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The Impact of Better Work: Firm Performance in Vietnam, Indonesia and Jordan

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Abstract

The impact of Better Work (ILO/OFC) is assessed on costs, profits, productivity and business terms for firms in Vietnam, Indonesia and Jordan. Participation in Better Work has a positive productivity effect on Vietnamese and Indonesian firms. Productivity gains are captured by workers in the form of higher pay. Unit costs rise due to increased compliance with payment requirements such as the minimum wage, paying as promised and mandated promotions. Despite the increase in wages, profits for firms in Better Work Vietnam and Indonesia increase due to improved business terms such as larger orders and possibly an increase in price. The impact of Better Work Jordan suggests that exposure to the program for individual firms may have temporarily increased costs and lowered profits. However, the Jordanian apparel industry becomes more profitable over time, suggesting a positive country reputation effect. Participation in Better Work and firm performance are not jointly determined by manager quality. Early entrants into Better Work are, on average, high cost-low profit firms.

Keywords: high road, working conditions, supply chains, social compliance, International Labor Organization, supply chains.

I. Introduction

Firms with harsh and humane conditions of work have coexisted since the early stages of industrialization, generating a long-running debate concerning the efficiency properties of sweatshops and interventions promoting remediation (Osterman, 2018). The tension over optimizing labor management practices was apparent by 1800. Sir Robert Peel, a factory owner of Bury in Lancashire and Member of Parliament, initiated the practice of hiring paupers. Sanitary conditions were so poor in Peel's factories that nearly all of the pauper apprentices died. In contrast, Robert Owen, a contemporary of Peel's, imposed restrictions on the minimum age of employment and maximum hours of work for women and children and provided employees housing and food. The viability of Owen's management practices led to the Pauper Act of 1802,[1] the first legislative attempt to reform factories during the industrial revolution.

It has been argued that harsh conditions of work in developing country firms are the inevitable consequence of the fine division of labor common in the early stages of industrialization and worker preferences concerning pecuniary and nonpecuniary compensation. As long as labor markets are perfectly competitive and factory workers are paid by the piece, a cost-minimizing firm will chose the mix of working conditions and pecuniary compensation that maximizes the utility of workers subject to the condition that total compensation not exceed the marginal value product of labor (Lazear and Shaw, 2007). Critics counter that abusive conditions of work reflect monopsonistic exploitation (Freeman and Kleiner, 2005; Harrison and Scorse, 2010) in which employees are paid below their marginal value product.

However, abusive conditions of work are not necessarily motivated by exploitation. Poor conditions of work may reflect a deficit in managerial capital (Locke, 2013; Sabel, et al, 2000).

[1] The 1802 Health and Morals of Apprentices Act.

Indeed, empirical evidence clearly indicates the prevalence of managerial quality heterogeneity that persists over time (Melitz, 2003; Bloom, et al, 2012; Bandiera, et al, 2007). For example, managers who adopt labor management practices that tolerate or precipitate workplace verbal abuse and sexual harassment employ workers who have below average productivity and demand a pay differential to compensate for the abuse (Rourke, 2014; Lin, et al, 2014). In contrast, firms that adopt labor management innovations such as production teams and multi-dimensional pay increase productivity and profitability (Dunlop and Weil, 1996; Ichniowski, et al, 1997).

Despite the existence of potential productivity and profit opportunities from workplace innovations, factory managers may sub-optimally allocate managerial attention to their human resource management decisions. Experimental evidence demonstrates that managers may not be aware of productivity-enhancing innovations even after systematically exploring variations in their production process (Hanna, et al, 2012).

Legal structures, customer requirements, certifications, etc., are all systems that affect the direction of managerial attention. If it is the case that managers inefficiently under-allocate attention to conditions of work, then it is possible that remediation systems may accomplish their proximate objectives concerning working conditions while also improving outcomes for firms. That is, interventions intended to redress abusive conditions of work may be Pareto improving (Atleson, et al, 2008; Barrientos, et al, 2010; Boiral, 2007; Bromley and Powell, 2012; Eichholtz, et al, 2010; Heerwagen, 2010; Levine and Toeffel, 2010; Miller, et al, 2009; Sabel et al, 2000; Ton, 2014).

There is growing evidence that systemic interventions intended to direct manager attention to outcomes for workers do, indeed, improve working conditions. Locke, et al (2007), analyzing 800 Nike compliance audits in 51 countries, find that conditions improve when audits are

combined with interventions identifying root causes. Bird, et al (2017), analyzing 3276 suppliers in 55 countries, find that firms combining legal and worker participation structures improve conditions of work. Distelhorst, et al, (2016), using a difference-in-difference methodology analyzing over 300 firms, find improvements in compliance for factories in the Nike supply chain that adopt lean manufacturing techniques.

Our question, though, is whether workplace improvement systems are Pareto improving. Do firms gain, as well? If yes, then sweatshops are not efficient.

In the case of occupational safety and health, Levine, et al (2012), analyzing a natural experiment, find that inspections at 409 randomly selected California firms subsequently reduced the injury rate and costs associated with injuries without reducing employment, sales, market value or firm survival when compared to similar uninspected firms. Such a finding certainly suggests that, prior to inspection, firms were sub-optimally providing for workplace safety. Even in the absence of cost reductions from improved working conditions, firms may be rewarded for compliant behavior by reputation-sensitive buyers. Difference-in-difference estimates for 2000 firms in developing countries calculated by Distelhorst and Locke (2016) indicate that improvement in compliance is associated with a four percent increase in business. Similarly, Brown et al (2015) find that improvements in compliance are associated with an increase in profits.

Compliant firms may be more efficient and/or rewarded for a record of compliance by reputation-sensitive buyers. However, it is also possible that compliant firms may simply have better managers. That is, compliance and firm performance may be jointly determined by manager quality.

The establishment of Better Work, a joint program of the International Labor Organization (ILO) and International Finance Corporation (IFC), provides an opportunity to understand the causal link between compliance and firm outcomes. Better Work combines enterprise assessments, advisory services and training to help firms improve conditions of work across eight broad compliance categories. The analysis below presents results from a quasi experiment designed to measure the impact of Better Work on the cost structure and profits of participating firms in Vietnam, Indonesia and Jordan.

The analysis begins by estimating translog cost and profit functions for participating firms. The cost and profit functions abstract away from the impact of Better Work on output and factor prices, focusing attention on productivity and customer sourcing practices unrelated to price. The full impact of Better Work is then measured by analyzing costs and profits with a panel estimator and Better Work treatment variables. Identification is achieved by exploiting aspects of program delivery and the strategic timing of data collection.

The experimental design in presented in section II below. Description of the data is provided in section III and results are presented in section IV. Conclusions follow.

II. Experimental Design

The original identification strategy involved a randomized controlled trial, exploiting oversubscription to Better Work. It was expected that 300 Vietnamese factories would enroll in the first year. The Program anticipated a first-year capacity of 100 factories, with capacity expanding each year by an additional 100. Random assignment to program entry cohort would allow for the identification of a treatment effect. The first cohort of 100 factories would be

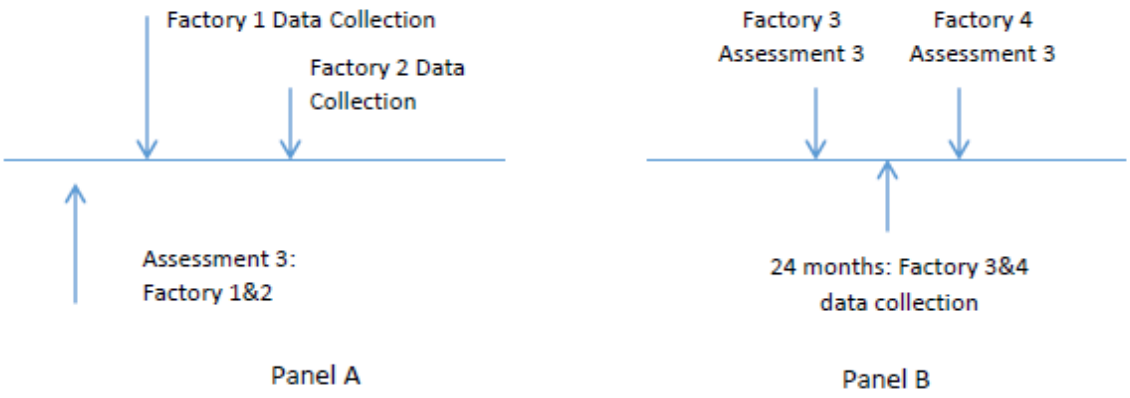
randomly assigned to enter the program in year 1, the second randomly selected cohort of 100 factories would be assigned to enter in year 2 and a third in year 3.

However, over-subscription never occurred. Rather, identification is achieved by exploiting certain idiosyncrasies of program delivery and strategically managing the timing of data collection.

Participating factories are assessed once each year. Each assessment is unannounced and typically occurs in a window of 11 to 14 months after the preceding assessment.

Consider four factories that have been in Better Work for about 24 months, as depicted in Figure 1. All four factories are ready for their 3rd assessment. In panel A, both factories receive their 3rd assessment at about the same time. Factory 1 then receives a data collection shortly thereafter. Factory 2 receives a data collection several months later. Comparing the data for factory 2 relative to factory 1, controlling for year, month and factory age, provides a measure of the impact of months of exposure to Better Work. In panel B, Factory 3 receives its 3rd assessment 11 months after the 2nd assessment. Factory 4, receives its 3rd assessment 14 months after its 2nd assessment. If a data collection occurs in the intervening period, comparing the data for factory 3 relative to factory 4, controlling for year, month and factory age, provides a measure of the impact of the 3rd assessment.

Figure 1



To achieve random exposure in the case of Panel A, a baseline data collection was conducted for each factory. Each factory was then randomly assigned to a follow-up data collection at one of several time intervals. Panel A, then, identifies the impact of months of exposure to Better Work conditional on the most recent assessment.

The impact of the assessment itself is identified in Panel B. Better Work schedules assessments with the intent of preventing the factory from anticipating an imminent assessment. Exogenous variation in exposure to assessment is achieved if the timing of an assessment in the 4-month window between 11 and 14 months after the preceding assessment is unrelated to other characteristics of the firm.

The timing of entry into the program, however, is not random. Therefore, factories are identified by their program entry cohort. Factories that enter the program in the first or second year of program operation are coded as cohort 1. Factories that enter after the second year are coded as cohort 2.

The impact of Better Work on two firm performance indicators is measured. In order to determine the impact of the program on a firm's cost structure, a translog cost function is

estimated. The impact of the program on a firm's overall performance is then assessed by estimating a translog profit function. In each case, the assessments are introduced as treatment variables in order to determine whether Better Work is shifting the cost and profit functions.

The analysis begins by estimating a second order translog cost function of the form

(1) $\ln C_i = \beta_0 + \beta_1 X_i + \beta_2 \ln w + \beta_3 \ln q_i + \beta_4 (\ln w)^2 + \beta_5 (\ln q_i)^2 + \beta_6 \ln q_i \ln w + \sum_{j=2}^{n} \gamma_j cycle_j + \sum_{k=2}^{n} \delta_j year_k$

where

$C_i = quarterly\ cost\ for\ firm\ i\ measured\ in\ US\ dollars$

$X_i = firm\ i's upply\ chain\ position$

$w = the\ prevailing\ wage\ required\ of\ the\ firm$

$q_i = units\ of\ firm\ i\ output$

$cycle_j = 1$

$if\ the\ most\ recent\ previous\ assessment\ at\ the\ time\ of\ the\ observation\ is\ assessment\ j,$

$0\ otherwise$

$year_k = 1\ if\ the\ observation\ occured\ during\ year\ k, 0\ otherwise\ and$

$n = the\ number\ of\ years\ Better\ Work\ has\ been\ conducting\ assessments.$

It is important to note that Better Work may affect a firm's supply chain position and the wage firms must pay. Including factor prices into equation (1) controls for the impact of Better Work on wages paid to employees. Introducing, market characteristics controls for the impact of Better Work on market selection. Therefore, the assessment variables are measuring the impact of Better Work on employee quality and firm productivity.

In order to estimate the impact of Better Work on profits, a translog profit function is estimated. Given the limit on the number of observations, year is treated as a continuous rather than binary variable, yielding equation (2).

$$(2)\ \ln \pi_i = \beta_0 + \beta_1 X_i + \beta_2 \ln w + \beta_3 \ln p + \beta_4 (\ln w)^2 + \beta_5 (\ln p)^2 + \beta_6 \ln p \ln w + \beta_t \ln scale + \sum_{j=2}^{n} \gamma_j cycle_j + \sigma\, year$$

where

$p = firm\ price$ and

$scale\ is\ a\ measure\ of\ firm\ size.$

It should be noted that in cases of limited sample size, only a first order approximation of the profit function is estimated.

As with the cost function, Better Work may have affected the price firms receive. Reputation sensitive international buyers may be rewarding participation in Better Work with a higher price. Or, conversely, cost-conscious buyers may be attempting to extract any productivity gains they may believe factories are realizing as a consequence of their participation in Better Work. By controlling for price, the Better Work cycle variables in equation (2), then, are measuring the impact of Better Work on productivity, product quality and order size and stability.

In order to capture the full treatment effect of Better Work on costs and profits, the analysis is conducted as an experimental difference-in-difference. The treatment effect of Better Work is captured by the cycle variables. Additionally, a dose effect is measured by including the months that have elapsed since the most recent previous assessment. The equation is then controlled for year and month.

Two additional factory characteristics are included in the regression equation. First, a factory's program entry cohort controls for selection into Better Work. Second, factories

assigned to receive their data collection several months after an assessment will be, on average, older than factories assigned to receive their data collection immediately after an assessment. Therefore, factory age is also added to control for changes in cost that occur simply due to increased experience of the firm.

The cost equation then becomes

$$(3)\ \ln C_i = \beta_0 + \beta_1 X_i + \sum_{j=2}^{n} \gamma_j cycle_j + \sigma\ year + \theta\ month + \mu_1\ cohort\_1 + \mu_2\ factory\_age$$

where, as defined above, *cohort_1* = 1 if the factory entered the program in the first two years of program operation, and 0 otherwise. Similarly, the profit equation becomes

$$(4)\ \ln \pi_i = \beta_0 + \beta_1 X_i + \sum_{j=2}^{n} \gamma_j cycle_j + \sigma\ year + \theta\ month + \mu_1\ cohort\_1 + \mu_2\ factoryage$$

Equations (1) to (4) are estimated with a panel estimator with random effects.

In order to understand the causes for changes in costs and profits, two firm outcomes are explored: productivity and business terms. Business terms include order practices, delivery penalties and payment terms.

III. Data

For the impact evaluation of Better Work, managers and workers were surveyed using a Computer Assisted Personal Interview (CAPI). In the case of workers, audio supplementation was provided. Workers were surveyed on demographics, wages, hours, working conditions and life experiences. Managers were surveyed on management practices, market characteristics, supply chain practices, perceptions of working conditions and firm performance indicators. For management, the general manager, human resources manager, financial manager and industrial

engineer were surveyed. For workers, a random sample of 30 employees was surveyed. In the case of smaller factories, the worker sample was limited not to exceed five percent of the workforce.

Revenue, production and capacity data were collected from the general manager, cost data was collected from the financial manager and employment data was collected from the general, financial and human resource managers.

After a factory enrolled in Better Work, it would be recruited to the impact evaluation study. Factories that agreed to participate received a baseline data collection. After each data collection, a factory would be randomly assigned to the timing of a follow up data collection. Factories included in this study had a minimum of two data collections. Though, for a small set of factories, four data collections occurred.

Data collection began in Vietnam in 2010 and continued to 2015. Two complete records were collected in 53 factories, with a total of 176 observations. Summary statistics for variables of analysis are reported in Table 1.

Data collection was conducted in Indonesia during the period 2011 to 2017. Two complete records were collected for 58 factories with a total of 141 observations. Summary statistics for variables of analysis are reported in Table 2.

Data collection was conducted in Jordan during the period 2010 to 2015. Two complete records were collected in 29 factories, with a total of 83 observations. Summary statistics for variables of analysis are reported in Table 3.

Variables are constructed as follows

cycleI (*I=1,…,6*) is a binary variable taking on the value of 1 if the most recent previous assessment at the time of the data collection was assessment *I*, and 0 otherwise.

treat is calculated to be the number of months that elapsed between the last previous assessment and the data collection.

Total_Sales is quarterly sales measured in U.S. dollars for the most recently completed calendar quarter.

Current_Empl is current employment as reported by the general manager, human resource manager and financial manager. In the event that none of the managers reported an employment total, production employment data reported in the most recent previous assessment was substituted.

CostUSD is costs incurred in the most recent previous calendar quarter in U.S. dollars. Costs include Compensation, Benefits, Materials, Electricity, Communication Services, Water and Rental.

prefsup, *contractor*. The general manager is surveyed on the firm's supply chain position. For the two most important customers of the factory, the general manager is asked to indicate whether the firm is a preferred supplier, contractor or subcontractor. *prefsup* and *contractor* are binary variables, taking on the value of 1 if the firm is a preferred supplier or contractor to its most important customer, respectively, and zero otherwise. The excluded group is sub-contractor.

monthlyoutput is calculated from the general manager's report of monthly capacity and capacity utilization. The general manager is asked how many pieces the factory could produce when operating at full capacity. The manager is then asked the fraction of the factory's capacity that was utilized in the most recently completed calendar quarter. *monthlyoutput* is the product of capacity and capacity utilization.

Factory_Age The general manager is asked what year the factory was established. The factory age is calculated as the difference between the date of the manager survey and the date of establishment.

wagehr The hourly wage is calculated from data collected in the worker survey. Workers are asked how often they are paid and how much they received the last time they were paid. The pay data is used to calculate weekly pay converted to U.S. dollars. Workers are also asked which days they usually work. For the days they usually work, workers are asked work start and stop times. The hours data is used to calculate the number of hours worked in a typical week. The ratio of factory average weekly pay and factory average hours worked is taken as the hourly wage.

price is the unit value. Total quarterly sales is divided by quarterly output.

cohort1 is a binary variable, set equal to 1 if the factory entered Better Work in the first two years of country program operation, and zero otherwise.

profits is calculated as quarterly sales minus quarterly costs.

VND_USD , *INDR_USD* and *JOD_USD* are the foreign exchange price of the U.S. dollar for the Vietnamese dong, the Indonesian rupiah and the Jordanian dinar. Exchange rates are included in the regression since costs are incurred in the local currency and revenue is earned in U.S. dollars.

In some cases, factory managers failed to provide an entry for one or more pieces of data. Rather than drop incomplete records, given the small sample size, missing values were imputed using the regression method. The imputation models are described in Table 4.

IV. Results

Cost Function. The analysis begins with an estimation of the translog cost and profit functions using a panel estimator with random effects. Results for Vietnam are reported in Table 5. The translog cost and profit functions are estimated with and without cohort 1 fixed effects. In light of the small sample size, significance levels up to 20% are considered.

Column 1 of Table 5 reports findings for the translog cost function, excluding cohort 1 fixed effects. The estimated coefficients for cycles 4 and 5 are positive and significant at the 10% level. Such an outcome indicates that costs rose with each successive assessment cycle.

However, when cohort 1 fixed effects are added, as reported in column 2, the cycle 4 and 5 variables are no longer statistically significant. The estimated coefficient of *cohort1*, 0.725, is positive and significant at the 10% level. That is, firms that entered Better Work Vietnam in the first two years that the program was active are high cost firms when compared to later entrants.

The implication of the results in Table 5 is that, abstracting away from the impact of Better Work on wages, firm costs did not rise. Participating firms, then, were able to manage compliance without a decline in productivity. Further, any increase in productivity was captured by workers by increasing pay or reducing work hours.

Profits Function. Turning to the translog profit function reported in columns 3 and 4, estimates of the cycle variables are positive and significant at the 10 percent level. Note further that the size of the profit effect grows with each successive assessment cycle, as the excluded group is cycle 1. Therefore, the effect of the second assessment relative to the first is 0.646. The effect of the fifth assessment is 4.544 relative to the first assessment.

Cohort 1 fixed effects are included in column 4. Cohort 1 firms, in addition to being high cost firms, earn below average profits. The estimated coefficient -0.657, significant at the 10% level, indicates that early entrants had lower profits than later entrants. Unlike in the case of

costs, however, the positive treatment effect on profits persists when cohort fixed effects are included.

These results taken together indicate that, abstracting away from the impact that Better Work has on wages and prices, Better Work does not affect the cost function but it does shift the profit function up. An upward shift in the cost function would have reflected a decline in productivity, which does not appear to have occurred. The shift up in the profit function, then, indicates that participating factories may have received non-price benefits such as larger or more stable orders and/or reduced defect or delivery penalties. The results also indicate that participating firms do not have above average quality managers, providing evidence countering the argument that high quality managers jointly determine compliance and firm performance.

A more complete picture of the impact of Better Work on Vietnamese factories can be seen by analyzing the treatment effect as a difference-in-difference. Results for costs are reported in Table 6. Estimates from the basic model are reported in column 1, cohort 1 fixed effects are added in column 2, supply chain controls in column 3 and cohort and supply chain controls in column 4.

In the base model, Better Work is associated with increasing costs with each assessment cycle. The estimated coefficients for cycle 2 (0.410), cycle 3 (0.607), cycle 4 (0.743) and cycle 5 (1.831), indicate that costs increase relative to cycle 1. All estimates are significant at the 15% level or lower with the exception of cycle 4. Such an outcome is not very surprising. Better Work has a significant impact on wages. Firms coming into compliance with the minimum wage report a higher wage bill. The pattern is robust to the introduction of cohort and supply chain controls.

The estimated coefficient of the dosage variable, *treat*, is also positive but not statistically significant. Such a pattern indicates that costs rise with each successive assessment cycle but the effect is limited to the assessment. Costs do not continue to rise in the months following the assessment.

The full treatment impact of Better Work on the profits of Vietnamese firms is reported in Table 7. As with costs, four specifications are tested. In all four, the estimated coefficients rise with each successive assessment cycle. Consider, for example, results reported in column 4 for which cohort fixed effects and supply chain position controls are included. The coefficients on cycle 2 (0.659), cycle 3 (1.93), cycle 4 (3.075) and cycle 5 (4.833) are positive and increasing in magnitude. Statistical significance at the 10% level emerges at cycles 4 and 5. Note, though, that the dosage variable, *treat*, while positive, is not statistically significant.

These results indicate, then, that Better Work Vietnam did not negatively affect productivity. Any positive effect must have been captured by workers. Per worker costs rise as a consequence of increased wages. The increase in costs, however, does not reduce profits.

Estimates of the translog cost and profit functions for Indonesia are reported in Table 8. Turning first to the estimate of the cost function in columns 1 and 2, none of the estimated coefficients of the cost variables are statistically significant. That is, as with Vietnam, Better Work Indonesia does not seem to have affected productivity, either positively or negatively, other than productivity gains captured by workers in the form of higher wages.

In contrast, the Better Work cycle variables in the profit function are positive and significant at the 10% level. The estimated coefficients for cycle 3 (1.043) and 4 (1.006) indicate a significant increase in profits compared to profits at the first and second assessments.

The difference-in-difference estimation reported in Table 9 indicates, however, that there may have been Better Work treatment effect on costs, though the pattern is not consistent and the effect is only significant at the 15% level. In the absence of cohort 1 fixed effects (columns 1 and 3), costs rise with each successive cycle. At the 4th assessment, the effect becomes statistically significant at the 15% level. Note, also, that the coefficient estimate for the dosage variable, *treat*, while negative, is not statistically significant.

By contrast, difference-in-difference estimates for profits indicate a strong treatment effect for the cycle and the dosage variables, as can be seen in Table 7. Consider, for example, the specification that includes cohort 1 and supply chain controls in column (4). The estimated coefficients of cycle 2 (0.676), cycle 3 (1.664) and cycle 4 (1.647) are positive and increasing in magnitude. The cycle 3 variable is significant at the 10% level and the cycle 4 variable is significant at the 20% level.

Further, the estimated coefficient on the dosage variable, *treat*, is significant and positive. With each passing month of exposure to Better Work, Indonesian firms experience an increase in profits. The estimated coefficient for *treat* in the base specification is 0.0978 and is significant at the 10% level. When cohort 1 and supply chain controls are included, the estimated coefficient is 0.0998 and significant at the 15% level.

Indonesia, then, exhibits a similar pattern to Vietnam. Better Work does not shift up the cost function, which would indicate a change in productivity, but does increase labor costs. However, firms still enjoy an increase in profits at least in part due to improvement in business terms. There may have been an increase in price as well.

Program impact for Jordan stands in sharp contrast to findings for Vietnam and Indonesia. Estimates of the translog cost and profit functions are reported in Table 11. Note first that the

initial impact of Better Work Jordan has a negative effect on costs. The cycle 2 coefficient is estimated to be -1.442 (column 2). Such an effect indicates that there was an initial improvement in productivity. However, by cycle 5 or 6, Better Work is associated with increasing unit cost.

Note further, that the estimated coefficients for some of the treatment effects for the profit function are negative, as can be seen in columns 3 and 4. The negative effect reaches its peak at cycle 4 (-1.091) and then begins to diminish. By cycle 5 or 6, the effect of Better Work on profits is not significantly different than at the first assessment.

The contrast between the results for Jordan, on the one hand, and Vietnam and Indonesia, on the other, may reflect a difference in program context. The programs in Indonesia and Vietnam are voluntary and there was not a specific event that triggered the creation of these programs. By contrast, the Jordan program was created in the wake of significant concerns with the possibility of human trafficking and the exploitation of migrant labor. To the extent that the exploitation of migrant labor is profitable and Better Work constrained its use, one would expect Better Work to be associated with a rise in costs and a fall in profits.

This is not to suggest, however, that firms did not benefit from the establishment of Better Work Jordan. Rather, it is entirely possible that, absent Better Work, the negative reputation effects associated with exploitive labor practices would have severely compromised the future of the industry. It should be noted that profitability of Jordanian firms is rising over time. The estimated coefficient on the *year* variable, is positive and statistically significant at the 10% level. Thus, while exposure to the Better Work treatment itself may have been painful for firms, Better Work may still have had a positive effect to the extent that it improved the overall reputation of the Jordanian apparel industry.

Turning to the total treatment effects for Jordan, estimates for costs are reported in Table 12. Estimates of the coefficients of the cycle variables increase with each successive assessment and become statistically significant around the 5th or 6th assessment. The effect of the 5th and 6th assessment is significant at the 10% level when the equation is controlled for supply chain and program entry cohort.

The impact of Better Work on profits is reported in Table 13. Results are similar to those obtained from the translog profit function. There is a positive treatment effect at the 2nd assessment when controlling for supply chain position (columns 3 and 4). The treatment effect turns negative at the 4th assessment but the adverse effect dissipates by the 5th or 6th assessment.

Note, however, that there is a strong *year* effect. Overall, profits rise for Jordanian firms with each successive cycle.

Findings suggest that, then, that there may have been a rise in productivity captured by workers and there may have been an improvement in business terms other than price. Analysis of the impact of Better Work on indicators of productivity and business terms follow.

Productivity. The standard measure of productivity in the apparel sector is the *efficiency rate*, the ratio of actual to planned production. However, when firms become more productive they tend to increase planned production. As a consequence, it is unclear whether a change in the efficiency rate is due to a change in the numerator, indicating a change in output, or the denominator, indicating a change in planning. An alternative indicator productivity is how long a worker takes to reach her production target, conditional on the length of the workday. Workers who complete their production target early in the work day are taken to be more productive than those who require nearly all of the workday to complete their production target.

Estimates of the treatment effect on time to target for Vietnam are reported in Table 14. Results for Monday, Friday and Saturday are reported in columns (2), (3) and (4) respectively. Time to target falls for all three days. For example, after cycle 3, time to target declines by 0.318 of an hour, or 19 minutes. After cycle 4, time to target decline by 0.521 of an hour and, after cycle 5, time to target declines by 0.678 of an hour or 41.1 minutes.

The fall in time to target indicates that firms are experiencing an increase in productivity with each successive assessment cycle. The fact that firms experience no fall in costs as productivity rises indicates that improvements in productivity are being captured by workers in Vietnam.

Business Terms. In light of the finding that productivity gains are captured by workers, what accounts for the rise in profits? Profits will rise if buyers are rewarding productivity of program participation with improved business terms.

Three measures of business terms are considered. In the course of the impact evaluation, firms managers asked about obstacles to business success. Obstacles include those related to the interaction with their main customers. Managers are also surveyed on how much time elapses between delivery of an order and payment received from their buyer. Finally, we consider the impact on order size.

Results of the impact of Better Work on business obstacles are reported in columns (1) to (8) in Tables 15 (Vietnam), 16 (Indonesia) and 17 (Jordan). Generally, there are few beneficial effects of Better Work on the interaction between the buyer and the factory. There is a possible decline in late fines in Vietnam at the third assessment (column 3, Table 15), order changes after production has begun (columns 5 and 6, Table 15) and replenish orders (column 7, Table 15). However, the benefits dissipate with subsequent cycles. For Indonesia, manager complaints with uncertain orders and defect fines rise during exposure to Better Work, as can be seen in columns

1 to 4 in Table 16. The only consistent benefit in business interactions for Indonesian firms concerns the change in orders after a production run has begun, (column 5, Table16). Improvements in business interactions for Jordanian firms are limited to rush orders (columns 3 and 4, Table 17).

Time elapsed between delivery and payment treatment effects are reported in column 9 in Tables 15 (Vietnam) and 16 (Indonesia). As a consequence of exposure to Better Work, time to payment declines in Vietnam but rises in Indonesia. There is no treatment effect for Jordan.

The only consistent benefit firms enjoy in their interactions with their buyers as a consequence of Better Work is in order size, as reported in Table 18. Positive treatment effects emerge for Vietnam by the 4th cycle (columns 1 and 2), Indonesia by the 3rd cycle (columns 3 and 4) and Jordan by the 2nd cycle (column 6). Though, it should be noted in the case of Jordan that the treatment effect on order size at the 6th assessment is negative.

V. Conclusions

Systems intended to improve working conditions in abusive places of work affect dimensions of the production process that relate to labor. To the extent that firms systematically under-invest in human resource management, productivity and profits may consequently increase. Existing empirical evidence indicates that occupational safety and health inspections reduce costs associated with accidents and injuries and do not adversely affect sales, profits, firm value or survival (Levine, et al, 2012). A broader definition of compliance is associated with increased sales (Distelhorst and Locke, 2016).

The question is, "how does compliance affect firm performance?" Does compliance increase productivity? Are reputation-sensitive firms rewarding compliant behavior? Or is it simply the case that compliance and firm performance are jointly determined by manager quality? The introduction of Better Work is an opportunity to gain insight into these questions.

Cost and revenue data is collected on firms in Vietnam, Indonesia and Jordan between 2010 and 2017. Identification of Better Work treatment effect is achieved by exploiting idiosyncrasies of program delivery and strategic timing of data collection.

Key findings are as follows

1. Early entrants into Better Work were high cost-low profit firms. Therefore, it is not the case that firm performance and compliance choice are jointly determined by manager quality, increasing the likelihood that improved firm outcomes after exposure to Better Work is casual.

2. Productivity is not reduced by the Better Work intervention. Productivity rises in Vietnam and is not reduced in Indonesia. Any increase in productivity in either country is captured by workers in the form of higher pay or lower hours.

3. Better Work, thus, solves a fundamental puzzle in attempts to improve working conditions. To the extent that compliance is costly, compliance requires some accommodation in the sourcing practices of international buyers in the form of higher prices and/or larger and more stable orders. However, buyers who increase price to accommodate compliance may not have a mechanism for ensuring that additional payments are dedicated to workers rather than simply increasing profits. Better Work assessments, by monitoring the conduct of vendors in global supply chains, provide such a mechanism.

4. Unit costs associated with participation in Better Work Vietnam increase with each successive assessment cycle due to increase in wages.

5. However, the increasing costs per worker in Vietnam are offset by an increase in productivity and improved sourcing terms. As a consequence, profits rise with each successive assessment cycle.

6. The increasing profits for participating firms is likely attributable to larger orders. Firms in Better Work may have also received an increase in price. Such an outcome is consistent with an increase in product quality or reputation sensitive international buyers may be rewarding compliance.

7. A similar pattern is observed for Indonesia. However, in addition to finding positive profits effects associated with each assessment cycle, profits rise with months of exposure to the program.

8. The impact of Better Work Jordan reflects the contrasting contexts in which the three programs were founded. The Better Work Jordan initiative was undertaken in the wake of evidence of significant abuse of the migrant model. Estimated treatment effects indicate that costs per worker rose and profits declined with each successive assessment cycle in the early years of the program.

9. The adverse program effects on profits dissipate by the 5^{th} or 6^{th} assessment cycle. Such an outcome indicates that firms may have learned to manage the demands of the program without adversely affecting firm performance.

10. Profits for Jordanian firms rise over time, independent of program exposure. Such an outcome indicates that while Better Work may have been making significant demands on individual factories, it had a positive affect overall by enhancing the reputation of the Jordanian apparel sector.

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Table 1 Vietnam Summary Statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
year	176	2,012	1.515	2,010	2,015
cycle	176	2.068	1.109	1	5
VND_USD	176	20,459	844.4	18,243	22,166
month	176	6.472	2.771	1	12
Factory_Age	153	9.275	5.273	0	28
FacTotalHours	176	58.28	5.122	40.87	79.62
FacWeeklyPayUSD	176	46.63	15.72	23.29	132.5
prefsup	176	0.409	0.493	0	1
contractor	176	0.290	0.455	0	1
lnCostUSD	124	14.13	1.207	11.90	17.15
lnProfit	93	13.91	1.384	10.87	17.49
lnwagehr	144	5.984	0.583	4.126	7.316
lnprice	128	0.451	1.137	-2.630	3.799
lnmonthlyoutput	139	12.77	1.266	8.631	16.10
cohort1	176	0.563	0.497	0	1
Number of factorycode	53	53	53	53	53

Table 2 Indonesia Summary Statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
year	141	2,014	1.976	2,011	2,017
cycle	110	2.200	1.065	1	5
month	141	6.078	3.550	1	12
FacTotalHours	141	48.29	4.472	38.19	65.83
FacWeeklyPayUSD	140	43.89	11.50	23.64	73.58
prefsup	141	0.638	0.482	0	1
contractor	141	0.113	0.318	0	1
Factory_Age	121	12.66	9.045	0	42
lnCostUSD	135	14.26	1.072	10.32	16.66
lnProfit	106	16.03	2.245	10.50	22.04
lnwagehr	123	5.914	0.723	2.152	6.965
lnprice	105	1.786	2.121	-1.686	7.973
lnmonthlyoutput	105	12.75	1.147	6.908	15.32
cohort1	141	0.426	0.496	0	1
INDR_USD	141	11,594	1,830	8,681	14,288
Number of factorycode	58	58	58	58	58

Table 3 Jordan Summary Statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
year	83	2,013	1.700	2,010	2,015
cycle	80	2.850	1.527	1	6
month	83	6.699	3.200	1	12
FacTotalHours	83	57.66	7.734	38.50	78.50
FacWeeklyPayUSD	83	73.23	31.51	37.18	260.1
prefsup	83	0.627	0.487	0	1
contractor	83	0.0723	0.261	0	1
Factory_Age	70	8.800	4.252	0	19
lnCostUSD	61	15.25	1.368	11.13	17.96
lnProfit	47	15.20	1.109	12.98	17.58
lnwagehr	74	6.419	0.841	4.045	8.912
lnprice	53	1.220	2.187	-7.325	7.488
lnmonthlyoutput	62	12.40	1.964	5.347	21.73
cohort1	83	0.518	0.503	0	1
ER_USD	83	0.706	0.00102	0.704	0.708
Number of factorycode	29	29	29	29	29

Table 4 Imputation Models

Variables	Vietnam	Indonesia	Jordan
Total Sales Quarterly Sales USD	monthlyutilization monthlycapacity FacWeeklyPayUSD FacTotalHours Current_Empl prefsup contractor B1_standardfactor1 B1_standardfactor2 B1_standardfactor3 cycle2 cycle3 cycle4 cycle5 year2011 year2012 year2013 year2014 year2015	Current_Empl INDR_USD FOB cycle2 cycle3 cycle4_5 year2012 year2013 year2014 year2015 year2017	Current_Empl JOD_USD FOB cycle2 cycle3 cycle4 cycle5_6 year2011 year2012 year2013 year2014 year2015_17
Monthly Capacity	monthlyutilization FacWeeklyPayUSD FacTotalHours Current_Empl CMT FOB Wash Dye Emb App Weave Knit Woven tops pants skirts dress jacket suit Compete MNC Export prefsup contractor cycle2 cycle3 cycle4 cycle5 year2011 year2012 year2013 year2014 year2015	Current_Empl INDR_USD FOB cycle2 cycle3 cycle4_5 year2012 year2013 year2014 year2015 year2017	Current_Empl JOD_USD FOB cycle2 cycle3 cycle4 cycle5_6 year2011 year2012 year2013 year2014 year2015_17
Compensation	FacWeeklyPayUSD FacTotalHours Current_Empl prefsup contractor B1_standardfactor1 B1_standardfactor2 B1_standardfactor3 FacWeeklyPay cycle2 cycle3 cycle4 cycle5 year2011 year2012 year2013 year2014 year2015	FacTotalHours Current_Empl INDR_USD cycle2 cycle3 cycle4_5 year2012 year2013 year2014 year2015 year2017	Current_Empl JOD_USD prefsup contractor cycle2 cycle3 cycle4 cycle5_6 year2011 year2012 year2013 year2014 year2015_17
Materials	Total_Sales Current_Empl prefsup contractor B1_standardfactor1 B1_standardfactor2	FacTotalHours Current_Empl INDR_USD cycle2 cycle3 cycle4_5 year2012 year2013	Current_Empl JOD_USD prefsup contractor cycle2 cycle3 cycle4 cycle5_6 year2011 year2012

	B1_standardfactor3 FacWeeklyPay cycle2 cycle3 cycle4 cycle5 year2011 year2012 year2013 year2014 year2015	year2014 year2015 year2017	year2013 year2014 year2015_17
Transportation, Electricity, Communication Services, Water, Rental	monthlyoutput Total_Sales Current_Empl prefsup contractor B1_standardfactor1 B1_standardfactor2 B1_standardfactor3 FacWeeklyPay cycle2 cycle3 cycle4 cycle5 year2011 year2012 year2013 year2014 year2015	FacTotalHours Current_Empl INDR_USD cycle2 cycle3 cycle4_5 year2012 year2013 year2014 year2015 year2017	Current_Empl JOD_USD prefsup contractor cycle2 cycle3 cycle4 cycle5_6 year2011 year2012 year2013 year2014 year2015_17

Table 5 Vietnam Translog Cost and Profit Functions

VARIABLES	(1) lnCostUSD	(2) lnCostUSD	(3) lnProfit	(4) lnProfit
cycle2	0.465**	0.251	0.603***	1.016***
	(0.320)	(0.331)	(0.357)	(0.406)
cycle3	0.904***	0.293	0.870**	1.696***
	(0.473)	(0.534)	(0.575)	(0.694)
cycle4	1.499***	0.423	2.190***	3.318***
	(0.696)	(0.759)	(1.014)	(1.149)
cycle5	2.609***	0.996	4.450***	5.360***
	(1.085)	(1.007)	(1.095)	(1.178)
lnmonthlyoutput	-0.367	-0.306		
	(1.089)	(1.080)		
lnFacHourlyPay	-2.460	-4.319	0.645	1.101
	(3.531)	(3.479)	(0.916)	(0.910)
lnw2	0.124	-0.0901	0.512	0.917
	(1.021)	(0.949)	(0.977)	(0.982)
lnQ2	0.0293	0.0283		
	(0.0443)	(0.0439)		
lnQ_lnw	0.202	0.333		
	(0.268)	(0.264)		
prefsup	-0.0403	-0.232	0.267	0.391
	(0.236)	(0.236)	(0.314)	(0.319)
contractor	0.303	0.205	0.497*	0.627**
	(0.265)	(0.262)	(0.384)	(0.383)
Factory_Age	0.0233	0.0271	0.0714***	0.0594***
	(0.0230)	(0.0225)	(0.0226)	(0.0225)
VND_USD	-0.000681*	1.69e-05	0.000527***	0.000592***
	(0.000513)	(0.000177)	(0.000298)	(0.000298)
year2011	0.829			
	(0.877)			
year2012	0.711			
	(0.944)			
year2013	0.451			
	(1.078)			
year2014	-0.511			
	(1.263)			
month	-0.0174	-0.0291	-0.0442	-0.0546*
	(0.0376)	(0.0327)	(0.0421)	(0.0417)
year		-0.107	-0.524***	-0.883***
		(0.234)	(0.271)	(0.319)
cohort1		0.575***		-0.722***
		(0.332)		(0.345)
lnprice			0.132	0.142
			(0.196)	(0.191)

lnprice2			-0.0211	-0.00668
			(0.0679)	(0.0668)
lnprice_lnw			-0.732***	-0.716***
			(0.359)	(0.351)
lnCurrent_Empl			0.616***	0.700***
			(0.148)	(0.148)
Constant	26.85***	227.0	1,052***	1,772***
	(11.69)	(469.4)	(541.0)	(637.3)
Observations	114	114	89	89
Number of factorycode	61	61	49	49

Standard errors in parentheses
*** p<0.1, ** p<0.15, * p<0.20

Table 6 Vietnam Cost Treatment Effects

VARIABLES	(1) lnCostUSD	(2) lnCostUSD	(3) lnCostUSD	(4) lnCostUSD
cycle2	0.410**	0.384	0.531***	0.516**
	(0.253)	(0.345)	(0.251)	(0.350)
cycle3	0.607**	0.556	0.860***	0.829*
	(0.412)	(0.619)	(0.415)	(0.632)
cycle4	0.743	0.667	0.777*	0.732
	(0.586)	(0.898)	(0.574)	(0.898)
cycle5	1.831***	1.733*	2.167***	2.106***
	(0.856)	(1.210)	(0.851)	(1.204)
treat	0.00459	0.00229	0.00841	0.00707
	(0.0211)	(0.0295)	(0.0211)	(0.0290)
Factory_Age	0.00874	0.00891	0.00757	0.00772
	(0.0176)	(0.0178)	(0.0174)	(0.0177)
lnCurrent_Empl	0.819***	0.817***	0.817***	0.815***
	(0.118)	(0.120)	(0.116)	(0.119)
VND_USD	2.23e-05	2.58e-05	0.000127	0.000129
	(0.000160)	(0.000164)	(0.000160)	(0.000164)
year	-0.277**	-0.256	-0.411***	-0.398**
	(0.186)	(0.266)	(0.189)	(0.272)
month	-0.0458**	-0.0454**	-0.0324	-0.0321
	(0.0311)	(0.0315)	(0.0308)	(0.0311)
prefsup			-0.101	-0.103
			(0.207)	(0.215)
contractor			0.381***	0.379***
			(0.222)	(0.229)
cohort1		0.0421		0.0242
		(0.389)		(0.397)
Constant	565.3**	522.2	833.1***	806.8**
	(372.6)	(534.4)	(378.5)	(546.6)
Observations	123	123	123	123
Number of factorycode	63	63	63	63

Standard errors in parentheses
*** p<0.1, ** p<0.15, * p<0.20

Table 7 Vietnam Profit Treatment Effects

VARIABLES	(1) lnProfit	(2) lnProfit cohort controls	(3) lnProfit buyer controls	(4) lnProfit cohort, buyer controls
cycle2	0.310	0.522	0.375	0.659*
	(0.355)	(0.488)	(0.362)	(0.496)
cycle3	0.402	0.824	0.533	1.093
	(0.565)	(0.846)	(0.582)	(0.864)
cycle4	2.153***	2.851***	2.145***	3.075***
	(0.987)	(1.444)	(0.997)	(1.451)
cycle5	3.777***	4.535***	3.831***	4.833***
	(1.144)	(1.628)	(1.156)	(1.638)
treat	0.00199	0.0203	-0.00531	0.0185
	(0.0277)	(0.0394)	(0.0283)	(0.0394)
Factory_Age	0.0680***	0.0660***	0.0653***	0.0627***
	(0.0213)	(0.0214)	(0.0213)	(0.0213)
lnCurrent_Empl	0.735***	0.754***	0.697***	0.718***
	(0.151)	(0.152)	(0.153)	(0.153)
VND_USD	0.000445***	0.000431**	0.000516***	0.000500***
	(0.000264)	(0.000268)	(0.000276)	(0.000280)
year	-0.360*	-0.541*	-0.416**	-0.656***
	(0.262)	(0.378)	(0.275)	(0.389)
month	-0.0256	-0.0319	-0.0221	-0.0295
	(0.0444)	(0.0452)	(0.0448)	(0.0455)
prefsup			0.447*	0.475**
			(0.323)	(0.328)
contractor			0.533*	0.563**
			(0.379)	(0.383)
cohort1		-0.334		-0.440
		(0.503)		(0.504)
Constant	724.2*	1,086*	835.1**	1,318***
	(524.4)	(757.7)	(550.4)	(779.4)
Observations	93	93	93	93
Number of factorycode	50	50	50	50

Standard errors in parentheses
*** p<0.1, ** p<0.15, * p<0.20

Table 8 Indonesia Translog Cost and Profit Functions

VARIABLES	(1) lnCostUSD	(2) lnCostUSD	(3) lnProfit	(4) lnProfit
cycle2	0.0338	-0.132	-0.0482	0.0324
	(0.319)	(0.277)	(0.304)	(0.329)
cycle3	-0.233	-0.0417	1.043***	1.233***
	(0.413)	(0.418)	(0.420)	(0.519)
cycle4	-0.233	-0.0848	0.809***	1.006***
	(0.544)	(0.541)	(0.484)	(0.575)
lnmonthlyoutput	-3.271***	-3.975***		
	(1.447)	(1.432)		
lnFacHourlyPay	0.209	0.316		
	(10.15)	(10.15)		
lnw2	-1.343	-1.875**		
	(1.282)	(1.229)		
lnQ2	0.0218	0.00430		
	(0.0313)	(0.0300)		
lnQ_lnw	0.816***	1.120***		
	(0.441)	(0.428)		
prefsup	0.326	0.287		
	(0.284)	(0.282)		
contractor	0.416	0.408		
	(0.338)	(0.339)		
Factory_Age	0.0127	0.0147	0.00907	0.00957
	(0.0124)	(0.0124)	(0.0143)	(0.0144)
INDR_USD	0.000545**	-0.000114	0.000174	0.000210
	(0.000372)	(0.000119)	(0.000178)	(0.000187)
year2012	-0.554*			
	(0.407)			
year2013	-1.021			
	(0.830)			
year2014	-2.375***			
	(1.249)			
year2015	-2.784**			
	(1.857)			
year2017	-2.506			
	(1.999)			
month	-0.0563	0.0121		
	(0.0557)	(0.0340)		
year		0.0797	-0.369***	-0.454***
		(0.165)	(0.181)	(0.225)
cohort1		-0.452**		-0.240
		(0.312)		(0.387)
lnprice			0.934***	0.932***
			(0.0634)	(0.0637)

lnwagehr			0.0747	0.0742
			(0.153)	(0.153)
lnCurrent_Empl			0.555***	0.547***
			(0.176)	(0.177)
Constant	26.94	-123.4	750.7***	921.3***
	(23.67)	(333.8)	(361.8)	(452.0)
Observations	101	101	78	78
Number of factorycode	55	55	49	49

Standard errors in parentheses
*** p<0.1, ** p<0.15, * p<0.2

Table 9 Indonesia Cost Treatment Effects

VARIABLES	(1) lnCostUSD	(2) lnCostUSD cohort controls	(3) lnCostUSD buyer controls	(4) lnCostUSD buyer, cohort controls
cycle2	0.130	0.116	0.140	0.132
	(0.190)	(0.196)	(0.191)	(0.197)
cycle3	0.201	0.159	0.171	0.153
	(0.242)	(0.288)	(0.247)	(0.293)
cycle4	0.485**	0.431	0.464**	0.436
	(0.296)	(0.351)	(0.298)	(0.352)
treat	-0.00863	-0.0110	-0.00903	-0.0101
	(0.0162)	(0.0186)	(0.0162)	(0.0187)
Factory_Age	0.0122**	0.0120**	0.0115**	0.0114*
	(0.00791)	(0.00797)	(0.00796)	(0.00802)
lnCurrent_Empl	1.067***	1.070***	1.051***	1.053***
	(0.0947)	(0.0960)	(0.0944)	(0.0958)
INDR_USD	-2.69e-05	-3.07e-05	-2.92e-05	-3.09e-05
	(8.72e-05)	(8.85e-05)	(8.92e-05)	(9.04e-05)
year	-0.0761	-0.0571	-0.0627	-0.0541
	(0.101)	(0.123)	(0.102)	(0.123)
month	-0.0384**	-0.0384**	-0.0363**	-0.0364**
	(0.0249)	(0.0250)	(0.0251)	(0.0251)
prefsup			0.225	0.222
			(0.191)	(0.193)
contractor			0.306*	0.303
			(0.235)	(0.238)
cohort1		0.0594		0.0265
		(0.225)		(0.224)
Constant	159.9	121.6	132.8	115.5
	(202.4)	(247.5)	(204.0)	(247.8)
Observations	116	116	116	116
Number of factorycode	58	58	58	58

Standard errors in parentheses
*** p<0.1, ** p<0.15, * p<0.2

Table 7 Indonesia Profit Treatment Effects

VARIABLES	(1) lnProfit	(2) lnProfit cohort controls	(3) lnProfit buyer controls	(4) lnProfit buyer, cohort controls
cycle2	0.544	0.646	0.609	0.676
	(0.612)	(0.634)	(0.604)	(0.627)
cycle3	1.122**	1.499**	1.424***	1.664***
	(0.766)	(0.934)	(0.780)	(0.939)
cycle4	1.019	1.492	1.345*	1.647*
	(0.949)	(1.167)	(0.960)	(1.169)
treat	0.0978***	0.118***	0.0864**	0.0998**
	(0.0550)	(0.0622)	(0.0546)	(0.0620)
Factory_Age	0.0271	0.0274	0.0365*	0.0365*
	(0.0265)	(0.0265)	(0.0272)	(0.0272)
lnCurrent_Empl	0.587***	0.575***	0.646***	0.636***
	(0.290)	(0.290)	(0.295)	(0.296)
INDR_USD	-0.000102	-7.79e-05	-0.000116	-0.000102
	(0.000296)	(0.000301)	(0.000298)	(0.000302)
year	-0.238	-0.406	-0.310	-0.417
	(0.350)	(0.427)	(0.352)	(0.425)
month	0.0231	0.0175	0.0154	0.0117
	(0.0794)	(0.0801)	(0.0786)	(0.0794)
prefsup			-1.261***	-1.223***
			(0.641)	(0.646)
contractor			-1.058*	-1.009
			(0.781)	(0.790)
cohort1		-0.508		-0.337
		(0.738)		(0.745)
Constant	491.0	828.3	635.5	851.5
	(702.0)	(857.5)	(705.8)	(853.3)
Observations	103	103	103	103
Number of factorycode	55	55	55	55

Standard errors in parentheses
*** p<0.1, ** p<0.15, * p<0.2

Table 11 Jordan Translog Cost and Profit Functions

VARIABLES	(1) lnCostUSD	(2) lnCostUSD	(3) lnProfit	(4) lnProfit
cycle2	-1.536**	-1.442**	-0.430	0.181
	(0.950)	(0.958)	(1.059)	(1.174)
cycle3	0.208	0.200	-0.335*	-0.327*
	(0.502)	(0.510)	(0.239)	(0.233)
cycle4	0.228	0.250	-1.051***	-1.091***
	(0.585)	(0.603)	(0.309)	(0.305)
cycle5_6	0.894**	0.881**	-0.0566	-0.233
	(0.574)	(0.604)	(0.518)	(0.524)
lnmonthlyoutput	0.192	0.206		
	(0.754)	(0.755)		
lnwagehr	-2.240	-2.567	-0.372	-0.263
	(4.170)	(4.248)	(0.324)	(0.327)
lnQ2	-0.0399***	-0.0424***		
	(0.0231)	(0.0238)		
lnwagehr2	0.0102	0.0259		
	(0.230)	(0.236)		
lnQ_lnwagehr	0.164	0.174		
	(0.182)	(0.185)		
prefsup	1.537**	1.518**		
	(0.987)	(1.023)		
contractor	1.800*	1.773*		
	(1.261)	(1.288)		
Factory_Age	0.0572	0.0535	0.104	0.105
	(0.0576)	(0.0605)	(0.0946)	(0.0951)
JOD_USD	-401.2***	-400.0***	-54.34	-68.68
	(183.4)	(185.3)	(210.0)	(206.4)
year	-0.0224	-0.0172	0.466***	0.509***
	(0.169)	(0.190)	(0.144)	(0.146)
month	0.00930	0.00605		
	(0.0669)	(0.0681)		
cohort1		0.0646		1.229*
		(0.585)		(0.944)
lnprice			0.280***	0.285***
			(0.123)	(0.121)
lnCurrent_Empl			-0.201	-0.302
			(0.335)	(0.335)
Constant	346.0	335.6	-880.8***	-958.6***
	(310.2)	(347.2)	(327.8)	(331.0)
Observations	46	46	32	32
Number of factorycode	25	25	22	22

Standard errors in parentheses
*** p<0.1, ** p<0.15, * p<0.20

Table 12 Jordan Cost Function Treatment Effects

VARIABLES	(1) lnCostUSD	(2) lnCostUSD	(3) lnCostUSD	(4) lnCostUSD
cycle2	-0.470	-0.446	-0.394	-0.348
	(0.724)	(0.736)	(0.789)	(0.802)
cycle3	0.301	0.375	0.301	0.395
	(0.452)	(0.502)	(0.453)	(0.502)
cycle4	0.183	0.321	0.0809	0.247
	(0.490)	(0.620)	(0.485)	(0.611)
cycle5_6	0.548*	0.605*	0.673**	0.734***
	(0.411)	(0.437)	(0.411)	(0.436)
treat	-0.00626	-1.46e-06	-0.0117	-0.00459
	(0.0254)	(0.0303)	(0.0255)	(0.0301)
Factory_Age	0.0367	0.0409	0.0307	0.0359
	(0.0344)	(0.0369)	(0.0339)	(0.0361)
lnCurrent_Empl	0.674***	0.680***	0.652***	0.664***
	(0.137)	(0.142)	(0.139)	(0.142)
JOD_USD	-447.4***	-447.4***	-476.3***	-476.6***
	(144.4)	(145.7)	(146.1)	(147.5)
year	-0.0312	-0.0715	-0.0289	-0.0785
	(0.125)	(0.168)	(0.126)	(0.167)
month	-0.0103	-0.0116	-0.0270	-0.0287
	(0.0530)	(0.0537)	(0.0528)	(0.0535)
prefsup			1.031***	1.039***
			(0.585)	(0.591)
contractor			0.631	0.634
			(0.861)	(0.869)
cohort1		-0.167		-0.200
		(0.449)		(0.440)
Constant	389.0***	470.1**	404.1***	504.0**
	(235.3)	(325.8)	(233.7)	(322.2)
Observations	56	56	56	56
Number of factorycode	29	29	29	29

Standard errors in parentheses
*** p<0.1, ** p<0.15, * p<0.20

Table 13 Jordan Profits Treatment Effects

VARIABLES	(1) lnProfit year controls	(2) lnProfit year, cohort controls	(3) lnProfit year, buyer controls	(4) lnProfit year, buyer, cohort controls	(5) lnProfit buyer controls	(6) lnProfit buyer, cohort controls
cycle2	0.128	0.108	0.560*	0.542*	1.043***	1.011***
	(0.529)	(0.531)	(0.398)	(0.398)	(0.463)	(0.469)
cycle3	-0.518	-0.672**	-0.289	-0.400	0.159	0.186
	(0.410)	(0.444)	(0.297)	(0.313)	(0.327)	(0.332)
cycle4	-1.017***	-1.204***	-0.865***	-1.004***	-0.251	-0.222
	(0.444)	(0.489)	(0.339)	(0.362)	(0.350)	(0.356)
cycle5_6	0.0445	-0.157	0.0670	-0.0871	0.435	0.481
	(0.502)	(0.547)	(0.381)	(0.404)	(0.408)	(0.417)
treat	-0.000281	-0.0123	0.0277	0.0182	0.0383	0.0432*
	(0.0331)	(0.0356)	(0.0253)	(0.0267)	(0.0301)	(0.0313)
Factory_Age	-0.0372	-0.0399	0.0237	0.0198	0.0524	0.0515
	(0.0455)	(0.0456)	(0.0418)	(0.0417)	(0.0431)	(0.0437)
lnCurrent_Empl	0.523***	0.473***	0.571***	0.529***	0.561***	0.589***
	(0.168)	(0.177)	(0.138)	(0.143)	(0.151)	(0.161)
JOD_USD	316.1**	295.5*	320.1***	304.2***	413.8***	411.2***
	(214.0)	(215.7)	(149.2)	(149.7)	(180.7)	(181.9)
year	0.361***	0.442***	0.366***	0.430***		
	(0.140)	(0.166)	(0.106)	(0.121)		
month	0.0314	0.0290	0.0632*	0.0598	0.0157	0.0215
	(0.0666)	(0.0668)	(0.0473)	(0.0473)	(0.0564)	(0.0575)
prefsup			-1.585***	-1.588***	-1.643***	-1.633***
			(0.327)	(0.326)	(0.382)	(0.386)
contractor			-1.863***	-1.827***	-1.739***	-1.766***
			(0.433)	(0.434)	(0.526)	(0.531)
cohort1		0.472		0.465		-0.234
		(0.510)		(0.421)		(0.396)
Constant	-937.4***	-1,086***	-951.1***	-1,069***	-280.4***	-278.8***
	(290.7)	(333.4)	(218.9)	(243.4)	(127.8)	(128.7)
Observations	46	46	46	46	46	46
Number of factorycode	27	27	27	27	27	27

Standard errors in parentheses
*** p<0.1, ** p<0.15, * p<0.20

Table 14 Time to Target Vietnam

VARIABLES	(1) TimetoTargetM	(2) TimetoTargetF	(3) TimetoTargetSat
cycle2	-0.147	-0.0995	-0.00417
	(0.162)	(0.127)	(0.0714)
cycle3	-0.318*	-0.0693	-0.0635
	(0.193)	(0.163)	(0.0999)
cycle4	-0.521**	-0.329*	-0.172
	(0.223)	(0.182)	(0.117)
cycle5	-0.678**	-0.387*	-0.269*
	(0.297)	(0.203)	(0.150)
female	-0.132*	-0.112	-0.0517
	(0.0797)	(0.147)	(0.0748)
Educ2	-0.0518	0.249	0.0781
	(0.272)	(0.193)	(0.167)
Educ3	0.0268	0.374*	0.0767
	(0.266)	(0.201)	(0.154)
Educ4	-0.0621	0.330*	0.0965
	(0.268)	(0.185)	(0.170)
Educ5	-0.371	0.208	0.629
	(0.398)	(0.497)	(0.445)
Educ7	-0.316	-0.0271	-0.0658
	(0.302)	(0.231)	(0.206)
Educ8	0.0992	0.209	-0.0655
	(0.389)	(0.330)	(0.210)
Educ9	-0.560	-0.447	-0.800**
	(0.361)	(0.373)	(0.390)
Exp_More_1_Year	0.0896	0.253**	-0.0787
	(0.0711)	(0.106)	(0.0747)
Job2	-0.0147	0.258	0.369
	(0.131)	(0.437)	(0.376)
Job3	0.233*	-0.0850	-0.0367
	(0.141)	(0.250)	(0.266)
Job4	0.261**	0.0442	-0.0438
	(0.126)	(0.0949)	(0.0630)
Job5	-0.354**	-1.402***	-0.196*
	(0.160)	(0.195)	(0.109)
Job6	-0.0195	-0.126	-0.0360
	(0.130)	(0.220)	(0.0938)
Job7	-0.230	-0.297	-0.142
	(0.227)	(0.195)	(0.270)
Job8	0.427***	0.178	0.0348
	(0.146)	(0.220)	(0.145)
Job9	0.212*	0.144	0.0976
	(0.109)	(0.120)	(0.106)

Job10	0.156**	0.0376	-0.0247
	(0.0667)	(0.0972)	(0.0564)
Promoted1	-0.209	-0.200	-0.0889
	(0.141)	(0.144)	(0.170)
Promoted2	-0.0863	0.0254	0.195
	(0.156)	(0.141)	(0.200)
Promoted3	0.135	-0.0900	-0.0261
	(0.0841)	(0.102)	(0.0623)
year2011	-0.0773	-0.0895	-0.0514
	(0.131)	(0.125)	(0.0803)
year2012	0.317*	0.174	-0.125
	(0.170)	(0.146)	(0.108)
year2013	0.377*	0.0797	0.0605
	(0.220)	(0.194)	(0.129)
year2014	0.383	0.123	0.0240
	(0.246)	(0.188)	(0.145)
year2015	0.543**	0.244	0.207
	(0.243)	(0.198)	(0.156)
TotalHoursMon	0.661***		
	(0.0473)		
TotalHoursFri		0.659***	
		(0.0794)	
TotalHoursSat			0.495***
			(0.101)
Constant	3.075***	3.086***	4.653***
	(0.518)	(0.743)	(0.849)
Observations	1,252	1,313	1,254
Number of factorycode	67	68	68

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 15 Obstacles to Business Success Vietnam

VARIABLES	(1) Multiple_Codes	(2) Multiple_Codes	(3) Late_Fines	(4) Defect_Fines	(5) Change_Order	(6) Change_Order	(7) Replenish_Orders	(8) Payment_Terms	(9) Payment_Terms
cycle2	0.190	0.685**	-0.493**	0.432	-0.505**	-1.039**	-0.876***	-0.614***	-0.415
	(0.400)	(0.418)	(0.325)	(0.398)	(0.346)	(0.624)	(0.496)	(0.349)	(0.527)
cycle3	0.490	1.160***	-0.158	0.933	-0.0380	-0.421	-0.535	-0.889**	-0.429
	(0.551)	(0.605)	(0.637)	(0.747)	(0.621)	(1.090)	(0.836)	(0.581)	(0.680)
cycle4_5	1.473**	1.556***	0.345	1.720***	0.373	-0.177	-0.335	-0.639	-3.148***
	(0.902)	(0.892)	(0.791)	(1.007)	(0.783)	(1.421)	(1.087)	(0.981)	(1.588)
cohort1	-0.161		0.141		-0.0463			1.075***	
	(0.287)		(0.315)		(0.291)			(0.495)	
B1_standardfactor1	1.084**		0.692**		0.0641			0.819***	
	(0.674)		(0.441)		(0.596)			(0.459)	
B1_standardfactor2	-0.794***		-0.640***		-0.708***			0.569	
	(0.397)		(0.379)		(0.411)			(0.490)	
B1_standardfactor3	0.920***		0.452		0.0858			-1.745**	
	(0.511)		(0.552)		(0.548)			(1.096)	
Factory_Age	0.0248	0.0465	-0.0158	0.0688*	0.0254	0.0273	0.119***	0.0253	0.0126
	(0.0263)	(0.0798)	(0.0282)	(0.0492)	(0.0227)	(0.0599)	(0.0513)	(0.0227)	(0.0505)
Relationship_Length	0.0154	-0.0108	0.0165	0.00788	-0.0269	-0.000498	0.00170	0.0167	-0.0544
	(0.0261)	(0.0445)	(0.0242)	(0.0392)	(0.0257)	(0.0310)	(0.0323)	(0.0313)	(0.0604)
prefsup	-0.149		0.471**		0.270			0.336	
	(0.344)		(0.311)		(0.346)			(0.274)	
contractor	0.0726		0.265		0.0191			0.0273	
	(0.313)		(0.352)		(0.371)			(0.250)	
year2012	0.0802	-0.462	0.521***	-0.327	0.837***	0.845***	0.827***	0.203	0.356
	(0.389)	(0.396)	(0.306)	(0.425)	(0.308)	(0.312)	(0.326)	(0.214)	(0.411)
year2013	-0.138	-0.876**	0.605	-0.921*	0.973***	1.205*	0.762	0.496	0.282
	(0.528)	(0.573)	(0.594)	(0.667)	(0.505)	(0.833)	(0.611)	(0.515)	(0.581)
year2014	-0.583	-1.238**	0.0149	-1.482***	0.120	0.693	0.304	-0.614	1.393
	(0.808)	(0.787)	(0.704)	(0.864)	(0.659)	(1.129)	(0.896)	(0.877)	(1.540)
Constant	2.310***	2.170***	2.864***	2.366***	2.821***	2.500***	1.457***	3.387***	4.569***
	(0.391)	(0.583)	(0.445)	(0.503)	(0.511)	(0.627)	(0.473)	(0.483)	(0.660)
Observations	108	135	110	135	79	103	98	72	83
R-squared		0.105		0.085		0.365	0.376		0.421
Number of factorycode	57	66	60	65	55	61	58	53	56

Robust standard errors in parentheses
*** p<0.1, ** p<0.15, * p<0.20

Table 16 Obstacles to Business Success Indonesia

VARIABLES	(1) Uncertain_Orders	(2) Uncertain_Orders	(3) Defect_Fines	(4) Change_Order	(5) Change_Order	(6) Replenish_Orders	(7) Replenish_Orders	(8) Payment_Terms	(9) Payment_Terms
cycle2	0.0994	0.151	-0.0839	0.00973	-1.542***	0.286	-0.706***	0.678***	0.673***
	(0.259)	(0.291)	(0.313)	(0.319)	(0.302)	(0.433)	(0.393)	(0.254)	(0.324)
cycle3	-0.581***	-0.532**	-0.181	-0.130	-2.295***	0.474	-1.258*	0.00190	0.307
	(0.299)	(0.343)	(0.298)	(0.541)	(0.678)	(0.491)	(0.901)	(0.349)	(0.420)
cycle4_5	0.461**	0.383	0.627***	0.866*	-2.648***	1.282***	-1.676*	0.0601	-0.0183
	(0.318)	(0.417)	(0.369)	(0.608)	(0.767)	(0.598)	(1.156)	(0.458)	(0.466)
cohort1	0.262		0.260*	-0.00973		-0.336		0.00484	
	(0.225)		(0.203)	(0.475)		(0.485)		(0.271)	
Factory_Age	-0.0234***	-0.0220	-0.0356***	-0.0304***	-0.0397**	-0.0395***	-0.0384	-0.00110	0.0320
	(0.0122)	(0.0263)	(0.0128)	(0.0137)	(0.0248)	(0.0145)	(0.0325)	(0.0153)	(0.0389)
Relationship_Length	-9.28e-05	-0.000173	1.53e-06	-0.000738***	-0.000325***	-0.00103***	-0.000294*	0.000697***	0.000578
	(0.000258)	(0.000237)	(0.000269)	(0.000189)	(0.000168)	(0.000229)	(0.000208)	(0.000383)	(0.000476)
prefsup	-0.256		0.0985	0.0167		0.323		0.171	
	(0.275)		(0.376)	(0.367)		(0.338)		(0.328)	
contractor	-0.412		-0.220	0.425		0.127		-0.244	
	(0.348)		(0.441)	(0.409)		(0.488)		(0.398)	
year2012	0.0245	0.0543	0.0189					-0.105	0.239
	(0.354)	(0.417)	(0.376)					(0.383)	(0.452)
year2013	0.525*	0.154	0.476					-0.728***	-0.505
	(0.383)	(0.472)	(0.375)					(0.403)	(0.551)
year2014	0.101	0.366	0.0769	0.760	-1.622***	0.499	-1.691*	-0.779***	-0.466
	(0.290)	(0.327)	(0.447)	(0.617)	(0.867)	(0.607)	(1.177)	(0.375)	(0.618)
year2015	0.453***	0.283	0.273	0.874***	-0.832**	0.795***	-0.628	-0.337*	-0.293
	(0.221)	(0.255)	(0.274)	(0.456)	(0.509)	(0.460)	(0.756)	(0.254)	(0.274)
Constant	3.453***	3.349***	3.136***	2.527***	5.733***	2.010***	4.575***	4.599***	4.140***
	(0.385)	(0.496)	(0.506)	(0.750)	(0.983)	(0.601)	(1.078)	(0.422)	(0.599)
Observations	114	114	113	68	68	68	68	110	110
R-squared		0.120			0.600		0.155		0.195
Number of factorycode	56	56	56	48	48	48	48	56	56

Robust standard errors in parentheses
*** p<0.1, ** p<0.15, * p<0.20

Table 17 Obstacles to Business Success Jordan

VARIABLES	(1) Uncertain_Orders	(2) Multiple_Codes	(3) Rush_Orders	(4) Rush_Orders	(5) Late_Fines	(6) Defect_Fines	(7) Defect_Fines
cycle2	1.079**	2.548***	0.375	0.737	1.438***	1.606***	0.614
	(0.675)	(0.641)	(0.764)	(0.739)	(0.563)	(0.542)	(0.771)
cycle3	0.673	-0.0546	-0.818***	-0.944***	0.0551	0.419	0.468*
	(0.588)	(0.483)	(0.322)	(0.209)	(0.496)	(0.383)	(0.325)
cycle4	0.176	0.0112	-0.865***	-0.967***	-0.286	-0.0412	-0.493
	(0.335)	(0.610)	(0.406)	(0.387)	(0.436)	(0.299)	(0.436)
cohort1	-0.0272		-0.0477		0.432***	0.308	
	(0.405)		(0.244)		(0.207)	(0.303)	
Factory_Age	0.107***	-0.0774***	0.0721***	-0.0461	0.0217	0.00766	-0.0609
	(0.0325)	(0.0427)	(0.0249)	(0.0705)	(0.0280)	(0.0278)	(0.0797)
Relationship_Length	0.00817	-0.0399	-0.000528	0.0142	-0.00434	-0.0285	-0.0697***
	(0.0331)	(0.0474)	(0.0298)	(0.0374)	(0.0381)	(0.0304)	(0.0365)
prefsup	0.0485		0.105		-0.185	-0.0903	
	(0.470)		(0.354)		(0.262)	(0.540)	
contractor	-1.368***		0.128		-0.320	-0.179	
	(0.667)		(0.582)		(0.504)	(0.730)	
year2012	1.825***	1.520***	0.689***	1.198***	0.888**	0.629	0.961***
	(0.475)	(0.746)	(0.340)	(0.427)	(0.579)	(0.523)	(0.317)
year2013	0.0959	-0.0277	0.404	0.625**	-0.340	-0.153	0.742**
	(0.500)	(0.628)	(0.413)	(0.385)	(0.456)	(0.406)	(0.495)
year2014	-0.269	0.387	-0.0335	0.619*	-0.902**	-0.604**	-0.197
	(0.494)	(0.493)	(0.445)	(0.453)	(0.563)	(0.382)	(0.471)
year2015	-0.285	0.613	0.130	1.003***	-0.383	-0.205	0.522
	(0.432)	(0.641)	(0.413)	(0.530)	(0.505)	(0.378)	(0.578)
Constant	1.181***	2.696***	1.940***	2.664***	2.568***	2.264***	3.000***
	(0.569)	(0.362)	(0.441)	(0.608)	(0.524)	(0.683)	(0.650)
Observations	61	64	63	63	62	62	62
R-squared		0.500		0.444			0.444
Number of factorycode	30	30	30	30	30	30	30

Robust standard errors in parentheses
*** p<0.1, ** p<0.15, * p<0.20

Table 18 Order Size

	Vietnam		Indonesia		Jordan	
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Order_Size	Order_Size	Order_Size	Order_Size	Order_Size	Order_Size
cycle2	859,103	2.301e+06	1.361e+06	-924,760	897,828	5.491e+06***
	(832,890)	(2.207e+06)	(1.194e+06)	(1.623e+06)	(2.633e+06)	(2.514e+06)
cycle3	-364,479	3.356e+06	9.239e+06***	7.102e+06***	-134,744	2.210e+06*
	(1.610e+06)	(2.710e+06)	(3.510e+06)	(3.475e+06)	(2.320e+06)	(1.509e+06)
cycle4_5	4.528e+06***	1.372e+07*	5.312e+06***	419,236		
	(2.330e+06)	(1.046e+07)	(3.105e+06)	(4.208e+06)		
cohort1	-383,904		-965,024			
	(746,163)		(1.929e+06)			
B1_standardfactor1	-2.006e+06***					
	(916,485)					
B1_standardfactor2	823,731					
	(921,657)					
B1_standardfactor3	-692,552					
	(1.104e+06)					
Factory_Age	-40,921	351,767*	29,009	-241,225	50,476	190,613*
	(61,194)	(261,332)	(121,742)	(332,448)	(87,998)	(143,987)
Relationship_Length	16,915	-83,428	1,646	2,862	34,903	-10,279
	(42,373)	(249,072)	(1,391)	(2,289)	(88,699)	(101,456)
prefsup	170,702		2.326e+06**		486,492	
	(438,297)		(1.443e+06)		(1.210e+06)	
contractor	349,843		7.669e+06*		-1.390e+06	
	(630,077)		(5.453e+06)		(1.384e+06)	
year2012	-1.357e+06***	-3.718e+06	-187,969	754,407	-744,807	-1.309e+06
	(698,915)	(2.902e+06)	(1.363e+06)	(1.264e+06)	(800,899)	(1.069e+06)
year2013	-687,748	-3.422e+06*	-3.455e+06***	-8.168e+06	239,096	-3.064e+06**
	(1.411e+06)	(2.522e+06)	(2.026e+06)	(6.533e+06)	(1.923e+06)	(2.058e+06)
year2014	-5.353e+06***	-1.397e+07**	70,356	3.179e+06	1.898e+06	-423,879
	(2.363e+06)	(9.301e+06)	(2.717e+06)	(3.130e+06)	(2.539e+06)	(1.352e+06)
year2015			-1.299e+06	1.932e+06	896,096	-169,451
			(2.403e+06)	(3.167e+06)	(1.735e+06)	(1.543e+06)
year2017			-5.866e+06***	-789,574		
			(3.507e+06)	(4.780e+06)		
cycle4					-732,731	2.419e+06**
					(2.111e+06)	(1.611e+06)
cycle5_6					-1.532e+06***	-1.689e+06*
					(887,591)	(1.264e+06)
Constant	1.736e+06**	-47,501	341,791	5.244e+06	526,570	-460,902
	(1.158e+06)	(2.848e+06)	(2.483e+06)	(4.101e+06)	(706,713)	(827,082)
Observations	109	137	116	116	65	65
R-squared		0.205		0.352		0.359
Number of factorycode	59	66	56	56	30	30

Robust standard errors in parentheses
*** p<0.1, ** p<0.15, * p<0.20