

Building Safety: The Role of Construction Unions in the Enforcement of OSHA*

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Because unionized workers are more likely to exercise their rights under OSHA, it is hypothesized that OSHA is more stringently enforced at unionized construction workplaces than at comparable nonunion workplaces. A comparison of OSHA enforcement in union and nonunion construction sites demonstrates that union sites face higher probabilities of inspection and receive greater scrutiny during inspections than do comparable nonunion sites. Further, union employers are required to correct violations of safety and health standards more quickly and bear higher overall penalty costs than their nonunion counterparts. As a result, the construction industry operates under a "two-tiered" safety and health regulatory system.

I. Introduction

From the building of one- and two-story structures during the nineteenth century to the skyscrapers of today, construction remains one of the most dangerous industries in the United States. Injuries associated with falls and slips, and with falling materials or tools and equipment are commonplace. So, too, are the health risks associated with exposure to wood and cement dust, other airborne materials, and the many chemicals used on modern construction sites. Growing pressure from the public, and particularly from the labor movement, led Congress to pass the Occupational Safety and Health Act in 1970 to regulate safety and health conditions for most workplaces in the U.S., including construction sites. The act created an Occupational Safety and Health Administration (OSHA) to improve safety and health conditions in the workplace by enforcing a detailed set of standards.

Since OSHA was created, labor unions, public interest groups, policy makers, and some private sector organizations have criticized the agency for not fulfilling its mandate, for leaving too many workers exposed to risk. Many have criticized OSHA's inability to adequately enforce standards, primarily because of its limited manpower compared to the huge number of work sites covered under the act.

Unions in the construction industry play a critical role in ensuring the enforcement of safety and health policies in a world of limited OSHA resources. Because unionized workers are more likely to exercise their rights under OSHA, the agency

enforces standards at unionized construction workplaces more stringently than at comparable nonunion workplaces. A comparison of different aspects of OSHA enforcement in union and nonunion construction workplaces demonstrates that unions force OSHA to allocate its limited resources on union job sites.

II. *Unions and OSHA Rights*

The Occupational Safety and Health Act grants employees a number of "rights" that directly affect the act's enforcement: the right to initiate inspections; to participate in those inspections; and to be included in decisions regarding violations, penalties, and remediation of violations. Because the OSHA inspection force provides only limited "surveillance" to the millions of workplaces under its purview, the exercise of these rights by workers is critical to achieving the quality of enforcement envisioned under the act.

It is hypothesized that unionized construction workers more fully exercise their OSHA rights than workers who are not unionized. Specifically, union construction workers receive formal and on-going training on health and safety risks as well as their rights under OSHA; business agents initiate and participate in inspections on unionized construction sites; and collective bargaining agreements protect union workers from reprisals for exercising their OSHA rights.

Training. The unionized construction industry has developed a complex system of formal training programs within the various crafts. While these programs primarily teach specific job and craft skills (e.g., carpentry or bricklaying), they also train workers in safe work practices, hazard recognition, and other aspects of safety.¹ These efforts primarily seek to make workers more aware of and better able to identify potential risks on the job site.²

In addition, construction unions like the United Brotherhood of Carpenter and Joiners of America (UBCJA) the United Association of Plumbers and Pipe Fitters (UA) and the Laborers International provide their members with information on OSHA rights and developments in standards and administrative procedures. These unions sponsor workshops and other educational forums on OSHA, and produce manuals and articles in union journals on safety issues.³ Studies by Bourdon and Levitt (1980) and Northrup (1984) indicate that the unionized sector of the construction industry provides far more, and more sophisticated, formal training than the nonunion sector does. Although some of the largest nonunion contractors and subcontractors provide some formal training to their work force, much of the nonunion industry relies on informal on-the-job training as well as on training provided to former union members who now work on nonunion jobs.

Business Agents. Business agents play a distinctive role at union construction sites which is critical to construction union safety and health activity. Business agents hold a central position in the policing of collective bargaining agreements in the construction industry. Their responsibilities include the negotiation of local

agreements, grievance handling, legal responsibilities, and political responsibilities. The business agent is, therefore, a jack-of-all-trades who administers to the needs of local membership working on different construction work sites.

Responsibility for helping workers to exercise their rights under OSHA typically falls to the business agent. In addition to assisting workers in filing complaints in order to trigger inspections, the agent is also the most likely person to accompany OSHA inspectors on site visits. He also helps union members to follow-up OSHA inspections through administrative channels (e.g., on appeals of abatement or citation orders).

The absence of business agents or their equivalent in the nonunion sector means that safety and health enforcement activities must rely solely on an individual worker's knowledge of his or her rights under OSHA. The lack of additional assistance provided by a business agent could also dampen the relative effectiveness of OSHA in the nonunion sector.

Protection from Discrimination. Section 11(c)(1) of the act protects workers who exercise their rights from discrimination (e.g., reprisals for triggering an inspection or speaking to OSHA personnel during a site visit). Nonetheless, these protections are reinforced on union sites by the additional protections that union workers enjoy under their collective bargaining agreements. A union worker knows that he will not lose his job by calling OSHA. The right of a union member to a formal process to review a dismissal—regardless of the cause—will “spill-over” and decrease their perceived risk from initiating an inspection. In contrast, the absence of these protections in the nonunion workplace once again makes individual workers less likely to exercise their rights under the act.⁴

Taken together, unionized construction workers should have a greater awareness of safety and health risks as well as their rights and the remedial actions possible under the act. In turn, this awareness and the workers' exercise of rights should create a higher level of OSHA enforcement at union construction sites than at comparable nonunion sites.

III. Methodology

The Data Base. The data set for this analysis represents a complete inspection history of federally run OSHA programs that is comprised of records for every inspection undertaken in 1985 (OSHA programs administered by state agencies are not included).⁵ Each OSHA inspection record contains characteristics of the establishment inspected (union status, number of employees, size of controlling company), data on inspection procedures, and administrative information connected to the individual inspection. The inspection record also contains details of each violation of OSHA standards cited during an inspection, its relative severity, the number of people potentially exposed to risk due to the violation, its associated penalty levels and

abatement periods, and its administrative history (e.g., was it contested, who filed the appeal, how far did it go).

Methodology. OSHA enforcement activity is related to prevailing safety and health conditions, OSHA enforcement policies, and to the hypothesized impact of construction unions. Therefore, enforcement can be expressed as a function of union status and those factors associated with safety and health condition and OSHA enforcement policy.

To estimate the impact of union status on several different aspects of OSHA activity, an ordinary least squares regression model was used. The relationship of union status to four enforcement variables (inspection duration, abatement duration, violation frequency, and penalty per violation) was determined by this model:

$$y = a + b_1 \text{UNION} + b_2 \text{SIZE} + b_3 \text{UNION} * \text{SIZE} + b_4 \text{COMPANY} \\ + b_5 \text{WORKCONDITION}_1 + b_6 \text{WORKCONDITION}_2 \\ + \text{INDUSTRY DUMMIES} + e,$$

where

<i>y</i>	= OSHA enforcement variables (e.g., length of inspection, penalty levels; see section IV for details)
<i>UNION</i>	= union status of establishment
<i>SIZE</i>	= log of number employees in establishment
<i>UNION*SIZE</i>	= union/size interaction variable
<i>COMPANY</i>	= log of number of employees in company
<i>WORKCONDITION</i> ₁	= ratio of serious to total violations found in the inspection
<i>WORKCONDITION</i> ₂	= estimated number of workers exposed to violations of OSHA standards on the inspection
<i>INDUSTRY</i>	= 2-digit SIC industry dummies
<i>e</i>	= random error term.

The model controls for two measures of size: establishment (i.e., the number of employees at the construction work site) and company (the total number of employees of the company undertaking the work). Because company and establishment size variables are positively related to OSHA enforcement policy and unionization, I explicitly control for the independent effects in the model.⁶ In addition, including a union/establishment size interaction term allows for the assessment of the extent that union impact varies with establishment size.

OSHA enforcement and unionization seem likely to correlate positively with working conditions at the construction site. Enforcement and working conditions are correlated, since OSHA tends to focus its inspection resources on the most "danger-

ous" work sites. Unionization and working conditions are related because dangerous work sites might be more readily organized by unions than less dangerous ones. The study measures underlying safety and health conditions with two proxy variables from OSHA inspection records: (1) the ratio of serious to total violations found in an inspection (where a higher ratio indicates more dangerous conditions), and (2) the estimated number of workers exposed to safety and health risks from violations found in the inspection.⁷ Finally, two 2-digit SIC industry dummies control for cross-industry factors potentially related to enforcement and unionization.

The empirical section presents estimates of the union/nonunion differential for three groups: work sites with fewer than 100 employees, those with between 100 and 249 employees, and those with from 250 to 499 employees.⁸ The core results shown in Table 1 present a series of union/nonunion differentials for four OSHA enforcement variables. Union/nonunion enforcement differentials represent the union coefficient plus the union/size interaction coefficient evaluated at the midpoint of each group. The standard error of the resulting union estimate is calculated by the following equation:

$$\text{Standard Error} = [\text{Var } a + (Q)(\text{Var } c) + (2Q)(\text{Cov } ac)]^{1/2},$$

Table 1
*Estimated Union Effects on
OSHA Enforcement Outcomes, 1985*

Size (Employees)	(A) Inspection Duration (Hour/Employee) ^a	(B) Abatement Duration (Days/violation) ^b	(C) Violation per 100 Employees ^c	(D) Penalty per Violation ^d
1 (1-99)	1.77** (.185)	-1.30** (.28)	5.9** (1.6)	-12.66** (5.02)
2 (100-249)	2.69** (.274)	-1.76** (.41)	10.4** (2.2)	-14.85* (7.42)
3 (250-499)	3.26** (.330)	-2.04** (.50)	13.1** (2.6)	-16.18 (8.92)
N	38623	22628	38623	22628
R ²	.1679	.0056	.1326	.1791
F Ratio	974.0	15.9	737.7	1053.4

Standard errors are in parentheses below estimated coefficients.

^aMean (standard deviation) of dependent variable: 5.42 (8.39).

^bMean (standard deviation) of dependent variable: 5.44 (9.12).

^cMean (standard deviation) of dependent variable: 30.0 (54.3).

^dMean (standard deviation) of dependent variable: 51.74 (226.67).

*(**) Significant at the .05 (.01) level.

where a = estimate of union coefficient, Q = mean log establishment size, and c = estimated union/size coefficient.

Enforcement variables ("y") are adjusted either by number of employees in the establishment or number of violations. Variables dealing with characteristics of the inspection as a whole (duration of inspection; number of violations found) are adjusted by number of employees, since larger workplaces will usually take longer to inspect and have more violations due to scale and the other factors discussed above. Enforcement variables connected to specific violations (penalty levels; abatement durations) are adjusted by the number of violations received during the inspection. This again controls for the scale of operations by basing the outcome measure on individual violations (rather than total penalty levels per inspection, for example).

IV. Empirical Analysis

OSHA has two mechanisms for improving employer compliance through enforcement activities. First, it can directly enforce health and safety standards for those sites inspected. Second, its activities can deter standard violations at noninspected sites through the "threat effect" of inspection activity, that is, it can provide employers incentives to comply by increasing the likelihood of detection and the expected penalties if caught out of compliance. Each of the following aspects of enforcement affect these basic regulatory mechanisms.

Triggering Inspections. Only a minority of workplaces regulated by OSHA receive inspections during a given year. Thus, OSHA has a very limited "direct" impact. Further, the low percentage of covered sites that OSHA actually inspects also reduces its "threat" effect, since a low probability of receiving an inspection reduces the incentives for employers to comply with OSHA on their own.

By combining data on inspection frequency from OSHA records with data on the number of establishments in the construction industry, we can calculate the probability of inspection for union and nonunion establishments of comparable size. Table 2 presents these results for the construction industry.⁹

Table 2
*Probability of OSHA Inspection
in Union and Nonunion Establishments, 1985*

Size (No. Employees)	Union	Nonunion
0-99	.17	.13
100-249	.36	.13
250-499	.40	.12

Unions dramatically increase the chance of being inspected in the construction industry. For the smallest construction sites, unions increase inspection probabilities slightly, with a 17 percent probability for union establishments versus 13 percent for nonunion sites. This difference grows with establishment size, increasing finally to a 40 percent chance of inspection for large union construction establishments versus only a 12 percent probability for nonunion sites of the same size.

Increasing the probability of inspections affects both aspects of OSHA implementation. First, a higher number of inspections in the unionized sector means more surveillance of working conditions in that sector. Second, the higher *probability* of receiving an inspection in the unionized sector increases the incentives for all unionized employers (whether they are inspected or not) to comply with safety and health laws.

Inspection Intensity. OSHA guarantees employees a right to accompany OSHA inspectors during their workplace tour—the so-called walkaround right. When there is no walkaround right, inspectors undertake their inspection alone or, more typically, accompanied by an employer representative. In theory, the walkaround right ensures that OSHA personnel hear about and address problems that concern employees. Thus, to the extent that OSHA inspectors' discussions with employees reveal potential safety and health violations that might not be apparent to an inspector left on his own, the walkaround right improves the "intensity" of the inspection.

The union impact on the incidence of walkaround inspections is dramatic. Table 3 demonstrates that workers at union sites are far more likely to use their walkaround right. While 34 percent to 48 percent of OSHA inspections in unionized sites involved walkaround inspections, fewer than 5 percent did in nonunion inspections.

The greater frequency of walkarounds directly influences the length of an inspection. Table 1 dramatically supports this hypothesis. It presents the union/nonunion inspection duration differential (measured as hours of inspection per employee) for three groups after controlling for establishment size, firm size, and workplace conditions. For workplaces with fewer than 100 employees, inspections last an average of

Table 3
Exercise of Walkaround Employee Rights, 1985
(by size and union status)

Size/ No. of Employees	Union		Nonunion	
	No.	Inspections (% of all)	No.	Inspections (% of all)
0-99	5422	34.2%	530	2.3%
100-249	100	47.6%	7	4.6%
250-499	20	42.6%	1	3.7%

1.8 hours longer per employee in union construction sites, increasing to 3.3 hours per employee in large sites (the regression coefficients are highly significant).

Safety and Health Remediation. OSHA enforcement involves citing employers for violations of standards, levying penalties for those violations, and setting a deadline for correcting the violation ("remediation"). In construction, deadlines must be short to be effective, since the construction job is often finished within months.

Construction unions can potentially improve remediation activity by participating in inspections. Under the Occupational Safety and Health Act, employees have the right to participate in setting initial abatement periods, which are set at the completion of the inspection. In that way they can insist that OSHA require contractors to correct violations as quickly as possible.

Table 1, compares the initial abatement periods set by OSHA in comparable union and nonunion establishments. Abatement periods equal the number of days between the date OSHA issues a citation and the date set for abatement of the violation. Thus, the shorter the abatement period, the shorter the amount of time workers face potential safety and health problems.

The estimated union effects from the regressions confirm the unions' positive impact on this critical aspect of OSHA enforcement. The regression estimates indicate that small-sized unionized construction employers have 1.3 fewer days to correct a violation than nonunion employers do. The difference in abatement period is 2.0 days shorter in large union construction establishments than in comparable nonunion ones. Because OSHA gives construction employers an average of six days to correct violations, these reductions equal a decrease of 22 percent (fewer than 100 employees) and 33 percent (250 to 499 employees). Although the regression model as a whole does not explain much of the overall variation in abatement durations, the significance of the union estimates demonstrate that union activity has an important impact on decreasing abatement periods.

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

The expected total penalty an employer faces depends on the expected number of violations found and the average penalty assessed for each violation. Unions potentially affect both elements of total penalty costs. Through walkaround participation, unions can increase the likelihood of an existing violation being discovered. Through participation in penalty setting, unions can also increase specific penalties, driving up the average penalty a violator can expect to pay. The analysis, therefore, examines the union effect on each of these elements separately.

The number of violations found on an inspection arises from the actual safety and health conditions at the workplace *and* the intensity of the workplace inspection.

Given that unions substantially improve OSHA inspection intensity, one would expect a higher number of violations per inspection in unionized workplaces *after holding constant differences in underlying safety and health conditions*.

Table 1 presents the estimated impact of unions on the number of violations cited per employee in the construction industry. The estimates hold establishment and company size and work condition constant thus providing a measure of the true impact of unions on the number of violations cited. Specifically, the results demonstrate that OSHA inspections uncover an average of 6 more violations per 100 employees on small sites than on comparable nonunion sites. This difference in inspection performance increases to an estimated 13 more violations per 100 employees in large sites than on comparable nonunion sites.

By raising the number of violations found during an inspection, the expected costs to an employer from an OSHA inspection increase, providing greater incentives to comply in future periods.

The cost of violating OSHA standards can also be raised by increasing the penalty level charged *per violation*. Penalty setting for serious violations under OSHA primarily arises from inspectors' judgment of violation severity. Unions can potentially increase penalties by ensuring that inspectors "stick to the book" and assess the maximum penalty for a violation or by affecting an inspector's assessment of the severity of the violation.

Table 1 presents the estimated impact of unions on penalty levels, holding constant workplace condition and company and establishment size. The estimated union effects on penalty per violation imply that unions *reduce* rather than raise the penalty level. Thus, in contrast to the effect construction unions have on the number of violations received in an inspection, they appear to have a reverse impact on penalties set per each violation received.

There are several possible explanations for the anomalous penalty result. Although formal OSHA rules do not dictate such a policy, OSHA inspectors might follow an informal "maximum total penalty" rule, where they establish a cap on the total penalties borne by an employer. Because union activity on inspections leads to a higher number of violations cited, inspectors might seek to stay within an overall penalty ceiling by decreasing the penalty paid per violation. A more intriguing explanation could be that, given the relatively short duration of construction projects, unions are more concerned with eliminating potential hazards immediately (hence, the union impact on abatement periods) and are willing to "trade off" higher penalties to achieve more immediate remediation.

V. Conclusions

The more complete exercise of workers' rights under OSHA laws leads to more stringent enforcement of safety and health standards in the unionized construction sector. Unions facilitate implementation by increasing both the direct effect of an inspection and the potency of the threat presented by OSHA.

Unions affect the direct effect of an inspection by improving the quality of OSHA monitoring. Specifically, this empirical study demonstrates a highly positive union effect on workers' exercise of their walkaround right; greater time spent by OSHA inspectors in union workplaces; and a higher percentage of physical inspections of union workplaces. Union inspections thus surpass nonunion inspections in both breadth and depth.

As a result of this increased intensity, inspections turn up more violations of OSHA standards in unionized workplaces than in nonunion workplaces *of comparable underlying safety and health conditions*. Finally, unions reduce the abatement period set by OSHA, forcing employers to "clean up" their work site in a shorter period of time. The short-term nature of construction work sites makes quick remediation of violations critical to improving safety and health.

Unions also increase the potency of the threat of an OSHA inspection. By initiating more inspections of workplaces, unions increase the overall probability of inspection. Thus, employers have greater incentives to comply with safety and health standards on their own. Further, unions increase the expected price of "getting caught" out of compliance by increasing the number of violations cited per inspection and, therefore, the overall penalty costs per inspection, although their effect seems to be somewhat counterbalanced by a negative impact on average penalty per violation. Given OSHA's inability to inspect even a small percentage of the workplaces they are mandated to protect, union enhancement of OSHA's threat effect is particularly important in achieving the level of enforcement envisioned under the act.

As a result of these significant differences in enforcement activity, a *de facto* "two-tiered" system of regulation has emerged in the construction industry. For the union sector, OSHA represents a real force in ensuring the enactment of safety and health standards, particularly in larger sites. For nonunion workers, however, OSHA has become the "toothless tiger" commonly cited by its critics.

Open-shop and nonunion construction contractors and subcontractors have grown rapidly over the past two decades. Allen (1988) demonstrates that the union share of construction employment has declined from almost 50 percent in 1966 to less than 33 percent in 1983. Given this precipitous decline and the "two-tiered" nature of regulation found in this study, OSHA's ability to maintain even the current level of protection of the average construction worker must be called into serious question.

NOTES

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¹The Laborers International Union in the New England area, for example, offers eleven courses, including two on safety: "Line Foreman Safety" and "Asbestos Removal Techniques." See New England Laborers Training Trust Fund (1988).

²One measure of the relative success of these training efforts on unionized construction workers can be found in a 1984 survey conducted by the Labor Institute for Public Affairs (LIPA). The LIPA survey found that 78 percent of union construction workers cited health and safety issues as a top concern at the workplace (in relation to other issues such as wages, job security, and benefits). This compares to union workers in manufacturing industries, where 53 percent of workers cited safety and health as a top concern, and workers in service industries, where only 29 percent registered such concern. Based on LIPA/Harris Union Image Survey, 1984.

³Typical is the UBCJA program initiated in the fall of 1982, which seeks to "educate rank and file membership about safety and health hazards and how to get them corrected" via publication of manuals, pamphlets, and articles in the *Carpenter* journal; organization of seminars held at local unions and district councils; and answering requests for technical assistance (primarily from business agents). See United Brotherhood of Carpenters and Joiners of America (1983a, 1983b).

⁴Mark Rothstein (1981, p.132) noted, "implementation of the Act's anti-discrimination provision has been seriously flawed. OSHA simply lacks the personnel and resources to investigate adequately and litigate employee complaints of discrimination."

⁵The Occupational Safety and Health Act allows states to administer their own safety and health programs if the state program is certified by OSHA. Certification requires the state to prove that it provides at minimum the same level of enforcement and safety and health provision as the federally operated programs. The states that run their own program and, therefore, are not on the data base are: 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.

⁶In much of its inspection activity, OSHA targets larger rather than smaller establishments. Unions also tend to devote more attention to larger establishments, particularly in terms of the amount of time business agents devote to that work site.

⁷If unions affect the inspectors' assessment of a violation's severity, it could bias the union coefficient estimates in the study, since work condition variables are based on inspection record data. If unions lead inspectors to increase assessment of a violation's severity, a union establishment will be rated as "more dangerous" than a comparable nonunion establishment. Although this makes the working condition variables endogenous rather than exogenous to the model, the direction of the bias will make the resulting union estimate a *lower-bound* one, since some of the measured impact of the working conditions variables are actually attributable to the union.

⁸Work sites with more than 500 employees were not included due to the small number of such large sites, particularly in the nonunion sector.

⁹Because the OSHA data base does not include the total number of establishments in an industry, it was necessary to make a separate calculation of this number using the following steps. First, the total number of establishments per size group was found for the twenty-eight states included in the data base. These numbers were taken from U.S. Department of Commerce (1985). Second, the number of establishments per size group was multiplied by 1980 unionization levels drawn from Kokkelenberg and Sockell (1985). This resulted in a base number of establishments by union status and establishment size. Third, the total number of inspections by union status and size was divided by the number of establishments for that grouping, resulting in the proportion of establishments inspected in a year. These proportions are presented in Table 2 as inspection probabilities.

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