

## Deregulation and the Labor Market

James Peoples

**D**eregulation, specifically the removal of government rate regulations and restrictions on entry, has been one of the most significant economic policy changes of the last few decades. The effects of such policy changes are not limited to the product market, as stepped-up competition in an industry can easily place greater downward pressure on labor earnings. This article focuses on employment, earnings, and unionization patterns in the deregulated trucking, railroad, airline and telecommunications industry, as an approach for examining the influence of deregulation on the labor market. This set of industries represents many of the primary targets of deregulation in the late 1970s and early 1980s, as they have moved toward a business environment in which government policies place greater emphasis on allowing the market to set prices and determine successful entry. The time that has elapsed since these policy changes provides a long enough observation period to allow for detecting patterns in these industries.

One way to visualize quickly the relationship between economic regulation and the labor market is to consider the relationship between regulated industries and unions. Regulation that restricts entry of potential competitors allows for relative ease of unionization, because the per worker cost of organizing employees is low in industries consisting of a few large firms. Moreover, successfully organizing a large proportion of the industry work force enhances the bargaining advantage of unions, since they possess the power to severely disrupt operations during a labor strike. Indeed, before deregulation, unions in the trucking, railroad, airline and telecommunications industries negotiated wages for their members that were at least 14 percent higher than the wages received by their counterparts in other industries (Hendricks, 1994). Rate regulation that allowed carriers in these indus-

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tries to pass on costs to costumers also contributed to their unions receiving high wages for their members (Annable 1973; Ehrenberg, 1979; Moore, 1986). The movement towards deregulation and enhanced competition thus presents a challenge to unions, since new and typically non-union firms are now able to take advantage of the removal of entry restrictions.

The following section presents an overview of the employment and unionization patterns in the four industries considered here over time. The next section then tells the story, one industry at a time, of how the relationship developed between a regulated industry and its workers. The article then examines patterns of labor earnings following deregulation in these industry sectors. Finally, some concluding remarks are offered.

### **Industry Unionization, Employment and Earnings Trends**

Table 1 presents information on the size of the work force in trucking, railroads, airlines and telecommunications from the early 1970s to the 1990s, along with the weekly earnings of workers and percentage of workers in each industry belonging to a union. The sample years from 1978 to 1996 should be taken to cover the post-deregulation period for trucking, railroads, and airlines. The years 1983 to 1996 encompass the post-deregulation period for telecommunications, following the break-up of AT&T in 1984. The summary results in the table show some similarities and differences across the industries.

For example, the findings on trucking suggest an appreciable reduction of the union membership rate of 46 to 23 percent over the deregulation period from 1978 to 1996. Apparently this is not the continuation of a trend in this industry, given that unionization was falling only mildly, by 3 percentage points, from 1973 to 1978. The union membership pattern is consistent with the notion that the trucking industry has relatively low barriers to entry, which meant that deregulation allowed non-trivial entry of non-union carriers. The trucking employment pattern reveals further evidence suggesting the ease of entry into this industry. After a pre-deregulation period of relatively low employment growth, from 977,000 in 1973 to 1,111,000 in 1978, the number of workers employed in trucking dramatically increased to 1,907,000 in 1996. Together, the union membership rate and industry employment trends suggest a tremendous loss of labor bargaining power following deregulation. This loss is further supported by the findings in Table 1 that show workers in this industry experiencing their real weekly earnings falling from \$491 in 1978 to \$353 in 1996.

In contrast to the trucking industry, the findings on railroad workers do not reveal any especially substantial effect of deregulation on the union membership rate in this industry; as shown in Table 1, the percentage of railroad workers belonging to a union only fell from 79 to 74 percent over the 1978 to 1996 observation period. This pattern reflects the difficulties of non-union entry in an industry which is often characterized as naturally oligopolistic. However, while a high percentage of union membership suggests that railroad unions

Table 1

**Unionization, Employment and Labor Earnings Patterns in Transportation and Telecommunications Industries**

<i>Industry</i>	<i>1973</i>	<i>1978</i>	<i>1983</i>	<i>1988</i>	<i>1991</i>	<i>1996</i>
<i>Trucking</i>						
Union Membership Rate	49%	46%	38%	25%	25%	23%
Work Force Size (×1,000)	997	1,111	1,117	1,544	1,617	1,907
Weekly Earnings (1983/84 dollars)	\$499	\$491	\$404	\$386	\$405	\$353
<i>Railroad</i>						
Union Membership Rate	83%	79%	83%	81%	78%	74%
Work Force Size (×1,000)	587	580	428	363	286	282
Weekly Earnings (1983/84 dollars)	\$475	\$491	\$507	\$490	\$494	\$470
<i>Airlines</i>						
Union Membership Rate	46%	45%	43%	42%	37%	36%
Work Force Size (×1,000)	368	465	464	683	696	800
Weekly Earnings (1983/84 dollars)	\$499	\$498	\$455	\$420	\$443	\$435
<i>Telecommunications</i>						
Union Membership Rate	59%	55%	55%	44%	42%	29%
Work Force Size (×1,000)	949	1,075	1,060	1,114	1,107	1,126
Weekly Earnings (1983/84 dollars)	\$399	\$442	\$457	\$447	\$458	\$488
<i>All Other Industries</i>						
Union Membership Rate	23%	22%	19%	16%	15%	14%
Work Force Size (×1,000)	72,619	81,737	85,220	97,704	99,080	107,844
Weekly Earnings (1983/84 dollars)	\$399	\$363	\$301	\$310	\$322	\$334

*Source:* Information on union membership rates and industry work force sizes were provided by Barry Hirsch and David Macpherson. Information on labor earnings for the 1973–1991 sample period are taken from Current Population Survey Files and the 1996 earnings are taken from Hirsch and Macpherson's Union Membership and Earnings Data Book (1997a). The sample years from 1978 to 1996 cover the post-deregulation period for trucking, railroads and airlines. The years 1983–1996 cover the post-divestiture period for telecommunications.

retained their bargaining power following deregulation, the employment decline reported in Table 1 suggests otherwise. The number of workers employed in this industry fell by more than half from 1978 to 1996. This employment pattern certainly suggests that carriers had some ability to consolidate services and negotiate more efficient work rules. Despite increased joblessness in this industry, railroad unions were able to avoid the earnings losses experienced in trucking. Rather, by 1996 the real mean labor earnings of \$470 was only \$21 below the level attained in 1978.

The profile of airline workers is similar to the trucking example, but in a less extreme way. Union membership rates in this industry are declining; in Table 1, the percentage of unionized airline members fell from 45 percent to 36 percent between 1978 and 1996. As opposed to trucking, the airline industry has retained

a highly concentrated market structure since deregulation. Moreover, the dramatic expansion in the number of people flying—driven in part by the lower prices due to deregulation—has led to appreciable employment gains in this industry. This growth in an industry dominated by a few large carriers enhances the ability of unions to increase their membership roles. Indeed, taking the product of the annual union membership rates and employment levels suggests the number of union members in this industry increased from 209,250 to 288,000 from 1978 to 1996, respectively. The reduction of the percentage of workers belonging to the union may still indicate some loss of bargaining power, as real labor earnings did decline from \$498 in 1978 to \$435 in 1996. Nonetheless, this decline is much less than for trucking.

Telecommunications workers showed declining union membership rates over the 1973–1996 observation period. This is most pronounced following the 1984 break-up of AT&T and the deregulation of long-distance services. The findings in Table 1 show that the union membership rate fell by 26 percentage points from 1983 to 1996, which is the largest post-deregulation decline of the four industries examined here. The introduction of labor saving technology into the production process most likely contributed to this reduction in the percentage of union members. The findings in Table 1 reveal that this drop in percentage membership occurred during a period of moderate employment growth of 66,000 workers from 1983 to 1996. While these trends might signal the erosion of union bargaining advantage, the findings in Table 1 reveal real weekly earnings gains for telecommunications workers of \$457 to \$488 covering the 1983 to 1996 post-divestiture/deregulation observation period. This earnings trend is a continuation of gains occurring before regulatory reform. An explanation of such a trend is that the introduction of new technology throughout the 1970s, '80s and '90s requires the employment of highly skilled workers who command high wages.

The summary figures in Table 1 offer some evidence that the bargaining power of labor declined in all four of these industries following deregulation. This evidence is consistent with the observation that entry by non-union firms weakens unions' control over the industry labor supply, and that the shift from rate regulation toward competitive pricing makes it unprofitable for carriers to pass on higher union wages that are not justified by higher productivity. Nonetheless, it is also interesting that the percentage of workers represented by unions in these industries continues to exceed by far the national average. The bottom rows of Table 1 shows that *outside* of the four industries specifically listed in Table 1, only 14 percent of the workers belonged to a union in 1996. It is possible then that while unions in deregulated industries face greater difficulties, they may still retain some bargaining power to negotiate advantageous wage and benefit packages. This seems to be the case for rail, airlines and telecommunications, given the findings in Table 1 that show workers in these industries continuing to experience a substantial earnings advantage over their counterparts in other industries. Only workers in trucking faced a marked erosion of their mean earnings premium.

## **Regulation, Deregulation, and Labor Relations: Four Industry Stories**

Regulation of prices and entry was applied somewhat differently in each of these industries. The conditions of deregulation, like what barriers to entry remained, differed as well. The industries have some inherent differences, and labor laws differ across these industries. The combination of these differences can help to explain the different patterns of labor market outcomes in the trucking, railroad, airline and telecommunications industries.

### **Trucking**

Of the industries examined here, trucking might seem the one that comes closest to satisfying the conditions for competition. Most sectors of this industry are characterized by low capital and entry costs to carriers and because worker skills are acquired quickly, the supply of labor to the industry is elastic (Hirsch and Macpherson, 1997b). However, this industry had long faced severe entry and rate restrictions. The Motor Carrier Act of 1935 gave the Interstate Commerce Commission (ICC) authority to the “for-hire” part of the trucking industry, which consisted of restricting entry and setting rates for truck companies or owner-operators who could be hired to provide long-haul service for intercity and interstate carriage service. “Private” carriers—the non-trucking companies who are limited to transporting their own products—were not similarly restricted, and thus provide a useful comparison group.

Entry and rate regulation had a profound effect on labor relations in the trucking industry. Entry restrictions supported the development of high concentration along long-haul routes and across major U.S. regions that are serviced by for-hire carriers. The low per worker cost of organizing employees that is associated with this type of market structure allows ease of unionization in this industry. Indeed, following the enactment of the Motor Carrier Act of 1935, the International Brotherhood of Teamsters (IBT) organized a large segment of the trucking sector. IBT’s membership in trucking grew from 75,000 in 1933 to 370,000 by 1939 (Perry, 1986, p. 41), and reached 920,000 by 1948. The IBT’s presence was most pronounced in intercity carriage, where the percentage of truckers under union contract grew from essentially none in 1933 to 80 percent by the mid-1940s. While regulatory legislation enacted in 1935 surely helped create an industrial relations environment conducive to union growth, the concurrent passage of the 1935 National Labor Relations Act also contributed to conditions that are favorable to union membership gains. Nonetheless, the IBT did take advantage of this favorable environment. This opportunistic behavior is further depicted by this union augmenting their bargaining advantage by instituting the National Master Freight Agreement in 1964 as a framework for negotiating concurrently with major carriers.

Uniform shipping rates along entry-regulated routes that were determined by using mark-up pricing methods influenced industrial relations in this industry by allowing carriers to partly pass on labor costs (Annable, 1973; Moore, 1978). While

most researchers agree that this type of regulation allowed for-hire carriers to capture significant rents, there is also some argument suggesting that shippers received better quality service in the form of superior on-time performance and low probability of cargo damage (Alexis, 1997). Engaging in such non-price competition influences labor market outcomes by increasing the demand for better qualified drivers who command high wages.

Labor and product market conditions in trucking were significantly altered by deregulation. The ICC made some initial policy changes in 1978, leading to a record number of applications from new and existing carriers for routes (Rose, 1987; Hirsch, 1988). Congress then legislated these changes with the approval of the 1980 Motor Carrier Act, which further facilitated the influx of low-cost, non-union carriers in the for-hire sector. This increased availability of alternative low-cost carriers following deregulation certainly weakened the bargaining advantage of the Teamsters.

### **Railroads**

The railroad industry did not much resemble a competitive industry prior to regulation. In fact, one of the primary economic rationales for regulating this industry was that it was an oligopolistic market characterized by economies of scale and high sunk costs, and thus potentially subject to fits of “destructive” competition, where the existence of sunk costs would lead to very low prices and cycles of bust and boom (Perelman, 1994). Probably the most significant reason for implementing rate and entry regulation was to enhance the financial performance of this industry (Grimm and Windle, 1997). Nonetheless, railroads were plagued with financial problems following the implementation of regulation in the 1920s. The problem was a combination of excess capacity in the railroad industry and the emerging alternative modes of transportation, mainly trucking. Regulatory rules enacted to help carriers in the railroad industry ironically also contributed to the poor performance of railroad carriers. For instance, the setting of minimum rates above competitive levels heightened railroad carriers’ vulnerability to intermodal competition from trucking. Regulations stipulating that these carriers service low density, unprofitable lines further reduced their ability to compete successfully.

This sort of product market environment does not suggest that regulation generated much rent to share with workers. Instead, high labor costs might arise from the additional demand for workers to service poorly performing routes.

Consistent with the notion that concentrated industries are easier to organize, railroad unions represented nearly all non-management workers during the pre-deregulation period of restricted entry. The development of railroad unionization was heavily influenced by the labor law guidelines of the 1926 Railroad Labor Act that prohibited unions representing different occupational group of workers employed by the same carrier. As a result, rather than the emergence of a single dominant union representing the work force, the majority of union rail workers belonged to three unions: the United Transportation Union; the Brotherhood of Maintenance of Way Employees; and the Transportation Communications Union (Talley and Schwarz-Miller, 1997). Fragmenting union representation in this man-

ner could shift the bargaining advantage in favor of carriers. If these unions were unable to coordinate their negotiations, then carriers could use the strategy of targeting the weakest union and trying to use that settlement as a pattern for successful negotiations with other carriers. However, railroad unions addressed this problem in 1973 by negotiating industrywide agreements as a group with the representative of the major railroad carriers belonging to the National Railway Labor Conference (which had been established in 1963).

Railroad negotiations during the period of regulation were characterized by the unions' emphasis on work-rules. The outcome of focusing on this issue, in part, was defining a work day based on mileage covered. Sustaining this requirement over time allowed rail workers to take advantage of this rule as an approach towards increasing their earnings, since improvements in train speed permitted them to work extra shifts without markedly increasing their weekly hours worked (Talley and Schwarz-Miller, 1997; MacDonald and Cavalluzzo, 1996). Railroad unions also negotiated work rules that defined appropriate crew sizes to consist typically of an engineer, conductor and two brakemen, and sometimes included an extra brakeman and fireman. While such a requirement might have helped to create employment for workers, it introduced inefficiencies when carriers converted from steam to diesel engines, and automated switching operations, since these changes eliminated the need for firemen and extra brakemen (Talley and Schwarz-Miller, 1997).

Railroad deregulation drastically changed the business and labor relations environment. Following the 1976 Railroad Revitalization Reform Act and the 1980 Staggers Act, railroad carriers were provided the latitude to charge competitive shipping rates, abandon unprofitable routes and consolidate operations (Grimm and Windle, 1997). Carriers also emphasized labor costs reduction as an approach for improving their financial performance, as evidenced by the post-deregulation negotiation of work-rule changes that reduced required crew sizes and lengthened the minimum daily mileage constituting a basic work day (MacDonald and Cavalluzzo, 1996).<sup>1</sup> This declining demand for rail workers was further facilitated by the industry's adoption of labor-saving technologies, like electronic-based communications and information systems, which made it possible to automate almost every phase of traffic control: signaling, car management, train dispatching, and train movement (Talley and Schwarz-Miller, 1997). In sum, these labor market changes clearly indicate an erosion of the bargaining advantage of railroad unions following the deregulation of this industry.

### **Airlines**

The airline industry was characterized by the dominance of four major trunk carriers by the 1930s: American Airlines, Eastern Airlines, Trans World Airlines and United Airlines. While this type of market structure might foster the non-competitive behavior that is targeted by price regulators, it was actually once again

<sup>1</sup> Talley and Schwarz-Miller (1997) argue that federal recommendations during the early 1980s by the Presidential Emergency Board gave railroads the leverage to make subsequent crew-reduction agreements possible.

the potential for “destructive” competition that led to the introduction of economic regulation through the 1938 Civil Aeronautics Act. As in the case of railroads, the fear was that an industry with large sunk costs could be susceptible to outbreaks of price-slashing that would lead to harmful boom and bust cycles. This market structure did not change appreciably following regulation; after 1938, potential entrants were prohibited from competing with incumbent trunk carriers, and after 1952 new entry did not occur in the local carrier sector (Keeler, 1981). In an attempt to avoid destructive pricing behavior, uniform rates were set for carriers as a mark-up over costs. The regulated companies competed along non-price dimensions by offering more frequent flights (Douglas and Miller, 1974; DeVany, 1975), and on other elements like using more modern aircraft, providing more comfortable seating and the like (Card, 1997). The overall extent of this type of competition was probably strong, given the relatively low levels of airline profitability during this period of regulation (Card, 1997), which suggest that this industry was not generating substantial regulatory rents to share with labor.

Union membership in the airline industry reached relatively high levels during the period of restricted entry and non-price competition. As was the case in the railroad industry, airline carriers and their unions were covered by the 1926 Railroad Labor Act. Under the administration of this act’s provisions in the airline industry, labor relations were characterized by the proliferation of over 100 bargaining unions across carriers (Hendricks et al., 1980) and by a lack of inter-union cooperation.<sup>2</sup> Indeed, Cappelli (1987) observes that it was common for unions to cross each other’s picket lines, and Craypo (1986) and Cremieux (1996) argue that certain contract provisions had the effect of making it illegal for one union to engage in sympathetic job actions in support of other airline unions. Clearly, this type of union behavior enhanced the bargaining power of carriers. Airline carriers also acted to cooperate and to bolster their bargaining advantage through the 1958 establishment of the Mutual Aid Pact, which put in place a strike insurance system that provided grounded carriers with a portion of the extra revenue earned by their competitors during the strike (Card, 1997). Overall, when compared to the pre-deregulation labor relations environment in trucking, it seems that airline unions should have experienced greater difficulty receiving rent for their members. Nonetheless, past research suggests that unionized workers employed in the airlines industry did receive an earnings premium (Card, 1986, 1997; Hirsch and Macpherson, 1995; Hendricks, 1994). Airline unions may have been able to retain bargaining power for their employees partly because they represented workers such as pilots and mechanics who are vital to carrier operations and who are difficult to replace quickly during strikes (Cremieux, 1996; Peoples, 1990a).

Deregulation had an immediate impact on labor relations in the airline industry. Card (1997) reports that the number of certified carriers tripled from 1977 to 1983, reaching a total of 93, and then reached a high of 106 carriers in 1985.

<sup>2</sup> Walsh (1995) observes that while intra-carrier union coalitions were highly uncommon, there was a history of union interaction at the national level among AFL-CIO-affiliated airline unions.



This influx of non-union and low-cost carriers challenged the bargaining advantage of airline unions, and many incumbent carriers were able to negotiate major wage concessions from their unions (Cappelli, 1985). However, the extent to which deregulation influenced these wage changes is not obvious, since stepped-up competition in this industry in the late 1970s and early 1980s coincides with an increase in oil prices during the late 1970s and business cycle downturn in the early 1980s. By the end of the 1980s, airline industry conditions had evolved in a way that was much more favorable to the enhancement of union bargaining power. By that time, the introduction of the hub-and-spoke distribution system and the dominance of a few computer reservation systems again created a competitive advantage for a few major union carriers. However, even the bargaining advantage of these carriers is challenged due to the 1978 elimination of the MAP strike insurance program. Many of these large union carriers had contributed to this source before deregulation and were able to draw from it to support continued operations during a labor strike. Without this funding these carriers must now finance their own operations when faced with a strike. Despite the development of these favorable union bargaining conditions, the switch from non-price to price competition in this industry suggests post-deregulation carrier resistance to union wage demands.

### **Telecommunications**

At the turn of the century, the telecommunications industry was essentially an integrated monopoly. AT&T was the dominant long-distance and short-haul voice transmission carrier, as well as the primary supplier of telecommunications equipment. In accordance with the guidelines of the 1910 Mann-Elkins Act, the industry was regulated to ensure that AT&T provided affordable and universal service. However, it was not until the passage of the 1934 Federal Communications Commission Act that the FCC was established to oversee competitive entry and set interstate rates in this industry. State public utility commissions enforced these regulations for intrastate communications services, and entry was prohibited into the local interstate sector. Regulation of entry was less restrictive in the long-haul sector, as certificates of operation were granted to specialized carriers starting in 1960. Nonetheless, AT&T accounted for over 90 percent of the market sales in this sector prior to its breakup in 1984.

Up until the break-up of AT&T, regulators addressed the possibility of AT&T exercising its monopoly power by setting a maximum rate of return on AT&T's net investment. It has been observed that this type of regulation presents less of an incentive to contain costs, when compared to the alternative of setting a price cap (Hendricks, 1994). Ehrenberg (1979) observes that rate-of-return regulation might have contributed to reducing AT&T's resistance to union wage demands since the regulatory commission did not seriously consider labor costs when setting rates.

Union organizing was tremendously successful in this industry during the period of entry restriction, thanks in part to the absence of significant entry by non-AT&T carriers. The industry's largest union, the Communications Workers of America (CWA), represented more than 550,000 construction, maintenance,

switchboard, and clerical workers throughout the Bell system. The second largest union, the International Brotherhood of Electrical Workers (IBEW), represented more than 100,000 telephone linemen, cable splicers, installers and draftsmen. These unions have been successful in taking advantage of the labor market environment; past research reveals telecommunication labor earnings premiums of 22 percent (Peoples, 1990b; Hendricks, 1994). The introduction of labor saving technology, however, has eroded the bargaining advantage of these unions even before regulatory change in this industry. Most vulnerable were telephone operators whose job responsibilities were rapidly replaced by new transmission equipment.

The 1984 breakup of AT&T and the differing application of regulation across states radically altered labor relations in the telecommunication industry. The changes stipulated by the U.S. Department of Justice required AT&T to divest itself of 22 Bell operating companies represented by seven regional Bell operating companies. After this, the CWA and IBEW faced separate negotiations with AT&T and the regional operating companies and their subdivisions. Bargaining separately with multiple employers stretches union resources and reduces union leverage. This erosion of bargaining power is compounded by the continued displacement of members by new labor saving technology and the increased share of non-union supervisory personnel in craft and clerical occupations (Keefe and Boroff, 1994).

Although competition in telecommunications is still gaining momentum, the competition that does exist has already placed downward pressure on costs. For instance, AT&T now competes with non-union rivals in long distance and manufacturing. In addition, by entering non-traditional telecommunication markets, it now faces new domestic and foreign competition (Smith, 1989). Even though the regional Bell operating companies dominate local and regional markets, they have also encountered greater pressure to lower costs. For instance, by 1995 more than half of the state public utility commissions instituted rate regulation, such as price caps, that promoted profit enhancement through cost savings. Furthermore, the introduction of fiber optic cables allowed new entrants to compete for the lucrative metropolitan area service. Despite this increased pressure to contain costs, the generally strong financial performance of AT&T and the regional Bell operating companies following divestiture suggests some potential for rent sharing with labor, at least in the near term. Continuing policy changes in this industry might further affect labor relations. An example is the 1996 telecommunications bill that allows long-distance carriers to compete in local exchange markets; allows regional Bell operating companies to compete in the long-distance market and allows cable companies to compete for telephone service (Harris and Kraft, 1997; Pal, 1997).

### **Labor Earnings and Rent Sharing**

To this point, the focus of the discussion has been primarily on the institutional legislative and regulatory details of how deregulation has affected the labor market

in these four industries. While there have been mention of earnings premiums for union workers in these industries, the discussion of earnings has not, to this point, offered much detail. This section will analyze earnings figures from several perspectives.<sup>3</sup>

### **Non-Management Earnings Patterns**

In a deregulated industry, enhanced industry emphasis on cost savings and declining union control over the labor supply reduce the likelihood of workers receiving high earnings. This earnings effect is not necessarily limited to union workers, especially if the union set the standard industry wage before deregulation. This would occur if non-union employers matched union wages in an attempt to avoid unionization of their work force. Past research tests the deregulation-wage effect hypothesis by estimating pre- and post-deregulation labor earning premiums. Any erosion of these premiums is interpreted to suggest that pre-deregulation earnings advantages partly reflect workers having received economic rents in the past. The possibility of increased labor demand arising from stepped-up competition suggests the potential for a countervailing effect following deregulation. Hence, earnings premium outcomes are not certain, *a priori*. This section reports past findings and uses individual worker information from Current Population Survey files to estimate weekly earnings premiums on non-management workers employed in the deregulated trucking, railroad, transportation and telecommunications industries.<sup>4</sup> This set of non-supervisory workers is comprised of union and non-union employees. These workers represent over 90 percent of their respective industry's workforce prior to deregulation. Past research indicates that telecommunications is the only one of the industry groups considered here in which non-management workers experienced a substantial reduction in their share of industry employment following deregulation (Peoples, 1997). On average, 91 percent of telecommunications workers were employed in non-management positions from 1973 to 1985; this fell to an average of 86 percent over the succeeding six years. The earnings premiums of these workers are derived by separately estimating earnings equations for each observation year. The equation is specified such that the log of earnings is the dependent variable. The explanatory variables include for individual workers their years of education and work experience; race, sex and marital status; standard metropolitan statistical area (SMSA) and regional residential status; and the individuals' occupation and (log of) "usual" weekly hours worked. A dummy variable indicating employment in a particular deregulated industry is also included as an explanatory variable, and the estimated coefficient on the dummy variable repre-

<sup>3</sup> Tables with the complete results presented in this section are available from the author upon request.

<sup>4</sup> To be more specific, the samples used in Figures 1–4 that follow are based on information taken from the 1973 to 1977 May CPS files and from CPS outgoing rotation group files of the 168 monthly surveys conducted between January 1987 and December 1991. Full-time employees between the ages of 16 and 65 who reported non-zero weekly earnings is used as the selection criterion for individuals employed in non-trucking industries. Only individuals employed as truck drivers who satisfy the selection criterion are used in the trucking sample. This restriction yields a sample of 835,770 for all industries and 18,863, 6,395, 6,988, and 16,054 for trucking, railroad, airlines and telecommunications, respectively.

Figure 1

**Non-Management Percentage Earnings Differential of Truck Drivers in the For-hire Sector (Comparison Group: Non-Transportation Operatives)**



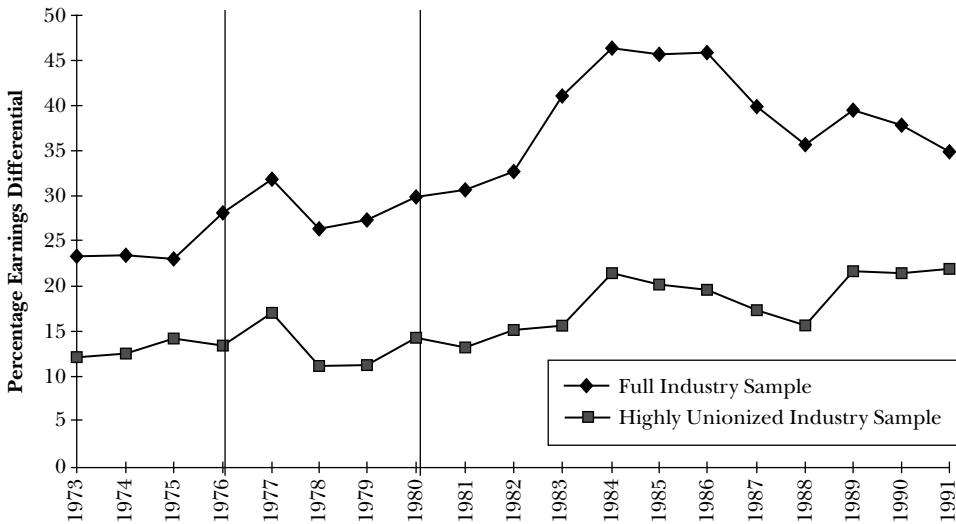
sents the earnings differential of deregulated industries.<sup>5</sup> Two sets of estimates for each deregulated industry are reported in Figures 1–4: one set of estimates uses the sample population of workers employed in all U.S. industries; the other uses the sample of workers employed in highly unionized industries. Additional vertical lines in these figures distinguish the dates of changes in regulatory regimes. In trucking, 1978 depicts the beginning of deregulation, since this is the year in which entry and rate restrictions were substantially reduced by the ICC. In rail, 1976 and 1980 depict the years when the Railroad Revitalization Reform Act and Staggers Act were passed to deregulate this industry. In airlines, 1978 depicts the year of the airline deregulation act. In telecommunications, 1986 depicts the initial year of labor negotiations following the 1984 break-up of AT&T.

Let us again begin with the trucking industry. Past research has found that for-hire truck drivers received an earnings premium that declined after the industry was deregulated. For instance, Hirsch and Macpherson (1997b) report truck drivers' earnings advantage over their non-truck driver counterparts employed in other industries declining from 22 percent in 1977–78 to less than 2 percent by 1995 (see also Rose, 1987; Hendricks, 1994). Figure 1 presents the results of the earnings equation estimated for truck drivers. The vertical axis reveals the gap in earnings for truck drivers as revealed by the dummy variable in the earnings equation, after adjusting for other characteristics, as compared to highly unioned non-

<sup>5</sup> This is converted into percentage differentials by exponentiating the estimated coefficient, subtracting one, and then multiplying this difference by 100.

Figure 2

**Non-Management Percentage Earnings Differential of Workers in the Railroad Industry (Comparison Group: Workers in Non-Transportation and Non-Telecommunications Industries)**



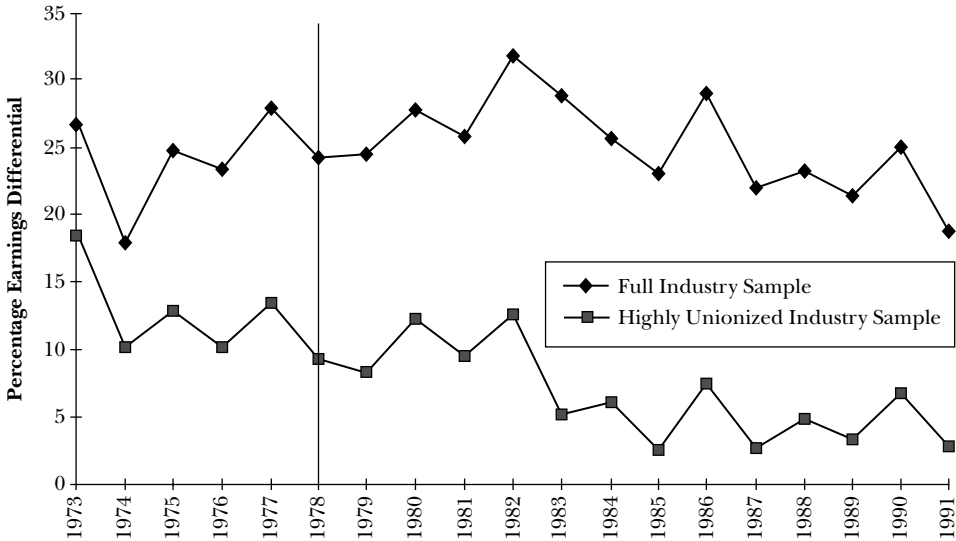
transportation operatives in other industries.<sup>6</sup> The findings suggest a noticeable drop of this earnings gap beginning by 1982. This corresponds with post-deregulation contract negotiations stipulating no wage gains from 1982 to 1984. Apparently, before deregulation, truckers were not only able to earn a premium compared to workers in other industries, they were also able to earn a premium compared to workers in other highly unionized industries. Soon after deregulation, the premium relative to other highly unionized industries disappeared, although a lesser earnings premium relative to other workers remained.

The findings on railroad earnings do not uncover any obvious evidence that earnings premiums declined after deregulation, whether the date of deregulation is taken as the 1976 Railroad Revitalization Reform Act or as the 1980 Staggers Act. Figure 2 shows that in comparison with all other workers, after adjusting for the characteristics in the earnings equation, the wage premium for railroad workers rose from 30 percent in 1980 to 45 percent in 1986, and then declined to 35 percent

<sup>6</sup> Following Hirsch (1988) the earnings of for-hire truck drivers are compared to non-transportation operatives. This choice avoids that possibility of comparing the earnings of these drivers to a set of workers whose wages are also likely to be influenced by deregulation. This might occur when using truck drivers outside the for-hire sector as the comparison group. Truck drivers are chosen as the representative group for this industry because they comprise such a large share of the work force. This restriction is not applied to the other transportation and telecommunications industries because they employ workers in a much more varied set of occupations; for those industries, the comparison group is all workers in non-transportation and non-telecommunications industries.

Figure 3

**Non-Management Percentage Earnings Differential of Workers in the Airline Industry (Comparison Group: Non-Transportation and Non-Telecommunications Industries)**

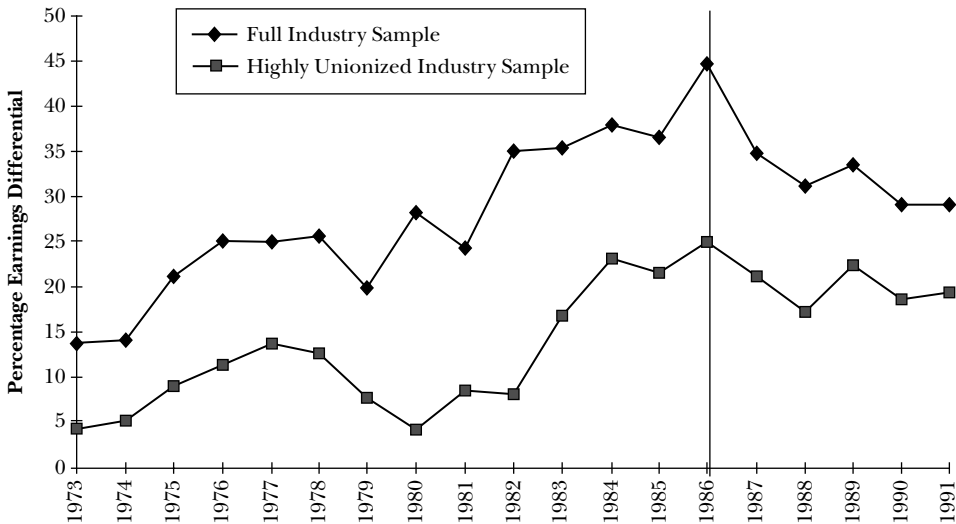


by 1991. However, the lower premiums do not fall below their pre-deregulation level. The earnings premium compared to other highly unionized industries is smaller, but it does not decline after deregulation. The earnings premium for workers in the railroad industry over their counterparts in other highly unionized industries actually rises over the initial years following regulatory reform, peaks in the mid-1980s and declines thereafter. Studies by Talley and Schwarz-Miller (1997) and MacDonald and Cavalluzzo (1996) confirm this overall pattern of earnings in the railroad industry.

In the airline industry, for the full industry sample, airline labor premiums in Figure 3 rose slightly after deregulation and peaked at 32 percent by 1982, before falling to 18 percent in 1991. In comparison, airline workers' earnings advantage over workers in other highly organized industries peaked at 13 percent by 1982 and fell to less than 3 percent by 1991. Past findings on earnings in the airline industry using a similar methodology have also indicated that labor earnings premiums following deregulation of 10 percentage points (Card, 1997; Hirsch and Macpherson, 1995). Using a simulation methodology, Cremieux (1996) found a larger drop. However, airline workers continued to receive markedly higher post-deregulation earnings than their non-airline counterparts employed in industries with a small percentage of the workers belonging to a union. This evidence supports the possibility of continued rent-sharing in this industry despite greater competition. Past research on wage dispersion complements this observation. While theory suggests that the law of one price should hold in a competitive market, Card (1997) reports

Figure 4

**Non-Management Percentage Earnings Differential of Workers in the Telecommunications Industry (Comparison Group: Non-Transportation and Non-Telecommunications Industries)**



greater wage dispersion for homogenous workers within the airline sector following deregulation. Further, Fortin and Lemieux (1997) find a sizeable deregulation effect on wage dispersion for unionized men in transportation and telecommunications.

In telecommunications, Figure 4 reveals that earnings differentials were climbing in this industry up to 1986, which is the initial year of separate regional and local labor negotiations following the 1984 break-up of AT&T. When using the full industry sample, telecommunications earnings premiums rose from 14 percent in 1973 to a high of 45 percent in 1986. This is consistent with the notion that the continuous pre-divestiture introduction of new labor-saving technology required the payment of high wages to employ the highly skilled workers needed to operate such equipment. However, after the breakup of AT&T, these premiums fall to 29 percent by 1991. Still, on average over this time horizon, post-divestiture earnings differentials for telecommunications workers are on average slightly higher than the pre-divestiture findings (Hendricks, 1994; Peoples, 1990b). In comparison with other highly unionized industries, the pattern is similar, although the wage premium is lower. Hendricks (1994) finds a similar pattern of earnings premiums for telecommunications workers. Since deregulation in telecommunications is still gathering momentum, it may be that the declining premiums reported for the relatively short time period following divestiture will signal the beginning of longer term erosion of telecommunications earnings advantage.

Taken as a whole, what do the findings on earnings differentials in these four industries tell us? Non-management workers in all four industries continue to receive an earnings premium after deregulation; however, in three of the four industries (railroads excepted), that premium declined after deregulation. The largest decline in earnings premium was in trucking, which seems to be the industry which has moved closest to full competition, and suggests that less competitive industries will have higher profits and pay higher wages to workers. In the case of railroads, deregulation almost certainly helped profits by giving carriers in this industry the flexibility to change outmoded labor practices. Remember that all four industries also are relatively highly unionized, which has surely helped in maintaining their earnings premiums. It is also possible, however, that the earnings equations did not include all the possible characteristics that may be affecting earnings differentials, and there may be unobserved factors about the industry or the workers which are affecting the earnings differentials over time.

### **Management Earnings Patterns**

The opportunity for sharing the rents of regulated industries was not just available to workers in these industries—it was available to managers as well. Since managers are prohibited from joining a union, estimating earnings for this set of employees allows for investigating whether rent sharing is a more general phenomenon that only occurs in unionized environments. Here, separate earnings equations were estimated for the pre- and post-deregulation observation periods, again using Current Population Survey files. The dependent variable was the log of weekly earnings, and excluding occupational dummies, the independent variables were the same as those used to specify the non-management earnings equation. The occupational dummies were not needed when estimating the management earnings equation, since the sample population consist solely of managers from all industries.<sup>7</sup> It is not productive here to use this data to estimate annual figures, because the small annual sample size of managers for most of the deregulated industries means that such estimates are not very precise. However, comparing the coefficient on the dummy industry variable for the pre- and post-deregulation period is revealing.

These results uncover earnings patterns that parallel those reported on non-management employees. In trucking, management earnings premiums declined markedly in trucking following deregulation, falling from a 13 percentage point earnings premium in the pre-deregulation years to a “premium” of –2 percent in the post-deregulation years. The earnings premium for railroad managers barely budged; it was 20 percentage points before deregulation, and 19 percentage points after. The earnings premiums for airline and telecommunications managers fell slightly with deregulation: from 10 to 7 percentage points for airline managers, and from 31 percentage to 25 percentage points for telecommunications managers.

<sup>7</sup> Restricting this sample to managers allows for the earnings comparison of workers with similar job responsibilities. Non-transportation and non-telecommunications industries are chosen as the comparison group to avoid earnings distortion that arise from including other deregulated industries as part of this group.



Notably the earnings premiums for telecommunications managers stayed relatively high, similar to the high premiums received by workers in that industry. Similar results on the pattern of management earnings in deregulated industries are found by Belzer (1997) in railroads, Card (1997) in airlines, and Hendricks (1997) in telecommunications.

In sum, not only did workers receive high earnings before deregulation, but managers did as well. The way in which these earnings premiums for managers eroded as a result of deregulation is similar to the way the premiums eroded for workers.

### **Relative Earnings Loss Following Job Displacement**

Workers in all four of these industries continued to receive relatively high earnings following deregulation. This was especially the case for railroad and telecommunications workers. One possible explanation here is that these industries were not yet competitive, and substantial rents remained to be shared. Another related possibility is that a highly organized work force contributed to higher non-management earnings. However, an alternative explanation is that employers in these industries hired highly valued workers who would command high earnings even if they were not employed in a regulated, unionized, lower competition industry. Conventional inter-industry earnings comparisons do not allow for testing this possibility, because detailed individual data on the relevant worker characteristics such as reliability, promptness, being painstaking, and so on does not exist. However, Alexis (1997) argues that the non-price competition that developed during regulation created a business environment that encouraged the employment of such workers. This pre-deregulation focus on employing highly valued workers might have set the precedence for hiring standards that continued even with the switch to competitive pricing.

The experience of displaced workers offers one method for identifying the relative market value of individual workers' characteristics, as suggested by Krueger and Summers (1988). Such an approach assumes that the demand for workers exhibiting highly valued characteristics will reduce their earnings loss following job displacement, all else equal. Evidence on the experience of displaced workers is available through the biannual Displaced Worker Survey.<sup>8</sup> The specification of the earnings change equation follows that used by Card (1997) and Hirsch and Macpherson (1997b). The dependent variable is the difference of the log of earnings, both pre- and post-displacement, in real dollars. Explanatory variables include measures of the pre-displacement characteristics of workers such as age, experience, years of schooling, sex, race, and marital status. Other explanatory variables include

<sup>8</sup> The samples used when estimating earnings changes of displaced workers are taken from the 1984, 1986, 1988, 1990, 1992, and 1994 displaced worker supplement to the CPS. These sources provide information on a random sample of individuals who reported losing a job any time during a 5 year span prior to the respective survey year (previous 3 years in 1994). Displaced individuals between the ages of 16 and 65 who are re-employed full-time is used as the selection criterion for individuals employed in non-trucking industries. Only individuals employed as truck drivers who satisfy the selection criterion are used in the trucking sample. This yields a sample of 21,463 individuals for all industries and 475, 97, 194, and 132 for trucking, railroad, airlines and telecommunications, respectively.

dummy variables indicating the displacement year, whether the displacement was caused by plant closing, whether the worker received early notification of displacement, the pre- and post-displacement occupation, and the post-displacement industry. The key explanatory variable is an added dummy variable identifying whether the industry had been deregulated. This is intended to reveal whether the experience of workers displaced in deregulated industries differs from that of others. This calculation is carried out separately for each of the four industries, which allows for different dates at which deregulation occurred. The comparison groups are the same as those used earlier when examining earnings differentials.

The results of these calculations are that workers displaced from the trucking and airline industries experienced very similar earnings changes to workers displaced from other industries; the coefficient on the industry dummy variable in these cases was less than 2 percentage points and lacked statistical significance. An interpretation of these results is that the market demand for the re-employed trucking and airline workers is strong enough for them to avoid relatively high earnings losses—remember, employment overall is growing in these industries. Of course, this does not mean that displaced trucking and airline workers did not suffer losses, only that their losses were no different than those of displaced workers from other industries.

In contrast, workers displaced from the railroad and telecommunications industries experienced markedly higher earning losses than workers displaced from other industries: 20 percentage points higher for railroads and 15 percentage points higher for telecommunications. This may reflect the strong possibility that industry-specific skills attained in these industries are not in high demand by other employers. It also fits with the observation that increased use of labor saving technology in railroad and telecommunications has lowered the demand for workers with skills specific to these industries.

## **Concluding Remarks**

Deregulation has radically altered labor relations in the trucking, railroad, airline, and telecommunications industries, but what is interesting is the differing approaches to reducing labor costs that were used in each industry. For example, industry labor earnings premiums fell sharply in trucking, somewhat in airlines, slightly in telecommunications, and barely in railroads. It is perhaps no coincidence that the size of the workforce dramatically increased in trucking and airlines, held roughly steady in telecommunications, and fell dramatically in railroads—a pattern roughly the opposite of the changes in earnings.

Finding declining per worker labor costs following deregulation reveals an important source of consumer welfare gains in transportation and telecommunications. Indeed, taking the product of the earnings premium changes reported in this article from the time before deregulation and labor's total annual compensation in 1991 indicates worker losses in current dollars up to \$5.7 billion in trucking, \$1.2 billion in railroads, \$3.4 billion in airlines, and \$5.1 billion in tele-

communications.<sup>9</sup> Of course, these quick calculations should be taken only as illustrating the order of magnitude of losses to labor. But to place these figures in context, the annual consumer welfare gains from deregulation have been roughly estimated at \$50 billion for a not exactly comparable group of industries in the accompanying paper by Clifford Winston in this issue. This indicates that worker surplus losses do represent a sizeable share of consumer welfare gains from deregulation. Moreover, the losses to labor are greater than just the erosion of worker wages. The declining percentage of workers belonging to a union following deregulation raises other labor market concerns. For instance, unions can serve a positive economic role by helping employers to identify and address workers concern over issues such as working conditions, promotional practices, job security and labor compensation. A healthy interaction between unions and employers can lead to a healthier work environment, which in turn can enhance worker productivity. However, deregulation has had the expected labor market effect of reducing the bargaining advantage of unions in transportation and telecommunications.

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<sup>9</sup> The base years used to calculate the change in earnings premiums for rail and airlines are 1985, and 1982, respectively. These choices reflect the peak years for these premiums. 1978 and 1986 are the base years for trucking and telecommunications, respectively. For trucking, this represents the year that the ICC removed entry and rate restriction and for telecommunications, this represents the initial year of labor negotiations following the break-up of AT&T.

## References

- Alexis, Marcus**, "Commentary on Earnings and Employment in Trucking: Deregulating a Naturally Competitive Industry." In James Peoples, ed. *Regulatory Reform and Labor Markets*. Boston, Massachusetts: Kluwer Academic Publishers, 1997.
- Annable, James**, "The ICC and the Cartelization of the American Trucking Industry," *Quarterly Review of Economics and Business*, Summer 1973, 13, 13–47.
- Belzer, Michael**, "Collective Bargaining After Deregulation: Do the Teamsters Still Count?" *Industrial and Labor Relations Review*, July 1995, 48, 636–55.
- Belzer, Michael**, "Commentary on Railroad Deregulation and Union Labor Earnings." In James Peoples, ed. *Regulatory Reform and Labor Markets*. Boston, Massachusetts: Kluwer Academic Publishers, 1997.
- Cappelli, Peter**, "Airlines." In David Lipsky and Clifford Donn, eds. *Collective Bargaining in American Industry*. Lexington, Massachusetts: Lexington Books, 1987.
- Cappelli, Peter**, "Competitive Pressures and Labor Relations in the Airline Industry." *Industrial Relations*, Fall 1985, 24, 316–38.
- Card, David**, "Deregulation and Labor Earnings in the Airline Industry." In James Peoples, ed. *Regulatory Reform and Labor Markets*. Boston, Massachusetts: Kluwer Academic Publishers, 1997.
- Card, David**, "The Impact of Deregulation on the Employment and Wages of Airline Mechanics," *Industrial and Labor Relations Review*, July 1986, 39, 527–38.
- Craypo, Charles**, *The Economics of Collective Bargaining*. Washington, D.C.: Bureau of National Affairs, 1986.

**Cremieux, Pierre-Yves**, "The Effect of Deregulation on Employee Earnings: Pilots, Flight Attendants, and Mechanics, 1959–1992," *Industrial and Labor Relations Review*, July 1996, 49, 223–42.

**DeVany, Arthur**, "The Effect of Price and Entry Regulation on Airline Output Capacity and Efficiency," *Bell Journal of Economics*, Spring 1975, 6, 327–35.

**Douglas, George, and James Miller**, "Quality Competition, Industry Equilibrium, and Efficiency in the Price Constrained Airline Market," *American Economic Review*, September 1974, 64, 657–69.

**Ehrenberg, Ronald**, *The Regulatory Process and Labor Earnings*. New York: Academic Press, 1979.

**Fortin, Nicole, M., and Thomas Lemieux**, "Institutional Changes and Rising Wage Inequality: Is There a Linkage?" *Journal of Economic Perspectives*, Spring 1997, 11:2, 75–96.

**Grimm, Curtis, and Robert Windle**, "Regulation and Deregulation in Surface Freight, Airlines and Telecommunications." In James Peoples, ed. *Regulatory Reform and Labor Markets*. Boston, Massachusetts: Kluwer Academic Publishers, 1997.

**Harris, Robert, G., and C. Jeffrey Kraft**, "Meddling Through: Regulating Local Telephone Competition in the United States," *Journal of Economic Perspectives*, Fall 1997, 11:4, 93–112.

**Hendricks, Wallace**, "Deregulation and Labor Earnings," *Journal of Labor Research*, Summer 1994, 15, 207–34.

**Hendricks, Wallace**, "Labor Negotiations with Regional Monopolies: The Telecommunications Industry." In James Peoples, ed. *Regulatory Reform and Labor Markets*. Boston, Massachusetts: Kluwer Academic Publishers, 1997.

**Hendricks, Wallace, Peter Feuille, and Carol Szerszen**, "Regulation, Deregulation, and Collective Bargaining in Airlines," *Industrial and Labor Relations Review*, October 1980, 34, 67–81.

**Hirsch, Barry**, "Trucking Regulation, Unionization, and Labor Earnings: 1973–85," *Journal of Human Resources*, Summer 1988, 23, 296–319.

**Hirsch, Barry, and David Macpherson**, "Earnings and Employment in Trucking: Deregulating a Naturally Competitive Industry." In James Peoples, ed. *Regulatory Reform and Labor Markets*. Boston, Massachusetts: Kluwer Academic Publishers, 1997b.

**Hirsch, Barry, and David Macpherson**, "Earnings, Rents, and Competition in the Airline Labor Market," Florida State University Economics Working Paper 94-12-1, December 1995.

**Hirsch, Barry, and David Macpherson**, *Union Membership and Earnings Data Book 1996: Compilations from the Current Population Survey*. Washington, D.C.: Bureau of National Affairs, 1997a.

**Keefe, Jeffrey, and Karen Boroff**, "Telecommunications Labor-Management Relations After Divestiture." In Paula Voos, ed. *Contemporary Collective Bar-*

*gaining in the Private Sector*. Madison, Wisconsin: Industrial Relations Research Association, 1994.

**Keeler, Theodore**, "The Revolution in Airline Regulation." In Leonard Weiss and Michael Klass, eds. *Case Studies in Regulation: Revolution and Reform*. Boston, Massachusetts: Little, Brown, 1981.

**Krueger, Alan B., and Lawrence H. Summers**, "Efficiency Wages and the Inter-Industry Wage Structure," *Econometrica*, March 1988, 56, 259–93.

**MacDonald, James, and Linda Cavalluzzo**, "Railroad Deregulation: Pricing Behavior, Shipper Responses, and the Effects on Labor," *Industrial and Labor Relations Review*, July 1996, 50, 80–91.

**Moore, Thomas Gale**, "The Beneficiaries of Trucking Regulation," *Journal of Law and Economics*, October 1978, 21, 327–43.

**Moore, Thomas Gale**, "U.S. Airline Deregulation: Its Effects on Passengers, Capital and Labor," *Journal of Law and Economics*, April 1986, 24, 1–28.

**Pal, Debashis**, "Commentary on Labor Negotiations with Regional Monopolies: The Telecommunications Industry." In James Peoples, ed. *Regulatory Reform and Labor Markets*. Boston, Massachusetts: Kluwer Academic Publishers, 1997.

**Peoples, James**, "Airline Deregulation and Industry Wage Levels," *Eastern Economic Journal*, January–March 1990a, 16, 49–58.

**Peoples, James**, "Concluding Observations." In James Peoples, ed. *Regulatory Reform and Labor Markets*. Boston, Massachusetts: Kluwer Academic Publishers, 1997.

**Peoples, James**, "Wage Outcomes Following the Divestiture of AT&T," *Information Economics and Policy Journal*, 1990b, 4, 105–26.

**Perelman, Michael**, "Fixed Capital, Railroad Economics and the Critique of the Market," *Journal of Economic Perspectives*, Summer 1994, 8, 189–95.

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

**Rose, Nancy**, "Labor Rent-Sharing and Regulation: Evidence from the Trucking Industry," *Journal of Political Economy*, December 1987, 95, 1146–8.

**Smith, Sharon P.**, "Bargaining Realities: Responding to a Changing World." In Wei-Chiao Huang, ed. *Organized Labor at the Crossroads*. Kalamazoo, Michigan: W. E. Upjohn Institute for Employment Research, 1989.

**Talley, Wayne, and Ann Schwarz-Miller**, "Railroad Deregulation and Union Labor Earnings." In James Peoples, ed. *Regulatory Reform and Labor Markets*. Boston, Massachusetts: Kluwer Academic Publishers, 1997.

**Walsh, David**, "Toward a 'Seamless' Workforce? Interunion Cooperation in the Airline Industry." In Peter Cappelli, ed. *Airline Labor Relations in the Global Era*. Ithaca, New York: Industrial and Labor Relation Press, 1995.

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2. Gilles Saint-Paul. 2021. Pareto-improving structural reforms. *Journal of Economic Theory* 194, 105262. [[Crossref](#)]
3. Sumit K. Majumdar, Rabih Moussawi, Ulku Yaylaci. 2019. Mergers and Wages in Digital Networks: a Public Interest Perspective. *Journal of Industry, Competition and Trade* 19:4, 583-615. [[Crossref](#)]
4. Azrina Abdullah Al-Hadi, John Bitzan, James Peoples. 2019. Input allocation efficiency in the United States railroad industry: Changing work rules and managerial flexibility. *Transportation Research Part A: Policy and Practice* 126, 281-296. [[Crossref](#)]
5. Abu Saleh Mohammad Sowad. Picking the People up From Poverty 222-231. [[Crossref](#)]
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7. Hamid Boustanifar, Everett Grant, Ariell Reshef. 2018. Wages and Human Capital in Finance: International Evidence, 1970–2011\*. *Review of Finance* 22:2, 699-745. [[Crossref](#)]
8. Abu Saleh Mohammad Sowad. 2016. Picking the People up from Poverty. *International Journal of Sustainable Economies Management* 5:4, 1-9. [[Crossref](#)]
9. Sébastien Jean, Giuseppe Nicoletti. 2015. Product market regulation and wage premia in Europe and North America: An empirical investigation. *International Economics* 144, 1-28. [[Crossref](#)]
10. Sumit K. Majumdar. 2015. Competitor entry impact on jobs and wages in incumbent firms: retrospective evidence from a natural experiment. *Business and Politics* 17:2, 291-326. [[Crossref](#)]
11. Nancy L. Rose. Regulation, Empirical Analysis of 172-177. [[Crossref](#)]
12. Nick A Malyshev. 2015. The Importance of Regulatory Policy. *SSRN Electronic Journal* . [[Crossref](#)]
13. Nick A Malyshev. 2015. The Achievements of Regulatory Policy. *SSRN Electronic Journal* . [[Crossref](#)]
14. James Peoples. 2014. Marcus Alexis and Regulatory Reform in Surface Transportation Industries. *The Review of Black Political Economy* 41:3, 243-258. [[Crossref](#)]
15. James Peoples. 2013. The Legacy of the Interstate Commerce Act and Labor: Legislation, Unionization, and Labor Earnings in Surface Transportation Services. *Review of Industrial Organization* 43:1-2, 63-84. [[Crossref](#)]
16. Blaise Melly, Patrick A. Puhani. 2013. DO PUBLIC OWNERSHIP AND LACK OF COMPETITION MATTER FOR WAGES AND EMPLOYMENT? EVIDENCE FROM PERSONNEL RECORDS OF A PRIVATIZED FIRM. *Journal of the European Economic Association* 11:4, 918-944. [[Crossref](#)]
17. Italo Colantone. 2012. Trade openness, real exchange rates and job reallocation: evidence from Belgium. *Review of World Economics* 148:4, 669-706. [[Crossref](#)]
18. NATÁLIA P. MONTEIRO, MIGUEL PORTELA. 2011. RENT SHARING IN PORTUGUESE BANKING \*. *The Manchester School* 79:4, 861-883. [[Crossref](#)]
19. Eva Jansson. 2010. Deregulation and the stakeholder model. *Corporate Governance: The international journal of business in society* 10:2, 129-139. [[Crossref](#)]
20. Siew Hoon Lim, C.A. Knox Lovell. 2009. Profit and productivity of US Class I railroads. *Managerial and Decision Economics* 30:7, 423-442. [[Crossref](#)]
21. Natália Pimenta Monteiro. 2009. Regulatory reform and labour earnings in Portuguese banking. *Empirical Economics* 36:3, 557-574. [[Crossref](#)]

22. Horst Feldmann. 2009. Business regulation, labor force participation and employment in industrial countries. *Journal of Economics and Business* 61:3, 238-260. [[Crossref](#)]
23. . Notes 185-214. [[Crossref](#)]
24. Peter V. Hall. 2009. Container ports, local benefits and transportation worker earnings. *GeoJournal* 74:1, 67-83. [[Crossref](#)]
25. Horst Feldmann. 2008. Business regulation and labor market performance around the world. *Journal of Regulatory Economics* 33:2, 201-235. [[Crossref](#)]
26. John Robst. 2007. Regulatory legislation, unions, and labor market earnings. *International Journal of Manpower* 28:8, 656-673. [[Crossref](#)]
27. Michelle W. Trawick, Stephen E. Lile. 2007. Religious Market Competition and Clergy Salary: Evidence from SBC Congregations in the South. *American Journal of Economics and Sociology* 66:4, 747-763. [[Crossref](#)]
28. François Rycx, Ilan Tojerow. 2007. Inter-Industry Wage Differentials: What Do We Know?. *Reflète et perspectives de la vie économique Tome XLVI*:2, 13-22. [[Crossref](#)]
29. Abigail K. Wozniak. 2007. Product Markets and Paychecks: Deregulation's Effect on the Compensation Structure in Banking. *ILR Review* 60:2, 246-267. [[Crossref](#)]
30. JACQUELINE AGESA, KRISTEN MONACO. 2006. THE DECREASING INFLUENCE OF DOMESTIC MARKET STRUCTURE ON RACIAL EARNINGS DIFFERENTIALS: 1984 TO 1996. *Contemporary Economic Policy* 24:2, 224-236. [[Crossref](#)]
31. Dennis W. Carlton, Randal C. Picker. 2006. Antitrust and Regulation. *SSRN Electronic Journal* . [[Crossref](#)]
32. Sylvester C. W. Eijffinger, Alberto G. P. Rossi. 2006. Structural Reforms and Growth: Product and Labor Market Deregulations. *SSRN Electronic Journal* . [[Crossref](#)]
33. John Schmitt. 2005. Labor Markets and Economic Inequality in the United States since the End of the 1970s. *International Journal of Health Services* 35:4, 655-673. [[Crossref](#)]
34. Alberto Alesina, Silvia Ardagna, Giuseppe Nicoletti, Fabio Schiantarelli. 2005. Regulation and Investment. *Journal of the European Economic Association* 3:4, 791-825. [[Crossref](#)]
35. Alan B. Krueger. 2005. The Economics of Real Superstars: The Market for Rock Concerts in the Material World. *Journal of Labor Economics* 23:1, 1-30. [[Crossref](#)]
36. Jacqueline Agesa, Kristen Monaco. 2004. Industry racial employment by skill level: The effects of market structure and racial wage gaps. *Journal of Labor Research* 25:2, 315-328. [[Crossref](#)]
37. James Peoples, Wayne K Talley. 2004. 1. INTRODUCTION AND OVERVIEW. *Research in Transportation Economics* 10, 1-9. [[Crossref](#)]
38. Daniel P. Rich. 2004. 6. PRODUCTIVITY, TECHNICAL CHANGE AND LABOR RELATIONS IN TRANSPORTATION INDUSTRIES. *Research in Transportation Economics* 10, 109-135. [[Crossref](#)]
39. James Peoples, Wayne K Talley. 2004. 9. OWNER-OPERATOR TRUCK DRIVER EARNINGS AND EMPLOYMENT: PORT CITIES AND DEREGULATION. *Research in Transportation Economics* 10, 191-213. [[Crossref](#)]
40. Jorge Arbache. 2004. Does Trade Liberalization Always Decrease Union Bargaining Power?. *SSRN Electronic Journal* . [[Crossref](#)]
41. David E. Davis, Wesley W. Wilson. 2003. Wages in Rail Markets: Deregulation, Mergers, and Changing Networks Characteristics. *Southern Economic Journal* 69:4, 865-885. [[Crossref](#)]
42. M. Bertrand, F. Kramarz. 2002. Does Entry Regulation Hinder Job Creation? Evidence from the French Retail Industry. *The Quarterly Journal of Economics* 117:4, 1369-1413. [[Crossref](#)]

43. D. Checchi, C. Lucifora. 2002. Unions and labour market institutions in Europe. *Economic Policy* 17:35, 361-408. [[Crossref](#)]
44. Giuseppe Nicoletti, Andrea Bassanini, Sébastien Jean, Ekkehard Ernst, Paulo Santiago, Paul Swaim. 2002. Product and Labour Market Interactions in OECD Countries. *SSRN Electronic Journal* . [[Crossref](#)]
45. Sandra E. Black,, Philip E. Strahan. 2001. The Division of Spoils: Rent-Sharing and Discrimination in a Regulated Industry. *American Economic Review* 91:4, 814-831. [[Abstract](#)] [[View PDF article](#)] [[PDF with links](#)]
46. Barry T. Hirsch, Edward J. Schumacher. 2001. Private sector union density and the wage premium: Past, present, and future. *Journal of Labor Research* 22:3, 487-518. [[Crossref](#)]
47. Wayne K. Talley. 2001. Wage Differentials of Transportation Industries: Deregulation Versus Regulation. *Economic Inquiry* 39:3, 406-429. [[Crossref](#)]
48. Dale L. Belman, Kristen A. Monaco. 2001. The Effects of Deregulation, De-Unionization, Technology, and Human Capital on the Work and Work Lives of Truck Drivers. *ILR Review* 54:2A, 502-524. [[Crossref](#)]
49. François Nielsen, Arthur S. Alderson. Trends in Income Inequality in the United States 355-385. [[Crossref](#)]
50. Michael L. Wachter, Barry T. Hirsch, James W. Gillula. Difficulties of Deregulation When Wage Costs are the Major Cost 3-24. [[Crossref](#)]
51. N.L. Rose. Regulation: Empirical Analysis 12957-12963. [[Crossref](#)]
52. Michael L. Wachter, Barry T. Hirsch, James W. Gillula. 2001. Difficulties of Regulation When Wage Costs are the Major Cost. *SSRN Electronic Journal* . [[Crossref](#)]
53. Barry T. Hirsch, Edward J. Schumacher. 2001. Private Sector Union Density and the Wage Premium: Past, Present, and Future. *SSRN Electronic Journal* 89. . [[Crossref](#)]