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**The effects of minimum wage hikes on
employment and wages in Viet Nam's micro,
small, and medium enterprises**

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Abstract: Very little is known about the extent to which wage and employment offsetting behaviours change by firm size to mitigate the detrimental effects of minimum wage regulation. Do micro establishments react more aggressively to minimum wage shocks compared to small and medium establishments? To answer this question, this paper examines the impact of minimum wage hikes on employment and wages in Viet Nam’s micro enterprises, and small and medium enterprises (SMEs), respectively. In particular, I exploit the differences in the rates of increases in minimum wages across minimum wage regions to identify the effects of minimum wage changes. The findings indicate that minimum wage has greater employment effects on SMEs, but alters employment structure of micro firms.

Keywords: minimum wage, employment, wage

JEL classification: J38

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1 Introduction

Most firms in the manufacturing sector of the Viet Nam economy are micro, small, and medium in size. In 2011, 40.6 per cent of the 52,587 enterprises had between 0 and 9 employees (micro), 53.8 per cent had between 10 and 299 employees (small and medium), and only 5.6 per cent had 300 employees and more (large). Among these three classes, the first two firm types provided 41 per cent of the employment share of the whole economy. Tran et al. (2008) provide evidence that micro, small, and medium establishments have formed the backbone of Viet Nam's economy, especially in the transition from a centrally planned economy to a market-oriented one. Given its importance, how minimum wage affects micro, small, and medium enterprises is a hotly debated topic.

The purpose of this paper is to examine the impact of minimum wage hikes on employment and wages in Vietnamese micro enterprises, and in small and medium enterprises (SMEs). My main contributions are twofold. First, I explore the differences in the effect of minimum wage changes on employment and wages across firms with different employment sizes—micro firms and SMEs—in a developing country setting. Second, I provide more detailed evidence of the effects of minimum wage changes in Viet Nam than in the existing studies (Nguyen 2013, 2014), using employer–employee matched data.

Among the issues raised by minimum wage policy, none is as controversial as its effect on employment and wages. The literature on the economic effects of minimum wage regulation is numerous. However, the available literature is mostly based on developed countries (Hamermesh 2002; Gindling and Terrell 2004) where the impact of minimum wages is generally analysed using a competitive labour market model and the imposition of a binding minimum wage certainly leads to disemployment effects. Furthermore, the empirical evidence is mixed. Some find negative effects on employment, as predicted by the theory (Neumark and Wascher 1992; Brown 1999; Fajnzylber 2001; Alatas and Cameron 2008). Others find positive or insignificant effects (Card and Krueger 1994; Lemos 2006; Dube et al. 2010; Allegretto et al. 2011).

For developing countries where the labour market is characterized as dual, an alternative approach is required (Suryahadi et al. 2003). Minimum wage legislation in developing country labour markets is usually thought to have incomplete cover. As a result, there is a large proportion of workers whose incomes are most likely to fall below the minimum. The 'ripple effect' of having a minimum wage predicts that the effect declines with the distance from the minimum for workers who would have been above this wage legislation. This effect increases with the distance for those below the minimum. Consequently, empirical evidence indicates that the wage compression and employment effects are considerably stronger in developing countries than they are in developed countries (Lemos 2006).

Most of the literature for developing countries is concerned with the direct effects of minimum wages on wage rates, fringe benefits, and employment. Harrison and Scorse (2010) use Indonesian firm-level data to look at wages and employment in foreign-owned textile, footwear, and apparel plants. In response to activist pressure, targeted plants increase their real wages by 10 to 20 per cent. No employment effects have been detected. Fang and Lin (2015) examine the impact of minimum wages on employment levels of potentially affected workers in China. Their findings indicate significant negative employment effects on females, young adults, and low-skilled workers. The most relevant study for this paper is Long and Yang (2016) who examine the impact of minimum wages on employment and fringe benefits (coverage pension, insurance) of affected

firms in China. Consistent with economic theory, they find that firms affected by regulation attempt to reduce their expenditures on fringe benefits. Interestingly, adverse employment effects vary across firm size. For large firms, minimum wages have a larger effect on the size of employment but a smaller effect on the structure of workers.

While the literature is abundant in other developing countries (China, Indonesia), studies on the economic impacts of minimum wages in Viet Nam are relatively few in number. Using the basic difference-in-difference framework, Nguyen (2013) finds statistically significant negative employment effects in formal sectors but no evidence of adverse effects on overall employment. Nguyen (2014) assesses employment-level effects from a fixed effects approach. Using Viet Nam Enterprise Censuses, he finds a negative employment demand elasticity which is around 0.1 per cent. A positive effect on wages is also concluded in Nguyen (2014). However, only average monthly wages per worker are available in the Viet Nam Enterprise Censuses.

The contribution of this paper is to explore how firm size differentiates in response to minimum wage shocks. Even though both neoclassical and institutional labour economists have offered explanations of why larger employers pay more than smaller employers, the literature on why employers of different sizes respond very differently to the same wage shocks is not fully explored.

Specifically, I examine the impact of minimum wage hikes on employment and wages in Vietnamese micro enterprises and, separately, in small and medium enterprises (SME), exploiting a panel dataset from the 2011, 2013, and 2015 surveys of the Viet Nam Small and Medium Manufacturing Enterprise Survey (SME Survey). In this study, employment effect is examined by implementing the standard fixed effect regression. Different regions of Viet Nam might face heterogeneous economic shocks that are correlated with changes in the minimum wage. As a counter measure, time fixed effects are allowed to vary across geographical regions. Wage effects are examined by using the ‘employee’ module of the SME survey. In this module, around five individual workers from all job categories of randomly selected firms are interviewed. As a result, a matched employer–employee data can be formed. This paper, therefore, provides a more precise measure of effects on wages. With these results, I hope I can advance understanding of the labour market in the country.

I find evidence that overall employment falls following an increase in minimum wages which are driven by a decrease in full-time regular workers. The disemployment impact is larger and highly statistically significant for SMEs. However, micro firms realign the marginal product of labour with wages by substituting part-time workers for their full-time counterparts. Contrary to expectations, I find little evidence that minimum wage increases in the period 2011–15 raised the wages in SMEs. However, negative effects on wages have been detected in micro firms.

The rest of the paper is structured as follows. In section 2, I discuss the background of minimum wage regulation in Viet Nam. Section 3 introduces the data and the empirical strategy. Section 4 provides estimated results. Section 5 offers some discussion and concluding remarks.

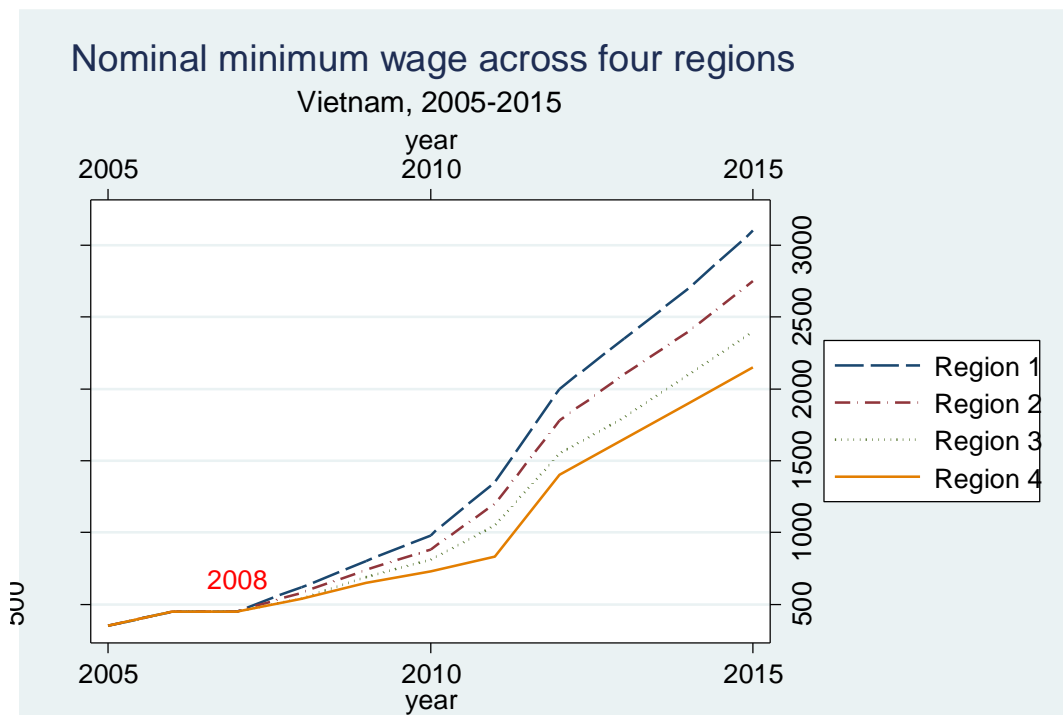
2 Minimum wage regulations in Viet Nam

2.1 Minimum wage: background

In the early 1990s, the Vietnamese government established a myriad of minimum wages differentiated by legal status (foreign and domestic firms) and by region. For domestic firms, minimum wages were regulated on a national basis until 2008. Since January 2008, there have been different wage rates covering four regions, ranked according to socio-economic development level. Minimum wage regions are groupings of districts across provinces. I exploit the differences in the rates of increases in minimum wages across regions to identify the effect of minimum wage changes. These minimums apply to all firms and are based on the cost of living of employees who are untrained and do the simplest jobs under normal working conditions.

In Viet Nam, all workers are legally entitled to a minimum wage irrespective of sex, race, or ethnicity. The minimum wage regulation was first revised in 1997, and since then there have been almost annual changes. Figure 1 presents the monthly nominal minimum wage for domestic firms in Viet Nam from 2005 to 2015. Region 1 is largely urban, while most of Region 4 is rural. The cost of living is consequently higher in Region 1 than it is, on average, in Region 4, reflected by the lower minimum wage in Region 4. Since the intended purpose of this wage policy is to compensate for the overall cost of living, the rates of increases in regional minimum wages were greatest for the highest-developed regions.

Figure 1: Nominal minimum wage in Vietnamese domestic firms



Note: Thousand VND.

Source: Vietnam Government Regulations (2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014).

As shown in Figure 1, nominal minimum wages have experienced rapid growth during the period analysed (2010–15). In particular, the average increasing rate (25 per cent) is highest in Region 1 and lowest (23 per cent) in Region 4. These figures are much larger than the increasing rates during the previous ten-year period.

2.2 Determinants of minimum wages

In Viet Nam, the statutory minimum wage was set by the government without formal consultation with unions and employers' representatives. In fact, the tripartite setting was not enforced until the establishment of the National Wage Council in 2013 (ILO 2014). Before 2013, these social partners (unions and employers' representatives) had taken an indirect stake in minimum wage negotiations and recommendations. The government consulted them on several aspects of minimum wages. However, the final decision was made autonomously by the government (Dang 2012). National authorities have to rely on a number of indicators to determine this legal wage floor. According to Viet Nam Labour Law (Code 92, 1994) minimum wage adjustments were made to compensate for changes in commodity prices, high economic growth rates, or to adjust to state budget constraints. This endogenous nature poses important challenges in measuring the impact of minimum wages.

In this section, I identify the sources of wage policy variations in Viet Nam. Since minimum wage differs by four minimum wage regions, ideally one would like to have region-specific detailed macroeconomic indicators. However, the data are only available at the provincial level, whereas a province can include districts in different minimum wage regions. Therefore, the calculation in this section focuses on average minimum wages at the province level. Let W_{kt} represent the measure of the average minimum wage in province k at time t . I utilize data from the General Statistics Office of Viet Nam from 2005 to 2013 to estimate the following equation:

$$\ln(W_{kt}) = \tau_t + \varphi_k + Q_{k,t-1}\phi + \varepsilon_{kt}$$

Where τ_t is year fixed effect and φ_k is province fixed effect. The vector $Q_{k,t-1}$ is a set of lagged time-varying province-level economic variables. Explanatory variables include logarithm of provincial gross domestic product (GDP), GDP per capita, and labour force to population ratio.¹

Table 1 shows the estimated results of minimum wage determinants. Minimum wages tend to increase more in regions with lower GDP per capita. As minimum wages are used as a key social policy in Viet Nam, this trend might come from the concern of the government to secure adequate incomes for the poorest workers. It is also reasonable from an economic point of view. Low-wage workers are much more likely to spend extra earnings. Raising their wages can certainly boost economic activity. Similarly, having larger proportions of individuals aged over 15 years and currently in the labour force, also drives up the minimum wage.

Table 1 indicates that omitting time-variant economic and demographic control variables from incidence studies would bias the estimated effects of the policy. Some studies try to address this problem by using politically based instrumental variables (Lemos 2004). Unfortunately, there are unlikely to be such instrumental variables in a single political party in Viet Nam. The next section discusses the identification strategy to control for these time-variant macroeconomic conditions.

¹ GDP is at current price and indexed by VND billion. GDP per capita is at current price and indexed by VND billion per person. Labour force ratio is the ratio of working population aged 15 to 59 over total population.

Table 1: Determinants of minimum wages

	(1)	(2)	(3)
GDP	0.24508 (0.18847)		
GDP per capita		-9.97167* (5.30973)	
Labour ratio			2.69093 (1.92086)
Adjusted R_squared	0.77150	0.77455	0.85744
Obs	289	289	349

Note: All specifications include province and year fixed effects. Due to the availability of the data, specifications (1) and (2) include data for years 2005 to 2010 while specification (3) regresses on data for years 2007 to 2013. In all specifications, Ha Tay is dropped from the dataset. Significance levels are denoted as follows: *** 1 per cent, ** 5 per cent, * 10 per cent.

Source: General Statistics Office of Vietnam (2010, 2013).

3 Data and empirical strategy

3.1 Data

This study uses the Vietnamese Small and Medium Manufacturing Enterprise Survey (SME Survey), conducted by the United Nations University World Institute for Development Economics (UNU-WIDER) in collaboration with the Central Institute for Economic Management (CIEM) and the Institute of Labor Science and Social Affairs (ILSSA) of Viet Nam. The survey was conducted in 2005, 2007, 2009, 2011, 2013, and 2015 and covers up to 2,500 enterprises in the ten provinces with a high percentage of repeat firms. The SME survey consists of a main employer questionnaire, an employee module, and economic accounts. This study utilizes the employer questionnaire and the employee module of the SME survey rounds of 2011, 2013, and 2015.

3.1.1 Employer data

Employer data were based on detailed personal interviews with individual company owners or managers. The target population for the surveys included private firms with fewer than 300 employees. Table 2 shows that about half of the enterprises manufacture food products, wood products, and fabricated metal products. Regarding the location, compared with micro firms, more SMEs are located in high minimum-wage regions (Regions 1 and 2).

With the limited availability of data, this survey is considered the only multi-round survey on SMEs in Viet Nam. Each survey round was conducted in June/July of each year but the data refer to the previous year. Therefore, detailed information on total employees and the regular workforce in the years 2004, 2006, 2008, 2010, 2012, and 2014 can be detected. Because the setting of minimum wages in the private sector has been a regional regulation since 2008, data prior to 2008 were disregarded to increase the validity of regression results. I exclude firms that moved across provinces to avoid potential biases caused by endogenous location choice of the firm which arises from changes in minimum wages. Also, since the definition of minimum wage regions changes over time, some provinces include districts whose minimum wage regions changed. I keep such provinces in the sample because I have already controlled for factors specific to such provinces by including firm fixed effects.

Table 2: Characteristics of micro enterprises and SMEs

	Micro enterprises		SMEs	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Minimum region				
Region 1	1,733	39.82	1,300	61.06
Region 2	584	13.42	371	17.43
Region 3	1,310	30.1	356	16.72
Region 4	725	16.66	102	4.79
Line of business				
Food products	1,615	37.24	351	16.58
Fabricated metal products	865	19.94	249	11.76
Wood and wood products	475	10.95	205	9.68

Note: Frequency and percentage are reported for all regions with a full panel of observations. Line of business is arranged by descending order. Firms that move across provinces are excluded.

Source: 2011, 2013, and 2015 Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) in Viet Nam (UNU-WIDER et al. various years).

Table 3 summarizes statistics on employment structure for each firm size. It shows the average total labour, casual, and regular workforce. Delineating by type of employment, most of the employees in both micro enterprises and SMEs are regular full-time workers. One can also notice important differences by job category of each firm type. The number of production workers is likely to account for one-third of the total regular workers in SMEs. This number is one-half in micro firms.

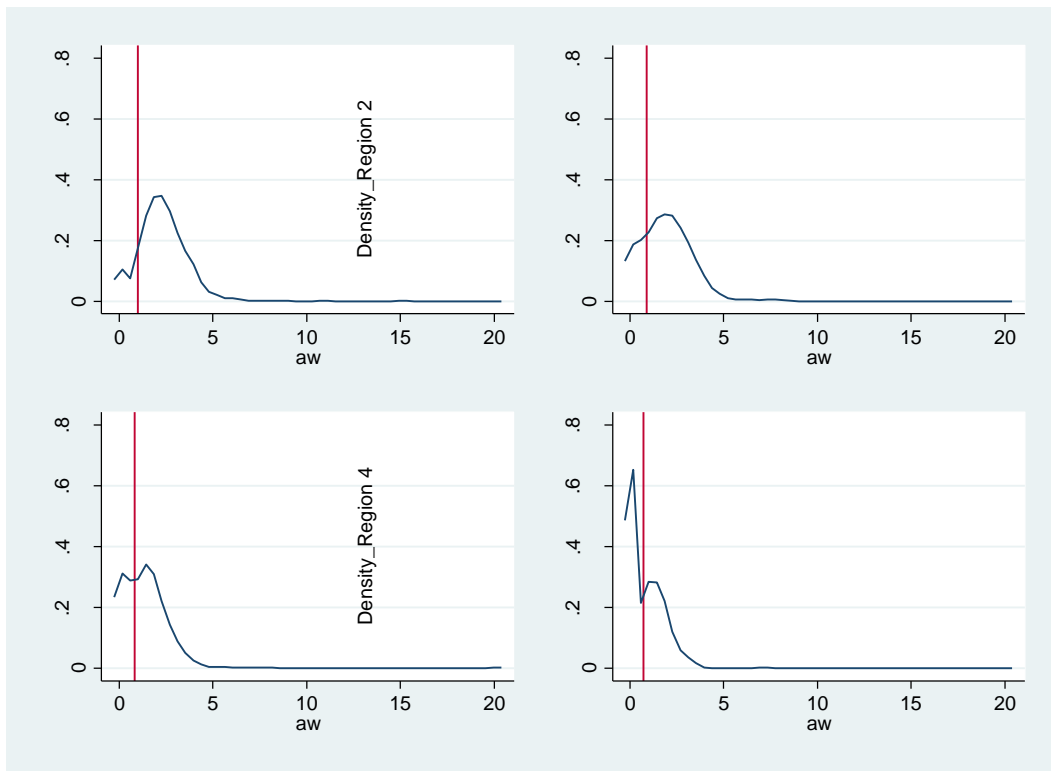
To examine the bindingness of minimum wage in the SME dataset, I also graph the kernel density of the nominal monthly average wage in different minimum wage regions for the year 2010. Figure 2 shows that minimum wage was more binding in Regions 3 and 4 than in Regions 1 and 2.

Table 3: Descriptive statistics—employer data

	Micro	SMEs
Total labour = casual labour + regular labour	4.057 (2.137)	37.24 (42.393)
Casual labour force	.188 (.598)	2.613 (12.776)
Regular labour force	3.929 (2.076)	34.175 (40.456)
<i>By type of employment</i>		
Full-time regular	3.643 (2.105)	32.444 (39.255)
Part-time regular	.286 (.661)	1.731 (8.503)
<i>By job category</i>		
Manager	1.282 (.459)	2.719 (2.408)
Production worker	2.402 (1.763)	25.134 (33.295)
Observation	4,352	2,129

Source: 2011, 2013, and 2015 Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) in Viet Nam (UNU-WIDER et al. various years).

Figure 2: Kernel density of monthly average wage by region in 2010



Source: 2011, 2013, and 2015 Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) in Viet Nam (UNU-WIDER et al. various years).

3.1.2 Matched employer–employee data

I was provided with the matched firm–employee data in which a random identification is created to protect firm and employee identity. Between five and six workers from each firm were interviewed. The interviewed employees change from year to year, therefore, I was unable to follow the same worker over time. In other words, the firm–employee panel is balanced only at the firm level. The information on wages refers to the gross monthly values, including allowances in the survey year. The database also includes information on the previous year’s bonus, job tenure, education, gender, age, and employment status. Most interviewed workers are regular workers. Furthermore, wage is reported by month, week, day, or hour. Because the data on working weeks per month are not available, to refine the data, I restricted the analysis to regular workers who reported their wage unit as monthly.

Table 4: Descriptive statistics: matched employer–employee data

	Micro firms	SMEs
Monthly wage (in thousand VND, survey year)	3,393.07 (1,461.25)	3,856.371 (1,910.432)
Tet bonus (in thousand VND, previous year)	1,191.47 (1,186.331)	2,037.747 (2,421.58)
Job tenure (year)	5.729 (5.166)	6.325 (5.087)
Age	33.911 (9.766)	34.806 (9.566)
Female	356 (28.66%)	1,044 (47.65%)
Male	886 (71.34%)	1,147 (52.35%)
Education		
Secondary school	297 (23.91%)	244 (11.14%)
High school	440 (35.43%)	555 (25.33%)
Technical certificate	169 (13.61%)	222 (10.13%)
College/university/post-graduate	39 (3.14%)	336 (15.34%)
Observation	1,242	2,191

Source: 2011, 2013, and 2015 Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) in Viet Nam (UNU-WIDER et al. various years).

Table 4 shows that job tenure is smaller in micro firms than in SMEs. Furthermore, workers at micro firms are less educated than in SMEs. In particular, 59 per cent of interviewed workers at micro firms are high school graduates and below, while only 3 per cent are degree holders. These figures are 36 per cent and 15 per cent in SMEs, respectively.

3.2 Empirical strategy

This study uses the following dependent variables: (1) total labour: logarithm of total employees recorded at the last day of year t in firm i ; (2) total regular workers: logarithm of those with open-ended or at least a six-month contract or who have worked for at least six months in the enterprise; (3) total regular full-time workers: logarithm of persons working more than 183 days per year, more than 20 days a month, and more than 20 hours per week; and (4) part-time ratio: the ratio of regular part-time workers to total regular workers.

The following equation is used to explore employment effects:

$$y_{ijt} = \beta_0 + \beta_1 MW_{jt} + \omega_{it} + \phi_i + \tau_t + u_{ijt} \quad (1)$$

The dependent variable (y_{ijt}) is the outcome of interest as explained previously. Subscripts i, j and t refer to the firm i in minimum-wage region j and year t . MW_{jt} is the logarithm of monthly minimum wage in real terms (deflated by national GDP deflator), firm fixed effects ϕ_i to capture firm's time-invariant characteristics and year dummies τ_t . In this specification, I assume that most supply shocks come from the aggregate labour market. By including year dummies, I control for these shocks. Furthermore, sector ω_{it} of firm i in year t is added to account for the fact that firms could change sectors to adjust the wage level.

As discussed in section 2, minimum wages are purposefully determined, based on the economic and labour-market conditions. In order to obtain unbiased estimates, it is necessary to control for those conditions. In particular, time effects are allowed to vary across six geographical regions:²

$$y_{ijt} = \beta_0 + \beta_1 MW_{jt} + \beta_2 X_{it} + \omega_{it} + \phi_i + \tau_{gt} + u_{ijt} \quad (2)$$

Additionally, a vector of province-specific time-varying economic and demographical covariates, X_{it} , is added into specification (2). As rough proxy for supply of labour and average employee productivity, the share of working population aged 15–59 and real gross provincial domestic product per capita (provincial GDP per capita)³ are controlled for. Migration is another factor that can make my estimated results on employment spurious which will be discussed further in the next section.

To estimate the effects on wages, the following equation is used:

$$y_{ajt} = \beta_0 + \beta_1 MW_{jt} + \chi_a + w_p + \tau_t + u_{ajt} \quad (3)$$

The dependent variable (y_{ajt}) is the nominal monthly wage (including allowances) or Tet bonus of individual workers. Subscripts a, j , and t refer to the individual a in minimum-wage region j and year t . MW_{jt} is the logarithm of nominal monthly minimum wage χ_a including individual characteristics of workers, including age, education, and their tenure. Provincial dummies w_p and year dummies τ_t are also included.

4 Estimated results

4.1 Total employment

Table 5 shows the elasticity of total employment with respect to the minimum wage. The first column presents the results from canonical fixed effect specifications. It is apparent that minimum wage has a fairly large, strongly statistically significant effect of -0.987 on employment level. This estimated result remains significant even after controlling for macroeconomic covariates (specification 3). However, this significance vanishes and estimated coefficients reduce considerably in magnitude once I account for spatial heterogeneity by varied-time fixed effect (specifications 2 and 4). As in Dube et al. (2011), these results provide evidence that spatial heterogeneity does produce spurious employment effects among studies using the canonical specification.

As illustrated in Figure 1, minimum wage level and its growth rate change by region in descending order. Minimum wage is largest and increases fastest in Region 1, which includes most parts of Hanoi and Ho Chi Minh City. Because the minimum wage is higher in Hanoi and Ho Chi Minh

² The six geographical regions include: Red River Delta, Northern Midlands and Mountain Areas, North Central and Central Coastal Areas, Central Highlands, South East, and Mekong River Delta. Each geographical region contains several adjacent provinces.

³ Real provincial GDP per capita is calculated by dividing nominal GDP per capita to provincial CPI (Year 2010 or Survey year 2011 =1).

City, there is an influx of workers into these cities⁴ and an outflow in other areas. This migration pattern will likely weaken my estimated results which is actually confirmed in specification (2) and (4).

The estimated results in specifications (2) and (4) imply that a 1 per cent increase in real minimum wage leads to a 0.19 per cent decrease in total employment. This estimated coefficient is not statistically insignificant but is close to those found by researchers using similar models in Viet Nam (Nguyen 2014). During the period analysed, the average labour size of firms is around 16 workers. In other words, a 1 per cent increase in the real minimum wage reduces the average labour size by approximately 0.03 workers.

Table 5: Effects of minimum wage increases on total labour

	(1)	(2)	(3)	(4)
Minimum wage	-0.987*** (-0.215)	-0.157 (-0.114)	-0.86*** (-0.233)	-0.196 (-0.133)
Sector	-0.003 (0.004)	-0.006 (0.004)	-0.003 (0.004)	-0.006 (0.004)
Constant	15.502*** (2.95)	12.65*** (3.347)	14.77 (37.25)	82.459 (65.76)
Labour ratio			1.90** (0.746)	-0.76 (1.742)
GDP per capita			0.00 (0.00)	0.00 (0.00)
Firm FE	Y	Y	Y	Y
Year FE	Y		Y	
Geographical region x year FE		Y		Y
Observations	6,470	5,545	6,470	5,545
R-squared	0.93	0.938	0.931	0.938

Note: All are reported in parentheses. Regressions 1 and 2 report the results of equations (1) and (2), respectively. Significance levels are denoted as follows: *** 1 per cent, ** 5 per cent, * 10 per cent.

Source: 2011, 2013, and 2015 Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) in Viet Nam (UNU-WIDER et al. various years).

4.2 Full-time and part-time regular workers

Although the point estimate for total employment provides an overall measure of the policy's effects, it is useful to understand how the minimum wage affects each sub-group of workers. As mentioned in Table 3, total labour includes regular and casual workers. Regular workers are then divided into full-time and part-time workers. Table 6 shows that most employees in Vietnamese SMEs are full-time regular workers. In around 80 per cent of enterprises, more than 75 per cent of the work force is made up of full-time workers. I next examine how estimated results fluctuate when the dependent variables are regular workers and full-time regular workers.

Table 7 contains the main results in this section, i.e. the different impacts of minimum wages on the number of regular workers and full-time regular workers. The point estimate for the number of regular workers is statistically significant and negative at the 1 per cent level in specifications (1) and (3), and only at the 10 per cent level in specifications (2) and (4). When it comes to the effect of minimum wage on the number of full-time regular workers, the point estimates in all four specification are strongly statistically significant. The estimated elasticity for the number of full-time regular workers in specification (4) suggests that a 10 per cent increase in the minimum wage

⁴ The mean of immigration rate (over total population) over the 2005–14 period is 10.61 per cent in Hanoi, 22.42 per cent in Ho Chi Minh City, and less than 8 per cent elsewhere. The mean of emigration rate (over total population) over that period is 6.16 per cent in Hanoi, 8.28 per cent in Ho Chi Minh City, and less than 10 per cent in other provinces.

reduces the number of full-time regular workers by 3.1 per cent which is greater than the estimated results reported in Table 5 for total labour. The results here are in line with those in Gramlich (1976) who found that among teenagers, minimum wages reduce full-time employment.

Table 6: Regular worker ratio and full-time regular worker ratio (over total employees)

	Regular worker ratio	Full-time regular worker ratio
0-50%	3.4	11
50-75%	5	10.7
75-90%	2.9	5.8
90%-100%	88.7	72.5

Source: 2011, 2013, and 2015 Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) in Viet Nam (UNU-WIDER et al. various years).

4.3 Employment effects varied by firm size

In this subsection, I will explore how minimum wage employment effects vary by firm size. Specifically, I use two indicators to measure employment size: total labour and total regular full-time workers. The employment structure is measured through the percentage of regular part-time workers (part-time ratio). As preferred estimation methods, the results of equations (1) and (2), in which macro-economic indicators are added, will be reported.

Tables 8 and 9 show how adverse employment effects vary depending on firm size. I begin with a base specification that includes firm fixed effects and year fixed effects and does not correct for region-specific shocks over time. The estimates of both the number of total workers and the number of total regular full-time workers are statistically significant for both firm types. This significance vanishes for micro firms when time fixed effects are allowed to vary across regions, as shown by OLS estimates in Panel B of Table 8. However, the estimated results on SMEs are still robust after controlling for region-specific shocks. The main conclusion is therefore that the minimum wage has no adverse effect on employment in micro firms between 2010 and 2015. For SMEs, both the number of total labour and the number of total regular full-time workers appear to decrease. Furthermore, negative effects on total regular full-time workers in SMEs tend to outweigh those in micro firms. Specifically, the estimated results on regular full-time workers is -0.54 per cent (statistically significant) for SMEs but only -0.203 per cent for micro firms. This is in line with prior evidence in Long and Yang (2016) who found that the larger the firm, the larger the effect on the size of employment.

What is happening, as can be seen clearly from the rest of Table 8, is that high minimum wages reduce full-time employment substantially, forcing many into part-time employment. If one of the goals of minimum wage legislation is to eliminate sweatshop low-wage jobs, for those working in micro firms the law appears to be counterproductive. The remaining question is what is the incentive for micro firms when replacing full-time regular workers with part-time ones? Large firms demand a higher quality of labour, defined by such observable characteristics as education, as shown in Table 4. Therefore, part-time regular workers are considered a closer substitute for full-time regular workers at micro firms.

4.4 Minimum wage effects on individual monthly wages and bonuses

4.4.1 Effects on wages

I turn next to the effect on wages, reported in Tables 10 and 11. As discussed in section 3.1.2, due to the availability of data, in this section, I restrict the analysis to regular workers whose reported wage unit is monthly. In response to higher minimum wages, firms could reduce worker benefits.

In addition to monthly wages, I therefore also examine how the minimum wage affects workers' bonuses. Even though minimum wage increases lead to negative effects on regular full-time workers in both firm types, the wage effect of each firm type is different.

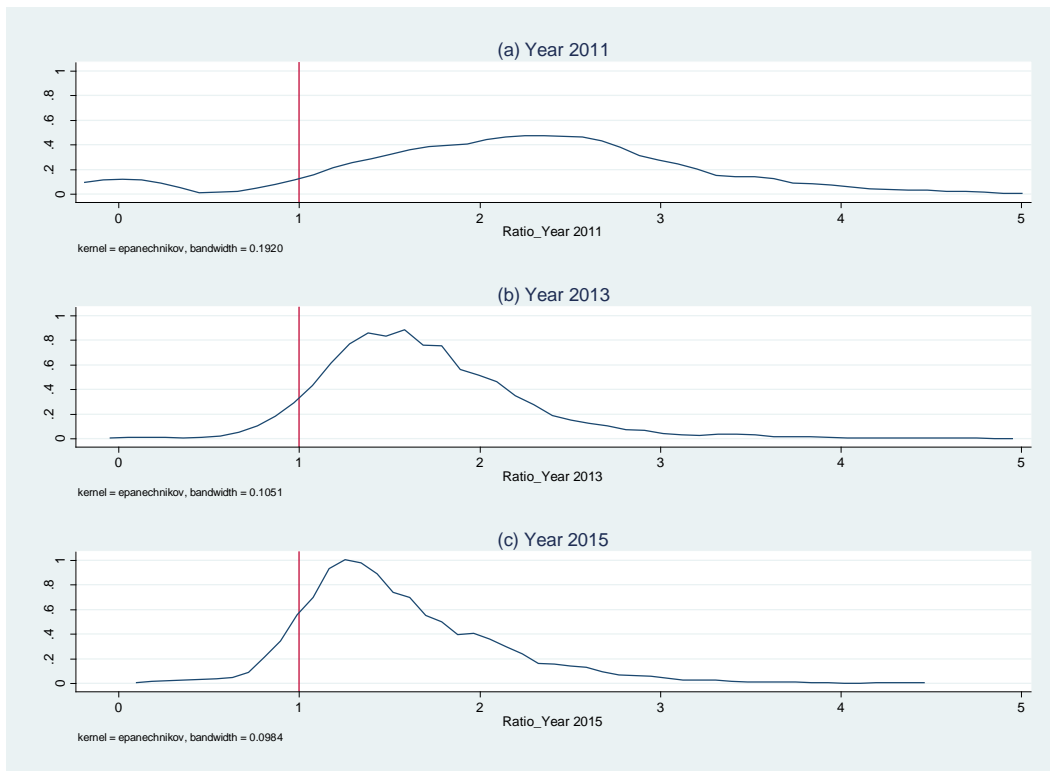
For SMEs, contrary to expectations, I find little evidence that the minimum wage increases in the period from 2011 to 2015 raised wages. The estimated results on individual monthly wages is statistically insignificant and quite close to zero. For micro firms, as a result of changes in employment structure, a negative effect on both monthly wages and bonuses has been confirmed.

4.4.2 Effects on wage distribution

Some studies have shown that minimum wages have an impact not merely on wages around the minimum but on the whole wage distribution (Maloney and Nunez 2001). Figure 3 presents a set of kernel densities of the wage distribution for both micro firms and SMEs, showing how minimum wages have affected the wage distribution over time. In these diagrams, the wage of each worker is measured as a ratio of the worker's monthly nominal wage to the nominal minimum wage applying in the region where the worker is employed. The vertical line at point 1 in each of the graphs represents the minimum wage level.

Ideally, one should observe a control group—a group of workers who are not exposed to minimum wage regulation—to assess the impact of minimum wages. However, some judgement can be made from Figure 3 without observation of this control group. If the minimum wage is not binding, the wage distribution should not have any spike, especially around the minimum wage level. If the minimum wage is fully enforced, the starting point of wage distribution should be at the minimum wage level since no one will earn less than this wage floor. Figure 3 suggests that the reality is between these two extreme scenarios. Furthermore, it is apparent that the spike shifts toward the minimum wage level from 2011 to 2015, indicating that minimum wages become more binding for the majority of workers.

Figure 3: The impact of minimum wages on wage distribution, 2011–15



Note: The vertical line represents the minimum wage. Observations represent the ratio of each worker's nominal wage to the region's nominal minimum wage.

Source: 2011, 2013, and 2015 Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) in Viet Nam (UNU-WIDER et al. various years).

Table 7: Effects of minimum wage increases on regular labour force and full-time regular labour force

	Regular labour force				Full-time regular labour force			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Minimum wage	-0.665*** (0.208)	-0.216* (0.111)	-0.65*** (0.225)	-0.239* (0.129)	-0.779*** (0.215)	-0.36*** (0.12)	-0.84*** (0.23)	-0.31** (0.136)
Sector	-0.002 (0.003)	-0.006 (0.0043)	-0.002 (0.0038)	-0.005 (0.0044)	-0.004 (0.004)	-0.006 (0.004)	-0.004 (0.004)	-0.006 (0.004)
Constant	11.038*** (2.85)	-0.479 (36.22)	10.34*** (3.23)	68.83 (63.014)	12.51*** (2.94)	-50.25 (39.33)	13.703*** (3.37)	-44.37 (67.48)
Labour force ratio			0.789 (0.736)	-1.805 (1.666)			-0.595 (0.802)	-3.14* (1.78)
GDP per capita			0.00 (0.00)	0.00001 (0.00)			0.00 (0.00)	0.00 (0.00)
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y		Y		Y		Y	
Region x time FE		Y		Y		Y		Y
Observations	6,470	5,545	6,470	5,545	6,444	5,522	6,444	5,522
R-squared	0.932	0.939	0.932	0.939	0.928	0.933	0.928	0.933

Note: Regression 1 and 2 report the results of equations (1) and (2), respectively. Significance levels are denoted as follows: *** 1 per cent, ** 5 per cent, * 10 per cent. Data in three years (2010, 2012, 2014), which are extracted from the 2011, 2013, 2015 SME surveys, are utilized.

Source: 2011, 2013, and 2015 Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) in Viet Nam (UNU-WIDER et al. various years).

Table 8: Employment effects of minimum wage increases on micro enterprises

	Panel A: Equation (1)			Panel B: Equation (2)		
	Total labour	Regular full-time	Part-time ratio	Total labour	Regular full-time	Part-time ratio
Minimum wage	-0.462** (0.222)	-0.874*** (0.245)	0.277** (0.125)	0.072 (0.128)	-0.158 (0.144)	0.093 (0.073)
Sector	-0.004 (0.003)	-0.005 (0.004)	0.0007 (0.0018)	-0.0055 (0.004)	-0.004 (0.005)	0.00064 (0.0018)
Constant	6.658** (3.176)	13.444*** (3.518)	-4.221** (1.776)	58.325 (58.068)	-102.9 (63.137)	124.918*** (32.232)
Labour force ratio	1.567** (0.727)	-0.563 (0.815)	0.835** (0.411)	-1.54336 (1.58058)	-3.93** (1.754)	2.199** (0.94)
GDP per capita	0.00** (0.00)	0.00 (0.00)	0.00** (0.00)	-0.00000 (0.00000)	-0.00001 (0.00)	0.00001** (0.00)
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y			
Region x time FE				Y	Y	Y
Observations	4,337	4,313	4,337	3,741	3,720	3,741
R-squared	0.848	0.842	0.523	0.85150	0.847	0.523

Note: Significance levels are denoted as follows: *** 1 per cent, ** 5 per cent, * 10 per cent. Data in three years (2010, 2012, 2014), which are extracted from the 2011, 2013, 2015 SME surveys, are utilized.

Source: 2011, 2013, and 2015 Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) in Viet Nam (UNU-WIDER et al. various years).

Table 9: Employment effects of minimum wage increases on SMEs

	Panel A: Equation (1)			Panel B: Equation (2)		
	Total labour	Regular full-time	Part-time ratio	Total labour	Regular full-time	Part-time ratio
Minimum wage	-0.961** (0.455)	-0.406 (0.461)	-0.116 (0.162)	-0.527** (0.249)	-0.614** (0.249)	0.04652 (0.07755)
Sector	-0.007 (0.009)	-0.008 (0.008)	0.00018 (0.003)	-0.0047 (0.011)	-0.008 (0.01)	0.00089 (0.00262)
Constant	15.639** (6.615)	9.506 (6.761)	0.923 (2.346)	222.792 (149.166)	272.567* (152.925)	-41.61869 (44.667)
Labour force ratio	1.438 (2.32)	-1.657 (2.639)	1.304 (0.814)	-2.758 (4.079)	-1.972 (3.992)	-0.946 (1.322)
GDP per capita	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.00002** (0.00001)	0.00002** (0.00001)	-0.00 (0.00)
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y			
Region x time FE				Y	Y	Y
Observations	2,117	2,115	2,117	1,791	1,789	1,791
R-squared	0.9003	0.904	0.631	0.907	0.905	0.667

Note: Significance levels are denoted as follows: *** 1 per cent, ** 5 per cent, * 10 per cent. Data in three years (2010, 2012, 2014), which are extracted from the 2011, 2013, 2015 SME surveys, are utilized.

Source: 2011, 2013, and 2015 Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) in Viet Nam (UNU-WIDER et al. various years).

Table 10: Effects of minimum wage increases on monthly wage and Tet bonus (micro firms)

	Monthly wage	Tet bonus
Minimum wage	-0.032*** (0.01)	-0.089*** (0.023)
Constant	7.957*** (0.109)	6.894*** (0.244)
Age	0.003** (0.001)	-0.0005 (0.003)
Education	0.014** (0.006)	0.067*** (0.014)
Tenure (at current firm)	0.0046* (0.003)	0.024*** (0.006)
Observations	1,233	947
R-squared	0.23	0.236

Note: All are reported in parentheses. The regression reports the results of equation (3). Significance levels are denoted as follows: *** 1 per cent, ** 5 per cent, * 10 per cent. Estimated result is based on individual wages from the employee data.

Source: 2011, 2013, and 2015 Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) in Viet Nam (UNU-WIDER et al. various years).

Table 11. Effects of minimum wage increases on monthly wage and Tet bonus (SMEs)

	Monthly wage	Tet bonus
Minimum wage	-0.012 (0.012)	0.007 (0.039)
Constant	7.703*** (0.096)	6.192*** (0.312)
Age	0.003*** (0.0008)	0.003 (0.003)
Education	0.038*** (0.003)	0.082*** (0.008)
Tenure (at current firm)	0.0015 (0.0016)	0.01* (0.005)
Observations	2,167	1,931
R-squared	0.332	0.212

Note: All are reported in parentheses. The regression reports the results of equation (3). Significance levels are denoted as follows: *** 1 per cent, ** 5 per cent, * 10 per cent. Estimated result is based on individual wages from the employee data.

Source: 2011, 2013, and 2015 Survey of Small and Medium Scale Manufacturing Enterprises (SMEs) in Viet Nam (UNU-WIDER et al. various years).

5 Conclusion

This paper examines the effect of minimum wages on employment and wages in Viet Nam's micro firms and SMEs. The estimated results suggest a negative effect of minimum wages on total employment. The estimated elasticity of total employment to the minimum wage is around -0.2 and is statistically insignificant. However, the negative employment impact of minimum wage increases is statistically significant for the number of full-time regular workers which appear to be the most vulnerable to changes in labour market conditions. Moreover, part-time workers are likely to be a closer substitute for full-time workers in micro firms. Therefore, I find that micro firms reduce full-time regular workers and substitute them with their part-time counterparts. As a result, there are no effects on total employment, and negative effects on wage. On the contrary, a decrease in full-time regular workers is truly the driving force for negative effects on total employment in SMEs. However, the estimation on monthly wage indicates that minimum wage hikes do not boost the pay cheques of employees in SMEs.

The main policy implication deriving from the estimated findings is that minimum wages should be reconsidered as an effective policy tool in the fight against poverty and inequality in Viet Nam. The usual rationale for a higher national minimum wage is to raise the incomes of poor or near-poor families in the workforce which is expected to allow them to spend more, boost demand for goods and services, and stimulate growth. However, my estimated results suggest that this might not be the case.

As discussed in section 4, there is an inflow of migration into higher-wage provinces and an outflow of migration from lower minimum-wage regions which might make my estimated results spurious. Minimum wages have been used as an important wage distribution policy in Viet Nam. This becomes more important when the Central Committee of the Communist Party of Viet Nam has recently stated that the minimum wage needs to be adjusted more rapidly in the private sector so that it will reach the level of basic needs wages (Decision 23-KL/TW on 29 May 2012). Given its importance, I advocate that more research be devoted to correct those limitations which I cannot solve in this paper.

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