

Enforcing OSHA: The Role of Labor Unions

DAVID WEIL*

This study examines the role of unions in implementing the Occupational Safety and Health Act (OSHA) by using a data set that provides information on regulatory enforcement. The analysis demonstrates that unionized establishments are more likely to receive safety and health inspections, face greater scrutiny in the course of those inspections, and pay higher penalties for violating health and safety standards than comparable nonunion establishments. Implementation of OSHA therefore seems highly dependent upon the presence of a union at the workplace.

SINCE ITS PASSAGE IN 1970, the Occupational Safety and Health Act (OSHA)¹ has been the subject of numerous analyses concerning its effectiveness at improving safety and health conditions in U.S. workplaces. Early assessments found little evidence of an impact on safety and health outcomes (Smith, 1976, 1979; Mendeloff, 1979; Viscusi, 1979). Similarly, recent analyses reveal only a very modest OSHA impact on injury rates (Viscusi, 1986). These studies paid little attention to the causes of this ineffectiveness, however, citing only the inability of OSHA's inspection force to adequately monitor the 3 million workplaces under its mandate.

This paper investigates the implementation of OSHA in order to explicate the Act's limited success. It examines the level of OSHA enforcement in unionized and nonunionized workplaces by using a unique set of inspection-level data that provides a complete history of OSHA enforcement that has

* School of Management, Boston University. Partial funding came from the Center for Business and Government at the Kennedy School of Government, Harvard University. The author is grateful to James Medoff and John Dunlop for their helpful comments on earlier versions of this paper.

¹ The act also created the Occupational Safety and Health Administration within the Department of Labor. Throughout this paper, the term "OSHA" is used interchangeably to connote both the Act and the Administration.

not been directly examined in other studies. Analysis of these data shows the existence of a pronounced union effect: A far higher level of OSHA enforcement is found in unionized workplaces than in comparable nonunionized establishments in the manufacturing sector. Since the nonunion manufacturing sector represents the majority of all workplaces, OSHA's observed limited overall performance arises in part from its low level of enforcement in this sector.

The Implementation of OSHA

The structure of implementation envisaged under OSHA is premised upon the active enforcement of detailed safety and health standards in the nation's workplaces. Enforcement, in turn, is achieved by workplace inspections which monitor employer compliance with standards.

OSHA grants workers specific rights related to all aspects of enforcement.² These include the right to initiate inspections; the right to participate in pre- and post-inspection meetings between the inspectors and the employer and to actively participate in the inspection itself; the right to participate in any employer attempt to appeal a decision on penalties, violations, or abatement plans handed down by an inspector; and the right to all information dealing with employer compliance or noncompliance with health and safety standards.

Employee exercise of OSHA rights before, during, and after an inspection is critical to achieving the quality of enforcement envisioned under the Act. The OSHA inspection force alone can provide neither enough inspectors to ensure adequate enforcement nor a sufficiently large threat effect to compel voluntary employer compliance. For example, in 1983, OSHA staff could inspect only 17 out of every 100 manufacturing establishments they were mandated to regulate. With workers as "partners" in this regulatory process, the chances for OSHA success are significantly improved.

Union employees are uniquely positioned to influence OSHA enforcement. Labor unions devote substantial resources to monitoring and improving safety and health conditions. Union-based safety and health institutions regularly assist members in exercising the same rights as those guaranteed by OSHA. Currently, eight of the top ten unions maintain separate health and safety departments, many staffed with epidemiologists, physicians,

² The notion of "worker rights" used in this paper encompasses only those rights specifically granted to workers by OSHA. The Labor Management Relations Act, and subsequent interpretations of it by the National Labor Relations Board, also enumerates a set of worker rights germane to safety and health, but these are not addressed here. For an overview of these rights, see Ashford and Katz (1977).

industrial hygienists, and public health specialists. Activities of these departments include sponsoring original research on health risks; creating training materials and programs concerning workplace health and safety; and keeping abreast of changes in health and safety technologies and in laws.³

There are several reasons to hypothesize that union health and safety programs influence employee exercise of OSHA rights and affect overall inspection activity. First, unionized workers are more likely to have information concerning the nature of health and safety risks in their workplaces since on-the-job risk education is a common component of union health and safety programs.⁴ Thus, unionized workers should be better equipped to identify potential risks requiring OSHA attention. Unionized workers also have greater knowledge of their rights under OSHA and hence their recourse under the law (see Bureau of National Affairs, 1971). Finally, unions provide their members protection from unjust dismissals through contract provisions governing firing procedures, particularly dismissals arising from employee exercise of a legal right. Thus, unionization likely reduces the potential dampening effect of employer retaliation against employees who exercise their OSHA rights.

The combination of a regulatory structure requiring employee participation and complementary union safety and health structures that promote worker participation in enforcement provides the basis for the hypothesis that OSHA enforcement will be significantly increased by the presence of labor unions.

Methodology

OSHA enforcement activity (inspection activity, penalty levels, citations issued) is based on factors related to prevailing safety and health conditions (work technology, specific work conditions) and OSHA enforcement policy (which targets larger establishments) as well as on the hypothesized impact of unions. Enforcement, therefore, can be expressed as a function of union status and those factors associated with safety and health conditions, as well as of OSHA enforcement policy.

In order to examine the independent effect of union status on enforcement,

³ Directors and staff of safety and health departments from the United Auto Workers, United Steel Workers, Amalgamated Clothing and Textile Workers, International Association of Machinists, and other industrial unions were interviewed in the course of this research.

⁴ For an example of hazard information focusing on safety, see United Brotherhood of Carpenters and Joiners of America (1983). An example of a detailed account on identifying more complex health risks at the workplace (created for the United Auto Workers) is in Silverstein (1980).

this study controls for the following factors related to safety and health conditions and enforcement policy:

Interindustry variation. Unionization and OSHA enforcement policies are correlated with industrial sector even within the manufacturing sector. For example, since unionization is higher among certain manufacturing sectors (e.g., transportation equipment) than among others (e.g., apparel), and OSHA enforcement activity is also greater in those sectors, a spurious association between unionization and OSHA might be made. This potential problem is addressed by including in the regression analysis a series of industry dummy variables based on Standard Industrial Classification two-digit industries.

Establishment size. Due to its limited enforcement resources, OSHA typically targets larger workplaces over smaller ones. Since unionization rates are also higher among large establishments,⁵ establishment size can confound the finding of a true union effect on OSHA implementation. In this paper, number of employees per establishment is used as the metric and this size factor is controlled for in all the analyses. Also, a continuous rather than a dummy size variable is used, consistent with other empirical studies of the impact of size on labor market outcomes (e.g., Brown and Medoff, 1989).

Company size. The size of the controlling entity of a given establishment might also confound the analysis of the role of unions in implementation. Compared to small companies, larger companies tend to have more formal and often more strict internal rules governing safety and health policy. Since unions have organized a larger percentage of the workers in larger firms,⁶ the analyses also control for the possible influence of company size on implementation independent of union status.

Work conditions. The actual safety and health conditions prevailing in a workplace may also confound the finding of a true union effect. If unions have been more successful in organizing less safe workplaces in a given industry and size group, unionized workplaces may be more dangerous a

⁵ In 1979, 11 per cent of workers in establishments with 1–24 workers were unionized, as opposed to 40 per cent of workers in establishments with more than 500 workers. See Medoff (1984).

⁶ In 1983 only 4 per cent of workers in companies with 1–24 workers were unionized, compared to 30 per cent of workers in companies with more than 500 workers. See Brown, Hamilton, and Medoff (1990).

priori. A more unsafe workplace should lead to higher levels of OSHA activity as a result of those prevailing conditions. Thus a union impact on implementation might only reflect that the average union worker is subjected to more danger than his or her nonunion counterpart.

Two measures of workplace conditions from the workplace inspection itself are used as control variables for working conditions. OSHA inspectors classify each violation cited in an inspection as either “serious” or “non-serious”. Using these assessments of violations as a metric, the first measure of overall work conditions in the inspected establishment is the percentage of serious to total violations. The second measure arises from inspection-based records concerning the estimated number of workers potentially exposed to a given OSHA violation (e.g., the number of workers potentially endangered by violation of the asbestos standard). The estimated number of workers exposed for each violation was aggregated for the entire inspection in order to calculate the *average* number of workers exposed to health or safety risk for an inspected establishment. Higher levels of either work condition measure indicate more hazardous conditions in a given workplace.

Model. Ordinary least squares regression is employed to estimate the effect of unions on enforcement variables holding constant the confounding factors discussed above. The relation of union status to each of the enforcement variables is determined by the following model:

$$(1) \quad y = \hat{a} + \beta_1 \text{Union} + \beta_2 \text{Size} + \beta_3 \text{Union} * \text{Size} + \beta_4 \text{Company} \\ + \beta_5 \text{WorkCondition1} + \beta_6 \text{WorkCondition2} \\ + \text{Industry Dummies} + e$$

Where Union is the union status of the establishment; Size equals ln (number of employees in the establishment); Union*Size is an interaction variable; Company equals ln (number of employees in the company); WorkCondition1, 2 are work condition controls (as discussed above); and Industry includes 19 two-digit SIC industry dummies.

Two features of the model should be noted. First, since both government and labor union safety and health activity vary according to establishment size, a union/establishment size interaction term is included to assess the extent that union impact changed with establishment size.⁷ The estimated

⁷ Safety and health activity varies on an establishment rather than company level since OSHA targets its efforts on an establishment basis and the primary focus of union safety and health levels is typically the plant. This is confirmed by the fact that a union/company size interaction term had little impact on the estimated union effect and lacked statistical significance.

union effect is calculated by summing the union coefficient with the interaction term evaluated at the mean employment size of each of four size groups.⁸ The standard error of the resulting union estimate is calculated as $\text{Standard Error} = \sqrt{\text{Var } \hat{a} + (\bar{Q} * \text{Var } \hat{c}) + (2\bar{Q} * \text{Cov } \hat{a}\hat{c})}$, where \hat{a} equals the estimate of the union coefficient; Q equals \ln size of the establishment in the size group; and \hat{c} equals the estimated union/size coefficient.⁹

Second, the inclusion of work condition variables based on information from inspection activity potentially leads to bias in the union coefficient. Specifically, if unions lead to an increase in the value of working condition variables due to their hypothesized impact on inspection intensity (i.e., they lead to more intensive inspections), union establishments will be rated as “more dangerous” than comparable nonunion establishments (where inspections were less thorough). While this makes the working conditions variables endogenous rather than exogenous to the model, the resulting union estimate of enforcement will be a *lower-bound* estimate as a result of the bias, since some of the measured impact of the working conditions variables are actually attributable to the union.

Data Base

The data set for this analysis represents a complete inspection history of federally run OSHA programs. OSHA programs administered by state agencies, including those in Arkansas, Arizona, California, Connecticut, Hawaii, Indiana, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, North Carolina, Oregon, South Carolina, Tennessee, Utah, Vermont, Virginia, West Virginia, Washington, and Wyoming, are excluded from the data base. The data base covers all OSHA-regulated industries for the period January 1972 to June 1986. The focus here is on the manufacturing industry in 1985, since this comprised the most current, annual set of inspection data.

The data base provides inspection-level information for *all* OSHA enforcement activity in the period studied. Each observation includes

⁸ The four size groups are establishments with 1–99 employees (representing 90 per cent of manufacturing establishments and 28 per cent of employees in manufacturing industries); 100–249 employees (representing 6 per cent of establishments and 18 per cent of employees); 250–499 employees (representing 2 per cent of establishments and 15 per cent of employees); and more than 500 employees (representing 2 per cent of establishments and 38 per cent of all employees). These figures are based on data from the U.S. Department of Commerce (1985).

⁹ Regressions run using size dummies rather than a continuous size variable resulted in estimates consistent with those reported here. The complete regression results for each of the implementation outcomes are available from the author.

characteristics of the establishment inspected (union status, number of employees, size of controlling company); information on inspection procedures; and the administrative history associated with the individual inspection. The data base also contains detailed information on *each* violation of OSHA standards cited in the course of an inspection, including its severity; the number of people potentially exposed to risk; the penalty levels and abatement periods associated with the violation; and an administrative history of the individual violation.

Empirical Results

Only a minority of workplaces regulated by OSHA receive inspections in the course of the year. This undermines OSHA's impact since only a small number of workplaces benefit from surveillance by OSHA inspectors. Moreover, a low number of inspections minimizes OSHA's threat to covered employers as a whole.

There are two primary types of inspections under OSHA: targeted (or "programmed") inspections and complaint inspections initiated by employees. Information on inspection frequency from the OSHA data base can be used in conjunction with data on the number of establishments in different industry and size groups to calculate the probability of different inspection types for union and nonunion establishments of comparable size. Table 1 presents these results.

Inspection type and frequency. The first two columns of Table 1 suggest that unions substantially raise the probability of receiving a complaint inspection, an effect that grows with size. For example, unionized workplaces with more than 500 employees face a probability of a complaint inspection of .51 versus only .06 for nonunion establishments. If, however, unionized workplaces are less safe *a priori*, one would expect higher levels of complaints, arising from the more dangerous conditions faced by unionized workers rather than from the institutional factors discussed earlier. Results from a study by Smith (1986) suggest that the percentage of unionized employees is the key factor.

Using aggregated inspection data for four-digit SIC industry groups, Smith calculated the influence of the percentage of production workers unionized (as well as other factors) on the total number of complaint inspections received in an industry. He found a strong positive correlation between the percentage unionized and the number of complaint inspections received in an industry after holding constant workplace conditions as well as size and strike activity. His findings suggest that a 1 per cent increase in unionization

TABLE 1
 PROBABILITY OF OSHA INSPECTION IN UNION AND NONUNION ESTABLISHMENTS
 MANUFACTURING, 1985^a

| Size (Emp) | <i>Complaint</i> | | <i>Programmed</i> | | <i>Total</i> | |
|----------------|------------------|----------|-------------------|----------|--------------|----------|
| | Union | Nonunion | Union | Nonunion | Union | Nonunion |
| 1 (1-99) | .01 | .02 | .05 | .11 | .06 | .14 |
| 2 (100-249) | .09 | .04 | .23 | .15 | .37 | .22 |
| 3 (250-499) | .18 | .06 | .24 | .11 | .51 | .19 |
| 4 (500+) | .51 | .06 | .21 | .07 | .95 | .16 |

^aThe total number of establishments in an industry as a whole was calculated as follows. The total number of establishments per size group for the 28 states included in the OSHA data base for manufacturing industries (drawn from U.S. Department of Commerce, 1985) was multiplied by 1980 unionization levels for that industry group (drawn from Kokkelenberg and Sockell, 1985). This resulted in a base number of establishments by union status and establishment size. The total number of OSHA inspections by union and size group was then divided by the number of establishments for that grouping, yielding the proportion of establishments inspected in a year. These proportions are presented here as inspection probabilities.

Source: OSHA enforcement data base, 1985 (see text for details).

leads to a more than 1 per cent increase in the number of complaint inspections in the industry. Thus, even after controlling for the underlying conditions in the workplace, workers in unionized establishments take far greater advantage of their right to initiate an OSHA inspection than do employees in comparable nonunion cases.

In theory, programmed inspections should not be subject to union activity since they are based on OSHA's internally determined policy procedures. Nevertheless, the results shown in the middle columns of Table 1 indicate a union impact on programmed inspections. There are several possible explanations for this anomalous association between unions and OSHA targeting activity. First, the association might arise from the disproportionate presence of unions in industries targeted under different OSHA policies. Second, OSHA might use safety and health information gathered by unions (in complaint inspections and through other channels) to help direct their programmed inspection activity.¹⁰ This suggests that unions help target

¹⁰ Smith (1986) offers a similar hypothesis to explain his finding of a positive relationship between the number of complaint inspections received in an industry and the total level of programmed inspections in that industry.

OSHA inspection efforts on those workplaces most in need of surveillance, resulting in a more positive allocation of OSHA resources. A final possibility is that unions affect targeting practice through their high profile (and ability to exert pressure) in OSHA regional offices. This implies that OSHA regional personnel respond to "political" pressures and therefore misallocate limited inspection resources.

As a result of these impacts on complaint and programmed inspection activity, overall inspection probabilities are strikingly higher in unionized manufacturing establishments (see the final columns of Table 1). These differences are dramatic in large establishments, where the union/nonunion difference in probability reaches almost 80 per cent. Increasing the probability of inspections affects two aspects of OSHA implementation. First, a higher number of inspections in the unionized sector leads directly to greater surveillance of working conditions in that sector, and therefore to more enforcement via direct inspection activity. Second, the higher probability of receiving an inspection in the unionized sector increases an employer's incentive to comply voluntarily with safety and health standards.

Inspection intensity. An employee's right to accompany an OSHA inspector during a workplace tour is the most important mechanism affecting inspection intensity. This "walkaround" right insures that OSHA inspectors address problems of concern to employees. Absent exercise of the walkaround right, an inspector undertakes her/his inspection alone or, more typically, accompanied only by an employer representative.

Table 2 presents the frequency of walkarounds for manufacturing industries, controlling for the size of establishment inspected. Employees (or their representatives on safety and health committees) exercise their walkaround right in 48 per cent of union OSHA inspections in size 1 establishments. By comparison, less than 3 per cent of nonunion workers in this size category exercise the walkaround right. This already large union/nonunion differential grows markedly with establishment size, amounting to a 64 per cent difference in frequency between union and nonunion size 4 establishments.

How does greater use of the walkaround right influence inspection activity? If worker involvement during OSHA inspections forces inspectors to investigate prevailing conditions at the workplace more vigorously, the average inspection in a union workplace should last longer than in a comparable nonunion setting. Table 3, column A provides dramatic support for this hypothesis.

Column A presents the calculated union/nonunion inspection duration differential (measured as hours of inspection per employee) for the four size

TABLE 2

EXERCISE OF EMPLOYEE WALKAROUND RIGHTS, MANUFACTURING, 1985

| Size (Employees) | Per cent of Inspections with Employee Walkaround | |
|---------------------|--|----------|
| | Union | Nonunion |
| 1 (1-99) | 47.8% | 2.7% |
| 2 (100-249) | 59.3% | 2.6% |
| 3 (250-499) | 63.7% | 2.6% |
| 4 (500+) | 69.8% | 3.7% |

Source: OSHA enforcement data base, 1985 (see text for details).

TABLE 3

ESTIMATED UNION EFFECTS ON OSHA ENFORCEMENT OUTCOMES, MANUFACTURING, 1985
(STANDARD ERRORS ARE IN PARENTHESES BELOW ESTIMATED COEFFICIENTS)

| Size (Employees) | Estimated Union Effect | | |
|---------------------|---|---|---|
| | (A) Inspection duration (hour/employee) ^a | (B) Violations per employee ^b | (C) Penalty per violation ^c |
| 1 (1-99) | .262** (.057) | -.005** (.002) | -5.25 (3.61) |
| 2 (100-249) | .720** (.068) | .014** (.0003) | 18.05** (4.30) |
| 3 (250-499) | 1.00** (.087) | .025** (.002) | 32.21** (5.50) |
| 4 (500+) | 1.69** (.146) | .053** (.006) | 67.48** (9.31) |
| N | 26,242 | 26,242 | 26,242 |
| R ² | .1659 | .1081 | .1057 |
| F Ratio | 208.9 | 127.1 | 124.0 |

*Significant at the .05 level; **significant at the .01 level.

^aMean (standard deviation) of dependent variable = 1.77 (3.98).

^bMean (standard deviation) of dependent variable = .075 (.213).

^cMean (standard deviation) of dependent variable = 34.06 (249.66).

groups, after controlling for the confounding factors discussed previously.¹¹ The results indicate that inspectors spend .3 hours per employee longer in union workplaces for size 1 establishments, increasing to 1.7 hours per employee for size 4 groups (after controlling for size, work conditions, and including two-digit SIC industry). Thus, the union effect cannot be explained as simply the result of union presence in more dangerous workplaces or industries.¹²

The cause of longer inspections can be partially explicated by comparing the percentage of all inspections that resulted in a physical workplace inspection versus those where no physical inspection occurred either because only establishment records were inspected or because the inspector was

TABLE 4
OSHA INSPECTION SCOPE, MANUFACTURING, 1985

| Scope of Inspection | Per cent of All Inspections of Given Scope | |
|---|--|----------|
| | Union | Nonunion |
| Physical Inspection of Workplace ^a | | |
| 1 (1-99) | 66.5% | 53.0% |
| 2 (100-249) | 79.9% | 72.5% |
| 3 (250-499) | 84.4% | 75.6% |
| 4 (500+) | 90.4% | 80.9% |
| No Physical Inspection ^b | | |
| 1 (1-99) | 33.5% | 47.0% |
| 2 (100-249) | 20.1% | 27.5% |
| 3 (250-499) | 15.6% | 24.4% |
| 4 (500+) | 9.6% | 19.1% |

^aWall-to-wall or partial.

^bRecord inspection or no inspection concluded.

¹¹ The coefficients used to derive all of the estimates presented in Table 3, as well as the coefficients for the other control variables, are available from the author.

¹² Analysis of OSHA inspection data for 1974 and 1979 reveals a similarly large union impact on inspection durations in these earlier periods. This evidence would seem to underscore the role of unions in improving inspection intensity, rather than ascribing that impact to OSHA inspection policy (such as the "records inspection" procedure undertaken during the Reagan administration).

turned away. Table 4 compares the frequency of physical inspections in union and nonunion establishments of comparable size. While 67 per cent of all union inspections in size 1 establishments involved some type of physical inspection, only 53 per cent of the nonunion workplaces were inspected. For the largest worksite, physical inspections occurred in 90 per cent of union versus 81 per cent of nonunion inspections.

The findings in these tables indicate unions strongly affect the intensity of inspections, particularly through the far greater use of walkaround rights in unionized workplaces. Greater use of walkaround rights results in large increases in the time devoted to inspection activities (an effect which increases with the size of the establishment).

The pattern of increased inspection intensity affects other important outcomes of the inspection process, including the number of violations cited in an inspection and total penalties received by employers. These factors, in turn, affect both the immediate impact of an OSHA inspection and the threat OSHA poses to noninspected workplaces. The next section examines the union impact on penalty-setting procedures.

Union Impact on Penalty Setting

OSHA assesses penalties for the violation of OSHA standards as a means of affecting the future behavior of firms that have been inspected and found out of compliance with those standards. It also assesses penalties to obtain better safety and health performance in those workplaces that have not been (or will not be) inspected. For both groups, the higher the penalty charged for a violation, the greater the incentive for employers to voluntarily comply with standards.

The total penalty faced by an employer will be conditioned both by the number of violations found on a workplace inspection and by the average penalty assessed for each violation. Unions play an important role in affecting these two elements of total penalty costs. The analysis below examines the union effect on each of these elements separately.

Citing violations. The higher the number of violations cited on an inspection, the higher the total penalty costs to the employer. The number of violations found on an inspection arises from the actual safety and health conditions at the workplace *and* from the intensity of the workplace inspection itself. Given that unions substantially improve OSHA inspection intensity, a higher number of violations per inspection are likely to be found in unionized workplaces, after holding constant the differences in underlying safety and health conditions.

Table 3, column B presents the estimated impact of unions on the number of violations cited per employee for four size groups. The estimates hold constant industry mix, company size, and work conditions, thus providing a measure of the true impact of unions on the number of violations cited. As the figures show, unions generally increase the number of violations cited. While the negative union coefficient for the smallest size group indicates that unions are associated with a slightly lower number of violations cited per employee (an anomalous result given the overall hypothesis), overall the evidence in column B is consistent with the claim that unions sizably increase the number of violations cited in larger workplaces in the manufacturing sector.

The higher number of violations found in unionized versus comparable nonunion establishments might arise from the increased length of union inspections (see column A of Table 3) and/or from a union effect on the intensity of those inspections (i.e., the number of violations found in a given period of time). The evidence presented in Table 2 regarding the considerably higher participation of employees in OSHA inspections in unionized establishments indicates that both effects contribute to the overall union effect on violations. Regardless of which effect predominates, both support the overall hypothesis that unions improve OSHA enforcement outcomes.

The size and statistical significance of all estimates of the union effect on number of violations cited arise from the greater intensity of OSHA inspections in the union sector. By raising the number of violations found in the course of an inspection, the potential costs to an employer from an OSHA inspection increase, providing greater incentives to comply in future periods.¹³

Union impact on penalty level. OSHA employs a ranking system, based on the severity of the injury or illness which could result from the violations and the probability that such an injury or illness could occur, to determine the gravity of a violation. Penalty setting for serious violations arises primarily from the inspectors' judgment of violation severity. The "gravity-based penalty" can be adjusted downward by as much as 80 per cent depending on the employer's good faith; the size of the business; and the employer's

¹³ Regression analysis of abatement durations (the time between initial finding of a violation and when employers are required to correct that violation) indicates that unions decrease the amount of time employers are given to correct violations of safety and health standards. The results indicate a decrease in abatement durations for union establishment for all size groups. The findings are particularly striking for the largest establishments, where average durations are 1.7 days shorter (or about 8 per cent lower than average abatement durations) per violation in union establishments than in comparable nonunion establishments. (Abatement duration results are available from the author.)

history of previous violations (for a full description, see U.S. Department of Labor [1977]).

Employees or their unions affect the penalty level during the inspection tour and in the post-inspection meeting by influencing inspectors' determination of the severity of individual violations. Thus, unions and/or employees' impact on the basis of penalty setting provides only an indirect method of influencing the penalty level per violation.

Since penalty levels originate from the interaction of OSHA inspectors, employers, and unions, as well as from underlying health and safety conditions, a true comparison of the union effect on these implementation outcomes requires explicit controls for safety and health conditions. The final column of estimated union effects on OSHA enforcement contained in Table 3, column C, presents the results of a regression analysis of the effect of union status on penalty per violation, holding constant industry mix within a sector, workplace condition, and company and establishment size.

Unions increase the penalty received per violation and penalty per serious violation in the manufacturing sector, even after controlling for differences in underlying health and safety conditions. Column C indicates sizable union effects on average penalties per violation for all size groups other than the very smallest establishments. Specifically, unions increase the penalty level paid per violation from \$18.05 per violation (size group 2) to \$67.48 per violation (size group 4) above the level paid by comparable nonunion establishments. The magnitude of these union effects can be appreciated by noting that the average manufacturing establishment paid only \$34.00 per violation in OSHA penalties in 1985.

Union impact on penalty appeals. Employers have the right to appeal any OSHA penalty. An appeal may take either of two forms: the employer may appeal the violation from which the penalty arose or the employer may appeal the penalty level. When an employer files an appeal, employees retain the right to participate in any hearing dealing with the reduction of a penalty. Unions play a critical role at this stage. By participating in administrative appeals proceedings, unions minimize the extent to which penalties fall between the time they are first assessed and the time of final payment by the employer.¹⁴

The regression analysis results demonstrate a negative union effect on the change in penalties, meaning that unions, as predicted, reduce the amount

¹⁴ OSHA data base evidence (available from the author) confirms the role of unions in administrative procedures related to penalty setting. Unions exercise their most important influence by limiting informal penalty-reduction settlements reached between employers and OSHA and by reducing employer "win rates" in formal OSHA administrative procedures.

penalties change from the time they are set to when they are actually paid. The predicted union effect is small, however, equalling only about a \$2.50 reduction per violation in the amount penalties fall relative to nonunion establishments.

Conclusion

Unions dramatically increase enforcement of the Occupational Safety and Health Act in the manufacturing sector. The empirical evidence indicates that the union effect on OSHA enforcement grows substantially with establishment size. Although the negative impact of unions on violation and penalty enforcement in very small firms is anomalous and cannot be easily explained, the overall union/size effect on enforcement may arise from OSHA and union safety and health enforcement strategies.

OSHA pursues an overall enforcement program that focuses its limited inspection resources on larger establishments, both in the *de facto* exemption of very small workplaces and, more importantly, in the *de jure* focus of enforcement procedures.¹⁵ As a result, the ability of a union to raise enforcement activity at small establishments is limited by the low level of OSHA resources apportioned to such workplaces. Moreover, like OSHA, unions are typically better organized to deal with safety and health in larger rather than smaller establishments. Larger workplaces are more likely to have the critical number of people to create, train, and maintain effective safety and health committees which carry on activities that assist enforcement.¹⁶ Thus, the union impact on enforcement activities is most pronounced in larger workplaces.

The size and consistency of the union effects on OSHA enforcement activities raise issues for both future research and public policy. Future research must probe further into the *mechanisms* that lead to the observed union enforcement effect. For example, how much of the union impact on inspection durations arises from the far higher frequency of walkaround in unionized establishments, versus other union activities during the inspection? Is the union effect more pronounced in complaint versus programmed inspections? More broadly, what part of the observed union impact on

¹⁵ A recent example of this emphasis on larger workplaces is the "special emphasis program on ergonomics" drafted by OSHA for the meatpacking industry. The program targets the largest meatpackers, specifically nine corporations that each employ 1,000 or more workers (see Bureau of National Affairs, 1989). Mintz (1985) presents a more general discussion of the continuing efforts to exempt small employers from OSHA.

¹⁶ These observations are based on case studies of 21 union safety and health programs conducted by the author.

enforcement arises from better use of OSHA rights by unionized employees versus the "political" pressure of labor union leaders on government regulators? The answers to these questions will broaden our understanding of the mechanisms unions use to improve enforcement activity.

Previous studies have provided little evidence of the underlying causes of OSHA's inability to appreciably lower occupational injury rates. The empirical results presented here provide a partial explanation, given the uneven enforcement of the law between union and nonunion establishments. Through their activities, unions facilitate implementation by influencing both the "immediate" inspection impact of OSHA and the threat OSHA exerts over noninspected establishments. The low level of enforcement in nonunionized workplaces indicates the absence of these pressures.

Given that the great majority of manufacturing workplaces are in the low-enforcement, nonunion sector, it is little wonder that previous analyses of OSHA's overall effectiveness have found its performance so lacking. Nor does it seem likely that the effectiveness of a safety and health law premised on the exercise of worker rights in a predominantly nonunion regulatory environment will improve significantly in the future.

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