Duration of Non-Work Spells in the Workers' Compensation Insurance System: Unionized vs. Non-Unionized Workers

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Abstract

This paper analyzes the effect of unions on the duration of non-work spells of claimants in the workers' compensation insurance system. It has been argued that a union may affect the duration of non-work spells in two ways. First, a union may alter the true level of workplace safety and in turn affect both the frequency and severity of work-related injuries ('true safety' effect). Second, a union may influence workers' incentives to file claims or stay in the system for the longer non-work spell ('claims-reporting moral hazard' effect). This study analyzes 9,818 workers' compensation claims filed with the Minnesota Department of Labor and Industry for injuries that occurred in 1993 and 1994 in 873 sample firms included in the Minnesota Human Resource Management Practice (MHRMP) Survey. To correct for the right-censoring data problem, we use a maximum likelihood estimate of duration of non-work spells using the Weibull distribution. Empirical results show that being a union member is associated with a 19% increase in the duration of non-work spells. This means that on average, the non-work spells are approximately ten days longer for workers from unionized firms as compared to their non-unionized counterparts in the sample of this study.

Key Words: Union, Occupational Safety, Industrial Accident, Workers' Compensation
              Insurance System, Moral Hazard

Introduction

The purpose of this paper is to analyze what role unions play in affecting the duration of non-work spells in the workers' compensation system. In particular, this study focuses on the temporary total indemnity claims, where workers are temporarily forced to be out of work due to total physical impairment on the job[1]. Temporary total indemnity claims account for about 70 percent of all workers' compensation claims (Minnesota Department of Labor and Industry, 1995).

The duration of non-work spells in the workers' compensation system depends on both the severity of the impairment and the worker's incentives, for example introduced by the availability of disability benefits, to return to work. The presence of a union in the workplace may have effects on the duration of non-work spells in workers' compensation system in two ways. First, a union may alter the true level of workplace safety and in turn affect both the frequency and severity of work related injuries (i.e., 'true safety' effect), and second, a union may influence workers' incentives to file claims or stay in the system for a longer period of non-work spell (i.e., 'moral hazard' effect).

Literature Review and Hypotheses

In general, earlier studies analyzing non-work spells in the workers' compensation system find that higher benefits, lower wages, older age, and attorney involvement are associated with longer claim duration (i.e., less successful return-to-work outcomes). Evidence on the impact of unions on returns to work comes primarily from US studies using samples of temporary total disability claims. These studies find the longer work absences among unionized workers (Butler and Worrall, 1985, 1993; Johnson and Ondrich, 1990). Claim frequency also increases with union membership both in analyses using aggregate US

data (Butler and Worrall, 1983) and in disaggregated micro-data sets (Kruger, 1990; Hirsch, MacPherson and Dumon, 1996). Hirsch *et al.* (1996) conducted a study of claim recipiency using a union dummy variable among US workers using Current Population Survey data from 1977-1992. Their empirical results show that union members are much more likely to receive workers' compensation benefits than nonunion members with similar characteristics employed in similar jobs, and that union members are more sensitive to variations in benefits levels and waiting periods than nonunion members. Particularly, they argue that 'moral hazard' may be a more seious problem in unionized firms where management has less discretion and ability to monitor and penalize workers for questionable claims.

However, studies based on industry-level data may suffer from aggregation-bias problem, whereas studies using micro-data have analyzed only the incidence of the individual claims but not claim duration. Furthermore, union workers are more likely than nonunion workers to be in jobs with dangerous or unpleasant working conditions (Duncan and Stafford, 1980; Leigh, 1982; Worrall and Butler, 1983). Most previous studies focused on the industry-level analyses fail to control such industry or occupation variables to estimate the independent effect of union on safety outcome of the workplace.

The 'true safety' effect

The first way in which the presence of a union in the workplace may affect the duration of a workers' compensation claim through the 'true safety' effect: a union may alter workplaces safety conditions, and the incidence and severity of injuries will change, thus affecting the durations of workers' compensation indemnity claims.

How do unions affect workplace safety? The literature focuses mainly on unions' effects on compensating payments for hazardous work, generally finding that unionized firms maintain greater compensation for job hazards than nonunion settings (Thaler and Rosen,

1975; Viscusi, 1979,1980; Olson, 1981; Dickens, 1984; Fairris, 1992). The greater compensating-wage differential as a risk premium in unionized settings is due to improved information about workplace safety available to employees in the course of collective bargaining. An increase in the risk premium, in turn, will provide an incentive to firms to increase their investment in safety inputs because the marginal benefit of such an investment is, *ceteris paribus*, increased. Hence a union is expected to enhance workplace safety, unionized workers will experience less serious injuries, and therefore their injury-related non-work spells will be shorter than those of their non-unionized counterparts.

In addition, unions may provide a mechanism for workers to participate in decisions regarding the work environment, thereby increasing workers' level of job satisfaction. Workers who are more satisfied with their jobs use the disability system less often and for shorter spells of non-work than less satisfied workers (Robinson, 1988). In sum, based on the 'true safety' effect, we hypothesize that the presence of a union in the workplace will be associated with the shorter duration of non-work spells in the workers' compesation system.

The 'moral hazard' effect

Contrary to the 'true safety' effect, there are two reasons for expecting a positive association between union status and the duration of non-work spells in the workers' compensation system: 1) 'moral hazard' behavior on the claimant's (employee's) side, and 2) 'moral hazard' problem on the firm's side in the unionized workplace. Most important is the independent role of union voice in workplace governance (Freeman and Medoff, 1984), which may have two types of effects, both positive, on claim duration.

First, in the event of an injury, workers already who are not aware of the availability of workers' compensation benefits are quickly informed by co-workers, shop stewards, or supervisors. That is, unions encourage their members to file claims, or to continue to

maintain claimant status once a claim has begun by providing information and forms related to the workers' compensation system, and by providing legal counsel should problems arise in the claims process. The effect of such activities is to reduce discrepancies between true injuries and actual claims, discrepancies that could result from actions (or inactions) by firms interested in lowering the cost of claims.

Second, the behavior of workers in unionized workplaces may too be affected by reduced 'moral hazard' problem on the firm's side, if management has less discretion and ability to monitor and penalize workers for questionable claims. Managers are not likely to discourage legitimate claims for workers' compensation, since such actions would be known to the union and could provoke the filing of a grievance. Unions could reduce firm's moral-hazard problem, and thus increase claim duration. Individual workers are less likely to be penalized in the event that they file a false workers' compensation claim or stay longer period of non-work spells, due to union support. Hence claim duration will be, *ceteris paribus*, longer in unionized firms.

In sum, the 'true safety' and 'moral hazard' effects of unions on workers' compensation recipiency have opposite signs and the overall effect is therefore theoretically indeterminate and remains as an empirical question.

Data and Methodology

This study analyzes 9,818 workers' compensation claims filed with the Minnesota Department of Labor and Industry (DLI) for those injuries occurred in 1993 and 1994, which are matched against 873 sample firms of Minnesota Human Resource Management Practice (MHRMP) Survey data[2]. The Minnesota DLI's database has been constructed from 'first reports' of injuries filed in 1993 and 1994. The first report forms classify injury claims by

type of injury such as strain and laceration, and body part such as back and neck. Also, employee characteristics such as age, gender, and occupation, and employer's major industry and size are all available from this form. Information about union membership of the claimant employee comes from the MHRMP Survey.

We analyze the effect of union membership on the claim duration of workers' compensation temporary total indemnity cases controlling for wage, benefits, age, gender, attorney involvement, injury type, occupation, and industry. However, approximately 12 percent of observations consists of individual claimants who continue non-work spells with concomitant receipt of workers' compensation benefits. These continuing-status recipients, who have not yet completed their tenure on workers' compensation, are said to be right censored.

Right-censored observations represent a problem for the ordinary log-duration regression model, which is the procedure used in these sort of situations. If one excludes censored observations, one may be losing valuable information about the sample distribution, particularly since these observations may be right censored because they are the claims of those who have longer non-work spells; hence, discarding these observations is likely to result in a nonrepresentative sample, and could bias the results. On the other hand, including censored observations and applying ordinary-least-square regression techniques may result in biased estimates as a result of treating censored observations (incomplete spells) on the same basis as other observations (complete spells).

What one needs is a regression technique that controls for right censoring. We chose to use maximum likelihood estimate of duration using the Weibull distribution, and the following equation expresses the time that workers spend off work after the injury:

$$\ln (T_i) = \alpha_0 + \beta U_i + \gamma X_i + \varepsilon_i$$

where

i : individual claimant

T : spell of time from the day of the injury until the day of return to work

U : union membership status of the i th claimant

X : individual, firm, injury, and pecuniary characteristics of claimant i

ε : independent random disturbance, such that T is Weibull distributed

The control variables vector X includes claimant characteristics (age, gender, wage, occupation, and nature of injury), employment size of the claimant's company, and primary industry of the company. While control variables are added into the model in order to estimate the independent effect of union on the dependent variable, the industry and occupation dummy variables are of particular importance in that they may control for the possible inherent differences in the safety of work environment between unionized and non-unionized workplaces.

Empirical Results

In the sample of this study, 53 percent of total claims are filed by employees from unionized firms. This relatively large proportion is due to the fact that the larger companies in the sample are more likely to be unionized. About 18 percent of 873 sample firms are unionized. About 59 percent of the claimants in the sample are male and 34 percent of the total claims in the sample are back-related injuries. Manufacturing and wholesale/retail firms accounted for about 59 percent of the entire sample. Table 1 summarizes the definition and sample descriptive statistics of the variables included in the study.

Empirical results of this study show that the presence of an union in the workplace affects claimants' non-work spells in a statistically significant and positive manner. Employees from unionized workplaces showed significantly longer duration of off-work

spells. In all specifications being a union member was associated with 19 percent increase in the duration of non-work spells. Considering that the mean duration of non-work spells in the sample is 52 days, this means that, on average, workers from unionized firms had about 10 days longer duration of non-work spells as compared to their non-unionized counterparts. Table 2 summarizes the results of Weibull estimates of the duration of non-work spells using the LIFEREG procedure in Statistical Analysis System (SAS).

The union impact on the duration of non-work spells was hypothesized to have two opposing effects. First, the union was hypothesized to facilitate moral hazard behavior on the claimant's side as well as to produce firm moral hazard behavior, both tending to increase non-work spells. And since unionized workplaces are apparently more hazardous compared to their non-unionized counterparts, injuries may be more severe, leading to longer non-work spells.

Second, unions were hypothesized to improve safety, and therefore shorten the non-work spells. However, even after controlling for industry and occupation variables, the effects of the union on the duration of non-work spells is still positive and significant, which suggests that the union impact is due mainly to the moral hazard behavior. Whether the effect is due mainly to more false claims, or fewer inappropriate denials by firm, remains an open question.

Some control variables showed statistically significant coefficients in all specifications. Several of these may be interpreted in terms of opportunity costs of being away from work, which affect the claimant's incentive to stay in the system by not returning to work. Female workers (MALE) are shown to have longer duration of non-work spells, which suggests that the opportunity cost of not being at work may be less than that of male workers. It may be argued that male workers are more likely to be a bread-winner of the family and more likely to be a major source of the family income. The wage replacement rate

(LnRRATE) in the workers' compensation system also suggests the incentive effects due to the different levels of opportunity costs of staying away from work. It is obvious that a higher level of replacement rate will be associated with a lower cost of being away from work. Empirical results support this argument. Self-insured employers (SELF) may have greater financial incentive to monitor the high-cost claims and in turn will be negatively associated with the duration of non-work spells in the workers' compensation system. Empirical results indeed showed a negative effect of SELF but without the statistical significance. Older workers (LnAGE) wait longer before returning back to work, once they are injured. It is not surprising to note this result because older workers are more prone to more serious injuries and may take more time before they are fully recovered from the injury as compared to relatively younger workers.

Employment size (SIZE) is negatively associated with the length of time from injury to return-to-work. It could be argued that larger firms facilitate their injured workers' return-to- work through greater investment in various rehabilitation programs, and providing less strenuous jobs to returning workers. Larger firms may have greater incentives to promote such return-to-work programs because they are more likely to be experience-rated in the workers' compensation system, and therefore have an incentive in improving the safety of their workplaces. As noted earlier, a safer workplace is likely to be associated with less severe injuries, and thus shorter spells of non-work time.

Conclusion

The purpose of this study is to empirically test the impact of the presence of a union in a workplace on the duration of non-work spell in the workers' compensation system. Matched micro-level data between Minnesota Department of Labor and Industry's

administrative data base and the Minnesota Human Resource Management Practices Survey data for the period of 1993 and 1994 were analyzed. Results from estimating the Weibull duration model suggest that the presence of a union in the workplace significantly lengthens the duration of the claimant's staying off work.

In all empirical specifications, being a union member was associated with a 19 percent increase in the duration of non-work spells. Considering that the mean duration of non-work spells in the sample is 52 days, this means that, on average, workers from unionized firms had about 10 days longer duration of non-work spells as compared to their non-unionized counterparts.

We had two hypotheses concerning the possible impact of unionism on the duration of non-work spells in a positive manner. A union may support employees who seek to stay longer off work after an injury - an employee-side moral hazard issue. A union may also oppose management pressure for early return of an injured employee - such pressure is an employer-side moral hazard issue. Both tend to increase non-work spells. And since unionized workplaces are apparently more hazardous compared to their non-unionized counterparts, injuries may be more severe, also leading to longer non-work spells. However, even after controlling for industry and occupation variables, the effects of the union on the duration of non-work spells is still positive and significant, which suggests that the union impact is due mainly to the moral hazard behavior. However, whether the union effect on non-work spell duration is due mainly to more false claims (employee-side moral hazard), or fewer inappropriate denials by firms (employer-side moral hazard), remains an open question. This would be a possible challenging research question in the future study in this area, despite the difficulty of being able to actually screen out a claimant's moral hazard behavior in filing fraudulent claims in the workers' compensation system[3].

Table 1.
Variable Definitions and Descriptive Statistics: Matched Sample of MHRMP Survey Data and Minnesota Workers' Compensation Claims (1993-1994)

Variable	Definition	Mean	St. Dev.
Dependent Variable			
NWSPELL	Duration of non-work spell: days of temporary total disability benefits paid in the workers' compensation system[1]	52.16	100.75
Claimant Characteristics			
UNION	A dummy variable coded 1 if the claimant filed a workers' compensation claim in an unionized firm, 0 otherwise	0.53	0.50
MALE	A dummy variable coded 1 if the claimant is male, and 0 otherwise	0.59	0.49
LnAGE	Log of age of the claimant at the time of injury	3.60	0.32
LnRRATE	Log of wage replacement rate in the Minnesota workers' compensation system[2]	4.30	0.21
Type of Injury			
FRACTR	Dummy variable coded 1 for fractures, 0 otherwise	0.03	0.16
BKSTR	Dummy variable coded 1 for back strains or sprains, 0 otherwise	0.18	0.38
OTHSTR	Dummy variable coded 1 for strains or sprains involving other body parts than back, 0 otherwise	0.16	0.37
CONTUS	Dummy variable coded 1 for contusions or concussions, 0 otherwise	0.05	0.21
CUT	Dummy variable coded 1 for cuts and lacerations, 0 otherwise	0.07	0.25
ALLOTR	Dummy variable coded 1 for all other types of injuries, 0 otherwise	0.51	0.50
Occupation of the Claimant			
OCC1	Dummy variable coded 1 for the occupational group of service, 0 otherwise	0.12	0.33
OCC2	Dummy variable coded 1 for the occupational group of laborers, 0 otherwise	0.15	0.36
OCC3	Dummy variable coded 1 for the occupational group of crafts, 0 otherwise	0.16	0.37
OCC4	Dummy variable coded 1 for the occupational group of professional, managerial, sales, and technicians, 0 otherwise	0.20	0.40
OCC5	Dummy variable coded 1 for the occupational group of operators, 0 otherwise	0.27	0.45
OCC6	Dummy variable coded 1 for the occupational group of transportation, 0 otherwise	0.04	0.19
OCC7	Dummy variable coded 1 for the occupational group of clerical, 0 otherwise	0.08	0.28
OCC8	Dummy variable coded 1 for the occupational group of farm and others, 0 otherwise	0.01	0.04
Y94	Dummy variable coded 1 if the injury occurred in 1994, 0 otherwise	0.54	0.50

(Table 1 Continued)

Firm Characteristics			
SIZE1	Dummy variable coded 1 if firm size is 1-50 employees, 0 otherwise	0.07	0.26
SIZE2	Dummy variable coded 1 if firm size is 51-100 employees, 0 otherwise	0.07	0.26
SIZE3	Dummy variable coded 1 if firm size is 101-500 employees, 0 otherwise	0.35	0.48
SIZE4	Dummy variable coded 1 if firm size is 501-1,000 employees, 0 otherwise	0.12	0.33
SIZE5	Dummy variable coded 1 if firm size is 1,001 or more employees, 0 otherwise	0.39	0.49

Industry Groupings			
SIC1	Dummy variable coded 1 if the firm's major industry is mining or construction, 0 otherwise	0.04	0.19
SIC2	Dummy variable coded 1 if the firm's major industry is durable or non-durable manufacturing (lumber, furniture, food, tobacco, textile, apparel, paper, printing, chemical, petroleum, rubber, etc.), 0 otherwise	0.19	0.39
SIC3	Dummy variable coded 1 if the firm's major industry is durable or non-durable manufacturing (metal, industrial machinery, equipment, etc.), 0 otherwise	0.36	0.48
SIC4	Dummy variable coded 1 if the firm's major industry is transportation, 0 otherwise	0.04	0.19
SIC5	Dummy variable coded 1 if the firm's major industry is whole-sale/retail, 0 otherwise	0.23	0.42
SIC6	Dummy variable coded 1 if the firm's major industry is finance, insurance, or real estate, 0 otherwise	0.05	0.22
SIC7	Dummy variable coded 1 if the firm's major industry is service, 0 otherwise	0.04	0.20
SIC8	Dummy variable coded 1 if the firm's major industry is health, legal, education, social, or engineering services, 0 otherwise	0.05	0.22

1. The dependent variable NWSPELL is transformed into logarithmic form in the LIFEREG function of SAS.
2. Real wage replacement rate was used to capture both wage and expected workers' compensation benefit effects on the dependent variable. In accordance with the Minnesota Workers' Compensation law, RRATE was calculated by the following formula (Minnesota WC income benefit schedule used; 1992 Analysis of Workers' Compensation Laws, US Chamber of Commerce)

$$\text{RRATE} = \begin{cases} MAX_t / Wage & \text{if } (Wage \times 0.66) >= MAX_t \\ 0.66 & \text{if } [MIN_t <= (Wage \times 0.66) < MAX_t] \\ MIN_t / Wage & \text{if } [(MIN_t * 0.66) <= (Wage \times 0.66) < MIN_t] \\ 1 & \text{otherwise,} \end{cases}$$

where   Wage = average production employee's gross weekly wage
MAX_t = Maximum amount of wage replacement through Minnesota workers' compensation system, which was \$428.00 and \$443.00 in 1993 and 1994, respectively
MIN_t = Maximum amount of wage replacement through Minnesota workers' compensation system which was \$214.00 and \$221.50 in 1993 and 1994, respectively

Table 2. Weibull Estimate of the Duration of Non-Work Spells in the Workers' Compensation System : Minnesota 1993-1994 (Standard Error in Parentheses)

	Dependent Variable : Log of Non-Work Spell in the Minnesota Workers Compensation System		
	Model (1)	*Model (2)*	*Model (3)*
Constant	1.14*	0.65*	0.92*
	(0.62)	(0.64)	(0.64)
Union Status			
UNION	0.18***	0.19***	0.18***
	(0.06)	(0.06)	(0.06)
Claimant Characteristics			
MALE	-0.24***	-0.24***	-0.21***
	(0.05)	(0.06)	(0.06)
LnAGE	0.67***	0.73***	0.68***
	(0.08)	(0.08)	(0.08)
LnRRATE	0.26**	0.27**	0.27**
	(0.12)	(0.12)	(0.12)
SELF	-0.06	-0.03	-0.04
	(0.07)	(0.06)	(0.07)
Control Variables			
Y94	0.11**	0.13***	0.11**
	(0.02)	(0.05)	(0.05)
SIZE2	-0.02	0.00	-0.01
	(0.13)	(0.13)	(0.13)
SIZE3	-0.17*	-0.16	-0.18*
	(0.10)	(0.10)	(0.10)
SIZE4	-0.36***	-0.37***	-0.39***
	(0.12)	(0.12)	(0.12)
SIZE5	-0.30***	-0.29**	-0.32***
	(0.11)	(0.11)	(0.11)
Industry Dummies	yes	yes	yes
Injury Type Dummies	no	no	yes
Occupation Dummies	no	yes	yes
Log Likelihood for WEIBULL	-6724.27	-6742.77	-6718.79
n	3994	3994	3994

* Statistically significant at the 0.1 significance level; ** at the 0.05 significance level; *** at the 0.01 confidence level (two-tail tests).

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Notes

[1] There are four main types of indemnity benefits in workers' compensation insurance. First, 'temporary total' benefits are paid to workers who are totally unable to work for a finite period of time. Second, workers who have returned to work after the injury with a wage loss, receive indemnity benefits known as temporary partial benefits. Typically two-thirds of the difference between current gross wages and gross wages at time of the injury, with the yearly inflation adjustment beginning two years after injury, are paid. Third, if a worker remains totally disabled after reaching the point of maximum medical improvement, he or she is eligible for permanent total benefits. Fourth, workers who suffer a disability that is partially disabling but is expected to last indefinitely qualify for permanent partial benefits. An employee who lost the use of a limb, for example, would receive permanent partial benefits.

[2] The Minnesota Human Resource Management Practices (MHRMP) Survey has been conducted in 1994 and 1996. The sample firms are size-and industry-stratified. The survey questionnaire asked for detailed information on various aspects of firm's human resource management practices including firm's history of maintenance of employee participation plans in decision-making (e.g., teams, quality circle, total quality management, etc.) and employee participation plans in financial returns (e.g., employee stock ownership plan, gain-sharing plan, etc.), as well as basic firm characteristics such as employee characteristics (e.g., tenure, age, education, etc.), task attributes of core employees, and unionization of the workplace. For more information on MHRMP Survey see Park (1997).

[3] For notable studies which attempted to measure the claimants moral hazard behavior in the workers compensation system, refer to Card and McCall (1996) and Park and Butler (2001).