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Improving Labor Standards in the Apparel Industry: Can Government Make a Difference?

By

David Weil
Harvard Center for Textile and Apparel Research
Harvard University
Cambridge, MA 02138
and
Finance & Economics Department
Boston University
Boston, MA 02215

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David Weil

Boston University / Harvard Center for Textile and Apparel Research

Author's Address:

Boston University
School of Management
Department of Finance / Economics
595 Commonwealth Avenue, Room 520A
Boston, MA 02215
Email: davweil@bu.edu

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Abstract

This paper examines patterns of 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. Specifically, in 1996, the U.S. Department of Labor began to use pressure arising from its statutory ability to interrupt the flow of goods in the retail-apparel supply chain as a means of gaining manufacturer agreement to monitor its network of contractors. Drawing on contractor-level data from a randomized survey of apparel contractors, the paper evaluates the impact of these agreements between manufacturers and the government used to monitor contractor behavior. Non-compliance is significantly correlated with characteristics predicted by theory including employer size, skill content, and the elasticity of labor and product demand. Nonetheless, stringent forms of contractor monitoring are associated with significant reductions in the presence, incidence, and severity of violations of minimum wage standards. The results suggest that well-designed private / public monitoring efforts can lead to significant improvements in regulatory performance. This has implications beyond apparel and to any number of industries where supply chain dynamics have become important.

Improving Labor Standards in the Apparel Industry: Can Government Make a Difference?

The economics of minimum wage has been an area of intense academic interest over the past decade (e.g. Card and Krueger 1995). Relative to this large and growing literature on the employment effects of minimum wage, comparatively little attention has been paid to the compliance behavior of employers subject to the minimum wage since the seminal article by Ashenfelter and Smith (1979). Yet there are strong reasons to believe that many employers will choose to violate minimum wage standards when evaluating 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 workforce and the mandated minimum wage. This divergence, in turn, is a function of features of the labor and product market facing the employer.

Workers in low wage industries are particularly likely to receive wages below the statutory level to which they are entitled. One such industry is apparel, which has long exemplified the problem of enforcing minimum labor standards and more generally the "sweatshop" problem. In 1893, The Committee on Manufactures of the House of Representatives released a report regarding their investigations of the sweating system of production. Among other findings, the Committee concluded that 80 percent of production originated in sweatshop production.[1] Several years later, President McKinley appointed a commission made up of members of Congress and private citizens to study the problem. Arising from their study

[1] See U.S. Congress, House of Representatives, Committee on Manufactures, "The Sweating System," House Reports, 52nd Congress, 2nd Session, Vol. 1, no. 2309, 1893, pp. iv-viii.

running from 1898-1901, the commission documented extensive abuses including long hours, low pay, and unsanitary conditions.[2]

This article examines the broader issue of compliance with minimum wage laws by empirically examining microdata from the U.S. apparel industry today. We first review the literature on the economics of minimum wage compliance. We then analyze product and labor market conditions and regulatory interventions to predict employer behavior in the industry. Using a unique set of data from random inspection-based surveys of apparel contractors in Los Angeles, we examine correlates of employer compliance as well as other regulatory performance measures. We then analyze the impact of a novel regulatory strategy that creates agreements between the government and manufacturers requiring the latter to monitor labor standards among their contractors. We model the determinants of minimum wage performance in order to measure the impact of those agreements and to explain how new monitoring arrangements change employer compliance behavior. The paper concludes with a discussion of the implications of these findings to the regulation of labor standards domestically and internationally and on other public policies.

II. Background

A. Economics of minimum wage compliance

A series of articles beginning with Ashenfelter and Smith (1979) analyze the economic calculus of compliance as it applies to minimum wage. In their article, Ashenfelter and Smith show that a profit maximizing firm selling output at price p and able to obtain workers L at a

[2] Reports of the Industrial Commission on Immigration and on Education. Washington, D.C.: Government Printing Office, 1901, vol. XV. A discussion of the history of regulating labor standards in the apparel industry can be found in Abernathy, Dunlop, Hammond, and Weil (1999), Chapters 2, 10, and 15.

wage rate *w* and other factors of production at price *r* will decide whether to comply with the minimum wage by balancing the expected costs of complying with the law and 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) against the chance of not being caught and paying wages below the mandated minimum wage (w). Ashenfelter and Smith show that an employer will choose non-compliance in the case that:

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

In (1), the employer balances the expected profit from not complying (E(Π)) against the profit known with certainty if the firm chooses to comply with the standard (Π(*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 portrayed in (1), Ashenfelter and Smith show that an employer will choose to not pay minimum wage if:

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

Rearranging slightly, a firm will choose not to comply with the law if the cost of non-compliance, being the chance of caught (λ) and assessed the penalty (D) is less than the benefit of not complying, being the chance of not being detected (1- λ) multiplied by the total labor cost saved by paying workers below the statutory minimum plus the additional savings arising from incremental labor added because of paying below minimum wage, or:

$$(1-\lambda)[L(M-w) - (L/w)[.5(M-w)^2\eta]] > \lambda D \qquad (3)$$

The estimated benefit of not complying grows with the amount of under payment, both because of the labor savings from the underpayment of a work force of a given size [L(M-w)] and the growing benefits arising from underpayments because of its effect on employment (the

second term in the benefit side of equation (3)). In particular, the incentive not to comply grows as a function of the following 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;
- 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:

- Increasing the probability of violation detection (λ) either from increasing the probability of inspection and / or the chance that those inspections uncover violations;
- Increase the expected penalty levied for non-compliance with the law (D).[3]

B. 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,

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[3] Grenier (1982) modifies the Ashenfelter and Smith analysis by noting that under the Fair Labor Standards Act, the government does not levy penalties for first time violators, nor typically assess high penalties for repeat offenders. Instead, the Wage and Hour Division (the arm of the U.S. Department of Labor with authority for enforcing FLSA) 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 points out that since the typical "penalty" facing a firm is a fraction of the underpayment in wages, the penalty effect is far less than implied by the Ashenfelter and Smith model (which assumed a lump sum penalty of "D"). Chang and Erlich (1985) modify 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 that workforce. This modification in the model (which brings it closer to the actual penalty policy pursued by WHD) leads them to conclude that a "minimum wage enforcement policy requiring

the women's segment of the industry has been characterized by a more splintered production system where different enterprises carry out the design, cutting, and sewing and pressing / packaging of apparel products (see Figure 1).[4] For example, a "jobber" may sell a design to retailer, 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 differential services (i.e. sewing and associated assembly) except for some operations requiring higher levels of skill content.

In general, as one goes to "lower" levels of apparel production (going from the top to bottom of Figure 1) the level of competition intensifies and profit margin per garment diminish. 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 towards 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). The apparel industry and sewing has always been attractive to immigrants given its low skill barriers (e.g. Slovaks, Germans, and Jews at turn of century; Hispanic, Chinese and Asian workers today (Kwong 1997)).[5] The consequent elastic supply of workers and the relatively low skill level demands for them keep wage levels low and the

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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).

[4] In the U.S., men's clothing--from the 1920s onward—is primarily produced in factory-type settings, with manufacturers designing, cutting, sewing, pressing, and packaging products.

incentive to work long hours--even in inhospitable work environments--high. Given these market features, non-compliance has historically been a problem among the large number of contractors and subcontractors that assemble apparel products.

Regulatory attention has historically been focused at the contractor-level of the industry.[6] Table 1 presents characteristics of 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 3-month period. This inspection activity translates into an annual probability that a given contract shop will receive an inspection (λ) below 0.10.[7] Penalties under FLSA are the civil penalties levied by WHD inspectors based on the scale and severity of non-compliance detected as well as the past history of the contractor.

Applying the enforcement outcomes in Table 1 to the employer trade-off depicted in equation (3) 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[8] a median civil penalty (D) of \$1,086, 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

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[5] See Commons (1901) in Part III of the Industrial Commission report entitled "Immigration and Its Economic Effects."

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

[7] 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 there were about 800 investigations conducted annually by WHD investigators, the annual probability of inspection is about .08. Focusing on one particular city yields similar estimates: there were a total of 260 investigations in New York City in 1998. Given that there were about 2600 apparel establishments, the probability of inspection in that year was .10.

[8] 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). We do not use the back wage information from Table 1 because they are based on contractors that have been the target of enforcement actions, and therefore do not represent a typical contractor in the industry.

versus a benefit of $12,205, implying that an apparel employer should clearly choose not to comply.[9]

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 faces an initial chance of detection, λ_{t1}=0.1. If a contractor is inspected in the first period and is found in violation of minimum wage, we assume that the chance of an inspection in the second period doubles (λ_{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 non-compliance 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.[10]

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[9] Given the above and assuming annual wages (w) of $8000, the first term in 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 not complying of $12,205. 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, both of which are not directly observable.

[10] 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.

C. 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, automation, industry standards, and management innovations to align more closely orders from suppliers with real-time sales data. This system reduces the need for retailers to stockpile large inventories of a growing range of products, thereby reducing their risks of stock-outs, markdowns, and inventory carrying costs. The companies that have adopted lean retailing principles now dominate major retail segments (Abernathy, Dunlop, Hammond, and Weil 1999).

Retailers operating with these systems require frequent replenishment and demand that shipments from apparel suppliers meet standards concerning delivery times, order completeness, and accuracy. Lean retailing therefore changes the problem faced by an apparel supplier: Suppliers must replenish products within a selling season, with retailers now requiring replenishment of orders in as little as 3 days. This makes lean retailers vulnerable to disruptions to the weekly replenishment of retail orders by apparel suppliers a major problem—one that can 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 regulating labor standards one contractor at a time, the WHD employed time sensitivity of lean retailers as a means of exerting 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, invocation of the hot goods provision 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 that it subcontracts work. This entails the manufacturer agreeing to sign two types of agreements: an agreement between the manufacturer (or jobber) and the Department of Labor that stipulate the basic components of a monitoring system that will be operated by the manufacturer[11]; and an agreement that the manufacturer signs with its contractors that set out how contractors will seek to comply with the labor standards (U.S. DOL, 1998; 1999; Ziff and Trattner 1999; Weil 2002).

For the economics of compliance arising from this new regulatory approach to change behavior, manufacturer monitoring would need to 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. We study whether the behavior of contractors under monitoring imply such dramatic changes in the underlying incentives to comply with minimum wage standards.

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[11] These agreements, however, are entered in voluntarily by the manufacturer and their terms are therefore negotiated out between the government and the manufacturer / jobber. The terms described here are taken from the

III. Data and Descriptive Statistics

A. 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 2000 random survey was comprised of all apparel industry firms appearing on the California manufacturing registration list for that year.[12] 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 sub-sample was created to represent contractors that had been previously inspected and found in violation of the Act. A list of all contractors that found in FLSA violation in the prior 2 years was assembled and a random sample of these contractors was selected for similar investigation-based surveys, resulting in a total of 30 contractors. The group of prior violators is over-sampled as a result of this procedure. In order to deal with this problem, the sample is re-weighted according to the expected percentage of prior violators that should be present in a randomly selected sample given an underlying level of non-compliance at 55%, an annual level of inspections of 10% and annual contractor turnover of 25%. Based on this, we re-weight the data in the regression analysis so that about 17% of the sample consists of observations for the prior violators.

Department of Labor's model agreement language specified in formal policy documents (see Wage and Hour Division, 1998).

[12] 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…"

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 contractors business, including employer size, years of operation, business structure (e.g. corporation or partnership), and types of products assembled. Information on the number of manufacturers that the contractor worked for over the past 6 months and whether or not those manufacturers had monitoring programs are also collected.

B. Descriptive statistics

Tables 2a and 2b provide descriptive statistics for the sample as a whole and split out by those contractors that had never received prior inspections and those with prior violations. Table 2a provides information regarding compliance among the contractors. Table 2b presents information on other contractor characteristics, including employer size, length of business operation, a measure of the ability of the contractor to affect the price of services, and the types of products assembled.

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 were underpaid in some way. A typical contractor owed about $3700 in back wages for the time period under study. These estimates can be standardized given that contractors in the sample differ in size and that there is some variation in the period of time of payroll review. One standardized measure used throughout this study is the average number of workers that 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 2a. With respect to these standardized measures of compliance, the differences in levels are not statistically significant differences between contractors that had no prior violations and those with prior violations.

The typical contractor in the sample is small (37 production workers), relatively new (almost half have been in business less than 25 months), managed directly by the owner, and engaged in producing slightly more than one type of product. In most respects, the characteristics of contractors inspected for the first time look similar to those with a prior violation of wage and hour laws, although prior violators have more employees than those that had not been inspected in prior periods.

C. Compliance measures

The measure of performance typically employed in regulatory evaluations is employer compliance with promulgated standards. In the case of minimum wage, a contractor is considered as being out of compliance if one or more employees is found to have been underpaid during the investigation period. The obvious problem with this approach is that it does not delineate between employers who underpaid a small fraction of their workforce from those who underpaid a large proportion or between cases where employees experience gross underpayment in wages from 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, it is possible that government interventions may have limited impact on the overall likelihood of violations (measured as one or more violations of the Act) even though it might substantially lower the number of violations per contractor, or the average severity of those violations. Accordingly, we measure contractor compliance behavior in terms of (1) overall likelihood of

compliance (traditional measure of compliance); (2) the *incidence* of violation (measured as the number of violation per 100 workers employed); and (3) the *severity* of violation (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] The overall extent of minimum wage violations is significant across all three measures: about 46% of employers comply with minimum wage; more than 27 of every 100 workers has experienced some degree of underpayment, and the seriousness of violations is equivalent to underpaying every worker on the employer 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 that have less elastic demand for labor--either because of the skill content of the work or of its labor force--would be less likely to violate minimum wage. One proxy for skill content is the product produced by a firm: T-shirts require low levels of skill (i.e. short periods of time for sewers to achieve desired levels of productivity). In contrast, dresses and jeans require higher degrees of sewing skill (with the time required to hitting desired productivity standards from six to eight months). Consistent with this skill content, compliance performance (as measured in all three dimensions) is lowest for T-shirts in all three dimensions than for jeans and dresses. Similarly, theory would predict that the more elastic the demand for the product (sewing services), the more likely that firms will violate minimum wage standards. One proxy for price elasticity is pricing power—here measured as the self-reported ability of a contractor to renegotiate price if the delivery time for a

[13] An alternative severity measure focuses solely on the back wages owed to workers affected by violations per week (rather than to all workers, whether affected or not by a violation as defined here). The results from empirical analysis using this definition are similar to those reported here and are available from the author.

product is moved up by their manufacturer customer. Contractors who report an ability to change prices have a far lower likelihood to be in violation of minimum wage (.384 vs. .824), a far lower incidence of violations (31.1 vs. 7.2) and significantly less severity than contractors lacking this ability (6.02 vs. .56). The relation of contractor size and age are also generally consistent with that predicted by theory: larger contractors have a lower likelihood of being out of compliance with minimum wage and have correspondingly lower incidence and severity levels than small contractors. Similar relations are found for older businesses and compliance, reflecting that enterprises that have survived longer are more likely to comply with the minimum wage (perhaps reflecting a desire of those employers to retain their workforce).

IV. The impact of contractor monitoring on compliance

A. Incidence of monitoring

The frequency of different types of monitoring arrangements between contractors and manufacturers is presented in Table 4.[14] The upper part of the table indicates the presence of seven different monitoring features by at least one of the manufacturers for whom the contractors worked in the past 6 months. For example, 59 percent of all Los Angeles contractors surveyed did work for at least one manufacturer that conducted unannounced visits.

Although there are many potential combinations of the different monitoring activities, certain combinations of activities have potentially larger impacts on contractor behavior than others. We focus below on specific combinations of monitoring activities, grouped into two categories, "low" and "high" monitoring, which indicate the stringency of monitoring

[14] In the random surveys, contractors are asked to specify the names of manufacturers and / or jobbers for whom the contractor provided services over a specified time period, and the monitoring activities (if any) that were conducted

arrangements under which a contractor operates. The category of Low monitoring is assigned to contractors who report that at least one of their manufacturers is conducting at least one of the seven monitoring activities. It therefore represents the presence of *any* monitoring activity. About 74 percent 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 of assessing the presence of possible minimum wage or overtime violations (payroll review) and a way of gaining a more realistic assessment of contractor operations (unannounced visits). We focus on these features because of their consistently significant impact on performance and complementary nature to one another.[15] High monitoring occurs when *all* of a contractor's manufacturing customers have *both* payroll review and unannounced visits in place. As a result, this very high level of oversight of a contractor by all of its customers represents the most stringent case of monitoring. The frequency of High monitoring was about 30 percent in 2000.

B. 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 compliance observed at contractor *i* can be modeled as:

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by those manufacturers. We use this information to create the different categories of monitoring discussed in the text.

[15] We 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.

$$MWPERF_i = f(Monitoring_i, Labor_i, Pdct_i, X_i)$$ Where:

MWPERF: Minimum wage performance of contractor *i* (likelihood, incidence, and severity);

Monitoring: Presence and stringency of monitoring by manufacturers;

Labor: Elasticity of labor demand and average wage level of the contractor, as characterized by the average skill level drawn upon by a contractor;

Product: Elasticity of product demand (i.e. sewing services) for the contractor, as characterized by its ability to affect the price of services it provides to manufacturers;

X: Vector of other employer characteristics that are correlated with minimum wage performance, including size, age of the business, and prior inspections by WHD.

The effects of labor and product market characteristics have been discussed above. We capture contractor features associated with labor demand elasticity by including a variable for T-shirts that have the lowest skill content relative to other products. For product market, we use the response to survey questions regarding the ability of the contractor to change price in the event that a manufacturer moves up the delivery date of a product ("pricing power").[16]

We 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 high monitoring variable as equaling the marginal effect of that more stringent method relative to having any monitoring present.[18] Finally, we

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[16] Contractors are coded as having an ability to influence price if they answered "yes" to the following: "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," "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. Because a typical contractor works for multiple manufacturers, some under requiring monitoring and some not, a monitoring effect 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

include variables for contractor size, age (measured as a dummy for those contractors that have been in business for more than 2 years), and a dummy for prior citations by the WHD for violations of the FLSA.

C. 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 violation of minimum wage by the contractor) we 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 presence of any monitoring feature by any manufacturer reduces the likelihood of noncompliance by 0.32, all other factors held constant at their means. Non-compliance probability declines by an additional .31 given the presence of high monitoring features. These represent substantial improvement in compliance, implying that the presence of monitoring significantly 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 and are statistically significant and imply relatively

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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 criteria used by the manufacturer (reduce the chance of goods embargo) is correlated with contractor compliance. We 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.

large impacts on contractor behavior. In particular, a contractor's ability to negotiate price with manufacturers (Pricing power) substantially reduces the likelihood of non-compliance in all four equations by an estimated 0.42. As predicted, producing a product with low-skill content (T-Shirt) raises the predicted level of non-compliance by 0.26 relative to producing goods with medium- or higher-skill content.

D. Incidence and severity of violations: Tobit Results

As discussed above, 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 or whether a typical worker has been grossly underpaid versus receiving very slight underpayments.

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 who 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. We correct for this problem by estimating a series of Tobit regressions for the two measures of minimum wage compliance.[19]

The estimated coefficients obtained from running a Tobit model are shown in Table 6. Since by construction, the dependent variables can never be negative, we 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, 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 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 minimum wage than those lacking such ability. The variables for contractor size, age of business, and type of garment all have the expected sign but are not statistically significant in the regressions.

V. Interpreting the monitoring effect

A. Direct versus matching effects

There are several factors important to interpreting the association between monitoring and regulatory performance. The "direct" impact of monitoring arises when manufacturer (or third-party) review of contractor payrolls, wage policies, and related activities during unannounced visits lead directly to improvement in the practices of contractors—that is,

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[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.

contractors change their levels of compliance with FLSA as a direct result of monitoring. As mentioned above, however, this is not the only way that monitoring might affect performance.

Manufacturers that sign monitoring agreements might also seek out contractors that are more likely to comply with FLSA as a means of lowering risks of future embargoes. If many of the manufacturers with monitoring agreements in place undertake this kind of activity, better contractors will end up matching themselves with manufacturers that undertake monitoring and worse contractors will end up with non-monitoring contractors.[20] Matching 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 over time 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 matching 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 have undertaken several different analyses to try to distinguish the direct effect of monitoring from those arising from manufacturer selection by comparing cases

[20] In an extreme case of pure selection, this sorting could lead to the appearance of an improvement of monitoring impacts, even though contractors have not changed their behavior at all, but simply sorted themselves between monitored and non-monitored contractors. For example, imagine that there are 30 "good" contractors and 70 "bad" contractors all of whom work for two manufacturers, so that the overall percent of good contractors is 30%. Prior to the implementation of monitoring, assume that good and bad contractors are distributed equally between the two manufacturers. Now imagine that one manufacturer signs a monitoring agreement and the other does not. If there is pure sorting, all 30 good contractors will end up pairing with the monitored manufacturer while the 70 bad contractors will pair with the non-monitored contractor. Even after sorting, the overall percent of good contractors will still be 30%. However, if one measured the impact of monitoring on contractors, one would find that monitored contractors had far better performance than non-monitored contractors. In this pure selection case, program effect would be incorrectly ascribed to monitoring.

where manufacturers have different amounts of information about a contractor's likelihood of violating minimum wage provisions (which is arguably tied to the risk of embargoes).

Violators vs. non-violators

One method of separating out the direct impact of monitoring from the effect of selection is to compare the association between monitoring and regulatory performance for contractors with prior WHD violations and for those without prior violations. If manufacturers had access to information about violators through government records and matching was predominately responsible for the measured effect of monitoring, one would expect little remaining association between monitoring and performance for prior violators. Conversely, if manufacturers had information about prior contractor violations and still selected these contractors, the presence of monitoring effects on compliance could be ascribed to direct effects of monitoring on behavior.

Information on prior violators of FLSA is public and published in the WHD's quarterly *Garment Enforcement Report* during the survey period. 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 $1000.[21] A manufacturer concerned about past behavior of contractors could use this information in selecting firms.[22] As a result, manufacturers potentially had access to information regarding prior violators directly from reviewing prior *Garment Enforcement Reports*.

We can create a comparison between the impact of monitoring in contractors with prior violations and those without a prior violation history by splitting the dataset into the subset from

[21] The reports were first published in 1996 and released quarterly throughout the study period in Los Angeles.
[22] Even though prior violators could behave better because they might perceive that the probability of being caught a second time is higher, this same fact (a higher probability of being inspected) could drive manufacturers to avoid working with prior violators.

the random sample of contractors that had *prior* violations of FLSA and the random sample taken from the population of registered contractors in Southern California.[23] Table 7 presents the Tobit results for the random sample of contractors from the entire LA garment population and compares them with similar regressions for the sample of randomly-selected prior violators. If the primary monitoring effect arose primarily from sorting, we would predict that the monitoring coefficients would be small for the violator group (because of the availability of prior information about those companies available to manufacturers).

In fact, high monitoring is statistically significant both for incidence and severity. As was the case in Table 6, the coefficient for low monitoring is not statistically significant. However, high monitoring is once again associated with substantial reductions in minimum wage violation incidence of 26.7 per 100 workers (compared to 15.6 for the non-violator sample) and a reduction in back wages owed per worker per week of $3.44 (compared to $5.19 for the non-violator sample). These results are consistent with the story that the primary monitoring effect is driven by a change in behavior generated by the monitoring activity itself.

New vs. old contractors

A second approach for discerning the direct from sorting effects of monitoring involves separating the sample between recent entrants and established contractors. New contractors (defined in our analysis as those that had been in business less than two years) have no real track record and because of this lack of information, manufacturer matching is less likely. An

[23] The survey was undertaken by WHD using the universe of prior violators of FLSA in the Los Angeles area as a sample frame. Although prior violators are not a random cross-section of the contractor population as a whole, the survey results represent a random sample of the universe of prior violators conditional on their still being in business in 2000.

association between monitoring and performance among this group would therefore arise primarily from direct monitoring effects on behavior.[24]

For this analysis, we look solely at the randomly chosen sample of contractors and exclude the contractors from the violator sample entirely. We then separate the remaining random sample into older contractors (defined as those that had operated for more than two years) and new contractors. Matching takes time, partially because it requires manufacturers to find "good" contractors 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 to be paired with manufacturers for reasons other than matching.

Table 8 presents Tobit estimates for the non-violator sample only, further separated between "new" and "old" contractor sub-samples. Once again, we find significant evidence of an association between monitoring and performance after separating by the contractors' years in operation. Among contractors that had been in business less than 2 years, the estimated marginal effect for high on incidence is –22.3 and -$5.80 for severity for new contractors. In addition, the coefficients are similar to the values obtained in Table 6 for the whole sample, indicating that changes in behavior seem to prevail over sorting.

[24] For sorting to operate, contractors must have characteristics that are observable at relatively low cost by manufacturers which, in turn, are correlated with probable FLSA performance. This may include the reputation of established contractors available from other manufacturers, the type of work (skill and quality level) it is engaged, the nature of it work force (skill, tenure, training), or the particular production system it employs (e.g. progressive bundle; modular production; Toyota system). Even though these are not direct measures of pay practices, they may be highly correlated with them.

In this case, the results are consistent with a matching story among older contractors. Coefficients for high monitoring are not significantly different than zero, implying that there is no incremental effect of monitoring in this subgroup. Equally interesting, however, is the large and significant effects of *low monitoring* for older contractors (with predicted impacts 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 performance. One interpretation of this result is that if manufacturers have significant 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 implied 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.

VI. Conclusion

The literature on the economics of minimum wage going back to Ashenfelter and Smith (1979) predict that employers in certain industries will face significant incentives to violate those laws. In addition, subsequent literature (e.g. Grenier 1982; Chang and Erlich 1985; Yaniv 2001) predicts 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 correspondingly 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 like apparel that has conditions tailor-made for wide-scale non-compliance. And 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, we find very strong evidence that new forms of regulation that draw on supply chain dynamics can have a substantial impact on improving labor standards outcomes. Government, it seems, can make a difference.[25]

Note that the use of supply chain pressure to create monitoring systems leads to changes in contractor behavior by altering the basic regulatory calculus facing those contractors. In particular it introduces substantial *private* penalties (*D*) that easily swamp in magnitude the civil penalties available to the government as well as appreciably increase the implicit probability of inspection (λ) facing contractors. We can roughly estimate the magnitude of those implicit penalties. Section II showed that the level of penalties required to tip contractors towards 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 (to λ=.2). This level of implicit private penalty is plausible given that a typical contractor in our sample has approximate annual sales of $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 leads to the loss by the contractor of one of its manufacturer's business, roughly equivalent to $100,000, the implied penalties arising under the new monitoring system could indeed induce substantial change in regulatory performance.[26]

Using supply chain dynamics as a regulatory 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

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[25] Improved regulatory performance, however, will impact overall employment in the industry. We 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 better minimum wage compliance. However, in his model of minimum wage compliance, Yaniv (2001) suggests a more complicated picture in regard to the relation of compliance and employment levels.

[26] Figures based on data from Current Industrial Reports—Apparel (U.S. Department of Commerce, MQ315a(02), February 2002) and survey data regarding the number of manufacturers.

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 characterizes 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 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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Figure 1:
Structure of retailer-manufacturer-contractor relations

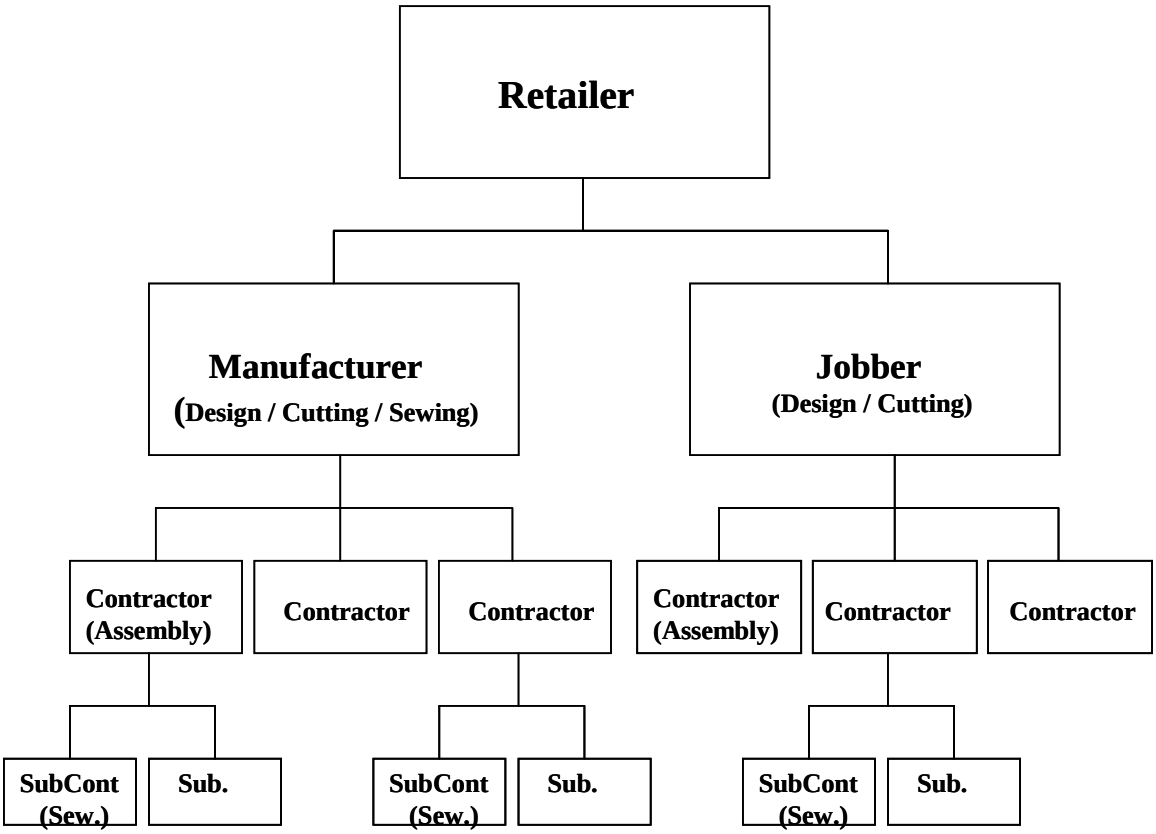

Table 1
Enforcement of FLSA in the U.S. Apparel Industry: 1996-2000 (Quarterly)

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 quarter include payment for minimum wage and overtime wage violations documented by the Wage and Hour division in the course of investigations.
[b] Calculated as 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 quarter.
[c] Calculated as 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 FLSA divided by the total number of investigations during quarter.

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

Table 2a
Descriptive Statistics, Los Angeles 2000

	(1)	(2)	(3)	(4)
	Mean	**First time**	**Previous violation**	**Difference**
Regulatory performance characteristics				
Employer non-compliance with minimum wage	0.54	0.54	0.56	0.02
Number of employees with minimum wage violations	8.1	6.50	11.1	-4.6
	(15.5)	(11.5)	(20.9)	(3.22)
Minimum wage back wages findings ($ / contractor)	3695.8	1999.1	6853.7	-4854.6**
	(11102.6)	(4597.3)	(17424.6)	(2257.95)
Number of employees with minimum wage violations per 100 workers	27.2	27.4	26.8	0.6
	(34.8)	(34.1)	(36.5)	(6.67)
Minimum wage back wages/week/employee ($)	5.1	6.5	2.5	4
	(10.6)	(12.2)	(6.4)	(2.17)

Standard errors are in parentheses. An asterisk denotes significance at the 10 percent level and a double asterisk for 5 percent. 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 text for description of these samples.

Table 2b
Descriptive Statistics, Los Angeles 2000

	(1)	(2)	(3)	(4)
	Mean	**First time**	**Previous violation**	**Difference**
Contractor characteristics				
Size of contractors (number of employees)	37.3	32	46.9	-14.9**
	(33.5)	(31.3)	(35.6)	(6.77)
Owner operates other establishments (check)	0.039	0.03	0.055	-0.025
	(0.19)	(0.17)	(0.23)	(0.039)
Owner is involved in daily workplace management	0.874	0.866	0.888	-0.022
	0.33	(0.34)	(0.32)	(0.067)
Length of operation of business				
0-6 months	0.118			
7-12 months	0.118			
13-18 months	0.167			
19-24 months	0.059			
25 or more months	0.539			
If manufacturer changes due date for delivery, can contractor renegotiate price? (Pricing power)	0.165			
Product assembled by contractor				
Jeans	0.136			
T-shirt	0.301			
Slacks/fleece/sweaters	0.709			
Dresses	0.379			
Suit / jacket	0.136			
Miscellaneous	0.078			
Number of products produced				
One	0.476			
Two	0.311			
Three	0.194			
Four or more	0.019			
N	103			

Standard errors are in parentheses. An asterisk denotes significance at the 10 percent level and a double asterisk for 5 percent. Column (1) depicts the sample means of the combined sample without using weights.

Table 3
Compliance performance by contractor characteristics, Los Angeles 2000

	Percent of employers not complying	*Minimum wage violations per 100 employees*	*Back wages owed per worker per week ($)*
Overall compliance	0.544	27.2	5.12
		(34.8)	(10.64)
Quartile 1: size<=14	0.607	39.0	7.57
		(38.8)	(13.32)
Quartile 2: 26>=size>=15	0.583	21.7	3.24
		(29.1)	(8.60)
Quartile 3: 49>=size>=27	0.577	24.5	5.72
		(32.9)	(11.51)
Quartile 4: size>=50	0.400	22.0	3.56
		(35.7)	(7.69)
Contractor's business is < 2 years old	0.660	34.9	7.60
		(36.5)	(13.21)
Contractor's business is > 2 years old	0.446	20.8	3.03
		(32.2)	(7.36)
No pricing power: Contractor is unable to renegotiate price if delivery time changed	0.616	31.1	6.02
		(35.3)	(11.42)
Pricing power: Contractor is able to renegotiate price if delivery time changed	0.176	7.2	0.56
		(24.3)	(1.59)
Contractor produces T shirts	0.677	31.5	5.36
		(36.3)	(11.03)
Contractor produces dresses	0.590	26.4	4.45
		(32.4)	(8.85)
Contractor produces jeans	0.429	24.2	4.48
		(38.4)	(9.85)
N	103		

Table 4
Monitoring Activity

	(1)	*(2)*
Monitoring Activity	**Mean**	**Monitoring activity for all manufacturers**
Monitoring activity employed by manufacturer		
Manufacturers Review Payroll	0.602	.375
Manufacturers Review Time Cards	0.633	.396
Manufacturers Conduct Employee Interviews	0.561	.354
Manufacturer Requires Contractor to Provide Minimum Wage Information	0.561	.354
Manufacturer Discloses Problems with MW to Contractor	0.439	.250
Manufacturer Recommends Corrective Action to Contractor	0.429	.250
Manufacturer May Conduct Unannounced Visits	0.592	.344
Number of Monitoring Features		
0	0.265	--
1	0.082	--
2	0.041	--
3	0.041	--
4	0.061	--
5	0.102	--
6	0.082	--
7	0.327	--
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[1]	98	--

[1]Five observations omitted because the randomly selected establishment was a manufacturer. The empirical analysis draws on the remaining 98 observations. Column (1) and (2) depict the sample means of the combined sample: recidivism and non recidivism, without any use of weights.

Table 5

Logit Regressions of Determinants of Employer Noncompliance with Minimum Wage Standards, Los Angeles 2000

	Mean	*Estimated logit Coefficients*	*Estimated dY/dX*
Dependent (percent 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)	
Bizage	.521	-.63	-.151
		(0.57)	
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	

Standard errors are shown in parentheses. dY/dX is implied change in probability in noncompliance for discrete change in dummy independent variables from 0 and 1, all else evaluated at their mean values. An asterisk after the logit coefficient denotes significance at the 10 percent level and a double asterisk for 5 percent. The two samples (see Section III) were weighted so that observations from the sample of all registered contractors were considered to comprise 83% of the overall sample and prior-violator sample were considered to make up 17% of the overall sample.

Table 6

Tobit Estimates of Determinants of Compliance Performance with Minimum Wage Standards, Los Angeles 2000

	True coefficients		Marginal Effect: Conditional on being greater than zero	
	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	-1.58	-3.27	-.559
	(13.61)	(5.39)	(5.74)	(1.92)
High monitoring	-45.74**	-15.49**	-16.87**	-4.85**
	(15.20)	(5.18)	(5.17)	(1.52)
Pricing power	-46.02**	-13.07**	-15.36**	-3.81**
	(17.76)	(5.45)	(4.86)	(1.35)
Ln(Size)	-12.84	-3.05	-5.27	-1.06
	(8.00)	(3.01)	(3.36)	(1.04)
T-shirt	20.44*	5.30	8.96	1.94
	(11.96)	(4.41)	(5.53)	(1.69)
Bizage	-13.76	-4.25	-5.64	-1.48
	(12.39)	(4.93)	(5.03)	(1.70)
Violator	6.68	-3.37	2.82	-1.12
	(12.26)	(3.61)	(5.25)	(1.18)
Constant	75.76**	17.45		
	(22.39)	(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 independent variable on the compliance measure, conditional on it taking a value greater than zero. Standard errors for marginal effects are the corrected standard errors for these conditional estimates. An asterisk after the Tobit coefficient denotes significance at the 10 percent level and a double asterisk for 5 percent. The two samples (see Section III) were weighted so that observations from the sample of all registered contractors were considered to comprise 83% of the overall sample and prior-violator sample were considered to make up 17% of the overall sample.

Table 7

Tobit Regressions, non-violators versus violators

	True coefficients				**Marginal Effect: Conditional on being greater than zero**			
Dependent	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	
	1-Non violators	*2-Violators*	*3-Non violators*	*4-Violators*	*5-Non violators*	*6-Violators*	*7-Non violator*	*8-Violator*
Low monit	-20.03	15.62	-4.77	5.29	-8.86	5.64	-1.75	1.52
	(16.05)	(20.79)	(6.07)	(3.72)	(6.71)	(7.95)	(2.15)	(1.19)
High monit	-41.18**	-85.37**	-16.19**	-12.84**	-15.63**	-26.71**	-5.19**	-3.44**
	(17.26)	(25.81)	(6.63)	(4.53)	(7.21)	(9.87)	(2.35)	(1.45)
Pricing power	-41.31	-62.17**	-12.37	-9.27**	-14.08	-19.81**	-3.71	-2.53*
	(32.19)	(25.22)	(12.21)	(4.40)	(13.45)	(9.64)	(4.33)	(1.40)
Ln(Size)	-9.27	-13.91	-2.31	-1.04	-3.87	-5.32	-0.82	-0.33
	(8.64)	(10.23)	(3.28)	(1.81)	(3.61)	(3.91)	(1.16)	(0.58)
Dresses	-22.18	-3.81	-5.23	-3.89	-8.90	-1.45	-1.81	-1.23
	(14.46)	(17.50)	(5.49)	(3.13)	(6.04)	(6.69)	(1.95)	(1.00)
Bizage	-17.47	15.17	-5.21	-2.74	-7.26	5.69	-1.84	-0.89
	(15.03)	(18.66)	(5.72)	(3.21)	(6.28)	(7.13)	(2.03)	(1.02)
Constant	86.31**	73.56*	20.42**	7.42	36.05**	28.12*	7.23**	2.37
	(27.30)	(39.92)	(10.29)	(7.16)	(11.40)	(15.26)	(3.65)	(2.29)
Prob > Chi^2	0.0004	0.0031	0.0050	0.0213				
Pseudo R^2	0.0585	0.0819	0.0541	0.0897				
Log likelihood	-194.483	-110.514	-162.064	-75.472				
N	62	35	62	35				

Standard errors are shown in parentheses. An asterisk after the Tobit coefficient denotes significance at the 10 percent level; a double asterisk denotes significance at the 5 percent level.

Table 8

Tobit Regressions, new versus old contractors

	True coefficients				Marginal Effect: Conditional on being greater than zero			
	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	
Dependent								
	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 monit	-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 monit	-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	Dropped	-69.725	a	-25.546**	dropped	-17.05	a	-5.36*
	(all zeros)	(45.026)		(12.272)	(all zeros)	(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.

Standard errors are shown in parentheses. An asterisk after the Tobit coefficient denotes significance at the 10 percent level; a double asterisk denotes significance at the 5 percent level. These results are only for the random sample of registered firms (n=62) and does not include the random prior-violator sample.