Union Wage Premiums Following Intrastate Deregulation: Evidence from the US Trucking Industry*

Steven Trick
University of Wisconsin-Milwaukee
Department of Economics
trick@uwm.edu

James Peoples
University of Wisconsin-Milwaukee
Department of Economics
peoples@uwm.edu

***Prepared for presentation at the joint TPUG/AEA session of the 2010 Allied Social Science Association meetings**

Union Wage Premiums Following Intrastate Deregulation: Evidence from the US Trucking Industry

Abstract

This study contributes to the analysis of union wage patterns in the trucking industry by using state level information to gain greater understanding of the persistence of relatively high premiums in the for-hire sector following federal legislation promoting interstate competition. For-hire trucking still faced intrastate rate and entry regulation following interstate deregulation of the for-hire sector. Hence, intrastate service could still generate rent to be shared with drivers. The passage of the Airport Information Act (AIA) of 1994 created a business environment that placed competitive pressure on rates by eliminating intrastate regulation. Given the stepped-up competition at the state level, this study hypothesizes that for-hire union premiums should decline to levels that resemble premiums in the non-regulated private carriage sector following the passage of the AIA act. Findings using individual worker information support this study's hypothesis.

I. Introduction

Much of the literature on trucking deregulation suggests that union rent sharing in the previously regulated for-hire sector of the trucking industry persisted despite enhanced competition following the passage of the Motor Carrier Act of 1980. [1] For instance, using driver level data Rose (1987) and Hirsch (1988) find post deregulation union wage premiums declined in the for-hire trucking sector, however, these premiums continued to exceed union wage premiums of truck drivers in the non-regulated private carriage sector. Even stronger support of limited union rent erosion is observed by Hendrickson and Wilson (2007) as they report widening union-nonunion labor compensation differentials when using carrier level data. Hendrickson and Wilson attribute the

[1] The for-hire sector of the trucking industry consists of carriers that specialize in the distribution of freight. In contrast, the private carriage sector of the trucking industry consists of non-trucking firms that provide in house freight service.

contrasting findings from their work and those using worker level data in part to the inclusion of fringe benefits in carrier level data and to the dominant trucking union's ability to negotiate relatively lucrative post deregulation fringe benefits.[2] Despite apparent contradicting union premium results, finding relatively large union premiums from both groups of researchers suggest the possibility of rent sharing by union drivers in the previously regulated sector of the trucking industry following interstate trucking deregulation. The maintenance of large union premiums is interesting because such findings are inconsistent with economic theory that suggests rent-sharing is limited in a naturally competitive industry such as the deregulated for-hire sector of the trucking industry.

Research investigating post-deregulation wage patterns of truck drivers attributes compensation for unobserved worker characteristics as partial explanation of relatively large union premiums for for-hire truck drivers (Hirsch (1993), and Hirsch and Macpherson (1998)). These truck driver studies, though, still report large union wage premiums that cannot be explained by compensation from observed and unobserved worker characteristics. Additional examination of state level regulation could assist in explaining post interstate deregulation union wage patterns. For instance, research on intrastate regulation reports the potential for continued rent-sharing following interstate deregulation because many states regulated entry and rates (Teske, Best, Mintrom, 1994). Federal policy enacted in the mid 1990s changed the interstate trucking services business

[2] Hendrickson and Wilson note findings from Alexis (1998) that indicate growth in the real value of fringe benefits for union truck drivers that match pre-deregulation benefits growth. Such post-deregulation growth is indicative of potential rent sharing given findings by Lane (1989) that reveal that the highly organized less-than-truck-load sector of the for-hire industry received fringe benefits that nearly triple the value of benefits received by drivers in the much less organized truck-load sector of this industry.

environment by removing remaining economic regulations at the state level. The enhanced potential for stepped-up entry and competitive pricing within states arising from the enforcement of this new policy can present a challenge for carriers generating rent to share with drivers. In light of this policy shift this study contributes to the literature on truck driver earnings by examining the pre and post intrastate pattern of union earnings premiums of drivers residing in previously regulated localities. Analysis on pension coverage is also provided to examine whether the contrasting union premium patterns reported in earlier research persists following intrastate deregulation.

II. Intrastate Deregulation and the Labor Market for Truck Drivers

Initial deregulation in the trucking industry was enacted by the Interstate Commerce Commission (ICC) in 1978 and was later legislated by Congress in 1980 with the passage of the Motor Carrier Act. This legislation eliminated the Interstate Commerce Commission's role in restricting entry and setting interstate rates in the for-hire sector. Past research indicates that this legislation produced the desired effect of introducing significant competition that not only lowered shipping rates but also dramatically changed the labor market for truck drivers by making it easier for nonunion carriers to compete in the formerly regulated for-hire sector.[3] Carriers in this sector are truck companies and owner operators providing local and long-haul service for intercity and interstate carriage. This sector of the trucking industry was heavily organized by the International Brotherhood of Teamsters (IBT) prior to deregulation. However, the percentage of union drivers in this sector fell to levels that more closely resembled the

[3] Ying and Keeler (1991) report interstate trucking rates declining by 15 to 20 percent three years after the passage of the 1980 MCA.

percentage of union drivers in the historically less unionized private carriage sector of the trucking industry following deregulation (Hirsch and Macpherson, 1998).[4] The relatively low percentage of union drivers in the private carriage sector was due in large part because carriers in this sector are non-trucking firms that transport their own products, and hence present unions with the challenge of organizing several companies across a wide range of industry sectors. The post deregulation erosion of union membership roles parallels declining wage premiums found in past research (Rose, 1987, Hirsch ,1988). At issue, though, is findings by these studies that show union drivers maintaining a relatively large wage advantage in the for-hire sector following interstate deregulation, and findings by Hendrickson and Wilson (2007) suggesting an apparent increasing union driver non-wage advantage over non-union drivers.

The potential for rent-sharing with union drivers still existed even though regulatory reform following the 1980 MCA ushered in a new era of market determined rates and ease of entry in interstate freight hauling. For instance, significant regulation still occurred *within* states throughout the early 1990s. Information presented in the last column of Table -1 shows that before the passage of the 1980 MCA New Jersey and Delaware were the only states that did not regulate rates and entry. Florida deregulated intrastate trucking operations the same year that the MCA was enacted. Arizona, and Maine and Wisconsin followed in 1981 and 1982, respectively. Last, Alaska and Vermont deregulated intrastate trucking operations by 1986.

Intrastate trucking regulation of the remaining states varied in the severity of regulation. Information presented in the third column of Table-1 shows 60 percent of the

[4] Hirsch and McPherson (1998) report 55.8 and 34.2 percent of the for-hire and private carriage truck drivers work force, respectively, belonging to a union just prior to interstate deregulation. These percentages fall to 24.9 and 17.2 percent for the for-hire and private carriage sector, respectively by 1995.

states imposed strict entry regulation. Such regulation allowed existing carriers protection from the entry of new carriers and the expansion of authority of existing carriers (Taylor, 1994). Information in Table-1 also reveals 42 percent of states imposed strict rate regulations on carriers. Rate regulation often included pricing controls designed to assure that rates covered relevant costs (Taylor). Apparently, such pricing policy by state regulators allowed significant cost pass through. For instance, empirical evidence reported by Taylor on the highly regulated state of Texas shows freight rates 40 percent higher than comparable interstate rates. He also reports that 75 percent of shippers in Michigan believed that intrastate rates were higher than deregulated interstate rates for route of equal distance. Taylor further observes evidence of deregulation promoting low rates in Florida where 55 percent of shippers report a rate decline after intrastate deregulation.[5]

In light of the pricing inefficiencies associated with intrastate regulation federal legislation was enacted in 1994 to pre-empt remaining state economic regulation over intrastate trucking routes. Effective January 1, 1995 Section 601 of the 1995 Airport Improvement Act (AIA) prohibited state and local authorities from regulation of rates, routes or services within the transportation industry.[6] Past studies indicate 9,826 more establishments competing in the trucking industry for six years following intrastate deregulation (Peoples, 2005). This same research indicates that post AIA carrier entry easily surpassed the number of new carriers for the 1970 to 1980 pre-MCA period. In

[5] Taylor (1994) observes that 48 percent of Florida shippers reported a price decline following state deregulation.

[6] States were permitted to continue to exercise regulatory authority over safety, financial fitness, insurance, vehicle size and weight and highway route controls for hazardous materials following passage of the 1995 AIA.

contrast, that research reports post AIA establishment growth was a continuation of entry gains that occurred during the first 15 years following the 1980 MCA (Peoples, 2005).

Intrastate deregulation creates a challenge for for-hire union drivers maintaining their post interstate deregulation wage advantage over non-union drivers in this sector of the trucking industry. The continued influx of non-union establishments weakens the IBT's monopoly control over the supply of drivers. In addition stepped-up competition combined with less stringent rate regulation limits the ability of firms continuing to grant high union wage demands. Downward pressure on union wages, however, may not necessarily contribute to an erosion of union wage premiums. Hendrickson and Wilson note that incumbent non-union establishments had an incentive to pay high wages to their drivers in an attempt to prevent unionization of their operations. This threat effect implies that pre-AIA rent sharing with non-union drivers is a possibility in previously regulated states. Hence, cost demands associated with enhanced competition would also place downward pressure on non-union wages. In contrast to the threat effect, it is possible that the IBT's ability to maintain high wages creates a labor market environment such that drivers find it difficult to secure employment with unionized carriers because employers face relative high labor cost associated with the payment of union wages. A growing supply of non-union drivers arises as a consequence of limited union jobs. This spill-over effect implies that non-union carriers would posses the leverage to avoid sharing rent with their drivers prior to the 1995 AIA. The lack of an obvious theoretical prediction of AIA's influence on union premiums in the for-hire sector suggests that this remains an empirical issue.

III. Data and Empirical Approach

Data

The source of data used to examine driver earnings trends for this study is the 204 monthly CPS Outgoing Rotation Group (CPS-ORG) files for January 1983 through December 2006.[7] Information taken from these files include individuals' labor earnings, ethnicity, gender, age, level of educational attainment, union status, marital status, full-time status, hours worked per week, central city residency status, state residency, and occupation of employment as well as industry of employment. The sample employed here is limited to truck drivers who are at least 21 years old. This selection criterion is imposed to account for the age limit of 21 to attain the proper commercial drivers license (CDL) to legally drive such vehicles on interstate routes. Additional sample selection criterion includes only information for drivers with unedited earnings. Making this restriction excludes allocated earnings reported by the CPS that are actually estimated loosely based on worker characteristics. Hence, only drivers reporting their actual labor earnings are included in this study's sample. Even after imposing these restrictions the sample population taken from the CPS is still large enough to allow separate annual observations union premiums for the for-hire and private carriage sectors of the trucking industry. Census occupational codes 804 and 913 are used to select truck drivers from the 1983-2002 files and 2003-2006 files, respectively. The census industry codes 410 and 617 are used to identify truck drivers employed in the trucking industry for the 1983-

[7] 1983 is chosen as the initial observation year due to the lack of information identifying union workers in the CPS sample prior to that date. In addition, choosing 1983 as the initial observation year avoids the use of pre 1980 CPS data that assigns the earnings of drivers who don't report their earnings from a non-union, non-driver employed in a different industry (Hendrickson and Wilson, 2007, and Hirsch and Schumacher, 2004).

2002 files and 2003-2006 files, respectively.[8] Drivers in other industries are categorized as private carriage employees. Annual sample sizes for the for-hire sector range from 288 observations for the 2004 population to the largest sample size of 652 observations for 1992. The private carriage sample sizes range from 933 observations for 1988 to 1724 observations for 1993.

An additional benefit derived from using CPS-ORG files is it allows for identify whether a driver resides in a state that received strict, partial or no regulation prior to the AIA act. A shortcoming associated with the data is the sample population for the selected truck drivers is not large enough to use separate sample populations to estimate labor earnings by these three state regulatory categories. Rather estimates are pooled across states to examine the effects of intrastate regulation on truck driver labor earnings.

Additional data taken from1983 to 2006 March CPS files are used to examine non-wage compensation patterns in the trucking industry. Information identifying whether a driver receives an employer funded pension and/or health plan is available for use from this data sources. Unfortunately, though, the sample population of truck drivers is too small to allow for reliable analysis when comparing union and non-union probabilities of receiving health care coverage. Only information on pension plans is used in this study, and that information is pooled over years to create a separate sample populations for the pre and post-AIA pre and post-AIA observation periods.

Empirical Approach

[8] The 410 and 617 census codes are equivalent to the 484 NAICS industry classification cod**e.**

The following labor earnings equation for the truck driver sample is estimated to analyze union labor earnings differentials for for-hire and private carriage drivers for each of the sample observation years.

$$\ln(W_{ijt}) = \beta_0 + \beta_1 \mathbf{Z}_{ijt} + \beta_2 \mathbf{X}_{ijt} + \beta_3 union_{ijt} + \beta_4 strict_{ijt} + \beta_5 partly_{ijt} + \beta_6 (strict \times union)_{ijt} + \beta_7 (partly \times union)_{ijt} + \varepsilon_{ijt} \quad (1)$$

where '*i*' indexes individual truck drivers '*j*' indexes whether the driver is employed in the for-hire or private carriages sector and '*t*' indexes the observation year. The dependent variable is the log of real weekly earnings of the *jth* driver.[9] The matrix **Z** consists of a set of driver residency and worker profile variables. These explanatory variables include residency dummies for U.S. geographic quadrant, and urban residency status. The matrix **X** consists of a set of driver profile variables. These variables include dummies depicting a driver's marital, ethnicity, sex, full-time, and educational attainment status, as well as the weekly hours worked, age and age-squared of the individual driver. The variable *union* is a dummy equaling one if a driver belongs to a union. The variables *strict* and *partly* are, respectively dummy equaling one if a driver resides in a state that strictly or partially enforces rate and entry regulation prior to the AIA act. The interaction terms *strict*×*union* and *partly*×*union* are respectively dummy variables identifying union drivers residing in a strictly or partly regulated states prior to AIA deregulation.

The coefficients that are of special interest to this study are β_3, $\beta_3+\beta_6$ and $\beta_3+\beta_7$. The coefficient β_3 measures the union-non-union log earnings differential for truck

[9] Weekly earnings are adjusted for inflation using the consumer price index with 1983 as the base year.

drivers residing in states that were deregulated before the 1994 AIA.[10] The sum of the estimated coefficients $\beta_3+\beta_6$ measures the union-non-union log earnings differential for truck drivers residing in states that were strictly regulated before the 1994 AIA. Last, the sum of the estimated coefficients $\beta_3+\beta_7$ measures the union-non-union log earnings differential for truck drivers residing in states that were partly regulated before the 1994 AIA.

Non-labor earnings equations identifying whether drivers received employer funded pension plans are also estimated. The specification for the pension plan equation is presented as follows:

$$\Pr(pensions_{ijt}=1)= \Phi\{\alpha_0 +\alpha_1\mathbf{Z}_{ijt} + \alpha_2\mathbf{X}_{ijt} + \alpha_3 union_{ijt} + \alpha_4 strict_{ijt} + \alpha_5 partly_{ijt} + \alpha_6(strict\times union)_{ijt} + \alpha_7(partly\times union)_{ijt}\}+ \mu_{ijt} \quad (2)$$

where Φ is a normal probability function and *pension* is a binary variable with a value of one if a driver is covered by an employer financed pension plan and zero if the driver is not covered. The explanatory variables and subscripts are the same as those used in the earnings equations. The coefficients of key interest are α_3, $\alpha_3+\alpha_6$ and $\alpha_3+\alpha_7$. The coefficient α_3 measures the union-non-union probability differential that a driver residing in non-regulated state receives a pension plan. The sum of the estimated coefficients $\alpha_3+\alpha_6$ measures the union-non-union probability differential that a driver residing in a strictly regulated state receives a pension plan. Last, the sum of the estimated coefficients $\alpha_3+\alpha_7$ measures the union-non-union probability differential that a driver residing in a partly regulated state receives a pension plan.

[10] Estimated coefficients are converted to percentage differentials by using the formula $(\varepsilon^{\beta}-1)100$.

IV. Results

Labor earnings findings

Before reporting results on the key estimated coefficients a brief presentation on the control variables is presented. A summary of the results for these variables derived from separately estimating the labor earnings equation for each of the 24 yearly observations are presented in Table-2.[11] The smallest and largest estimated coefficient from the separate labor earnings estimations is reported in parentheses. For instance, the first entry in Table-2 indicates that the smallest estimated coefficient on the full-time status dummy variable is a statistically significant 0.158 for drivers employed in the for-hire sector prior to the passage of the 1994 AIA. The second entry indicates that the largest estimated coefficient on the full-time status dummy variable is a statistically 0.43 for drivers employed in this sector prior to the passage of the AIA. These results suggest full-time drivers employed in the for-hire sector received at minimum a 17.11 percent earnings premium and at most a 53.72 percent premium over part-time for-hire drives for the 1983 to 1994 observation sample. The findings taken from the entire table suggest standard labor earnings results for the estimated coefficients on the control variables. For instance, high labor earnings are paid to drivers who are older, work full-time, who are married, male receive at minimum a high school diploma, work longer hours, and reside in a metropolitan area in the Pacific US region.

The key findings on union-non-union earnings differentials derived when controlling for differences in worker characteristics and US region of residency are presented in Figures 1-6. These figures convert the estimated coefficient on union status

[11] Earnings estimates that correct for clustered standard errors by state and the end result does not change. Complete results from clustered standard error analysis are available from the authors upon request

(β_3) and the state regulatory category dummy variables (β_6, β_7) to plot union premiums for each observation year. Findings from Figure-1 present union premiums for for-hire truck drivers residing in states that faced strict rate and entry regulation prior to the 1994 AIA. The pre-AIA findings do not reveal an obvious earnings trend for the pre-AIA observation sample as the estimated trend line's slope is not significantly different from zero.[12] Union premiums for this sample observation period fluctuate annually within the range of 33 percent in 1989 and 45 percent in 1983. In contrast to the pre-AIA finding for for-hire drivers, post-AIA findings in Figure-1 reveal a clear pattern of declining union premiums starting at 41 percent in 1995 and falling to 28 percent by 2004. The slope of the fitted trend line has a statistically significant value of -0.899, which suggests an annual union premium decline of 0.899 percentage points.

Union premium trends for for-hire drivers residing in states that were partly regulated prior to the AIA are presented in Figure-2. The pre-AIA trend reveals a noticeable but small union premium decline. The estimated slope is -0.473, and is statistically significant only at the 10 percent level. The post AIA trend is much steeper with an estimated slope of 0.829, and is statistically significant at the 5 percent level. Union premiums for the post-AIA observation sample start at 45 percent in 1995 and fall as low as 27 percent by 2005.

Union premium estimates for truck drivers in the private carriage industry are presented in Figures-3 and 4 to examine whether the findings of appreciably large union post-AIA premium declines reported for the for-hire drivers is unique to that sector are

[12] While the small sample size for the trend lines in Figures 1-6 pose a challenge satisfying the condition for statistical significance when estimating trend lines, the results from these estimations are presented to allow for empirical comparisons of pre and post AIA union premium trends. The results from these estimates are available from the authors on request.

part of an industry wide labor earnings pattern. Findings in Figure-3 show very little change in union premiums for private carriage drivers residing in strictly regulated states prior to the AIA. Premiums for this observation sample fluctuate in a small range between 36 and 40 percent. The union premium pattern does not change appreciably following intrastate deregulation as the slope of the trend line remains flat, even though the range of premiums widens from a low of 33 percent to a high or 41 percent. The lack of a union premium trend for private carriage drivers does not change when estimating earnings for drivers residing in partly regulated states. For instance, the findings presented in Figure-4 show flat trend lines for the pre and post-AIA sample populations. In sum, findings for private carriage workers do not indicate an AIA effect on the earnings of private carriage drivers. In addition, a comparison of the post-AIA for the two industry sectors indicate the by 2005 union premiums for for-hire drivers converged to levels that nearly match levels in the private carriage sector.

Union premium estimates for truck drivers residing in states that did not impose rate and entry regulation prior to the AIA are presented in Figures-5 and 6 to further examine whether the findings of appreciably large union post-AIA premium declines reported for for-hire drivers is unique to that sector. A comparison of pre-AIA trends shows interestingly that union premiums of private carriage drivers residing in non-regulated states are markedly larger than premiums of for-hire drivers in the early 1980s. However, pre-AIA premiums for drivers in the private carriage sector trended closer to for-hire levels. Premiums trended measurably higher for both groups of drivers following the passage of the AIA act. This post-AIA trend for drivers residing in

previously non-regulated states sharply contrasts with the union premium erosion reported in Figures 1 and 2.

Pension coverage findings

Findings on the key explanatory variables derived from estimating the pension coverage equation are presented in Table-3. Columns (1) and (2) report the findings for drivers employed in the for-hire sector. The estimated coefficient on the union status dummy suggests that compared to non-union drivers residing in non-regulated states, union drivers residing in these same locations are 41 and 44 percent more likely to receive employer provided pension coverage before and following the AIA, respectively. The findings on the estimated coefficients of the union status-state regulatory intensity variables indicate a lack of a statistically significant difference in pension coverage for drivers residing in previously regulated states.

Findings in Columns (3) and (4) report the key findings for drivers employed in the private carriage sector. The estimated coefficient on the union status dummy suggests that union drivers residing in pre-AIA non-regulated states are 25 and 33 percent more likely to receive employer sponsored pension coverage before and after the passage of the AIA, respectively. A more pronounced difference in the pre and post-AIA, union –non-union pension coverage differential is reported for individuals residing in strictly regulated prior to the AIA. For example, in Column (3) the estimated coefficient on the union status-strictly regulated interactive term suggests a statistically significant 22 percent pre-AIA union-nonunion differential compared to a 1 percent post-AIA differential reported in Column (4). A union-non-union differential change occurs for

private carriage drivers residing in originally non-regulated states resembles the change found for drivers in strictly regulated states. However, the lack of statistical significance suggests caution interpreting these results. Nonetheless, limiting the analysis to the sample of drivers residing in strictly regulated states reveals appreciably different union-non-union pension coverage differentials patterns for the for-hire and private carriage drivers.

V. Conclusion

A substantial amount of research examines the effect of the 1980 Motor Carrier Act of 1980 on the earnings of for-hire truck drivers. Findings from that work consistently show that following interstate deregulation union premiums in the for-hire sector declined , but remained above premium levels in the private carriages sector. Previous analysis shows that compensation for unobserved driver characteristics partially explains the maintenance of relatively high union premiums for drivers in the for-hire sector. This study extends the analysis on post-deregulation earnings trends in the trucking industry by considering the potential labor earnings influence of intrastate deregulation. The significance of making such an examination is attributed to the fact that state level regulation following the passage of the 1980 MCA created a business environment that could promote rent-sharing in states that continued the practice of setting rates and restricting entry in the for-hire sector. We compare pre and post-intrastate union premium trends to test whether the removal of state regulations is associated with an erosion of union drivers' earnings advantage over non-union drivers in

the for-hire trucking sector. A comparison of non-labor earnings compensation is also presented.

Findings on truck driver earnings support the notion that state level regulation contributes to rent-sharing with union drivers. For example, for-hire union premiums in previously regulated states fall to levels resembling premium levels found in the non-regulated private carriage sector. While these driver earnings findings suggest that union drivers in the for-hire sector were beneficiaries of intrastate regulation, evidence from pension plan estimates do not suggest the use of non-wage compensation to share rent with union drivers in this sector. Rather, findings on pension plan coverage suggest that compared to non-union drivers, union drivers in the for-hire sector maintain a higher probability of receiving an employer funded pension plan following intrastate deregulation. It is important to note that the lack of a deregulation effect on pension coverage for the for-hire sample does not indicate that carriers did not consider non-wage compensation as a source of rent. In fact, pension findings for the private carriage sample show that carriers in strictly regulated states were significantly more likely to fund pension plans for union drivers compared to non-union drivers and this probability differential eroded completely following intrastate deregulation.

In sum, additional economic deregulation of trucking freight services has placed greater pressures on carriers to lower labor cost by reducing union earnings relative to earnings paid to non-union drivers. Nonetheless, union membership still has it rewards, as unionized drivers continue to receive higher pay than non-union drivers and unionized drivers are still more likely to receive employer funded pension coverage regardless of their employment sector. Findings from this study show that following intrastate

deregulation unionized truck drivers compensation advantage over non-union drivers no longer differs appreciably by major trucking sector

Table 1 Intrastate Economic Regulatory Environment

State	Pre-AIA Regulatory Environment		Year of State Deregulation
	Entry Regulation	Rate Regulation	
Alabama	strict	strict	1995 AIA
Alaska	none	none	1984
Arizona	none	none	1982
Arkansas	moderately liberal	limited	1995 AIA
California	strict	strict	1995 AIA
Colorado	strict	limited	1995 AIA
Connecticut	strict	limited	1995 AIA
Delaware	none	none	never regulated
Florida	none	none	1980
Georgia	strict	strict	1995 AIA
Hawaii	strict	strict	1995 AIA
Idaho	partly deregulated	limited	1995 AIA
Illinois	strict	strict	1995 AIA
Indiana	strict	little control	1995 AIA
Iowa	moderately liberal	limited	1995 AIA
Kansas	liberal	limited	1995 AIA
Kentucky	strict	limited	1995 AIA
Louisiana	strict	strict	1995 AIA
Maine	none	none	1982
Maryland	partly deregulated	little control	1995 AIA
Massachusetts	strict	little control	1995 AIA
Michigan	strict	strict	1995 AIA
Minnesota	strict	little control	1995 AIA
Mississippi	strict	strict	1995 AIA
Missouri	strict	strict	1995 AIA
Montana	strict	strict	1995 AIA
Nebraska	strict	strict	1995 AIA
Nevada	strict	strict	1995 AIA
New Hampshire	strict	little control	1995 AIA
New Jersey	none	none	never regulated
New Mexico	strict	strict	1995 AIA
New York	partly deregulated	limited	1995 AIA
North Carolina	strict	limited	1995 AIA
North Dakota	moderately liberal	little control	1995 AIA
Ohio	strict	little control	1995 AIA
Oklahoma	strict	strict	1995 AIA
Oregon	strict	strict	1995 AIA
Pennsylvania	strict	strict	1995 AIA
Rhode Island	strict	strict	1995 AIA

Table 1: Continued

State	Pre-AIA Regulatory Environment		Year of State Deregulation
	Entry Regulation	Rate Regulation	
South Carolina	strict	strict	1995 AIA
South Dakota	little control	little control	1995 AIA
Tennessee	little control	little control	1995 AIA
Texas	strict	strict	1995 AIA
Utah	little control	little control	1995 AIA
Vermont	none	none	1986
Virginia	little control	little control	1995 AIA
Washington	strict	strict	1995 AIA
West Virginia	strict	strict	1995 AIA
Wisconsin	none	none	1982
Wyoming	strict	strict	1995 AIA

Sources: Daniel Baker "State Regulatory Activity and Federal Pre-emption." 21st Transportation Law Institute, pp. 83-95 and "The Impact of State Economic Regulation of Motor Carriage on Intrastate and Interstate Commerce," US Department of Transportation

Table 2 Summary of Parameter Estimates Taken from Estimating Earnings Equation for Drivers Employed in the for-hire and Private Carriage Sectors of the Trucking Industry.[a] (Twenty-four earnings equations are estimated for each observation year by trucking sector)

	For-Hire		Private Carriage	
	Pre-AIA	Post-AIA	Pre-AIA	Post-AIA
Variable[b]	(1983-1994)	(1995-2006)	(1983-1994)	(1995-2006)
Full-time	(.158***, .43***)	(.086, .28***)	(.155***, .316***)	(.129***, .421***)
Age	(.006, .03**)	(.037***, .05***)	(.023***, .05***)	(.032***, .0487***)
Age^2×1000	(-.08, -36***)	(-.39***, -.57***)	(-.23***, -.56***)	(-.34***, -.56***)
Married	(.030, .055***)	(.068***, .072***)	(.006, .09***)	(.006***, .08***)
High School	(.179**, .062)	(.17**, .31**)	(.052, .157***)	(.003, .12***)
College	(.034, .163**)	(.24**, .29***)	(.065, .18***)	(-.005, .199***)
Hours	(.021***, .027***)	(.018***, .02***)	(.024***, .035***)	(.028***, .037***)
Black	(-.092, .016)	(-.13, .02)	(-.125*, .167*)	(-.071, .16***)
White	(.03, .087)	(-.09. .156)	(-.059, .215**)	(-.89, .184**)
Female	(-.24***, .15)	(-.17*, .099**)	(-.298**, .062)	(-.27**, .12**)
SMSA	(-.029, .06*)	(.056*, .097*)	(.038, .11**)	(.0169, .308***)
US Region				
New Eng.	(-.158**, .04)	(-.017, -.066)	(-.038, -.30***)	(-.037, .008)
Mid. At.	(-.15***,-.17**)	(-.018, -.015)	(-.257**, -.078*)	(-.09, -.036)
East N.C.	(-.159**, -.103)	(-.22**, .07)	(-.235***, -.109**)	(-.17***, -.052)
West N.C.	(.017**, -.09***)	(-.16*,-.034)	(-.29***, -.212**)	(-.12**, -.10**)
South At.	(-.226***, -.20**)	(-.13, -.025)	(-.32***, -.17***)	(-.16**, .059)
East S.C.	(-.316***, -.09)	(-.278**, -.149)	(-.508***, -19**)	(-.268**, -.069)
West S.C.	(-.23**, -.177**)	(-.066, -.011)	(-.383***, -.28***)	(-.259**, -.14**)
Mountain	(-.18**, -.13)	(-.064, -.041)	(-.139**, -.086**)	(-.14**, -.09**)

[a] The range of the parameter estimates starting with the lowest to the highest value is presented in parentheses. Note that the log of weekly earnings is the dependent variable.

[b] A description of the dependent variables is presented in Appendix A.

[c] The benchmark comparison driver is a full-time, married, nonblack minority, male with less than a high school diploma living outside an SMSA in the Pacific region of the US.

***=significance at the 1 percent level, **= significance at the 5 percent level *=significance at 10 percent level.

Figure 1: For-Hire Union Premium for Strictly-Regulated States (percentages are estimated annually using equation 1)

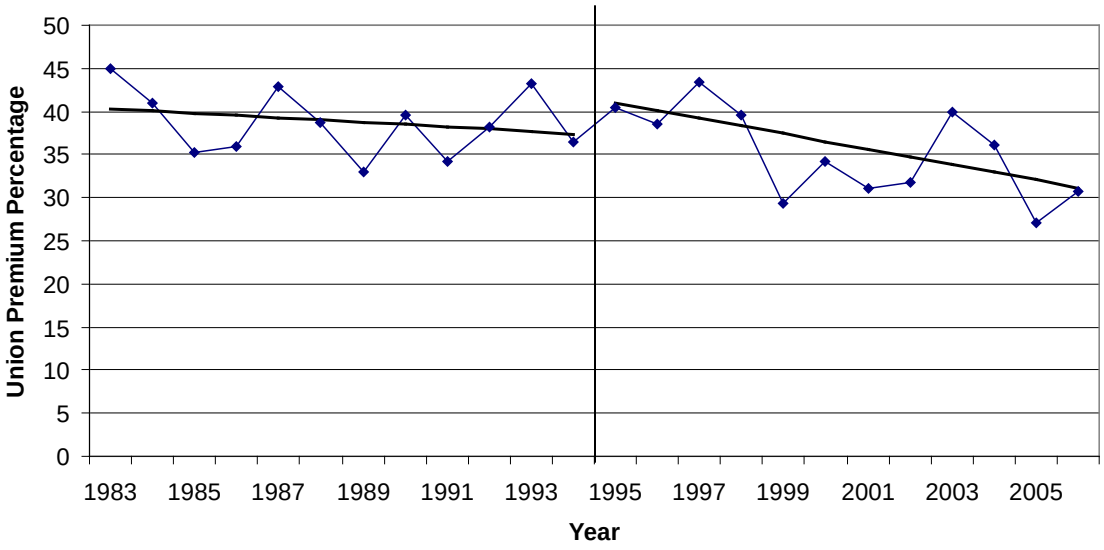

Figure 2: For-Hire Union Premium for Partly-Regulated States (percentages are estimated annually using equation 1)

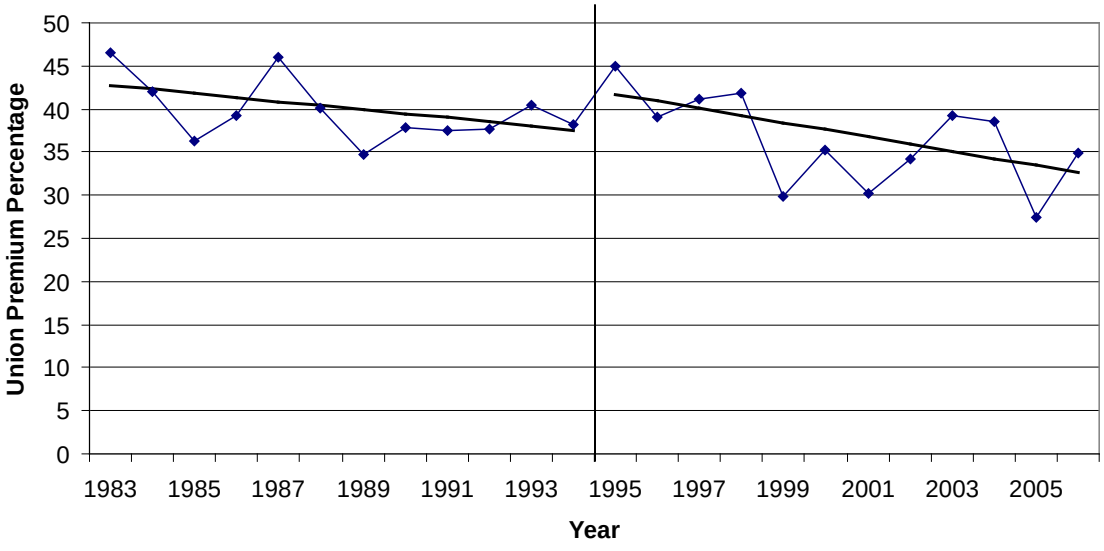

Figure 3: Private Carriage Union Premium for Strictly-Regulated States (percentages are estimated annually using equation 1)

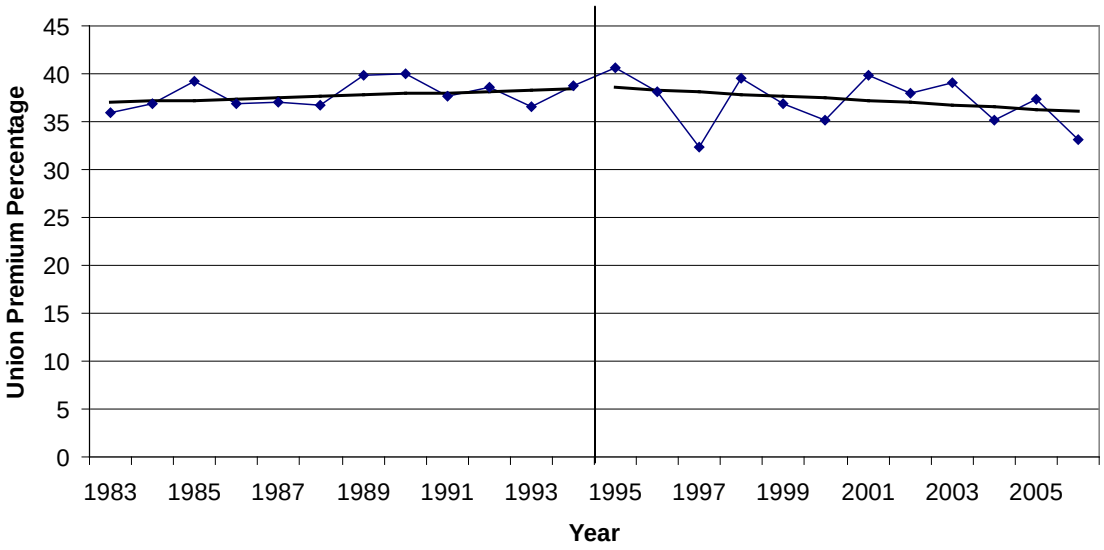

Figure 4: Private Carriage Union Premium for Partly-Regulated States (percentages are estimated annually using equation 1)

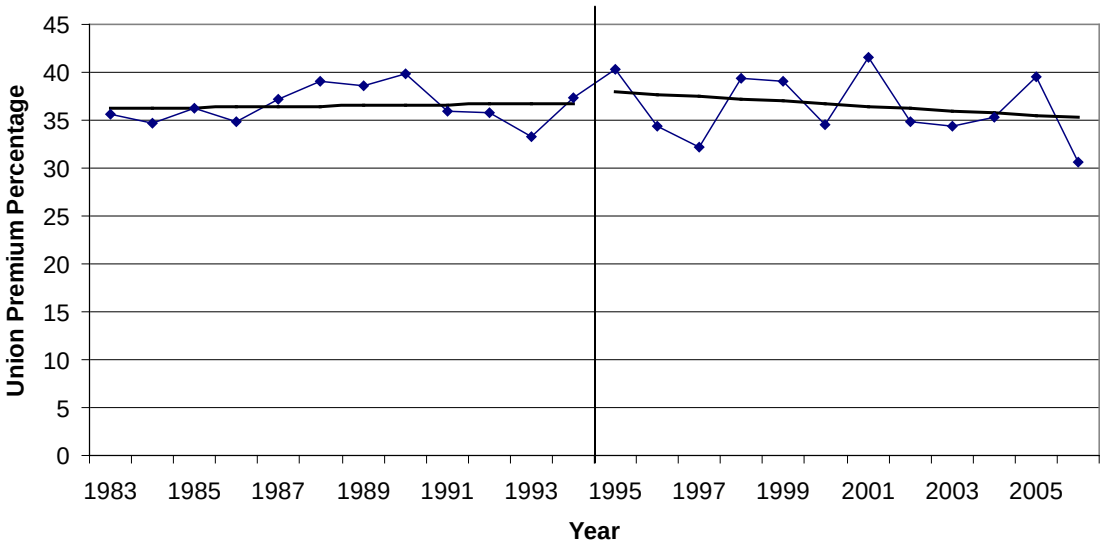

Figure 5: For-Hire Union Premium for Non-Regulated States (percentages are estimated annually using equation 1)

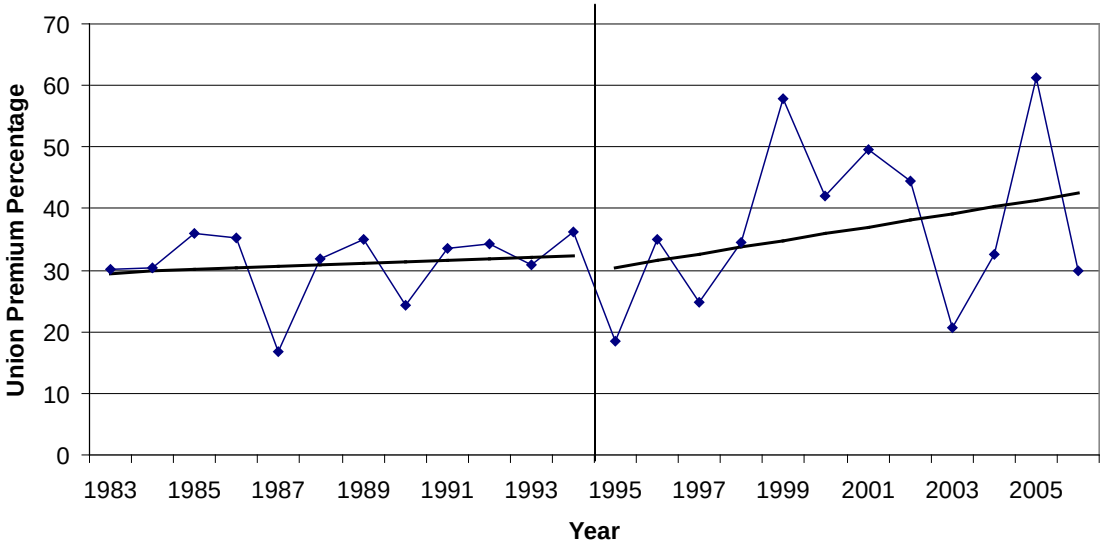

Figure 6: Private Carriage Union Premium for Non-Regulated States (percentages are estimated annually using equation 1)

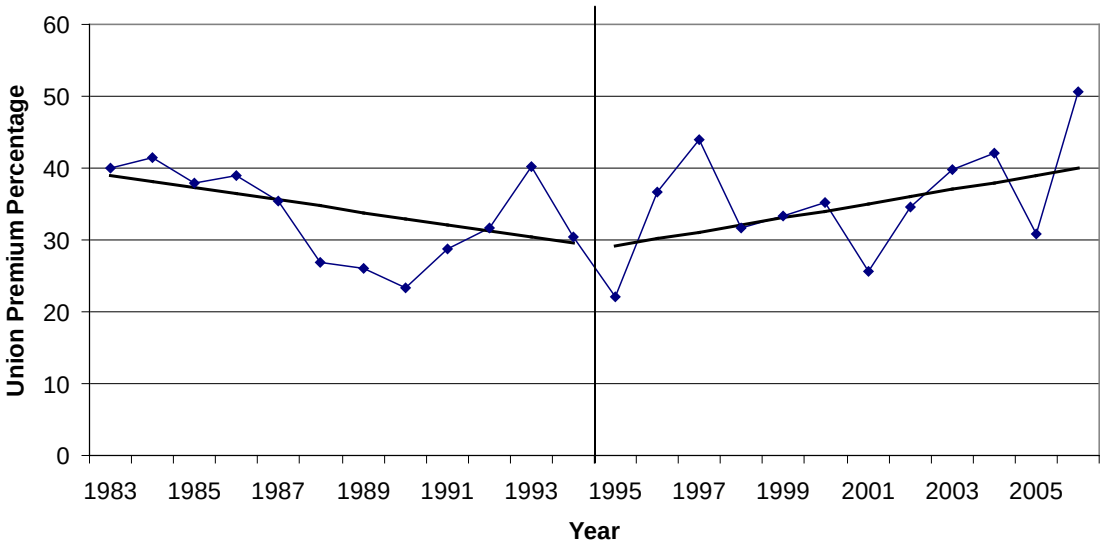

Table 3: Pension coverage results for key explanatory variables[a]
(Parameter estimates derived from estimating equation-2

	For-hire		Private Carriage	
Variables	Pre-AIA	Post-AIA	Pre-AIA	Post-AIA
Union	0.41***	0.44***	0.25***	0.33***
	(4.78)	(4.29)	(3.32)	(3.71)
Strict	-0.04	0.06	-0.10**	0.001
	(-0.62)	(1.09)	(-2.36)	(-0.05)
Partly	0.01	0.07	-0.03	0.03
	(0.17)	(1.17)	(-0.88)	(0.83)
Strictly×union	0.03	-0.06	0.22**	0.01
	(0.34)	(-0.47)	(2.55)	(0.11)
Partly×union	0.09	-0.15	0.14	-0.03
	(0.85)	(1.18)	(1.53)	(-0.28)

[a] Marginal effects on the probability of receiving an employer funded pension plan are listed as parameter estimates.
***=significance at the 1 percent level, **= significance at the 5 percent level.

References

Alexis, Marcus. "Commentary on Earnings and Employment in the Trucking: Deregulating an Naturally Competitive Environment. In *Regulatory Reform and Labor Markets*, edited by James Peoples. Norwell, Mass.: Kluwer Academic Publishers 1998, 113-124.

Hendrickson, Kevein, E. and Wesley W. Wilson, "Compensation, Unionization, and Deregulation in the Motor Carrier Industry," *Journal of Law and Economics*, 51 (February 2008): 153-77.

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

Hirsch, Barry T. "Trucking Deregulation and Labor Earnings: Is the Union Premium a Compensating Differential?" *Journal of Labor Economics* 11 (April 1993): 279-301.

Hirsch, Barry T. and David A. Macpherson. "Earnings and Employment in Trucking: Deregulating a Naturally Competitive Industry." In *Regulatory Reform and Labor Markets*, edited by James Peoples, Boston, Massachusetts: Kluwer Academic Publishers, 1998, 61-112.

Hirsch, Barry T. and Edward J. Schumacher. "Match Bias in Wage Gap Estimates due to Earnings Imputation," *Journal of Labor Economics*, 22 (2004): 689-722.

Lane L. Lee. "Intermodal Trends" An AAR/Intermodal Policy Division Report (1989).

Peoples, James H. "Industry Performance Following Reformation of Economic and Social Regulation in the Trucking Industry." In *Trucking in the Age of Information*, edited by Dale Belman and Chelsea White, Ashgate Publishing, 2005, 127-146.

Rose, Nancy L. "Labor Rent Sharing and Regulation: Evidence from the Trucking Industry." *Journal of Political Economy* 95 (December 1987): 1146-78.

Taylor, John, C. "Regulation of Trucking by the States," *Regulation*, 17: (1994).

Teske, Paul and Samuel Best and Michael Mintrom. "The Economic Theory of Regulation and Trucking Deregulation: Shifting to the State Level." *Public Choice* 79 (1994): 247-56.

Ying, John S. and Theodore Keeler. "Pricing in a Deregulated Environment: The Motor Carrier Experience," *RAND Journal of Economics*, 22 (1991): 264-73.

Appendix A: Description of Control Variables Presented in Table 2

Variable	Description
fulltime	Dummy variable indicates worker's full-time or part-time status, value equal to 1 for full-time
age	Worker's age in years
age X age	Worker's age squared
married	Dummy variable indicates worker's marital status, value equal to 1 for married workers
high	Dummy variable indicates worker's highest level of education, value of 1 for high school
college	Dummy variable indicates worker's highest level of education, value of 1 if some college education
hours	Worker's usual number of hours of work per week
black	Dummy variable indicates worker's race, value equal to 1 if a worker is black
white	Dummy variable indicates worker's race, value equal to 1 if a worker is white
female	Dummy variable indicates worker's sex, value equal to 1 for female
smsa	Dummy variable indicates worker's residence, value equal to 1 for workers living in a metropolitan area
neweng	Dummy variable indicates worker's geographical regional division, value equal to 1 indicates worker resides in New England Division
midat	Dummy variable indicates worker's geographical regional division, value equal to 1 indicates worker resides in Middle Atlantic Division
enc	Dummy variable indicates worker's geographical regional division, value equal to 1 indicates worker resides in East North Central Division
wnc	Dummy variable indicates worker's geographical regional division, value equal to 1 indicates worker resides in West North Central Division
satl	Dummy variable indicates worker's geographical regional division, value equal to 1 indicates worker resides in South Atlantic Division
esc	Dummy variable indicates worker's geographical regional division, value equal to 1 indicates worker resides in East South Central
wsc	Dummy variable indicates worker's geographical regional division, value equal to 1 indicates worker resides in West South Central Division
mount	Dummy variable indicates worker's geographical regional division, value equal to 1 indicates worker resides in Mountain Division