The Effects of Union Membership on Absence from Work Due to Illness

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A simple model of the effects of unionization on absenteeism due to illness is developed and tested. It is argued that unions lower absenteeism through providing a monopoly wage, but raise it by providing liberal sick-leave benefits. Data from the Michigan Panel Study of Income Dynamics are used to test the model. In regressions which control for human capital and demographic characteristics as well as working conditions, it is found that the net effect of unionization is to encourage absence.

I. *Introduction*

Brown and Medoff (1978) have suggested that unions increase productivity through, among other mechanisms, reducing voluntary turnover among workers and Freeman (1980) found substantial support for a negative relation between quit rates and unionization. Freeman argued that unions reduce quits by providing a monopoly wage and a formal grievance and arbitration procedure which allows workers to express discontent and possibly ameliorate work place conditions. Yet, reducing worker turnover is only one criterion for increasing productivity; reducing absenteeism is another. Although absenteeism has received only scant attention by economists,[1] it has been a subject of considerable interest among industrial psychologists and organization researchers and its implications for productivity are obvious. A simple model of the effects of unionization on workers' self-reported absence from work due to illness is developed and tested to determine whether unions influence absenteeism, an important aspect of the effects of unions on productivity.

II. *Specification of the Effects of Union Membership on Work-Loss*

At least three effects of unions on absence can be identified. First, unions provide a monopoly wage which, in turn, affects absence. Silver (1970) argued that a worker's wage should be regarded as the "price" of recovery from an illness at home; that is, the wage is the opportunity cost of missing work. The higher this price, the less the demand for recovery at home. In addition to Silver's substitution argument, one would also expect income effects. On the one hand, a higher wage generates greater income which allows the individual access to medical

[1]The most recent paper by Winkler (1980) contains only one citation for an economic study of absenteeism.

care, thus increasing his chances for a quick recovery. On the other, opposing income effects (feeling wealthy) may allow the individual greater recovery time from an illness. Second, unionization is often associated with certain working conditions which, in turn, should influence a worker's health. If unionization is more prevalent in "safe" industries, that is, in industries with low injury rates, or if it enhances job safety, one would expect a negative relation between union membership and absence due to illness. If, however, unionization is associated with undesirable or hazardous working conditions as Duncan and Stafford (1980) suggested, one would expect the opposite relation. Finally, unions may affect absence through sick-leave benefits. Freeman (1978) argued that there are very strong union effects on fringe benefits including sick-leave. In setting their bargaining goals unions are likely to give greater weight to the preferences of senior employees, who favor fringes, and less to young, marginal employees than would occur in a nonunionized competitive market. Ichniowski (1980) found cogent evidence that unions are more effective in expanding fringe benefits than in increasing the wages of firefighters. In addition, that generous sick-leave benefits encourage work-loss due to illness has been found in samples for teachers by Winkler (1980). To the extent that unions provide workers with liberal sick-leave benefits in comparison to nonunion workers, one would expect a positive relation to hold between unionization and absence.

These ideas are summarized in the following model

$$ABSENT = f(\overset{?}{WAGE}, \overset{-}{WRKCND}, \overset{+}{UNION}, X) + e, \qquad (1)$$

where *ABSENT* measures work-loss due to illness; *WAGE* is the potential annual wage, i.e., actual hourly wage times 2,000 hours; *WRKCND* measures undesirable and unhealthful working conditions; *UNION* represents union membership; *X* is a vector of control variables; and *e* is a normally distributed random error term. A (+) above a right-hand-side variable indicates an anticipated positive relation between it and the corresponding dependent variable; a (−) indicates the opposite and a (?) indicates an ambiguous relationship because of possible opposing income and substitution effects. Once the effects of the wage and working hazards have been accounted for, *UNION* is expected to have a positive sign because of the liberal sick-leave benefits associated with unions.

Equation (1) can be viewed in two ways. First, it may be viewed as the final structural equation in a fully recursive model in which union membership determines working conditions and wages. In this case, the reduced form is simply

$$ABSENT = g(\overset{?}{UNION}, X) + u, \qquad (2)$$

where *u* is an error term. Alternatively, (1) may be viewed as the final structural equation in a block recursive system in which *UNION, WRKCND,* and *WAGE* (but not *ABSENT*) are all simultaneously determined.[2] In this case, the reduced form is

$$ABSENT = h(X) + v. \qquad (3)$$

[2]Thaler and Rosen (1975) have argued for simultaneity between job risks and wages and Lee (1978), between union membership and wages.

Assuming the error terms in the equations determining *UNION, WRKCND,* and *WAGE* are uncorrelated with *e,* equation (1) can be estimated by ordinary least squares together with the reduced form equations (2) and (3). Theory does not suggest any particular functional forms. Linear and semi-log linear functions are assumed for empirical convenience.

III. *The Data and Empirical Results*

This study relies on data from the Michigan Panel Study of Income Dynamics (PSID), a national survey which gives detailed information on job and absence measures not available elsewhere. The particular subset of heads-of-households in the PSID examined here includes individuals who: (1) are either male or female; (2) white or nonwhite; (3) reported being employed in a three-digit occupation in 1974[3] within the one-digit classification of craftsmen, operatives, or laborers; (4) reported a wage in 1973 and 1974; and (5) were employed full-time in the same occupation with the same employer for 1973 and 1974. The third restriction is required to eliminate white-collar employees, typically exempt from union membership, from the subsample and to allow construction of an occupational hazard variable from the individual's three-digit occupation. Restriction (4) eliminates persons with missing observations on the key wage variable. Finally, the fifth restriction allows a standard basis of comparison for the absence variable. That is, everyone in the subsample has the same potential for work-loss since everyone reported being fully employed for two consecutive years. After imposing these restrictions on heads-of-households in the PSID, the sample size was reduced to 2,224 individuals of whom 719 were union members.[4]

Definitions of variables to be used appear in Table 1 and some deserve additional comment. *WAGE* is expressed in terms of potential earnings over the year containing 2,000 work-hours rather than actual earnings so that simultaneity bias resulting from absence also influencing actual earnings is avoided. Because the PSID had no information on working conditions, two indirect measures of undesirable conditions were considered. The first, *OCCHZ*, is extra deaths per 100,000 life insurance policy years within 37 three-digit occupations. These data, from the Society of Actuaries, were first introduced by Thaler and Rosen (1975) who discussed them thoroughly and concluded that they are the "best data available for estimating risk in the labor market." The 37 three-digit occupations, as well as the risk associated with each, appear in the Appendix. Loosely speaking, *OCCHZ* may be thought of as the occupation's mortality rate, controlling for age. In the PSID, 347 individuals were employed in one of the 37 occupations during 1973 and 1974. *OCCHZ* was assigned a zero for individuals not so employed. Clearly, this procedure generates sizeable measurement error for the majority of the subsample not employed in one of the 37 occupations. As a result, another measure of workplace hazards — the Bureau of Labor Statistics' (BLS) injury rate for the worker's two-digit industry — is

[3]The 1974 survey was chosen because it was the only year which included information on the worker's three-digit occupation.

[4]Summary statistics on all the variables in the subsample are available from the author.

Table 1

List of Variables

ABSENT	Two-year average of annual work-hours lost due to illness
UNION	Equals 1 for union member; 0, otherwise
WAGE	Two-year average hourly wage at the time of the interview
OCCHZ	Excess mortality rates within 37 occupations (See Appendix)
INJURY	Two-digit industry injury rate
SCH	Years of formal schooling completed
MARRIED	Equals 1 for married individuals currently living with spouse
AGE	Age in years
WHITE	Equals 1 for whites; 0, otherwise
MALE	Equals 1 for men; 0, otherwise
POOR	Equals 1 for individuals stating they were reared in a poor family; 0, otherwise
KIDS	Number of kids in the household

also considered. Although the entire subsample reported a two-digit industry in 1973 and 1974 and thus could be assigned an injury rate, this measure too suffers from error since the BLS measure is an averate rate for the entire, broadly defined, two-digit industry. The more specific three-digit industry injury rate, available from the BLS could not be applied to the subsample because the PSID did not record the worker's three-digit industry. Although *OCCHZ* and *INJURY* are not the most desirable measures of work hazards they are nevertheless the best measures available to the PSID data user.

Table 2 presents the empirical results for the structural and reduced form equations estimated by ordinary least squares. Although each equation included variables for city size, region of residence, age squared, and a constant term, these results are not shown. Moreover, in the discussion that follows, attention will be directed to explaining the results of the behavioral variables rather than on the controls so that the maintained hypotheses are highlighted.

Consider equation (1) first. Neither *OCCHZ* nor *INJURY* are significant; the estimated coefficients, while having the expected sign, are smaller than their standard errors. This result was not expected but possible explanations can be offered. One might first imagine that *OCCHZ* and *INJURY* are colinear and that the least squares procedure could not separate their effects. In separate regressions explaining *ABSENT*, neither were significant. A more reasonable explanation involves measurement error. *INJURY* is measured at only the two-digit industry level and *OCCHZ* has a value of zero for most individuals in the sample who are not employed in one of the 37 hazardous occupations. As is well known, measurement error inflates the size of the standard error.

Table 2

Least Squares Results Explaining ABSENT[a,b]

Independent Variables	Equation (1)	Equation (2)	Equation (3)
UNION	30.522**	29.082**	
	(11.248)	(11.225)	
WAGE	−.002*		
	(.001)		
OCCHZ	−.191		
	(2.14)		
INJURY	.065		
	(.219)		
SCH	−1.980	−1.808	−1.778
	(1.863)	(1.863)	(1.811)
MARRIED	−13.086	−15.831	−15.457
	(19.002)	(18.974)	(18.997)
AGE	−.680	.709*	−.709*
	(.428)	(.359)	(.359)
WHITE	−18.797	−24.332*	−22.311*
	(12.831)	(12.577)	(12.459)
MALE	−79.269**	−83.826**	−85.861**
	(21.648)	(21.560)	(21.511)
POOR	3.288	3.914	3.778
	(10.869)	(10.874)	(10.877)
KIDS	−1.414	−1.488	−1.488
	(2.894)	(2.896)	(2.896)
R^2	.0374	.0349	.0301
F	7.162**	7.386**	7.488**

*Indicates significance at the .05 level in a two-tailed test.

**Indicates significance at the .01 level in a two-tailed test.

[a]Control variables not shown include dummies for city size and residence, age squared, and a constant term.

[b]Standard errors appear in parenthesis.

UNION and *WAGE*, on the other hand, have the hypothesized signs and are significant. An increase of $1,000 of potential annual earnings results in two fewer hours of work-loss due to illness. Holding potential monopoly wages and some hazardous working conditions constant, a union member will miss 30 more work-hours a year than a nonunion member, presumably due to the liberal sick-leave benefits obtained by unions.

The second and third equations are reduced forms corresponding to the unidirectional and simultaneous models explaining *UNION, INJURY, OCCHZ,* and *WAGE* described earlier. Assuming the unidirectional, fully recursive model, the net effect of union membership is to encourage absenteeism. The generous sick-leave benefits and hazardous working conditions associated with unions apparently dwarf the effects of unions' monopoly wages on work-loss. The results from equation (3) suggest the overall empirical strength of union membership in explaining work-loss as the R^2 is 14 percent smaller than the R^2 for equation (2).

Each equation was subjected to several tests for robustness. Neither logarithmic transformations of dependent and independent variables nor adding or deleting various control variables changed the results involving *UNION, WAGE,* and *ABSENT.*

Three caveats should be noted which suggest caution in interpreting these findings, however. (i) If *OCCHZ* and *INJURY* do not properly measure work hazards, then the dummy *UNION* variable will implicitly capture these effects if unionization is associated with hazardous work, thus sick-leave policy is not the only explanation for *UNION*'s significance in the *ABSENT* equations. (ii) The sample may have a systematic bias because it is limited to those with full employment for two consecutive years. Illness may affect the probability of being in the sample. However, the equations have also been estimated with a sample limited to one full year employment but the results are virtually identical to those reported in Table 2. (iii) If liberal sick-leave policy is the major cause of absence due to illness and if unions choose between wages and other benefits, then liberal sick-leave policy may come at the expense of wages. This suggests that there may be a compensating differential phenomenon with respect to *WAGE* and *ABSENT.* The negative wage effect in equation (1) may be a compensating differential. In future research on unions and absence, these issues should be addressed.

IV. *Conclusion*

Although the recursive models represent a simple view of the relation between unions and absenteeism and the data are not the most desirable, the results nevertheless indicate that unionization has strong effects on absence from work due to illness. The monopoly wage union members receive lowers their absenteeism while the generous sick-leave benefits and perhaps the undesirable working conditions associated with unionized industries raises absenteeism. The net union effect found in the Michigan Panel Study data encourages work-loss due to illness which suggests that, to the extent absenteeism lowers productivity, unionization can have adverse indirect effects on productivity.

APPENDIX

Table A.1

Sample Occupations and Risks

Occupation	Risk[a]	Occupation	Risk[a]
Fishermen	19	Truck drivers	98
Foresters	22	Bartenders	176
Teamsters	114	Cooks	132
Lumbermen	256	Firemen	44
Mine operatives	176	Guards, watchmen, and doorkeepers	267
Metal filers, grinders and polishers	41	Marshals, constables, sheriffs and bailiffs	181
Boilermakers	230	Police and detectives	78
Cranemen and derrickmen	147	Longshoremen and stevedores	101
Factory painters	81	Actors	73
Electricians	93	Railroad conductors	203
Railroad brakemen	88	Ships' officers	156
Structural iron workers	204	Hucksters and peddlers	76
Locomotive firemen	186	Linemen and servicemen	2
Power plant operatives	6	Road machine operators	103
Sailors and deckhands	163	Elevator operators	188
Sawyers	133	Laundry operatives	126
Switchmen	152	Waiters	134
Taxicab drivers	182	Other painters	46

Source: Society of Actuaries.

[a]Units of measurement are extra deaths per 100,000 policy years. To convert to the probability of an extra death per year on each job, multiply by 0.0001.

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