Relations industrielles
Industrial Relations

Union Impacts on the Receipt of Workers' Compensation Benefits

Ronald Meng and Douglas Smith

Volume 48, Number 3, 1993

URI: https://id.erudit.org/iderudit/050875ar
DOI: https://doi.org/10.7202/050875ar

See table of contents

Publisher(s)

Département des relations industrielles de l'Université Laval

ISSN

0034-379X (print)
1703-8138 (digital)

Explore this journal

Cite this article

Meng, R. & Smith, D. (1993). Union Impacts on the Receipt of Workers' Compensation Benefits. *Relations industrielles / Industrial Relations*, *48*(3), 503–518. https://doi.org/10.7202/050875ar

Article abstract

La convention collective et l'obligation d'accommodement selon l'arrêt Okanagan

Union Impacts on the Receipt of Workers' Compensation Benefits

Ronald Meng
and
Douglas Smith

This paper examines the relationship among union status, occupational injury rates and the probability of collecting workers' compensation benefits. The results indicate that union status and occupational injury rates have an especially significant effect on the probability of obtaining workers' compensation. This paper also explores the potential linkages between union occupational health and safety initiatives, actual injuries, reported injuries and the receipt of workers' compensation. The analysis suggests that the relationship between unionization, and occupational risk is complex and difficult to disentangle even with a detailed data set.

Recent research demonstrates that occupational fatality and non-fatal injury rates are higher in Canada than in most industrial nations (Digby and Riddell 1986; Marsollier and Stobert 1990). In a recent study, Meng (1991) shows that reported fatality rates by occupation are higher in Canada than those reported in comparable American studies (Leigh 1987).[1] This finding compares fatalities by occupation and thus removes the potential bias associated with different occupational mixes.

In spite of the substantial costs that result from industrial accidents in terms of impacts on injured individuals and lost production, there has been

* MENG, R., Associate Professor, Department of Economics,University of Windsor. SMITH, D., Professor, Department of Economics, Carleton University.

** The authors are indebted to SSHRC for partially funding this project.

1 While the data clearly indicate that occupational and industry fatality rates are much higher in Canada than in the U.S., it would be premature to conclude that safety standards are lower or risks are higher in Canada. The definition of what constitutes a job-related fatality may differ between the countries (Weiler 1983).

relatively little research on the determinants of accidents and accident benefits. Accident benefit claim data are important in carrying out research in this area because the available claim data are person-specific. Most other studies that focus on the risk of accidents use aggregated data on risk by industry or occupation. Clearly, the risks actually faced by individuals differ very substantially within industrial and occupational categories. The results reported here are a first step in studying risks using data that are specific to the individuals who find themselves exposed to different degrees of occupational risk. The use of disaggregated data also allows a more detailed look at union impacts on both risk and compensation for risk.

This study uses a large national data set to examine the probability of receiving workers' compensation. In particular, the paper examines the impact of collective agreement coverage on the receipt of workers' compensation benefits within a broader model that controls for other determinants of the receipt of these benefits. For a given accident rate, there are reasons to believe that union workers may have better access to the compensation system. We also examine whether or not individual characteristics, like age, education, and gender are more important predictors of the receipt of workers' compensation than occupational or industry characteristics, like firm size, work schedules, accident rates and industrial concentration.

The core results of this study are derived from a model of the probability of receiving workers' compensation. The statistical results focus on the determinants of injury claims and show the extent of systematic differences between individual and occupational or industry characteristics and injury claims. For instance, are older workers at greater risk or is the probability of accident claims higher in larger firms? The study results are presented in a way that makes them comparable to the U.S. findings in this area.

Overall, this paper has two purposes. The first objective is to provide Canadian estimates of the determinants of receiving workers' compensation within the kind of statistical model that is generally found in this literature. The second objective of the paper is to raise questions about the limitations of models of this kind given the nature of the available data on worker injuries and job risks. These data problems mean that even in well-specified models of the receipt of workers' compensation, there remain important ambiguities that are not always recognized.

PREVIOUS RESEARCH

A number of American studies have analyzed the correlation between individual characteristics and accidents. However, most studies are limited in scope and their results are only suggestive. Bennett and Passmore (1984), for instance, survey the accident and injury literature in the coal industry. They

examine the correlation between accidents and injuries and legislation, job experience, mine size, age of the workers, and other variables. The authors present an exhaustive survey of the literature but their results are unique to the coal industry.

Ferguson *et al.* (1984) provide an analysis of data that are based on accident claims. They deal with tabulations of personnel and occupation data from the U.S. Navy to determine the relationship between individual characteristics and accidents. They do not use any form of regression analysis so they are unable to determine the relative magnitude of a number of key independent variables. Given the specific nature of the individuals involved, it is not clear how generalizable these results are.

Leigh (1986) presents a more complete model for analyzing workers' compensation claims in the United States. In the study, Leigh sets out a model that examines the probability of being injured and receiving workers' compensation benefits. He assesses a number of possible reasons for qualifying for workers' compensation benefits in terms of human capital characteristics. Several regression equations were estimated using a logit estimation, with the dependent variable being one if the worker received workers' compensation during the year and zero otherwise.

Leigh's (1986) model of the incidence of workers' compensation claims is superior to a number of other studies in the field because it includes a wide range of personal characteristics as well as industry and occupational control variables. The only personal variables that are significant in determining workers' compensation benefits are prior health limitations, being a male and recent divorce. The first two coefficients for the above variables are positive and the latter is negative. Among the job related variables, persons who work overtime, or who are in operative, labourer or farming professions all have higher probabilities of collecting workers' compensation. Interestingly, in Leigh's results, wages, union membership and work experience are all insignificant. Greater job hazards as measured by industry injury rates also result in a higher probability of collecting workers' compensation.

While Leigh (1986) controls for a wide range of personal characteristics, his industry and occupational controls are quite limited. He uses aggregate industry injury rates, when the literature suggests that occupational injury rates are likely to be superior and the limitations of his data set mean that he is able to use only a limited number of industry and occupational control variables. It is clear that more detailed information on workers' industries and occupations would yield significant additional information.[2]

---

[2] One important variable that could influence the probability of collecting WC is the size of WC benefits. Some authors have argued that generous WC benefits encourage workers to apply for WC (Butler and Worrall 1983; Dionne *et al.* 1989). Unfortunately, we could not merge the nec-

MODEL AND DATA

In this paper, we use a logit model of the determinants of receiving workers' compensation (WC). The dependent variable is a (0,1) dichotomous variable for each individual in the sample. The form of the regression equation that we use is as follows:

$$WC = A + BX + C*COLLECT + D*INJURY + e \quad (1)$$

In this equation, WC is the dichotomous variable defined above, A is the constant term, X is a vector of regional, personal and job characteristics, COLLECT is a (0,1) variable denoting coverage by a union collective agreement, INJURY is a measure of occupational risk, B, C and D are regression coefficients and e is a random error term. In some of the extended models reported in this paper, we also use interaction terms involving union status and whether or not individuals report working in blue collar occupations.

A specific focus of this paper is on the union impact on the probability of collecting workers' compensation. This focus highlights the importance of a full model in which occupational injury rates and other factors influencing the receipt of workers' compensation are incorporated and controlled for. It is possible that union workers are exposed to greater risks, experience more injuries and therefore claim workers' compensation more frequently. In the model outlined above, C is the coefficient on the union coverage term. It is the partial derivative of the dependent variable with respect to union status and holds constant all the other regressors including the occupational injury rate. The coefficient C allows us to test the hypothesis that other things held equal including the extent of injuries, workers covered by union collective agreements are more likely to receive workers' compensation.

One hypothesis is that the greater effectiveness of union health and safety committees and the publicized union focus on occupational health and safety bargaining issues mean that union members have a greater probability of collecting workers' compensation. In addition, union administrative personnel are experienced in the procedures of the system and will be able to help in tailoring claims to increase the probability of success. The provision of these union services is covered through union dues as a way of resolving the problem that would be faced in a non-union setting of paying for the provision of public goods. Of course, this is a partial effect — it holds the level of risk constant but this is clearly also a variable about which unions negotiate directly.

---

essary data needed to construct such a variable because of the limitations of the Labour Market Activity Survey data base.

All the data to test this model with the exception of the risk and industry concentration variables were derived from the Labour Market Activity Survey (LMAS) of Statistics Canada. The LMAS is a large national panel data set for 1986-1987. The data are weighted to represent the national population. Individuals in the sample were interviewed every month for two years in order to keep an accurate account of their activities.

The specific sample used in this study is restricted to self-reported heads of households who worked over 500 hours in 1986. Further, only individuals between the ages of twenty and sixty-four years who were paid employees and not full-time students are included in the sample. Data restrictions described in more detail below limited the sample to workers in Logging, Mining and Manufacturing outside Québec. The final sample size in the data set we use contains 3,464 observations.

Workers are included in the sample only if they are employed in the three industries listed above because industry characteristics are not available for all sectors of the economy. In particular, industrial concentration ratios (a measure of monopoly power) are only available from Statistics Canada in unpublished form for these three industries.

Québec workers are excluded from this sample because of data limitations. The LMAS data base lists 49 occupations. Two sets of injury rates were merged with the occupational codes. The first variable (INJURY) measures the injury rate for each occupation.[3] The second injury variable (SEV) measures the severe injury rate for each of the 49 occupations. A severe injury is defined as the total number of injuries that fall under one of the following categories: amputation or enucleation, asphyxia, strangulation, concussion, electrocution, fracture, multiple injuries, chemical burn, systematic poisoning, silicosis, pneumoconiosis, and radiation effects.[4]

The injury data were also obtained from Statistics Canada. Unfortunately, the province of Québec does not send detailed information to Statistics Canada on source of injury. In other words, it is not possible to obtain a severe injury rate for the Québec population and this explains the exclusion in our data.

The dependent variable shown in the regression equation above is a binary variable equal to one if the individual received WC in 1987 and zero

---

3 The injury variables were obtained from Statistics Canada's National Work Injury Data base. Statistics Canada obtains its data from the Provincial Workers' Compensation Boards. To be included in the data base an individual must suffer from a time-loss injury or illness and be compensated for a loss in wages following the accident or discovery of a disease.

4 Both of the risk variables were deflated by persons' years worked in each occupation in order to obtain the two rates. Martinello and Meng (1992) and Dionne *et al.* (1989) discuss this classification in more detail.

otherwise. Individual and industry characteristics for our sample of workers in 1987 are regressed on this binary variable. If workers did not receive workers' compensation in 1986 but did receive it in 1987, the variable for WC benefits equals one; otherwise it is zero. Since our data set does not show what workers did in 1985, we eliminated from the sample all those individuals who collected WC in 1986. This final restriction on the data eliminates potential simultaneity bias because workers who did collect WC in 1986 might have done so because of work related problems they experienced in 1985.

RESULTS

The variables used in this analysis are all listed in Table 1. The regression models control for a large number of regional, personal, occupational and industrial characteristics as well as for union status and injury rates. Among these sets of variables, we control for region, age, education, gender, marital status, as well as whether a worker is a member of a visible minority group or an immigrant. We also control for weeks and hours worked in a year and whether or not the worker is covered by a collective agreement. Besides controlling for industry and occupation we include industrial concentration ratios and firm size.[5]

The logistic regression estimates are presented in Table 2. As indicated in all six equations, workers covered by union agreements have a much higher probability of collecting workers' compensation. This is a highly significant effect that is robust with regard to alternative specifications of the model. Note that this effect is significant in a model that specifically controls for injury rates so that the implication is that unions are more effective in assisting workers in collecting WC when injured.

Equations (2) through (6) in Table 2 explore the union effect, the type of risk and the occupational effect in more detail through the use of a series of interaction variables and more specific risk indicators. Specifically, we include occupational risk variables in all six equations. The first and third equations include only the injury variables. Equations (2) and (4) also contain a union interaction term (union times risk), while the last two equations include blue-collar interaction terms.[6]

---

5 The four-firm concentration ratio (CR4) and firm size are included in the analysis to capture any size affects in obtaining WC. In larger firms, for instance, we are more likely to see health and safety committees. It may be easier to obtain WC benefits when information about workers' rights is made available. The same is true for more concentrated industries.

6 This figure was obtained by examining the partial derivative:

$$\frac{\partial WC}{\partial X_i} = \pounds_i (P(1-P)),$$

where P is the sample mean of WC, and $\pounds_i$ is the coefficient for the i-th variable.

TABLE 1

Variable Definitions and Means

Variable Name	*Description*	*Mean*
WCB	Collected Workers' Compensation Benefits in 1987	0.041
EARN	1986 Earnings from Employment (100)	279.73
Region:		
ATL*	Atlantic Provinces	0.08
ONT	Ontario	0.64
PRA	Prairie Provinces	0.15
BC	British Columbia	0.13
Age:		
AGE 20*	20-24 years	0.08
AGE 25	25-34 years	0.33
AGE 35	35-44 years	0.30
AGE 45	45-54 years	0.18
AGE 55	55-64 years	0.12
MINORITY	Visible Minority	0.08
IMMIG	Born Outside Canada	0.27
MALE	Male	0.89
MARRIED	Married (Spouse Present)	0.78
Education:		
PUBS*	None or Elementary School	0.13
HIGHS	Some or Completed High School	0.52
POSTSEC	Some Post-Secondary	0.08
DIPLOMA	Post-Secondary Diploma	0.15
UNIV	University Degree	0.12
TENURE	Weeks of Work on the Job	482.3
COLLECT	Covered by a Collective Agreement	0.46
TOTHR	Total Hours Worked in 1986	2010.9
TOTJB	Total Number of Jobs in 1986	1.33
WKUNEM	Weeks Unemployed in 1986	2.10
CR4	Four-Firm Concentration Ratio	52.1
Industry:		
FOREST	Forestry	0.04
MINE	Mining	0.10
DURABLE	Durable Manufacturing	0.72
NONDUR*	Non-Durable Manufacturing	0.14

TABLE 1 (Ctnd.)

Variable Definitions and Means

Variable Name	*Description*	*Mean*
Occupation:		
OFFICE*	Management or Office Workers	0.31
SERVICE	Service Occupations	0.02
RESOURCE	Resource Occupations	0.06
PROCESS	Processing Occupations	0.40
MECHANIC	Repairing Occupation	0.10
MOTOR	Transport or Equipment Operators	0.11
REGULAR	Works Regular Hours	0.95
Firm Size:		
FIRM 19*	1-19 workers	0.12
FIRM 99	20-99 workers	0.20
FIRM 499	100-499 workers	0.19
FIRM 500	500 + workers	0.49
INJURY	Number of Accepted Time-Loss Occupational Injuries per 1,000 Person Years Worked	76.0
COLINJ	Collect × Injury	42.6
SEV	Number of Accepted Severe Time Loss Occupational Injuries per 1,000 Person Years Worked	7.51
COLSEV	Collect × SEV	4.16
BLINJ	Blue Collar × Injury	72.0
BLSEV	Blue Collar × SEV	5.99

* Reference group in regression equations.

TABLE 2

The Determinants of WC Benefits*
(Logit Estimates)

Independent Variable	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
EARN	-0.0996	-0.0999	-0.0987	-0.1001	-0.0997	-0.0987
	(3.80)	(3.81)	(3.77)	(3.79)	(3.81)	(3.77)
ONT	-0.0286	-0.0275	-0.0207	-0.0200	-0.0290	-0.0212
	(0.09)	(0.08)	(0.07)	(0.06)	(0.09)	(0.69)
PRA	-0.4230	-0.4144	-0.4249	-0.4155	-0.4245	-0.4258
	(1.07)	(1.05)	(1.07)	(1.05)	(1.07)	(1.08)
BC	0.2044	0.2157	0.2122	0.2554	0.2008	0.2094
	(0.55)	(0.58)	(0.57)	(0.68)	(0.54)	(0.56)
AGE25	-0.4786	-0.4888	-0.4829	-0.4700	-0.4773	-0.4817
	(0.36)	(1.39)	(1.37)	(1.33)	(1.36)	(1.37)
AGE35	-0.5371	-0.5448	-0.5382	-0.5234	-0.5355	-0.5372
	(1.41)	(1.43)	(1.42)	(1.37)	(1.41)	(1.41)
AGE45	-0.4239	-0.4482	-0.4095	-0.4098	-0.4223	-0.4088
	(1.02)	(1.07)	(0.98)	(0.98)	(1.01)	(0.98)
AGE55	0.0689	0.0699	0.0835	0.1070	0.0710	0.0841
	(0.16)	(0.16)	(0.19)	(0.25)	(0.16)	(0.19)
MINORITY	-0.4696	-0.5169	-0.5125	-0.6202	-0.4625	-0.5071
	(1.26)	(1.38)	(1.37)	(1.62)	(1.24)	(1.36)
IMMIG	0.4921	0.4725	0.5036	0.4914	0.4926	0.5038
	(2.18)	(2.09)	(2.23)	(2.18)	(2.18)	(2.23)
MALE	1.5380	1.4753	1.5437	1.4325	1.5436	1.5490
	(2.37)	(2.19)	(2.36)	(2.12)	(2.30)	(2.31)
MARRIED	0.7060	0.7263	0.7137	0.7375	0.7069	0.7048
	(2.37)	(2.43)	(2.36)	(2.45)	(2.37)	(2.36)
HIGHS	0.3120	0.3140	0.3122	0.2918	0.3131	0.3127
	(1.37)	(1.21)	(1.20)	(1.13)	(1.21)	(1.21)
POSTSEC	0.5284	0.5467	0.5492	0.5571	0.5252	0.5459
	(1.37)	(1.42)	(1.43)	(1.46)	(1.36)	(1.42)
DIPLOMA	0.2160	0.2084	0.2161	0.1987	0.2113	0.2131
	(0.60)	(0.58)	(0.60)	(0.55)	(0.59)	(0.59)
UNIV	-0.7152	-0.6450	-0.6987	-0.6447	-0.7392	-0.7155
	(0.97)	(0.87)	(0.94)	(0.87)	(1.00)	(0.96)
TENURE	-0.0004	-0.0004	-0.0004	-0.0004	-0.0004	-0.0004
	(1.63)	(1.63)	(1.68)	(1.76)	(1.65)	(1.69)
COLLECT	0.7607	1.1555	0.7375	1.3437	0.7656	0.7415
	(3.40)	(3.21)	(3.29)	(3.69)	(3.42)	(3.30)
TOTHR	-0.0003	-0.0002	-0.0002	-0.0003	-0.0003	-0.0002
	(1.11)	(1.09)	(1.09)	(1.07)	(1.11)	(1.09)
TOTJB	-0.3163	-0.3222	-0.3174	-0.3168	-0.3156	-0.3170
	(1.97)	(2.00)	(1.97)	(1.97)	(1.97)	(1.97)

TABLE 2 (Ctnd.)

The Determinants of WC Benefits*
(Logit Estimates)

Independent Variable	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
WKUNEM	-0.0060	-0.0053	-0.0064	-0.0069	-0.0061	-0.0064
	(0.39)	(0.35)	(0.42)	(0.45)	(0.40)	(0.42)
CR4	0.0019	0.0023	0.0024	0.0027	0.0019	0.0024
	(0.38)	(0.46)	(0.48)	(0.55)	(0.39)	(0.48)
FOREST	-0.5961	-0.6104	-0.6072	-0.7187	-0.5918	-0.6020
	(1.04)	(1.06)	(1.06)	(1.24)	(1.03)	(1.05)
MINE	0.1213	0.0979	-0.0258	-0.0429	0.1207	-0.0213
	(0.28)	(0.23)	(0.06)	(0.10)	(0.28)	(0.05)
DURABLE	-0.2973	-0.3217	-0.3816	-0.4208	-0.2973	-0.3792
	(1.13)	(1.21)	(1.43)	(1.57)	(1.13)	(1.41)
SERVICE	-0.2919	-0.3909	-0.2548	-0.4162	-0.1156	-0.0979
	(0.30)	(0.40)	(0.27)	(0.43)	(0.12)	(0.10)
RESOURCE	1.3998	1.3059	0.9936	0.7820	1.3444	0.9516
	(2.75)	(2.55)	(1.81)	(1.41)	(2.61)	(1.70)
PROCESS	0.4064	0.3088	0.4581	0.2884	0.3551	0.4108
	(1.08)	(0.81)	(1.25)	(0.78)	(0.91)	(1.09)
MECHANIC	1.0838	0.9841	1.0470	0.8845	1.0254	0.9959
	(2.76)	(2.48)	(2.66)	(2.22)	(2.58)	(2.50)
MOTOR	-0.3965	-0.4783	-0.3931	-0.5411	-0.4509	-0.4418
	(0.83)	(0.99)	(0.82)	(1.13)	(0.93)	(0.92)
REGULAR	-0.4739	-0.4731	-0.4677	-0.4696	-0.4762	-0.4695
	(1.23)	(1.22)	(1.21)	(1.21)	(1.23)	(1.22)
FIRM99	0.2736	0.2824	0.2503	0.2749	0.2741	0.2510
	(0.81)	(0.84)	(0.74)	(0.81)	(0.81)	(0.74)
FIRM499	0.1993	0.2241	0.1936	0.2462	0.1980	0.1929
	(0.55)	(0.62)	(0.53)	(0.67)	(0.55)	(0.53)
FIRM500	0.2111	0.2316	0.2136	0.2584	0.2079	0.2117
	(0.60)	(0.65)	(0.60)	(0.72)	(0.59)	(0.60)
INJURY	0.0040	0.0063				
	(3.03)	(3.08)				
COLINJ		-0.0033				
		(1.43)				
SEV			0.0418	0.0770		
			(3.20)	(3.74)		
COLSEV				-0.0489		
				(2.19)		
BLINJ					0.0039	
					(2.92)	
BLSEV						0.0409
						(3.12)
Constant	-3.6582	-3.8007	-3.6291	-3.8407	-3.5953	-3.5758
	(3.46)	(3.59)	(3.43)	(3.63)	(3.40)	(3.38)
-2ln (likelihood ratio)	1039.5	1037.4	1038.7	1033.8	1040.08	1039.1

* Asymptotic t-statistics in brackets.

The results for the risk variables indicate that when there is an increased probability of injury on the job, there is a greater probability of collecting workers' compensation. While both injury variables (INJURY, SEV) influence the probability of collecting workers' compensation, severe injuries are particularly significant. The blue-collar interaction variables (BLINJ and BLSEV) indicate that blue-collar workers are at greater risk than white-collar workers. The former have a higher probability of collecting WC benefits than white-collar workers for a given level of measured risk in our data set.

The union interaction terms are harder to interpret. As described above, unionized workers have a much higher probability of collecting workers' compensation. In equations (2) and (4), for instance, workers covered by a union agreement have a 7.8 percent and 9.6 percent greater chance of collecting workers' compensation than do non-unionized workers.[7] This result could occur for several reasons. First, unionized jobs may be more dangerous than non-unionized jobs (Duncan and Stafford 1980; Leigh 1982). Second, unions could over-report the risk their members face or non-unionized workers under report their risks (Olson 1981). Either possibility is consistent with a higher probability of collecting WC benefits for union members.

The coefficients for the union interaction terms are negative, and in the case of the union interaction term with severity (COLSEV), this variable is significant at the five percent level. One possible explanation is that as serious occupational risks increase the differences between union and non-union workers in their ability to obtain WC diminishes. Since union workers consistently have a higher probability of obtaining workers' compensation than non-union workers, there are intercept differences between the two groups. However, as serious risks increase these differences are not as great. This is especially true for severe accidents that would require a great deal of medical attention and are more easily observable. This supports the hypothesis of positive union impacts since union expertise in dealing with the workers' compensation system would be most relevant in more marginal cases.

When examining how individual characteristics affect the receipt of workers' compensation, it is interesting to note that the coefficient for annual earnings from employment is negative and highly significant. This result is contrary to other findings (Leigh 1986). Equation (1) indicates that for a one percent increase in earnings there is a 0.4 percent decrease in the probability

[7] The interaction terms are included to see if particular groups, like unionized or blue-collar workers, differ from a certain reference group. In the latter case, for instance, the coefficients for BLINJ and BLSEV indicate whether or not blue-collar workers have a higher probability of collecting WC.

of collecting workers' compensation.[8] Note again that this effect is observed in an equation in which exposure to risk is held constant. One interpretation of this result is that workers with higher incomes have a lower replacement rate through WC and that this may affect the actual injury rate as well as the probability of actually collecting WC while injured.

THE PROBLEM OF UNOBSERVABLES

In all of the results described above, we explore the relationship between receiving WC benefits and a series of independent variables including the degree of risk. That is, we try to hold constant the degree of risk when other determinants of workers' compensation are measured. However, in all studies of this kind, risk is imperfectly measured. That is, risk rates are measured for industrial categories, occupational categories or both. It is possible, however, that the actual risk exposure of specific workers or groups of workers may not be accurately captured by these variables.

Consider as examples the earnings and union effects reported for Table 2. Controlling for risk, individuals with higher earnings have a lower probability of receiving workers' compensation. However, without knowing the specific identities of injured individuals, it is impossible to know whether this reflects behaviour differences or differences in injuries within occupational categories for which we measure injury rates. It is possible and even likely that within many occupational categories, workers with higher earnings are exposed to fewer risks on the job (Garen 1988). Similarly in the case of workers covered by collective agreements, unions may be expected to bargain for greater protection on the job so that even when occupational risk is held constant, there may be important unmeasured differences between union and non-union workers in risks actually faced within each occupational category.

The implication of the existence of unmeasured differences in the risk exposure of workers is that estimates based on databases with broad risk categories measured must be interpreted with care. The pressing research need in this area is for more disaggregated data on the risk exposure of groups of workers within occupational categories in terms of variables such as union status and earnings level. In the absence of such data, the alternative explanation for our findings is that they reflect systematic but unmeasured differences in risk rather than the effects that are apparently being measured.

---

8 The effect of a change in an independent dichotomous variable is interpreted as

$$\Delta P_i = (1+e^{-X'\beta-\beta i})^{-1} - P,$$

where ΔP_i is the change in the probability of collecting WC and $X'£$ is the vector of explanatory variables and their coefficients. See Gunderson, *et al.* (1986) for more details.

CONCLUSION

This study uses the LMAS data base to examine the probability of collecting workers' compensation. Special attention is paid to analyzing four different categories of independent variables as key predictors of the probability of obtaining workers' compensation. First, the results for individual characteristics indicate that low wage earners, immigrants, males and married people have a much higher probability of collecting workers' compensation than other workers. Second, control variables for industrial concentration, firm size, and the various industry sectors indicate that these factors do not have a major influence on the probability of collecting workers' compensation. Third, the labour market variables, like job tenure, the number of different jobs held, and especially union status, all appear to influence the dependent variable. Finally, occupational risk has a very significant effect on the probability of collecting workers' compensation. Occupational injuries, and especially severe injuries, have a positive and significant influence on the probability of obtaining workers' compensation.

In terms of the focus of this paper, the major result deals with the impact of collective bargaining coverage on the probability of receiving workers' compensation. As we hypothesize, workers who are represented by trade unions appear to have a higher probability of receiving compensation for injuries even when a wide range of other variables including job risks are held constant. The finding of more workers' compensation claims for lower wage workers may be related to a higher replacement rate of previous earnings for these individuals. Immigrants have more frequent claims possibly because they face more actual risk in a given job situation because they do not fully understand safety regulations and warnings.

The other contribution of this paper is that it highlights the existence of important measurement problems that complicate the task of exploring the relationship between receiving workers' compensation and its determinants. This problem is important not only for the analysis of issues relating to workers' compensation but for the entire research area of compensating wage differentials for exposure to job risks. Future research in this area should focus on more disaggregated risk impacts although we recognize that there are important data limitations in pursuing work of this kind.

REFERENCES

BENNETT, J. D., and D. L. PASSMORE. 1984. "Correlates of Coal Mine Accidents and Injuries: A Literature Review." *Accident Analysis and Prevention*, Vol. 16, No. 1, 37-45.

BUTLER, R. J., and J. D. WORRALL. 1983. "Workers' Compensation : Benefit and Injury Claim Rates in the Seventies." *Review of Economics and Statistics*, Vol. 65, Nov., 580-589.

DIGBY, C., and W. C. RIDDELL. 1986. "Occupational Health and Safety in Canada." *Canadian Labour Relations*. W. C. Riddell, ed. Toronto : University of Toronto, 285-320.

DIONNE, G., P. St. MICHEL, and C. VANASSE. 1989. "Moral Hazard, Optimal Auditing and Workers' Compensation." University de Montréal, Working Paper No. 8941.

DUNCAN, G., and F. STAFFORD. 1980. "Do Union Members Receive Compensating Wage Differentials." *American Economic Review*, Vol. 70, June, 355-371.

FERGUSON, J. C., M. S. MCNALLY, and R. F. BOOTH. 1984. "Individual Characteristics as Predictors of Accidental Injuries in Naval Personnel." *Accident Analysis and Prevention*, Vol. 16, No. 1, 55-62.

GAREN, J. 1988. "Compensating Differentials and the Endogeneity of Job Riskiness." *Review of Economics and Statistics*, Vol. 70, 9-16.

GUNDERSON, M., J. KERVIN, and F. REID. 1986. "Logit Estimates of Strike Incidence from Canadian Contract Data." *Journal of Labor Economics*, Vol. 4, April, 257-276.

LEIGH, J. P. 1982. "Are Unionized Blue Collar Jobs More Hazardous than Nonunionized Blue Collar Jobs ?" *Journal of Labour Research*, Vol. 3, Summer, 349-357.

LEIGH, J. P. 1986. "Individual and Job Characteristics as Predictors of Industrial Accidents." *Accident Analysis and Prevention*, Vol. 18, No. 3, 209-216.

LEIGH, J. P. 1987. "Estimates of the Probability of Job-Related Death in 347 Occupations." *Journal of Occupational Medicine*, Vol. 29, June, 510-519.

MARSOLLIER, E., and I. STOBERT. 1990. "Fatal Accidents in the Workplace in Canada — 1979-1988." Labour Canada, Discussion Paper No. 6.

MARTINELLO, F., and R. MENG. 1992. "Workplace Risks and the Value of Hazard Avoidance." *Canadian Journal of Economics*, Vol. 25, No. 2, 333-345.

MENG, R. 1991. "How Dangerous is Work in Canada ? Estimates of Job-Related Fatalities in 482 Occupations." *Journal of Occupational Medicine*, Vol. 33, No. 10, 1084-1090.

OLSON, C. A. 1981. "An Analysis of Wage Differentials Received by Workers on Dangerous Jobs." *Journal of Human Resources*, Vol. 16, No. 2, 167-185.

WEILER, P. 1983. *Protecting the Worker from Disability : Challenges for the Eighties*. Toronto : Government of Ontario.

Les syndicats et l'indemnisation des accidents du travail

Des études récentes montrent que les taux d'accident du travail sont plus élevés au Canada que dans la plupart des autres pays industrialisés. Ce fait demeure même en

désagrégeant les données pour éliminer le biais découlant de différentes combinaisons occupationnelles. Cette recherche vise à examiner la relation entre le statut syndical, les accidents du travail et l'indemnisation des accidents du travail, en utilisant un grand ensemble de données canadiennes.

Le nombre de recherches antérieures dans ce domaine est limité. Certaines études existent aux États-Unis, mais elles sont restreintes à des secteurs particuliers ou sont limitées par la disponibilité des données. Les données utilisées proviennent de l'Enquête sur le marché du travail 1986-87 de Statistique Canada. Ces données permettront potentiellement d'isoler encore plus les différences entre industries et occupations que cela put être le cas dans d'autres études. Notre modèle statistique est basé sur 3 465 observations portant sur des travailleurs de la forêt, des mines et du secteur manufacturier hors Québec où les données requises n'étaient pas disponibles.

La variable dépendante de notre analyse de régression est dichotomique (0, 1) pour chaque individu dans l'échantillon selon qu'il a reçu ou non en 1987 des prestations d'accidents du travail. Les variables indépendantes clefs sont le statut syndical de l'individu, une mesure du risque d'accident spécifique à chaque occupation et un vecteur de caractéristiques personnelles, régionales et de travail.

Même si cette étude se penche sur un ensemble de facteurs influençant l'indemnisation des travailleurs victimes d'accidents du travail, l'intérêt premier vise l'impact du syndicat. Ainsi est dénoté l'importance de développer un modèle complet d'indemnisation d'accidents du travail dans lequel les taux occupationnels d'accidents et d'autres facteurs sont incorporés et contrôlés. Il est possible que les travailleurs syndiqués soient exposés à de plus grands risques, qu'ils se blessent plus et, partant, qu'ils réclament plus souvent des prestations d'accident du travail. L'inclusion d'un ensemble complet de variables indépendantes signifie que l'on peut vérifier l'hypothèse que, toutes choses étant égales par ailleurs, incluant l'étendue des blessures, les travailleurs assujettis à une convention collective sont plus susceptibles de recevoir des prestations d'accident du travail.

Les résultats de notre analyse de régression montre que les travailleurs régis par une convention collective sont plus susceptibles de recevoir des prestations d'accident du travail. Cette relation est hautement significative et demeure à travers une variété de différents modèles de spécifications. Cet effet syndical est significatif dans un modèle qui contrôle spécifiquement le taux d'accidents. La conclusion est donc que les syndicats sont plus efficaces à aider les travailleurs à être indemnisés lorsque blessés.

Eu égard à la relation entre les caractéristiques personnelles et la réception de prestations d'accidents du travail, il est intéressant de noter que le coefficient de régression pour les revenus d'emploi annuels est négatif de façon hautement significative. On observe cet effet dans une équation où le degré de risque au travail est maintenu constant. Une interprétation possible serait que le taux de remplacement est plus bas pour ces individus à revenus plus élevés influençant ainsi autant les accidents actuels que l'indemnisation.

Pour tous les résultats de cette étude, nous avons tenté de garder constant le degré de risque au travail pour les individus. Nous notons cependant que ces risques sont calculés par catégories occupationnelles et non par individus. Il est alors possible que le

risque réel d'exposition des individus ne soit pas reflété exactement par ces variables. Par exemple, pour les travailleurs syndiqués, à l'extérieur de chaque catégorie occupationnelle, les risques réels peuvent être différents de ceux des non-syndiqués. Il y a un besoin pressant d'obtenir des données plus désagrégées sur l'exposition au risque de groupes de travailleurs à l'extérieur des catégories occupationnelles. De telles limites dans les données peuvent avoir des effets importants sur nos conclusions.