PUBLIC ENFORCEMENT/PRIVATE MONITORING: EVALUATING A NEW APPROACH TO REGULATING THE MINIMUM WAGE

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This paper examines compliance with federal minimum wage laws in the U.S. apparel industry and analyzes the impact of new methods of intervention designed to improve regulatory performance. Drawing on data from a randomized survey of apparel contractors, the author evaluates the impact of agreements between manufacturers and the government used to monitor contractor behavior as a means of improving compliance outcomes. Several non-regulatory variables predicted by theory to be important influences—the level of work skills, for example, and product market factors related to the elasticity of labor demand—are indeed found to be correlated with compliance. Nonetheless, stringent forms of contractor monitoring are associated with substantial reductions in violations of minimum wage standards. The results suggest that well-designed public/private monitoring efforts can lead to significant improvements in compliance with labor standards.

The economic repercussions of minimum wages, and especially their employment effects, have attracted intense academic interest over the past decade (for example, Card and Krueger 1995). In contrast, since the seminal article by Ashenfelter and Smith (1979), comparatively little empirical attention has been paid to the compliance behavior of employers who are subject to the minimum wage. Yet there are strong reasons to believe that many employers will choose to violate minimum wage standards when they evaluate the benefits and costs of compliance (Stigler 1970; Shavell and Polinsky 2000). In general, the incentives not to comply grow with the divergence between the wage that employers desire to pay their work force and the mandated minimum wage. This divergence, in turn, is a function of features of the labor market facing the employer.

Workers in low-wage industries are particularly likely to receive wages below the statutory level to which they are entitled.

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A data appendix with additional results, and copies of the computer programs used to generate the results presented in the paper, are available from the author at Boston University, School of Management, 595 Commonwealth Avenue, Room 520A, Boston, MA 02215; davweil@bu.edu.

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One such industry is apparel, which has long exemplified the difficulties of enforcing minimum labor standards—so much so that it continues to be identified in the public mind with the "sweatshop" problem. In 1893, the Committee on Manufactures of the House of Representatives released a report regarding its investigations of the sweating system of production (U.S. Congress 1893). Among other findings, the Committee concluded that 80% of production originated in sweatshops. Several years later, President McKinley appointed a commission made up of members of Congress and private citizens to study the problem. Over the four years of the commission's existence (1898–1901), it documented extensive abuses, including long hours, low pay, and unsanitary conditions (Industrial Commission 1901).[1]

This article examines the determinants of compliance with minimum wage laws by empirically examining recent (year 2000) micro data from the U.S. apparel industry. Many features of the apparel labor market lead to wide-scale problems of noncompliance among the network of small contractors with whom most workers are employed. I focus on the impact of a novel regulatory strategy that attempts to increase compliance with minimum wage standards by creating agreements between the government and manufacturers requiring the latter to monitor the pay practices of their contractors. The resulting arrangements attempt to use government pressure on higher levels of an industry supply chain to change the behavior of lower level contractors that would face strong incentives to violate labor standards absent that pressure. To examine the impact of these monitoring arrangements, I model the determinants of compliance that the minimum wage literature predicts influence employer behavior. The analysis draws on a unique set of data arising from the U.S. Department of Labor's random inspection-based surveys of apparel contractors in the Los Angeles area. The data provide multiple measures of compliance outcomes, the specific nature of monitoring arrangements under which a contractor operates, and detailed employer characteristics.

Background

Economics of Minimum Wage Compliance

Several articles, in a series beginning with Ashenfelter and Smith (1979), have analyzed the economic calculus of compliance as it applies to minimum wages. In their article, Ashenfelter and Smith showed that a profit-maximizing firm selling output at price p and able to employ workers L at a wage rate w, an elasticity of demand for labor η, and other factors of production at price r will decide whether to comply with the minimum wage by balancing the expected costs of paying the mandated wage M against the expected cost of non-compliance. The latter reflects the probability of being caught (λ) and incurring a penalty D compared to the chance of not being caught and paying wages below the mandated minimum wage w. Ashenfelter and Smith showed that an employer will choose noncompliance when

$$(1) \qquad E(\Pi) - \Pi(M,r,p) = (1-\lambda)[\Pi(w,r,p) - \Pi(M,r,p)] - \lambda D > 0.$$

In (1), the employer balances the expected profit from not complying ($E(\Pi)$) against the profit known with certainty if the firm chooses to comply with the standard ($\Pi(M,r,p)$). Equation (1) predicts that noncompliance will rise with the divergence between the mandated wage and the market wage and fall with either increased probability of detection or higher penalty levels.

Given the tradeoff between compliance and noncompliance in (1), Ashenfelter and Smith showed that an employer will choose not to comply if the expected benefit arising from paying below the minimum wage is greater than the expected penalty arising from non-compliance, or:

[1] A discussion of the history of regulating labor standards in the apparel industry can be found in Abernathy et al. (1999), Chapters 2, 10, and 15.

$$(2) \qquad (1-\lambda)[L(M-w) - (L/w)[.5(M-w)^2\eta]] > \lambda D.$$

The expected penalty is simply the probability of being caught (λ) multiplied by the penalty D. The expected benefit of not complying is the chance of not being detected ($1-\lambda$) multiplied by the total labor costs saved by paying workers below the statutory minimum. The benefit of not complying grows with the amount of underpayment, both because of the labor savings from the underpayment of a work force of a given size [$L(M-w)$] and because of the increasing benefit from the employment effects of underpayment (the second term in the benefit side of equation 2). In particular, the incentive not to comply grows as a function of three employer characteristics:

- Correlates that would lead the market wage to be substantially below the statutory wage ($M-w>0$), such as low skill requirements for the required labor;
- Increases in the absolute value of the elasticity of labor demand (η), as measured by factors such as skill content, capital intensity, and other Marshallian factors of derived demand; and
- Employer business characteristics that lower the probability of detection of noncompliance (λ), such as high levels of industry exit and entry, small average establishment size, and an ability to evade public scrutiny by operating in the underground economy.

Conversely, government regulators can raise the incentives for employers to comply (holding constant the characteristics of contractors listed above) by two means:

- Increasing the probability of violation detection (λ) by increasing the probability of inspection, increasing the chance that those inspections uncover violations, or both;
- Increasing the expected penalty levied for non-compliance with the law (D).[2]

[2]Grenier (1982) modified the Ashenfelter and Smith analysis by noting that under the Fair Labor Standards Act, the government neither levies penalties for first-time violators nor, typically, assesses high penalties for repeat offenders. Instead, the Wage and Hour Division (the arm of the U.S. Department of Labor with authority for enforcing the Fair Labor Standards Act) requires offending employers to pay back wages to employees who have been underpaid during the period of time covered by the inspection (that is, an amount equal to $M-w$). Grenier pointed out that since the typical "penalty" facing a firm is a fraction of the underpayment in wages, the penalty effect is far smaller than implied by the Ashenfelter and Smith model (which assumed a lump sum penalty of "D"). Chang and Erlich (1985) modified the penalty function by allowing it to grow with the degree to which the actual total wages paid by the contractor are lower than the mandated wages for the work force. This modification in the model (which brings it closer to the actual penalty policy pursued by WHD) led them to conclude that a "minimum wage enforcement policy requiring the violating firm to pay only a fraction of the difference between the statutory minimum and the market wage per unit labor will not constitute an effective deterrent" (p. 87).

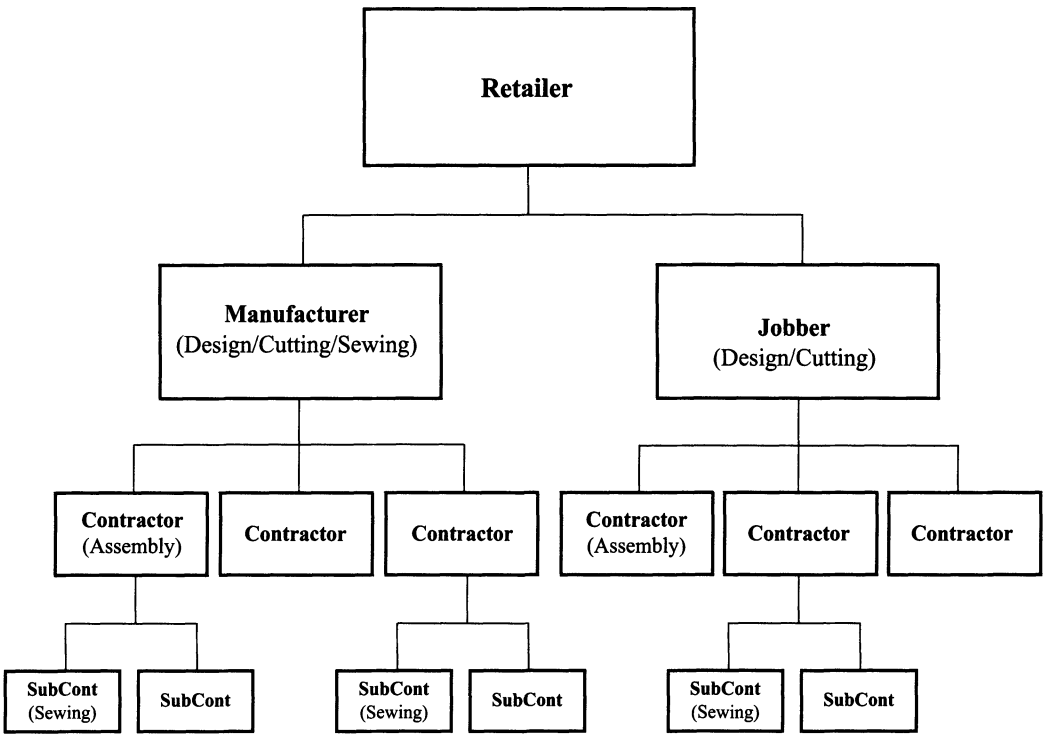
Apparel Industry Dynamics and Employer Compliance

Product and labor markets in the apparel industry have many of the features that would lead one to predict high rates of noncompliance with minimum wage standards. In particular, the women's segment of the industry has been characterized by a splintered production system, with different enterprises carrying out the design, cutting, sewing, and pressing/packaging of apparel products (see Figure 1).[3] For example, a "jobber" may sell a design to retailers, and then contract with a manufacturer for delivery of the product. Manufacturers typically purchase and cut garment fabrics, but then contract out sewing to one or more companies (which may, in turn, further contract out sub-assembly). Contractors compete to preassemble bundles of cut garment pieces in a market where there is little ability to differentiate services (that is, sewing and associated assembly) except for some operations requiring higher skills.

In general, as one goes to "lower" levels of apparel production (moving from the top to the bottom of Figure 1), the level of

[3]In the United States, men's clothing—from the 1920s onward—has primarily been produced in factory-type settings, with manufacturers designing, cutting, sewing, pressing, and packaging products.

Figure 1. Structure of Retailer-Manufacturer-Contractor Relations.



competition intensifies and the profit margin per garment diminishes. Sewing contractors compete in a market with large numbers of small companies, low barriers to entry, and limited opportunities for product differentiation. This creates classic conditions for intense price-based competition. Labor market conditions also tend to push wages toward the legal minimum or below. Entry-level sewers can typically reach the standard rate for sewing in a matter of months, making it relatively easy to substitute workers in the event of turnover (Abernathy et al. 1999). Given their low skill requirements, the apparel industry and sewing have always been attractive to immigrants. At the turn of the twentieth century, for example, Slovaks, Germans, and Jews were heavily represented in the industry's work force, and today many garment workers are Hispanic, Chinese, and Asian (Kwong 1997; also see Commons 1901). The consequent elastic supply of workers and the relatively low skill level demands for them keep wage levels low and the incentive to work long hours—even in inhospitable work environments—high. Given these market features, non-compliance with laws regulating labor conditions has historically been a problem among the large number of contractors and subcontractors that assemble apparel.

Regulatory attention has historically been focused at the contractor level of the industry.[4] Table 1 presents characteristics of

[4]Minimum wages (as well as regulation of child labor and of overtime compensation beyond 40 hours in a work week) are set out in the Fair Labor Standards Act (FLSA) of 1938. Enforcement of the FLSA is carried out by investigators of the Wage and Hour Division (WHD), located in 400 offices around the country.

Table 1. Enforcement of the FLSA in the U.S. Apparel Industry, 1996–2000 (Quarterly).

Quarter	*No. of Investigations*	*Back Wage per Employee*[a]	*Civil Fine per Violator*[b]	*Back Wage per Violator*[c]	*% Investigations w/ Violations*[d]
1996-Q3	223	$281	—	$5,338	58.7%
1996-Q4	194	$356	$919	$6,663	60.8%
1997-Q1	293	$376	$1,597	$6,727	42.0%
1997-Q2	212	$356	$511	$4,772	48.1%
1997-Q3	268	$495	$2,434	$11,296	39.9%
1997-Q4	212	$330	$1,135	$6,175	46.7%
1998-Q1	221	$268	$619	$4,132	36.2%
1998-Q2	201	$432	$1,094	$6,623	49.3%
1998-Q3	232	$347	$819	$5,590	54.3%
1998-Q4	154	$345	$1,960	$6,191	63.6%
1999-Q1	175	$493	$2,462	$11,567	31.4%
1999-Q2	82	$280	$2,352	$4,942	37.8%
1999-Q3	205	$380	$758	$8,232	53.2%
1999-Q4	115	$475	$1,136	$9,625	65.2%
2000-Q1	94	$462	$495	$10,278	41.5%
2000-Q2	100	$687	$1,079	$39,025	46.0%
2000-Q3	120	$1,028	$942	$24,769	53.3%
2000-Q4	125	$662	$3,750	$11,454	58.4%
Mean	179.2	$447	$1,337	$10,189	48.8%
Median	197.5	$378	$1,086	$6695	48.7%
S.D.	61.8	$187	$927	$8,611	9.9%

[a]Calculated as the total value of back wage settlements divided by the total number of workers receiving back wages. Back wage settlements with workers during the quarter include payment for minimum wage and overtime wage violations documented by the Wage and Hour division in the course of its investigations.

[b]Calculated as the total value of civil penalties divided by the number of employers with violations of labor standards. Civil penalties represent fines to employers above and beyond back wage settlements assessed (but not necessarily collected) during the quarter.

[c]Calculated as the total value of back wage settlements divided by the number of employers with violations of labor standards during quarter.

[d]Calculated as the total number of investigations with one or more violations of the FLSA divided by the total number of investigations during the quarter.

Source: Author's calculations based on data from the U.S. Department of Labor, Wage and Hour Division, Garment Enforcement Reports (issued quarterly).

FLSA enforcement in the apparel industry since 1996 that can be used to assess the economics of compliance for the typical contractor. The WHD conducted a total of 3,226 investigations in the garment industry between the final two quarters of 1996 and the fourth quarter of 2000, or about 200 inspections in a typical three-month period. This inspection activity translates into an annual probability that a given contract shop will receive an inspection (λ) below 0.10.[5] Penalties under the FLSA are the civil penalties levied by WHD inspectors based on the scale and severity of noncompliance detected, as well as on the contractor's past history.

Applying the enforcement outcomes in Table 1 to the employer trade-off depicted

[5]This is based on the following calculation. There were roughly 10,000 establishments in the segments of the apparel industry that are the focus of WHD regulation. Given that WHD investigators conducted about 800 investigations annually, the annual probability of inspection is about .08. Focusing on one particular city yields similar estimates: for example, in 1998, New York City had about 2,600 apparel establishments and was the scene of 260 investigations, for an inspection probability of .10.

in equation (2), the values for the above equation can be roughly estimated for an apparel contractor with 35 workers. Given an average annual underpayment per worker ($M - w$) of \$338,[6] a median civil penalty (D) of \$1,086, and an average annual likelihood of inspection (λ) of .1, and assuming a relatively high labor demand elasticity (η) of −1.5, the potential cost of not complying is \$121 versus a benefit of \$12,205, implying that an apparel employer should clearly choose not to comply.[7]

The incentives for noncompliance are further compounded by two factors: (1) contractors are not subject to civil penalties the first time they are found out of compliance with the law, thereby setting the value of D essentially to zero for first-time offenders; and (2) a high proportion of contractors do not stay in business for more than two years. We can do a simple simulation for an employer facing the compliance decision for two time periods, where the employer's initial risk of detection, λ_{t1}, is 0.1. If the contractor is inspected in the first period and is found in violation of the minimum wage law, we assume that the chance of an inspection in the second period doubles ($\lambda_{t2} = 0.2$); if the contractor is caught out of compliance in the first period, it must pay the back wages to underpaid workers, but no penalty. If caught a second time (and assuming the same average underpayment), the contractor must pay back wages plus the average expected civil penalty. Finally, we assume that in each period, a contractor faces a 0.80 probability of surviving to the next period. Under these conditions, a contractor should choose to underpay workers and violate minimum wage standards in periods 1 and 2. In fact, the incentives facing contractors are such that an employer will choose noncompliance even when found in violation of minimum wage requirements in the first period and facing a higher inspection probability and civil penalty in the second period.[8]

New Methods of Regulatory Enforcement

Product market forces have been modified in recent years by a new dynamic in the channel of relations between retailers—apparel manufacturers—and textile producers. A new model of retailing—"lean retailing"—takes advantage of information technologies such as bar codes and scanners, electronic data interchange, and industry-wide product identification standards to achieve a closer alignment between real-time sales data collected by retailers and the orders they place with suppliers. By improving retailers' information about the underlying state of consumer demand, this system reduces their need to stockpile large inventories, thereby lowering the costs associated with stock-outs, markdowns, and inventory, as well as reducing retailers' overall exposure to inventory risk. The companies that have adopted lean retailing principles now dominate major retail segments (Abernathy, Dunlop, Hammond, and Weil 1999).

Retailers using these systems require suppliers to provide more frequent and smaller orders of products than under the traditional retail system. They also require ap-

[6]This estimate of underpayments is based on the randomly selected set of first-time violators used for the empirical portion of this paper (see below). I do not use the back wage information from Table 1 because these data are based on contractors that, having been the target of enforcement actions, were not typical of the industry as a whole.

[7]Given the above, and assuming annual wages (w) of \$8,000, the first term in the left-hand part of the equation is \$11,830 and the second term is -\$375 (given the elasticity of −1.5); subtracting the second (negative) term from the first leads to an estimated benefit of \$12,205 for not complying. The estimate is an approximation because it uses observed levels for several key factors—in particular, back wages owed to estimate ($M - w$), and the annual probability of inspection rather than the perceived inspection probabilities, neither of which is directly observable.

[8]Contractors will also choose not to comply in a three-period model even with similar escalation of inspection probabilities and penalties. These results are available from the author.

parel suppliers to meet rigorous logistic standards concerning delivery times, order completeness, and shipment accuracy. Lean retailing therefore changes the problem faced by apparel suppliers: suppliers must replenish products on an ongoing basis, with some retailers now requiring replenishment of electronic orders in as few as three days. The change in retailer-supplier relations makes anything that disrupts the ongoing replenishment of retailers a major problem for apparel suppliers: replenishment interruptions lead to penalties, cancellation of orders, and even loss of retail customers for those suppliers. Given that retailers drive the dynamics of the apparel markets depicted in Figure 1, the increasing importance of time translates into a potential tool of regulatory enforcement.

Beginning in 1996, the WHD shifted its enforcement focus in response to these new relations in the apparel channel. Rather than regulate labor standards one contractor at a time, the WHD employed time sensitivity of lean retailers to exert regulatory pressure by invoking a long-ignored provision of the FLSA, Section 15(a). Under Section 15(a), the "hot cargo" provision, WHD can embargo goods that have been manufactured in violation of the Act. Although this provision had limited impact in the traditional retail-apparel relationships given the long delays in shipments and the presence of large retail inventories, its invocation now raises the costs to retailers and their manufacturers of lost shipments and lost contracts.

In addition to ensuring that back wage claims are resolved, the new WHD policy uses the threat of embargoing goods to persuade manufacturers to augment the regulatory activities of the WHD. It does so by making the release of embargoed goods contingent on the *manufacturer's* agreement to create a compliance program for all contractors to whom it subcontracts work. The manufacturer must sign two types of agreements: one with the Department of Labor, stipulating the basic components of a monitoring system that will be maintained by the manufacturer (or jobber);[9] and one with the manufacturer's contractors, setting out how the contractors will seek to comply with FLSA standards (U.S. DOL 1998, 1999; Ziff and Trattner 1999; Weil 2002).

For the economics of compliance arising from this regulatory approach to change behavior, manufacturer monitoring must substantially change the chances of detection (λ) and penalties (D) for contractors. For example, if manufacturer monitoring arrangements doubled the annual expected probability of detecting violations to .2, the effective penalty facing a contractor would need to be $48,819 to induce compliance for the median contractor; if the chance of detection rose to .33, the penalty would still need to be $24,780, more than twenty times the current level. I study whether the behavior of contractors under monitoring implies such dramatic changes in the underlying incentives to comply with minimum wage standards.

Data and Descriptive Statistics

Data Source

The data for this study arise from surveys conducted by the U.S. Department of Labor Wage and Hour Division (WHD) of randomly selected apparel contractors in the Los Angeles area garment industry. The universe for the year-2000 random survey was comprised of all apparel industry firms appearing on the California manufacturing registration list for that year.[10]

[9]These agreements, however, are voluntarily entered into by the manufacturer, and their terms are therefore worked out between the government and the manufacturer/jobber. The terms described here are taken from the Department of Labor's model agreement language specified in formal policy documents (see Wage and Hour Division 1998).

[10]The California registration list for apparel consists of "all persons or firms engaged in the business of apparel manufacturing," where apparel manufacturing is defined as "sewing, cutting, making, processing, repairing, finishing, assembling, or otherwise preparing any garment or any article of wearing apparel or accessories designed or intended to be worn by any individual."

Table 2. Regulatory Performance, Los Angeles, 2000.

Description	*(1) Mean*	*(2) First Time*	*(3) Previous Violation*	*(4) Difference*
Employer Non-Compliance with Minimum Wage Standards	0.54	0.54	0.56	−0.02
Number of Employees with Minimum Wage Violations	8.1 (15.5)	6.50 (11.5)	11.1 (20.9)	−4.6 (3.22)
Minimum Wage Back Wages Findings ($/Contractor)	3,695.8 (11,102.6)	1,999.1 (4,597.3)	6,853.7 (17,424.6)	−4,854.6** (2,257.95)
Number of Employees with Minimum Wage Violations per 100 Workers	27.2 (34.8)	27.4 (34.1)	26.8 (36.5)	0.6 (6.67)
Minimum Wage Back Wages/Week/ Employee ($)	5.1 (10.6)	6.5 (12.2)	2.5 (6.4)	4 (2.17)

Notes: Standard errors are in parentheses. Column (1) depicts the sample means of the combined sample: recidivism and non recidivism, without any use of weights. Column (2) is based on the random sample of all apparel enterprises in Los Angeles. Column (3) is based on the random sample of prior FLSA violators. See the text for description of these samples.

*Statistically significant at the .10 level; **at the .05 level.

Using this comprehensive list of apparel manufacturers and contractors as the sampling universe, the WHD randomly selected establishments representing contractors operating in 2000.

Because of the high rate of turnover of contractors, a separate subsample was created to represent contractors that had been previously inspected and found in violation of the Act. A list of all contractors found in violation of the FLSA in the prior two years was assembled and a random sample of them selected. Because the group of prior violators is over-sampled as a result of this procedure, the entire sample is re-weighted according to the expected percentage of prior violators that would be present in a randomly selected sample given an underlying level of non-compliance of .55, an annual probability of inspections of .10, and annual contractor turnover of 25%.[11] Based on this, I re-weight the data in the regression analysis so that about 17% of the sample consists of observations for the prior violators.

[11]These are based on estimated levels of non-compliance and contractor turnover from the sample of non-violators and an estimated inspection probability from industry data as set out in footnote 5.

Contractors selected from both lists received an "inspection-based survey" by WHD investigators that included a review of all payroll records for the prior 12-week period. The payroll review is similar to that conducted by WHD in regular inspection activities. In addition, the investigators collect information on other aspects of the contractor's business, including employer size, years of operation, business structure (for example, corporation or partnership), and types of products assembled. Information on the number of manufacturers for whom the contractor worked over the past six months and whether or not those manufacturers had monitoring programs is also collected.

Compliance Measures and Descriptive Statistics

Table 2 provides descriptive statistics regarding different measures of minimum wage compliance for the sample as a whole and broken out by those contractors that had never received prior inspections and those with prior violations. In terms of overall compliance, 54% of contractors surveyed were not in compliance with minimum wage provisions of the FLSA, with an average of 8 employees per contractor un-

derpaid in some way (unconditional on compliance behavior). A typical contractor owed about $3,700 in back wages for the time period under study. Given that contractors in the sample differ in size and that there is some variation in the period of time of payroll review, standardization of these estimates is desirable. One standardized measure used throughout this study is the average number of workers who were underpaid per 100 production workers employed. A second standardized measure is the average back wage owed per week per employee. These estimates are provided in the final two rows of Table 2.[12] With respect to these standardized measures of compliance, the differences in levels between contractors that had no prior violations and those with prior violations are not statistically significant.

The measure of performance typically employed in regulatory evaluations is employer compliance with promulgated standards. In the case of the minimum wage, a contractor is considered out of compliance if one or more employees are found to have been underpaid during the investigation period. The obvious problem with this approach is that it does not differentiate between employers who underpay a small fraction of their work force from those who underpay a large proportion, or between cases where employees experience gross underpayment in wages and cases where the typical infraction is minor.

The economics of minimum wage compliance and the impact of government interventions may differ dramatically according to what measure one employs. For example, government interventions could have limited impact on the overall likelihood of violations (measured as one or more violations of the Act) even while substantially lowering the number of violations per contractor, or the average severity of those violations. Accordingly, I measure contractor compliance behavior in terms of (1) overall likelihood of compliance (the traditional measure of compliance); (2) *incidence* of violations (measured as the number of violations per 100 workers employed); and (3) *severity* of violations (measured as the back wage owed per week per worker).

Table 3 provides all three measures of compliance, and compares them across contractors with different characteristics.[13] Minimum wage violations are pervasive in the sample using all three measures of compliance: about 46% of employers comply with the statutory minimum wage; more than 27 of every 100 workers experienced some degree of underpayment; and in terms of seriousness, the violations are equivalent to underpaying every worker on an employer's payroll by about $5.00 per week (in an industry where average hourly earnings were approximately $8.00 in 2000).

Table 3 also provides evidence consistent with the predictions of the minimum wage literature surveyed above. For example, theory would predict that firms with less elastic demand for labor—because of the skill content either of the work or of its labor force—will be less likely to violate minimum wage laws. One proxy for skill content is the type of garment produced by a firm: T-shirts require low levels of skill (that is, short periods of time for sewers to achieve desired levels of productivity). In contrast, dresses and jeans require higher degrees of sewing skill (with six to eight months' training generally needed to reach desired productivity). As predicted, compliance performance is lower for T-shirts in

[12]The comparatively large size of back wages owed per contractor among prior violators relative to first-time violators reflects a longer investigation period used by the WHD when surveying prior violators. For this reason, I use back wages owed per worker per week to provide a standardized measure of regulatory performance.

[13]Incidence and severity measures in Table 3 are unconditional on underlying compliance (that is, they represent the average of those measures across contractors with and without violations of the minimum wage standard).

Table 3. Compliance and Regulatory Performance by Contractor Characteristics, Los Angeles, 2000. (Standard Errors in Parentheses)

	Percentage of Employers Not Complying	*Minimum Wage Violations per 100 Employees*	*Back Wages Owed per Worker per Week ($)*
Overall Compliance	0.544	27.2 (34.8)	5.12 (10.64)
Quartile 1: Size ≤ 14	0.607	39.0 (38.8)	7.57 (13.32)
Quartile 2: 26 ≥ Size ≥ 15	0.583	21.7 (29.1)	3.24 (8.60)
Quartile 3: 49 ≥ Size ≥ 27	0.577	24.5 (32.9)	5.72 (11.51)
Quartile 4: Size ≥ 50	0.400	22.0 (35.7)	3.56 (7.69)
Contractor's Business ≤ 2 Years Old	0.660	34.9 (36.5)	7.60 (13.21)
Contractor's Business > 2 Years Old	0.446	20.8 (32.2)	3.03 (7.36)
No Pricing Power: Contractor Is Unable to Renegotiate Price If Delivery Time Changed	0.616	31.1 (35.3)	6.02 (11.42)
Pricing Power: Contractor Is Able to Renegotiate Price If Delivery Time Changed	0.176	7.2 (24.3)	0.56 (1.59)
Contractor Produces T-Shirts	0.677	31.5 (36.3)	5.36 (11.03)
Contractor Produces Dresses	0.590	26.4 (32.4)	4.45 (8.85)
Contractor Produces Jeans	0.429	24.2 (38.4)	4.48 (9.85)
N	103		

all three dimensions than for jeans and dresses.

Similarly, theory would predict that the more elastic the demand for the product (and therefore the demand for labor), the more likely that firms will violate minimum wage standards. One proxy for price elasticity is pricing power, measured here as the contractor's self-reported ability to renegotiate price if the delivery time for a garment is moved up by the manufacturer customer. Contractors who report an ability to change their prices have a far lower likelihood of being in violation of minimum wages (.176 versus .616) and a far lower incidence of violations (7.2 versus 31.1), and the severity of their violations is much lower than that for contractors lacking this ability (average per-worker back-wage liability of $0.56 versus $6.02). The effects of contractor size and age are also generally consistent with those predicted by theory: larger contractors have a lower likelihood of being out of compliance with minimum wage laws and have correspondingly lower incidence and severity levels than small contractors; and a similar positive relationship is found between compliance and the age of the business. The mean values of these contractor characteristics are provided in the first column of Table 5 and discussed in greater detail below.

Table 4. Monitoring Activity.

Monitoring Activity	*Frequency*
Monitoring Activity Employed by Manufacturer	
Manufacturer Reviews Payroll	0.602
Manufacturer Reviews Time Cards	0.633
Manufacturer Conducts Employee Interviews	0.561
Manufacturer Requires Contractor to Provide Minimum Wage Information	0.561
Manufacturer Discloses Problems with MW to Contractor	0.439
Manufacturer Recommends Corrective Action to Contractor	0.429
Manufacturer May Conduct Unannounced Visits	0.592
Type of Monitoring	
Low Monitoring: One or More Monitoring Activities by One or More Manufacturers	0.735
High Monitoring: Payroll Review and Unannounced Inspections by All Manufacturers	0.299
N[a]	98

[a]Five observations were omitted because the randomly selected establishment was a manufacturer. The empirical analysis draws on the remaining 98 observations.

The Impact of Contractor Monitoring on Compliance

Incidence of Monitoring

The frequencies of different types of arrangements used by manufacturers to monitor their contractors are presented in Table 4.[14] The upper part of the table indicates, for each of seven monitoring practices, the percentage of contractors that had worked in the previous six months for at least one manufacturer employing that practice. For example, 59% of all Los Angeles contractors surveyed did work for at least one manufacturer that conducted unannounced visits.

Although there are many possible combinations of the different monitoring activities, certain combinations have larger potential effects on contractor behavior than others. I focus below on specific combinations of monitoring activities, grouped into two categories, "low" and "high" monitoring, that indicate the stringency of monitoring arrangements under which a contractor operates. The category *low monitoring* is assigned to contractors who report that at least one of their manufacturers conducts at least one of the seven monitoring activities. It therefore represents the presence of *any* monitoring activity. About 74% of the contractors in Los Angeles could be classified as operating under low monitoring.

High monitoring is defined according to the presence of two specific monitoring features: payroll review and unannounced inspections. This combination of monitoring activities provides manufacturers with the means to assess the presence of minimum wage violations (via payroll review) and a way to accurately assess contractor operations (via unannounced visits). I focus on these two features because of their consistently important impact on performance and their complementary fit with each other.[15] High monitoring occurs when

[14]In the random surveys, contractors are asked to specify the names of manufacturers or jobbers (or both) for whom the contractor provided services over a specified time period, and the monitoring activities (if any) that were conducted by those manufacturers. I use this information to create the different categories of monitoring discussed in the text.

[15]I arrive at this particular combination of monitoring activities as the focus of subsequent empirical analysis through a factor analysis of the seven monitoring activities as predictors of compliance behavior. These results are available from the author. The importance of the two attributes is also supported by discussions with WHD investigators.

all of a contractor's manufacturing customers have *both* payroll review and unannounced visits in place—indicating a fairly stringent level of monitoring. The frequency of high monitoring was about 30%.

Statistical Model of Compliance

Given the economics of minimum wage compliance and the expected impact of monitoring, the overall likelihood, incidence, and severity of minimum wage noncompliance observed at contractor i can be modeled as

$$(1) \qquad \text{MinWagePerf}_i = f(\text{Monitoring}_i, \text{LaborDemand}_i, X_i),$$

where MinWagePerf is the minimum wage performance of contractor i (likelihood, incidence, and severity of non-compliance); Monitoring is the presence and stringency of monitoring by manufacturers; LaborDemand is the elasticity of labor demand arising from Marshallian factors such as the skill level of a contractor's work force and the elasticity of product demand; and X is a vector of other employer characteristics that are correlated with minimum wage performance, including size, the age of the business, and prior inspections by WHD.

The effects of factors relating to the elasticity of labor demand have been discussed above. I capture contractor features associated with skill level by including a variable for T-shirts, the product demanding the lowest-level skills. For product market influences on labor demand, I use the response to survey questions regarding the contractor's ability to change price in the event that a manufacturer moves up the delivery date of a product ("pricing power").[16]

I use the above definitions of monitoring to estimate the *incremental* effects of having no monitoring, some ("low") monitoring, or stringent ("high") monitoring.[17] As a result, the coefficient on the low monitoring variable can be interpreted as the marginal effect of any monitoring relative to no monitoring, and the coefficient on high monitoring as the marginal effect of high monitoring versus any monitoring.[18] Finally, I include variables for contractor age (measured as a dummy variable for those contractors that have been in business for more than two years) and size, as well as a dummy variable equal to one if the contractor had prior violations of the minimum wage.

Likelihood of Non-Compliance

In order to gauge the impact of monitoring on the likelihood of overall non-compliance (measured as the presence of any minimum wage violation by the contrac-

[16]Contractors are coded as having an ability to influence price if they both answered "yes" to the question "If manufacturers change the due date (move it up), do you renegotiate the contract cost with the manufacturer to adjust for any added expenses?" and indicated that they renegotiate such costs "sometimes," "50/50," "frequently," or "always."

[17]In the data, low monitoring is therefore always equal to 1 if high monitoring is equal to 1.

[18]The estimated monitoring effects should be considered carefully. Because the agreement to monitor contractors is made between the manufacturer and the WHD, coverage is not directly determined by the contractor. Since a typical contractor works for multiple manufacturers, some of which are subject to monitoring requirements and some of which are not, an effect of monitoring on compliance cannot simply be regarded as an artifact of self-selection by contractors. At the same time, one cannot regard monitoring as completely exogenous. Manufacturers wary of future embargos who enter into contractor monitoring agreements will engage in two types of activities: attempting to change the behavior of contractors, and selecting contractors that have a higher probability of paying their workers the minimum wage. Because of the latter activity, monitoring—although not chosen by the contractor—is endogenous in that the selection criterion used by the manufacturer (reduce the chance of a goods embargo) is correlated with contractor compliance. I attempt to decompose these effects in the next section. It should be noted that in the case of measuring the overall impact of monitoring, both effects can be attributed to the intervention. Thus, although endogeneity of monitoring cannot be ruled out, both manufacturer effects are relevant to the question of whether monitoring improves contractor behavior.

Table 5. Logit Regressions of Determinants of Employer Noncompliance with Minimum Wage Standards, Los Angeles, 2000. (Standard Errors in Parentheses)

Variable	*Mean*	*Estimated Logit Coefficients*	*Estimated dY/dX*
Dependent Variable:			
% Non-Compliance among Contractors	0.456	0.456	—
Low Monitoring	0.735	−1.50*	−.323
		(0.84)	
High Monitoring	0.299	−1.28**	−.309
		(0.60)	
Pricing Power	.165	−1.80**	−.416
		(0.83)	
Ln(Size)	3.24	−0.29	−0.07
		(0.41)	
T-Shirt	.30	1.16*	.261
		(0.66)	
Business > 2 Years Old	.521	−.63	−.151
		(0.57)	
Prior Violator	.35	0.40	.096
		(0.62)	
Constant	—	2.91**	—
		(1.18)	
Prob > F	—	0.002	
F Ratio (7, 89)	—	3.49	
N	97	97	

dY/dX is the implied change in probability in noncompliance for a discrete change in the dummy independent variables from 0 and 1, all else evaluated at their mean values. The two samples (see the text under "Data and Descriptive Statistics") were weighted so that observations from the sample of all registered contractors and from the sample of prior violators were considered to comprise 83% and 17% of the overall sample, respectively.

*Statistically significant at the .10 level; **at the .05 level.

tor), I estimate a logit regression for monitoring, holding constant the other variables discussed above. The logit estimates are presented in Table 5 along with their implied marginal effects on compliance.

The presence of monitoring is associated with a statistically significant reduction in the probability that contractors will be in violation of minimum wage standards. The logit coefficient for "low" monitoring implies that the use of any monitoring practice by any manufacturer reduces the likelihood of noncompliance by 0.32, all other factors held constant at their means. The non-compliance probability declines by an additional .31 when high monitoring is present. These improvements in compliance are substantial, implying that the presence of monitoring appreciably raises the costs to contractors of failing to pay the minimum wage.

The variables controlling for other contractor characteristics included in the model also have their expected effects on compliance, are almost all statistically significant, and imply relatively large effects on contractor behavior. In particular, the estimates suggest that a contractor's ability to negotiate price with manufacturers (pricing power) reduces the likelihood of noncompliance by a substantial 0.42. As predicted, producing garments with low-skill content (T-shirts) raises the predicted level

of non-compliance by 0.26 relative to producing garments with medium- or higher-skill content.

Incidence and Severity of Violations: Tobit Results

One limitation of using non-compliance as a measure of contractor behavior is that it tells little about the incidence or severity of minimum wage violations. That is, an employer will be classified as not complying with the law whether a small or large fraction of employees are underpaid and whether a typical worker has been grossly or only slightly underpaid.

Ordinary Least Squares (OLS) regression estimates of the determinants of minimum wage incidence (violations per 100 employees) or severity (back wages owed per worker per week) will be biased because of the substantial number of contractors that have not committed any minimum wage violations. As a result, the dependent variables are left-censored and therefore subject to bias in estimates of the various independent variables. I correct for this problem by estimating a series of Tobit regressions for the two measures of minimum wage compliance.[19]

The estimated coefficients obtained by running a Tobit model are shown in Table 6. Since, by construction, the dependent variables can never be negative, I also present the marginal effect of monitoring and other factors conditional on the dependent variable being uncensored. These coefficients more accurately depict the marginal effect of the independent variables on the dependent variable, both because we are interested in the change in behavior of those who do not comply (dependent variable greater than zero), and also because the dependent variables cannot have a negative value.

The results indicate that the presence of any monitoring (Low) is associated with lower incidence and severity of minimum wage violations than is the absence of monitoring, although the coefficients are not statistically significant. However, the marginal effect of more stringent monitoring (High) is large, lowering the incidence of violations by 16.9 per 100 workers and reducing severity by $4.90. Minimum wage performance improves markedly with the stringency of monitoring.

The coefficients for pricing power are large (similar in magnitude to the coefficients for high monitoring) and statistically significant. The negative coefficient implies that contractors with an ability to affect the price of their products are more likely to comply with the minimum wage than are those lacking such ability. The variables for contractor size, business age, and garment type all have the expected signs but are not statistically significant in the regressions.

Interpreting the Monitoring Effect

There are several possible sources of the association between monitoring and regulatory performance. A "direct" impact of monitoring arises when a manufacturer's review of contractor payrolls, wage policies, and related activities during an unannounced visit leads the contractor to change its levels of compliance with the FLSA. As mentioned above, however, this is not the only way in which monitoring might affect performance.

Manufacturers that sign monitoring agreements might also seek out contractors that are more likely to comply with the FLSA as a means of lowering risks of future embargoes. If many of the manufacturers with monitoring agreements in place take this kind of action, contractors with higher compliance rates will end up sorting themselves with manufacturers that undertake monitoring, while

[19]Tobit models for an alternative severity measure, back wages per affected worker per week, were also run. The sign and significance of monitoring and other key independent variables were similar for this measure of severity and are therefore not reported here. The results are available from the author.

less-compliant contractors will end up with non-monitoring manufacturers.[20] Sorting effects still lead to real changes in the overall level of regulatory performance if an increasing percentage of manufacturers in the market undertake monitoring over time. In fact, this has happened in Los Angeles as the WHD has expanded the number of manufacturers that have agreed to undertake monitoring of their contractors (WHD 2001). Nonetheless, both the direct and sorting effects could contribute to the results depicted in Tables 5 and 6.

Because the survey data pertain to a group of randomly selected contractors in one year rather than the same set of companies followed over time, it is not possible to directly observe whether the measured effect arises from behavior changes induced via monitoring or sorting behavior. However, we can compare cases where manufacturers have different amounts of information about a contractor's likelihood of violating minimum wage provisions as a means of gauging direct versus sorting effects.

An obvious test for the importance of sorting is to compare the incidence of monitoring among contractors with prior WHD violations to that among contractors without prior violations. Information on a contractor's prior violations of the FLSA is publicly available and published in the WHD's quarterly *Garment Enforcement Report*.[21] A manufacturer concerned about the past behavior of contractors has ready access to this report and could use the information in selecting firms. If sorting were predominantly driving the measured effect of monitoring, we would expect contractors *without* a prior violation history to have a higher probability of being monitored (because they would be selected by manufacturers with monitoring) than contractors possessing a prior violation history.

In fact, the incidence of high monitoring is about the same among contractors with prior violations as among those without prior violations—.29 and .31, respectively (the small difference is not statistically significant). This lack of association between a contractor's prior history of violations and the probability of being monitored runs counter to the sorting story as an explanation of the monitoring effects in Tables 5 and 6.[22]

A second approach for examining direct and sorting effects is to split the sample between recent industry entrants and established contractors. New contractors (defined in this analysis as those in business for two years or less) have no real track record, and because of this lack of informa-

[20]In an extreme case of pure selection, this sorting could lead to the appearance of monitoring effects, even though contractors did not change their behavior at all, but simply sorted themselves between monitored and non-monitored contractors. For example, imagine that there are 30 compliant contractors and 70 non-compliant contractors. The 100 contractors work for two manufacturers, so the overall rate of compliance is 30%. Prior to the imposition of monitoring, assume that compliers and non-compliers are distributed equally between the two manufacturers. Now imagine that one of the manufacturers signs a monitoring agreement with the government and the other does not. If there is pure sorting, all 30 compliers will end up pairing with the monitoring manufacturer while the 70 non-compliers will pair with the non-monitoring manufacturer. After sorting, the overall rate of compliance will still be 30%. However, if one measured the impact of monitoring, monitored contractors would have far better compliance performance than non-monitored contractors. In this pure selection case, a program effect would be incorrectly ascribed to monitoring.

[21]The *Garment Enforcement Report* provides the name, location, and violation details found for garment contractors inspected in the prior three-month period and found to owe back wages above $1,000. The reports were first published in 1996 and released quarterly throughout the study period in Los Angeles.

[22]I further tested the sorting story by dividing the sample into "non-violator" and "prior violator" groups and running the Tobit models in Table 6 on the two subsamples separately. If the primary effect arose from sorting, small monitoring coefficients would be expected for the subsamples. In regressions for both subsamples, the high monitoring coefficient remains large and statistically significant, consistent with the direct effect story dominating the sorting effects. These model results are available from the author.

Table 6. Tobit Estimates of Determinants of Compliance Performance with Minimum Wage Standards, Los Angeles, 2000. (Standard Errors in Parentheses)

	True Coefficients		*Marginal Effect: Conditional on Being Greater Than Zero*	
Variable	*Minimum Wage Violations per 100 Employees*	*Minimum Wage Back Pay Owed per Worker per Week*	*Minimum Wage Violations per 100 Employees*	*Minimum Wage Back Pay Owed per Worker per Week*
Dependent Mean and S.E. (Weighted)	27.32 (34.50)	5.83 (11.17)		
Low Monitoring	−7.78 (13.61)	−1.58 (5.39)	−3.27 (5.74)	−.559 (1.92)
High Monitoring	−45.74** (15.20)	−15.49** (5.18)	−16.87** (5.17)	−4.85** (1.52)
Pricing Power	−46.02** (17.76)	−13.07** (5.45)	−15.36** (4.86)	−3.81** (1.35)
Ln(Size)	−12.84 (8.00)	−3.05 (3.01)	−5.27 (3.36)	−1.06 (1.04)
T-Shirt	20.44* (11.96)	5.30 (4.41)	8.96 (5.53)	1.94 (1.69)
Business > 2 Years Old	−13.76 (12.39)	−4.25 (4.93)	−5.64 (5.03)	−1.48 (1.70)
Prior Violator	6.68 (12.26)	−3.37 (3.61)	2.82 (5.25)	−1.12 (1.18)
Constant	75.76** (22.39)	17.45 (8.81)		
Prob > F	.000	.006		
F Ratio (7, 89)	5.74	3.09		
N	97	97	97	97

Coefficients are Tobit estimates of the predicted impact of the independent variable on the compliance measure, conditional on its taking a value greater than zero. Standard errors for marginal effects are the corrected standard errors for these conditional estimates. The two samples (see the text under "Data and Descriptive Statistics") were weighted so that observations from the sample of all registered contractors and from the sample of prior violators were considered to comprise 83% and 17% of the overall sample, respectively.

*Statistically significant at the .10 level; **at the .05 level.

tion, manufacturer matching is less likely. An association between monitoring and performance among this group would therefore arise primarily from direct monitoring effects on behavior.[23]

For this analysis, I look solely at the randomly chosen sample of contractors and entirely exclude the contractors from the

[23]For sorting to operate, contractors must have characteristics that are observable at relatively low cost by manufacturers and that are correlated with probable FLSA performance. This may include the reputation of established contractors among other manufacturers, the volume, quality, and other characteristics of the products it supplies, the nature of its work force, or the particular production system it employs (for example, traditional bundle system; modular production; Toyota system). Even though these are not direct measures of pay practices, they may be highly correlated with them.

Table 7. Tobit Regressions, New versus Old Contractors. (Standard Errors in Parentheses)

	True Coefficients				*Marginal Effect: Conditional on Being Greater Than Zero*			
Dependent Variable:	*Minimum Wage Violations per 100 Employees*		*Minimum Wage Back Pay per Worker per Week*		*Minimum Wage Violations per 100 Employees*		*Minimum Wage Back Pay per Worker per Week*	
Ind. Variable	*1-New Contractors*	*2-Old Contractors*	*1-New Contractors*	*2-Old Contractors*	*1-New Contractors*	*2-Old Contractors*	*1-New Contractors*	*2-Old Contractors*
Low Monitor	-5.559	-67.766*	2.281	-27.904**	-3.17	-26.10**	0.99	-12.08**
	(16.880)	(36.947)	(7.163)	(9.538)	(9.54)	(10.91)	(3.14)	(2.59)
High Monitor	-47.358**	-4.089	-15.386*	-1.034	-22.30*	-1.20	-5.80	-0.28
	(20.698)	(32.178)	(8.752)	(8.182)	(11.69)	(9.50	(3.84)	(2.22)
Pricing Power	a	-69.725	a	-25.546**	a	-17.05	a	-5.36*
		(45.026)		(12.272)		(13.29)		(3.33)
Ln(Size)	-11.780	-0.500	-5.392	5.284	-6.66	-0.15	-2.37	1.44
	(10.023)	(18.769)	(4.257)	(4.973)	(5.66)	(5.54)	(1.87)	(1.35)
Dresses	-35.673*	8.739	-12.238	5.220	-18.37*	2.61	-4.95	1.46
	(18.034)	(27.001)	(7.632)	(6.698)	(10.19)	(7.97)	(3.35)	(1.82)
Constant	91.740**	53.161	27.884*	5.518	51.83**	15.70	12.24**	1.50
	(34.297)	(41.327)	(14.483)	(10.611)	(19.38)	(12.20)	(6.36)	(2.88)
Prob > Chi^2	0.0172	0.0402	0.0879	0.0037				
Pseudo R^2	0.0447	0.0802	0.0367	0.1490				
Log Likelihood	-128.355	-66.668	-106.417	-49.862				
N	33	29	33	29				

[a]Variable not included in model because all values equal to zero.

Note: These results are only for the random sample of registered firms (n = 62), which does not include the random prior-violator sample.

*Statistically significant at the .10 level; **at the .05 level.

violator sample. I then separate the remaining random sample into longer-established contractors (those that had operated for more than two years) and new contractors. Sorting takes time, partly because it requires manufacturers to find contractors that comply with the minimum wage but also because the process itself is based on reputation, which may take time for contractors to establish. Given the high rate of turnover in the industry, manufacturers will have comparatively little information about new contractors relative to older contractors. As a result, new contractors are much more likely than longer-established contractors to be paired with manufacturers for reasons other than matching.

Table 7 presents Tobit estimates for the non-violator sample only, further disaggregated into "new" and "old" contractor subsamples. Again, evidence of an association between monitoring and performance is revealed once the analysis sorts contractors by their years in operation. Among contractors that had been in business for two years or less, the estimated marginal effects of high monitoring on violation incidence and severity are, respectively, -22.3 and -$5.80. In addition, the coefficients are similar to the values obtained in Table 6 for the whole sample, suggesting that changes in behavior prevail over sorting.

In contrast, the empirical results show evidence of sorting among older contractors. Coefficients for high monitoring are not statistically significantly different from zero, implying that there is no incremental effect of monitoring in this subgroup. Equally interesting, however, are the large and statistically significant effects of *low monitoring* for older contractors (with predicted effects on incidence of -26.1 and severity of -$12.1). These results imply that

the presence of *any* monitoring features leads to large and significant reductions in minimum wage violations. One interpretation of this result is that when manufacturers have good information on prior contractor behavior, only threshold levels of monitoring are necessary to induce changes in behavior. That is, given prior information on contractor behavior, intensive monitoring is not required to elicit relatively large changes in contractor behavior. For this subgroup, sorting might be a more important part of monitoring effects because of the additional information manufacturers may have about these contractors.

Conclusion

The early literature on the economics of minimum wages, starting with Ashenfelter and Smith (1979), predicted that employers in certain industries would face sizeable incentives to violate those laws. In addition, subsequent literature (for example, Grenier 1982; Chang and Erlich 1985; Yaniv 2001) posited that the traditional structure of government enforcement creates insufficient regulatory incentives to overcome these behaviors because of the low expected penalties for violation and the small probability of being detected out of compliance.

This paper provides strong empirical evidence to support the predictions of the minimum wage literature on the incentives for non-compliance in an industry (apparel) that has conditions tailor-made for widescale non-compliance. Although the results of the study are consistent with the notion that traditional tools of regulation will not provide sufficient incentives to improve labor standards, I find very strong evidence that new forms of regulation that exploit supply chain dynamics can substantially improve labor standards outcomes. Government, it seems, can make a difference.

The use of supply chain pressure to create monitoring systems leads to changes in contractors' behavior by altering the basic regulatory calculus facing them. In particular, it introduces substantial *private* penalties that easily swamp in magnitude the civil penalties available to the government as well as appreciably increase the implicit probability of inspection. We can roughly estimate the magnitude of those implicit penalties. I have shown that the level of penalties required to tip contractors toward compliance given the amount of back wages owed by a typical contractor would be about $49,000 if that monitoring also led to a doubling of the *de facto* probability of detection. This level of implicit private penalty is plausible given that a typical contractor in my sample has annual sales of approximately $1.0 million and works for an average of 8–10 manufacturers in the course of a year. If being caught in violation of minimum wage regulations leads to the contractor's losing the business of one of its manufacturers, roughly equivalent to $100,000, the implied penalties arising under the new monitoring system could indeed induce substantial change in regulatory performance.[24]

Improved regulatory performance, however, will also affect overall employment in the industry. I do not estimate here the probable size of employment effects of improved regulatory performance. In general, to the extent that improved compliance leads to higher wages on the margin, there will be some employment loss associated with improved minimum wage compliance.[25] As a result, the overall social welfare implications of these findings—weighing both the benefits of improved compliance for employed workers and the costs arising from employment reductions—raise the larger debate on the net benefits of minimum wage policies discussed extensively elsewhere (for example, Card and Krueger 1995).

Using supply chain dynamics as a regula-

[24]Figures are based on data from U.S. Department of Commerce (2002) and survey data regarding the number of manufacturers.

[25]Yaniv's model of minimum wage compliance (2001) suggests a more complicated picture in regard to the relation of compliance and employment levels.

tory lever has a number of implications beyond its direct use by the WHD in the domestic apparel market. Supply chains link the U.S. retail market with international sources of apparel production, thereby providing potential analogs for those considering international labor standards regulation (Elliott and Freeman 2003; Sabel, O'Rourke, and Fung 2000). Monitoring is an important component of many of the international labor standards systems currently in place (for example, the Fair Labor Association's arrangement for monitoring apparel companies). Many of those systems have been criticized for their inability to induce changes in supplier behavior. The domestic monitoring system studied here demonstrates the critical role played by embargo authority created by the FLSA in making such a private system of monitoring effective.

Retail restructuring and the growing compression of time in supply chain relations characterize a growing set of industries, from food to computers to home building supplies. At the same time (and in some cases related to the diffusion of information technologies), many companies are spinning off parts of their production process and ceding them to networks of contractors and subcontractors. This trend is well known in the manufacturing sector—for example, in the spinning off of suppliers formerly owned by the major car companies. Creation of multiple layers of subcontracting relationships has also become common in service sectors, from the health care industry to the provision of janitorial services in commercial building.

Understanding developments in industry supply chains in this way may provide new opportunities to use private incentives to achieve public ends. Establishing where these dynamics are occurring across different industries and harnessing them to serve public policy objectives therefore may prove a fertile means for achieving public purposes in a wide variety of regulatory arenas.

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