Labor Compliance and Factory Performance

Evidence from the Cambodian Garment Industry

23
DISCUSSION PAPER

FEBRUARY 2017

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BETTER WORK DISCUSSION PAPER NO. 23

LABOR COMPLIANCE AND FACTORY PERFORMANCE: EVIDENCE FROM THE CAMBODIAN GARMENT INDUSTRY

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Abstract

This paper examines the association between various working conditions and the performance (profit rate, productivity, and employment) of the Cambodian garment-exporting factories between 2001-2002 and 2006-2008. Using a unique factory-level data set, we mainly find that (i) higher overall compliance is associated with higher labor productivity and employment, (ii) higher compliance in the area of modern human resource management is associated with higher profit rate, TFP, and employment, and (iii) higher compliance in occupational safety and health is positively associated with employment.

JEL Classification: J81, L25, L67

Keywords: Cambodia, Compliance, Better Factories Cambodia, Garment industry. Working Conditions

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1. Introduction

Since the mid-1990s, the Cambodian garment industry has rapidly expanded in terms of number of factories, employment, and exports. As a consequence, Cambodia, a small low-income country with only 15 million people, has become the 15th largest garment exporter in the world.[1] Industry productivity also improved during the 2000s (Asuyama *et al*. 2013; Asuyama and Neou 2014). Contrary to the "race to the bottom" argument, such rapid growth has been achieved without lowering the welfare of workers (Asuyama *et al*. 2013). In fact, as shown by Ang *et al*. (2012) and this paper, factory working conditions have also improved substantially while the unique labor monitoring project called "Better Factories Cambodia (BFC)" operated by the International Labour Organization (ILO) was in effect.

A natural question then arises: have better working conditions come at the expense of factory productivity and profits? Improving working conditions (such as compensation, occupational safety and health [OSH], working hours, freedom of association and collective bargaining [FACB, which we sometimes also refer to as "unions"], and other core labor standards[2]) generally entails some cost. These costs suggest that the association between improving working conditions and productivity or profits would be negative. If improving working conditions motivates workers, attracts higher-skilled workers, reduces worker fatigue, accidents, or defect rates, or fosters better communications, however, the association between such improvements and productivity or profits could be positive.

To estimate the relationship between working conditions and factory

1 Based on data for 2014 extracted from the WTO statistics database (accessed on March 29, 2016). The garment industry is defined as SITC84. Re-exports from Hong Kong and Singapore are excluded from the exports from these countries.

2 In this paper, however, we separate FACB from the other core labor standards, which are child labor, forced labor, and discrimination. This separation follows the factor analysis results in Ang et al. (2012).

performance, we combine unique factory-level Cambodian garment data with BFC's administrative audit data. We find that (i) better working conditions are generally associated with higher labor productivity and employment, (ii) better working conditions in modern human resource management (MHR) are associated with higher profits, total factor productivity (TFP), and employment, and (iii) better working conditions in OSH are positively associated with employment. Although less robust, we also find that (iv) better working conditions in OSH tend to be associated with lower profit rates and TFP and (v) better working conditions in MHR are associated with higher labor productivity. Aggregate compliance in other areas (FACB and communication, compensation, working hours, and the three core labor standards) are not significantly related with factory performance measures (profit rate, TFP, labor productivity, and employment).

This paper mainly contributes to the literature in three ways. First, this paper adds empirical evidence to the scarce literature on the impact of working conditions on firm performance.[3] Few empirical studies examine profit and productivity as firm performance in developing countries.[4] As summarized in Asuyama (2014), these previous studies have found mixed evidence on the impact of better working conditions on profit and productivity.[5] Additional studies, therefore, are necessary.

Second, this paper contributes to the literature by providing a comprehensive evaluation of working conditions regarding types of labor regulations. This is possible because our factory-level data contain detailed

3 See literature review such as Croucher et al. (2013) and Betcherman (2012).

4 For example, Cuong (2013) examines the effect of minimum wage increase in Vietnam. Yang et al. (2010) and Li and Wu (2013) examine the effect of pension and health insurance in China.

5 For example, as for firm (establishment)-level empirical studies, see Draca et al. (2011) for the impact of minimum wage; Dorsey et al. (1998), Schnabel and Wagner (2001), Decressin et al. (2009), and Nguyen and Zawacki (2009) for the effect of pensions and health insurances; Clifton and Shepard (2004) and Bloom and Van Reenen (2006) for work-life balance related benefits; Schank (2005) for working hours; and Buhai et al. (2015) for OSH. As for the effect of unions, see the literature review by Macleaod (2011), Doucouliagos and Laroche (2003, 2009), and Freeman (2010).

information on very specific working conditions. Previous empirical studies usually focus on a particular area of working conditions (e.g. wages, fringe benefits, occupational safety and health, working hours) and are not able to control for other working conditions. Brown *et al*. (2015) is an exception. Since they use the Vietnamese analog of our labor compliance data, they are also able to comprehensively examine the association between working conditions and factory performance. They generally find that better working conditions are associated with higher profit margin, worker effort, and wages. Their data, however, are based on factories that voluntarily participated in the ILO's "Better Work" project and thus suffer from a selection problem. Since participation in BFC is required for all garment-exporters in Cambodia, our data suffer less from this selection problem.

Our third contribution is more practical one. Our study is the first to directly examine the association between working conditions and factory-level profit and productivity in Cambodian garment industry. Before this paper, two studies have examined the relationship between working conditions and other profit/productivity-related factory performance. Both studies use the BFC's labor compliance data, which is also used in our empirical analysis. First, Brown *et al*. (2011) show that improving working conditions does not lead to more factory closure. On the contrary, they find some evidence that the improvement in terms of compensation and modern human resource management is associated with higher chances of factory survival. Second, Oka (2012) shows that better working conditions in terms of "working hours and leaves" are associated with more reputation-conscious buyers and that better working conditions in "OSH and welfare" increase the chances of retaining these buyers. Since monitoring projects similar to BFC have emerged in other developing countries through the ILO's "Better Work" program (See Kotikula *et al*. (2015), Better Work (2016), Alois

(2016), and Brown *et al*. (2016), for recent overviews of the Better Work program), evaluating the impact of better working conditions on factory performance under BFC is practically very important.[6]

The rest of the paper is organized as follows: Section 2 briefly describes the garment industry in Cambodia and the unique “Better Factories Cambodia (BFC)” program that monitors factory working conditions. Section 3 provides a conceptual framework for understanding the relationship between working conditions and firm (factory) performance. Section 4 describes the data sources, presents summary statistics, and briefly examines how labor compliance varies with several factory behaviors. Section 5 explains the empirical strategy. Section 6 presents the estimation results. Section 7 discusses the results and concludes.

2. Cambodian Garment Industry and the Better Factories Cambodia

2.1 Garment Industry in Cambodia[7]

In Cambodia, the modern export-oriented garment industry (hereafter, garment industry) emerged in the mid-1990s as a result of foreign direct investment from several Asian countries (Bargawi 2005). Foreign investment generally, and Chinese (mainland, Hong Kong, and Taiwan) investment in particular, drove the sector’s rapid growth. During the late 2000s, the industry accounted for around 10% of Cambodia’s GDP, 4% of total employment (or half of manufacturing employment), and 60-80% of total exports.[8] As of 2015, there

6 Better Work (including BFC) operates in seven countries including Cambodia, Bangladesh, Haiti, Indonesia, Jordan, Nicaragua, and Vietnam (Better Work website: http://betterwork.org/about-us/where-we-work/, December 19, 2016 accessed).

7 For more details on the development and current status of Cambodian garment industry, see Asuyama and Neou (2014) and ILO Cambodia (2016).

8 GDP data is based on WTO (2011). Employment and export data are based on ADB (2011) and data from Cambodia’ Ministry of Economy and Finance and Ministry of Commerce.

were 626 garment factories employing 522 thousand workers and exporting 5.7 billion USD (ILO Cambodia 2016). In 2014, Cambodia was the 15th largest garment exporter in the world (see footnote 1). Factories mainly produce casual clothes and engage in low-value-added production activities.[9] The industry also contributed to reducing Cambodian poverty by employing many less-educated female workers migrating from rural areas (Asuyama *et al*. 2013).

2.2 Monitoring Working Conditions: Better Factories Cambodia[10]

One of the unique features of the Cambodian garment industry is its labor compliance monitoring project called "Better Factories Cambodia (BFC)," which is operated by the International Labour Organization (ILO). Under the 1999 US-Cambodia Textile and Apparel Trade Agreement (TATA), the United States imposed quotas on garment imports from Cambodia. The TATA incorporated labor standards clauses that stipulated that the United States would increase the quota if Cambodian garment industry substantially improved factory working conditions. In order for this incentive mechanism to work effectively, the ILO stepped in and started to monitor working conditions of Cambodian garment factories in 2001. This monitoring program was and is known as Better Factories Cambodia (BFC). Even after the expiration of TATA in the end of 2004, BFC continued to operate in Cambodian garment industry.

Through unannounced visits, BFC monitors check whether factories comply with Cambodian labor law and international labor standards. The monitoring is very comprehensive: it covers over 100 compliance items in the

9 According to the list of BFC buyers, major fast fashion retailers such as Inditex, H&M, and Gap, major sports apparel brands such as Nike and Adidas, and other large retailers such as Wal-Mart, Target, and Sears source garments from Cambodia (http://betterfactories.org/cambodia/?page_id=1219, accessed on March 29, 2016). The main export market has been the United States up to 2013, but in 2014, the EU share (41.7%) exceeded the US share (34.9%) for the first time (GMAC website: http://www.gmac-cambodia.org/imp-exp/garment.php, accessed on March 29, 2016).

10 This subsection is mainly based on BFC website (http://betterfactories.org/), Kolben (2004), Bargawi (2005), Polaski (2006), Beresford (2009), and Ang et al. (2012).

areas of core labor standards (child labor, forced labor, discrimination, freedom of association and collective bargaining), compensation (including leaves and other fringe benefits), working hours, contracts, and OSH (BFC website; Ang *et al*. 2012).[11] All garment-exporting factories accept this monitoring because it is mandatory to obtain an export license. The aggregate results are regularly released as a synthesis report. Prior to November 2006, BFC publicly disclosed the names of non-compliant factories and their noncompliance items in its report (Ang *et al*. 2012). In November 2006, BFC stopped this public disclosure process. Instead, third parties such as buyers became able to regularly access the detailed monitoring results of factories, conditional on the consent of factories and payment of access fees (Beresford 2009; BFC website).[12]

3. Theory: Working Conditions and Firm Performance

To guide our empirical analysis, we model the firm's decision as a function of the benefits and costs of improving working conditions. We then discuss the potential ways that working conditions may be related to firm performance. The main insight here is that not all working conditions are expected to be related to firm performance in the same way. Those that are more likely to be directly associated with worker effort are more likely to be positively correlated with productivity. Others that may mitigate risk (such as fire safety equipment) may not have an observable effect on factory productivity and performance in the short run.

3.1 Benefits and Costs of Improving Working Conditions

11 The number of compliance items increased over time from the original 156 items (BFC 2001).

12 Since January 2014, BFC has re-started to publicly disclosure compliance results of each factory in particular for 21 critical issues (BFC 2013).

Improving working conditions may involve both benefits and costs. Poor working conditions may increase the probability of fire, serious injuries, or accidents. Improving conditions may lower these risks. Orders from new or existing buyers, especially reputation-conscious ones, may increase when working conditions improve.[13] When BFC publicly disclosed factory-level compliance results (up to November 2006), the risk of losing a buyer relationship was higher.[14] Furthermore, until the end of 2004, firms had collective benefits from an increase in the U.S. import quota as a result of better working conditions.

A positive association between working conditions and profits would also be expected if workers value the improvements in working conditions and increase effort as a result. The "efficiency wage" hypothesis suggests that productivity increases with worker effort. Effort increases as working conditions improve because workers want to avoid being caught shirking, getting fired, and losing a good working environment. Better working conditions can also attract more productive workers through hiring and retention processes (Katz 1986). Accordingly, worker turnover may fall. Lower turnover, and the resulting longer experience on the job, may promote skill development. Better working conditions (such as better temperature, ventilation, noise, light, and appropriate working hours) may enhance intensity of work by maintaining good health conditions of workers and reducing labor disputes and strikes. A better work environment, such as managers' respectful attitudes towards workers and transparent information sharing with workers, may also motivate workers through enhancing their trust towards management.

13 Based on the panel-data analysis using the BFC's labor compliance data (2005-2010), Oka (2012) finds that higher compliance in terms of "working hours and leaves" is associated with higher number of reputation-conscious buyers and that higher compliance in terms of "OSH and welfare" is associated with longer relationship with those buyers.

14 Using the factory-panel labor compliance data (2001-2008) from BFC, Ang et al. (2012) find that the termination of the public disclosure in November 2006 leads to a slower pace of improvement in working conditions, although the absolute level of compliance remains higher than that of November 2006.

A negative association between working conditions and profits would be expected if improving working conditions is costly. Paying extra wages or fringe benefits, purchasing air conditioners or safety devices, and training managers to implement the better practices can all increase costs. Changes in worker's behavior, could also increase costs. Workers may be discouraged to work productively if they feel their job is more secured by the factory's compliance or protection by a union. Labor disputes may increase due to union activity. Table 3.1 summarizes the potential benefits and costs of improving working conditions for the six areas of working conditions examined in our empirical analysis.

It is important to point out that the potential benefits of improving working conditions, except the increased export quota, were available for firms without the BFC program. We assume, therefore, that even before implementation of the BFC, firms chose working conditions based on their information set or financial constraints. The BFC program introduced an incentive scheme (the export quota) that increased the potential benefits from improving working conditions. We therefore expect that Cambodian garment firms accordingly improved working conditions (the firm's choice of working conditions is shown in the next section). While we assume that firms make optimal decisions based on their current information set, we acknowledge that it is also possible that firms did not have perfect information about the benefits and costs of working conditions. If so, firms may not have made the optimal choice before the BFC program began. Several empirical studies (e.g. Bloom *et al.* 2013) find that managers may not have perfect information, which raises the possibility that the association between working conditions and firm performance would be positive. Furthermore, considering the variation across different categories of working conditions is important because factories would have the largest incentive to improve areas that contribute to factory performance.

Responding to the above changes in buyers and workers, firms may also change their input decisions and generate secondhand effects. For instance, falling worker turnover could encourage firms to provide more training due to lower risks that trained workers would leave and the factory would lose their investment. They also have an incentive to raise labor productivity by hiring more skilled workers and increase the capital-labor ratio to offset the higher costs. Hiring more skilled workers or adding capital would not necessarily increase profits because they just offset the increased costs from improving conditions. Finally, as predicted by the theory of compensating wage differentials (CWD), firms may also suppress wage increases instead of improving other working conditions.[15]

3.2 Relationship with Firm Performance

The net result of the benefits and costs determines the association between improving working conditions and firm performance, which we define as profits, productivity, and employment. As mentioned in section 2.2, participation in the BFC program (and thus accepting inspections) is mandatory for all garment exporters in Cambodia. BFC, buyers, the Cambodian government, the industry association, and other factories may all encourage improving working conditions.[16] In the end, however, it is up to each factory to what level or in which areas the factory improves its working conditions: the recommendations from BFC are not legally binding. Our goal, therefore, is to estimate the correlation between firm performance and changes in different dimensions of working conditions.

15 According to the CWD hypothesis, jobs under bad working conditions are compensated by higher wages than those under more pleasant conditions. For more on CWD, see Chapter 8 of Ehrenberg and Smith (2005) and Rosen (1986).

16 Such pressures were likely to be evident in particular until the end of 2004, when the amount of export quota increase to US depended on the industry-wide performance of working conditions (Polaski 2003: 22; Polaski 2006: 923).

To illustrate the firm's decision, begin by assuming that firms are small (i.e. price-takers in the goods (i.e., garments) and factor markets). Let the variable C represent the level of working conditions, where $0 \leq C \leq 1$. C stands for an average compliance rate. A firm chooses an optimal C (denoted as C^*) by solving the following profit (π) maximization problem:

$$\text{Max}_C \ \pi = pf(C, X) - w(C, X) \quad (1)$$

$$\text{s.t. } 0 \leq C \leq 1$$

where p denotes product price, and X is a vector of other production inputs. Functions f and w, both of which are increasing in C and X, are the production function and cost function, respectively. The function f is concave with respect to C.

Solving this problem yields a well-known fact: the firm chooses C^* so that the marginal revenue (MR) equals to the marginal cost (MC):

(i) $pf'(C^*, X) = w'(C^*, X)$, or

(ii) C^*=0 if MC always exceeds MR ($pf'(C, X) < w'(C, X) \ \forall \ C$), or

(iii) C^*=1 if MR always exceeds MC ($pf'(C, X) > w'(C, X) \ \forall \ C$).

These cases are illustrated in Figure 3.1. Within the C's range from 0 to 1, a profit function with respect to C is non-monotonic (inverse-U shape) in case (i), monotonically decreasing in case (ii), and monotonically increasing in case (iii).

4. Data

We construct a two-period factory-level dataset by matching (i) the labor compliance data from BFC (2001-02 and 2006-07) and (ii) the factory performance and characteristics data from IDE's garment firm surveys (for fiscal years (FYs) 2002 and 2008).[17] In order to ensure that the working conditions were measured before factory performance as much as possible, we choose the compliance data of the *earliest* (i.e., first) visit for the period 2001-02,[18] and those of the *latest* visit for the period 2006-07. Production-item data come from the 2003 and 2009 member lists of the Garment Manufacturers Association in Cambodia (GMAC). The unionization rate is included in the BFC data.

4.1 Labor Compliance Data

We examine 114 compliance items that were monitored in both periods.[19] Each item records binary monitoring results: one for compliance and zero for non-compliance. The overall compliance score (*C_all,* a percentage of compliant questions) is calculated by averaging the binary results over all 114 items. Like industry or occupation codes, the individual compliance items are also coded with multiple levels of aggregation. We focus on the 1- and 2-digit aggregation levels. There are 27 2-digit groups, and six 1-digit groups, which are: $C1\_Union_{it}$ (union and communication), $C2\_OSH_{it}$ (occupational safety and health [OSH]), $C3\_MHR_{it}$ (modern human resource management [MHR] practices), $C4\_Compe_{it}$

17 Matching is based on factory names and addresses. The IDE's garment firm survey contacted all the garment-producing exporters in the member lists of the Garment Manufacturers Association in Cambodia (GMAC), which cover almost all the garment-exporting factories in Cambodia. The first-wave of the IDE survey was conducted in August-October 2003, jointly with the LIDEE Khmer. The second-wave was conducted in August-November 2009, jointly with the Economic Institute of Cambodia. The first (respectively, second) survey mainly asks about the factory performance and characteristics in FY2002 (FY2008), which usually starts from January. The sample (164 and 123 factories) covered 85.4% of all the garment exporters in Cambodia in 2003 and 49.0% in 2009 (Asuyama et al. 2013; Asuyama and Seiha 2014). Based on the comparison of factory turnover rate and the average gross product and employment, between the IDE survey sample and all the garment-producing exporters in Cambodia, Asuyama et al. (2013: endnote 5) claim that the IDE survey sample "does not suffer from significant sample-selection bias."

18 Because the BFC program started in 2001, the 2000 data do not exist and the sample size of the 2001 data is not enough. Thus, we also include the labor compliance data collected in 2002, but focus on the first-visit data, which were more likely to be measured before factory performance.

19 Compliance items that (i) are missing in many factories, (ii) have the almost same meaning with other items, and (iii) do not contain any item content information in the original BFC data are also excluded from the sample. Remaining missing data that are prevalent in the first period are estimated as follows: Missing score for item j in group A of factory i = (Average score of other factories for item j in the same time period)*(Average score of non-missing items in group A of factory i) / (Average score of the same items of other factories), where the group is based on 27 classification in Table 4.1. When the estimated score exceeds 100% (respectively, falls below 0%), it is replaced with 100% (or 0%).

(compensation), $C5\_Hour_{it}$ (working hours), and $C6\_Core3_{it}$ (three core labor standards [child labor, discrimination, and forced labor]). These various groups are shown in Table 4.1. The six 1-digit groups are created primarily based on the factor analysis results in Ang *et al*. (2012). However, some of the categories are modified so that we can interpret the results more easily. For example, working hour issues that are included in the MHR factor in Ang *et al*. (2012) are separately examined in our analysis.

Table 4.1 includes the average compliance rates for two samples. Data for Sample 1 are based on all factories that were inspected in the first and second periods. Sample 1 represents the population of all garment-exporting factories in Cambodia, since permission to export requires (by law) that factories participate in the BFC program.[20] Sample 2 is restricted to the factories in Sample 1 with non-missing profit information.

4.2 Factory Performance and Characteristics Data

For each factory, profit is computed by subtracting labor costs and capital costs (rent, interests, and depreciation) from value added, which is equal to the gross output (revenue) minus the sum of all costs except labor and capital costs.[21] The profit rate (*Profit*) is computed as the percentage of profit in gross output. Our TFP index (*TFP*), which is used in Asuyama *et al*. (2013) and Asuyama and Neou (2014), is estimated by the index number approach (Caves *et al*. 1982):

20 It is possible that monitoring data on some factories are entirely missing in the first period, since the 2001-02 data do not cover all garment factories operating at that time.

21 These costs include costs for material, energy, utility (water/telephone), office supplies and facilities, insurance, payment to subcontractors, and any other costs.

$$TFP_{it} = (lnY_{it} - \overline{lnY}) - \sum_n \left(\frac{s_{nit} + \overline{s_n}}{2} \right) (lnx_{nit} - \overline{lnx_n}) - (lnu_{it} - \overline{lnu}), \quad (2)$$

in which *Y* is value added, x_n stands for the amount of input *n* (capital, high-skilled labor, and low-skilled labor), s_n is *n*'s factor share, and *u* is annual operation hours. The superscript bar, such as $\overline{\ln Y}$, stands for a sample mean, which is the average over the pooled sample of the first and the second periods. This TFP measure is positive (respectively, negative) when a factory's TFP is higher (lower) than the hypothetical average factory. This estimation approach is non-parametric and thus free from the endogeneity problem of labor input that arises in production function estimation.[22]

Table 4.2 reports the summary statistics for factory performance data. Table 4.2 reveals that between 2002 and 2008, the average size of factories increased in terms of both gross output and employment. At the same time, the average profit rate, TFP, and labor productivity also improved. At first glance, the profit rate seems too large, particularly in the second period. This is because our profit measure is pre-tax and the high profit rate is driven by subcontractors.[23] Considering the possibility of subcontractors' over-reporting of gross output (which should be mainly processing fees for subcontractors), we control for subcontractor status in our regression analysis.

Appendix Table A1 reports summary statistics for other factory characteristics. Several points are noted. First, as mentioned before, the labor compliance data in 2001/02 were obtained by the first monitoring visit, whereas it is the 3.7th visit on average that the data in 2006/07 were taken. The average age of factories also increases from 4.9 to 6.7 years. Second, the skill level of

22 For more detail on the TFP index, see Asuyama et al. (2013).

23 The IDE survey asks whether the factory is a subcontractor, which mainly engages in CMT (cut, make, and trim) activities. Usually, buyers provide materials to such subcontractor factory and pay processing fee for CMT activities. The average profit rate of subcontractors is particularly high in the second period (57.3%), compared to non-subcontractors (23.0%) and the first-period sample factories (24.7% for non-subcontractors and 31.5% for subcontractors).

employees increased between 2002 and 2008 in terms of both experience and education. Third, the incidence of formal training also increased during the same period. Lastly, the unionization rate significantly increased from 16.8% to 43.2%.

4.3 Associations of Labor Compliance with Firms Behaviors

Compliance could be associated with firm performance through changes in behaviors of workers, buyers, and firms as illustrated in section 3.1. Appendix Table A2 presents descriptive statistics of the relationships between the compliance rate (at the 1-digit levels) and various worker and firm characteristics. In column (1), only second-period dummy (when applicable) is included. In column (2), only significant or nearly significant (at 10% level) variables are included given our small sample size (see footnote 35).

Appendix Table A2 shows that the association between compliance rates and wages is positive. Wages are higher in a factory with a higher overall compliance rate as well as higher compliance in the compensation area (columns 1, 2). These associations suggest that the BFC's compliance data and the IDE's factory data tell a consistent story: wages captured by the IDE surveys are high for a factory marked as compliant with the compensation standards in the compliance data. This positive and significant association between the overall compliance rate and wages is inconsistent with the compensating wage differential hypothesis, which predicts that better working conditions lead to lower wages.

Worker turnover is negatively associated with the overall compliance rate, though the effect is not statistically significant. Among the six categories of compliance items, higher compliance in working hours is significantly associated with lower turnover (columns 3, 4). This result indicates that labor turnover is lower in a factory effectively restricting overtime work.

The relationship between compliance and labor disputes and unionization rates are mixed. Associations between days lost due to strikes and lockouts and compliance with items regarding union/communication and OSH are positive, whereas those with compensation are negative (in column 5, although statistical significance disappears when control variables are included in column 6). Union presence in a factory is positively associated with the compliance in three core labor standards and negatively associated with the compliance in working hours (columns 7, 8).

Given the lower frequency of labor turnover under good working conditions, firms attaining high compliance may be motivated to provide worker training (Royalty 1996). This holds among the Cambodian garment factories. Factories with higher overall compliance rates tend to provide formal training, particularly outside the factory (columns 9 to 14). These results are consistent with the hypothesis that better working conditions reduce labor turnover and, in turn, encourage firms bear costs of training.

We cannot find any evidence of a tendency for firms with higher compliance rates to employ more skilled workers (columns 15 to 24). The one possible exception is the positive relationship between compliance in working hours and the supervisors' average experience shown in columns 19 and 20. It should be noted, however, that our factory data contain only a crude measure of skills: working experience (less than 1 year, 1-5 years, 6 and more years), composition by job categories, and average educational attainment of workers (for only helper, operator and supervisor) based on the perception of managers.

A factory with higher compliance rates in working hours is more likely to introduce a performance bonus and the share of the bonus in total remuneration is significantly larger. Higher compliance in OSH, however, tends to be negatively associated with the introduction of both performance bonuses and piece rate pay (columns 25 to 32). The capital-labor ratio does not significantly vary with the compliance rate (columns 33 and 34).[24]

Although they are not necessarily causal relationships, the above analysis shows links between compliance rates and worker and firm behaviors, and they are generally consistent with the theoretical predictions. We formalize the analysis in the next section.

5. Empirical Methodology

5.1 Empirical Model

The theoretic framework in section 3.2 explicitly assumes that the level of compliance is a factory's choice variable.[25] It is noted that conditioning on factory characteristics and assuming a common production technology, the optimal compliance rate does not vary across factories. It is plausible, however, to assume that many factories in Cambodia do not attain the optimal compliance rate due to a lack of information regarding benefits and costs of good working conditions or financial constraints. Knowledge may be scarce in developing countries (Bloom *et al*. 2013). Given variation in the actual compliance rates, estimation of performance functions is possible using factory-level data. Endogeneity problems stemming from factory's choice of compliance rate will be discussed later.

Our empirical strategy is simple. In order to examine the relationship between compliance rate and factory performance, we begin by estimating the following equation by the ordinary least squares (OLS):

24 This indicates that effects of compliance on labor productivity through adjustment of capital-labor ratio to changes in working conditions are unlikely to present in our data.

25 We use the word "firm" and "factory" interchangeably in the present paper, since we use factory-level data in our empirical analysis. In Cambodia, most firms seem to be single-factory firms.

$$Performance_{it} = \alpha + \beta C_{it} + \gamma X_{it} + F_t + \varepsilon_{it}, \quad (3)$$

where subscripts *i* and *t* denote factory and time period (2001-02 and 2006-08), respectively.

Although section 3.2 focuses on the relationship between profit and the compliance rate, we also examine the relationship between compliance and both productivity and employment. This is mainly because we assume a strong correlation between productivity, profit, and employment. $Performance_{it}$ therefore stands for the following four factory performance measures: $Profit_{it}$ (profit share [%] in gross product)[26], TFP_{it} (TFP index), $Lprod_{it}$ (log of labor productivity [value added per worker] per hour), and Emp_{it} (log of employment size). As shown in Table 3.1, the potential relationship between working conditions and profits are generally thought to occur through productivity.[27] TFP is the most appropriate productivity measure, but labor productivity and employment size suffer less from measurement errors and using those measures increases the sample size. If better working conditions increase labor costs, employment may fall. But if productivity increases and offsets rising labor costs, employment may rise. Thus, employment size can serve as a proxy for productivity.

C_{it} is the compliance score of factory *i* at time *t*, X_{it} is a vector of factory characteristics (e.g., quota status of items, years of operation, nationality of ownership, being located in Phnom Penh), F_t denotes the second period dummy, and ε_{it} is the error term. Compliance score (C_{it}) is primarily measured by either (i) overall compliance rate (C_all_{it}), or (ii) average compliance rates by the six 1-digit categories.

26 Here, we measure short-term profit. When the goods market is perfectly competitive, profit converges to zero in the long-run as a result of exit and entry of firms.

27 Our productivity measures (TFP and labor productivity) are based on value added, which incorporates the price effects. Thus, profit has a stronger relationship with our productivity measures than with a quantity-based productivity measure.

5.2 Estimation Issues

Case (i) of section 3.2 assumes an inverse-U relationship between *C* and profit. We do not include a quadratic term of C_{it}, however, for three reasons. First, it is not suitable to fit a quadratic polynomial to the actual compliance data because the values cover only a small part of the 0-1 range. The minimum overall compliance rate (C_{min}) and the maximum one (C_{max}) is 50.9% and 87.5%, respectively, in the first period, and 69.3% and 98.2% in the second period.[28] In addition, our sample size (around 50-90 factories) is not sufficient to correctly identify C^* by fitting quadratic polynomial.

Second, as shown in the next subsection, our most plausible cases of endogeneity assume either situation of $C_i \leq C^* \ \forall \mathrm{i}$, or $C_i \geq C^* \ \forall \mathrm{i}$. Since profits always increase or decrease by raising compliance in those cases, a linear approximation is more appropriate. Third, when we estimate equation (3) by adding a quadratic term, the goodness of fit of the model become worse (based on Bayesian information criterion) and almost all of the coefficients on $C^2{}_{it}$ are insignificant.

The associations we estimate are represented by the β parameters. $\hat{\beta}$ >0 means $C^* > C_{min}$ and $\hat{\beta}$ <0 means $C^* < C_{max}$, which includes C^*=0. In other words, when $\hat{\beta}$ >0, better working conditions are positively associated with firm performance. By contrast, when $\hat{\beta}$ <0, the impacts are unclear as it may imply C^*=0. This result does imply, however, that compliance rates of all the sampled factories were beyond the optimal.

5.3 Endogeneity

The firm's choice of compliance rates is endogenous and may be

28 This relatively small variation in compliance rates could be a result of each factory's optimal compliance rate, which may be due to strong pressure by the government, GMAC, other factories, or buyers.

correlated with unobserved factors that are also correlated with performance. In our case, managerial ability and financial capacity are candidates of such unobserved factors, since firm managers with high ability are likely to understand benefits and costs of working conditions better and factories with higher financial capacity are able to invest more in enhancing working conditions.

The two most standard ways to tackle this endogeneity problem are an instrumental variables (IV) and panel-data estimation approaches. We experimented with various IVs (e.g., cumulative number of monitoring visits; months passed since the first visit; time passed since the last visit; number of recent visits of other firms located in the same *Sangkat* (commune), average compliance rate of other firms with same/similar ownership nationality; the IV proposed by Lewbel [2012]), but they all suffer from the weak instrument problem (i.e., weak correlation between the IV and the compliance score in the first stage). As for the panel-data estimation approach, there is not a sufficient number of panel-factories in our sample. As such, we hesitate to draw conclusions about causality. We can, however, propose a novel approach to generate additional evidence that may be consistent with the causality hypothesis.

Suppose that the true population model is as follows:

$$Profit_{it} = \alpha + \beta_1 C_{it} + \beta_2 A_{it} + \gamma X_{it} + F_t + u_{it}\,, \tag{4}$$

$$A_{it} = \delta_0 + \delta_1 C_{it} + v_{it}\,, \tag{5}$$

where A_{it} is unobserved factory characteristics (that is, either managerial ability or factory's financial capacity), which is included in ε_{it} in the actual regression (equation (3)). β_1 is the true impact of C_{it} on $Profit_{it}$ that we would like to move towards identifying.[29]

29 Note that reversing A_{it} and C_{it} may seem more intuitively consistent with the theory, but here we assume that the relationship is invertable and use the presented form because with the alternative, substituting C_{it} with a function of A_{it} in equation (4) results in $Profit_{it}$ as a function of A_{it} (C_{it} disappears from equation (4)). Wooldridge (2010: 67) presents a similar form as Ability = b1 + b2Education + r. where Ability is the unobserved variable when regressing wage on education. Here, b2 mainly captures the mechanism

By substituting equation (5) into (4), the probability limit (plim) of the OLS estimator $\hat{\beta}$ we observe becomes:

$$plim(\hat{\beta}) = \beta_1 + \beta_2\delta_1. \qquad (6)$$

When $\delta_1 = 0$, that is, C_{it} and A_{it} (thus, ε_{it}) are not correlated, $plim(\hat{\beta}) = \beta_1$ (consistent). When $\delta_1 \neq 0$, the OLS estimator $\hat{\beta}$ becomes inconsistent by $\beta_2\delta_1$. In the present paper, we are not able to get rid of $\beta_2\delta_1$ and obtain the consistent/unbiased estimator, but we aim to at least predict the sign of β_1 from the estimated $\hat{\beta}$. As discussed, sign of parameters are important to know whether C^* is zero or positive.

It is plausible to assume that more capable managers (high A_{it} factories) earn higher profits ($\beta_2 > 0$) and can evaluate impact of good working conditions more precisely, and thus, their choice of compliance rate is closer to C^* than less capable managers. Then, two subcases can be considered as summarized in Table 5.1; (1) a factory with less managerial capacity undervalues C^* and (2) a factory with less managerial capacity overvalues C^*. In the first case, since $\delta_1 > 0$ and $\beta_2 > 0$, $\hat{\beta}$ is overestimated, $\hat{\beta} > \beta_1$. It is noted that the compliance rate of all factories is below or equal to C^* ($C_i \leq C^*$ ∀i). Therefore, at least in the range of 0 to C_{max}, the true parameter is positive ($\beta_1 > 0$) because in the area $C<C^*$ marginal revenue is greater than marginal cost (see Figure 3.1) and C is positively correlated with profits. Then, $\hat{\beta} > \beta_1 > 0$ and sign of estimated parameter is same as that of the true one.

Likewise, in the second case with $\delta_1 < 0$ (and $\beta_2 > 0$), $\hat{\beta}$ is underestimated. Since all factories over-comply, the true parameter is negative ($\beta_1 < 0$)[30] and the sign of the estimated parameter matches with that of the true one $\hat{\beta} < \beta_1 < 0$). It is noted that when less capable factories both undervalue or

in which more-abled person receives more education.

30 At least in the range of 0 to Cmax.

overvalue C* with a larger gap, the compliance rate is no longer correlated with managerial ability ($\delta_1 = 0$), and no bias is caused by endogeneity.

When financial capacity matters for the compliance rate, it is assumed that factories with better financial capacity (high A_{it}) invest more in better working conditions ($\delta_1 > 0$). We also assume that $\beta_2 > 0$: factories with better financial capacity earn higher profits. If all factory managers know the true *C**, then compliance rate of factories with better financial capacity is closer to *C**. As in subcase (1) above, the true parameter is positive, and thus, the overestimated parameter is also positive. Even when they do not know the true *C**, the sign of the estimated parameter matches the sign of the true one in most cases as long as financial capacity is correlated with managerial capacity.[31] We maintain the assumption that financial and managerial capacity are correlated, and check the robustness of estimation results by estimating the performance functions with a dummy indicating manager's perception of financial constraints, which is, however, only available for the second period.[32]

6. Empirical Results

6.1 Compliance Score and Profit, Productivity, and Employment Size

Tables 6.1 and 6.2 report the baseline performance regression results for equation (3).[33] As a measure for C_{it}, Table 6.1 uses the overall compliance rate

31 Our identification strategy requires either $C_i \leq C^*$ (when $\delta_1 > 0$) or $C_i \geq C^*\ \forall i$(when $\delta_1 < 0$), so that true parameter $\beta_1 > 0$ or $\beta_1 < 0$ in the range of actual data. When a less capable factory underestimates the optimal compliance rate, C* ($\delta_1 > 0$), target compliance rates of all the factories, denoted by C_i^s are equal to or less than C* ($C_i^s \leq C^*$). With a credit constraint, the realized compliance rate is not more than the target rate ($C_i \leq C_i^s$) and therefore, $C_i \leq C^*$ holds. On the other hand, when a less capable factory overestimates C* ($\delta_1 < 0$), $C_i^s > C^*$. Credit constraints again lower actual compliance less than the target, but in this case, there could be two cases $C^* \leq C_i \leq C_i^s$ or $C_i \leq C^* \leq C_i^s$. Therefore, $C_i \geq C^*$ does not necessarily hold. However, when managerial and financial capacity are positively correlated, there will be no correlation between compliance score and financial capacity. This is because financial capacity is positively correlated with C_i, whereas managerial capacity is negatively correlated with it (a less capable firm overestimates the target). Therefore, $\delta_1 = 0$ and no endogeneity bias emerges.

32 Controlling for the financial constraint also mitigates the bias caused by reverse causality, that is, profitable firms can afford to invest more in working conditions.

33 In both tables, standard errors are not adjusted for heteroskedasticity, based on the Breusch-Pagan/Cook-Weisberg test for

(*C_all*), whereas Table 6.2 use the average compliance rates by the six 1-digit categories. For each factory performance measure, regression in column (1) controls for the second-period dummy only. The quota status of items (*China_Q04* and its interaction with the second-period dummy), which are a statistically significant determinant of TFP of Cambodian garment factories (Asuyama and Neou 2014), are also included in column (2).[34]

In column (3), a subcontractor dummy is added to add the possibility of an overvalued factory performance measure (see section 4.2). We also include other firm characteristics that are significant or nearly significant at 10% level, such as years in operation, nationality of ownership, and the location of factory.[35] In column (4), we add the estimated average years of education of operators and helpers (*Edu_oh*) and those of supervisors (*Edu_super*), and the unionization rate (*UnionRate*) because these variables are often found to be significant determinants of firm performance (see Asuyama and Neou (2014) for education in Cambodian case, and Doucouiagos and Laroche (2003, 2009), Macleaod (2011), and Freeman (2010) for unions).[36] Column 4 includes estimates of the relationship between working conditions and the dependent variables that

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heteroskedasticity. In some Emp regressions, the homoscedastic variance hypothesis is rejected, but computing robust standard errors does not change the significance of the results. This also applies to Tables 6.2 to 6.4, and Appendix Table A3.

34 The variable China_Q4 approximates the share of items for which quota was imposed on garments exported from China up to the end of 2004. Since China is the most competitive garment exporter in the world, the quota on Chinese imports mitigates the price competition of garments, and thus leads to higher product prices, value-added, and profits. Thus, producing more of these China-quota-imposed items leads to a higher TFP index (because this index measures output by value added) in the first period (2002), but this effects erode in the second period (2008) when such quotas were no longer imposed on China (Asuyama and Neou 2014).

35 These variables may directly influence factory performance or be correlated with compliance rate. For example, foreign firms may bring preferences for working conditions from their home country. Therefore it is important to control for national origin. We first experimented with controlling for China_Q04, China_Q04*t2, Opeyear, Opeyear^2, China3, Cambo, PhnomPenh, and Moafter (see Appendix Table A1), and only keep significant or nearly significant (at 10% level) variables. This is because adding irrelevant variables would lead to larger standard errors of the estimators (given our small sample size) and should therefore be avoided. We also control for Wage (log of annual wage and salary per worker) in the profit regression, but the coefficient on Wage is not significant and does not change the estimated relationship with compliance.

36 When constructing our TFP index, labor quality differences between high-skilled and low-skilled job categories are captured by our labor input measure, and thus are not included in our TFP measure. However, factories' variations in labor quality within these job groups are still included in our TFP index (Asuyama and Neou 2014: 60-61).

exclude their confounding effects with worker skills and union presence. Controlling for education and union variables reduces the sample size, which would lead to larger standard errors of the estimated coefficients on compliance. Considering these pros and cons of controlling for *Edu_oh*, *Edu_super*, and *UnionRate*, we mainly focus on the results in both columns (3) and (4).

As mentioned in section 5.3, the sizes of the estimated coefficients are likely to be either over- or under-valued, but the signs of those are likely to be consistent with the direction of a causal impact (in particular for that in the profit regression). Therefore, we mainly focus on the signs of the estimated coefficients that are statistically significant.

Table 6.1 shows that the overall compliance rate (*C_all*) is correlated with neither profit rate nor TFP, but is positively associated with employment in all specifications. Overall compliance is positively correlated with labor productivity in the specifications with full covariates (column 4). When working conditions are grouped into 6 categories (Table 6.2), the OSH compliance rate is negatively associated with profit rate and TFP, while that in MHR is positively associated with profit rate, TFP, and labor productivity. None, however, are significant in column (4).[37] In column (4) of profit regression, the coefficient on *C6_Core3* (three core labor standards) is significantly positive. Both *C2_OSH* and *C3_MHR* are positively associated with employment in all specifications.

As in Asuyama and Neou (2014), the coefficients of *China_Q04* and *Edu_oh* tend to be positive, while those of *China_Q04*t2* and *Edu_super* tend to be negative - except in the employment regressions. Asuyama and Neou (2014) speculate that the negative coefficient of *Edu_super* probably emerges because lower education levels of supervisors indicate a greater localization of supervisors

37 We also decompose one of the six compliance categories into more detailed groups and estimate similar performance regressions. See Appendix.

and thus better communication between them and Cambodian operator/helpers. The subcontractor status is not significantly related with factory performance in general after controlling for other factors. Finally, higher unionization rates are associated with lower profit rates, TFP, and labor productivity.

As mentioned in section 3.1, the benefit and cost structures might be different between the two periods (2001-02 and 2006-07). In the first period, the net benefits of compliance might be greater because of the quota incentives provided by the bilateral trade agreement with United States (TATA, 1999-2004) and of the potential damage due to the public disclosure of non-compliant factories until November 2006. Therefore, we estimate equation (3) separately for each period (Appendix Table A3), although it is expected that standard errors of the estimators become larger due to much smaller sample sizes.

Appendix Table A3 shows that, as in the two-period sample, the overall compliance rate is correlated with neither profit nor TFP, but is positively associated with employment in both periods. In the second period, it is also associated with higher labor productivity. In terms of the 1-digit compliance scores, the negative effect of OSH is only observed in the first period. The positive effect of MHR is observed in the TFP and labor productivity regressions in the first period and in the TFP and employment regressions in the second period. OSH is positively related with employment only in the second period.

Finally, in order to mitigate the endogeneity bias of compliance scores (see section 5.3), and predict the sign of the true impact of better working conditions, we control for factory's financial constraint (*Finconst*), which is only available for the second period.[38] As expected, in Tables 6.3, *Finconst* tends to both lower profit rates and TFP. As for the effects of the overall compliance rate,

38 We consider factories to be financially constrained if they answer "Yes" to the following question: "Suppose a financial institution tells your firm that it is willing to lend money more than the amount your firm currently borrows at the market interest rate. Would your firm like to take the offer and borrow more?"

the estimation results do not change substantially from those obtained in the second-period sample in Appendix Table A3. When the 1-digit compliance scores are used as regressors, however, the positive effect of MHR is observed not only in TFP but also in profit regression. In addition, working hours are associated with lower TFP, although it is significant in only column (4).

As argued in section 5.3, a positive coefficient on compliance score is not definitive, but is consistent with the hypothesis that better working conditions have a positive causal impact on factory performance (profit rate, in particular), while negative coefficients indicate that the compliance rate of Cambodian garment factories is at least too high from the viewpoint of maximizing short-term profit. The results from Table 6.3 suggest that the following relationships are robust: (i) a positive association between the overall compliance rate on labor productivity and employment, (ii) a positive association between the MHR and profit rate and TFP, and (iii) a positive association between OSH and MHR and employment.[39] Some associations did not generate robust results (which may be due to smaller size of the sample): (i) OSH is associated with lower profit rate and TFP (in the first period, in particular), and (ii) MHR is associated with higher labor productivity (in the first period, in particular).

6.2 Potential Channels from Compliance to Profit and Productivity

In section 4.3, we found that higher compliance is associated with lower labor turnover, higher incidence of formal training, and higher wages. On the other hand, the association between compliance and the magnitude of labor disputes, unionization rate, experience of supervisors, and provisions of incentive pay are mixed. In this subsection, we examine whether these channels exhibit stronger associations between working conditions with productivity and profit of factories.

39 The small sample sizes may contribute to the lack of statistical significance here.

Both the profit rate and productivity (TFP index and labor productivity) are directly regressed on each of these channels (Table 6.4). The estimation results suggest that only wages are significantly associated with both indices of productivity, and that unionization rate is negatively associated with TFP. For the other channels, the results are generally insignificant. These results are consistent with the idea that, while compliance with labor regulations seems to have provoked expected changes in behavior of workers and factories, such changes have not yet resulted in changes in firm performance. Other channels, therefore, may link compliance and performance. Since compliance in the area of modern human resource management is correlated with better firm performance, improved trust and motivation in the workplace may possibly link compliance and performance.

7. Discussions and Conclusion

Using a unique factory-level data set for the two periods (2001-02 and 2006-08), we have examined the association between working conditions of Cambodian garment factories and their performance (profit, productivity, and employment). Our baseline results (section 6.1) shows (i) that higher overall compliance rate is associated with higher labor productivity and employment, (ii) that higher compliance in MHR (modern human resource management) is associated with higher profit rate, TFP, and employment, and (iii) that higher compliance in OSH (occupational safety and health) is positively associated with employment.

The positive signs of these associations, in particular for those with profit rate, are likely to predict the direction of causal impact. Although less robust, we also have found that (iv) higher compliance in OSH tends to be associated with lower profit rate and TFP and (v) higher compliance in MHR is associated with higher labor productivity. Aggregate compliance in other areas (union and communication, compensation, working hours, and the three core labor standards) are not significantly related with factory performance measures.

Our MHR compliance indicator is an aggregate index of the compliance rate in information about wages, contract/hiring, discipline/management misconduct, and internal regulations. The positive association between MHR and our factory performance measures may reflect the importance of transparent information sharing between management and workers and trust between them. Although less robust, the negative association between OSH and profit and TFP indicates that compliance in OSH may not be a channel through which firm performance is increased. This is plausible since many OSH items (e.g. appropriate temperature, ventilation, noise, light, safe chemical storage, machine safety, nursing room and infirmary) require a relatively costly investment but may not be something that motivates workers. In short run, this would decrease profit and TFP.[40] It is important to mention, however, that this paper does not incorporate the potential long-term savings or benefit to the firm from reduced risk of accidents or disasters. If we could account for the probability of huge losses that incur from injuries, accidents, and fires, and the reduced risk of such disasters that might result from OSH, we may find nonnegative effects of OSH.

This paper contributes the literature as the first to directly examine the association between working conditions and profit and productivity of factories operating under the BFC program. Our results indicate that better working conditions are associated with higher productivity and profit of factories in ways that are consistent with a positive worker effort effect. Our results offer

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40 Our TFP measure may decline in short run, if output does not increase sufficiently (due to adjustment to new OSH conditions) to offset the increase in capital and energy cost.

opportunities for future studies. Expanding the coverage of factories and time periods in order to increase sample size, constructing a panel dataset, and finding instruments to address potential endogeneity bias would be fruitful areas for future research.

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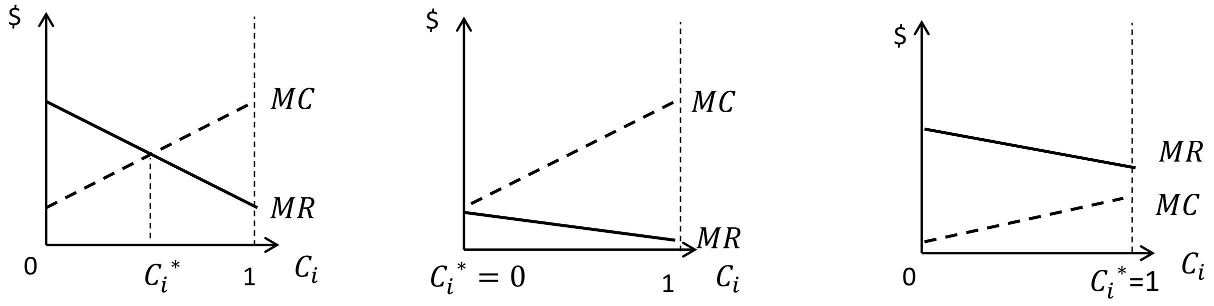
Appendix: Compliance Score Based on 27 groups and Factory Performance

The six compliance categories can be decomposed into 27 more detailed groups that are shown in Table 4.1. Appendix Table B.1 reports the OLS estimation results, which are the same as those of Table 6.2, using selected disaggregated categories.

Regarding profit rate and productivity, *C16* (Disputes) and *C34* (Internal Regulations) tend to have positive coefficients, whereas *C22* (Machine Safety) tends to have negative coefficients. Additionally, *C14* (Liaison Officer) and *C25* (Workplace Operations) tend to be associated with higher TFP. *C51* (Overtime) and *C62* (Discrimination) tends to be associated with higher profit rate, whereas *C43* (Holy days/Annual/Special Leave) tends to be associated with lower productivity. As for employment, *C11* (Collective Agreements) and *C21* (Health/First Aid) have positive coefficients, while *C22* (Machine Safety) and *C27* (Chemicals) tend to have negative coefficients.

In sum, despite the generally insignificant results of *C1_Union*, *C4_Compe*, *C5_Hour*, and *C6_Core3* in Table 6.2, breaking down these aggregated scores into more detailed groups yield some significant results. The negative coefficient of *C2_OSH* and the positive coefficient of *C3_MHR* found in profit and productivity regressions in Table 6.2 seems partly due to the effect of *C22* (Machine Safety) and *C34* (Internal Regulations). However, it should be recalled that increasing the number of regressors by breaking down six compliance categories leads to larger standard errors of the estimators. Given our small sample size, it is difficult to judge whether the remaining insignificant results indicates no relationship or just imprecise estimates.

Figure 3.1. Marginal Revenue (MR) and Marginal Cost (MC) of Compliance



(i) MR=MC at $C^* \in (0,1)$ (ii) MC>MR $\forall C_i$ (iii) MR>MC $\forall C_i$

Table 3.1. Potential Benefits and Costs of Improving Working Conditions

Areas of Working Conditions	Benefits	Costs
Union and Communication (*C1_Union*)	Productivity/profit may increase through a reduction of labor disputes and work-days lost and better communication in the workplace	Productivity/profit may decrease if militant labor union is organized.
Occupational Safety and Health (*C2_OSH*)	Productivity/profit may increase through (i) a reduction in fatigue and greater concentration of workers, and defect rates, by improving the conditions of temperature, ventilation, noise, and light etc., (ii) a reduction in production halt due to malfunction of machineries, sick absence of workers, and fires, (iii) an avoidance of search and training cost of replacement workers for those sick or injured, and (iv) an avoidance of paying leave allowances and compensation for injured workers.	Profit/productivity may decrease due to the costs for purchasing air conditioners, lights, safety devices, equipment to remove chemical hazards etc., and introducing emergency drills.
Modern Human Resource Management Practices (*C3_MHR*)	Productivity/profit may increase through raising the trust level of workers towards managers/supervisors and increasing their motivation by formally informing the work conditions and respecting workers.	Profit/productivity may decline due to the costs for training managers and supervisors and introducing new systems to implement new practices.
Compensation (*C4_Compe*)	Productivity/profit may increase by providing higher wages and fringe benefits through "efficiency-wage" type mechanism: It leads to less labor turnover and longer work experience, hiring of better workers, and higher effort level of workers.	Profit/productivity may decrease because of (i) higher compensation costs, and (ii) search and training cost of replacement workers for those on leave.
Working Hour (*C5_Hour*)	Productivity/profit may increase as a result of a reduction in fatigue of workers, accidents, sick leave, defect rates, and overtime premiums.	Profit/productivity may decline (i) if labor cost per hour increases because of fixed wage (independent of work hours) or resistance from labor union against wage reduction, (ii) if costs of hiring, training, fixed labor costs (e.g., fringe benefits) increases because of hiring new workers to keep the same production level, and (iii) if reduced work hours are too few for productive work.
Core Labor Standards (*C6_Core3*)	Productivity/profit may increase because of (i) avoiding the risk of termination and decline of orders, and (ii) improving and attracting higher-skill workers.	Profit/productivity may decrease because of training costs of managers/supervisors.

Notes: For the definitions of six subcategories of working conditions, see Table 4.1. In addition to the examples in the above table, general benefits of better working conditions

include greater demand from buyers and “efficiency wage” type benefits (see the main text in section 3.1).
Source: Constructed by authors mainly based on the following studies: Doucouliagos and Laroche (2003, 2009) for union; Fernández-Muñiz *et al*. (2009) and Yakovlev and Sobel (2010) for OSH; Morishima (1991) and Breuer and McDermott (2013) for MHR; Katz (1986) and OECD (2007) for compensation; White (1987), Shepard and Clifton (2000), Kodz *et al*. (2003), and Golden (2012) for working hour, and Kucera (2002) and Elliott and Freeman (2003) for core labor standards.

Table 4.1. Average Compliance Rate (%) across Aggregated Working Conditions

		Sample 1				Sample 2			
		2001-02 (*N* = 127*)		2006-07 (*N* = 305)		2001-02 (*N* = 59)		2006-07 (*N* = 33)	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
C_all (overall compliance rate)		***67.7***	***9.0***	***83.7***	***8.7***	***68.0***	***8.6***	***88.0***	***6.9***
C1_Union (union and communication)		***62.2***	***12.5***	***83.9***	***12.4***	***62.5***	***11.9***	***84.5***	***13.7***
C11	Collective Agreements	88.5	21.6	98.0	8.0	88.4	20.4	98.5	8.7
C12	Strikes	93.2	20.2	99.8	2.9	95.3	18.9	100.0	0.0
C13	Shop Stewards	33.4	17.1	65.4	28.1	35.3	18.2	58.6	26.4
C14	Liaison Officer	15.2	31.3	60.8	47.3	13.4	30.5	68.5	46.4
C15	Unions	88.0	23.3	99.0	5.4	88.3	23.2	96.4	10.6
C16	Disputes	91.0	23.6	90.5	29.4	90.5	24.1	97.0	17.4
C2_OSH (occupational safety and health)		***60.6***	***12.0***	***78.3***	***11.5***	***61.4***	***12.3***	***85.9***	***8.5***
C21	Health/First Aid	46.3	23.4	68.1	26.8	47.0	24.5	80.8	22.1
C22	Machine Safety	81.1	21.2	97.1	8.0	80.6	20.6	98.0	5.5
C23	Temperature /Ventilation/Noise/Light	59.8	19.6	82.5	18.6	58.6	20.1	90.9	15.1
C24	Welfare Facilities	67.0	16.5	84.1	14.2	67.7	16.2	89.9	13.8
C25	Workplace Operations	61.2	16.4	80.5	10.6	62.3	17.0	84.0	5.9
C26	OSH Assessment/ Recording/Reporting	21.5	22.0	54.5	25.8	23.3	22.6	67.7	24.3
C27	Chemicals	83.3	29.5	77.9	34.4	85.5	28.9	90.9	20.1
C28	Emergency Preparedness	71.7	27.8	83.7	17.6	73.1	26.4	87.9	16.7
C3_MHR (modern human resource management)		***75.0***	***14.5***	***89.6***	***11.9***	***76.5***	***13.3***	***92.9***	***9.4***
C31	Information About Wages	43.9	30.4	81.4	24.9	44.2	28.6	87.9	24.7
C32	Contract/Hiring	87.6	16.6	95.7	10.1	89.3	14.4	96.2	9.1
C33	Discipline/Management Misconduct	74.6	27.0	86.7	17.9	74.1	25.7	89.9	17.6
C34	Internal Regulations	84.0	25.8	91.5	22.8	87.1	23.3	95.2	18.0
C4_Compe (compensation)		***75.8***	***16.1***	***92.0***	***10.5***	***75.5***	***16.4***	***94.9***	***6.8***
C41	Payment of Wages	74.2	28.7	91.0	19.3	72.9	29.3	93.3	15.5
C42	Accidents/Illnesses Compensation	68.6	42.1	89.5	30.7	73.7	38.3	97.0	17.4
C43	Holidays/Annual/ Special Leave	86.6	16.3	93.3	10.4	86.7	16.4	96.6	6.5
C44	Maternity Benefits	61.5	29.1	91.2	13.1	60.5	28.4	93.3	13.8

C5_Hour (working hours)		***60.5***	***20.9***	***69.6***	***16.5***	***60.7***	***21.1***	***73.5***	***13.9***
C51	Overtime	52.0	27.7	59.0	20.8	52.6	27.0	62.4	18.5
C52	Regular Hours/ Weekly Rest	74.6	19.2	87.3	16.9	74.3	19.6	91.9	14.5
C6_Core3 (3 core labor standards)		***97.5***	***6.7***	***98.8***	***4.9***	***96.5***	***8.3***	***98.3***	***5.9***
C61	Child Labor	97.5	9.9	99.5	4.9	95.3	13.3	100.0	0.0
C62	Discrimination	97.2	8.2	98.1	8.0	96.6	9.4	97.0	10.4
C63	Forced Labor	98.5	12.1	100.0	0.0	98.3	13.0	100.0	0.0

Notes: Sample 1 is based on all factory data with non-missing labor compliance scores (including factories that did not participate in the IDE's surveys). Sample 2 is restricted to those with non-missing *Profit* information. The number of observations of the Sample 1 in 2001-02 is based on that of *C_all*. For other groups, it ranges from 131 to 136.

Table 4.2. Factory Performance: Summary Statistics

Variable	Description	First period (FY2002)			Second period (FY2008)		
		Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
Profit	Profit share (%) in gross output	59	25.590	28.510	33	45.529	38.174
TFP	TFP index	57	-0.241	0.942	31	0.545	0.948
Lprod	Log of labor productivity per hour	73	-0.062	1.043	51	0.408	0.966
Lprod2_raw	Labor productivity per worker ('000)	75	3811	4139	53	5896	4902
GO	Log of gross output	75	15.293	1.110	53	15.482	1.135
GO_raw	Gross output ('000)	75	7772	9986	53	9394	10813
Emp	Log of employment size	100	6.568	0.840	96	6.692	1.077
Emp_raw	Emplyment size	100	1041	1176	96	1186	1038

Notes: All performance data are annual records computed based on the sample with non-missing labor compliance data. Labor productivity and gross output data are based on 2002 USD price. Annual working hours per worker, which are used to compute *Lprod* are estimated as the average hours of shift (weighted by the employment of the corresponding production section) times the number of annual working days.

Table 5.1 Predicted Direction of the Causal Impact of Compliance When Unobserved Factory Characteristics (*A*) = Managerial Ability

Case	Assumption (sign of δ_1)	Observed compliance level of factories	Predicted sign of β_1	Observed sign of $\hat{\beta}$
1	$\delta_1 > 0$: Factories with lower-ability (*A*) managers undervalue *C** more significantly	$C_i \leq C^* \forall i$	$\beta_1 > 0$	$\hat{\beta} > 0$
2	$\delta_1 < 0$: Factories with lower-ability (*A*) managers overvalue *C** more significantly	$C_i \geq C^* \forall i$	$\beta_1 < 0$	$\hat{\beta} < 0$

Notes: $\hat{\beta} = \beta_1 + \beta_2 \delta_1$, and $\beta_2 > 0$ is assumed. Subscript *i* indicates a factory. For more details, see equations (4), (5), and (6), and the main text in section 5.3.

Table 6.1. Overall Compliance Score and Profit, Productivity, and Employment Size: Baseline Results

Dep. Var	***Profit***				***TFP***			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C_all	0.224	0.183	0.086	0.684	0.009	0.000	-0.003	0.007
	(0.425)	(0.429)	(0.428)	(0.475)	(0.013)	(0.013)	(0.012)	(0.014)
	15.472	28.382**	20.177	47.689**	0.617*	1.348***	1.095**	2.607***
t2 (2nd period dummy)	(11.028)	(13.836)	(14.282)	(19.627)	(0.328)	(0.416)	(0.442)	(0.603)
China_Q04		12.375	18.859	34.911		1.469**	1.649**	1.597
		(23.261)	(23.238)	(33.342)		(0.676)	(0.661)	(0.973)
*China_Q04 *t2*		-61.371*	-61.502*	-116.187***		-2.744***	-2.736***	-4.266***
		(32.198)	(32.391)	(39.875)		(1.026)	(1.022)	(1.190)
Subcon			18.641**	8.160			0.606**	-0.047
			(8.865)	(12.046)			(0.274)	(0.376)
Edu_oh				4.065**				0.168***
				(1.910)				(0.055)
Edu_super				-4.171*				-0.157**
				(2.102)				(0.058)
UnionRate				-0.473***				-0.019***
				(0.168)				(0.005)
Opeyear								
Opeyear^2								
China3							0.391*	0.524*
							(0.226)	(0.265)
Cambo								
PhnomPenh							0.385	0.135
							(0.292)	(0.291)
Constant	10.378	10.077	12.779	-11.041	-0.823	-0.532	-1.043	-0.973
	(29.197)	(29.053)	(28.805)	(38.295)	(0.869)	(0.853)	(0.856)	(1.158)
Adj.R-squared	0.065	0.081	0.107	0.330	0.124	0.171	0.227	0.501
F-statistic	4.144	2.891	3.007	4.200	7.155	5.230	4.356	5.914
Observations	92	87	85	53	88	83	81	50

Dep. Var	Lprod				Emp			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C_all	0.008	0.008	0.011	0.029**	0.037***	0.036***	0.034***	0.041***
	(0.011)	(0.011)	(0.011)	(0.013)	(0.008)	(0.008)	(0.008)	(0.010)
t2 (2nd period dummy)	0.335	0.687**	0.426	0.798*	-0.539***	-0.606**	-0.551**	-0.713**
	(0.264)	(0.324)	(0.375)	(0.467)	(0.193)	(0.253)	(0.249)	(0.287)
China_Q04		1.229**	1.215**	1.824***		-0.084	-0.233	0.617
		(0.546)	(0.546)	(0.621)		(0.464)	(0.422)	(0.526)
*China_Q04 *t2*		-1.352	-1.221	-2.554***		0.182	0.475	-0.038
		(0.884)	(0.914)	(0.948)		(0.663)	(0.613)	(0.692)
Subcon			0.277	0.511			-0.111	-0.110
			(0.252)	(0.322)			(0.147)	(0.171)
Edu_oh				0.105**				0.009
				(0.048)				(0.032)
Edu_super				-0.094*				0.024
				(0.052)				(0.035)
UnionRate				-0.013***				0.007**
				(0.004)				(0.003)
Opeyear							0.016	-0.122
							(0.089)	(0.101)
Opeyear^2							0.000	0.006
							(0.006)	(0.006)
China3			0.420*	0.681**			-0.062	-0.183
			(0.216)	(0.257)			(0.146)	(0.180)
Cambo							-0.657*	-0.523
							(0.350)	(0.358)
PhnomPenh								
Constant	-0.583	-0.950	-1.492*	-2.716**	4.041***	4.147***	4.355***	3.810***
	(0.733)	(0.738)	(0.784)	(1.128)	(0.550)	(0.578)	(0.622)	(0.868)
Adj.R-squared	0.039	0.074	0.092	0.313	0.096	0.079	0.102	0.212
F-statistic	3.486	3.304	2.900	4.486	11.296	4.912	3.221	3.510
Observations	124	117	114	70	196	183	177	113

Notes: Standard errors are in parentheses. ***p <0.01, **p < 0.05, *p <0.1.

Table 6.2. Six Compliance Scores and Profit, Productivity, and Employment Size: Baseline Results

Dep. Var	**Profit**				**TFP**			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union	0.149	0.217	0.199	0.141	0.011	0.007	0.006	0.005
	(0.283)	(0.296)	(0.303)	(0.326)	(0.009)	(0.009)	(0.009)	(0.010)
C2_OSH	-0.732**	-0.853**	-0.786**	-0.327	-0.022**	-0.024**	-0.018*	-0.005
	(0.362)	(0.371)	(0.375)	(0.484)	(0.011)	(0.011)	(0.011)	(0.014)
C3_MHR	0.725**	0.717**	0.683**	0.720	0.028***	0.024**	0.020*	0.020
	(0.326)	(0.339)	(0.341)	(0.437)	(0.010)	(0.010)	(0.010)	(0.013)
C4_Compe	-0.086	-0.002	0.009	-0.477	-0.004	-0.003	-0.002	-0.013
	(0.316)	(0.318)	(0.319)	(0.375)	(0.009)	(0.009)	(0.009)	(0.011)
C5_Hour	0.111	0.144	0.082	0.289	0.000	0.002	-0.002	-0.005
	(0.207)	(0.215)	(0.220)	(0.292)	(0.006)	(0.006)	(0.006)	(0.008)
C6_Core3	0.813	0.625	0.467	1.480**	0.013	0.000	-0.003	0.034
	(0.531)	(0.539)	(0.549)	(0.729)	(0.017)	(0.017)	(0.018)	(0.024)
t2	21.494*	33.252**	25.688*	66.366***	0.673**	1.425***	1.111**	2.703***
	(11.429)	(14.201)	(15.075)	(21.259)	(0.335)	(0.428)	(0.474)	(0.638)
China_Q04		9.264	15.062	34.551		1.614**	1.738**	1.713
		(24.052)	(24.396)	(35.888)		(0.704)	(0.699)	(1.045)
*China_Q04*t2*		-60.994*	-60.812*	-121.030***		-2.864***	-2.795**	-4.180***
		(32.444)	(33.005)	(40.475)		(1.038)	(1.057)	(1.222)
Subcon			14.550	-1.380			0.577**	-0.047
			(9.037)	(13.095)			(0.280)	(0.394)
Edu_oh				5.235**				0.160***
				(2.033)				(0.058)
Edu_super				-4.480**				-0.164**
				(2.147)				(0.061)
UnionRate				-0.486**				-0.020***
				(0.182)				(0.005)
Adj.R-squared	0.105	0.127	0.132	0.345	0.182	0.206	0.234	0.494
F-statistic	2.524	2.396	2.275	3.112	3.758	3.365	3.037	4.186
Observations	92	87	85	53	88	83	81	50

Dep. Var	Lprod				Emp			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union	-0.005	-0.005	-0.002	0.004	-0.001	-0.002	-0.001	-0.003
	(0.008)	(0.008)	(0.008)	(0.009)	(0.006)	(0.006)	(0.006)	(0.006)
C2_OSH	-0.008	-0.006	-0.003	0.012	0.019**	0.016**	0.015**	0.015*
	(0.010)	(0.011)	(0.011)	(0.014)	(0.007)	(0.008)	(0.007)	(0.009)
C3_MHR	0.014*	0.016*	0.015*	0.013	0.012**	0.013**	0.010*	0.017**
	(0.008)	(0.008)	(0.009)	(0.011)	(0.006)	(0.006)	(0.006)	(0.007)
C4_Compe	0.002	0.000	-0.002	-0.012	0.004	0.005	0.006	0.012
	(0.009)	(0.010)	(0.010)	(0.012)	(0.007)	(0.007)	(0.006)	(0.008)
C5_Hour	0.002	0.002	0.000	0.002	0.001	0.002	0.002	0.001
	(0.006)	(0.006)	(0.006)	(0.009)	(0.004)	(0.005)	(0.004)	(0.005)
C6_Core3	0.009	0.004	0.008	0.030	-0.005	-0.007	-0.008	-0.020
	(0.017)	(0.018)	(0.018)	(0.025)	(0.012)	(0.013)	(0.012)	(0.014)
t2	0.485*	0.837**	0.574	1.0288*	-0.485**	-0.521*	-0.502*	-0.660**
	(0.290)	(0.349)	(0.413)	(0.534)	(0.210)	(0.273)	(0.270)	(0.301)
China_Q04		1.274**	1.247**	1.949***		-0.012	-0.169	0.646
		(0.565)	(0.570)	(0.653)		(0.476)	(0.433)	(0.528)
China_Q04*t2		-1.331	-1.221	-2.605***		0.129	0.433	-0.048
		(0.901)	(0.938)	(0.974)		(0.673)	(0.623)	(0.691)
Subcon			0.259	0.515			-0.106	-0.111
			(0.262)	(0.349)			(0.150)	(0.170)
Edu_oh				0.111**				0.015
				(0.051)				(0.031)
Edu_super				-0.109*				0.019
				(0.055)				(0.035)
UnionRate				-0.014***				0.008**
				(0.004)				(0.003)
Adj.R-squared	0.029	0.066	0.072	0.283	0.091	0.075	0.092	0.238
F-statistic	1.519	1.906	1.798	2.945	3.784	2.632	2.274	3.058
Observations	124	117	114	70	196	183	177	113

Notes: Standard errors are in parentheses. The control variables of each column are the same as those in the corresponding column of Table 6.1. ****p* <0.01, ***p* < 0.05, **p* <0.1.

Table 6.3. Compliance Score and Profit, Productivity, and Employment Size: Financial Constraint Controlled (Second Period Only)

Dep. Vars	**Profit**				**TFP**			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C = Overall compliance								
C_all	1.615	1.306	1.482	1.172	0.047*	0.037	0.045	0.021
	(1.038)	(0.966)	(0.976)	(1.096)	(0.026)	(0.026)	(0.029)	(0.022)
Finconst	-23.022*	-28.862**	-26.527**	-11.721	-0.846**	-1.013***	-0.934**	-0.651**
	(12.161)	(11.587)	(12.255)	(13.817)	(0.315)	(0.313)	(0.370)	(0.283)
F-statistic	3.020	4.360	3.784	3.013	5.326	5.511	2.692	7.190
C = Six Compliance Scores								
C1_Union	-0.049	0.021	0.069	-0.617	0.007	0.009	0.012	-0.010
	(0.517)	(0.481)	(0.560)	(0.581)	(0.015)	(0.015)	(0.019)	(0.013)
C2_OSH	-1.007	-1.771	-1.593	-1.340	-0.027	-0.042	-0.035	-0.024
	(1.122)	(1.080)	(1.169)	(1.097)	(0.036)	(0.035)	(0.042)	(0.024)
C3_MHR	2.341**	2.098**	2.119**	1.798*	0.059**	0.049*	0.044	0.047*
	(0.860)	(0.803)	(0.863)	(0.826)	(0.026)	(0.025)	(0.032)	(0.020)
C4_Compe	-1.200	0.519	0.078	-0.298	-0.011	0.037	0.040	0.023
	(1.606)	(1.650)	(1.811)	(1.584)	(0.048)	(0.052)	(0.074)	(0.038)
C5_Hour	-0.738	-0.663	-0.529	-0.587	-0.013	-0.019	-0.007	-0.047*
	(0.502)	(0.559)	(0.604)	(0.578)	(0.015)	(0.017)	(0.027)	(0.019)
C6_Core3	2.587*	1.295	1.351	2.861	0.022	-0.024	-0.043	-0.036
	(1.317)	(1.327)	(1.481)	(1.674)	(0.057)	(0.059)	(0.086)	(0.047)
Finconst	-33.245**	-30.271**	-30.837*	-26.366	-0.873**	-0.914**	-0.728	-0.645*
	(13.292)	(13.117)	(14.529)	(14.674)	(0.393)	(0.399)	(0.531)	(0.300)
F-statistic	2.876	3.479	2.777	3.587	2.132	2.596	1.476	6.705
Observations	26	24	22	20	25	23	21	19

Dep. Vars	*Lprod*				*Emp*			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C = Overall compliance								
C_all	0.033*	0.036*	0.039*	0.065***	0.046***	0.045***	0.048***	0.042***
	(0.017)	(0.018)	(0.020)	(0.022)	(0.013)	(0.014)	(0.015)	(0.014)
Finconst	-0.560*	-0.524	-0.442	-0.176	0.316	0.354	0.350	0.163
	(0.294)	(0.313)	(0.364)	(0.375)	(0.203)	(0.222)	(0.235)	(0.208)
F-statistic	2.947	1.930	1.360	2.146	8.107	4.691	2.077	2.689
C = Six Compliance Scores								
C1_Union	0.000	0.001	0.008	0.011	0.008	0.007	0.003	-0.007
	(0.013)	(0.014)	(0.017)	(0.019)	(0.009)	(0.010)	(0.012)	(0.010)
C2_OSH	0.022	0.027	0.031	0.033	0.029**	0.030**	0.035**	0.028**
	(0.026)	(0.027)	(0.030)	(0.031)	(0.013)	(0.014)	(0.016)	(0.013)
C3_MHR	0.004	-0.001	0.001	0.022	0.015	0.015	0.013	0.021**
	(0.016)	(0.017)	(0.019)	(0.023)	(0.010)	(0.011)	(0.012)	(0.011)
C4_Compe	0.020	0.031	0.003	-0.013	-0.006	-0.012	-0.012	0.007
	(0.034)	(0.038)	(0.048)	(0.051)	(0.021)	(0.023)	(0.026)	(0.022)
C5_Hour	-0.007	-0.008	-0.008	-0.012	-0.008	-0.007	-0.001	-0.008
	(0.013)	(0.015)	(0.017)	(0.018)	(0.008)	(0.009)	(0.010)	(0.009)
C6_Core3	-0.012	-0.024	-0.006	0.019	-0.002	-0.001	-0.013	-0.014
	(0.050)	(0.054)	(0.062)	(0.061)	(0.021)	(0.022)	(0.026)	(0.021)
Finconst	-0.627*	-0.602	-0.552	-0.306	0.266	0.313	0.324	0.141
	(0.343)	(0.368)	(0.437)	(0.445)	(0.208)	(0.230)	(0.244)	(0.207)
F-statistic	0.856	0.756	0.626	1.211	2.853	2.124	1.464	2.323
Observations	41	38	35	31	79	72	67	58

Notes: Standard errors are in parentheses. The control variables of each column are the same as those in the corresponding column of Table 6.1, although *t2* and *China_Q04*t2* cannot be controlled for. ***$p<0.01$, **$p<0.05$, *$p<0.1$.

Table 6.4. Potential Channels and Profit/Productivity (OLS regression)

Dep. Var	Channel=	Wage		Turnover		LostDay		UnionRate		Training		Train_Out	
		(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Profit	*Channel*	4.217	5.031	-1.108	-1.233	0.763	2.636	-0.122	-0.237	-4.810	-4.204	-4.497	-5.934
		(9.303)	(10.033)	(0.852)	(0.981)	(3.191)	(3.604)	(0.141)	(0.148)	(8.178)	(9.324)	(7.564)	(8.039)
	Obervations	129	120	36	30	36	30	61	56	129	120	129	120
TFP	*Channel*	1.005***	0.772**	-0.021	0.004	0.016	0.059	-0.008*	-0.009**	-0.188	0.342	-0.247	-0.194
		(0.277)	(0.332)	(0.021)	(0.026)	(0.077)	(0.088)	(0.004)	(0.004)	(0.244)	(0.286)	(0.226)	(0.259)
	Obervations	124	84	33	26	33	26	58	53	124	84	124	84
Lprod	*Channel*	1.023***	1.067***	0.000	0.008	-0.056	0.043	-0.005	-0.006	-0.080	0.039	-0.245	-0.137
		(0.240)	(0.266)	(0.013)	(0.015)	(0.073)	(0.088)	(0.004)	(0.004)	(0.207)	(0.230)	(0.211)	(0.232)
	Obervations	164	151	54	44	54	45	86	78	167	152	167	152
Dep. Var	**Channel =**	**Train_In**		**Eduy_super**		**PFB**		**PFB_share**		**Piecerate**		**Piecerate_share**	
		(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Profit	*Channel*	-1.449	-0.480	-1.644	-2.162	-1.165	-4.565	-0.105	-0.093	5.477	-20.129	-0.152	-0.536
		(7.428)	(8.296)	(1.248)	(1.389)	(8.227)	(9.316)	(0.129)	(0.134)	(18.914)	(24.348)	(0.510)	(0.576)
	Observations	129	120	126	118	93	90	93	90	35	29	34	28
TFP	*Channel*	-0.079	0.454*	-0.050	-0.072	0.081	0.014	-0.005	-0.004	0.336	-0.162	0.010	0.003
		(0.222)	(0.261)	(0.038)	(0.044)	(0.278)	(0.343)	(0.004)	(0.005)	(0.491)	(0.642)	(0.012)	(0.014)
	Obervations	124	84	121	82	91	58	91	58	33	26	32	25
Lprod	*Channel*	-0.010	0.070	-0.058*	-0.057	0.111	-0.143	-0.003	-0.003	0.363	-0.114	0.012	0.003
		(0.194)	(0.214)	(0.035)	(0.039)	(0.259)	(0.284)	(0.004)	(0.004)	(0.354)	(0.441)	(0.010)	(0.012)
	Observations	167	152	159	145	112	107	112	107	54	44	51	42

Notes: Standard errors are in parentheses. In every column (1), only *Channel* and *t2* (when applicable) are included as control variables. As for column (2), the following additional regressors are also included: *China_Q04*, *China_Q04*t2*, and *Subcon* in Profit regression; *China_Q04*, *China_Q04*t2*, *Subcon*, *China3*, and *PhnomPenh* in TFP regression; *China_Q04*, *China_Q04*t2*, *Subcon*, and *China3* in *Lprod* regression.

***$p<0.01$, **$p<0.05$, *$p<0.1$.

Appendix Table A1. Factory Characteristics: Summary Statistics

Variable	Description	First period			Second period		
		Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Visit	Number of cumulative monitoring visits	100	1.000	0.000	97	3.711	1.443
Opeyear	Years in operation	100	4.870	1.631	97	6.742	3.811
Subcon	Dummy for subcontractor	100	0.190	0.394	91	0.593	0.494
China3	Dummy for Chinese (mainland, Hong Kong, and Taiwanese)-owned	100	0.740	0.441	97	0.629	0.486
Cambo	Dummy for Cambodian-owned	100	0.050	0.219	97	0.031	0.174
PhnomPenh	Dummy for being located in Phnom Penh	100	0.830	0.378	97	0.825	0.382
Moafter	Months passed after the last visit till the end of fiscal year when factory performances are measured	100	11.870	4.948	97	17.557	14.906
China_Q04	Number of export items for which quota is imposed on China up to 2004 / number of export items for US and EU	96	0.244	0.208	88	0.222	0.212
Finconst	Dummy for financial constraint	Not asked in the survey			80	0.388	0.490
Turnover	Labor turnover (%)	Not asked in the survey			91	14.582	11.964
Employee Skill Variables							
Exp	Estimated average years of experience of employees	100	2.924	0.764	91	3.278	0.995
Exp_oh	Estimated average years of experience of operators and helpers	100	2.881	0.828	85	3.189	1.093
Exp_super	Estimated average years of experience of supervisors	98	3.173	0.814	84	3.739	1.227
Edu	Estimated average years of education of supervisors, operators, and helpers	92	6.684	1.251	85	7.293	2.681
Edu_oh	Estimated average years of education of operators and helpers	94	6.564	1.270	88	7.084	2.833
Edu_super	Estimated average years of education of supervisors	97	9.794	2.056	89	10.180	2.558
UnionRate	Unionization rate (%)	47	16.771	25.159	95	43.225	31.935

LostDay	Days lost due to strikes and lockouts	Not asked in the survey			94	0.548	1.680
Wage	Log of annual wage and salary per worker (2002 USD price)	100	6.809	0.366	89	6.810	0.266
Wage_raw	Annual wage and salary per worker (2002 USD price)	100	971	385	89	940	255
Performance Pay Variables							
Piecerate	Dummy for piece rate for operators	Not asked in the survey			92	0.793	0.407
Piecerate _share	Average share (%) of piece rate in total remuneration	Not asked in the survey			87	13.082	13.966
PFB	Dummy for providing performance bonus	100	0.830	0.378	Not asked in the survey		
PFB_share	Average share (%) of performance bonus in total remuneration	100	22.750	24.913	Not asked in the survey		
Training Variables							
Training	Dummy for having any formal training scheme for employees	100	0.780	0.416	94	0.851	0.358
Train_Out	Dummy for having formal outside training scheme	100	0.130	0.338	97	0.258	0.440
Train_In	Dummy for having formal inside training scheme	100	0.730	0.446	97	0.814	0.391
K/L	Log of capital stock per worker (2002 USD price)	78	5.748	0.788	59	5.826	1.105
K/L_raw	Capital stock per worker (2002 USD price)	78	531	1255	59	625	863

Notes: The above statistics are computed based on the IDE surveys' sample with non-missing labor compliance data. The estimated years of experience (respectively, education) are computed based on the average experience (education) level by job category, weighted by the corresponding number of employment. We assign 0.5, 3, and 6 years respectively to each of the three experience categories (less than 1 year; 1-5 years; 6 years or more). The standard years of schooling (0, 6, 9, 12, and 16 years) are assigned respectively to each of the five educational levels (below primary; primary; lower secondary; higher secondary; bachelor's degree or higher). Only *UnionRate* is extracted from the BFC dataset and thus measured at the same timing of the compliance data. For the more information on *Finconst*, see section 6.1.

Appendix Table A2. Compliance Score and Potential Channels through which Working Conditions Affect Productivity and Profit

Dep. Var	***Wage***		***Turnover***		***LostDay***		***UnionRate***	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) Use C_all as compliance score								
C_all	0.006**	0.005	-0.098	-0.242	0.020	0.010	0.400	0.216
	(0.003)	(0.003)	(0.166)	(0.192)	(0.015)	(0.016)	(0.312)	(0.325)
Adj.R-squared	0.014	0.063	-0.007	-0.001	-0.002	0.050	0.147	0.277
Robust SE		Yes			Yes	Yes	Yes	
(b) Use six compliance subgroup scores								
C1_Union	0.002	0.001	0.046	0.054	0.031**	0.019	0.009	0.065
	(0.002)	(0.002)	(0.121)	(0.122)	(0.014)	(0.013)	(0.206)	(0.189)
C2_OSH	0.000	-0.001	0.053	0.032	0.034*	0.030	0.383	0.365
	(0.003)	(0.003)	(0.159)	(0.166)	(0.020)	(0.020)	(0.300)	(0.263)
C3_MHR	0.002	0.002	-0.144	-0.194	0.008	-0.001	0.098	0.001
	(0.002)	(0.002)	(0.144)	(0.153)	(0.015)	(0.012)	(0.232)	(0.206)
C4_Compe	0.004	0.005**	0.076	-0.007	-0.071*	-0.043	0.085	-0.014
	(0.002)	(0.003)	(0.257)	(0.263)	(0.039)	(0.033)	(0.235)	(0.222)
C5_Hour	-0.001	-0.001	-0.169*	-0.178*	-0.014	-0.011	-0.242	-0.292*
	(0.002)	(0.002)	(0.101)	(0.102)	(0.012)	(0.015)	(0.184)	(0.176)
C6_Core3	-0.004	-0.006	0.443	0.290	-0.009	-0.023	0.374	0.692**
	(0.004)	(0.005)	(0.290)	(0.313)	(0.032)	(0.033)	(0.336)	(0.313)
Adj.R-squared	0.009	0.072	0.018	0.014	0.033	0.039	0.134	0.285
Robust SE		Yes			Yes	Yes	Yes	Yes
Observations	189	170	91	91	94	86	142	141
Other control vars.								
t2	Yes	Yes					Yes	Yes
Opeyear						Yes		Yes
Opeyear^2						Yes		Yes
Emp								Yes
China3				Yes				Yes
Cambo				Yes				Yes
PhnomPenh		Yes						
Subcon		Yes				Yes		
Moafter				Yes				
UnionRate						Yes		
Edu		Yes						
Exp								

Dep. Var	***Training***		***Train_Out***		***Train_In***		***Exp***	
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(a) Use C_all as compliance score								
C_all	0.006*	0.006*	0.008**	0.003	0.004	0.002	-0.003	-0.005
	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	(0.009)	(0.008)
Adj.R-squared	0.016	0.052	0.047	0.120	0.006	0.035	0.030	0.213
Robust SE	Yes	Yes	Yes	Yes		Yes	Yes	Yes
(b) Use six compliance subgroup scores								
C1_Union	0.000	0.001	0.002	0.001	-0.001	0.000	0.002	0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)	(0.004)
C2_OSH	0.004	0.004	0.002	0.000	0.005	0.005	-0.009	-0.004
	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)	(0.004)	(0.007)	(0.006)
C3_MHR	0.005*	0.005	0.002	0.001	0.004	0.003	0.002	0.001
	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.006)	(0.006)
C4_Compe	0.000	-0.001	-0.001	-0.001	0.000	-0.001	-0.003	-0.005
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.007)	(0.007)
C5_Hour	-0.002	-0.001	0.001	0.001	-0.003	-0.003	0.004	0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)	(0.004)
C6_Core3	-0.006	-0.004	0.010***	0.009***	-0.008**	-0.007**	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.006)	(0.006)
Adj.R-squared	0.024	0.056	0.040	0.116	0.024	0.051	0.013	0.195
Robust SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	194	176	197	185	197	176	191	190
Other control vars.								
t2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Opeyear		Yes				Yes		Yes
Opeyear^2		Yes				Yes		Yes
Emp		Yes		Yes		Yes		Yes
China3				Yes				
Cambo				Yes				Yes
PhnomPenh				Yes				Yes
Subcon				Yes				
Moafter				Yes		Yes		
UnionRate								
Edu		Yes				Yes		
Exp				Yes				

Dep. Var	***Exp_oh***		***Exp_super***		***Edu_oh***		***Edu_super***	
	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
(a) Use C_all as compliance score								
C_all	0.000	-0.001	-0.010	-0.012	-0.021	-0.018	-0.002	-0.007
	(0.009)	(0.008)	(0.011)	(0.010)	(0.020)	(0.020)	(0.019)	(0.022)
Adj.R-squared	0.015	0.190	0.066	0.253	0.010	0.016	-0.004	0.035
Robust SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(b) Use six compliance subgroup scores								
C1_Union	0.002	0.002	0.002	0.003	0.012	0.012	0.004	0.009
	(0.005)	(0.005)	(0.006)	(0.006)	(0.013)	(0.013)	(0.015)	(0.015)
C2_OSH	-0.010	-0.004	-0.013	-0.007	-0.003	0.001	0.017	0.013
	(0.007)	(0.006)	(0.009)	(0.008)	(0.018)	(0.018)	(0.019)	(0.018)
C3_MHR	0.005	0.002	0.000	-0.006	-0.010	-0.011	-0.008	-0.015
	(0.006)	(0.006)	(0.007)	(0.007)	(0.011)	(0.011)	(0.015)	(0.015)
C4_Compe	-0.002	-0.004	-0.010	-0.011*	-0.019	-0.019	-0.008	-0.007
	(0.008)	(0.007)	(0.007)	(0.007)	(0.013)	(0.013)	(0.017)	(0.016)
C5_Hour	0.004	0.002	0.010**	0.009**	-0.002	-0.002	-0.005	-0.006
	(0.005)	(0.004)	(0.005)	(0.004)	(0.012)	(0.012)	(0.011)	(0.011)
C6_Core3	0.000	-0.002	-0.006	-0.005	0.014	0.011	-0.007	-0.016
	(0.006)	(0.007)	(0.011)	(0.011)	(0.019)	(0.020)	(0.031)	(0.029)
Adj.R-squared	0.000	0.171	0.072	0.260	-0.005	0.003	-0.023	0.022
Robust SE	Yes	Yes	Yes	Yes	Yes	Yes		
Observations	185	181	182	182	182	179	186	180
Other control vars.								
t2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Opeyear		Yes		Yes				Yes
Opeyear^2		Yes		Yes				Yes
Emp								Yes
China3								
Cambo		Yes						
PhnomPenh				Yes				
Subcon		Yes						Yes
Moafter				Yes				
UnionRate								
Edu								
Exp								

Dep. Var	***PFB***		***PFB_share***		***Piecerate***		***Piecerate_share***		***K/L***	
	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
(a) Use C_all as compliance score										
C_all	0.001	0.001	0.237	0.475	-0.008	-0.006	-0.285	-0.218	-0.006	0.014
	(0.004)	(0.005)	(0.284)	(0.287)	(0.005)	(0.004)	(0.188)	(0.192)	(0.010)	(0.010)
Adj. R-squared	-0.010	0.201	-0.003	0.053	0.014	0.059	0.015	0.029	-0.011	0.166
Robust SE		Yes		Yes		Yes			Yes	
(b) Use six compliance subgroup scores										
C1_Union	0.002	0.003	-0.206	-0.018	-0.006	-0.003	-0.077	-0.035	-0.007	-0.006
	(0.003)	(0.004)	(0.144)	(0.186)	(0.004)	(0.004)	(0.151)	(0.161)	(0.006)	(0.007)
C2_OSH	-0.004	-0.007*	0.135	0.334	-0.011**	-0.011**	-0.188	-0.175	-0.004	0.002
	(0.003)	(0.004)	(0.235)	(0.208)	(0.005)	(0.005)	(0.199)	(0.202)	(0.008)	(0.008)
C3_MHR	0.001	0.001	-0.078	-0.145	0.003	0.003	0.119	0.128	-0.009	0.001
	(0.003)	(0.003)	(0.174)	(0.169)	(0.005)	(0.005)	(0.154)	(0.158)	(0.009)	(0.007)
C4_Compe	0.001	0.000	-0.044	-0.135	0.009	0.004	-0.035	-0.110	0.002	0.003
	(0.003)	(0.003)	(0.185)	(0.193)	(0.008)	(0.008)	(0.304)	(0.312)	(0.006)	(0.007)
C5_Hour	0.002	0.004*	0.282	0.344*	0.003	0.004	-0.023	0.006	0.006	0.006
	(0.002)	(0.002)	(0.197)	(0.182)	(0.003)	(0.003)	(0.117)	(0.122)	(0.006)	(0.005)
C6_Core3	-0.003	0.001	-0.264	-0.276	-0.002	0.001	-0.387	-0.327	0.016	0.012
	(0.005)	(0.005)	(0.389)	(0.361)	(0.009)	(0.009)	(0.411)	(0.416)	(0.011)	(0.013)
Adj. R-squared	-0.037	0.200	0.007	0.091	0.013	0.050	-0.019	-0.009	-0.005	0.161
Robust SE	Yes	Yes	Yes	Yes	Yes	Yes			Yes	
Observations	100	92	100	100	92	88	87	83	137	136
Other control vars.										
t2									Yes	Yes
Opeyear										Yes
Opeyear^2										Yes
Emp				Yes						Yes
China3										
Cambo										
PhnomPenh										Yes
Subcon		Yes				Yes		Yes		
Moafter				Yes						Yes
UnionRate										
Edu		Yes								
Exp										

Notes: Standard (or robust standard) errors are in parentheses. Robust standard errors (SE) are reported when the homoscedastic variance hypothesis is rejected in the Breusch-Pagan/Cook-Weisberg test. ***p <0.01, **p < 0.05, *p <0.1.

Appendix Table A3. Compliance Score and Profit, Productivity, and Employment Size:
Separately by Time Period
(a) First-Period sample

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Dep. Var		***Profit***				***TFP***		
C = Overall compliance								
C_all	-0.188	-0.272	-0.343	0.334	-0.003	-0.013	-0.021	-0.017
	(0.438)	(0.457)	(0.464)	(0.562)	(0.015)	(0.014)	(0.014)	(0.023)
F-statistic	0.184	0.410	0.538	1.121	0.030	3.005	4.188	1.298
C = Six Compliance Scores								
C1_Union	-0.097	-0.214	-0.243	-0.289	0.006	-0.004	-0.012	-0.011
	(0.325)	(0.363)	(0.370)	(0.471)	(0.011)	(0.012)	(0.011)	(0.020)
C2_OSH	-0.783**	-0.774**	-0.750*	-0.259	-0.021*	-0.021*	-0.019	-0.014
	(0.355)	(0.377)	(0.383)	(0.581)	(0.012)	(0.012)	(0.011)	(0.025)
C3_MHR	0.402	0.447	0.437	0.459	0.021*	0.019*	0.009	0.016
	(0.319)	(0.343)	(0.346)	(0.513)	(0.011)	(0.011)	(0.011)	(0.021)
C4_Compe	0.165	0.180	0.178	-0.186	0.001	-0.001	0.001	-0.010
	(0.303)	(0.313)	(0.316)	(0.391)	(0.010)	(0.010)	(0.009)	(0.015)
C5_Hour	0.103	0.090	0.069	0.302	-0.002	0.000	0.001	-0.003
	(0.209)	(0.223)	(0.228)	(0.350)	(0.007)	(0.007)	(0.007)	(0.013)
C6_Core3	0.340	0.162	0.115	0.376	0.007	-0.006	-0.011	0.018
	(0.552)	(0.590)	(0.601)	(1.012)	(0.018)	(0.019)	(0.018)	(0.039)
F-statistic	1.177	1.029	0.920	0.752	1.044	1.527	2.320	0.696
Observations	59	57	57	27	57	55	55	26
Dep. Var		***Lprod***				***Emp***		
C = Overall compliance								
C_all	-0.004	-0.006	-0.002	-0.002	0.027***	0.026***	0.022**	0.044**
	(0.014)	(0.014)	(0.014)	(0.021)	(0.009)	(0.009)	(0.009)	(0.018)
F-statistic	0.078	2.663	2.400	2.730	8.474	4.061	4.198	1.799
C = Six Compliance Scores								
C1_Union	-0.014	-0.017*	-0.015	-0.015	-0.004	-0.004	0.000	-0.002
	(0.010)	(0.010)	(0.010)	(0.015)	(0.007)	(0.007)	(0.007)	(0.013)
C2_OSH	-0.016	-0.016	-0.014	-0.003	0.013	0.010	0.008	0.023
	(0.012)	(0.012)	(0.012)	(0.023)	(0.008)	(0.009)	(0.008)	(0.018)
C3_MHR	0.019*	0.024**	0.020*	0.008	0.006	0.007	0.000	0.005
	(0.010)	(0.010)	(0.011)	(0.021)	(0.007)	(0.007)	(0.007)	(0.015)
C4_Compe	0.004	0.002	0.002	-0.005	0.005	0.007	0.002	0.012
	(0.010)	(0.010)	(0.010)	(0.014)	(0.006)	(0.007)	(0.006)	(0.013)
C5_Hour	0.001	0.000	0.001	0.005	0.003	0.003	0.007	0.002
	(0.007)	(0.007)	(0.007)	(0.013)	(0.005)	(0.005)	(0.005)	(0.010)
C6_Core3	0.003	-0.003	0.002	0.016	-0.003	-0.007	0.003	-0.018
	(0.019)	(0.019)	(0.020)	(0.034)	(0.013)	(0.014)	(0.013)	(0.027)
F-statistic	1.027	1.987	1.725	1.527	1.700	1.438	2.509	1.110
Observations	73	70	70	31	100	96	96	42

(b) Second-Period Sample

	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Dep. Var	***Profit***				***TFP***			
C = Overall compliance								
C_all	1.393	1.418	1.393	1.189	0.041	0.035	0.039	0.022
	(0.965)	(0.931)	(0.907)	(1.016)	(0.024)	(0.025)	(0.026)	(0.025)
F-statistic	2.085	3.062	3.470	2.552	2.805	2.338	1.461	3.583
C = Six Compliance Scores								
C1_Union	0.449	0.624	0.800	0.114	0.022	0.025	0.031	0.020
	(0.618)	(0.642)	(0.691)	(0.869)	(0.016)	(0.017)	(0.019)	(0.021)
C2_OSH	-0.326	-1.023	-1.012	-0.128	-0.034	-0.047	-0.047	-0.003
	(1.245)	(1.296)	(1.310)	(1.387)	(0.032)	(0.035)	(0.037)	(0.035)
C3_MHR	1.773	1.710	1.637	1.040	0.055**	0.051*	0.052*	0.029
	(1.046)	(1.055)	(1.064)	(1.140)	(0.026)	(0.028)	(0.029)	(0.027)
C4_Compe	-1.927	-1.054	-0.945	-1.218	-0.033	-0.010	-0.012	-0.028
	(1.334)	(1.477)	(1.481)	(1.543)	(0.033)	(0.040)	(0.041)	(0.037)
C5_Hour	0.095	0.321	0.156	0.167	0.007	0.007	0.002	-0.014
	(0.531)	(0.577)	(0.600)	(0.663)	(0.013)	(0.015)	(0.018)	(0.018)
C6_Core3	2.175	1.350	0.595	2.400	0.029	0.002	0.006	0.009
	(1.377)	(1.472)	(1.548)	(1.891)	(0.053)	(0.059)	(0.065)	(0.059)
F-statistic	1.521	1.579	1.702	1.595	1.486	1.342	1.190	2.013
Observations	33	30	28	26	31	28	26	24
Dep. Var	***Lprod***				***Emp***			
C = Overall compliance								
C_all	0.026	0.030*	0.038**	0.056***	0.051***	0.050***	0.046***	0.035***
	(0.016)	(0.016)	(0.017)	(0.018)	(0.013)	(0.015)	(0.013)	(0.012)
F-statistic	2.619	1.684	1.950	3.150	14.279	6.015	2.525	2.703
C = Six Compliance Scores								
C1_Union	0.006	0.007	0.017	0.020	0.002	0.001	0.001	-0.007
	(0.013)	(0.013)	(0.014)	(0.015)	(0.010)	(0.011)	(0.010)	(0.009)
C2_OSH	0.010	0.013	0.019	0.032	0.028**	0.028*	0.027**	0.018
	(0.023)	(0.024)	(0.024)	(0.024)	(0.013)	(0.015)	(0.013)	(0.012)
C3_MHR	0.007	0.003	0.004	0.021	0.022**	0.023*	0.016	0.024**
	(0.014)	(0.015)	(0.015)	(0.016)	(0.011)	(0.012)	(0.010)	(0.009)
C4_Compe	-0.018	-0.010	-0.027	-0.040	-0.009	-0.013	-0.004	0.005
	(0.027)	(0.030)	(0.031)	(0.032)	(0.021)	(0.023)	(0.020)	(0.019)
C5_Hour	0.005	0.005	0.002	-0.010	-0.001	0.001	0.000	-0.005
	(0.012)	(0.013)	(0.013)	(0.013)	(0.008)	(0.009)	(0.008)	(0.007)
C6_Core3	0.029	0.018	0.029	0.046	-0.008	-0.008	-0.019	-0.016
	(0.044)	(0.047)	(0.047)	(0.044)	(0.023)	(0.025)	(0.023)	(0.020)
F-statistic	0.537	0.486	0.985	2.081	3.027	2.285	1.722	2.423
Observations	51	47	44	39	96	87	81	71

Notes: Standard errors are in parentheses. The explanatory variables of each column are the same as those in the corresponding column of Table 6.1, although *t2* and *China_Q04*t2* cannot be controlled for. ***p <0.01, **p < 0.05, *p <0.1.

Appendix Table B1. Breakdown of Six-group Compliance Scores into Those of 27-groups

(a) Breakdown of *C1_Union*

Dep. Var	***Profit***				***TFP***			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union								
C2_OSH	-0.748**	-0.879**	-0.812**	-0.458	-0.025**	-0.028**	-0.023**	-0.011
C3_MHR	0.782**	0.760**	0.710**	0.826*	0.030***	0.025**	0.022**	0.024*
C4_Compe	-0.220	-0.164	-0.148	-0.625	-0.007	-0.008	-0.007	-0.019
C5_Hour	0.161	0.233	0.170	0.306	0.002	0.004	0.001	-0.001
C6_Core3	0.759	0.582	0.386	1.250	0.013	-0.001	-0.004	0.025
C11	0.031	0.114	0.031	-0.103	0.001	0.000	-0.001	-0.003
C12	0.013	-0.036	-0.032	-0.155	-0.006	-0.008	-0.009	-0.013
C13	0.066	0.041	-0.035	0.068	0.003	0.001	0.001	0.009
C14	0.064	0.107	0.134	0.086	0.005*	0.006*	0.006*	0.001
C15	-0.153	-0.151	-0.138	-0.143	-0.002	-0.002	-0.001	0.004
C16	0.332*	0.344**	0.337*	0.336	0.008	0.009*	0.009	0.006
Observations	92	87	85	53	88	83	81	50

(b) Breakdown of *C2_OSH*

Dep. Var	***Profit***				***TFP***			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union	-0.035	0.066	0.065	-0.201	0.011	0.008	0.008	0.000
C2_OSH								
C3_MHR	0.829**	0.806**	0.744**	0.479	0.027**	0.024**	0.019*	0.011
C4_Compe	-0.021	0.101	0.101	-0.212	-0.001	-0.001	0.001	-0.002
C5_Hour	0.060	0.096	0.047	0.172	0.004	0.004	0.001	-0.007
C6_Core3	0.674	0.464	0.346	1.303	0.011	-0.001	-0.006	0.024
C21	-0.140	-0.206	-0.153	-0.436	-0.003	-0.005	-0.004	-0.009
C22	-0.529*	-0.509*	-0.510*	-0.254	-0.013	-0.012	-0.011	-0.014
C23	0.084	0.111	0.066	-0.016	-0.002	-0.002	0.000	0.000
C24	0.158	0.132	0.054	0.930	-0.011	-0.008	-0.012	0.014
C25	0.190	0.231	0.305	0.615	0.010	0.008	0.009	0.027*
C26	-0.034	-0.102	-0.115	0.086	-0.002	-0.002	-0.001	0.006
C27	-0.048	-0.057	-0.082	-0.039	0.001	0.001	0.000	0.001
C28	-0.135	-0.124	-0.066	-0.147	-0.001	0.000	0.002	-0.008
Observations	92	87	85	53	88	83	81	50

(a) Breakdown of *C1_Union*								
Dep. Var	***Lprod***				***Emp***			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union								
C2_OSH	-0.012	-0.009	-0.007	0.014	0.020***	0.018**	0.017**	0.016*
C3_MHR	0.016*	0.016*	0.015*	0.014	0.012**	0.014**	0.012*	0.018**
C4_Compe	0.002	-0.001	-0.003	-0.013	0.003	0.004	0.005	0.012
C5_Hour	0.002	0.003	0.001	0.004	0.002	0.002	0.002	0.000
C6_Core3	0.011	0.008	0.013	0.035	0.001	0.000	-0.001	-0.013
C11	-0.002	0.001	0.003	-0.009	0.010**	0.010**	0.010**	0.013
C12	-0.009	-0.008	-0.009	-0.009	-0.001	-0.001	-0.001	-0.003
C13	0.003	0.001	0.002	0.010*	0.004	0.004	0.005	0.003
C14	0.000	0.000	0.001	0.001	-0.001	-0.002	-0.002	-0.002
C15	-0.001	-0.002	-0.002	0.006	-0.006	-0.005	-0.005	-0.003
C16	0.001	0.001	0.002	-0.001	0.000	-0.001	0.000	-0.003
Observations	124	117	114	70	196	183	177	113

(b) Breakdown of *C2_OSH*								
Dep. Var	***Lprod***				***Emp***			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union	-0.006	-0.007	-0.004	0.001	-0.001	-0.003	-0.002	-0.004
C2_OSH								
C3_MHR	0.015*	0.015*	0.014	0.012	0.010*	0.014**	0.011*	0.020***
C4_Compe	-0.002	-0.002	-0.004	-0.013	0.002	0.003	0.004	0.007
C5_Hour	0.004	0.004	0.002	0.004	0.001	0.001	0.000	0.000
C6_Core3	0.014	0.008	0.011	0.030	-0.001	-0.003	-0.005	-0.014
C21	-0.001	0.000	0.002	0.006	0.011***	0.012***	0.012***	0.009**
C22	-0.015**	-0.014*	-0.013*	-0.013	-0.002	-0.007	-0.004	-0.013*
C23	0.003	-0.002	-0.002	-0.001	0.001	0.003	-0.001	0.002
C24	-0.005	-0.005	-0.007	-0.007	-0.006	-0.006	-0.005	-0.004
C25	0.008	0.008	0.009	0.006	0.001	0.001	0.003	0.006
C26	-0.004	-0.001	0.000	0.008	0.004	0.004	0.003	0.004
C27	0.002	0.002	0.001	0.001	-0.004*	-0.005*	-0.006**	-0.003
C28	0.005	0.006	0.006	0.004	0.004	0.003	0.003	0.002
Observations	124	117	114	70	196	183	177	113

(c) Breakdown of *C3_MHR*								
Dep. Var	***Profit***				***TFP***			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union	0.206	0.312	0.324	0.245	0.013	0.011	0.011	0.012
C2_OSH	-0.748**	-0.872**	-0.755*	-0.189	-0.025**	-0.026**	-0.020*	0.000
C3_MHR								
C4_Compe	-0.083	0.004	0.009	-0.477	-0.003	-0.003	-0.002	-0.013
C5_Hour	0.054	0.105	0.010	0.196	-0.002	0.000	-0.004	-0.009
C6_Core3	0.878	0.690	0.504	1.456*	0.017	0.005	0.001	0.037
C31	0.063	0.033	-0.047	-0.026	0.004	0.002	0.000	-0.003
C32	0.237	0.115	0.180	0.279	0.002	0.002	0.004	0.012
C33	0.047	0.123	0.118	0.129	0.001	0.001	0.002	0.001
C34	0.406**	0.410**	0.432**	0.333	0.018***	0.017***	0.016***	0.010
Observations	92	87	85	53	88	83	81	50

(d) Breakdown of *C4_Compe*								
Dep. Var	***Profit***				***TFP***			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union	0.041	0.107	0.106	0.083	0.009	0.006	0.005	0.006
C2_OSH	-0.639*	-0.760*	-0.713*	-0.112	-0.021*	-0.023**	-0.019	-0.002
C3_MHR	0.829**	0.830**	0.783**	0.722	0.033***	0.029***	0.024**	0.019
C4_Compe								
C5_Hour	0.132	0.193	0.134	0.264	0.000	0.002	-0.002	-0.007
C6_Core3	0.699	0.511	0.367	1.192	0.010	-0.001	-0.003	0.022
C41	0.079	0.067	0.046	0.057	0.004	0.003	0.002	0.007
C42	-0.155	-0.176	-0.156	-0.154	-0.005	-0.004	-0.003	-0.001
C43	-0.166	0.010	0.031	-0.586	-0.013	-0.012	-0.010	-0.033**
C44	0.081	0.066	0.070	0.063	0.005	0.004	0.004	0.002
Observations	92	87	85	53	88	83	81	50

(c) Breakdown of *C3_MHR*								
Dep. Var	***Lprod***				***Emp***			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union	-0.005	-0.005	-0.001	0.004	-0.001	-0.002	-0.001	-0.004
C2_OSH	-0.008	-0.006	-0.003	0.012	0.019**	0.016*	0.014*	0.014
C3_MHR								
C4_Compe	0.002	0.000	-0.002	-0.013	0.004	0.005	0.006	0.012
C5_Hour	0.002	0.002	0.000	0.001	0.001	0.002	0.002	0.001
C6_Core3	0.009	0.005	0.009	0.033	-0.005	-0.007	-0.007	-0.019
C31	0.002	0.002	0.001	0.001	0.002	0.003	0.003	0.005
C32	0.005	0.004	0.003	0.002	0.001	0.001	0.002	0.004
C33	0.002	0.004	0.005	0.005	0.003	0.003	0.001	0.002
C34	0.005	0.006	0.006	0.006	0.004	0.005	0.004	0.005
Observations	124	117	114	70	196	183	177	113

(d) Breakdown of *C4_Compe*								
Dep. Var	***Lprod***				***Emp***			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union	-0.006	-0.007	-0.005	0.005	-0.001	-0.002	-0.001	-0.003
C2_OSH	-0.009	-0.008	-0.004	0.010	0.019**	0.016**	0.015**	0.014
C3_MHR	0.018**	0.020**	0.019**	0.016	0.012*	0.013*	0.010	0.018**
C4_Compe								
C5_Hour	0.002	0.002	0.000	0.000	0.001	0.001	0.001	0.001
C6_Core3	0.006	0.000	0.005	0.024	-0.002	-0.005	-0.005	-0.021
C41	0.004	0.004	0.004	0.001	0.002	0.003	0.003	0.005
C42	-0.003	-0.004	-0.003	0.003	0.002	0.002	0.002	0.002
C43	-0.010	-0.010	-0.012	-0.023*	-0.001	-0.001	0.000	-0.002
C44	0.006	0.005	0.004	0.001	0.000	0.000	0.000	0.004
Observations	124	117	114	70	196	183	177	113

(e) Breakdown of *C5_Hour*

Dep. Var	***Profit***				***TFP***			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union	0.149	0.221	0.202	0.118	0.011	0.007	0.006	0.002
C2_OSH	-0.733**	-0.839**	-0.770**	-0.150	-0.022**	-0.023**	-0.018	0.001
C3_MHR	0.726**	0.718**	0.684*	0.654	0.028***	0.024**	0.020*	0.017
C4_Compe	-0.085	-0.010	0.000	-0.544	-0.004	-0.003	-0.002	-0.013
C5_Hour								
C6_Core3	0.810	0.662	0.507	1.749**	0.014	0.001	-0.002	0.036
C51	0.066	0.128	0.093	0.426*	0.002	0.002	0.000	0.003
C52	0.048	-0.020	-0.051	-0.293	-0.003	-0.001	-0.003	-0.012
Observations	92	87	85	53	88	83	81	50

(f) Breakdown of *C6_Core3*

Dep. Var	***Profit***				***TFP***			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union	0.064	0.115	0.088	0.104	0.010	0.006	0.005	0.005
C2_OSH	-0.698*	-0.817**	-0.748*	-0.320	-0.023**	-0.024**	-0.019	-0.006
C3_MHR	0.662**	0.649*	0.618*	0.666	0.027***	0.023**	0.019*	0.019
C4_Compe	0.075	0.166	0.174	-0.375	0.000	0.000	0.001	-0.011
C5_Hour	0.128	0.164	0.104	0.312	0.001	0.002	-0.001	-0.005
C6_Core3								
C61	-0.310	-0.399	-0.446	0.179	-0.009	-0.014	-0.014	0.005
C62	0.825**	0.725*	0.635	0.971**	0.019	0.012	0.011	0.024
C63	0.095	0.055	0.051	0.000	-0.002	0.000	-0.002	0.000
Observations	92	87	85	53	88	83	81	50

(e) Breakdown of ***C5_Hour***								
Dep. Var	***Lprod***				***Emp***			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union	-0.005	-0.006	-0.003	0.001	-0.001	-0.002	-0.001	-0.004
C2_OSH	-0.008	-0.006	-0.002	0.019	0.018**	0.015*	0.015**	0.016*
C3_MHR	0.014*	0.016*	0.015*	0.011	0.012**	0.013**	0.010*	0.016**
C4_Compe	0.002	0.000	-0.001	-0.012	0.004	0.005	0.006	0.011
C5_Hour								
C6_Core3	0.009	0.004	0.009	0.031	-0.005	-0.007	-0.008	-0.018
C51	0.002	0.002	0.002	0.008	0.000	0.000	0.001	0.002
C52	-0.001	-0.002	-0.004	-0.012	0.002	0.002	0.001	-0.002
Observations	124	117	114	70	196	183	177	113

(f) Breakdown of ***C6_Core3***								
Dep. Var	***Lprod***				***Emp***			
Exp. Vars	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
C1_Union	-0.002	-0.004	0.000	0.006	-0.001	-0.002	-0.001	-0.003
C2_OSH	-0.009	-0.006	-0.004	0.011	0.019**	0.017**	0.016**	0.017*
C3_MHR	0.014	0.015*	0.014	0.013	0.011*	0.013*	0.010*	0.016**
C4_Compe	0.005	0.003	0.002	-0.009	0.005	0.006	0.007	0.014*
C5_Hour	0.002	0.002	0.001	0.001	0.001	0.002	0.002	0.001
C6_Core3								
C61	-0.004	-0.006	-0.004	0.008	-0.007	-0.008	-0.006	-0.013
C62	0.014	0.013	0.015	0.023	0.002	0.000	-0.001	-0.006
C63	-0.010	-0.005	-0.007	-0.009	-0.002	-0.002	-0.002	-0.004
Observations	124	117	114	70	196	183	177	113

Note: In every column, other control variables are same as those in the corresponding column of Table 6.1. Significances are based on unadjusted standard errors. ***p <0.01, **p < 0.05, *p <0.1.

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