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**Labour Law Compliance and Human Resource
Management Innovation: Better Factories Cambodia**

Raymond Robertson, Rajeev Dehejia, Drusilla Brown, Debra Ang

January 2011



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Abstract: Analyzing labour law compliance data in the apparel industry from Better Factories Cambodia, we find that (1) there was a broad improvement in working conditions among factories both with and without a reputation sensitive buyer, (2) factories with a reputation sensitive buyer have higher average compliance, (3) after the elimination of public disclosure of factory level noncompliance the rate of improved compliance slowed for factories with a reputation sensitive buyer and compliance declined for factories lacking a reputation sensitive buyer but (4) compliance did not return to the baseline even in the absence of a reputation sensitive buyer or threat of public disclosure of noncompliance. These findings are consistent with the hypotheses that (1) third party enforcement complements code compliance efforts by reputation sensitive buyers, (2) factory-specific public disclosure of noncompliance helps control free-riding of noncompliant factories lacking a reputation sensitive buyer on the market-level reputational externalities generated by compliant factories and that (3) enforcement activities induce factories to experiment in human resource management innovations that are both more humane and more efficient.

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1. INTRODUCTION

Harsh conditions of work in apparel factories have been the subject of social activism for over a century. The persistence of *traditional* human resource (HR) management practices, including extremely fine division of labour, close monitoring of work effort, etc., are arguably the consequence of apparel manufacture technology. Work effort for most garment production tasks is easily observable and, therefore, perfectly contractible (Lazer and Oyer, 2007). Indeed, piece rate pay has been shown to increase productivity in traditional industries (e.g., Bandiera, et al, 2007). However, this technological explanation is challenged on two accounts. First, recent empirical evidence suggests that HR innovations, such as production teams, increase productivity and workplace satisfaction even in an apparel factory (Hamilton, et al, 2003; Ichniowski, Shaw and Prennushi, 1997). Second, workplace practices in apparel factories commonly fall below even the traditional system, including excessive hours of work, nonpayment of wages, physical and sexual abuse, etc. (National Labor Committee, 2006). Failure to pay wages as promised poses a particular challenge for the technology explanation, for unpaid wages cannot induce consistent work effort.

There are several factors that limit the adoption of efficiency-enhancing HR innovations in the apparel industry. The complementary relationship between HR components may render traditional labour management practices locally optimal (Lazear and Shaw, 2007). Empirical evidence also indicates that experimentation in HR innovations by small organizations involves risk and macro events external to the firm may confound interpretation of results (Freeman and Kleiner, 2005; Brown, et al, 2009). Boning et al (2007) argue that HR innovations are only profit-maximizing in the production of sufficiently complex products, though Locke and Romis (2006) find greater HR innovation in the factory producing simpler garments.

However, factories may resist even those HR innovations that have been demonstrated to improve factory productivity in the presence of imperfect competition in goods and factors markets (Bloom and Van Reenen, 2007). HR innovations may be accompanied by an enhanced sense of worker agency and perceptions of fairness, thereby increasing labour's relative bargaining power and reducing capital's share of any economic rents earned by the firm (Lazear and Oyer, 2007). Freeman and Kleiner (2005), reporting on experimentation with the use of pay incentives in a footwear factory, found that the study factory reverted to pre-experiment pay practices at the end of the study. The role of labour market imperfections and monopsonistic

wage-setting behavior in suppressing wages is particularly evident in Harrison and Scorse's (2009) analysis of corporate codes of conduct and wage-setting behavior by foreign-owned and export-oriented firms in Indonesia. Thus, HR innovations in the presence of labour market imperfections characteristic of developing countries may be profit-maximizing only within the confines of a set of clearly articulated and enforced binding constraints such as laws, corporate codes or international labour standards (Weil, 2005).

In the following analysis we explore two fundamental questions. First, do binding constraints on labour management practices alter a factory manager's information set concerning the determinants of productivity and product quality, thereby accelerating the adoption of humane labour management innovations? Second, what enforcement mechanisms, such as soft enforcement and market-based rewards, promote compliance with international standards and local labour law?

We use a new and highly detailed dataset from Cambodia to assess the forces driving improved working conditions that arise due to compliance with labour law. These data were collected as a part of the Better Factories Cambodia (BFC) program carried out by the International Labour Organization (ILO), and allow us to observe labour conditions during 1154 factory inspections along 405 dimensions of labour standards with five survey rounds spanning six years. We exploit a 2006 change in the format of BFC public reports to decompose the specific impact of the presence of a reputation sensitive buyer, the threat of public disclosure of factory-level noncompliance and information acquired by firms on the productivity and product quality effects of some aspects of compliance on a factory's decision to comply.

Firms in the Cambodian apparel industry share a collective interest in demonstrating a record of labour law compliance. In the early period of Better Factories Cambodia, the apparel industry's record of compliance was a factor used by the U.S. government in determining Cambodia's apparel export quota allocation. Further, the general reputation of working conditions in the Cambodian apparel industry induced reputation sensitive buyers, most notably Nike, to resume sourcing from Cambodia.

The focus on industry-wide labour law compliance created the possibility of free-riding, with non-compliant factories costlessly benefiting from the general positive reputation of the Cambodian apparel industry created by compliant factories. One of the strategies employed by BFC to control free-riding was to publically disclose noncompliant factories and their points of

noncompliance. Such disclosure occurred in the periodic Synthesis Reports issued and publically disclosed by BFC (Polaski, 2004 & 2006).

However, two events altered firm perceptions of the cost of noncompliance. With the end of the MFA in 2005, Cambodian factories were no longer earning economic rents associated with an expanded quota allocation, thus lowering the payoff for compliant behavior. Further, in the fall of 2006, BFC stopped publically identifying individual factories and their points of noncompliance. The elimination of public disclosure differentially impacted factories not supplying a reputation sensitive buyer.

We begin with a factor analysis approach that allows us to identify the aspects of labour law compliance that appear to be systematically related. The factor analysis identifies five dimensions of compliance that can be used to infer a factory's HR system. We then present a multivariate regression analysis that estimates the impact of public disclosure of noncompliance on the pattern of compliance with labour standards, controlling for the presence of reputation sensitive buyers and a set of firm characteristics (through geographic and firm fixed effects). We find that during the public-disclosure period all factories improved compliance. BFC appears to complement and enhance the monitoring efforts by reputation sensitive buyers and the threat of public disclosure of noncompliance induces compliance even in those factories lacking a reputation sensitive buyer. In the post-public disclosure period, all groups of factories still maintain a significant record of compliance. However compliance is most persistent for factories supplying a reputation sensitive buyer. Average compliance rates in factories lacking a reputation sensitive buyer declined in the post-public disclosure period, though not returning to baseline compliance rates

Given the limitations of the data, the empirical model is somewhat under-identified. However, compliance choices before and after the two policy changes are consistent with the hypotheses that (1) the presence of compliance-linked quota rents and the threat of public disclosure of individual points of noncompliance helped all Cambodian factories coordinate on a high compliance equilibrium, (2) enforcing compliance induced factories to experiment with humane labour management innovations, (3) some labour management innovations were found to increase productivity and (4) some labour management innovations were found to improve product quality.

The rest of the paper proceeds as follows. Section 2 contains an analytical framework that helps motivate the empirical approach. We describe the data in Section 3 and present the empirical results in section 4.

2. ANALYTICAL FRAMEWORK

In the theoretical framework of the personnel economics literature, workers are assumed to maximize utility and factory managers maximize profits subject to market, technology parameters and information constraints. Firm output is the consequence of worker effort (e) directed at quality ($e_q \in [0,1]$) and quantity ($e_n \in [0,1]$). Working conditions are characterized by a vector ($z_1 \dots z_N$), e.g., the rate paid for piece work ($z_1 = w_n$), pay based on product quality ($z_2 = w_q$), work hours ($z_3 = h$), and other working conditions such as the quality and availability of first aid, the incidence of abuse by factory supervisors and other conditions.

Workers' bargaining position with regard to the vector of working conditions is determined by maximizing an additively separable utility function of working conditions and work effort. That is, $u = c(z_1 \dots z_N) + g(e_q, e_n)$. The partial derivatives of c are non-negative. The partial derivative, g_1 , is negative but the partial, g_2 , may be positive, allowing for the possibility of intrinsic value of work.

The bargaining position of factory managers is derived from the solution of an expected profit maximization program with expected profits given by:

$$\pi = p(e_q)S h f(e_n, z_1, \dots, z_N; I) - (w_n e_n + w_q e_q) h - \sum_{i=4}^N a_i(I) z_i, \quad (1)$$

where p is the price of output, $S \geq 1$ is the price premium for meeting a minimum compliance standard, h is hours worked by workers, e_n and w_n (or e_q and w_q) are effort and wages for effort directed at quantity (or quality), z_i refers to working condition i and $a_i(I)$ its cost as perceived by managers with information set I . The price, $p()$, depends on the workers' effort with regard to the quality of the product. The production function $f()$ is the factory manager's expectation of hourly output based on the working conditions chosen and is conditional on the factory manager's information set, I , concerning production technology.

Factory managers can elicit work effort directed at quality and quantity by paying an efficiency wage or by altering the conditions of work. Factories face an upward sloping effort schedule where the slope depends on the conditions of work. That is

$$e_q = e_q(z_1 - \bar{w}_n, z_2 - \bar{w}_q, z_3, \dots, z_N) \quad (2)$$

$$e_n = e_n(z_1 - \bar{w}_n, z_2 - \bar{w}_q, z_3, \dots, z_N). \quad (3)$$

Here we assume that

$$\frac{\partial e_q}{\partial z_1} < 0, \frac{\partial e_q}{\partial z_2} > 0, \text{ and } \frac{\partial e_q}{\partial z_3} < 0$$

$$\frac{\partial e_n}{\partial z_1} > 0, \frac{\partial e_n}{\partial z_2} < 0, \text{ and } \frac{\partial e_n}{\partial z_3} < 0.$$

That is, incentives targeting quantity reduce effort directed toward quality and *vice versa*. Increased hours reduce effort toward quality and quantity. The partial derivatives of the other working conditions may be positive or negative. Verbal or physical abuse may increase effort on quantity if such treatment is effectively intimidating. However, all working conditions that are perceived by workers as degrading the work environment will reduce effort on quality and quantity. Working conditions that improve information flow will increase effort on quality and quantity. This includes information relating to wages and worker grievances.

Working conditions enter the profit-maximization problem at several points. First, the variable S indicates whether the factory is deemed to be in compliance with a minimum working conditions standard, \bar{s} , as required by their principal customers or relevant government agent. Here we take $S = 1$ if $s(z_1 \dots z_N) < \bar{s}$ and $S > 1$ if $s(z_1 \dots z_N) \geq \bar{s}$.

The size of the compliance premium is increasing in compliance reflecting the degree of reputation sensitivity of a vendor's principal customers. We take low-reputation sensitive buyers to be negatively impacted by BFC-generated public reports of noncompliance by its vendors. However, such buyers do not consider themselves to be the target of anti-sweatshop activism and are, thus, not concerned intrinsically with conditions of work in their vendors.

High reputation sensitive buyers are concerned both with any noncompliance publically reported by BFC and the potential of an exposé by anti-sweatshop activists. Thus, for the high reputation sensitive buyer, a record of BFC compliance may be infra-marginal. For these buyers, the threat of an exposé exists whether or not BFC is disclosing noncompliance in its vendors.

Working conditions also reflect the HR system employed in the factory. The sign of the partial derivative of the production function, f , with respect to a working condition depends on

the level of other working conditions and the factory manager's information set, I . The coefficient a_i indicates the perceived marginal cost of working condition z_i and also depends on the manager's information set, I . Working conditions also affect the work effort targeting quantity and quality.

Working conditions are the outcome of bargaining between the worker and the firm. The bargaining function is $B = \pi^\delta u^{1-\delta}$, where $\delta(z_1, \dots, z_N)$ indicates the relative bargaining power of the firm. In the extreme case, $\delta = 1$, a factory manager sets working conditions just high enough to satisfy a reservation wage requirement, $u \geq \bar{u}$. We also allow for the possibility that the bargaining power of workers is increasing in the working conditions variables. Improved working conditions, particularly related to two-way communication and positive motivational techniques, may increase a sense of agency on the part of the worker and, thereby, alter the bargaining parameter.

In our context, the factory manager's information set and perceptions of the partial derivatives of the production function, f , with respect to working conditions will be augmented by experience with compliance. A factory that attempts to come into compliance on a particular point acquires information about the cost and benefits of compliance.

The solution to the firm's optimization problem and bargaining with workers, then, produces the optimal choice of working conditions at time t and profits that are a function of output prices, minimal acceptable working conditions, the reservation wage and past compliance choices. That is

$$\pi^* = \pi^*(\bar{s}, p(e_q), \bar{w}_n, \bar{w}_q, I, \delta) \quad (4)$$

$$z_{it}^* = z_i^*(\bar{s}, p(e_q), \bar{w}_n, \bar{w}_q, I(z_{i,t-1}^*), \delta); \quad i = 1, \dots, n \quad (5)$$

The vector of working conditions in equation (5) constitute the factory's human resource management system.

We employ two events to identify the sign of the partial derivatives of the equilibrium HR system. The introduction of the set of constraints imposed by Better Factories Cambodia altered the information set and market opportunities available to Cambodian apparel manufacturers. Better Factories Cambodia enters into the firm's calculus at six points. BFC may alter: (1) the manager's perception of the set of partial derivatives, $f_2 \dots f_N$, due to a change in the manager's information set, (2) the actual productivity impact of a change in labour practices by improving implementation, (3) the manager's perceptions of the cost of a labour practice, a_i , (4) the capacity of the factory to signal its compliance with a minimum set of labour standards,

thereby raising the return to code compliance, (5) the manager's perception of the rigidity with which legal constraints bind on the factory's behavior and (6) the bargaining position of the factory relative to the worker.

In the next section, we apply this framework to identify the factors affecting the decision to comply using factory-level panel data.

3. DATA

Better Factories Cambodia is a program established by the International Labour Organization (ILO) in 2001. It is a unique program that combines monitoring, remediation and training designed to improve working conditions in exporting apparel factories. The program is based on monitoring and reporting on working conditions in Cambodian garment factories according to national law complying with international standards, and uses the results to help factories improve working conditions and productivity. The program works with the Government and international buyers to ensure a rigorous, transparent and continuous cycle of improvement.¹

Monitors observe working conditions in all Cambodian garment factories during unannounced visits. Cambodian monitors enter factories to complete a tool assessing the factory's compliance on a variety of working conditions and wage requirements. To avoid monitor bias, each monitoring team contains at least two people, and the same team rarely assesses the same factory twice. After the factory's second BFC visit, BFC publishes the firm's name and progress on improving working conditions in an annual synthesis report, which they share with the factories' buyers.

As the Cambodian government has mandated that all exporting garment factories consent to this monitoring program, it eventually reached all such factories. The original wave of visits in 2001-2002 reached 119 factories with the first survey created for BFC. For the three years following the visits to these original factories, monitors conducted visits using less formal techniques and did not carefully record results, so data are unavailable for this three-year period. The next wave of documented visits began with the launch of the improved Information

¹ More information about the Better Factories program can be found at <http://www.betterfactories.org/>.

Management System (IMS) survey in December 2005. Since then, monitors have visited each factory an average of once every eight months.

4. SUMMARY STATISTICS

Table 1 summarizes the distribution of factories over time and visit. Several features of the data emerge in Table 1. First, participating factories can be divided into two “waves.” As noted above, the first “wave” includes factories visited in 2001 or 2002. At that time, factories were visited with the intention of identifying significant violations and then revisited later with the intent of identifying progress in those areas. As a result, the records for those firms are not as complete as factories visited in the second “wave” starting in 2006.

Table 1: Factory Counts Over Time

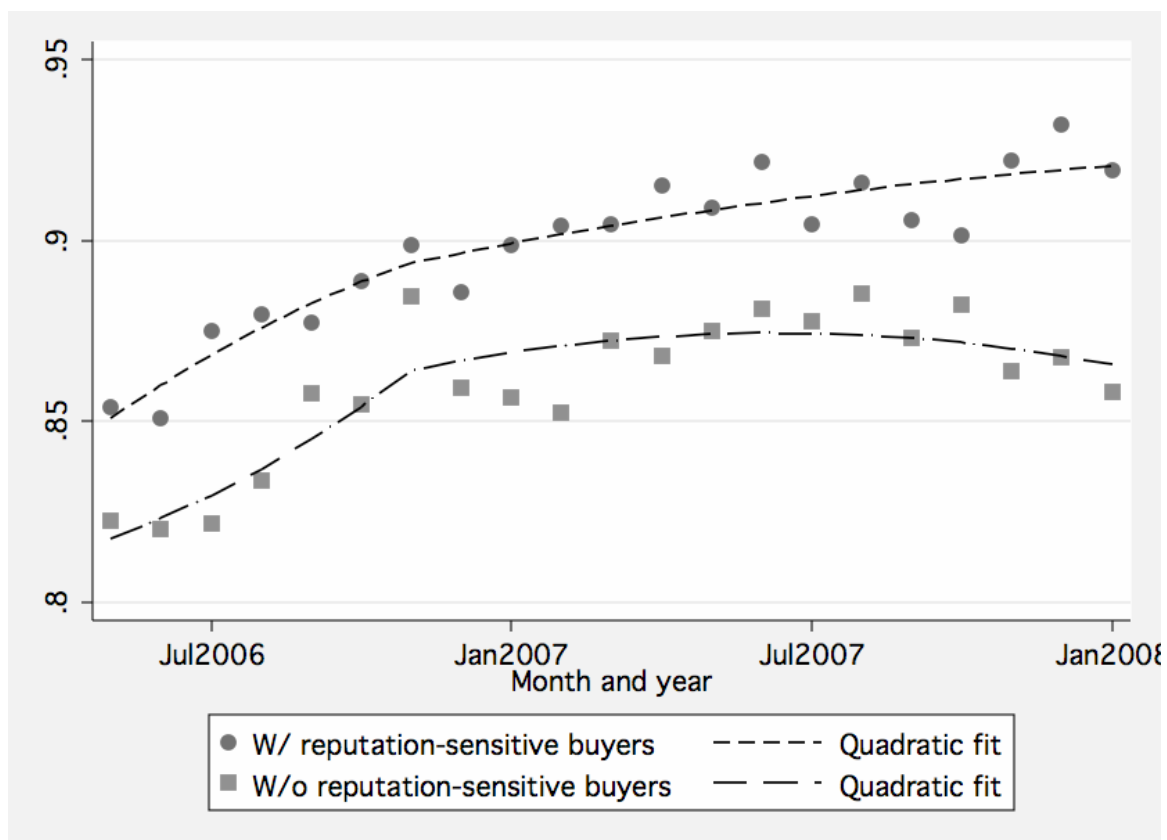
<u>Visit</u>	<u>Visit Year</u>						<u>Total</u>
	<u>2001</u>	<u>2002</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	
1	85	34	7	187	30	20	363
2	0	0	18	121	136	20	295
3	0	0	0	48	185	22	255
4	0	0	0	0	80	108	188
5	0	0	0	0	12	39	51
6	0	0	0	0	0	2	2
Total	85	34	25	356	443	211	1,154

Table 1 also reveals significant attrition in the data. While there are a total of 363 factories with an initial visit, there are only 51 with a fifth visit. Much of the lack of 5th visit observations comes from the fact that the second “wave” is relatively large. The goal was to schedule visits every 8 months, but in practice some factories were visited once per year. At that rate, it is not surprising that only 188 factories had four visits by 2008.

In addition to timing issues, however, there is clearly significant attrition in the sample. This attrition is particularly distinctive for the 119 first wave factories, for which 82 (69%) have their second visit in either 2005 or 2006. The remaining 37 have no recorded second visit. Since, by law, all exporting factories are required to be visited, the lack of a second visit is taken to imply that the factories are no longer operating.

Figure 1 focuses on the period just before and after the elimination of public disclosure, measuring compliance as an average across all firms and across approximately 405 working conditions within each visit, and establishes five key stylized facts: (1) There was a broad improvement in working conditions among firms both with and without reputation sensitive buyers, (2) factories with a reputation sensitive buyer have higher average compliance, (3) after the elimination of public disclosure the rate of improvement slowed for factories with a reputation sensitive buyer, (3) compliance for factories lacking a reputation sensitive buyer declined after the end of the public-disclosure period but (4) compliance did not return to the baseline even in the absence of a reputation sensitive buyer or threat of public disclosure of noncompliance.

Figure 1: Convergence in Compliance



While hardly definitive, these findings suggest that BFC is altering the information set of factories particularly as it relates to the productivity impact of compliance. In the case of factories supplying reputation sensitive buyers, BFC appears to complement the monitoring

efforts of the buyers. However, even in the absence of a reputation sensitive buyer, compliance performance improves. Furthermore, during the period following the end of the MFA when noncompliance was no longer publically disclosed, the cost of noncompliance declined perhaps to zero for factories not supplying a reputation sensitive buyer, yet a record of improved compliance persisted. This outcome is certainly suggestive of a productivity-enhancing effect of compliance discovered by the factory during the public disclosure period.

Table 2 disaggregates working conditions into 27 groups and summarizes the average compliance of each group.² Each factory's compliance measure is calculated by taking the average of all of the 0/1 compliance questions (1 indicates compliance) in each group. Statistics reported in Table 2 are the average of these factory-level values across all factories within each group. Therefore, a 1.000 indicates that all factories are fully compliant with all questions within that question group. A 0.800 indicates that the average compliance value for that question group is 80%.

Several features of compliance emerge from Table 2. First, there is a wide range of average compliance across groups – especially in the first visit. The standard deviation is 13% and average values range from 0.996 (forced labour) to 0.544 (Occupational Safety and Health Assessment, Recording, and Reporting). Second, on average, compliance improves across visits. Nearly all groups demonstrate an increase in average value through visits. Third, the correlation between average values in the first and fourth visits is only 0.78, which suggests that there is uneven improvement in groups across time.

² Of these 405 questions, 62 show no variation across both factory and visit. These questions are dropped from the analysis.

Table 2: Compliance in Aggregated Working Conditions Indicators by Visit

<u>Working Condition Group</u>	Visit				
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Child Labour	0.800	0.734	0.745	0.746	0.750
Discrimination	0.967	0.967	0.971	0.966	0.961
Forced Labour	0.996	1.000	1.000	1.000	1.000
Collective Agreements	0.904	0.933	0.966	0.977	0.976
Strikes	0.975	0.999	0.999	0.998	0.987
Shop Stewards	0.599	0.713	0.734	0.727	0.753
Liaison Officer	0.594	0.862	0.905	0.926	0.953
Unions	0.935	0.981	0.985	0.994	0.995
Information About Wages	0.613	0.736	0.775	0.781	0.788
Payment of Wages	0.769	0.805	0.840	0.861	0.896
Contracts/Hiring	0.829	0.833	0.868	0.886	0.924
Discipline/Management Misconduct	0.856	0.902	0.910	0.915	0.913
Disputes	0.933	0.955	0.958	0.974	0.967
Internal Regulations	0.896	0.956	0.971	0.981	0.986
Health/First Aid	0.570	0.690	0.710	0.746	0.778
Machine Safety	0.838	0.873	0.895	0.914	0.929
Temperature/Ventilation/Noise/Light	0.767	0.782	0.787	0.766	0.788
Welfare Facilities	0.767	0.837	0.856	0.867	0.874
Workplace Operations	0.697	0.757	0.775	0.786	0.804
OSH Assessment, Recording, Reporting	0.544	0.726	0.765	0.793	0.820
Chemicals	0.783	0.749	0.767	0.762	0.773
Emergency Preparedness	0.863	0.915	0.920	0.938	0.930
Overtime	0.588	0.662	0.709	0.723	0.762
Regular Hours/Weekly Rest	0.756	0.860	0.887	0.892	0.898
Workers' compensation for Accidents/Illnesses	0.813	0.968	0.972	0.984	0.990
Holidays and Annual/Special Leave	0.842	0.850	0.890	0.901	0.923
Maternity Benefits	0.724	0.837	0.863	0.881	0.922

5. FACTORS AFFECTING COMPLIANCE

Factor Analysis

To analyze the correlation between different measures of working conditions, we perform a principal-components factor analysis. Assuming the communalities are equal to 1, we find five groups of conditions that seem to suggest straightforward characterizations.

Factor 1 includes compliance points related directly to workplace regulations, information, and hours (“Communications and Workplace Systems”). Traditional workplaces are typically characterized by one-way communication and little information sharing. By contrast, a modern workplace has developed systems for two-way communication, teamwork, problem-solving and information sharing. Innovations in this factor are, in many ways, the most challenging for a factory as they involve a fundamental change in the nature of the relationships and responsibilities within the workplace.

The second factor captures ambient working conditions (“Occupational Safety and Health”). The third factor (“Modern Wage Practices”) involves contracts and wages. This factor relates factory practices, such as clarifying the terms of employment, payment of wages as promised, and adhering to rules regulating the length of the work day and days off. These are the labour management behaviors that most distinctively differentiate a *sweatshop* from a traditional but not oppressive or exploitative workplace.

The fourth factor involves Freedom of Association and Collective Bargaining (“Unions”) and the final factor involves discrimination, child labour and forced labour (“Core labour standards”). Together, these include labour standards that enjoy near universal acceptance and are *zero-tolerance* points of compliance for the U.S. government and reputation sensitive buyers.

Reputation Sensitivity

In order to investigate the impact of buyer reputation sensitivity on labour law compliance, we collect data on each buyer’s commitment to corporate social responsibility, whether the firm is an apparel retailer or mass merchandiser, and other measures of brand value as determined by consulting firms such as Inter-Brand’s Best Global Brands Ranking and *Fortune’s* “Most Admired Companies” scoring system. Based on this survey of information, buyers were first separated into apparel retailers and mass merchandisers. Apparel retailers are primarily in the business of selling apparel and may sell other related but non-apparel goods. Mass merchandisers refer to large chain stores that sell a wide range of products, with apparel being only one subgroup. These two groups of buyers differ principally in terms of product quality measures both in terms of the technical characteristics of the garment and defect rate.

Within these two groups, buyers are subsequently divided by reputation sensitivity. Of buyers sourcing from Cambodia during the study period, firms fell into four broad categories:

Type 1: Apparel retailers with significant evidence of corporate social responsibility.

Type 2: Apparel retailers with little evidence of a policy relating to corporate social responsibility

Type 3: Mass merchandisers with significant evidence of corporate social responsibility.

(No buyers fell into the category of mass merchandiser without evidence of CSR.)

Type 4: Buyers that were not accessing BFC compliance reports.

These categories are included in the regression analysis along with other controls.

Regression Results

We begin by investigating a broad measure of compliance: a binary variable equal to one if the factory remains in compliance with each of the 405 specific working-conditions question. We estimate equation (5) using the linear probability model (LPM). The LPM is a reasonable choice in this situation because we are concerned with marginal effects, the event defined in the dependent variable is not too rare, and we have many fixed effects in our regressions. We also estimated probit equations and obtained nearly identical results. For all specifications we cluster the standard errors on factory and therefore mitigate the effect of having factory-level (rather than question-level) variation on the right hand side.

As a first step, we estimate the impact that a compliance point's factor has on the probability of compliance. The estimated coefficients are the mean compliance rate for each compliance factor. Results, for the entire sample and disaggregated by buyer type, are reported in Table 3. Note first that the compliance factors characterized by core labour practices (Freedom of Association, Collective Bargaining, Discrimination, Child Labour and Forced Labour) uniformly approach perfect compliance for all factory and buyer types. At the other end of the spectrum, the three factors that are characteristic of innovations in labour management practices beyond sweatshop-like conditions (Modern Wage Practices, Occupational Safety and Health and Communication/Management Systems) are lower than for the two core labour protections.

Table 3: Compliance Rates by Buyer Type			
VARIABLES	(1) Means Full sample	(2) Means Buyer type1 Reputation Sensitive Retailer	(3) Means Buyer type3 Reputation Sensitive Mass Merchandiser
Communication and Workplace Systems	0.824*** [0.003]	0.859*** [0.005]	0.839*** [0.006]
Occupational Safety and Health	0.809*** [0.004]	0.849*** [0.007]	0.824*** [0.008]
Modern Wage Practices	0.862*** [0.004]	0.896*** [0.005]	0.874*** [0.006]
Unions	0.982*** [0.001]	0.986*** [0.002]	0.982*** [0.003]
Core Labour Standards	0.964*** [0.001]	0.964*** [0.002]	0.964*** [0.002]
Observations	349,150	81,754	94,076

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.10

We also confirm observations based on Figure 1. Factories with a reputation sensitive buyer (Buyer types 1 and 3) have overall compliance that exceeds that for the full sample. As will be seen below, this finding is robust to every specification of the model. In fact, the compliance gap between factories supplying reputation sensitive and nonreputation sensitive buyers will become larger as factory characteristics are introduced into the regression analysis.

Further, we observe a difference in compliance performance within the reputation sensitive supplier group. Factories supplying a quality sensitive retailer appear to be more compliant than factories supplying mass merchandisers. While not definitive, this evidence is consistent with the possibility that the human resource management system that minimizes the cost of achieving the level of product quality specified by retailers also brings the factory into some dimensions of compliance. That is, compliance along some dimensions is not binding on cost-minimizing factories producing quality garments.

We next add an array of factory-level controls and different sets of fixed effects. Results are reported in Table 4.

Table 4 Compliance with Factory Characteristics						
VARIABLES	Full sample	Buyer type 1	Buyer type 3	Full sample	Buyer type 1	Buyer type 3
Communication/Workplace Systems	0.793*** [0.015]	0.872*** [0.018]	0.834*** [0.014]	0.555*** [0.003]	0.893*** [0.008]	0.849*** [0.003]
Occupational Safety and Health	0.781*** [0.015]	0.869*** [0.019]	0.824*** [0.013]	0.546*** [0.004]	0.889*** [0.009]	0.838*** [0.005]
Modern Wage Practices	0.824*** [0.016]	0.907*** [0.018]	0.868*** [0.013]	0.591*** [0.004]	0.927*** [0.008]	0.883*** [0.003]
Unions	0.944*** [0.015]	0.996*** [0.017]	0.976*** [0.013]	0.710*** [0.004]	1.016*** [0.009]	0.990*** [0.006]
Core Labour Standards	0.926*** [0.015]	0.974*** [0.018]	0.959*** [0.013]	0.695*** [0.004]	0.995*** [0.009]	0.973*** [0.006]
Reputation sensitive buyer	0.041*** [0.005]					
Irreversible compliance point	-0.026*** [0.003]	-0.030*** [0.005]	-0.020*** [0.005]	-0.025*** [0.003]	-0.030*** [0.005]	-0.020*** [0.005]
Union active in labour rights	0.002 [0.006]	0.006 [0.009]	-0.003 [0.010]	0.008 [0.006]	0.013 [0.010]	0.005 [0.009]
Small unions ^a	0.012* [0.007]	0.006 [0.013]	0.014 [0.012]	0.008 [0.006]	0.012 [0.013]	-0.000 [0.012]
Politically affiliated unions	0.013 [0.014]	0.031** [0.012]	0.022 [0.016]	0.004 [0.010]	-0.005 [0.007]	0.025** [0.012]
Large unions ^b	-0.004 [0.008]	-0.003 [0.013]	-0.010 [0.014]	-0.001 [0.007]	0.002 [0.015]	-0.009 [0.012]
Public disclosure	-0.048*** [0.004]	-0.045*** [0.008]	-0.054*** [0.006]	-0.047*** [0.003]	-0.050*** [0.008]	-0.048*** [0.004]
Geographic Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	No	No	No	Yes	Yes	Yes
Observations	298,837	79,309	92,875	343,053	79,309	92,875

Notes: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.10. "Geo" fixed effects represent the region of factory ownership (Cambodia, China, Asia (excluding China), Europe (including Australia and the United States), and other). Public Disclose is a binary variable equal to one during periods when BFC disclosed noncompliance and zero otherwise.

^a Small unions possibly controlled by management

^b Large unions known to serve management

In column (1), we confirm that the presence of a reputation sensitive buyer has a positive and significant impact on compliance. The various union controls are both small and generally statistically insignificant. The conditional means of the compliance groups remain high, particularly for core labour standards. This implies that even after controlling for the presence of reputation sensitive buyers, the presence or absence of public disclosure, unions, and all time-invariant geographic and firm characteristics (fixed effects), there is a high rate of compliance. Although some of these factors are individually important (as we discuss below) the balance of compliance behaviour is not explained away by the presence of a reputation sensitive buyer or the threat of public disclosure. In fact, the probability of compliance for factories lacking a reputation sensitive buyer ranges from a low of 0.78 on Occupational Safety and Health to a high of 0.94 on unions.

The effect of public disclosure, however, is negative and statistically significant. This variable is equal to one during the periods when BFC publically disclosed noncompliance (and zero otherwise). A possible explanation for the negative coefficient is that the public disclosure variable is essentially acting as a time dummy variable, and changes over time may mask the true effect of the policy change. To focus more attention on the BFC's policy of public disclosure, we limit the sample to just the 2006:06-2007:05 period in column (4). By narrowing the time period, we can reduce the confounding effects of time and increase the likelihood of capturing the true effect of the policy change.

The magnitude of the estimated coefficient falls (and the difference is statistically significant), but the coefficient remains negative and significant, suggesting that average compliance and improvements in compliance persist even after the threat of public disclosure is removed.³ Continued compliance, even as the cost of noncompliance declines, is consistent with the hypothesis that the act of coming into compliance has altered the factory manager's information concerning the cost and/or productivity consequences of compliance.

The threat of public disclosure however does appear to affect a new decision to come into compliance. In Table 5, we directly examine the effect of public disclosure on first-time compliance. The dependent variable is equal to zero if a factory has never been compliant and equal to one if the factory changes from noncompliant to compliant for each of the disaggregated questions available in the data for each factory and each visit. Using first-time compliance as a dependent variable, firms are not included in the analysis after they become

³ Additional tests of robustness are reported in Ang (2010) and Brown, Dehejia and Roberston (2010).

compliant. The resulting sample includes about 141,000 observations (questions × plants × periods). We retain the same set of independent variables and specifications for the results presented in Table 4.

Table 5: First-Time Compliance

VARIABLES	(1) Full sample	(2) Full sample	(3) Full sample	(4) 2006:06 to 2007:05
Communication/Workplace Systems	0.658*** [0.006]	0.241*** [0.017]	0.151*** [0.010]	0.136*** [0.033]
Occupational Safety and Health	0.665*** [0.007]	0.264*** [0.017]	0.177*** [0.010]	0.148*** [0.033]
Modern Wage Practices	0.743*** [0.006]	0.300*** [0.017]	0.219*** [0.010]	0.188*** [0.033]
Unions	0.967*** [0.003]	0.461*** [0.018]	0.375*** [0.011]	0.345*** [0.034]
Core Labour Standards	0.904*** [0.002]	0.407*** [0.018]	0.333*** [0.011]	0.267*** [0.034]
Reputation sensitive buyer		0.035*** [0.007]		
Irreversible compliance point		-0.071*** [0.004]	-0.065*** [0.003]	-0.058*** [0.004]
Union active in labour rights		-0.003 [0.008]	-0.006 [0.016]	-0.058* [0.034]
Small unions ^a		0.001 [0.011]	0.011 [0.020]	-0.011 [0.043]
Politically affiliated unions		0.006 [0.020]	-0.003 [0.024]	0.066 [0.072]
Large unions ^b		0.011 [0.011]	-0.082*** [0.027]	-0.095** [0.041]
Public disclosure		0.465*** [0.010]	0.453*** [0.010]	0.433*** [0.014]
Geographical Fixed Effects	No	Yes	Yes	Yes
Firm Fixed Effects	No	No	Yes	Yes
Observations	141,048	107,983	136,040	89,970

Notes: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.10. “Geo” fixed effects represent the region of factory ownership (Cambodia, China, Asia (excluding China), Europe (including Australia and the United States), and other). Public Disclose is a binary variable equal to one during periods when BFC disclosed noncompliance and zero otherwise.

^a Small unions possibly controlled by management

^b Large unions known to serve management

The main qualitative difference between Table 4 and Table 5 is that in every specification, the public disclosure variable is now positive, large, and statistically significant. The key result here mirrors that of the control for reputation sensitive buyer: public information has a large and significant effect on the factory's decision to experiment with compliance. Given the relatively clear counterfactual in Table 5 compared to Table 4, the results suggest that public disclosure may have had a large and significant positive effect on the decision to experiment with new points of compliance. A corollary of this finding is that the threat of public disclosure of noncompliance helped Cambodian factories control free-riding and coordinate on a high compliance equilibrium.

As in Table 4, columns (3) and (4) add firm-specific controls. The conditional factor-category means continue to fall, but unions still show the highest average compliance. Since we only observe the reputation sensitivity of the firm's principle buyer once, it is not possible to include separately that variable – it is absorbed within the firm fixed effects. The other variables, such as having a physically irreversible compliance point, remain negative and significant in columns (2)-(4). This is consistent with the standard expectation that a significant fixed cost of compliance deters factories from improving in that area. The additional union variables are generally not statistically significant. One important exception seems to be that large unions known to serve management seem to deter compliance, which is not a particularly surprising result.

8. CONCLUSIONS

Working conditions in developing countries are often characterized as sweatshops. Improving these conditions requires an understanding of the factors that both lead to sweatshop-creating choices by firm managers and have the greatest impact on the decision to improve these conditions. We present an analytical model and use a novel factory-level dataset from Cambodia to identify mechanisms to induce innovation in labour management practices that are more humane and potentially more efficient.

Following the introduction of labour law enforcement by the ILO's Better Factories Cambodia program, we find broad improvement in working conditions among firms both with and without a reputation sensitive buyer. Though, factories with a reputation sensitive buyer

have higher average compliance than other factories. After the elimination of public disclosure of factory-level noncompliance the rate of improvement in compliance slowed for factories with a reputation sensitive buyer. During the same period, compliance for factories lacking a reputation sensitive buyer declined. However, compliance for such factories did not return to the baseline even after the threat of public disclosure was eliminated.

Though the empirical model is under-identified, these findings are consistent with several hypotheses concerning labour law enforcement and the adoption of humane labour management practices in apparel factories. First, third party enforcement complements and enhances code compliance efforts by reputation sensitive buyers. However, more importantly, Better Factories Cambodia also improved compliance with international labour standards and local labour law in factories lacking a reputation sensitive buyer. Such factories typically have a low buyer-level reputational pay-off to compliant behaviour and, thus, free-ride on the market-level reputation created by highly compliant factories supplying reputation sensitive buyers. That is, BFC appears to have improved compliance even among firms lacking a factory-level benefit from a reputation for compliance.

Factory-specific public disclosure of noncompliance appears to be the mechanism by which BFC controlled free-riding factories lacking a reputation sensitive buyer on the market-level reputational externalities generated by compliant factories. For, when public disclosure of noncompliance was terminated at the end of 2006, average compliance by factories lacking a reputation sensitive buyer declined absolutely and relative to the compliance record of other factories.

Second, factories lacking a reputation sensitive buyer did not retreat back to their compliance baseline in the post-public disclosure period, suggesting that some of the changes in labour management practices intended to improve compliance were found by the factory to improve productivity. Thus, enforcement activities may have induced factories to experiment in human resource management innovations that are both more humane and more efficient. Our findings are particularly consistent with evidence from the experimental literature concerning the use of payment of wages to induce work effort.

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