments in one pickup; the trucker could pass his cost savings on to the shipper. However, a trucker could not offer a lower price to a shipper who ships a specified monthly tonnage. While the trucker could argue such guaranteed volume allows him to plan ahead, thus saving him money, this kind of volume discount discriminates against smaller shippers and provides an opportunity for abuse. Thus, the rate quoted at the time of service should be the rate paid, a practice that would preclude bankrupt carriers' litigation over undercharges.

Fourth, contract carriers would report their contract rates to the ICC for inclusion in this database. As the volume of contract carriage increases, the importance of establishing the market for such services grows. At

minimum, if contract carriers list the commodities they haul, regions they serve, and prices they charge, agents can match them with shippers desiring lower-cost contract-carriage service. While the parties could execute contracts immediately, carriers would file the freight bill electronically with the ICC. This rate filing would enable the ICC to post, in the computerized rate database, current market rates for contract carriage.

Conventional analysis of deregulation ignores information costs when calculating the cost of transactions. Allen adds information costs to traditional economic welfare analysis and finds some advantage for the post-MCA of 1980 regime, but the advantage is narrow: benefits exceed costs by less than 10% (Allen 1990). Adding the dislocative institutional and labor force impact might tip the benefit-cost balance against economic deregulation.

A systematic market will reduce the temptation of individuals to cut special, under-the-table deals that defraud shippers, truckers, and the public.

This computerized database would resolve the critical problems of information asymmetry between the parties, provide them more perfect information on market prices, and make it easier and more efficient for both small and large carriers to compete. The electronic filing eliminates all need for advance filing, and the public nature of the filing will mitigate tendencies toward predatory or other illegal pricing. While true public information may allow small, unsophisticated carriers to price knowingly at some factor below the market leaders, intelligent pricing by market leaders may make these small carriers less inclined to price irrespective of cost. Finally, a systematic market will reduce the temptation of individuals to cut special, under-the-table deals that defraud shippers, truckers, and the public.

In sum, institutions can help or hinder market regulation by facilitating or obstructing the management of the market. Efficient, private service based on publicly available data will enhance the market, and a properly funded and directed ICC is best equipped to collect, manage, and operate such a database.

Data Collection Improvements. Data collection by the ICC must receive more budgetary and legal support. Much of the debate over whether industry productivity has improved or declined rests on insufficient data. The Bureau of Labor Statistics has stopped reporting labor productivity data because of declining data quality. This change has left a major vacuum, since no other government agency collects data on this industry.

Public policy evaluation, logistical policy analysis, and strategic in-

dustry analysis require the kind of financial and operating statistics that were collected by the ICC for nearly six decades. A lack of accurate data also hampers the debate over whether economies of scale and scope exist in the trucking industry. (The analysis in this report would not have been possible without the ICC data collection that has existed during these years.)

Policy makers need accurate information on which to base their decisions. Unfortunately, a severe decline in the breadth and reliability of economic statistics accompanied regulatory restructuring. The government slashed funding for the ICC, and data collection and reporting has deteriorated. For example, while the ICC reported only 191 Class I general-freight carriers in 1990, the ATA, after taking a close look at the operations of a large range of motor carriers, classified 495 carriers in that category.

If ICC policy continues on its current course, we can expect the institutional infrastructure of the entire transportation industry to continue to degrade.

Data collection has declined so severely that BLS can no longer trust its own productivity measures. Trucking is the lifeline of the U.S. freight transportation system and an important contributor to national productivity. The lack of accurate, detailed data on financial outcomes, operations, and the competitive environment makes it very difficult for analysts to determine whether the system is functioning efficiently.

The ICC is currently moving in the opposite direction. On January 27, 1994, it announced major cuts in data submission requirements. The commission raised the Class I carrier size threshold from $5 million to $10 million and the Class II threshold from $1 million to $3 million, drastically cutting the number of carriers required to report key operational and financial data. Furthermore, it eliminated the Uniform System of Accounts, thereby delivering the final blow to uniform data collection (Sparkman 1994). While "generally accepted accounting principles" may serve the accounting needs of the firm, as a data collection standard they can only be a disaster. Without uniformity, the data will be useless to transportation policy analysts. These actions probably will make routine data collection and evaluation impossible, thereby putting a blindfold on policy analysis and making it virtually impossible.

In sum, the ICC needs both direction and a mandate from Congress. If ICC policy continues on its current course, we can expect the institutional infrastructure of the entire transportation industry to continue to degrade. The complete destruction of these institutions will leave government policy in the dark, with dangerous consequences for commerce and industry.

Appendix

Glossary of Trucking Terms

for-hire carrier — A motor carrier which offers its services to the public.

private carrier — A company that uses its own trucks to deliver goods it produces or distributes. Deregulation allows private carriers to do limited for-hire hauling.

common carrier — A carrier that offers its services to the public according to published rates.

contract carrier — A for-hire carrier whose services are available only through a private contract between trucker and shipper.

exempt carrier — Carriers exempt from ICC regulation: haulers of certain commodities, haulers of shipments that are part of continuous airfreight movements, intrastate and local cartage, and private carriers.

owner operator — Persons who own and drive their own trucks, either under their own authority or under contract to a carrier. Some owner operators own more than one truck and employ other drivers.

operating authority — The ICC grants operating authority to for-hire carriers, specifying the commodities to be hauled and services to be offered.

certificated carrier — A carrier authorized to offer common carrier service to the public on the basis of published tariffs.

local cartage — Trucking operations limited to a single city or metropolitan area.

ton-mile — An output measure defined as the transportation of one ton of freight the distance of one mile.

general freight — Non-specialized freight that generally requires no special handling or equipment.

special commodities — Specialized freight that requires special handling and special equipment; e.g., bulk solids or liquids, refrigerated commodities, automobiles.

dock workers — Persons who work on a loading dock, loading and unloading freight.

truckload (TL) — A shipment weighing more than 10,000 pounds; also, a carrier primarily hauling these large shipments. A full load for a TL carrier typically consists of between one and four shipments. TL operations do not require terminal infrastructure.

less-than-truckload (LTL) — A shipment weighing less than 10,000 pounds; also, a carrier primarily hauling these small shipments. A full load for an LTL carrier typically consists of more than thirty shipments. LTL operations require elaborate terminal and pick-up and delivery operations.

front haul — The primary freight loading from a trucker's home terminal to the consignee.

back haul — The secondary freight loading from a point near the consignee, a region often outside the trucker's primary customer base, returning to the trucker's home terminal.

interline — A single freight movement shared by at least two carriers, neither of which can deliver the freight within its own system.

Class I — Carriers grossing more than $5 million annually.

Class II — Carriers grossing between $1 million and $5 million annually.

casuals — Workers hired on an irregular basis and without a position on a seniority board; they may be hired out of hiring halls.

linehaul — An "over-the-road" freight movement; also drivers who do intercity and interstate work, either from terminal-to-terminal or shipper-to-consignee.

Endnotes

1. For Derthick and Quirk, the contest is between "pro-competitive" and "anti-competitive" forces (1985, 11). Their analysis rests primarily on the capture theory, and the players are either pro-reform or anti-reform.

2. The use of value-of-service pricing in trucking paralleled its use for railroads. With value-of-service pricing, the value of the goods shipped determines the rate. This price structure ensures that producers ship low-value finished goods by truck or airplane.

3. Between 1935 and 1980, the ICC and the law strongly favored collective rate-making.

4. Unfortunately, while Kahn criticizes price discrimination based on "unrealistic value-of-service pricing schedules" (Vol. 2, 21) and favors cost-based pricing, he does not provide a convincing critique of value-of-service theory. Embroiled in a critique of regulated value-of-service pricing, he does not show why unregulated carriers ultimately would not rely on the same pricing mechanism.

5. The usefulness of value-of-service theory can be illustrated best by considering freight rates intermodally. Shippers have four basic modes to choose from: water, rail, highway, and air. Obviously, the cost of transportation increases across these four modes. A ton of iron ore can be more economically moved by barge than by plane. The ore shipper's demand curve would be almost infinitely elastic at the price an air carrier would charge. Since holding costs are relatively low, this shipper likely would hold out for a price so low only a water carrier could charge it. Conversely, a computer shipper's demand curve is relatively inelastic, as it must sell its goods quickly to keep its inventory costs low. This shipper is more likely to ship a ton of computers by air to a customer who is ready to pay on delivery.

Neither shipper is terribly concerned about the carrier's costs; that is the carrier's problem. If an air carrier offers a price competitive with a barge, the ore shipper will take it. A myriad of choices also exists within modes and between modes, reflecting market responses to an almost infinite variety of needs. Whether regulated or not, this calculus, repeated millions of times daily for millions of products, forms the basis for the logistic strategy of shippers and the business strategy of carriers.

Historically, the trucking industry settled on a synthesis of cost- and value-of-service as the basis for its tariffs. As a practical matter, cost was exceedingly difficult to determine and standardize, and shippers understood value-of-service rates well, knowing what to expect (Childs 1985: 157-161).

6. Smith indicates "non-ICC" carriers' proportion of all intercity trucking tonnage increased nearly 3% between 1980 and 1990 (Smith 1992: 10). In contrast, pro-deregulators expected tonnage to shift to the regulated sector because economic deregulation would reduce incentives for private carriage.

7. During the 1980s, the ICC allowed common carriers to file special tariffs for individual shippers using shipper code numbers that only the carriers can decode, rather than by company name. This allowed carriers to disguise public filings, enabling publicly filed tariffs to have many of the advantages of privately negotiated contract-carrier contracts while retaining common carrier

authority and protection. The NRA of 1993 made this practice illegal.

8. See the *State Motor Carrier Guide*, published by Commerce Clearing House, for current state regulations and state regulatory agencies.

9. U. S. Code Title 49 § 521.

10. U. S. Code Title 49 § 1814; see also note to U. S. Code Title 49 § 2501.

11. U. S. Code Title 49 § 11506.

12. CVSA is a state-based independent safety inspection system, coordinated with the FHWA (U.S. Congress, OTA 1988, 72-73). SAFETYNET is national network of carrier and driver safety records and includes violations and safety citations (U.S. Congress, OTA 1988, 77).

13. U. S. Code 1992 Transportation Appendix 49 App. § 2302.

14. U. S. Code 1992 Transportation Appendix 49 App. §§ 2716, 2717.

15. U. S. Code 1992 Transportation Appendix 49 App. §§ 2303, 2304.

16. U. S. Code 1992 Transportation Appendix 49 App. §§ 2303, 2708.

17. In a pilot program in cooperation with the federal government, New Jersey, Utah, Nebraska, and Minnesota all conduct roadside checks for drug and alcohol use (Hamilton 1993). The rules define intoxication as a blood alcohol level of .04%, compared to the usual .1% definition of legally drunk. Drivers removed from the road under this standard can return after their blood alcohol level drops below .02%.

18. Transferred to DOT in 1966. Note that DOT safety and other rules apply to many more drivers than those exempted by the FLSA.

19. In 1979, the Department of Labor estimated the exemption applied to 1 million nonsupervisory employees (Fritsch 1981: 167; U.S. DOL 1979). This figure corresponds to BLS SIC 421 nonsupervisory employment in 1979. The current figure is approximately 1.3 million.

20. In 1977, Class I carriers had at least $3,000,000 in annual gross operating revenues, while Class II carriers had at least $500,000 in revenues. Since January 1, 1980, these thresholds have been $5,000,000 and $1,000,000, respectively (ICC Bureau of Accounts 1977; 1982).

21. Roberts defines transcontinental carriers as those with an average haul of over 1,000 ton-miles per ton. Using 1990 data, this definition includes Yellow Freight System, Consolidated Freightways, Roadway Express, ABF Freight System, Watkins Motor Lines, and Northwest Transport Service. This definition excludes such arguably transcontinental carriers as Overnite Transportation (a subsidiary of Union Pacific Railroad that operates as five regional carriers with the capacity for interregional freight movements; it rails much of its transcontinental freight) and

Carolina Freight Carriers (which recently drew back from national LTL service). It also excludes G.I. Trucking (the California-based regional arm of ANR, with an average haul of 951 miles). Roberts inexplicably excludes Miles (Herman) Trucking of Texas, a small carrier with an average haul of 1,517 miles.

22. In 1990, the two largest carriers controlled 65% of this market. The largest, Jones Truck Lines, closed in 1991. Roadway bought the second largest carrier, Central Freight Lines.

23. In the pre-1980 regulatory environment, regulation's critics claimed service inflated beyond the level demanded by the market. Quality increased unnecessarily, leading to unwanted high frequency of service, short transit times, and reliability.

24. Using the state-based Current Employment Statistics (CES) survey, the BLS samples approximately a third of a million reporting units yearly. It reports employment, hours, and earnings data according to the 1987 *Standard Industrial Classification Manual.* Standard industrial classifications (SIC) group industries according to their primary economic activity. For the trucking industry, the BLS reports employment, hours, and earnings data for SIC 42 (Trucking and Warehousing) and SIC 421 (Trucking and Courier Services, Except Air). Using ICC data on the trucking industry, the BLS reports labor productivity according to a finer trucking industry classification: intercity trucking, Class I and II common and contract carriers (SIC 4213 part), and intercity trucking, general freight, Class I and II common carriers of general freight (SIC 4213 part) (Executive Office of the President, Office of Management and Budget 1987; U.S. Department of Labor, Bureau of Labor Statistics 1992b, 14-28, 78-98, 246-247). Outcomes between categories in either series are very similar. This study reports data for SIC 421 and SIC 4213, part.

25. The BLS reports similar declines for all Class I and Class II common and contract carriers.

26. BLS statistics never have included intrastate carriers, Class III carriers, owner operators, and exempt haulers. This means BLS data have always had a bias toward larger, interstate operations.

27. The classifications of Federal Express, United Parcel, and Airborne Express exemplify the problems caused by the federal government's failure to adjust classifications to fit current allowable operations. The ICC classifies UPS as a motor carrier, FedEx as an airline, and Airborne as a freight forwarder, yet they all compete with one another in the overnight package delivery business. Different economic and labor legislation applies to each, and data are collected (or not collected) on each according to completely different rules. Not only does this make policy analysis difficult, it wreaks havoc within the business community (Biesada 1992).

28. Note that this number still does not include nonreporting carriers.

29. Source: communications with current and former ATA officials.

30. Pustay claims that the "ICC's usage of a 95% operating ratio test yielded rates of return that were very generous to the carriers" (Pustay 1989, 244). His use of the 95% standard is unsubstantiated, as is his claim of "generous rates of return" to the carriers. Locklin explains the difficult tension between the two standards and suggests the higher return on investment (compared to

manufacturing) compensates motor carriers for the greater risk they took, long before deregulation (Locklin 1972, 709). The wide fluctuations in operating ratio since regulatory restructuring may explain the frequency of bankruptcies during periods of very high average operating ratios.

31. Industry employment also declined between 1979 and 1983, and did not recover its pre-deregulation high until 1985. See Figure 3 above.

32. In 1991, the author conducted a telephone survey of 223 Class I general freight carriers. Executives of these carriers were asked to state approximately what proportion of their drivers were unionized. This survey suffers from the obvious survivor bias; only carriers operating a decade after deregulation could be surveyed. Nonetheless, little change in union representation had occurred among surviving carriers during an obviously turbulent era.

33. The Teamsters represent most unionized trucking employees, with a very small fraction of the industry represented by United Transportation Employees, the International Association of Machinists, and a few others.

34. The ATA did not report the number of drivers at each company before 1990. Using ATA data for 1990, this study estimates that 50% of all carrier employees were drivers and assumed the same proportion applied to previous years. This is a conservative generalization, because BLS data show that the proportion of supervisory to production employees was constant or slightly rising between 1977 and 1990. The number of drivers was multiplied by the union density at each carrier. Since the latter data was obtained from the author's 1991 survey and current research, and the survey population was based on carriers existing in previous years' ATA tapes (as discussed above), information on union representation is limited to carriers listed as Class I General Freight during those years. Thus, the same data discontinuity discussed above affects these results. Finally, this study assumes that failed carriers were union shops, as probably most were.

In sum, while CPS data includes all truck drivers, from DOT-regulated intercity truck drivers to unregulated local couriers, ICC-based data is limited to the general-freight market. This approach avoids confounding broad changes in delivery markets with changes in the general-freight trucking industry.

35. MCLAC and RCI represented small- and medium-sized Midwest regional carriers.

36. The number of carriers represented by various associations, and the number of employees they represent, is kept secret as a matter of bargaining strategy. Therefore, estimates vary between sources and citation dates.

37. The remainder of the rents allegedly were captured by carrier stockholders in the form of inflated values of operating rights (Pustay 1983; Pustay 1989).

38. Roberts considers these estimates excessively high and "completely unbelievable" (1992, 2). However, he agrees with Winston et al. that organized labor has been the biggest loser from economic deregulation.

39. Methodology:

Conversion factor from 1977 to 1982-84 dollars: 1.642036125
{100/60.9 (1982-84 index / 1977 index)}
Avg. average welfare gain, 1982-84 dollars * 12 years: $94,384,236,453
{([$4.79 billion * inflator] * 12) * 1,000,000,000}
Unadjusted cumulative earnings loss: $77,348,498,764.22
Adjusted cumulative earnings loss: $55,799,391,406
Proportion of adjusted earnings loss to total welfare gain: 59.12%
{(cumulative loss per trucking worker minus cumulative loss per manufacturing worker) / total welfare gain}
Proportion of unadjusted earnings loss to total welfare gain: 81.95%
{unadjusted cumulative earnings loss / total welfare gain}

40. In this survey, 101 carriers are organized by the Teamsters and five organized by other unions. Teamsters average slightly higher pay, although the difference is not statistically significant.

41. These data reflect average earnings of all employees of trucking companies, including drivers and other production employees, clerical employees, and management.

42. The adjusted partial R^2 measures the relative influence of all predictors on the dependent variable, wages. For example, it supplies a measure of the effect of the Teamsters Union on wages, with all possible relationships between the Teamsters and other independent variables taken out. The dramatic increase in the adjusted R^2 for the union and the market share of the firm shows the most important influences on wages.

43. These figures are based on data available to the author for years prior to 1990. In 1990 the American Trucking Associations reclassified carriers according to their own understanding of the type of operations in which they were engaged. Thus, while the ICC classified 191 carriers as "Class I General-Freight Carriers Engaged in Intercity Service," the ATA classified 500 carriers in that category. While the ATA's reclassification may have been justified (since the ICC had not made such a reclassification since deregulation, despite massive industrial restructuring), the reclassification introduced tremendous discontinuities in the data. However, the general trend is consistent. Nonunion earnings were 76.3% of union earnings in 1987 and 75.7% of union earnings in 1990.

44. All wages expressed in 1982-84 dollars. Wage data do not include benefits. In terms of total compensation, union wage declines may overstate their losses. The Teamsters elected to freeze wages during the early and middle 1980s and shift revenue increases to their health and welfare funds. The wage data reported here do not reflect increases in health and welfare payments, except that lower wages may be compensated by retention of higher benefits.

45. At least freight will not move at current rates within the current structure. Valuable freight that is worth moving at a higher price will shift to LTL carriers, large TL firms that move their long-distance freight by rail, or premium TL firms that are large enough to create hub-and-spoke or relay systems. Less valuable freight will wait (see Machalaba 1993, A5).

46. For a detailed explanation of the methods used to develop this analysis, see Belzer 1993, Chapters 5 and 6.

Bibliography

Allen, W. Bruce. 1990. "Deregulation and Information Costs." *Transportation Journal*, Vol. 30, No. 2, pp. 58-67.

American Trucking Associations. 1988. *1987 Motor Carrier Annual Report.* Alexandria, Va.: Financial & Operating Statistics Service, Department of Statistical Analysis, ATA.

American Trucking Associations. 1964, 1966, 1967, 1968, 1969, 1972, 1974, 1975, 1976, 1977-1978, 1979-1980, 1993. *American Trucking Trends.* Alexandria, Va.: Financial & Operating Statistics Service, Department of Statistical Analysis, ATA.

Anderson, Dale G., and Ray C. Huttsell. 1989. "Trucking Regulation, 1935-1980." In *Regulation and Deregulation of the Motor Carrier Industry*, edited by John Richard Felton and Dale G. Anderson. Ames, Iowa: Iowa State University Press, pp. 14-41.

Beilock, Richard. 1985. "Is Regulation Necessary For Value-of-Service Pricing?" *Rand Journal of Economics*, Vol. 16, No. 1, pp. 93-102.

Belzer, Michael H. 1994. "The Motor Carrier Industry: Truckers and Teamsters Under Seige." *Contemporary Collective Bargaining in the Private Sector*, edited by Paula B. Voos. Madison, Wis.: Industrial Relations Research Association.

Belzer, Michael H. 1993. "Collective Bargaining in the Trucking Industry: The Effects of Institutional and Economic Restructuring." Ph.D. diss., Cornell University.

Belzer, Michael H. 1990. "The Transformation of Labor Relations in the Trucking Industry Since Deregulation." M.S. thesis, Cornell University.

Biesada, Alexandra. 1992. "Truck Soup: Or Why the Supreme Court Has Decided That 32,800 Trucks Are Really Planes." *Financial World,* Vol. 161, No. 16, (August 4), pp. 22-23.

Bohlander, George W., and Martin T. Farris. 1984. "Collective Bargaining in Trucking: The Effects of Deregulation." *Logistics and Transportation Review*, Vol. 20, No. 3, pp. 223-238.

Boyle H. Perry Jr. 1993. "Trucking Market Segmentation: Part III; A Look at the Trucking Industry Life Cycle." Baltimore, Md.: Alex. Brown & Sons.

Braver, Elisa R., Carol W. Pruesser, David F. Pruesser, Herbert M. Baum, Richard Beilock, and Robert Ulmer. 1992. "Who Violates Work Hour Rules? A Survey of Tractor-Trailer Drivers." Arlington, Va.: Insurance Institute for Highway Safety.

Breyer, Stephen G. 1982. *Regulation and its Reform.* Cambridge, Mass.: Harvard University Press.

Bureau of Labour Information. Various years. *Directory of Labour Organizations in Canada.* Ottawa: Bureau of Labour Information.

Bureau of Labour Information. 1991. *Union Membership in Canada 1991.* Ottawa: Bureau of Labour Information.

Bureau of National Affairs. 1985. "Teamsters, Employer Groups Begin National Master Freight Bargaining." *Daily Labor Report*, Vol. 11 (January 16), p. A-8.

Bureau of National Affairs. 1990. "Teamsters and Freight Carrier Group Begin Talks on Master Trucking Accord." *Daily Labor Report*, Vol. 228 (November 27), p. A-6.

Bureau of National Affairs. 1988. "Trucking Industry Talks Get Underway." *Daily Labor Report*, Vol. 10 (January 15), p. A-5.

Capelle, Russell B. Jr., ed. 1988. *Quarterly Survey of General Freight Carrier Operating Results; 1967 Thru 2nd Quarter 1988.* Alexandria, Va.: Economic Research Committee, Regular Common Carrier Conference.

Cassidy, William B. 1990. "Drug Testing: Rules Fleets Must Follow." *Fleet Owner*, Vol. 85, No. 4, pp. 83-86.

Cassidy, William B. 1994. "Shipper Codes Must Have Names: New Law Requires Changes in Rates on File." *Transport Topics*, Vol. 3 (January 17).

Childs, William R. 1985. *Trucking and the Public Interest: The Emergence of Federal Regulation 1914-1940.* Knoxville, Tenn.: University of Tennessee Press.

Code of Federal Regulations: Title 49: Transportation. 1992. Washington, D.C.: U.S. General Services Administration.

Cohan, Leon. 1992. "Hit the Mark with Random Testing." *Transportation & Distribution*, Vol. 33, No. 3, pp. 34-36.

Conyngham, Michael. 1993. "I.C.C. Regulated Motor Carriers of General Freight Under the National Master Freight Agreement that Terminated General Freight Operations from July 1, 1980 to May 30, 1993." *Teamsters Research Department Report.* Washington, D.C.: International Brotherhood of Teamsters.

Corsi, Thomas M. 1993. "Motor Carrier Industry Structure and Operations." Paper presented at the International Symposium on Motor Carrier Transportation, Williamsburg, Va.: May 31, 1993.

Corsi, Thomas M., Curtis M. Grimm, Ken G. Smith, and Raymond D. Smith. 1991. "Deregulation, Strategic Change, and Firm Performance Among LTL Motor Carriers." *Transportation Journal*, Vol. 31, No. 1, pp. 4-13.

Corsi, Thomas M., Curtis M. Grimm, Ken G. Smith, and Raymond D. Smith. 1992. "The Effects of LTL Motor Carrier Size on Strategy and Performance." *Logistics and Transportation Review*, Vol. 28, No. 2, pp. 129-145.

Corsi, Thomas M., and Joseph R. Stowers. 1991. "Effects of a Deregulated Environment on Motor Carriers: A Systematic, Multi-Segment Analysis." *Transportation Journal*, Vol. 30, No. 3, pp. 4-28.

De Vany, A. S., and T. R. Saving. 1977. "Product Quality, Uncertainty, and Regulation: The Trucking Industry." *American Economic Review*, Vol. 67, No. 4, pp. 583-594.

Dempsey, Paul Stephen, and William E. Thoms. 1986. *Law and Economic Regulation in Transportation.* Westport, Conn.: Quorum Books.

Derthick, Martha, and Paul J. Quirk. 1985. *The Politics of Deregulation.* Washington, D.C.: The Brookings Institution.

Duke, John. 1992. "Productivity Measures for Transportation Industries." Paper presented at the Highway Related Transportation Industries Productivity Measures Symposium, Washington, D.C., November 20, 1992.

Enis, Charles R., and Edward A. Morash. 1987. "Some Aspects of Motor Carrier Size, Concentration Tendencies, and Performance After Deregulation." *Akron Business and Economic Review*, Vol. 18, No. 1, pp. 82-94.

Executive Office of the President, Office of Management and Budget. 1987. *Standard Industrial Classification Manual, 1987.* Springfield, Va.: National Technical Information Service.

Felton, John Richard. 1989a. "Background of the Motor Carrier Act of 1935." In *Regulation and Deregulation of the Motor Carrier Industry*, edited by John Richard Felton and Dale G. Anderson. Ames, Iowa: Iowa State University Press, pp. 3-13.

Felton, John Richard. 1989b. "Motor Carrier Act of 1980: An Assessment." In *Regulation and Deregulation of the Motor Carrier Industry*, edited by John Richard Felton and Dale G. Anderson. Ames, Iowa: Iowa State University Press, pp. 143-162.

Filgas, James F., and L. L. Waters. 1987. *Yellow in Motion: A History of Yellow Freight System, Incorporated.* Bloomington, Ind.: Foundation of the School for Business, Indiana University.

Frew, James R. 1981. "The Existence of Monopoly Profits in the Motor Carrier Industry." *Journal of Law and Economics*, Vol. 24, No. 2, pp. 289-315.

Friedlaender, Ann F. 1969. *The Dilemma of Freight Transport Regulation.* Washington, D.C.: The Brookings Institution.

Friedlaender, Ann F., Richard H. Spady, and S. Judy Wang Chiang. 1981. In "Regulation and the Structure of Technology in the Trucking Industry." In *Productivity Measurement in Regulated Industries*, edited by Thomas G. Cowing and Rodney E. Stevenson. New York: Academic Press, pp. 77-106.

Fritsch, Conrad F. 1981. "Exemptions to the Fair Labor Standards Act, Transportation Sector." *Report of the Minimum Wage Study Commission.* Washington, D.C.: U.S. Government Printing Office.

Furlong, Tom. 1992. "Gasoline Tankers Seen as 'Rolling Bombs' of the Road." *Los Angeles Times* (September 21), p. A, 5:1.

Glaskowsky, Nicholas A. 1990. *Effects of Deregulation on Motor Carriers.* 2nd ed. Westport, Conn.: Eno Foundation.

Griffin, Gene C., Julene M. Rodriguez, and Brenda K. Lantz. 1993. "Job Satisfaction of U.S. Commercial Drivers." Fargo, N.D.: Upper Great Plains Transportation Institute.

Grimm, Curtis M., Thomas M. Corsi, and Judith L. Jarrell. 1989. "U.S. Motor Carrier Cost Structure Under Deregulation." *Logistics and Transportation Review*, Vol. 25, No. 3, pp. 231-249.

Hamilton, Dane. 1993. "Troopers Begin Roadside Testing of Truckers for Alcohol Use in N.J." *Journal of Commerce* (January 29), B, 4:3.

Hamilton, Dane, and Stephanie Nall. 1992. "Truckers Support New Rules for Drug and Alcohol Testing." *Journal of Commerce* (December 14), B, 2:2.

Harmatuck, Donald J. 1990. "Motor Carrier Cost Function Comparisons." *Transportation Journal*, Vol. 31, No. 4, pp. 31-46.

Harper, Donald V., and James C. Johnson. 1987. "The Potential Consequences of Deregulation of Transportation Revisited." *Land Economics*, Vol. 63, No. 2, pp. 137-146.

Hirsch, Barry T. 1988. "Trucking Regulation, Unionization and Labor Earnings: 1973-85." *Journal of Human Resources*, Vol. 23, No. 3, pp. 96-319.

Hirsch, Barry T. 1993. "Trucking Deregulation and Labor Earnings: Is the Union Premium a Compensating Differential?" *Journal of Labor Economics*, Vol. 11, No. 2, pp. 279-301.

Ingersoll, Bruce. 1992. "Rules to Test Transportation Workers for Alcohol are Proposed by Agency." *Wall Street Journal* (December 11), A, 2:4.

Interstate Commerce Commission, Bureau of Accounts. 1977-90 (individual years). *Transport Statistics in the United States; Motor Carriers Part 2.* Washington, D.C.: ICC, Bureau of Accounts.

Interstate Commerce Commission. 1992. *The U.S. Motor Carrier Industry Long After Deregulation.* Washington, D.C.: The Interstate Commerce Commission.

Kahn, Alfred E. 1988. *The Economics of Regulation.* 2nd ed. Cambridge, Mass.: MIT Press.

Kane, Edward J. 1988. "Interaction of Financial and Regulatory Innovation." *American Economics Association Papers and Proceedings*, Vol. 78, No. 2, pp. 328-334.

Keeler, Theodore E. 1989. "Deregulation and Scale Economies in the U. S. Trucking Industry: An Econometric Extension of the Survivor Principle." *Journal of Law and Economics*, Vol. 32, pp. 229-253.

Khan, M. A., and Roger Reinsch. 1989. "The Deregulation Debate Continues: Is ICC Control Over the Trucking Industry Necessary?" *Mid-Atlantic Journal of Business*, Vol. 26, No. 1, pp. 67-79.

Klem, Richard. 1977. "Market Structure and Conduct." In *Regulation of Entry and Pricing in Truck Transportation*, edited by Paul W. MacAvoy and John W. Snow. Washington, D.C.: American Enterprise Institute for Public Policy Research, pp. 119-138.

Kling, Robert W. 1990. "Deregulation and Structural Change in the LTL Motor Freight Industry." *Transportation Journal*, Vol. 30, No. 3.

Kochan, Thomas, and Harry C. Katz. 1988. *Collective Bargaining and Industrial Relations.* Homewood, Ill.: Richard D. Irwin.

Larkin, John. 1994. "The Truckload Outlook Is Very Bullish. For LTL, We Are Optimistic Short-Term but Less Optimistic Long-Term." *Transport Topics*, Vol. 8 (January 24).

Leiter, Robert D. 1957. *The Teamsters Union: A Study of Its Economic Impact.* New York: Bookman Associates.

Levinson, Harold M. 1980. "Trucking." In *Collective Bargaining: Contemporary American Experience*, edited by Gerald G. Somers. Madison, Wis.: Industrial Relations Research Association.

Locklin, D. Philip. 1972. *Economics of Transportation.* 7th ed. Homewood, Ill.: Richard D. Irwin.

Machalaba, Daniel. 1993. "Long Haul: Trucking Firms Find It Is a Struggle to Hire and Retain Drivers." *Wall Street Journal* (December 28), A, 1:5.

McNamara, Jim. 1994. "Lorry Drivers Wanted for Long Haul: M.S. Carriers Looks to Britain for Qualified Hands." *Transport Topics* Vol. 12 (January 17).

Methvin, Eugene H. 1985. "Additional Views of Commissioner Eugene Hilburn Methvin." *The*

Edge: Organized Crime, Business, and Labor Unions Appendix. Washington, D.C.: United States Government Printing Office.

Moore, Thomas Gale. 1978. "The Beneficiaries of Trucking Regulation." *Journal of Law and Economics*, Vol. 21, No. 2, pp. 327-43.

Moore, Thomas Gale. 1988. "Transportation Policy." *Regulation*, Vol. 11, No. 3, pp. 57-62.

Moore, Thomas Gale. 1991. "Unfinished Business in Motor Carrier Deregulation." *Regulation*, Vol. 14, No. 3, pp. 49-57.

Morash, Edward A., and Charles R. Enis. 1983. "Investor Perceptions of the Impact of Deregulation on Motor Carrier Earnings." *Logistics and Transportation Review*, Vol. 19, No. 4, pp. 309-323.

Nall, Stephanie. 1992. "DOT Proposes New Drug, Alcohol Test Rules." *Journal of Commerce* (December 11), p. A, 3:1.

Noll, Roger G. 1988. "Regulation After Reagan." *Regulation*, Vol. 11, No. 3, pp. 13-20.

Perry, Charles R. 1986. *Deregulation and the Decline of the Unionized Trucking Industry*. Philadelphia: Wharton Industrial Research Unit.

Pustay, Michael W. 1983. "Regulatory Reform and the Allocation of Wealth: An Empirical Analysis." *Quarterly Review of Economics and Business* (March).

Pustay, Michael W. 1989. "Deregulation and the U.S. Trucking Industry." In *The Age of Regulatory Reform*, edited by K. J. Button and D. Swann. Oxford: Clarendon Press, pp. 236-256.

Rakowski, James P. 1988. "Marketing Economies and the Results of Trucking Deregulation in the Less-Than-Truckload Sector." *Transportation Journal*, Vol. 28, pp. 11-22.

Reagan, Michael D. 1987. *Regulation: The Politics of Policy*. Boston: Little Brown.

Roberts, Paul O. 1992. "Comments on 'The U.S. Motor Carrier Industry Long After Deregulation'." Transportation Research Forum, St. Louis, Mo., October 21, 1992.

Robyn, Dorothy. 1987. *Braking the Special Interests*. Chicago: University of Chicago Press.

Rose, Nancy L. 1985. "The Incidence of Regulatory Rents in the Motor Carrier Industry." *Rand Journal of Economics*, Vol. 16, No. 3.

Rose, Nancy L. 1987. "Labor Rent Sharing and Regulation: Evidence from the Trucking Industry." *Journal of Political Economy*, Vol. 95, No. 6, pp. 1146-1178.

Schlesinger, Paul R. 1993. "Motor Carrier Industry: Traditional Small-Shipment Truckers Cope with an Uncertain Market; National Carriers Fighting Decay? Prospects for 1993 and Beyond." In *Industry Viewpoint*. Waldorf, Md.: Eno Transportation Foundation.

Smith, Frank A. 1992. *Transportation in America: A Statistical Analysis of Transportation in the United States: Supplements, Updates and Corrections*. Waldorf, Md.: Eno Transportation Foundation.

Snow, John W. 1977. "The Problem of Motor Carrier Regulation and the Ford Administration's Proposal for Reform." In *Regulation of Entry and Pricing in Truck Transportation.*, edited by Paul W. MacAvoy and John W. Snow. Washington, D.C.: American Enterprise Institute, pp. 3-46.

Snow, John W., and Stephen Sobotka. 1977. "Certificate Values." In *Regulation of Entry and Pricing in Truck Transportation*, edited by Paul W. MacAvoy and John W. Snow. Washington, D.C.: American Enterprise Institute, pp. 153-156.

Spady, Richard H., and Ann F. Friedlaender. 1978. "Hedonic Cost Functions for the Regulated Trucking Industry." *Bell Journal of Economics*, Vol. 9, No. 1, pp. 159-179.

Sparkman, David L. 1994. "ICC Posts New Reporting Rules: General Accounting Principles Will Apply." *Transport Topics* (February 7), Vol. 1.

Swann, Dennis. 1989. "The Regulatory Scene." In *The Age of Regulatory Reform*, edited by Kenneth J. Button and Dennis Swann. Oxford: Clarendon Press, pp. 1-23.

Sweeney, Daniel J. 1986. "Trucking: What's Still Regulated." *Handling & Shipping Management* (August).

Sweeney, Daniel J., Charles J. McCarthy, Steven J. Kalish, and John M. Cutler Jr. 1986. *Transportation Deregulation: What's Deregulated and What Isn't.* Washington, D.C.: National Small Shipments Traffic Conference.

Taff, Charles A. 1986. *Commercial Motor Transportation.* Centreville, Md.: Cornell Maritime Press.

Teamsters for a Democratic Union. 1989. "Whistle Blows on OSHA: Enforce Worker Protections." *Convoy Dispatch* (January), pp. 6-7.

Teamsters for a Democratic Union. 1994. "Teamsters Target Issues, Plan Strategy." *Convoy Dispatch* (January), Vol. 3.

Troy, Leo, and Neil Scheflin. 1985. *U.S. Union Sourcebook.* West Orange, N.J.: Industrial Relations Data and Information Services.

Tolchin, Martin. 1994. "U.S. Imposes New Alcohol Test Rules." *New York Times* (February 4), A15.

U.S. Congress, Office of Technology Assessment. 1988. *Gearing up for Safety: Motor Carrier Safety in a Competitive Environment*. Washington, D.C.: U.S. Government Printing Office.

U.S. Department of Labor, Employment and Standards Administrative. 1979. *Minimum Wages and Maximum Hours*. Washington, D.C.: U.S. Government Printing Office.

U.S Department of Labor, Office of Labor-Management Standards. 1984-90 (individual years). *Labor Organization Annual Report, Form LM-2*. Washington, D.C. 20210.

U.S. Department of Labor, Bureau of Labor Statistics. 1988. *Productivity Measures for Selected Industries and Government Services*. Washington, D.C.: U.S. Government Printing Office.

U.S. Department of Labor, Bureau of Labor Statistics. 1988. *Labor Force Statistics Derived From the Current Population Survey, 1948-1987*. Washington, D.C.: U.S. Government Printing Office.

U.S. Department of Labor, Bureau of Labor Statistics. 1989. *Productivity Measures for Selected Industries and Government Services*. Washington, D.C.: U.S. Government Printing Office.

U.S. Department of Labor, Bureau of Labor Statistics. 1991a. *Employment, Hours, and Earnings, United States, 1909-90*. Washington, D.C.: U.S. Government Printing Office.

U.S. Department of Labor, Bureau of Labor Statistics. 1991b. *Supplement to Employment and Earnings*. Washington, D.C.: U.S. Government Printing Office.

U.S. Department of Labor, Bureau of Labor Statistics. 1992a. *BLS Handbook of Methods*. Washington, D.C.: U.S. Government Printing Office.

U.S. Department of Labor, Bureau of Labor Statistics. 1992b. *Occupational Projections and Training Data: A Statistical and Research Supplement to the 1992-1993 Occupational Outlook Handbook; Bulletin 2401*. Washington, D.C.: U.S. Government Printing Office.

U.S. Department of Labor, Bureau of Labor Statistics. 1993. *Productivity Measures for Selected Industries and Government Services*. Washington, D.C.: U.S. Governmenrt Printing Office.

Wilson, George W. 1980. *Economic Analysis of Intercity Freight Transportation*. Bloomington, Ind.: Indiana University Press.

Winston, Clifford, Thomas M. Corsi, Curtis M. Grimm, and Carol A. Evans. 1990. *The Economic Effects of Surface Freight Deregulation*. Washington, D.C.: The Brookings Institution.

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