



Sexual Harassment in the Workplace:

How does it affect Firm
Performance and Profits?

16

DISCUSSION
PAPER

NOVEMBER 2014

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International
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BetterWork.

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International Labour Office

November 2014

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First published DATE

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BETTER WORK DISCUSSION PAPER NO. 16

SEXUAL HARASSMENT IN THE WORKPLACE:

HOW DOES IT AFFECT FIRM PERFORMANCE AND PROFITS?

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November 2014

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First published [2014]

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ILO Cataloguing in Publication Data

Lin, Xirong; Babbitt, Laura; Brown, Drusilla

Sexual harassment in the workplace : how does it affect firm performance and profits? / Xirong Lin, Laura Babbitt, Drusilla Brown ; International Labour Office. - Geneva: ILO, 2014
82 p. (Better Work discussion paper, ISSN: 2227-9539 ; 2227-9547 (web pdf))

International Labour Office

sexual harassment / wage incentive / supervisor / clothing industry / work performance / profitability / Haiti / Indonesia / Jordan / Nicaragua / Viet Nam

04.02.7

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ABSTRACT

Workplace sexual harassment is commonly attributed to workplace characteristics such as organizational tolerance. However, sexual harassment may also occur when there exists an asymmetry of incentives between supervisors and workers. Specifically, high-powered incentives for workers and low-powered incentives for supervisors create a vulnerability of workers to supervisors with a predisposition to sexually harass. Supervisors may seek sexual favors in exchange for a positive performance review or production-linked bonus. Power asymmetries may also be a contributing factor. A perception of relative power may lead a supervisor to disregard organizational norms related to the inappropriateness of workplace sexual harassment. Power asymmetries may also affect a worker's perception of her ability to seek alternative employment. Analyzing a micro-dataset collected in Better Work participating apparel factories in Haiti, Jordan, Vietnam, and Nicaragua, we find evidence that asymmetric incentives between supervisors and workers and power asymmetries between supervisors and workers predict a higher concern with sexual harassment among workers. Increased competition among firms for workers reduces sexual harassment. The impact of organizational awareness is ambiguous. Awareness of sexual harassment by HR managers in Haiti, Jordan and Vietnam did not translate into an organizational norm that deterred sexual harassment. However, in Nicaragua, we observe a negative correlation between HR manager awareness of sexual harassment and its incidence. Tracing the impact of sexual harassment on output and worker and supervisor compensation levels, we demonstrate the cost in terms of forgone profits for firms in which sexual harassment is common.

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I. INTRODUCTION

The efficiency properties of policies for improving working conditions in developing countries have been a focus of the international labour standards literature. Improved working conditions are beneficial for workers if they are able to work in a safer and cleaner environment, endure less sexual harassment or verbal abuse, and have more bargaining power over wages and other forms of compensation. However, it is not clear whether a factory benefits from compliance with international labour standards. While firms commonly view labour standards compliance as a cost, it is possible that improving working conditions will increase production efficiency and firm profits. Such an outcome could occur if firms in developing countries systematically adopt suboptimal labour management systems.

The aim of this paper is to explore whether tolerance of sexual harassment (SH) reduces profits in developing country apparel firms. A formal theoretical model is constructed with various incentive structures and punishment of workplace sexual harassment to characterize profit-maximizing working conditions. We draw on the social psychology literature to model the role of organizational norms and power asymmetries in the determination of sexual harassment and its impact on work outcomes.

The countries included in the analysis are Haiti, Jordan, Vietnam, and Nicaragua. The Better Work Programme, a partnership between the International Labour Organization (ILO) and the International Finance Corporation (IFC), has worked in collaboration with local and international stakeholders to design Better Work Haiti, Jordan, Vietnam, and Nicaragua. The project aims to improve competitiveness of the apparel industry by improving compliance with domestic labour law and the principles of the ILO Declaration on Fundamental Principles and Rights at Work in these countries (Better Work Haiti 1st Synthesis Report).

II. HUMAN RESOURCE MANAGEMENT SYSTEMS AND SEXUAL HARASSMENT

There are five aspects of the employment relationships studied in the field of personnel economics: (1) work incentives, (2) matching firms with workers, (3) compensation, (4) skill development, and (5) organization of work (Lazear and Oyer 2007). The analysis below focuses on the incentive and compensation structure, as well as the organization of work in a factory's human resources management system.

The structure of incentives is central to firm performance. Underlying a firm's choice between base salary and piece rate is a trade-off between risk in the form of compensation uncertainty and the incentive effect of piece rate pay. While piece rate pay rewards work effort, a firm may choose to offer hourly compensation to risk-averse employees (Lazear and Oyer 2007).

Firms choosing performance based pay have the added complication of monitoring effort and objectively assessing performance. Commonly, the performance of employees in developing countries is not based on objective evaluation, but rather on a supervisor's subjective measure of performance. Fama (1980), analyzing agency in a workplace, suggested that agents of management may incorrectly evaluate an employee's performance for their own benefits. Holmstrom (1999) analyzes how a person's future career consideration might affect his or her incentive to contribute effort and make decisions on the job. A subjective method for assessing performance may create an opportunity for *quid pro quo* sexual solicitation of a worker by a supervisor. A supervisor may solicit sexual favors as an implicit requirement for a strong performance evaluation. Workers, thinking about their future career, might choose to tolerate such behavior.

Theoretical analysis of a firm's incentive structure on an employee's work performance is supported by empirical work that demonstrates the positive impact of piece rate on productivity. Shearer (2004) employed a field experiment to assess a piece rate compensation structure and found a 20 percent increase in productivity when workers were paid by the piece rather than by wage or salary. Lazear (2000a) compared high-powered and low-powered schemes for supervisors. When a firm implements high-powered incentives, sorting effects lead managers to choose only profitable

projects. Similarly, Bandiera et al. (2007), using experimental methods, found that piece rate pay incentivizes supervisors to focus production support on their high productivity subordinates.

However, while piece rate pay will increase output, it does not necessarily increase profits. Freeman and Kleiner (2005) found a reduction in productivity but increase in profits when a piece rate incentive is removed.

One adverse effect of low-powered incentives for supervisors is the diversion of supervisor attention away from production to sexual solicitation of a subordinate (Brown et al. 2013). Sexual harassment is defined by Paludi and Barickman (1991) as bullying or coercion of a sexual nature, or the unwelcome or inappropriate promise of rewards in exchange for sexual favors. In a workplace environment, a demonstration of sexual interest may create a hostile or offensive environment that results in permanent pain to its victims. In developing country apparel firms, sexual harassment is widespread. The hierarchic environment consisting of male supervisors and female production workers is a contributing factor. Women are also more likely to be segregated into precarious employment characterized by low skill, low wages and low status employment with an immediate male supervisor, a situation common in apparel factories (Di Martino et al 2009).

Fitzgerald et al. (1997) develop a conceptual model of the causes and consequences of sexual harassment. In their framework, sexual harassment is modeled as a function of two conditions: organizational climate and job gender context. The outcomes of sexual harassment fall into three categories: job outcomes (satisfaction, job and work withdrawal), individual psychological outcomes (distress, trauma), and health outcomes (physical outcomes and health satisfaction). The empirical study supports this theoretical framework. Experiences of sexual harassment are positively correlated with the extent to which an organization tolerates sexual harassment in the workplace, as is the likelihood of working in a male dominated job context. Sexual harassment is directly related to job and psychological outcomes, but only indirectly correlated with health outcomes.

Given the sensitive nature of sexual harassment in the workplace, empirical testing is challenging. Participants may not be willing to divulge information about their sexual experiences at

work and overall satisfaction at work and the personality of the participant might also affect the research outcome.

A variety of research designs and sampling methods have been developed to avoid the above problems. Schneider et al. (1997) developed a stress framework for studying sexual harassment based on the conceptual framework of Fitzgerald et al. (1997). Following the stress and coping literature, Schneider et al. (1997) conceptualized sexual harassment as a workplace event that is appraised by the recipient as stressful. To study the negative psychological consequences of sexual harassment, they designed an experiment that separated the negative effects induced by possible variables other than sexual harassment. In their survey, they included questions to account for individual differences in sensitivity when determining the negative effects of sexual harassment. In addition, they included questions to measure the person's attitudes towards their job and their satisfaction at work.

Schneider et al. focus on a victim's manner of coping with and responding to sexual harassment. The sample included two independent groups: a private-sector organization and a large research-oriented university. All participants completed the "Workplace Environment Survey." The participants were informed that they would be asked about their job attitudes, job behavior, and a wide range of stressors that might occur on their job. Participants who reported experiencing sexual harassment over the preceding 24 months were asked to describe the incident and their coping strategy. The results suggest a negative relationship between sexual harassment and negative job-related and psychological outcomes. Additionally, harassed women in both samples exhibited similar outcomes, which implied that outcomes do not depend on work type. Further, this study provided evidence that the women who experienced sexual harassment were not necessarily "oversensitive" people.

Following Fitzgerald et al. (1997) and Schneider (1997), Willness et al. (2007) performed a meta-analysis of available data with respect to antecedents and consequences of workplace sexual harassment. Their findings are consistent with Fitzgerald et al. (1997) in that organizational context (organizational climate) and the job gender context both play an important role. Moreover, they

characterized significant negative consequences from sexual harassment such as decreased job satisfaction, increased job withdrawal behavior, and harm to the mental and physical health of the victims. As a consequence, reducing sexual harassment is seen as beneficial from a management or performance perspective.

Kisa et al. (2008) conducted sexual harassment research on nurses working in Turkish hospitals. Women in health care professions are primary targets of unwelcome sexual attention due to their subordinate positions and low status and power. The goal of the research was to test the hypothesis that sexual attention would decrease productivity of the nurses. The results indicate that sexual harassment is prevalent, with over half of victims reporting that their productivity was negatively affected.

Antecol and Cobb-Clark (2006) examined the relationship between sexual harassment and job satisfaction by sampling women from the U.S. military. They found that sexual harassment was associated with decreased job satisfaction and increased desire to leave the U.S. military. One criticism of the analysis is that the estimated relationship between sexual harassment and separation was biased upward since the authors did not control for the individual's unobserved, time-variant characteristics. When controlling for a woman's views about whether she has been sexually harassed, the positive relationship between sexual harassment and intent to leave the U.S. military was reduced.

Other research has found that sexual harassment is best predicted by the interaction of individual and situational factors (Pryor, Giedd, & Williams, 1995). Some individuals are more likely to harass than others; when it is easy to sexually harass, these individuals will take the opportunity. This individual factor is called Likelihood to Sexually Harass (LSH; Pryor, 1987), and is measured with a series of vignettes. Participants read about situations in which there is the potential for *quid pro quo* harassment and indicate how likely they would be to take advantage of that situation.

As described above, organizational tolerance is a key situational factor. Another study of women in the military found that women in units where the commanding officer was believed (by men and women) to tolerate or even encourage harassment were more likely to experience harassment;

women with commanding officers who were not tolerant of sexual harassment were much less likely to experience it (Pryor et al., 1993).

Empirical work shows the interaction of these situational and individual factors. In one study, male college students were asked to help a woman learn one of two tasks—putting or poker. The high-LSH men (those who had indicated that they would take advantage of *quid pro quo* situations) were likely to act inappropriately, touching and talking to the woman in a sexual way—but only when they were teaching putting, which put them in close physical contact and gave them the opportunity to harass. When they were sitting across a table and teaching poker, they did not harass the woman. Low-LSH men, on the other hand, behaved appropriately in both situations. Thus, sexual harassment was most likely when both individual and situational factors allowed it (Pryor, 1987). Similarly, another study found that high-LSH men were more likely to harass a woman when they had seen a male experimenter behave sexually with her (flirting and leering). These men followed the norm that had been set, and touched and flirted with the woman while they were supposed to be training her on a computer task. Low-LSH men behaved professionally regardless of the example that had been set (Pryor et al., 1993). Again, both individual and situational factors were important in predicting harassment. When the structure of the interaction provides the opportunity to harass, or social norms indicate that harassment is accepted or encouraged, men who are predisposed to harass will do so.

Truskinovsky et al. (2013) analyzed a micro-data set of worker demographics and workplace characteristics in Haitian, Jordanian, and Indonesian apparel factories. They tested four hypotheses concerning the determinants of reports of sexual harassment. These include the vertical alignment of incentives within the factory, the level of organizational awareness, sexual harassment as a form of worker discipline, and sexual harassment as a form of supervisor compensation. Sexual harassment arises primarily in factories in which supervisors are charged with assessing the individual work performance of their subordinates for the determination of production-related pay incentives. They found that sexual favors as a form of bribery for a positive work-effort report is more common in factories with low organizational awareness, as reflected in the human resource

manager's perception of sexual harassment as a concern, and supervisor training. Sexual harassment was also more common in factories lacking nearby competitors, suggesting that intensified competition among factories for labour deters sexual harassment (Truskinovsky et al. 2013, page 1).

III. A THEORETICAL MODEL OF SEXUAL HARASSMENT

While the empirical analysis of Truskinovsky et al. (2013) is suggestive, their analysis is not undertaken in the context of a formal model. Turning to the theoretical framework, we employ a 3-tiered model in which there are three agents: a manager, a supervisor, and a worker. The role of the manager is to maximize profits, determine the wage for the supervisor and worker, and choose a deterrent to sexual harassment in the form of a punishment. The role of the supervisor is to oversee the worker and choose the amount of sexual harassment. The role of the worker is to choose the amount of work effort contributed to production.

Our objective is to characterize the profit-maximizing incentive structure. The results will in turn suggest possible interventions aimed at reducing the occurrence of sexual harassment in the factory. The optimization problem for the factory is analyzed under three different but typical cases of incentive structure: (1) piece rate, (2) salary, and (3) deterrent of sexual harassment.

We assume that the worker and supervisor maximize utility within the incentive structure chosen by the manager. The factory manager maximizes profits subject to technology, output price and the participation constraints of both the worker and supervisor. The income for the worker is determined by a fixed income α and piece rate β . The income for the supervisor is also determined by a fixed income δ , piece rate γ , and the negative deterrent (t) of sexual harassment.

To allow for empirical determination of the impact of sexual harassment on productivity, we assume that sexual harassment might have a positive or negative effect on factory production. Factory output (q) is the consequence of the worker's effort (e) minus the amount of sexual

harassment (z) multiplied by a productivity parameter θ that represents the positive or negative effect of sexual harassment on output. That is,

$$(1) \quad q = \min\{k, e - \theta z\}.$$

The total cost function is given by $TC = TC(q, \alpha, \beta, \gamma, \delta, r)$, where r is the expenditure on one unit of capital (k).

The participation constraint for workers is

$$(2) \quad (\alpha + \beta q)(\bar{z} - z)(\bar{e} - e) \geq z^\sigma \bar{U}_w,$$

where the left hand side of the constraint is the utility function for workers, $(\bar{z} - z)$ reflects the disutility from sexual harassment, and $(\bar{e} - e)$ reflects the disutility from work. \bar{U}_w is the reservation utility, the utility obtainable in the next best alternative. If workers cannot realize \bar{U}_w at work, they will choose to quit. \bar{U}_w is multiplied by z^σ to reflect the possibility that a worker's perception of alternative opportunities may be affected by sexual harassment. If sexual harassment decreases a worker's ability to react, then their reservation utility, the right hand side of the constraint, will be lower. Workers will choose the amount of effort (e) to maximize utility in equation (1) subject to the incentive structure established by the manager.

The participation constraint for supervisors is

$$(3) \quad (\delta + \gamma q - tz)z - (\hat{p}z_n - z)^2 \geq \bar{U}_s,$$

where the left hand side of the constraint is the utility function for supervisors from factory work. It includes three parts: money income, sexual gratification, and deviation of sexual harassment from a perceived norm. The first part $(\delta + \gamma q)$ is the money income for supervisors and tz is the dollar value equivalent to the supervisor of the deterrent action taken by the firm to suppress sexual harassment. The total money compensation for the supervisor is then $(\delta + \gamma q - tz)$, which is multiplied by the amount of sexual harassment (z) to reflect the supervisor's gain in utility from sexual harassment.

The second part $(\hat{p}z_n - z)^2$ is a social psychological factor that reflects disutility arising from deviation from the perceived social norm related to sexual harassment. The perception of the norm, z_n , is affected by the supervisor's sense of power, \hat{p} . It reflects the cultural phenomenon or

tolerance of sexual harassment within the factory. $(z_n - z)$ measures how far the supervisor's actual sexual harassment behavior is from the norm. $\hat{p}z_n$ is the supervisor's own perception of the norm. The chosen functional form indicates that power magnifies the supervisor's perceived social tolerance of sexual harassment, as we assume that the more power a supervisor has, the higher the amount of sexual harassment will be perceived as the norm. In other words, the power of the supervisor changes how he perceives $(z_n - z)$, the difference between his actual level of sexual harassment and the social norm. If $(pz_n - z) \neq 0$, $(\hat{p}z_n - z)^2$ measures the mental discomfort of the supervisor as the level of z rises above or falls below the perceived norm of acceptable behavior.

\bar{U}_s is the reservation utility of the supervisor. If realized utility is less than \bar{U}_s , the supervisor will choose to quit. The supervisor chooses the amount of sexual harassment z by maximizing (2) subject to the incentive structure implemented by the manager.

Factory profits are the consequence of output times the price of output (p) plus revenue from the fine on sexual harassment minus total factor cost. The profit function for the manager is

$$(4) \quad \pi = pq + tz - (\alpha + \beta q) - (\delta + \gamma q) - rk,$$

where pq is production revenue, $(\alpha + \beta q)$ is the worker's income, $(\delta + \gamma q)$ is the supervisor's income, and rk is the capital expenditure. The output market is assumed to be perfectly competitive, implying price-taking by the firm. Managers will choose α , β , δ , γ , and t to maximize profits given by equation (3) subject to the worker's and supervisor's participation constraints.

The analysis focuses on two questions. First, do misaligned incentives within the firm promote sexual harassment that lowers firm profits? The second is: what are the roles that deterrents to sexual harassment in the form of punishment, norms, and power play in achieving the profit-maximizing level of sexual harassment? To simplify the solution, we first assume that piece rate (β) for the worker is equal to zero. We begin by assuming that the factory does not deter sexual harassment through t , z_n or \hat{p} . We then turn to the case in which supervisor pay incentives are misaligned with the manager, but punishment on sexual harassment is introduced.

Case I: $\beta = 0, \gamma > 0, t = 0$

When $\beta = 0$, there is no link between work effort and pay for the worker. Rather, we assume that the worker will only exert e_0 effort, which is the minimum amount of effort required to earn the base rate income α . So, e is given by

$$(5) \quad e = e_0.$$

Since $q = e - \theta z$, we have $q = e_0 - \theta z$.

The supervisor chooses actual z to maximize utility by solving the program

$$(6a) \quad \max_{\{z\}} U_s = (\delta + \gamma q)z - (\hat{p}z_n - z)^2$$

which yields first order condition

$$(6b) \quad \frac{\partial U_s}{\partial z} = -2(1 + \gamma\theta)z + 2\hat{p}z_n + \delta + \gamma e_0 = 0$$

and utility maximizing sexual harassment

$$(6c) \quad z = \frac{2\hat{p}z_n + \delta + \gamma e_0}{2(1 + \gamma\theta)}$$

which can be rewritten as

$$(6c') \quad \delta = 2z(1 + \gamma\theta) - 2\hat{p}z_n - \gamma e_0.$$

When solving the manager's problem with the *Lagrange* method, the worker's participation constraint requires that the manager set the compensation for the worker high enough to achieve the reservation utility. The worker's reservation utility constraint is binding if the *Lagrange* multipliers are nonzero. Substituting (5) into (2) yields an inequality that constrains the manager's choice of α :

$$(7) \quad z^\sigma \bar{U}_w \leq \alpha(\bar{e} - e_0)(\bar{z} - z) = \bar{e}\alpha(\bar{z} - z), \quad \text{where} \quad \bar{e} = \bar{e} - e_0.$$

Similarly for the supervisor constraint, by substituting (5c') for δ and substituting into (5a), the constraint on the utility of the supervisor is given by

$$(8) \quad \bar{U}_s \leq [\delta + \gamma(e_0 - \theta z)]z - (\hat{p}z_n - z)^2 = (\gamma\theta + 1)z^2 - (\hat{p}z_n)^2.$$

The base rate for workers (α), piece rate for supervisors (γ), and the amount of sexual harassment (z) is determined by the solution to

$$(9) \quad \max_{\{\alpha, \gamma, z\}} \pi = pq - \alpha - (\delta + \gamma q) - rk$$

subject to (7) and (8).

The first order conditions for maximizing (9) subject to (7) and (8) are given by

$$(10a) \quad \frac{\partial \pi}{\partial \alpha} = -1 - \lambda_1 \bar{e}(\bar{z} - z) = 0$$

which can be rewritten as

$$(10a') \quad \lambda_1 = -\frac{1}{\bar{e}(\bar{z} - z)},$$

$$(10b) \quad \frac{\partial \pi}{\partial \gamma} = -\theta z - \lambda_2 \theta z^2 = 0$$

which can be rewritten as

$$(10b') \quad \lambda_2 = -\frac{1}{z},$$

$$(10c) \quad \frac{\partial \pi}{\partial \lambda_1} = z^\sigma \bar{U}_w - \alpha \bar{e}(\bar{z} - z) = 0$$

which can be rewritten as

$$(10c') \quad \alpha = \frac{z^\sigma \bar{U}_w}{\bar{e}(\bar{z} - z)},$$

$$(10d) \quad \frac{\partial \pi}{\partial \lambda_2} = \bar{U}_s - (\gamma\theta + 1)z^2 + (\hat{p}z_n)^2 = 0$$

which can be rewritten as

$$(10d') \quad \gamma = \frac{\bar{U}_s - z^2 + (\hat{p}z_n)^2}{\theta z^2},$$

and

$$(10e) \quad \frac{\partial \pi}{\partial z} = -p\theta - \gamma\theta - 2 + \lambda_1 \sigma z^{\sigma-1} \bar{U}_w + \lambda_1 \bar{e} \alpha - 2\lambda_2 (\gamma\theta + 1)z = 0$$

where λ_1 and λ_2 are *Lagrange* multipliers for the constraints in equations (7) and (8). From (10a') and (10b'), λ_1 and λ_2 will not be equal to zero. Hence the constraints (7) and (8) bind with equality.

By substituting (10a'), (10b'), (10c'), and (10d') into (10e), the first order condition for maximizing π with respect to z is given by

$$(10e') \quad \frac{\partial \pi}{\partial z} = -p\theta - \frac{\sigma z^{\sigma-1} \bar{U}_w}{\bar{e}(\bar{z} - z)} - \frac{z^\sigma \bar{U}_w}{\bar{e}(\bar{z} - z)^2} + \frac{\bar{U}_s}{z^2} + \left(\frac{\hat{p}z_n}{z}\right)^2 - 1 = 0.$$

From equation (10e') above, we can observe the following relationships:

- a. When \bar{e} increases, z increases. A fall in the disutility of effort raises sexual harassment.
- b. When \bar{U}_w increases, z decreases. A rise in the worker's reservation utility lowers sexual harassment.
- c. When \bar{U}_s increases, z increases. A rise in the supervisor's reservation utility raises sexual harassment.
- d. When the perceived tolerance for sexual harassment rises either because of a relaxation in the norm, z_n , or a rise in the power asymmetry between the supervisor and the worker, \hat{p} , sexual harassment increases.

Case II: $\beta = 0, \gamma = 0, t > 0$

We now turn to the case in which both the worker's and supervisor's pay incentives are misaligned with the firm, but the firm chooses a deterrent to sexual harassment in the form of a punishment. Our solution strategy is the same as in Case I. Workers continue to exert effort e_0 , which is the minimum amount of effort to earn the base rate income α . So e is given by (4), $e = e_0$.

The supervisor chooses actual z to maximize utility by solving the program

$$(11a) \quad \max_{\{z\}} U_s = (\delta - tz)z - (\hat{p}z_n - z)^2$$

which yields first order condition

$$(11b) \quad \frac{\partial U_s}{\partial z} = \delta + 2\hat{p}z_n - 2z(1 + t) = 0$$

and utility maximizing sexual harassment

$$(11c) \quad z = \frac{\delta + 2\hat{p}z_n}{2(1+t)}.$$

Equation (11c) can be inverted to solve for the tax rate

$$(11c') \quad t = \frac{\delta + 2\hat{p}z_n - 2z}{2z}.$$

From (11c), we know that sexual harassment is constrained by the tax and the norm. Under misaligned incentives for the supervisor and no punishment on sexual harassment, the amount of sexual harassment will still be constrained by the norm.

To maximize profits, managers must set the compensation for workers at least high enough to achieve the reservation utility. Substituting (4) into (1) yields an equation that constrains α :

$$(12) \quad z^\sigma \bar{U}_w \leq \alpha(\bar{e} - e_0)(\bar{z} - z) = \bar{e}\alpha(\bar{z} - z), \quad \text{where} \quad \bar{e} = \bar{e} - e_0.$$

Similarly for the supervisor, substituting (10c) for t and substituting into (10a), the reservation utility of supervisors is given by

$$(13) \quad \bar{U}_s \leq \frac{\delta}{2}z + \hat{p}z_n z - (\hat{p}z_n)^2.$$

The base rate for workers (α), base rate for supervisors (δ), and the amount of sexual harassment (z) is determined by the solution to

$$(14) \quad \max_{\{\alpha, \delta, z\}} \pi = pq + tz - \alpha - \delta - rk$$

subject to (12) and (13).

Formally, the firm is choosing the incentive structure, α, δ , and t . However, in choosing δ and t , the manager is implicitly choosing z as governed by equation (11c). The maximization problem given by equation (14) is more easily solved for α, δ , and z , hence the reformulation of the manager's decision problem as reflected in (14).

The first order conditions for maximizing (14) subject to (12) and (13) are given by

$$(15a) \quad \frac{\partial \pi}{\partial \alpha} = -1 - \lambda_1 \bar{e}(\bar{z} - z) = 0$$

which is rewritten as

$$(15a') \quad \lambda_1 = -\frac{1}{\bar{e}(\bar{z} - z)},$$

$$(15b) \quad \frac{\partial \pi}{\partial \delta} = -1 - \lambda_2 \frac{z}{2} = 0$$

which is rewritten as

$$(15b') \quad \lambda_2 = -\frac{2}{z},$$

$$(15c) \quad \frac{\partial \pi}{\partial \lambda_1} = z^\sigma \bar{U}_w - \alpha \bar{e}(\bar{z} - z) = 0$$

which is rewritten as

$$(15c') \quad \alpha = \frac{z^\sigma \bar{U}_w}{\bar{e}(\bar{z} - z)},$$

$$(15d) \quad \frac{\partial \pi}{\partial \lambda_2} = \bar{U}_s - \frac{\delta}{2} z - \hat{p} z_n z + (\hat{p} z_n)^2 = 0$$

which is rewritten as

$$(15d') \quad \delta = \frac{2[\bar{U}_s - \hat{p} z_n z + (\hat{p} z_n)^2]}{z}$$

and

$$(15e) \quad \frac{\partial \pi}{\partial z} = -p\theta + \lambda_1 \sigma Z^{\sigma-1} \bar{U}_w + \lambda_1 \bar{e} \alpha - \lambda_2 \left(\frac{\delta}{2} - \hat{p} z_n \right) = 0$$

where λ_1 and λ_2 are *Lagrange* multipliers for the constraints in equations (12) and (13). From (15a') and (15b'), λ_1 and λ_2 will not be equal to zero. Hence the constraints (12) and (13) hold with equality.

By substituting (14a'), (14b'), (14c'), and (14d') into (14e), the first order condition of π with respect to z is given by

$$(15e') \quad \frac{\partial \pi}{\partial z} = -p\theta - \frac{\sigma Z^{\sigma-1} \bar{U}_w}{\bar{e}(\bar{z} - z)} - \frac{z^\sigma \bar{U}_w}{\bar{e}(\bar{z} - z)^2} + \frac{2\bar{U}_s}{z^2} + 2\left(\frac{\hat{p} z_n}{z}\right)^2 = 0.$$

When comparing Case I and II, the z solved from equation (15e') ($\gamma = 0, t > 0$) is higher than the z solved from equation (10e') ($\gamma > 0, t = 0$).¹ It implies that active policies or programs such as a tax directly targeting sexual harassment are not as effective as aligning supervisor's pay

¹ Equation (10e') and (15e') share the same terms except for the term $\frac{2\bar{U}_s}{z^2} + 2\left(\frac{\hat{p} z_n}{z}\right)^2$ in equation (15e') and the term $\frac{\bar{U}_s}{z^2} + \left(\frac{\hat{p} z_n}{z}\right)^2 - 1$ in equation (10e'). Since $\frac{2\bar{U}_s}{z^2} + 2\left(\frac{\hat{p} z_n}{z}\right)^2 > \frac{\bar{U}_s}{z^2} + \left(\frac{\hat{p} z_n}{z}\right)^2 - 1$, the z solved from equation (15e') is higher than that solved from equation (10e'). It is solved by indirect comparison method between the two equations rather than directly solving out z from either equation. Specifically, the equation with a higher positive term will require a higher negative term in absolute value to compensate in order to get the equation equal to zero. Both equations have negative term with $(\bar{z} - z)$ in the denominator. A higher negative term implies a lower denominator $(\bar{z} - z)$ and hence a higher z . In short, a higher positive term in the equation implies a higher value of z .

incentive to combat sexual harassment. The interpretation is that the tax or fine on sexual harassment will lower the supervisor's income, resulting in the factory not being able to satisfy the supervisor's reservation utility at the current level of compensation. To compensate for the negative impact on the supervisor's utility, the factory is forced to allow a certain amount of sexual harassment to maintain the current supervisor's employment.

Case III: $\beta = 0, \gamma > 0, t > 0$.

We now turn to the case in which the supervisor's pay incentives are aligned with the firm but the worker's are not. Our solution strategy is the same as in Cases I and II. The worker continues to exert effort e_0 , which is the minimum amount of effort to earn the base rate income α . So, e is given by $e = e_0$, is in equation (5).

However, the supervisor's pay incentives are now aligned with the interest of the manager. As a consequence, the amount of sexual harassment is determined by the solution to

$$(16) \quad \max_{\{z\}} [\gamma(e_0 - \theta z) - tz]z - (\hat{p}z_n - z)^2.$$

The first order condition for the program in (16) is given by

$$(17) \quad \frac{\partial U_s}{\partial z} = 0.$$

From (17), the optimal level of z in terms of t is given by

$$(18) \quad z = \frac{2\hat{p}z_n + \gamma e_0}{2 + 2t + 2\gamma\theta}.$$

Inverting equation (17), t in terms of z is given by

$$(18') \quad t = \frac{\gamma e_0 + 2\hat{p}z_n - 2z - 2\gamma\theta z}{2z}.$$

The worker's participation constraint is given by

$$(19) \quad z^\sigma \bar{U}_w \leq \alpha(\bar{e} - e_0)(\bar{z} - z) = \bar{e}\alpha(\bar{z} - z), \quad \text{where} \quad \bar{e} = \bar{e} - e_0$$

and the supervisor's participation constraint is given by

$$(20) \quad \bar{U}_s \leq [\gamma(e_0 - \theta z) - tz]z - (\hat{p}z_n - z)^2.$$

By substituting (18') into (20) to eliminate t , we obtain

$$(21) \quad \bar{U}_s \leq \frac{\gamma e_0}{2} z + \hat{p} z_n z - (\hat{p} z_n)^2.$$

The internal solution for the worker's base rate (α), the supervisor's piece rate (γ), and the amount of sexual harassment (z) is determined by the solution to

$$(22) \quad \max_{\{\alpha, \gamma, z\}} \pi = pq + tz - \alpha - \gamma q - rk$$

subject to (19) and (21).

The first order conditions for maximizing (22) subject to (19) and (21) are given by

$$(22a) \quad \frac{\partial \pi}{\partial \alpha} = -1 - \lambda_1 \bar{e}(\bar{z} - z) = 0$$

which is rewritten as

$$(22a') \quad \lambda_1 = -\frac{1}{\bar{e}(\bar{z} - z)},$$

$$(22b) \quad \frac{\partial \pi}{\partial \gamma} = -(e_0 - \theta z) - \lambda_2 \frac{e_0}{2} z = 0$$

which is rewritten as

$$(22b') \quad \lambda_2 = 2\left(\frac{\theta}{e_0} - \frac{1}{z}\right),$$

$$(22c) \quad \frac{\partial \pi}{\partial \lambda_1} = z^\sigma \bar{U}_w - \alpha \bar{e}(\bar{z} - z) = 0$$

which is rewritten as

$$(22c') \quad \alpha = \frac{z^\sigma \bar{U}_w}{\bar{e}(\bar{z} - z)},$$

$$(22d) \quad \frac{\partial \pi}{\partial \lambda_2} = \bar{U}_s - \frac{\gamma e_0}{2} z - \hat{p} z_n z + (\hat{p} z_n)^2 = 0$$

which is rewritten as

$$(22d') \quad \gamma = \frac{2[\bar{U}_s - \hat{p} z_n z + (\hat{p} z_n)^2]}{z e_0},$$

and

$$(22e) \quad \frac{\partial \pi}{\partial z} = -p\theta + \gamma\theta + \lambda_1 \sigma z^{\sigma-1} \bar{U}_w + \lambda_1 \alpha \bar{e} - \lambda_2 \frac{\gamma e_0}{2} - \lambda_2 \hat{p} z_n = 0$$

where λ_1 and λ_2 are *Lagrange* multipliers for the constraints in equations (19) and (21). From (22a') and (22b'), λ_1 and λ_2 will not be equal to zero. Hence the constraints (19) and (21) hold with equality.

By substituting (22a'), (22b'), (22c'), and (22d') into (22e), the first order condition of π with respect to z is given by

$$(22e') \quad \frac{\partial \pi}{\partial z} = -p\theta - \frac{\sigma Z^{\sigma-1} \bar{U}_w}{\bar{e}(\bar{z}-z)} - \frac{z^\sigma \bar{U}_w}{\bar{e}(\bar{z}-z)^2} + \frac{2\bar{U}_s \theta}{ze_0} + 2\hat{p}z_n \left[\frac{\hat{p}z_n \theta}{ze_0} + \frac{1}{z} - \frac{2\theta}{e_0} \right] = 0.$$

We now compare Case III with Case I and II separately. When comparing Case III and I, we subtract equation (22e') from (10e') to obtain

$$(23) \quad \begin{aligned} & \frac{\bar{U}_s}{z^2} + \left(\frac{\hat{p}z_n}{z} \right)^2 - 1 - \frac{2\bar{U}_s \theta}{ze_0} - 2\hat{p}z_n \left[\frac{\hat{p}z_n \theta}{ze_0} + \frac{1}{z} - \frac{2\theta}{e_0} \right] \\ &= \frac{\bar{U}_s}{z} \left(\frac{1}{z} - \frac{2\theta}{e_0} \right) + \left(\frac{\hat{p}z_n}{z} \right)^2 - 1 + \frac{4\hat{p}z_n \theta}{e_0} - \frac{2(\hat{p}z_n)^2 \theta}{e_0 z} - \frac{2\hat{p}z_n}{z} \\ &= \frac{\bar{U}_s}{z} \left(\frac{1}{z} - \frac{2\theta}{e_0} \right) + \frac{(\hat{p}z_n)^2}{z} \left(\frac{1}{z} - \frac{2\theta}{e_0} \right) + 2\hat{p}z_n \left(\frac{2\theta}{e_0} - \frac{1}{z} \right) - 1 \\ &= \left(\frac{1}{z} - \frac{2\theta}{e_0} \right) \left[\frac{\bar{U}_s}{z} + \frac{(\hat{p}z_n)^2}{z} - 2\hat{p}z_n \right] - 1. \end{aligned}$$

The z solved from Case III will be lower than that from Case I if equation (23) is greater than zero:

$$(24) \quad \left(\frac{1}{z} - \frac{2\theta}{e_0} \right) \left[\frac{\bar{U}_s}{z} + \frac{(\hat{p}z_n)^2}{z} - 2\hat{p}z_n \right] - 1 > 0$$

which is rewritten as

$$(24') \quad \left(\frac{1}{z} - \frac{2\theta}{e_0} \right) \left[\frac{\bar{U}_s}{z} + \frac{(\hat{p}z_n)^2}{z} - 2\hat{p}z_n \right] > 1 > 0.$$

The necessary condition to satisfy equation (24') is given by

$$(25) \quad \left(\frac{1}{z} - \frac{2\theta}{e_0} \right) > 0, \text{ which can be rewritten as}$$

$$(25') \quad e_0 > 2\theta z$$

and

$$(26) \quad \left[\frac{\bar{U}_s}{z} + \frac{(\hat{p}z_n)^2}{z} - 2\hat{p}z_n \right] > 0, \text{ which can be rewritten as}$$

$$(26') \quad \bar{U}_s + (\hat{p}z_n)^2 > 2\hat{p}z_n z.$$

The other possible necessary condition to satisfy equation (24') is given by

$$(27) \quad \left(\frac{1}{z} - \frac{2\theta}{e_0} \right) < 0, \text{ which is simplified to be}$$

$$(27') \quad e_0 < 2\theta z$$

and

$$(28) \quad \left[\frac{\bar{U}_s}{z} + \frac{(\hat{p}z_n)^2}{z} - 2\hat{p}z_n \right] < 0, \text{ which is simplified to be}$$

$$(28') \quad \bar{U}_s + (\hat{p}z_n)^2 < 2\hat{p}z_n z.$$

When comparing Case III and II, we subtract equation (22e') from (15e') to obtain

$$(29) \quad \begin{aligned} & \frac{2\bar{U}_s}{z^2} + 2 \left(\frac{\hat{p}z_n}{z} \right)^2 - \frac{2\bar{U}_s\theta}{ze_0} - 2\hat{p}z_n \left[\frac{\hat{p}z_n\theta}{ze_0} + \frac{1}{z} - \frac{2\theta}{e_0} \right] \\ &= \frac{2\bar{U}_s}{z} \left(\frac{1}{z} - \frac{\theta}{e_0} \right) + 2 \left(\frac{\hat{p}z_n}{z} \right)^2 + \frac{4\hat{p}z_n\theta}{e_0} - \frac{2(\hat{p}z_n)^2\theta}{e_0z} - \frac{2\hat{p}z_n}{z} \\ &= \frac{2\bar{U}_s}{z} \left(\frac{1}{z} - \frac{\theta}{e_0} \right) + 2 \frac{(\hat{p}z_n)^2}{z} \left(\frac{1}{z} - \frac{\theta}{e_0} \right) + 2\hat{p}z_n \left(\frac{2\theta}{e_0} - \frac{1}{z} \right) \\ &= 2 \left(\frac{1}{z} - \frac{\theta}{e_0} \right) \left[\frac{\bar{U}_s}{z} + \frac{(\hat{p}z_n)^2}{z} \right] + 2\hat{p}z_n \left(\frac{2\theta}{e_0} - \frac{1}{z} \right). \end{aligned}$$

The z solved from Case III will be lower than that from Case II if equation (29) is greater than zero:

$$(30) \quad 2 \left(\frac{1}{z} - \frac{\theta}{e_0} \right) \left[\frac{\bar{U}_s}{z} + \frac{(\hat{p}z_n)^2}{z} \right] + 2\hat{p}z_n \left(\frac{2\theta}{e_0} - \frac{1}{z} \right) > 0.$$

The necessary and sufficient conditions to satisfy equation (30) are given by

$$(31) \quad \left(\frac{1}{z} - \frac{\theta}{e_0} \right) > 0, \text{ which is written as}$$

$$(31') \quad e_0 > z\theta$$

and

$$(32) \quad \left(\frac{2\theta}{e_0} - \frac{1}{z} \right) > 0, \text{ which is written as}$$

$$(32') \quad e_0 < 2z\theta.$$

Condition (31') and (32') together place upper and lower bounds on e_0 .

$$(33) \quad z\theta < e_0 < 2z\theta.$$

The findings above lead to several conclusions. First, sexual harassment will exceed the profit-maximizing level if the firm does not align the supervisor's interests with the firm. It is clear from equation (6c) that absent any deterrence on the part of the firm, sexual harassment chosen by the supervisor is bounded only by the supervisor's own perception of the organizational norm.

Such an outcome will occur if the manager is not aware of the presence of sexual harassment in the factory, the negative consequences of sexual harassment on productivity, and/or the adverse impact on the worker's participation constraint.

Second, a program directly targeting sexual harassment by the supervisor will produce higher profits and less sexual harassment. The reason is that such a program eliminates the negative effect on worker's participation constraint due to sexual harassment by the supervisor.

Third, the firm can align the supervisor's incentives with the factory by introducing production-linked pay for supervisor. The structure is more effective in reducing sexual harassment than a program directly targeting sexual harassment by the supervisor. The reason is that with such a structure, the manager is internalizing the negative effect that sexual harassment has on productivity into the optimizing choice of the supervisor.

Finally, to the extent that the firm is unaware of the negative consequence of sexual harassment on firm profits, a monitoring program that requires the firm to introduce a sexual harassment deterrence program and production-linked pay system for supervisors will move sexual harassment down, thereby increasing firm profits.

IV. THE EMPIRICAL STRATEGY

From the insights of the theoretical model, we are interested in testing the role of the pay incentive structure for both supervisors and workers, norms of behavior, and power in determining the level of sexual harassment in a factory. We would like to further explore whether firm tolerance of sexual harassment is lowering firm profits. The effect of sexual harassment on profits depends on whether (1) sexual harassment has a positive or negative productivity effect (θ positive or negative), (2) the impact of sexual harassment on the workers' reservation wage ($z^\sigma \bar{U}_w$ increasing or decreasing in z) and (3) whether the supervisor perceives the opportunity to solicit sexual favors as a form of compensation.

The assessment strategy on firm profits is depicted in Figure 1. Consider first whether sexual harassment has a negative or positive impact on worker productivity. If the impact is negative, we turn next to the impact that sexual harassment has on a worker's intent to quit. If sexual harassment lowers productivity and increases the probability of quitting, then the only benefit to the firm from tolerating sexual harassment is if supervisors are willing to accept the opportunity to solicit sexual favors as a form of compensation.

However, before analyzing the effect of sexual harassment on firm performance, we perform a preliminary exploration into the role of compensation structure, power, and organizational norms on sexual harassment in the factory as directed by equation (34) below. The structure of compensation includes the base and piece rate for workers and supervisors and a measure of norms in the factory. Norms are measured by the awareness on the part of the HR manager that sexual harassment is a concern for workers in the factory. Controls introduced into the equation are the presence of nearby competitors and individual characteristics including position, gender, age, and education.

$$(34) \ z_{ij} = \beta_0 + \beta_1\alpha_j + \beta_2\beta_j + \beta_3\delta_j + \beta_4\gamma_j \\ + \beta_6\text{NearbyCompetitor}_j + \sum_{i=1}^n \mu_i \text{DemographicalCharacteristics}_{i,j} + \\ \beta_7\text{HRawareness}_j + \epsilon,$$

where i indicates an individual worker and j indicates factory.

We then turn to the impact of sexual harassment on firm output and profits as directed by equation (35). Output is taken to be a function of sexual harassment, capital and hours worked. In order to control for fact that sexual harassment is endogenous, we instrument z with its predicted value, \hat{z} , from equation (34).

$$(35) \ \text{Output}_j \text{ or Profits}_j = \mu_0 + \mu_1\hat{z}_j + \mu_2k_j + \mu_3e_j + \epsilon.$$

V. DATA DESCRIPTION

Data are obtained from the impact evaluation of Better Work. Workers and managers in enrolled factories in Haiti, Vietnam, Jordan, and Nicaragua completed surveys during the period 2010-2014 on work practices and outcomes. Summary statistics are presented in Tables 1-4.

Sexual harassment. Sexual harassment is measured by asking each worker whether sexual harassment is a concern for workers in their factory. Workers concerned with sexual harassment are additionally asked to indicate remedial action taken. The coding is as follows:

1=no concern

2=yes concern, discussed with co-workers

3=yes concern, discussed with supervisor or manager

4=yes concern, discussed with trade union representative

5=yes concern, considered quitting

6=yes concern, nearly caused a strike

7=yes concern, caused a strike.

Participants were also offered the opportunity to decline to answer either because they do not want to or because they do not know.

In Haiti, 52 percent of the workers (n=412) responded to the sexual harassment question. Of these, 39 percent of the respondents (n=159) report that sexual harassment is a concern. The average action code is 1.9, indicating that workers either discussed sexual harassment with their co-workers, a supervisor, or a manager. In Vietnam, 94 percent of the workers (n=4634) responded to this question, and 0.02 percent of the respondents (n=112) report sexual harassment to be a concern. The average response code is 2.3, indicating that workers either discussed sexual harassment with their co-workers, a supervisor, a manager, or with the trade union representative. In Jordan, 69 percent of the workers (n=717) responded to this question, and 30 percent of the respondents (n=244) report sexual harassment to be a concern. The average action code is 2.5, which indicates that workers principally discussed sexual harassment with co-workers, supervisors or managers.

Additionally, 14.75 percent of workers considered quitting as a reaction to sexual harassment. In Nicaragua, 63 percent of the workers (n=103) responded to this question, and 30 percent of the respondents (n=34) report sexual harassment to be a concern. The average action code is 2.1.

Organizational Awareness. Organizational awareness and tolerance are important factors in determining sexual harassment in apparel factories. The HR manager in each factory was asked, “Is sexual harassment a concern for workers in this factory?” Response options available to HR managers are identical to those available to workers. A positive response to this question can be interpreted as an indicator of organizational awareness. However, organizational awareness does not necessarily translate into an organizational norm.

Informant Index. The sexual harassment question was deliberately worded in such a way as to not require a respondent to report on his or her own experiences of sexual harassment. As a consequence, a positive or negative report may simply reflect the willingness of a participant to voice rather than an indication that the respondent had actually experienced an episode of sexual solicitation or violence. In fact, as will be seen below, gender is not generally a predictor of a positive report, and when it is, the respondent is often male with high status in the factory.

In order to control for individual characteristics that predispose a participant to provide a positive response we introduce an informant index that measures the probability of reporting concern by the participant when given the opportunity. The participants were asked 12 questions about concerns with work hours, pay, and working conditions. We divide the sum of individual participants’ reported concerns over the average worker’s concerns to indicate his/her personal disposition to voice concerns as compared with the others in the same factory. The informant is computed as

$$(24) \text{InformantIndex}_{i,j} = \frac{\sum_{q=1}^{12} C_{q,i}}{\sum_{q=1}^{12} \sum_{i=1}^n C_{q,i}/n}$$

where $\text{InformantIndex}_{i,j}$ is the informant index of worker i in factory j , $C_{q,i}$ is a dummy variable of worker i 's response to question q , and n is the total number of workers in factory j . Table 2 reports that the average informant index for Vietnam is 0.3.

Incentive Structure. The theoretical model indicates that the occurrence of sexual harassment might be due to the misaligned incentives between the supervisor and the factory. We expect higher reports on sexual harassment concern in the case of high-power incentive for the worker along with low-powered incentive for the supervisor.

The following variables measure the pay incentive structure of the worker and the supervisor.

- Supervisor incentive pay - worker. The HR manager estimate of the percent of a supervisor's pay that is based on the performance of the workers he or she supervises.
- Supervisor incentive pay – production line. The HR manager estimate of the percent of a supervisor's pay that is based on line production incentives.
- Supervisor incentive pay - production bonus. The HR manager estimate of the percent of a supervisor's pay that is based on an individual production bonus.
- Supervisor incentive pay - piece rate. The HR manager estimate of the percent of a supervisor's pay that is based on piece rate pay.
- Worker's incentive pay measured by production target. A binary variable coded 1 if the worker reports that the supervisor sets a production target.
- Worker's incentive pay measured by productivity bonus. A binary variable coded 1 if the worker reports that he/she receives bonus for his/her own productivity.

Labour Market Competition. In the theoretical model, the perception of alternative work opportunities for workers is a significant determinant of sexual harassment. The competitiveness of the labour market is indicated by the number of nearby competitors and the perception by the General Manager that high turnover is a source of poor firm performance. The General Manager is asked how many other apparel firms are within one kilometer of the factory. The General Manager is also surveyed on the perception of various sources of poor firm performance, including concern about turnover.

Power. We do not have a direct measure of the power imbalance between workers and supervisors. However, relative compensation of workers and supervisors is one indication of relative power. A high average compensation for supervisors relative to workers is indicative of a

hierarchical structure in which supervisors have considerable power relative to their subordinates. Therefore, we proxy a power imbalance by the average wage of supervisors.

- Supervisor's hourly wage. The HR manager estimate of the percent of a supervisor's pay that is based on hourly wage.
- Supervisor average wage. The HR manager estimate of supervisor's monthly wages and benefits, divided by 28.

Productivity. Two measures of firm productivity are used. First, productivity is measured as the time required to complete the daily production target. A longer time indicates a lower level of productivity. Second, General Managers are surveyed on whether low production efficiency is an obstacle to their business success. Responses are coded 1=Not a concern, 2=Minor Concern, 3=Modest Concern and 4= Major concern.

Cost Components. Financial managers are surveyed on the main cost components including value of capital and land, rent, electricity, transportation, communication, labour cost, and other costs.

Hours Worked. Workers are asked which days they usually work each week. A follow-up question asks what time they start work each day and what time they end work each day. The HR manager is surveyed on the number of employees. The total hours worked is a product of the total number of employees and the average hours worked per employee.

Profits. Firm managers are surveyed on quarterly total sales. Profits are calculated as the difference between revenue and costs.

VI. EMPIRICAL RESULTS

We turn first to consider the determinants of sexual harassment. Estimates of Equation (34) are reported for Haiti, Vietnam, Jordan, and Nicaragua in Tables 5-8, respectively. Coefficients for insignificant variables are suppressed.

Turn first to findings from Haiti in Table 5, column 1. As expected the presence of nearby competitors reduces reports of sexual harassment, indicating the importance of labour market competition in protecting vulnerable workers from sexual exploitation. The presence of one additional apparel firm within one kilometer significantly lowers reporting and degree of intensity of concern with sexual harassment (-0.209). Similarly, firms for which the HR manager is concerned with turnover also have fewer reports of sexual harassment (-0.421).

Gender and age are also significant in explaining sexual harassment. Young workers and men are more likely to report on-going sexual harassment in the factory. Such a finding is consistent with expectations that the workers most vulnerable to sexual harassment may be reluctant to report their perpetrators.

Turning to the structure of incentives, workers with a production target are significantly more vulnerable to sexual solicitation than other workers (0.934). While the theoretical model focuses on the adverse effects of low-powered incentives for supervisors, the theoretical point applies equally well to high-powered incentives for workers.

Power asymmetries also appear to be a contributing factor. The higher a supervisor's income the more likely workers are to report sexual harassment (0.003) as seen in column (4) of Table 5.

Findings for Vietnam are distinctive in that awareness of sexual harassment by Vietnamese HR managers is positively correlated with reports of sexual harassment as can be seen in columns (1), (2) and (3) of Table 7. A positive coefficient indicates that while HR managers are aware of the presence of sexual harassment, this awareness is not translating into a culture of intolerance of such behavior.

Interestingly, the structure of incentives is playing a diminished role in Jordan (Table 7) and Nicaragua (Table 8). In both countries, sexual harassment is increasing in the level of supervisor compensation and the power of incentives. These findings suggest that the structure of incentives is important in creating a vulnerability to sexual harassment. However, the high-powered incentives for workers rather than the low-powered incentives for supervisors appear to be the particular aspect of asymmetry that is creating a channel of vulnerability.

The fact that supervisor pay is positively correlated with sexual harassment, whether measured in terms of total compensation or power of incentives, directs attention to the social psychological importance of relative power rather than structure of incentives in determining sexual harassment. Further, we cannot rule out the possibility that the opportunity to solicit sexual favors is a component of the compensation package for supervisors. A positive correlation between the level of supervisor pay and reports of sexual harassment is consistent with high paid supervisors taking a portion of their compensation in the form of sexual favors.

Before moving on to the impact of sexual harassment on profits, it is worth noting that for Nicaragua, awareness of sexual harassment on the part of the HR manager translated into a change in organizational norms. That is, reports of sexual harassment are lower (-0.2862) in factories in which the HR manager reports awareness of the issue, as can be seen in column (3) of Table 8.

We turn next to the relationship between sexual harassment and firm performance. Sexual harassment may reduce firm profits if it adversely affects workforce retention and lowers productivity. Estimates of equation (34) indicate that sexual harassment adversely affects a firm's ability to retain workers. Increased competition in the labour market provides firms with an incentive to control sexual harassment within the factory. However, we also find some evidence that the opportunity to solicit sexual favors is a component of the supervisor's compensation package.

Turning to productivity, estimates of equation (35) are reported for Vietnam in Tables 9 and 10 and for Jordan in Table 11. In Vietnam, productivity is measured by the time required to complete a production target. Reports of sexual harassment significantly increase the time to target for both Monday (column 1) and Friday (column 2). Productivity in Vietnam and Jordan is also measured by the factory manager's concern with a low efficiency rate. Reports of sexual harassment are positively correlated with a factory General Manager's concern with low efficiency as an obstacle to business success.

Given the negative effect of sexual harassment on productivity and worker retention, a positive profit link between sexual harassment and profits would have to arise from the opportunity to solicit sexual favors as a component of a cost-minimizing compensation package for supervisors.

Estimates of a relationship between profits and sexual harassment are reported in Table 10 for Vietnam and Table 11 for Jordan. In both cases, there is a very strong negative relationship between incidence of sexual harassment and firm profits. The strong negative relationship between sexual harassment and profits is clearly evident in the scatter plots presented in Figures 2 (Vietnam) and 3 (Jordan).

VII. CONCLUSIONS

Workplace sexual harassment is pervasive in developing country apparel firms. Understanding its causes and consequences is critical to developing a program of deterrence. Organizational psychology focuses attention on organizational awareness and gender job context. Social psychology directs our attention to organizational norms, opportunity, and power asymmetries. Labour economics emphasizes the importance of labour market competition, and personnel economics emphasizes the importance of incentive alignment. Analyzing a micro-dataset collected in Better Work participating apparel factories in Haiti, Jordan, Vietnam, and Nicaragua, we find evidence that all of the mechanisms are significant determinants of sexual harassment.

HR managers are often aware that sexual harassment is a source of concern for their employees. However, awareness does not commonly translate into the establishment of organizational norms deterring sexual harassment. In the analysis reported above, awareness of sexual harassment translated into deterrence only in Nicaragua. The power that supervisors have over workers is particularly salient in Jordan. Supervisor training, focused on establishing organizational norms, has the potential to reduce the role of hierarchical structures and opportunity to sexually harass in the incidence of sexual harassment.

In Haiti and Vietnam, the presence of a production quota for workers is a significant predictor of sexual harassment. The fact that a supervisor is charged with monitoring work performance makes workers vulnerable to sexual solicitation. While eliminating or reducing pay incentives for workers may reduce the incidence of sexual harassment, such a remedy may have the adverse effect of

reducing productivity. Rather, objective monitoring of work effort will allow a firm to preserve the incentive effects of performance-based pay, while diminishing the power a supervisor has over a worker.

Finally, firms have an incentive to control the incidence of sexual harassment in their factories. Sexual harassment is positively correlated with time to complete a production target and concerns on the part of the factory manager with low production efficiency. Sexual harassment also increases workforce turnover and likely raises the wage necessary to retain workers. We find strong evidence that the negative effect that sexual harassment has on productivity and worker retention manifests as reduced firm profits.

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Figure 1 Sexual Harassment and Firm Outcomes

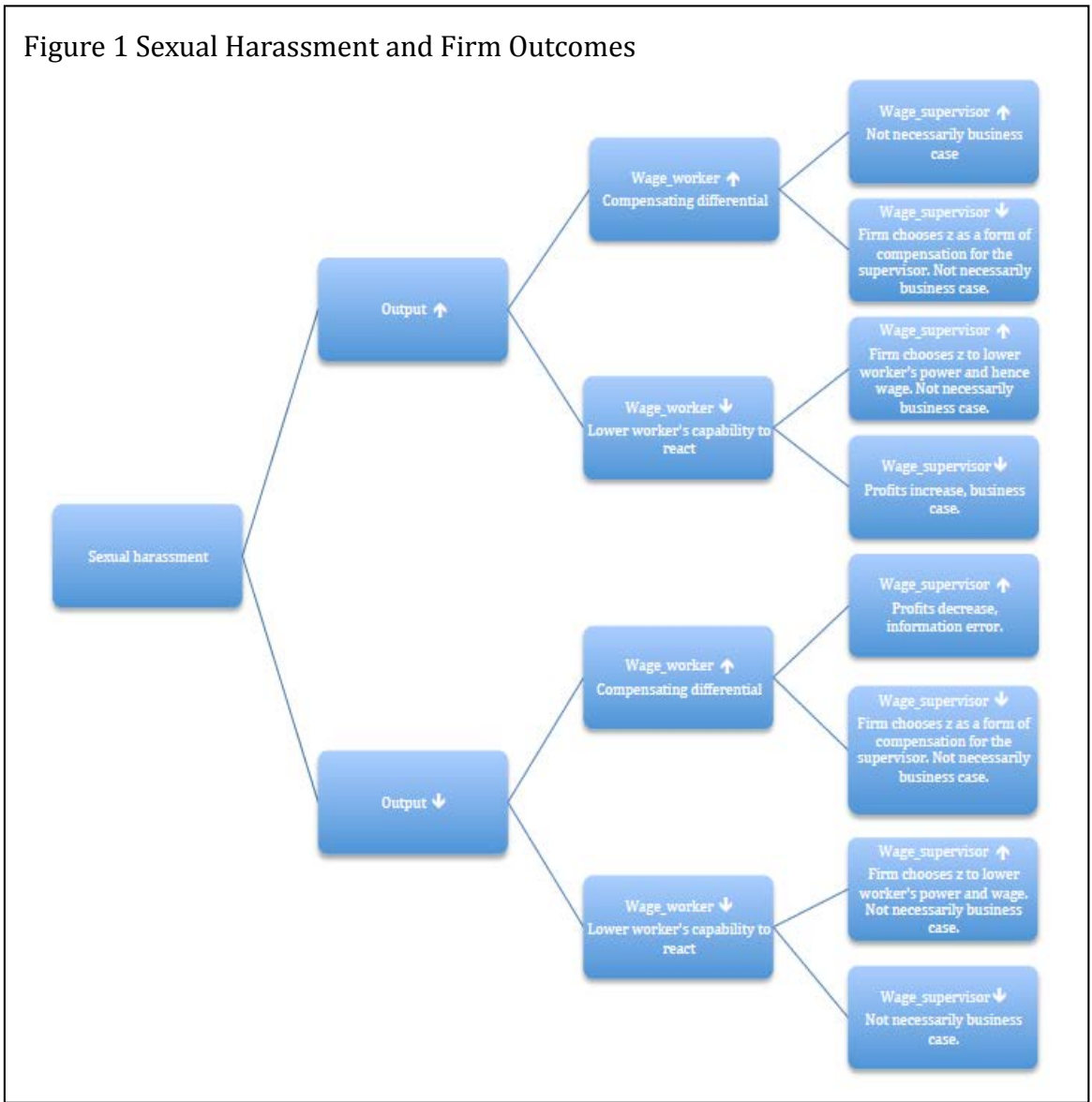


Table 1 Haiti sample characteristics	Mean	Median	SD	Min	Max	Count
Demographic						
Female	0.7	1	0.5	0	1	963
Age	5.2	5	1.3	3	8	963
Education	4.3	4	2	1	9	955
Residence	1	1	1	0	3	957
Haiti	0.3	0	0.5	0	1	1042
Bangladesh	0.1	0	0.3	0	1	1042
Sri Lanka	0.4	0	0.5	0	1	1042
Pakistan	0	0	0	0	1	1042
China	0	0	0.2	0	1	1042
Other	0.1	0	0.3	0	1	1042
Job characteristics						
Years Worked	6.6	7	3.3	1	12	666
Skill Level	0	0	0	0	0	668
Job description						
Sewer	0.5	0	0.5	0	1	658
Cutter	0.1	0	0.3	0	1	658
Spreader	0	0	0.1	0	1	658
Checker	0.1	0	0.3	0	1	658
Mechanic	0	0	0.1	0	1	658
Packer	0	0	0.2	0	1	658
Quality Control	0.1	0	0.3	0	1	658
Supervisor	0	0	0.2	0	1	658

Helper	0	0	0.2	0	1	658
Other	0.2	0	0.4	0	1	658
Contracts						
Contract Type	0	0	0	0	0	668
CBA	0.1	0	0.3	0	1	579
Productivity						
Production Target	1	1	0.5	0	2	630
Production Target Day	0	0	0	0	0	668
Production Target Time	0	0	0	0	0	668
Turnover Concern	2.3	3	1	1	4	501
Training						
Rights Training	0.2	0	0.4	0	1	624
Hours Training	0.1	0	0.3	0	1	624
Human trafficking indicator						
Remaining Debt	0.4	0	0.5	0	1	665
Sexual harassment						
SH Concern	0.4	0	0.5	0	1	412
SH Concern level	1.9	1	1.3	1	6	159
SH Compliance	0	0	0.2	0	1	789

Table 2 Vietnam Sample Characteristics	Mean	Median	Standard Deviation	Min	Max	Count
Demographic						
Female	0.8	1	0.4	0	1	4693
Married	0.5	1	0.5	0	1	4928
Education	3.3	3	1	1	9	4692
Grow up place	1.9	2	0.4	1	3	4693
Years of School	9	9	2.7	0	16	4683
Still in School	0	0	0.2	0	1	4692
Daughters	0.3	0	0.5	0	1	4685
Sons	0.3	0	0.5	0	1	4687
Job characteristics						
Years Worked	4.4	3	3.3	0	20	4687
Skill Level	2.9	3	1.1	1	5	4675
Job description						
Sewer	0.5	0	0.5	0	1	4687
Cutter	0	0	0.2	0	1	4687
Spreader	0	0	0.1	0	1	4687
Checker	0.1	0	0.3	0	1	4687
Mechanic	0	0	0	0	1	4687
Packer	0.1	0	0.2	0	1	4687
Quality Control	0	0	0.1	0	1	4687
Supervisor	0	0	0.2	0	1	4687
Helper	0.1	0	0.3	0	1	4687
Other	0.2	0	0.4	0	1	4687

Contracts						
Contract Type	4.4	4	0.8	1	6	4654
CBA	0.9	1	0.3	0	1	4502
Productivity						
Production Target Day	4.9	6	2	1	2	130
Production Target Hour	15:60	16:30	318.9	4:00	20:30	129
Turnover Concern	1.4	1	0.8	0	4	4543
Sexual harassment						
SH Concern	0	0	0.2	0	1	4634
SH Concern level	2.3	2	1.2	1	6	112
SH Compliance	0	0	0	0	0	3820
Informant Index	0.3	0	0.4	0	1	4693

Table 3 Jordan sample characteristics	Mean	Median	SD	Min	Max	Count
Demographic						
Female	0.7	1	0.5	0	1	963
Age	5.2	5	1.3	3	8	963
Education	4.3	4	2	1	9	955
Live dorm	1	1	1	0	3	957
Jordan	0.3	0	0.5	0	1	1042
Bangladesh	0.1	0	0.3	0	1	1042
Sri Lanka	0.4	0	0.5	0	1	1042
Pakistan	0	0	0	0	1	1042
China	0	0	0.2	0	1	1042
Other	0.1	0	0.3	0	1	1042
Human trafficking indicator						
Years Worked	5.1	7	3.1	1	9	959
Working Decision	1.7	1	1.7	1	9	961
Work Permit	1.8	3	1.4	0	3	956
Work Permit Paid	0	0	0.3	0	3	961
Money Contract	36,815.8	18,000.0	80,111.30	0	800,000	478
Factory Paid	0	0	0.2	0	1	961
Remaining Debt	0.1	0	0.3	0	1	963
Job characteristics						
Years Worked	6.8	7	3.2	1	12	960
Skill Level	0.1	0	0.6	0	5	961
Job description						
Sewer	0.5	0	0.5	0	1	957

Cutter	0.1	0	0.2	0	1	957
Spreader	0	0	0.1	0	1	957
Checker	0	0	0.2	0	1	957
Mechanic	0	0	0.1	0	1	957
Packer	0.1	0	0.2	0	1	957
Quality Control	0.1	0	0.3	0	1	957
Supervisor	0	0	0.2	0	1	957
Helper	0.1	0	0.3	0	1	957
Other	0.2	0	0.4	0	1	957
Productivity						
Production Target	1.2	1	0.4	0	2	934
Production Target Day	0	0	0	0	1	963
Production Target Time	0	0	0.5	0	17	963
Turnover Concern	1.7	1	0.9	1	4	1189
Contracts						
Contract Type	6.6	8	2.9	1	9	873
CBA	0.4	0	0.5	0	1	845
Training						
Rights Training	0.1	0	0.3	0	1	906
Hours Training	0.1	0	0.3	0	1	906
Sexual harassment						
SH Concern	0.3	0	0.5	0	1	717
SH Concern level	2.5	2	1.6	1	6	244
SH Compliance	0	0	0	0	1	868

Table 4 Nicaragua sample characteristics	Mean	Median	SD	Min	Max	Count
Demographic						
Female	0.5	0	0.5	0	1	153
Age	4.9	5	1.2	3	8	153
Education	3.9	4	1	1	6	153
Job characteristics						
Years Worked	3.1	2	2.3	1	7	150
Job description						
Sewer	0.5	1	0.5	0	1	153
Cutter	0.1	0	0.2	0	1	153
Spreader	0	0	0.1	0	1	153
Checker	0	0	0.2	0	1	153
Mechanic	0	0	0.1	0	1	153
Packer	0.1	0	0.2	0	1	153
Quality Control	0.1	0	0.3	0	1	153
Supervisor	0	0	0.1	0	1	153
Helper	0.1	0	0.3	0	1	153
Other	0.1	0	0.3	0	1	153
Productivity						
Production Target Day	4.7	5	1.9	0	7	20
Production Target Hour	26.4	35	13.1	2	39	70
Turnover Concern	2.6	3	1.1	1	4	153
Contracts						
Contract Type	7.7	8	1.7	1	9	148

CBA	0.4	0	0.5	0	1	122
Training						
Rights Training	0.6	1	0.5	0	1	74
Hours Training	0.6	1	0.5	0	1	74
Sexual harassment						
SH Concern	0.3	0	0.5	0	1	103
SH Concern level	2.1	1.5	1.3	1	6	34
SH Compliance	0	0	0	0	0	162

Table 5 Haiti Worker Sexual Harassment Concern	SH Concern	SH Concern	SH Concern	SH Concern
	(1)	(2)	(3)	(4)
Nearby Competitor	-0.209***	-0.186	-0.117	
	(0.061)	(0.100)	(0.075)	
Age	-0.088	-0.111	-0.131*	-0.186**
	(0.063)	(0.060)	(0.060)	(0.032)
Female	-0.490***	-0.430**		
	(0.109)	(0.150)		
Job Checker	0.283	0.254	0.260	-0.479*
	(0.370)	(0.320)	(0.406)	(0.156)
Turnover Concern	-0.421***	-0.284	-0.210*	
	(0.075)	(0.172)	(0.103)	
Worker Production Target	0.934***			
	(0.279)			
Supervisor Piece Rate		0.039		
		(0.025)		
Supervisor Daily Wage			0.001	
			(0.001)	
Sup Hourly Wage Percent				0.003*
				(0.001)
Constant	3.819***	3.848***	3.274**	2.893**
	(0.833)	(0.696)	(1.330)	(0.582)
Observations	184	152	173	38
R-squared	0.179	0.144	0.097	0.242

Table 6 Vietnam Sexual Harassment Concern	SH Concern	SH Concern	SH Concern	SH Concern
	(1)	(2)	(3)	(4)
HR awareness SH	0.019**	0.003	0.021**	0.007
	(0.008)	(0.013)	(0.008)	(0.008)
Education	0.022**	0.072	0.022**	0.029**
	(0.010)	(0.074)	(0.010)	(0.012)
Age	-0.003***	-0.005	-0.002**	-0.003**
	(0.001)	(0.003)	(0.001)	(0.001)
Job Cutter	-0.059***	0.032	-0.052***	-0.046***
	(0.011)	(0.058)	(0.010)	(0.013)
Job Quality Control	-0.060***	0.004	-0.058***	-0.065***
	(0.011)	(0.039)	(0.012)	(0.019)
Turnover Concern	-0.001	-0.038*	-0.000	0.001
	(0.008)	(0.020)	(0.009)	(0.009)
Worker Productivity Bonus	0.038**			
	(0.017)			
Supervisor Piece Rate		-0.000		
		(0.001)		
Supervisor Daily Wage			-0.000	
			(0.000)	
Supervisor Hourly Wage Percent				-0.000
				(0.000)
Constant	1.063***	1.058***	1.067***	1.095***
	(0.049)	(0.236)	(0.056)	(0.075)
Observations	4,052	371	3,795	2,734
R-squared	0.011	0.077	0.009	0.014

Table 7 Jordan Sexual Harassment Concern	SH Concern	SH Concern	SH Concern	SH Concern
	(1)	(2)	(3)	(4)
HR awareness SH	0.118**	0.124**	0.176***	0.134***
	(0.044)	(0.045)	(0.044)	(0.043)
Age	-0.155**	-0.121**	-0.117**	-0.113**
	(0.063)	(0.054)	(0.052)	(0.055)
Job Cutter	-0.552***	-0.424**	-0.469**	-0.474**
	(0.167)	(0.179)	(0.188)	(0.174)
Job Helper	-0.031	-0.107	-0.136	-0.105
	(0.211)	(0.216)	(0.216)	(0.219)
Turnover Concern	-0.159	-0.087	-0.103	-0.070
	(0.098)	(0.090)	(0.109)	(0.088)
Worker Hourly Pay USD	0.001			
	(0.006)			
Worker Productivity Bonus		-0.125		
		(0.230)		
Supervisor Piece Rate			0.071**	
			(0.026)	
Supervisor Daily Wage				0.005**
				(0.002)
Constant	2.611***	2.274***	2.152***	2.118***
	(0.531)	(0.424)	(0.453)	(0.419)
Observations	523	608	575	612
R-squared	0.052	0.043	0.060	0.044

Table 8 Nicaragua Vietnam Sexual Harassment Concern	SH Concern	SH Concern	SH Concern	SH Concern
	(1)	(2)	(3)	(4)
HR awareness SH	0.2846	0.0159	-0.2862**	
	(0.1751)	(0.1273)	(0.0699)	
Nearby Competitor	0.3570*	-0.0298	-0.0356	0.1694
	(0.1224)	(0.0406)	(0.0405)	(0.0748)
Age	-0.2324**	-0.2432**	-0.2432**	-0.2486
	(0.0557)	(0.0609)	(0.0609)	(0.1062)
Job Checker	0.7648	0.9576	0.9576	2.7871**
	(0.5573)	(0.6992)	(0.6992)	(0.5352)
Turnover Concern	-0.5884**			
	(0.1568)			
Informant Index	0.9289*	0.9210*	0.9210*	0.6507
	(0.2955)	(0.2923)	(0.2923)	(0.2589)
Worker Productivity Bonus	-0.2703			
	(0.1940)			
Supervisor Piece Rate		0.2139**		
		(0.0625)		
Supervisor Daily Wage			0.0012**	
			(0.0004)	
Supervisor Hourly Wage Percent				0.1058*
				(0.0273)
Constant	2.2585*	1.5553	2.6777**	-4.8692
	(0.8552)	(1.0305)	(0.7034)	(3.1076)
Observations	77	77	77	59
R-squared	0.3155	0.3062	0.3062	0.3675

Table 9 Vietnam Time to finish Production Target	(1)	(2)
	Time to Target Monday	Time to Target Friday
Total Hours Monday	0.189***	
	(0.037)	
Total Hours Friday		0.181***
		(0.037)
Capital Per Person	0.001	0.001
	(0.001)	(0.001)
SH Concern Predicted	6.575***	6.892***
	(0.564)	(0.577)
Constant	4.954***	4.714***
	(0.696)	(0.709)
Observations	2,778	2,684
R-squared	0.056	0.060

Table 10 Vietnam Revenue and Output Efficiency	(3)	(2)
	Low Efficiency Concern	Profits (Million USD)
Average Total Hours	0.008** (0.003)	-0.412*** (70.622)
Capital (1000 USD)	-0.000*** (0.000)	0.075*** (2.763)
SH Concern Predicted	4.567*** (0.424)	-56.22*** (9.107)
Constant	-1.679*** (0.522)	84.521*** (11.451)
Observations	3,397	1,125
R-squared	0.043	0.406

Table 11 Jordan Revenue and Output Efficiency	(1)	(2)
	Low Efficiency Concern	Profits (Million USD)
Average Total Hours	0.070***	0.180***
	(0.006)	(0.29)
Capital (1000 USD)	-0.000	0.027***
	(0.000)	(0.000)
SH Concern Predicted	1.113***	-5.538***
	(0.289)	(1.585)
Constant	-4.160***	-3.977
	(0.653)	(3.732)
Observations	332	239
R-squared	0.298	0.888

Figure 2 Vietnam Profits and Sexual Harassment Concern

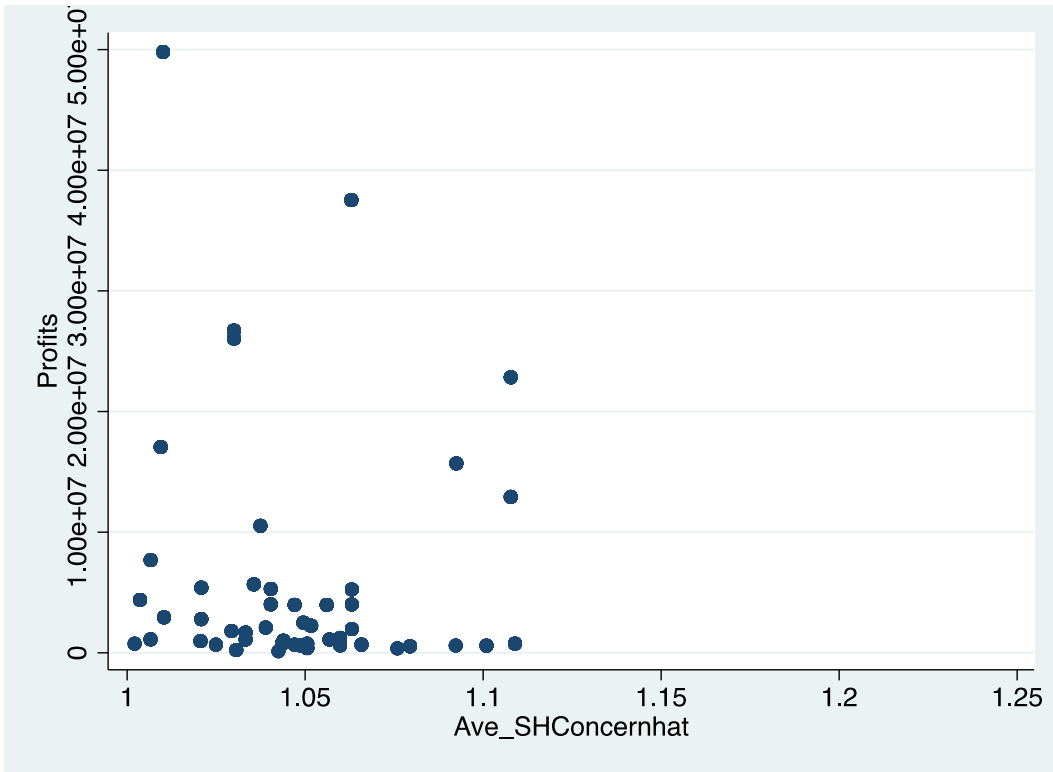
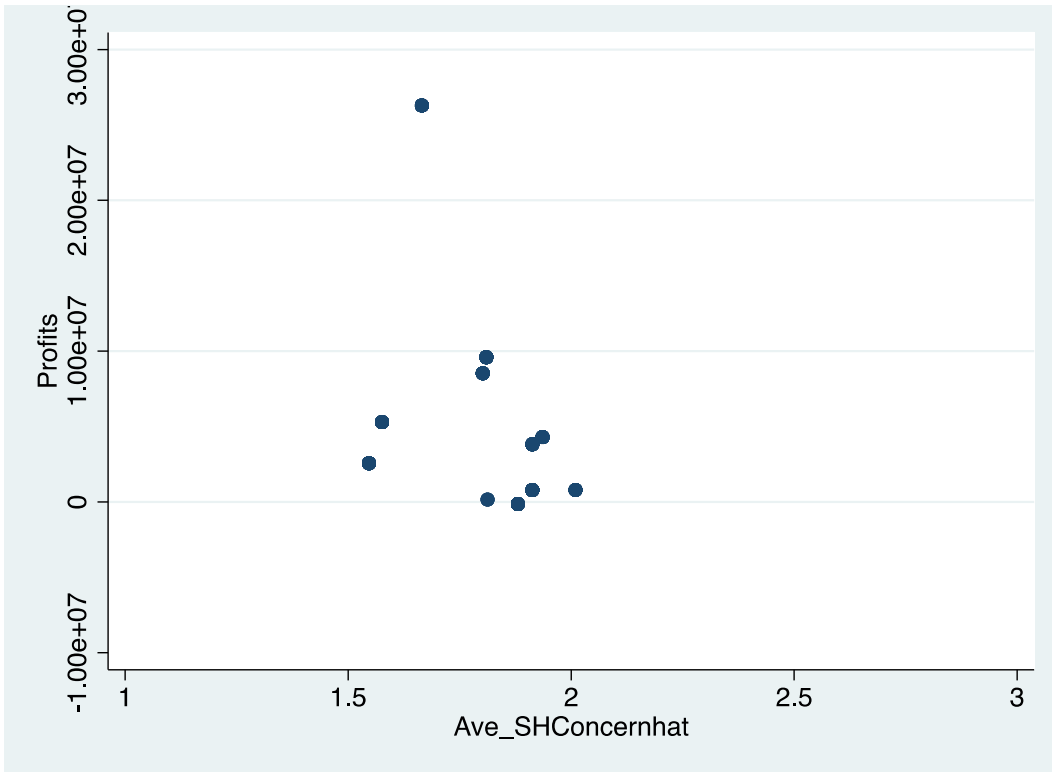


Figure 3 Jordan Profits and Sexual Harassment Concern



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