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Pecuniary returns to working conditions in Vietnam

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Abstract: Using matched worker-firm data from three waves of the Vietnam Small and Medium Enterprises data, we examine whether workers are compensated with higher wages for working in vulnerable jobs and unfavourable working conditions. Wage equations indicate that there are no clear compensating mechanisms for working in poor conditions, for having an informal contract, and for having few financial benefits. Quantile regressions show that workers in the upper tail of the wage distribution are more likely to be penalized for working in adverse conditions. Employees recruited through official hiring channels with an informal contract earn less than employees hired through social networks. Upon estimating mean decompositions of wage gaps based on working conditions, we find that the gap is almost entirely explained by the conjunction of worker, job and firm characteristics in 2015, in contrast to the previous survey year of 2013.

All tables and figures are placed at the end of the paper.

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1   Introduction

Working environments can vary in terms of hazards that workers are exposed to (e.g. noise, heat, asbestos, lead and pesticides), poor ergonomics (heavy lifting, repetitive tasks, sedentary work), unfavourable working times (working day length, overtime incidence), and workplace discrimination and harassment. Most studies in economics tend to focus on wages, wage growth, and occupational attainment as indicators of labour market success, while paying little attention to the quality of the work environment. This is especially important in developing countries in which manufacturing sectors have generated jobs in the face of rapid industrialization, but we have little knowledge about the working conditions being offered.[1] However, growing evidence shows that working conditions and job quality can have long-lasting effects on workers' physical and mental health, worker absenteeism, and more generally on life satisfaction (for overviews, see Pouliakas and Theodossiou, 2013; and Barnay, 2016).[2] For instance—using data from the European Community Household Panel—Datta Gupta and Kristensen (2008) find that a satisfactory work environment promotes employee health. Somanathan et al. (2015)—using high-frequency worker data spanning a variety of manufacturing sectors in India—find that higher ambient temperatures in the workplace have economically significant negative effects on worker productivity and attendance. In a related vein, Adhvaryu et al. (2018) show that adoption of LED lighting, an energy-saving technology that emits less heat, increases productivity among garment factory workers in India.[3]

In this paper, we first document working conditions in the case of Vietnamese small and medium enterprises (SMEs) and then examine the existence of compensating wage differentials for vulnerable jobs and unfavourable working conditions. The theory of compensating differentials which was formalized in the 1980s (Brown, 1980; Rosen, 1986; Murphy and Topel, 1987) states that workers may receive higher wages to compensate for the strenuous or hazardous nature of their jobs or adverse working conditions.[4] In developed countries, for example, it has been observed that physically hazardous and stressful jobs are often better paid (e.g. Groot and Maassen van den Brink, 1998; Lanfranchi et al., 2002), while the existence of compensating mechanisms mostly depends on the workers' labour market segment and their relative position in the wage distribution (Poggi, 2007; Fernández and Nordman, 2009). Despite the abundant explanations and the strength of the theoretical predictions regarding compensating wage differentials, the lack of appropriate data on job matches (including the workplace, the employee, and the attributes of the job) has been an impediment to empirically testing the theoretical predictions. Using rich data on working conditions faced by workers in Vietnamese SMEs, our aim is to contribute to this discussion. This is salient given the scope of SMEs in Viet Nam: they contribute to approximately 45 per cent of the country's GDP and 60 per cent of its employment.

In the UK, Fernández and Nordman (2009) assess the relative contribution of working conditions to wages with an emphasis on differences along the earnings distribution. They find that adverse

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[1] The deadly collapse in 2013 of the Rana Plaza building in Bangladesh that housed five garment factories producing for major apparel retailers is an infamous example of unsafe and poor-quality work conditions.

[2] The International Labour Organisation (ILO) estimates show that work-related diseases and accidents account for economic losses as high as 4 per cent of world-wide Gross Domestic Product (ILO, 2003).

[3] Dell et al. (2014) provide an overview of impacts on productivity arising from pollution and high indoor/outdoor ambient temperatures.

[4] The theory assumes that once job characteristics other than the wage become part of the labour market decisions of workers and firms, the resulting equilibrium will equalize utilities, rather than wages across individuals.

working conditions–such as doing repetitive tasks, working under tight deadlines or facing health risks on the job–are associated with significant premiums, but sometimes also penalties. Quantile regressions confirm the presence of penalties to poor working conditions that are significant in the middle section of the earnings distribution. Böckerman et al. (2011) also confirm the presence of compensating differentials using data from Finland where they show that workers are compensated in terms of wages for uncertainty arising from establishment-level worker turnover. Ose (2005) finds that private sector manufacturing workers in Norway are not fully compensated for working in noisy environments. Furthermore, his theoretical model shows that only partial compensation for such disamenities can result in higher worker absenteeism. In contrast, there is scant empirical evidence to support the existence of such risk premiums and penalties in developing countries. For West Africa, Bocquier et al. (2010) shed light on the link between vulnerability and incomes for wage workers and self-employed workers. They test whether workers in vulnerable jobs are paid better than workers in less strenuous jobs. They also adopt a distributional approach with the idea that vulnerability can have a different effect on income depending on the worker's relative position in the income distribution. Their results show that a vulnerability-compensating mechanism is mainly observed in the informal sector, and in the upper tail of the earnings distribution. Employment vulnerability is not compensated for the poorest workers in the private sector. They argue that long job queues and weak institutional protection of workers may have reduced bargaining power in the formal sector.

The existence of compensating mechanisms–or lack thereof–at different points of the earnings distribution can be due to bargaining power differences and labour market imbalances. For instance, workers in the upper tail of the earnings distribution may have greater bargaining power to demand and secure higher compensation for the stress that their jobs entail. The employer's capacity to provide financial compensation for adverse working conditions might also differ depending on the type of imbalances found in certain market segments. For example, in segments where labour supply far outstrips demand, employers are reluctant to compensate workers for adverse working conditions. Like in Fernández and Nordman (2009), this justifies looking at the existence of compensating mechanisms across the wage distribution, and not only at the mean.

We use the Viet Nam Small and Medium Enterprise data in which the employee survey has information on availability and type of contract, duration of work, provision of social security benefits and occupational health and safety training, and areas in which employees consider working conditions to be most affected. Based on this, we construct indicators of job vulnerability and working conditions. We first present descriptive statistics on working conditions and job quality for three rounds of data, 2011, 2013, and 2015, as well as by the formality status of the enterprise. Multivariate regression analyses at the employee level explore the existence of compensating mechanisms. We estimate unconditional quantile regressions at the employee level to discern whether the wage differential attributable to working conditions changes along the conditional wage distribution when we consider other wage shifters. One possible mechanism that can shift workers' bargaining power within the firm is the channel through which they were hired: formally or informally through social networks (Berardi, 2013). Hence, we also investigate whether the hiring channel of the workers may differentially affect the relationship between working conditions and wages. Finally, we estimate a mean decomposition of wage gaps based on working conditions. This splits the wage gap between workers in poor working conditions and workers in non-poor working conditions into two parts: the first is due to differences in socioeconomic characteristics between workers, and the second part is attributable to different valuations of the workers' characteristics in different jobs (the differences in returns to characteristics).

This paper is organized as follows. Section 2 provides a background on the Vietnamese context. In Section 3 we describe the data and methodology, and report descriptive statistics. Section 4

presents results from regressions and decomposition analyses. In Section 5, we provide concluding comments.

2   Background

Analysing the wage consequences of employment vulnerability and working conditions in Viet Nam is particularly interesting since the country has experienced spectacular social, economic, and political changes in the recent period. On the labour market front, two main striking features in recent years are: first, the increasing rate of wage and non-agricultural employment; and second, a sharp rise in real wages and labour incomes (Cling et al., 2010). Wage dynamics have been higher for the semi-skilled and highlyskilled workers than for unskilled workers. Although the formal sector of the economy has grown progressively, informal employment, especially that in SMEs, represents an important part of the Vietnamese labour market. Despite this, little is known about employment vulnerability and working conditions that workers in SMEs face, and that is the gap this paper intends to fill.

We now turn to a description of the landscape in Viet Nam with respect to laws on working conditions, social insurance as well as on occupational safety and health. The Labour Code of the 2012 is currently operational in Viet Nam. As compared to the Labour Code of 1994 which it superseded, it has introduced significant changes that are potentially beneficial from the employees' perspective. For instance, it stipulates that the employer and the employee are required to sign a contract *before* the start of employment to ensure that employers honour their statutory obligations towards employees. The new Labour Code also requires a 15-day termination notice period to be served to employees on definite-term contracts of 12 to 36 months' duration. The Code also dictates limits on working hours as well as overtime work. The first Law on Social Insurance was introduced in 2006 with the aim of improving social protection. The law applies to employees who work under a definite-term labour contract or a contract exceeding three months. Compulsory social insurance, which both employers and employees are obliged to join, includes sickness leave, maternity leave, employment injury and occupational and disease benefit, old-age benefit, and survivors' benefit. It also stipulates unemployment insurance that came into effect in 2009. The 2015 Law on Occupational Safety and Health applies to both contract and non-contract workers in all enterprises. The Law states that employers are obliged to provide training in matters related to occupational safety and health. They are also to compensate workers in case of occupational accidents or disease. Workers have the right to demand and work in safe working environments where they are provided information on hazardous factors as well as on preventive measures.

Despite the existence of a comprehensive social protection that is legally mandated, compliance and implementation remain a policy challenge. In a 2015–16 survey of 257 garment factories, ILO (2015) finds that while there has been improvement over time, non-compliance with the abovementioned laws remains high. For example, 40 per cent of factories were incorrectly paying for overtime work and 62 per cent of employers failed to specify all terms and conditions of employment in the contract. Furthermore, in around 40 per cent of factories, inadequate fire detection and alarm systems were observed. Trifkovic (2017) examines the effect of internationally recognized management standards on firm working conditions in Viet Nam to find that firms that have adopted standards are also more likely to offer formal contracts to their employees, although there is no systematic effect on financial benefits such as sick leave, unemployment insurance, accident insurance, etc.

3   Data and methodology

3.1   Data

We rely on the 2011, 2013 and 2015 waves of the Viet Nam Small and Medium Enterprises data, that is collected jointly by Central Institute for Economic Management (CIEM) of the Ministry of Planning and Investment (MPI) of Viet Nam, the Institute of Labour Science and Social Affairs (ILSSA) of the Ministry of Labour, Invalids and Social Affairs (MoLISA) of Viet Nam, the Development Economics Research Group (DERG) at the University of Copenhagen and the United Nations University World Institute for Development Economics Research (UNU-WIDER).

The enterprise-level surveys, administered to the owners or managers, are longitudinal in nature and have been conducted biennially since 2005. In about a quarter of randomly selected enterprises that are part of the enterprise surveys, a random subset of employees is interviewed for the employee survey. However, it should be noted that it is not possible to construct a panel dataset at the level of the employee. For this paper, we primarily use data from the 'employee module'. Through this, we have access to variables such as wages earned by these employees, their demographic and socioeconomic characteristics such as gender, marital status, educational attainment, prior experience (in years), tenure in the current enterprise (in years), and occupation.[5] In addition, the survey asks questions related to availability and type of contract, provision of social security benefits and occupational safety and health and training, and areas in which employees consider working conditions to be most adversely affected.

Our main variables of interest are those capturing vulnerable terms of employment and working conditions. To that end, we create a binary variable for *informal contract* (takes value 1 if there is no formal written contract, 0 otherwise). We construct a variable called *financial benefits* that sums up whether the following nine financial benefits are provided: sick leave, maternity leave, retirement pay, severance pay, survival benefit, health insurance, annual paid leave, unemployment insurance, and compensation for accidents/illness.[6] For working conditions, we create a binary variable that takes value 1 if the employee reports receiving no occupational safety and health (OSH) training. We also create binary variables that take the value 1 if the employee responds in the affirmative to each of the following working conditions being adversely affected, 0 otherwise: air quality, fire hazards, heat, lighting, waste disposal, and water pollution. We create an additive index that sums up the binary variables corresponding to the adverse working conditions and OSH training. All employees facing higher than the median number of adverse working conditions are assigned a value 1 indicating *poor working conditions*, 0 otherwise.[7]

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[5] Our analysis is limited to employees who report earning a monthly wage. This is about 88 per cent of the sample. Due to concern about quality of wage data where workers report being paid per hour, per day, and per week, we do not include those observations in our analysis.

[6] The question on maternity leave is answered by male and female employees.

[7] We considered using principal components analysis to reduce the dimensionality of the vector of working conditions. However, due to the low pair-wise correlations, five factors appeared to explain a large part of the variance (i.e., eigenvalues exceeding 1). As this was not helpful, we resorted to creating a binary variable based on an underlying additive index. The median number of adverse working conditions is 3 (for the pooled sample as well as for individual years).

3.2 Methodology

We begin with estimating OLS regressions of the following type where i represents the employee and j represents the firm:

$$Y_{ij} = \beta_0 + \beta_1 InformalContract_i + \beta_2 FinancialBenefits_i + \beta_3 PoorWorkingConditions_i + X_i\alpha + \delta_j + \varepsilon_i \tag{1}$$

Where Y is the log of real hourly wages of employee i in firm j. In addition to variables capturing vulnerable employment (*Informal Contract, Financial Benefits*) and working conditions (*Poor Working Conditions*), we include a vector X of dimension k, controlling for employee characteristics such as gender (takes value 1 if female, 0 if male), marital status (takes value 1 if married; 0 otherwise), years of experience prior to joining the firm and its quadratic term, tenure in the current firm and its quadratic term (in years), dummy variables for highest level of educational attainment such as secondary, high school, vocational, and college (with no education or primary being the omitted category) as well as dummy variables for occupation such as manager, professional worker, office worker, sales worker, and service worker (with production worker being the omitted category). We include firm-fixed effects (δ_j) that control for all time-invariant firm-level characteristics. As we pool the survey years in the regression analyses, we finally include dummies for survey years. To account for correlation in the error terms between employees in the same firm, we cluster standard errors at the firm level.

In the estimates, varying effects of working conditions and terms of employment on wages may result from worker selection by firms and vice versa. For example, firms with poor working conditions could only select workers that accept lower pay and are not inclined to bargain over wages. It may also be that some observed firms with adverse work environments select or attract workers that are more motivated or less reluctant to working in unfavourable situations. Moreover, firms may decide to compensate for the bad working conditions of the employees they seek to retain, i.e., those with greater unobserved productivity. All these selectivity effects may then affect estimates of working conditions and terms of employment in individual wage equations if one does not control for firm and worker matching processes. Since it is impossible to fully control for these phenomena with our data, we have little choice but to assume that selectivity and matching effects are well accounted for by the inclusion of workers' and firms' controls, in particular the firm-fixed effects, and that residual effects may be overlooked. However, due to the rigidity of the Vietnamese formal labour market (with sluggish administrative procedures, and little public information on jobs and workers), it is plausible that selection effects are less intensive than in developed countries in general.

Furthermore, as the OLS regressions only capture the average relationship between working conditions and hourly wages, we also conduct a distributional analysis by estimating unconditional quantile regressions (UQR) à la Firpo et al. (2009). This allows us to comment on how employment vulnerability and poor working conditions matter at different points of the wage distribution. The main advantage of this method over conditional quantile regressions is that the estimated effects do not depend on the set of explanatory variables in the model. UQR is based on extending the concept of Influence Function to what has been termed the Recentered Influence Function (RIF). The RIF for the quantile θ of log wage (Y) is given by:

$$RIF(Y,Q_\theta) = Q_\theta + [Y - d_\theta]/f_Y(Q_\theta) \tag{2}$$

where $f_Y(Q_\theta)$ is the density distribution function of Y at Q_θ and d_θ is a binary variable taking value 1 if $Y \leq Q_\theta$ and 0 otherwise.

After recalculating the variables of interest, the following is estimated by OLS:

$$RIF(Y, Q_\theta) = X\beta^{UQR} + \varepsilon \tag{3}$$

Finally, we conduct wage decompositions that allow us to discern how much of the 'working conditions wage gap' may be due to differences in workers' characteristics across jobs, and how much of it is due to the price the market pays for these workers' attributes in these different jobs (i.e., the differences in returns to characteristics). The most common approach for identifying sources of wage gaps is the Oaxaca-Blinder decomposition (Blinder, 1973; Oaxaca, 1973). The issue with these traditional approaches is how to determine the reference wage structure. This choice poses the so-called index number problem, given that either the poor working conditions group or the non-poor working conditions group structure can be used as the reference benchmark. While there is *a priori* no preferable alternative, the decomposition can be quite sensitive to the selection made. The literature has proposed different weighting schemes to deal with this index problem.

In this paper, we rely on the general decomposition proposed by Neumark (1988). This decomposition can be reduced to Oaxaca-Blinder's two special cases if it is assumed that the poor working conditions group structure is the benchmark (the non-poor working conditions group would be underpaid), or if it is assumed that the benchmark is that of the non-poor working conditions group (hence the poor working conditions group would be overpaid). This benchmark is then estimated using the weighted average of the wage structures of these two groups using the pooled sample. Neumark's approach usually provides estimates that lie between the two opposed assumptions of the Oaxaca-Blinder decompositions. This is also true in these data.

3.3 Summary statistics

In Table 1, we present summary statistics for each of the three survey years for the variables included in this study. We first discuss the demographic and socioeconomic characteristics of the study sample. Approximately 40 per cent of the employees are female, and over three-quarters are married. On average across the three years, 4–5 per cent are uneducated, 30–32 per cent have completed secondary education, and 21–24 per cent reached a college or higher degree level. The share of employees reporting high school education declined from 41 per cent in 2011 to 29 per cent in 2015. This was accompanied by an increase in those with vocational education from 3 per cent in 2011 to 9–10 per cent in 2013 and 2015. The average years of experience prior to joining the firm range between 6 and 7 years, and most employees have been at the current firm for around 6 years. In terms of occupational structure, 60 per cent of employees are in the production worker category, with managers, professional workers, office workers and sales workers each making up about 7–11 per cent of the sample. Service workers are about 3–4 per cent of the sample.

In terms of employment and working conditions, we find that between 2011 and 2015, there has been a significant drop in the share of employees with an informal contract from approximately 45 per cent to 38 per cent (p-value = 0.004), and a significant increase in the number of financial benefits offered by employers (p-value < 0.001). There is also significant increase in the share of employees reporting overall poor working conditions (i.e., those facing higher than the median number of adverse working conditions) from 30 per cent in 2011 to 49 per cent in 2015 (p-value < 0.001). In terms of individual components of working conditions, we observe that, while in 2011 about 45 per cent of employees reported receiving no OSH training at the workplace, this jumped to over two-thirds in 2015. There was also an increase in the share of employees reporting fire

hazard, heat problems, lighting, and poor air quality. On the other hand, there was a decline in water pollution reported as a problem. There were no meaningful changes in problems reported regarding noise and waste disposal.

In Table 2, we shed light on variation in employment terms and working conditions based on the formality or registration status of the firm. On the one hand, as per the compensating wage differential theory, informal firms might compensate workers for not being covered by social security and for facing generally poorer working conditions. On the other hand, according to efficiency wage theory, formal firms may voluntarily pay higher wages to attract high quality workers, to improve worker retention, and to elicit higher effort levels. Firms are defined as being formal if they have an Enterprise Code Number (ECN) or if they have a Business Registration Certificate (BRC) and a tax code. The share of workers reporting informal contracts is significantly lower in the formally registered firms, as expected (p-value < 0.001). On average, less than one financial benefit is provided in unregistered firms as compared to approximately 4 benefits in registered firms (p-value < 0.001). There is about a 7-percentage point gap between the shares of workers in formal and informal firms reporting poor working conditions, and this just fails to reach significance at conventional levels (p-value = 0.106). Looking at individual components, 57 per cent of workers in registered firms report no OSH training as compared to 65 per cent in unregistered firms (p-value = 0.05). Significantly higher shares of employees in the formal firms report problems related to fire hazards, heat, light and waste (all p-values < 0.1). This suggests that poor conditions are not specific to informal firms only, as unfavourable work environments seem to be prevalent in formal sector enterprises as well.

4   Results

4.1   Regression analyses

In Table 3, we present results from an OLS regression wherein the outcome variable is the log of real hourly wages. In Column 1, we only include worker characteristics such as gender, marital status, educational attainment dummies, experience and tenure and their respective quadratic terms, occupation, province and survey year dummies. In line with existing literature, we find that female employees earn 10 per cent less than male employees, and this result is robust to alternative specifications in Columns 2 and 3. In accordance with previous studies that have estimated wage returns to education in Viet Nam (Liu, 2006; Pham and Reilly, 2007; Nguyen et al., 2013; Oostendorp and Quang, 2013), we find returns to education to be increasing with the level of education attained. In Column 2, we proceed to adding the right-hand side variables measuring employment terms and working conditions, and we add each as a separate variable. We find some evidence that those reporting poor air quality earn higher wages, and those reporting poor lighting earn lower wages (although both these coefficients are weakly significant at the 10 per cent level). Note, however, that jointly these variables are statistically significant (F-statistic = 1.82; p-value = 0.05). In Column 3, we use the dummy for poor working conditions instead of the separate variables, and from this point on, this remains our preferred measure. We indeed believe that what would matter the most in order to observe wage compensations for poor working conditions (i.e., when the worker is able to bargain for such compensation) is the cumulative nature of adverse job conditions, rather than one specific unfavourable situation on the job. We find however that those facing poor working conditions earn about 3.7 per cent lower hourly wages, indicating that compensating differentials are not at work here. Finally, in Column 4, we add the firm-fixed effects. Upon adding these, we find that the association between wages and working conditions is negative but ceases to be significant. This indicates the existence of working condition-based sorting across

firms such that poor working condition jobs are mostly found in firms that tend to also offer low wages.

In Table 4, we estimate unconditional quantile regressions–with the full specification of right-hand side variables as in Column 4 of Table 3–at the following points of the wage distribution: 10th, 25th, 50th, 75th and 90th. We find that the number of financial benefits is positively correlated with wages at the 25th percentile of the wage distribution. On the other hand, those facing poor working conditions earn lower wages at the median and higher points of the distribution, but the coefficients are significant at the 75th and 90th percentiles only. Furthermore, throughout the distribution, those with informal contracts earn lower wages but the coefficients are not statistically significant. Our results on financial benefits and poor working conditions seem to suggest that workers at the bottom of the wage distribution are able to obtain some premium for unfavourable work conditions while for those at the higher wage percentiles, lower financial benefits and poor working conditions are also detrimental to wages. In terms of other controls included in the regression, we find that women are disadvantaged across the wage distribution and the gender wage gap is larger at higher percentiles. This phenomenon, known as the "glass ceiling" effect, is often obtained in emerging and developing countries, including using matched worker-firm data (Chi and Li, 2008; Nordman and Wolff, 2009; Cardoso et al., 2016). There are generally positive and significant returns to college education, except at the 10th and 90th percentiles, while the reverse is observed for high school education that is positively and significantly valued from the 10th to the median percentiles.

In Table 5, we explore the avenue of the channel through which the worker was hired, with the idea that the hiring channel may differentially affect the relationship between working conditions and wages. We do this by creating two variables. The first is whether the employee was hired through formal channels: a variable *formal hire* takes a value 1 if the job was obtained through an employment agency, door to door visits, responding to job advertisements, and 0 otherwise. The second is whether the worker got the job through a connection to the owner/manager or another worker within the firm. Using the formulation of Larsen et al. (2011), we create a variable called *manager tie* that takes a value 1 if the worker got a job through the owner/manager whom they are related to or friends with, and 0 otherwise. Similarly, we create *worker tie* that takes a value 1 if the worker got a job through a relative, friend or acquaintance who was also an employee at the firm, and 0 otherwise. Pooling data from the three survey rounds, we find that 27 per cent of employees found the job through a manager tie and 45 per cent through a worker tie.

In Column 1 of Table 5, we interact *formal hire* with the vector of employment terms and poor working conditions. We find that formally hired employees with an informal contract earn less than informally hired employees. In Column 2, we interact *manager tie* and *worker tie* with working conditions variables. Upon doing so, we find that those employed based on their connection to the manager as well to a worker earn more on an informal contract than those without a manager or worker tie. This is consistent with Column 1 wherein formally hired workers fared worse with an informal contract. This is in contrast to the findings of Larsen et al. (2011) who find that the manager tie is more important than the worker tie in wage determination. Here, we observe that both worker and manager ties are able to possibly provide workers with some additional wage bargaining power when they are informally hired.

4.2 Decomposition analyses

Up till now, we relied on the potentially restrictive assumption that the returns to covariates are the same in 'poor' and 'non-poor' working conditions jobs since we estimated wage equations on samples of workers working in both types of jobs. We now relax this assumption and observe the determinants of wages across jobs defined by the dummy for *poor working conditions*. Using a wage

decomposition allows us to discern how much of the mean 'working conditions wage gap' may be due to differences in workers' characteristics across jobs, and how much of it is due to the price the market pays for workers' attributes in these different jobs. We use decomposition proposed by Neumark (1988). The decompositions are performed on the pooled years sample, and also year-wise. We rely on nominal wages instead of real wages when we turn to the three specific years.

Before discussing the decompositions, we describe the distribution of workers across the two types of jobs. In the four panels of Figure 1, we present kernel density graphs of log hourly wages across workers facing 'poor' or 'non-poor' working conditions (WC) for the pooled sample, and then for each year separately. Kolmogorov-Smirnov tests for the equality of distributions cannot reject the null for the 2011 sample (p-value = 0.8) but for the pooled sample and for 2013 and 2015, the density functions are not equal (Kolmogorov-Smirnov tests with p-values = 0.049, 0.079 and 0.002, in the pooled sample, 2013 and 2015 respectively). This justifies looking at yearly decompositions.

The results of the decompositions for 2013 and 2015 are reported in Table 6. As expected, the raw wage differential is negligible in the pooled sample, and insignificantly different from zero in 2011. There is then nothing to be decomposed in these two samples. The raw differentials are in contrast somewhat sizable and significant in 2013 and 2015, respectively 6.1 and 7.6 per cent, in favour of non-poor WC job workers. For these two years, we then proceed with decomposing the raw gaps using as explanatory variables the employees' characteristics and terms of employment, and then we add the firm-fixed effects.

Interestingly, while the explained share of the gap (the differences in workers' characteristics and terms of employment) is dominant in 2013 (65 per cent), this explained share is much smaller in 2015 (40 per cent). We then conclude that most (if not all) of the increase in the WC wage gap between 2013 and 2015 (from 6.1 to 7.6 per cent) might be attributed to unobserved characteristics of the workers and/or of their jobs. Adding the firm-fixed effects to the decompositions further dramatically reduces the unexplained portion of the WC gap in 2015 from 60 per cent to 16.6 per cent, leading us to explain over 80 per cent of the WC wage gap. By contrast, adding firm-fixed effects does not increase the explained component of the gap in 2013, in fact it leads to a marginal drop in the explained share. This further reveals that most of the heterogeneity that was potentially increasing the WC gap between 2013 and 2015 was that of the firms, and much less that of the workers, perhaps reflecting changing firm wage policies between the two years.

5   Concluding comments

In this paper, our objective was to examine the existence of compensating wage differentials for workers in vulnerable jobs and those facing poor working conditions in SMEs in Viet Nam. Descriptive statistics first show that there is some heterogeneity in terms of the prevalence of vulnerable and unfavourable working conditions across the survey years. We find a decline over time in the share of employees with an informal contract, and an increase in the number of financial benefits offered by employers. There is also significant increase in the share of employees reporting overall poor working conditions. Looking at the formality divide at the firm level, an interesting finding is that adverse work environments seem to be also largely widespread in formal and informal sector enterprises.

Wage regressions show that there are no clear compensating mechanisms for poor working conditions in terms of wages in these Vietnamese SMEs, thus rejecting the compensating differentials theory. In fact, evidence from quantile regressions shows that employees above

median wage levels are not compensated for unfavourable working conditions and even suffer a wage penalty. This result of varying effects across the wage distribution appears puzzling at first sight. Indeed, one may expect to observe the reverse pattern assuming that workers at the upper tail of the wage distribution are usually more prone than their low-wage counterparts to negotiate for higher wages when their work environment is unfavourable. But the firm's ability to compensate the worker for bearing poor working conditions also depends on the degree of competition in the market for labour (Fernández and Nordman, 2009). If labour supply outstrips demand, which might only be the case in some parts of the pay ladder, the employer may not need to pay a premium for exposure to bad working conditions. This is one of the interpretations we could make here: highly qualified workers willing to enter the labour market may in fact be largely queuing for a formal sector job, perhaps creating a mismatch between qualifications and offered jobs if enterprise demand is weak and decreasing reservation wages of high ability workers. In such cases, poor working conditions jobs at the higher ends of the formal sector would largely correspond to poorly paid jobs, all else being equal. Finally, another interpretation of the absence of penalty at the bottom of the wage distribution relies on the existence of some wage rigidity in the lower formal labour market segment. There, subsistence wages would prevent employers from paying poorly even in unfavourable work environment compared to jobs without such attributes. The new Labour Code and Trade Union law of 2012–13, being part of the ongoing efforts in Viet Nam to modernize labour market governance in line with international standards, may have provided a more favourable environment for workers to negotiate their own terms and conditions of employment through collective bargaining (ILO, 2015).

Upon estimating mean decompositions of wage gaps based on working conditions, we find that the explained share of the gap is dominant in 2013 (65 per cent) and is much weaker in 2015 (40 per cent). Once firm-fixed effects are added in these decompositions, due to the matched worker-firm structure of the data, the working conditions wage gap is almost entirely explained by the conjunction of worker, job and firm characteristics in 2015 (83 per cent), in contrast to the previous survey year of 2013 where the explained share remained almost constant upon adding firm controls (63 per cent). Hence, we conclude that most of the increase in the working conditions wage gap between 2013 and 2015 is on account of increased unobserved firm heterogeneity in 2015. This then opens the door for additional interpretations, possibly changes over time in firm wage policies, perhaps due to the implementation of the new Labour Code in 2013. This paper does not consider these further aspects, but this is an avenue for further research.

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Figure 1. Density of Log hourly wages across workers facing 'poor' or 'non-poor' working conditions
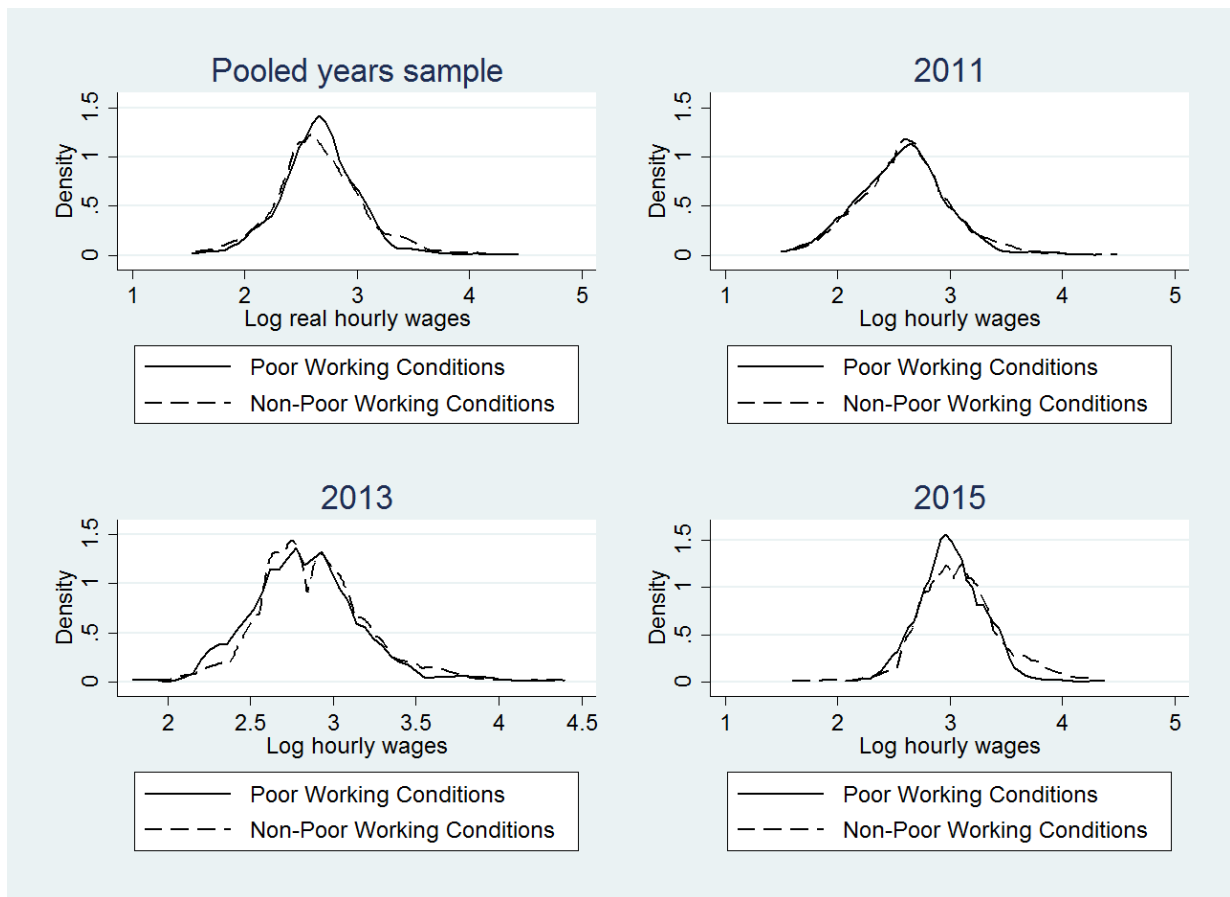
Notes: *Poor working conditions* takes a value 1 if the sum of the adverse working conditions is higher than the pooled or yearly sample median, 0 otherwise. For year-specific graphs, we use log of nominal hourly wages and for the pooled years graph, we use the log of real hourly wages.

Source: Authors' calculations using Viet Nam Small and Medium Enterprises Survey for 2011–15.

Table 1: Descriptive statistics

	2011 Mean (SD)	2013 Mean (SD)	2015 Mean (SD)
Employment & working conditions			
Informal contract	0.446	0.409	0.382
	(0.497)	(0.492)	(0.486)
Financial benefits	3.418	4.115	4.076
	(3.585)	(3.722)	(3.503)
No OSH training	0.445	0.569	0.682
	(0.497)	(0.495)	(0.466)
Problem: air quality	0.393	0.540	0.461
	(0.489)	(0.499)	(0.499)
Problem: fire hazard	0.339	0.471	0.411
	(0.474)	(0.499)	(0.492)
Problem: heat	0.582	0.633	0.617
	(0.494)	(0.482)	(0.486)
Problem: lighting	0.221	0.278	0.293
	(0.415)	(0.448)	(0.456)
Problem: noise	0.452	0.505	0.461
	(0.498)	(0.500)	(0.499)
Problem: waste disposal	0.121	0.155	0.130
	(0.327)	(0.362)	(0.336)
Problem: water pollution	0.0919	0.0499	0.0439
	(0.289)	(0.218)	(0.205)
Poor working conditions	0.300	0.448	0.486
	(0.459)	(0.498)	(0.500)
Employee characteristics			
Female	0.397	0.408	0.404
	(0.490)	(0.492)	(0.491)
Married	0.796	0.838	0.785
	(0.403)	(0.368)	(0.411)
No education/primary	0.0483	0.0456	0.0355
	(0.215)	(0.209)	(0.185)
Secondary education	0.298	0.309	0.329
	(0.458)	(0.462)	(0.470)
High school education	0.411	0.328	0.295
	(0.492)	(0.470)	(0.456)
Vocational education	0.0306	0.104	0.0944
	(0.172)	(0.306)	(0.293)
College education	0.212	0.214	0.246
	(0.409)	(0.410)	(0.431)
Prior experience	6.723	6.388	6.811
	(6.716)	(6.190)	(6.195)
Tenure	5.583	6.005	6.889
	(4.595)	(4.982)	(5.329)
Manager	0.0836	0.103	0.0738
	(0.277)	(0.304)	(0.262)
Professional Worker	0.101	0.111	0.0953
	(0.302)	(0.314)	(0.294)
Office Worker	0.0860	0.0987	0.107
	(0.281)	(0.298)	(0.310)
Sales Worker	0.0777	0.0727	0.0720
	(0.268)	(0.260)	(0.259)
Service Worker	0.0377	0.0456	0.0346
	(0.191)	(0.209)	(0.183)
Production worker	0.614	0.569	0.617
	(0.487)	(0.495)	(0.486)
Observations	849	922	1070

Notes: This table reports means and standard deviations in parentheses for each year of data included in the study. The sample is limited to employees who report earning a monthly wage. The minimum and maximum values for the *financial benefits* variable are 0 and 9 respectively. *Poor working conditions* takes a value 1 if the sum of the adverse working conditions is higher than the pooled sample median, 0 otherwise.

Source: Authors' calculations using Viet Nam Small and Medium Enterprises Survey for 2011–15.

Table 2: Employment and working conditions: formal and informal firms

	Informal firms	Formal firms
Informal contract	0.916	0.381
	(0.279)	(0.486)
Financial benefits	0.487	4.087
	(1.305)	(3.605)
No OSH training	0.649	0.571
	(0.479)	(0.495)
Problem: air quality	0.519	0.463
	(0.501)	(0.499)
Problem: fire hazard	0.331	0.413
	(0.472)	(0.493)
Problem: heat	0.513	0.617
	(0.501)	(0.486)
Problem: lighting	0.182	0.272
	(0.387)	(0.445)
Problem: noise	0.448	0.474
	(0.499)	(0.499)
Problem: waste disposal	0.0909	0.138
	(0.288)	(0.345)
Problem: water pollution	0.0325	0.0618
	(0.178)	(0.241)
Poor working conditions	0.481	0.415
	(0.501)	(0.493)
Observations	154	2687

Notes: This table reports means and standard deviations in parentheses. The sample is limited to employees who report earning a monthly wage. The minimum and maximum values for the *financial benefits* variable are 0 and 9 respectively. *Poor working conditions* takes a value 1 if the sum of the adverse working conditions is higher than the sample median, 0 otherwise. Firms are defined as being formal if they have an Enterprise Code Number (ECN) or if they have a Business Registration Certificate (BRC) and a tax code.

Source: Authors' calculations using Viet Nam Small and Medium Enterprises Survey for 2011–15.

Table 3: Mean wage regressions (pooled sample)

	(1)	(2)	(3)	(4)
Female	-0.104***	-0.103***	-0.109***	-0.042*
	(0.017)	(0.017)	(0.017)	(0.022)
Married	0.064***	0.059***	0.063***	0.028
	(0.021)	(0.020)	(0.021)	(0.023)
Secondary education	0.051	0.043	0.040	0.094*
	(0.034)	(0.034)	(0.035)	(0.054)
High school education	0.094***	0.078**	0.073**	0.111**
	(0.035)	(0.036)	(0.036)	(0.049)
Vocational education	0.128***	0.107**	0.100**	0.131**
	(0.044)	(0.045)	(0.045)	(0.062)
College education	0.239***	0.213***	0.206***	0.208***
	(0.044)	(0.044)	(0.044)	(0.057)
Prior experience	-0.000	0.000	-0.000	0.004
	(0.004)	(0.004)	(0.004)	(0.005)
Prior experience squared	0.000	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Tenure	0.010*	0.009*	0.009*	0.013**
	(0.005)	(0.005)	(0.005)	(0.006)
Tenure squared	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Informal contract		-0.015	-0.016	-0.024
		(0.027)	(0.027)	(0.042)
Financial benefits		0.005	0.005	0.004
		(0.004)	(0.004)	(0.008)
No OSH training		-0.037		
		(0.024)		
Problem: air quality		0.030*		
		(0.018)		
Problem: fire hazard		-0.003		
		(0.019)		
Problem: heat		0.008		
		(0.020)		
Problem: lighting		-0.045*		
		(0.024)		
Problem: noise		-0.009		
		(0.019)		
Problem: waste disposal		-0.008		
		(0.026)		
Problem: water pollution		-0.066		
		(0.042)		
Poor working conditions			-0.037*	-0.033
			(0.022)	(0.033)
Observations	2847	2841	2841	2841
R^2	0.237	0.247	0.242	0.600
Firm fixed effects	No	No	No	Yes

Notes: This table reports marginal effects from an OLS regression on the pooled sample for 2011, 2013 and 2015. The dependent variable is log of real hourly wage. Standard errors in parentheses clustered at the firm level. The sample is limited to employees who report earning a monthly wage. All regressions include year and occupation dummies. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations using Viet Nam Small and Medium Enterprises Survey for 2011–15.

Table 4: Unconditional Quantile Regressions (with firm fixed effects)

	Q10	Q25	Q50	Q75	Q90
Female	0.009	-0.044**	-0.043**	-0.073***	-0.130***
	(0.035)	(0.020)	(0.017)	(0.023)	(0.038)
Married	0.122**	0.032	0.001	-0.001	0.048
	(0.051)	(0.024)	(0.022)	(0.029)	(0.038)
Secondary education	0.121	0.065	0.083*	-0.002	-0.008
	(0.131)	(0.055)	(0.046)	(0.061)	(0.072)
High school education	0.144	0.088	0.101**	0.010	-0.028
	(0.134)	(0.056)	(0.047)	(0.060)	(0.071)
Vocational education	0.111	0.106*	0.122**	0.065	-0.060
	(0.146)	(0.063)	(0.054)	(0.071)	(0.092)
College education	0.131	0.123**	0.207***	0.147**	0.131
	(0.143)	(0.061)	(0.055)	(0.071)	(0.092)
Prior experience	-0.000	0.004	0.007**	0.010*	0.005
	(0.008)	(0.004)	(0.004)	(0.005)	(0.008)
Prior experience squared	0.000	-0.000	-0.000	-0.000*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tenure	0.019**	0.011**	0.014***	0.010*	0.009
	(0.009)	(0.005)	(0.004)	(0.006)	(0.010)
Tenure squared	-0.001**	-0.000*	-0.000**	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Informal contract	-0.085	-0.044	-0.028	-0.045	-0.010
	(0.064)	(0.037)	(0.033)	(0.042)	(0.063)
Financial benefits	0.013	0.010*	0.008	-0.002	-0.009
	(0.009)	(0.005)	(0.005)	(0.007)	(0.009)
Poor working conditions	0.011	0.017	-0.003	-0.092***	-0.077*
	(0.044)	(0.022)	(0.021)	(0.032)	(0.042)
Observations	2841	2841	2841	2841	2841

Notes: This table reports marginal effects from unconditional quantile regressions. Dependent variable is log of real hourly wage. Bootstrapped standard errors based on 500 replications are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The sample is limited to employees who report earning a monthly wage. All regressions include firm fixed effects, year dummies and occupation dummies.

Source: Authors' calculations using Viet Nam Small and Medium Enterprises Survey for 2011–15.

Table 5: Mean Wage Regressions, By Hiring Channels

	(1)	(2)
Informal contract	0.018	-0.164[**]
	(0.047)	(0.064)
Financial benefits	0.008	-0.007
	(0.008)	(0.011)
Poor working conditions	-0.023	-0.049
	(0.032)	(0.056)
Formal hire	0.133[*]	
	(0.080)	
Formal hire*Informal contract	-0.181[**]	
	(0.073)	
Formal hire*Financial benefits	-0.014	
	(0.010)	
Formal hire*Poor working conditions	-0.027	
	(0.051)	
Manager tie		-0.151[*]
		(0.086)
Worker tie		-0.121
		(0.084)
Manager tie*Informal contract		0.164[**]
		(0.080)
Manager tie*Financial benefits		0.019
		(0.012)
Manager tie*Poor working conditions		0.060
		(0.059)
Worker tie*Informal contract		0.192[**]
		(0.078)
Worker tie*Financial benefits		0.012
		(0.010)
Worker tie*Poor working conditions		0.007
		(0.054)
Observations	2833	2833
R^2	0.602	0.603

Notes: This table reports marginal effects from OLS regressions. Dependent variable is log of real hourly wage. Standard errors in parentheses clustered at the firm level. [*] $p < 0.10$, [**] $p < 0.05$, [***] $p < 0.01$. The sample is limited to employees who report earning a monthly wage. All regressions include worker characteristics (gender, marital status, education dummies, experience and tenure), firm fixed effects, year dummies and occupation dummies.

Source: Authors' calculations using Viet Nam Small and Medium Enterprises Survey for 2011–15.

Table 6: Neumark decompositions of log hourly wage gaps by working conditions (WC) (difference between 'poor' WC and 'non-poor' WC)

	(1) Raw differential	(2) Unexplained	(3) Explained	(4) % unexplained	(5) % explained
Pooled years	0.006				
2011	0.017				
2013 Employee characteristics & Employment terms	0.061**	0.021	0.040	34.4	65.6
Adding firm fixed effects		0.022	0.039	36.5	63.5
2015 Employee characteristics & Employment terms	0.076***	0.046	0.031	59.8	40.2
Adding firm-fixed effects		0.013	0.064	16.6	83.4

Notes: Year-wise Neumark decompositions stem from log hourly *nominal* wage equations shown in Columns 3 and 4 of Table 3 but without the poor working condition dummy. The sample is limited to employees who report earning a monthly wage. All regressions include employee characteristics (gender, marital status, education level, experience and tenure), year dummies, and occupation dummies. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations using Viet Nam Small and Medium Enterprises Survey for 2011–15.