The Impact of Minimum Wages on Employment, Wages and Welfare: The Case of Vietnam

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Abstract

The paper investigates the impact of recent minimum wage changes on wages, employment and household welfare in Vietnam. It finds that minimum wage changes reduce the total number of wage workers (especially in domestic firms) and increases the incidence of self-employment. The number of wage workers declines because many wage workers with informal contracts lose their jobs, but only a fraction of the job loss is absorbed by the creation of self-employment or formal jobs. In addition, minimum wages help raise the average wages of workers who keep their jobs. In terms of welfare, an increase in minimum wage reduces poverty and raises household income and consumption expenditure, most importantly in education-related expenditures.

JEL Classification: J31; L25; P42

Keywords: minimum wages, firms, impact evaluation, panel data, Vietnam.

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1. Introduction

The minimum wage policy in Vietnam has been getting considerable attention from Vietnamese households and policy makers in the past several years. Nominal minimum wages were previously considered too low in Vietnam, and the real value of minimum wages fell significantly in 2008 as a result of a large spike in inflation. Tensions between workers and firms rose and labor strikes and disputes were fairly common. In response, some reforms have taken place and many more are being discussed and debated.

The purpose of this paper is two-fold. First, it provides a description of workers who earn below and right above the minimum wage. This makes it possible to characterize vulnerable workers who are at risk when minimum wages are raised. Second, it assesses the impact of recent minimum wage changes on employment and wages, as well as on household welfare—measured by their likelihood of falling into poverty and their level of consumption.

For robust analysis, we both firm-level and household-level data, that is data from the Vietnam Enterprise Surveys (VES) and the Vietnam Household Living Standard Survey (VHLSS). The Vietnam Enterprise Survey is a firm-level census survey that tracks all registered firms annually and contains a wide range of information about the surveyed firms. The panel nature of the data allows the estimations to include firm fixed effects in order to estimate the impacts of minimum wage changes. The use of firm-level fixed effects potentially removes unobserved factors that jointly influence employment in the regions and the level of the minimum wage and exploits only variation in outcomes within firms. The Vietnam Household Living Standard Surveys 2006, 2008, and 2010 not only provide the data to perform descriptive analysis of workers who are likely to be affected by minimum wage changes, but also yield a repeated cross-section of data at the district level to perform district fixed effects regressions to estimate the impact of minimum wage changes on the welfare of workers and households. As VHLSS do not provide panel data of households for the period 2006-2010, as many individual and household control variables were added in the district fixed effects specifications to control for potential omitted variable bias.

Minimum wage increase reduces wage employment and increases self-employment in the economy. Within wage employment, minimum wage increase reduces employment of domestic firms, particularly on workers on informal contracts (those without social insurance), but does

not reduce employment in foreign firms. Minimum wage increases are found to be associated with wage increases, both across firms and across regions. Finally, minimum wage changes in Vietnam lead to a higher level of household consumption and lower poverty rate.

Past literature on minimum wage tends to focus on youth workers and the fast food industry in developed countries, where minimum wages matter most. Earlier studies in the United States provide evidence on positive or no effect of minimum wage increases on employment. For example, Katz and Krueger (1992) find that employment in the Texas fast food industry increased following the Federal minimum wage hike in 1991 and argue that the result is consistent with fast food restaurants having monopsonistic power. Card and Krueger (1994) exploit a differences-in-differences approach to examine the effects of the minimum wage increase in 1992 on employment in fast food restaurants in the state of New Jersey, relative to those in the neighboring state of Pennsylvania and find no effect of the minimum wage hike on employment. As the restaurants surveyed are near the state border and face similar economic conditions, except the change in minimum wage, unobserved economic conditions affecting both employment and minimum wage laws are differenced out from the estimated effect.

More recent US evidence indicates a small negative effect of minimum wage changes on employment. Neumark and Wascher (2000) reanalyze Card and Krueger's (1994) seminal work using payroll data and show a small decrease in employment in New Jersey relative to Pennsylvania after the 1992 minimum wage increase. Similarly, the study by Burkhauser, Couch and Wittenburg (2000) reassess the sensitivity of US studies on the effects of minimum wage on employment that rely on state-level panel data and show significant and modest negative effects of minimum wages on teenage employment. In particular, they demonstrate that past findings on the insignificant effect of minimum wage on employment are sensitive to the inclusion of year fixed effects, which capture the variation in federal minimum wage and eliminate virtually all of the variation in the minimum wage changes. Past US studies highlight the importance to control for unobserved economic conditions affecting both employment and minimum wage changes, to find variation in minimum wage changes at the sub-national level, and to use relatively high quality data to minimize measurement errors.

There is a growing volume of empirical studies examining the impacts of minimum wages on employment in developing countries. The evidence tends to indicate negative effects of minimum wage hikes on employment, especially in Latin American countries where the

minimum wage level is high relative to the overall wage distribution (Kristensen and Cunningham, 2006). Bell (1997) finds negative impacts of minimum wage rises in Colombia, where the minimum wage was close to the average wage, and no impacts in Mexico, where the minimum wage was way below the market clearing. Maloney and Nunez (2004) find a negative employment effect in both formal and self-employed sectors in Colombia. Ginding and Terrell (2007) also report a negative impact on employment in the formal sector in Costa Rica. Studies have also found similar negative impact of minimum wage increases in Indonesia (Rama, 2001; Alatas and Cameron, 2008; Del Carpio et al, 2012).

Although there are several studies focusing on the effect of minimum wages on employment and wages, there are few studies on the effect of minimum wages on household welfare. Several recent studies examine the effect of minimum wages on poverty. The effect of minimum wages on poverty is unambiguous. Minimum wages can help low-wage workers increase their income and reduce poverty. On the other hand, minimum wages can increase unemployment and poverty of unemployed workers. The effect of minimum wages on poverty can depend on other conditions, for example,, the ratio of minimum wages to poverty lines, the income sharing mechanism in society (Fields and Kanbur, 2007), and house composition (Fields et al., 2007).

Empirical studies on the effect of minimum wages on poverty are diverse. Addison and Blackburn (1999) find a poverty-reducing effect of minimum wages among teenagers and older junior high school dropouts in the U.S. Alaniz et al. (2011) find the minimum wages can reduce poverty incidence in Nicaragua. Other studies finding a poverty-reducing effect on minimum wages are Sagat (2001) and Gindling and Terrell (2010). However, in Arango and Panchon (2004), minimum wages increase the welfare of middle-income households but decrease the welfare of low-income households. Interestingly, Neumark and Wascher (2002) find minimum wages increase the probability of escaping poverty for the poor but also increase the probability of falling into poverty of the non-poor in the U.S.

There is a small literature on the impacts of minimum wage in Vietnam for earlier periods. For example, Nguyen (2011) finds that MW changes between 1994 and 2008 did not lead to higher inflation. Similarly, Nguyen (2013) also shows that changes in the national MW between 2004 and 2006 led to lower employment of low-wage workers in the domestic formal

sector. However, workers who lost jobs in the formal sector were able to find jobs in the informal sector. This study is possibly the first comprehensive analysis of the impact of minimum wages on employment, wage and welfare in Vietnam. In addition, by using more recent data, we can focus the analysis on the effect of significant reforms of minimum wages since 2006.

This paper is structured into six sections. The second section provides the background of minimum wage settings in Vietnam. The third section presents the data sets used in this study and descriptive statistics on household welfare and firm performance in Vietnam. The fourth and fifth sections present the estimation method and empirical findings on the impact of minimum wages, respectively. Finally, several conclusions and implications are presented in the sixth section.

2. Minimum Wage Settings in Vietnam

2.1 History

Prior to 2011, different minimum wage levels were applied to the foreign and domestic sectors. For the foreign sector, the very first minimum wage was established in 1990 at a level of the equivalent of $50 a month. It was later changed in 1996 to four levels across four regions: $45, $40, $35 and $30 dollars a month. For the domestic public sector, the first 'base minimum wage' went into effect in April 1993, and was used as a base to compute social insurance and pension contribution for the domestic public sector in the whole country. For the domestic private sector, minimum wage law specifies that private firms were not allowed to pay lower than the 'base minimum wage,' which essentially ties the minimum wage of the private sector to the base minimum wage for the public sector.

2.2 Recent Reforms

2006 marks the start of several reforms regarding minimum wage. The first reform is the regionalization of minimum wages. This is to meet the difference in prices of goods and services, consumption preferences of employees, local labor market condition, and poverty reduction strategy of each locality. The regionalization of minimum wages actually has been in place for

the foreign sector; but for the domestic private sector, that had to wait until 2008, when three minimum wage levels were established for the three regions, and in 2009, they were changed to four regions (see the graph above). Region 1 consists of the inner districts in Hanoi and Ho Chi Minh city—the two main cities of Vietnam; region 2 consists of the outskirt districts of those two cities; region 3 consists of other smaller cities and more developed rural area; and region 4 consists of the rest of the country.

The second reform is the unification of the minimum wages for the private domestic sector and the foreign sector. The unification of minimum wages for the two sectors took place gradually: the gap between the minimum wage levels between domestic firms and foreign firms slowly shrank. Effectively, since October 2011, domestic and foreign firms have the same level of minimum wages. Table 1 describes the nominal minimum wages between 2006 and 2012 across regions for domestic firms and foreign private firms. Tables 2 and 3 describe the average real minimum wages adjusted for provincial-level consumer price indices (CPI) and the percentage changes in average real minimum wages between 2006 and 2010 across minimum wage regions for both domestic and foreign private firms.

The third reform called for the separation of the common minimum wage used in the domestic public sector from that for the private sector in 2008. Not until the reform was the minimum wage used in the domestic private sector tied to the base minimum wage for the public sector. Since the decision to raise the base minimum wage depends on the Government's budget—which is usually tight—minimum wage for the private sector was also held down and fell behind inflation. This creates tensions for private workers because unlike public sector workers who have other benefits, the primary income source for private sector workers comes from their wages.

2.3 Issues

Minimum wages in Vietnam have been considered low, and the real value even worsened because of a sharp rise in inflation in Vietnam in 2008. Tensions between labor and firms rose and strikes were increasingly popular. In response, since 2008-2009, the nominal levels of minimum wages increased dramatically due to high inflation and had potentially meaningful impacts on employment and welfare of workers.

The second issue regarding minimum wage in Vietnam is related to social insurance contribution. The social insurance firms must pay for a formal worker is in principle tied to the worker's actual wage. Specifically, firms must pay the Government 17 percent of a worker's wage as social insurance. In reality, since the actual wages are usually not truthfully reported, the social security administration has to use the minimum wage as a base to calculate the compulsory social insurance contribution by firms. In effect, social insurance payment is tied to minimum wages. This creates a situation in which a rise in the minimum wage might hurt formal workers whose actual wages are higher than the minimum wage, because firms have to pay higher social insurance. In this situation, a rise in minimum wage might not only hurt low-skilled and low-waged workers, but also hurt more high skilled workers employed on formal contracts. Firms may lay off some formal workers, or not pay their social insurance (that is, the workers become informal), or cut their wages to offset the higher social insurance bill driven by a higher minimum wage.

3. Data and Descriptive Analysis

3.1 Vietnam Household Living Standard Surveys and Enterprise Surveys

This paper draws data from two major sources: the Vietnam Household Living Standard Surveys (VHLSS) in 2006, 2008 and 2010, as well as the Enterprise Surveys 2006-2010. VHLSS were implemented by the General Statistics Office of Vietnam (GSO) with technical support from the World Bank (WB). The number of households in the 2006, 2008 and 2010 VHLSS is 9189, 9189, and 9399 households, respectively. The samples are representative for the national, rural and urban, and regional levels. The 2006 and 2008 VHLSS contain a panel of 4090 households, but VHLSS 2008 and 2010 are not linked. The surveys contain detailed data on household and individual characteristics, such as basic demographic information, employment, earnings, labor force participation, education, health, expenditure, housing, fixed assets and durable goods, participation status in poverty alleviation programs, credit information, international remittances, private transfers, pensions, social allowances that households received during the 12 months before the interview, and so on. The information about expenditures and income is fairly detailed. Expenditures are categorized into food and non-food expenditures. Food expenditure includes

purchased food and self-produced products of households. Non-food expenditure comprises expenditure on education, healthcare, expenditure on houses and commodities, and expenditure on power, water supply and garbage. Income includes income from agricultural and non-agricultural production, salary, wage, pension, scholarship, income from loan interest and rental properties, remittances, and social transfers.

The Enterprise Surveys were also conducted by the GSO and the survey respondents were establishments. The Enterprise Survey is a census of all establishments in Vietnam and firms are linked across years to produce a panel data set. To be consistent with the VHLSS, the focus is on the period from 2006-2010, in which the number of firms ranges from 129,000 firms in 2006 to close to 287,000 firms in 2010. The survey questionnaires ask firms for detailed information related to industry, production, workforce, compensation of employees, assets, liabilities, exports and imports values, investments, and so on. The minimum regions of a firm can be located from the information—whether it is foreign or domestically-owned, its formal and informal employment (that is, those without social insurance), and other information necessary for the analysis.

3.2 Descriptive Analysis—Profiles of Vulnerable Workers

Figure 1 presents the distribution of individuals (aged above 14) by employment status in the most recent month. Around 52 percent of individuals are self-employed. Nineteen percent of individuals are not working: they are retired or unemployed. There are around 7.4 percent of people working for wages in the formal sector, and around 11.2 percent of people are wage earners in the informal sector.[2] Changes in the minimum wages are expected to have direct impacts on wage earners. Thus, the focus is on the sample of wage earners in both formal and informal sectors in the household data when examining the effect of minimum wages on employment.

[Figure 1]

[2] The 2010 VHLSS contains a question on whether a worker is enrolled in social insurance. Formal workers are defined as those who have social insurance, and informal workers as those not having social insurance.

Table 4 presents the proportion of workers below the minimum wages in 2010. All workers with wages are considered. For self-employed workers, there are no data on earning per person. For each wage earner, the average hourly wage is computed by dividing the total wage during the past 12 months by the total number of working hours. It shows that the average hourly wage varies across geographic areas. On average, a worker works for 169 hours per month with hourly wages of 20.3 thousand Vietnamese Dong or VND.

[Table 4]

Vietnam has monthly minimum wages, not hourly minimum wages. However, there is a large proportion of workers not working full time. They work some days per month, or a few hours per day. Thus, the monthly minimum wages are converted to hourly minimum wages by dividing monthly minimum wages by 208 (26 days multiplied by 8 hours/day). Workers below minimum wages are those having hourly wages below the imputed hourly minimum wages. There is a negative correlation between the average hourly wage and the total number of working hours per month (Figure 2), since workers tend to get higher hourly payment for short-time work.

Table 4 shows that 6.3 percent of workers earn below minimum wages. The young workers, ethnic minorities, and workers with low education (particularly those with primary education or below) are more likely to receive wages below the minimum wages. The proportion of workers around the minimum wage is also considered. More specifically, the proportion of workers below 110 percent of the minimum wage and above 90 percent of the minimum wage is also estimated. These workers would be more likely to be vulnerable to minimum wage adjustments. In 2010, there were 2.5 percent of wage workers that belonged to this group. The proportion of workers around the minimum wages tends to be higher for female and young workers, informal and agricultural workers.

The proportion of workers below the new minimum wages (increased in 2011) is 9.7 percent. In addition to the minimum wage level, the proportion of workers below different living standard levels is also examined. If one worker has to take care of one dependent, the minimum wage should be double of the poverty line. The current minimum wage is approximately the governmental poverty line multiplied by two. However, the minimum wage is much lower than the double of WB-GSO poverty line. 17.2 percent of workers have wages below double of the WB-GSO poverty line.

[Table 5]

Tables 5 and 6 present the proportion of workers below the minimum wages by employment sectors and geographical variables. There is a variation in wages as well as the proportion of workers below minimum wages across employment sectors and occupations. The proportion of workers below the minimum wage is higher in the informal sector and the agricultural sector. Unskilled workers also have a higher proportion below the minimum wages.

[Table 6]

There is a slight variation in hourly wages and the monthly number of working hours across urban/rural and regions. Although North West is the poorest region with a high poverty rate, it is not the region with the lowest wages as well as the highest proportion of workers below the minimum wage. Central Highlands have the lowest hourly wage. Mekong River Delta and North West are two regions having the highest proportion of workers below the minimum wage.

Table 7 examines the association between the probability of having wages at the minimum level and characteristics of individuals and households. An attempt was made to run regressions of hourly wages on age and age squared, but a U-shape relation between the relation of receiving wages below minimum wages and age was not found. Thus the age squared is not included in Table 7. Workers with higher wages are less likely to receive wages below the minimum levels.

[Table 7]

Male workers have higher wages than female ones, and are less likely to be below the minimum wages. Workers with low education are more likely to have wages below the minimum level. By sectors, workers in the informal sector tend to have higher probability of earning wages below the minimum wages.

4. Empirical Methodology

Several empirical strategies were utilized to investigate the impact of minimum wages on employment, salary, wages, consumption, and poverty in Vietnam.

First, data from the Enterprise Surveys 2006-2010 were used to examine the effects of real minimum wage changes on employment and average salary at the firm level. The real minimum wage is calculated as the nominal minimum wage divided by provincial CPI level (please see Table 2 in the Appendix).[3] Because panel data of firm was available, it was possible to exploit the variation of employment and average salary within firms and over time in a firm fixed effects specification. The empirical specification is:

$$y_{kjt} = \alpha_k + \alpha_t + \delta \log(MW_{jt}) + \epsilon_{kjt} \qquad (1)$$

The dependent variables for firm k located in district j in year t include the log of employment and the log of salary per worker. The effects on formal employment and informal employment are also examined separately. Firms are required to pay social insurance for formal employees working on formal contracts, but they are not required to pay social insurance for informal employees. The coefficient of interest δ captures the percentage change in employment or the percentage change in average salary in response to a one per cent increase in the real minimum wage. The term α_t is a set of year fixed effects which controls for time varying factors that affect all firms. The term α_k is a set of firm fixed effects that take into account all time invariant unobserved characteristics of firms. The firm fixed effects specification potentially mitigates concern of endogeneity bias as compared to a specification that includes only district fixed effects. Specifically, it is more difficult to argue that the Government sets the three to four regional minimum wages in accordance with changes in employment of thousands of firms, especially if the variation in employment or average salary is heterogeneous across firms. In other words, a typical firm is likely to have little influence on the setting of the regional minimum wage and is therefore likely to take the minimum wages as exogenous. For comparisons, we also report the Ordinary Least Squares (OLS), province fixed effects, and district fixed effects estimates for most specifications.

[3] As a robustness check an alternative measure of the real minimum wage was also calculated, by taking the nominal minimum wage divided by the national CPI level. The results still remain qualitatively robust.

As minimum wage changes may affect different industries differently, equation (2) by industry is also estimated. Industries are separated into the following six categories: a) construction; b) heavy manufacturing; c) light manufacturing; d) retail and wholesale; e) other high end services; and f) transportation, hotel and restaurant. Finally, as different minimum wages were applied to foreign and domestic firms prior to 2011, foreign firms and domestic firms are examined separately for all specifications.

To examine the effects of minimum wage changes on consumption and poverty, data from VHLSS 2006, 2008, and 2010 are used to construct repeated cross sections of households from the three waves of VHLSS and to estimate the effects using district fixed effects specifications. The empirical specification is:

$$y_{hjt} = \alpha_j + \alpha_t + \delta \log(MW_{jt}) + \beta' X_{hjt} + \epsilon_{hjt} \qquad (2)$$

The dependent variables for household *h* located in district *j* in year *t* are included whether the household is living in poverty and the log of consumption expenditure per household member. A household is defined as living in poverty if its expenditure is below the expenditure poverty line constructed by GSO-WB. When household poverty is used as the dependent variable, the coefficient of interest, δ captures the effect the percentage changes in real minimum wage on the probability of a household falling into poverty. When log of consumption expenditure per household member is used as the dependent variable, δ measures the percentage change in consumption expenditure per household members as a result of a one percent increase in the real minimum wage. Consumption expenditure is further differentiated by food expenditure, non-food expenditure, education expenditure, and healthcare expenditure. The term α_t is a set of year dummies, which capture all unobserved influences on poverty and consumption at the national level. α_j is a set of district fixed effects, and its inclusion ensures that the analysis looks at how changes in the real minimum wage affect the likelihood of an average household to fall into poverty within a district over time, and similarly, how changes in the real minimum wage affect the consumption expenditure of an average household within that district over time. Because the data do not contain households that are repeatedly observed over the sample period, it is not possible to include household or individual fixed effects. As a result, the analysis includes a rich set of household characteristics, X_{hjt}, such as the educational attainment of the household head,

the ethnicity of the household head, whether the household is in an urban area, household size, and the proportions of children and elderly living in the household, as control variables.

Finally, since the focus on employment at the firm level may miss important effects of minimum wage changes on informality and self-employment, the effect of minimum wage changes on the likelihood of individuals having any job, wage job, and being self-employed on the basis of specification (2) is also estimated.

5. Results

5.1 The Impacts of Minimum Wage Changes on Domestic Private Firms

The estimated effects of minimum wage changes on domestic private firms are reported in this section. Table 8 shows the estimated effect of minimum wage changes on employment for all domestic private firms across all industries. Column 1 shows the OLS estimates; column 2 shows the province fixed effects estimates; column 3 shows the district fixed effects estimates; and column 4 shows the firm fixed effects estimates. All estimates indicate that the effect of minimum wage changes on employment is negative and statistically significant. OLS estimate is the most negative, whereas firm fixed effects estimate is the least negative. The (most preferred) firm fixed effects specification indicates that for every one percent increase in real regional minimum wage, employment is expected to fall by 0.3 percent. District fixed effects specification suggests that for every one percent increase in real regional minimum wage, employment is predicted to fall by roughly 0.6 percent. Since only district fixed effects in specifications based on household and individual level data can be included, it is important to keep in mind that district fixed effects specification tend to show much stronger negative effect of minimum wage changes on employment.

[Table 8]

Table 9 shows the estimated effect of minimum wage changes on employment by industry based on firm fixed effects specification. The negative effect is large and statistically significant for construction firms at -0.56 (column 1), but small and statistically insignificant for transportation, hotel, and restaurant firms at -0.095 (column 6). Other industries medium size effects and are all statistically significant. Thus, the negative effect of minimum wage changes on employment is fairly consistent across industries.

[Table 9]

Table 10 reports the effect of minimum wage changes on formal employment for all firms; Table 11 reports the effect by industry. Note that formal employment requires social insurance contribution, while informal employment does not. According to the firm fixed effects estimates, for every one percent increase in the real regional minimum wage, formal employment in a firm is expected to rise by 0.7 percent. The effects vary somewhat across industries. Retail and wholesale industries experience the largest positive effect of 0.97 percent, whereas light manufacturing and heaving manufacturing firms face an insignificant positive effect of 0.07 percent and 0.18 percent, respectively.

[Table 10]

[Table 11]

Table 12 and Table 13 report the effect of minimum wage changes on informal employment for all firms and by industry, respectively. The firm fixed effects specification shows that informal employment is expected to fall by 1.05 percent for every one percent increase in the real minimum wage. Construction firms are expected to face the largest negative effect (1.5 percent), while firms in the transportation, hotel, and restaurant industries are expected to face the smallest negative effect (0.5 percent). Since roughly 40 percent of workers are employed on an informal basis, the negative effect of minimum wage changes on informal employment dominates the positive effect of minimum wage changes on formal employment. The results suggest that there are some substitutions between formal workers and informal workers as the minimum wage rises. Contrary to the expectation that formal employment would be hurt due to a rise in minimum wages, it is found that formal employment actually increases, which partly offsets the decline in informal employment.

[Table 12]

[Table 13]

Table 14 and Table 15 show the effects of minimum wage changes on the average salary that firms pay for all industries and by industry, respectively. Table 14 shows that the estimated effect of real minimum wage changes on average salary is positive. The effect is largest based on OLS, and smallest based on firm fixed effects. The estimate for OLS is larger probably because of the endogeneity problem: minimum wage is likely to be adjusted up by the Government when

the average wage across firms in the whole country goes up. According to the most preferred firm fixed effects specification (column 4), average salary is expected to increase by 0.48 percent for every one percent increase in real regional minimum wage. However, the effects vary across industries. Table 15 shows that as real minimum wage increases, firms in the construction industry experience a fall in average salary; firms in the heavy manufacturing industry see no change in average salary; and firms in all other industries experience rise in average salary.

[Table 14]

[Table 15]

5.2 The Impacts of Minimum Wage Changes on Foreign Firms

This section reports the effects of minimum wage changes on employment and average salary of foreign firms. First, Table 16 presents the estimated effect of minimum wage changes on the log of employment, the log of employment of workers on formal contracts, the log of employment of workers on informal contracts, and the log of average salary in foreign firms based on the firm fixed effects specification. The firm fixed effects estimate in column 1 indicates that minimum wage changes have no significant effect on the log of employment in foreign firms.

[Table 16]

Column 2 of Table 16 presents the estimated effect of minimum wage changes on employment of workers on formal contracts in foreign firms. Similar to the effect on overall employment, the firm fixed effects estimate shows a significant effect. Column 3 of Table 16 presents the estimated effect of minimum wage changes on employment of workers on informal contracts. Although the coefficient size is much larger than that on employment of workers on formal contracts, the estimate is very noisy and not statistically significant. Finally, column 4 of Table 16 shows that these minimum wage changes have no significant effect on the log of average salary in foreign firms. The result is not surprising given the lack of effect on employment. Thus, there is no evidence that minimum wage changes affect employment and average salary in foreign firms. Given the lack of effects of minimum wage changes on employment and average salary in foreign firms, the effects by industry are not estimated.

5.3 The Impacts on Households and Workers

Table 17 presents the estimated effects of minimum wage changes on individual employment and wages based on district fixed-effects regressions of household data. It shows that changes in real regional minimum wages do not have a significant effect on whether an individual has any employment or not. However, changes in minimum wage have effects on the types of employment that individuals hold. An increase in the real minimum wage reduces the probability of an individual having a job in the formal sector as well as the probability of having any wage job. For every one percent increase in the real minimum wage, the probability of having a formal-sector job and the probability of having a wage job decrease by 0.07 and two percentage points, respectively. On the other hand, as real minimum wage increases, workers losing formal-sector and wage employment become self-employed. For every one percent increase in the real minimum wage, the probability of an individual being self-employed increases by 0.02 percentage points. Table 17 also shows that regional minimum wages raise workers' wages. A one percent increase in the regional minimum wage leads to a 0.16 percent increase in the wages of workers. However, the number of working hours worked does not vary with minimum wage changes.[4]

Table 18 reports the estimated effects of minimum wage changes on poverty, income, consumption, and saving of households. Interestingly, minimum wages reduce the probability of the average household falling into poverty, based on the expenditure poverty line constructed by GSO-WB. A one percent increase in the minimum wages reduces the probability of a household being poor by 0.089 percentage points. Although the magnitude is fairly small, it is statistically significant. Minimum wages also help households increase income, consumption expenditure and saving ratio.

Finally, Table 19 reports the estimated effect of minimum wages on expenditures by expenditure item and expenditure share of item. Since minimum wages help households increase income and consumption, minimum wages increase both food and non-food expenditures of households. More specifically, a one percent increase in minimum wages can be associated with a 0.12 percent increase in per capita food expenditure and a 0.48 percent increase in per capita

[4] As mentioned, using the 2010 VHLSS, formal workers are defined as those having social insurance, and informal workers are defined as those not having social insurance. However, in the 2006 and 2008 VHLSSs, there are no data on social insurance. Thus, for regression analysis, formal workers are defined as those working for firms and organizations, and informal workers are defined as those working for households.

non-food expenditure. Two important non-food expenditure items are education and healthcare. The analysis shows minimum wage households, whose income is increased by minimum wages, tend to spend more on education than on healthcare. If minimum wages increase by one percent, the education expenditure can increase by 0.66 percent. In terms of share, minimum wages increase the expenditure share on non-food, and reduce the expenditure share on food. This is expected—since food is a necessity good, its share can decrease as household income increases. On the other hand, non-food is more likely to be luxury, and its share increases as a result of income increase.

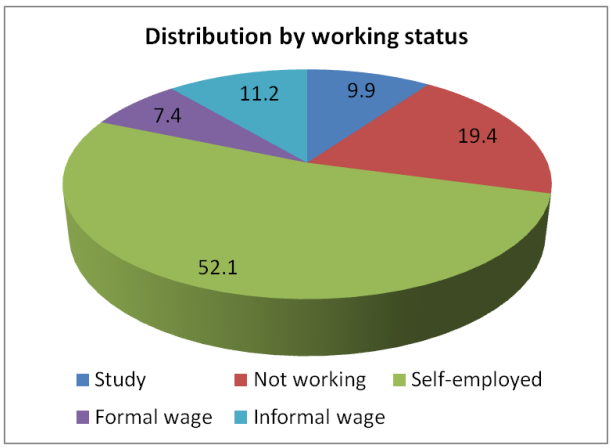
6. **Conclusions**

This paper first documents the profile of workers who earn below the minimum wages and find that they tend to be young, relatively uneducated and of ethnic minorities. This group is one of the most vulnerable groups in society which will likely require targeted assistance to help them cope with minimum wage increases. Secondly, the paper analyzes the impact of the changes in minimum wages on employment, wages, consumption and welfare of Vietnamese. It finds that minimum wage increases have little impact on employment and other outcomes in foreign firms, but significant impact on the domestic firms. Specifically, minimum wage rises reduce the number of wage workers and increase self-employment. The number of wage workers declines because many workers with informal contracts lose their jobs, but only a fraction of them is absorbed by the creation of formal jobs (i.e. those with formal contracts) or self-employment. In addition, minimum wages are found to help raise the average wages of workers who remain employed.

In terms of household consumption and welfare, it is found that overall an increase in minimum wage is beneficial. A one percent increase in minimum wages reduces the probability of a household being poor by 0.089 percentage points. Although the magnitude is fairly small, it is statistically significant. Minimum wages also help households increase income and consumption, particularly in terms of expenditures in education.

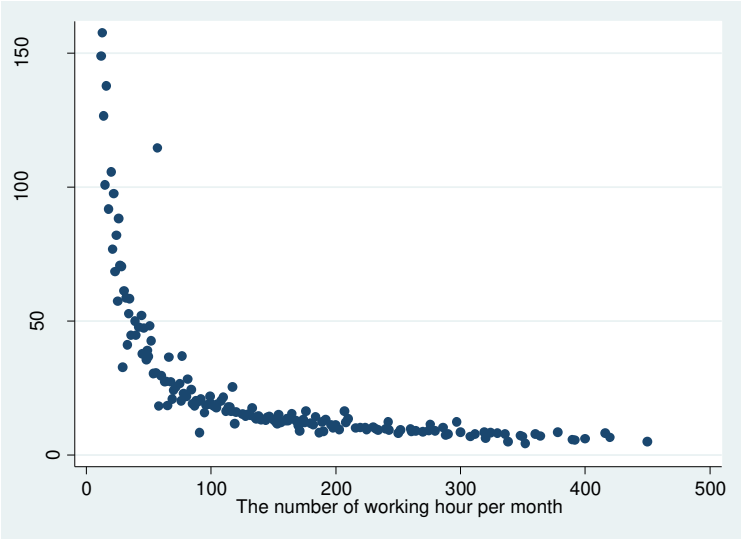
Appendix

Figure 1: Distribution of Individuals (aged above 14) by Employment Status



Source: VHLSS 2010

Figure 2: The Average Hourly Wage and the Total Number of Working Hours per Month



Source: VHLSS 2010

Table 1: Monthly Nominal Min. Wage for Private Domestic and Foreign Firms by Region and Year

	Monthly Nominal Minimum Wage for the private domestic sector (unit: thousand Vietnam dongs)				Monthly Nominal Minimum Wage for the private foreign sector (unit: thousand Vietnam dongs)			
Year	Region 1	Region 2	Region 3	Region 4	Region 1	Region 2	Region 3	Region 4
2006	350	350	350		870	790	710	
2007	450	450	450		870	790	710	
2008	620	580	540		1000	900	800	
2009	800	740	690	650	1200	1080	950	920
2010	980	880	810	730	1340	1190	1040	1000
2011	1350	1200	1050	830	1550	1350	1170	1100
2012	2000	1780	1550	1400	2000	1780	1550	1400

Source: Author's calculations

Table 2: Real Monthly Minimum Wages for Domestic Firms by Region and Year

	Real Minimum Wage (Provincial CPI Adjusted)				% Change in Real Minimum Wage (From Previous Year)			
Year	Region 1	Region 2	Region 3	Region 4	Region 1	Region 2	Region 3	Region 4
2006	348.1	347.5	347.8	-				
2007	445.3	445.5	444.9	-	28%	28%	28%	
2008	610.9	572.6	532.2	-	37%	29%	20%	
2009	795.3	736.1	686.3	646.5	30%	29%	29%	
2010	971.8	872.5	802.7	723.3	22%	19%	17%	12%

Notes: Nominal minimum wages (in thousand Vietnamese Dongs) are adjusted for provincial CPI to 2005 values and averaged across districts by region and year.

Source: Author's calculations

Table 3: Real Monthly Minimum Wages for Foreign Firms by Region and Year

	Real Minimum Wage (Provincial CPI Adjusted)				% Change in Real Minimum Wage (From Previous Year)			
Year	Region 1	Region 2	Region 3	Region 4	Region 1	Region 2	Region 3	Region 4
2006	622.6	552.0	484.1	-				
2007	860.9	782.1	702.1	-	38%	42%	45%	
2008	985.3	888.6	788.6	-	14%	14%	12%	
2009	1192.9	1074.3	944.9	914.9	21%	21%	20%	
2010	1328.8	1179.8	1030.5	990.7	11%	10%	9%	8%

Notes: Nominal minimum wages (in thousand Vietnamese Dongs) are adjusted for provincial CPI to 2005 values and averaged across districts by region and year.

Table 4: The Incidence of Workers below Minimum Wages and Different Living Standard Thresholds by Demographic Variables in 2010

	Hourly wages (thousand VND)	Number of monthly working hours	% workers below current MW	% workers between ±10%* MW	% workers below new MW	% workers below double gov.pov. line	% workers below double WB-GSO pov. line
Gender							
Female	21.5	166.7	6.5	2.7	10.2	7.6	18.2
Male	19.3	171.7	6.1	2.3	9.2	7.0	16.3
Age group							
15-24	17.4	176.8	6.7	3.1	10.7	7.9	21.3
25-45	16.6	180.9	6.3	2.6	10.0	7.3	17.7
46-60	23.5	157.1	6.2	2.0	9.1	7.2	15.3
61 +	45.5	104.1	5.2	2.0	7.1	5.8	11.9
Ethnicity							
Kinh/Hoa	20.4	171.6	6.2	2.5	9.6	7.1	17.0
Ethnic minorities	18.2	139.1	7.7	2.6	10.4	9.4	20.2
Education level							
< Primary	22.2	146.1	8.3	2.8	11.7	9.7	21.7
Primary	18.6	165.5	7.4	3.4	11.6	8.7	20.8
Lower-secondary	19.3	167.3	6.6	2.3	10.0	7.5	17.2
Upper-secondary	20.9	183.7	5.3	2.2	8.6	6.1	15.1
Post-secondary	21.8	181.7	2.8	1.2	4.9	3.4	8.9
Total	20.3	169.4	6.3	2.5	9.7	7.3	17.2

Note: The government poverty line is 400 and 500 thousand VND/person/month in rural and urban areas, respectively. The WB-GSO poverty line is 653 thousand VND/person/month.

Source: Authors' estimation from the 2010 VHLSS.

Table 5: The Incidence of Workers below Minimum Wages and Different Living Standard Thresholds by Employment Sector in 2010

	Hourly wages (thousand VND)	Number of monthly working hours	% workers below current MW	% workers between ±10%* MW	% workers below new MW	% workers below double gov.pov. line	% workers below double WB-GSO pov. line
Formal/informal							
Informal	17.3	161.1	9.4	3.3	13.8	11.0	23.9
Formal	24.9	182.2	1.5	1.2	3.4	1.6	6.8
Employer sector							
Agricultural households	14.9	146.2	11.4	4.6	15.7	13.8	29.0
Non-farm households	17.9	164.5	7.5	2.4	11.9	8.8	21.2
Collective	18.1	158.0	11.7	3.0	16.7	12.8	26.1
Private	22.1	183.1	2.7	1.4	5.8	3.5	11.3
State	23.8	172.4	5.3	1.9	7.6	6.2	12.8
Foreign	22.9	190.3	3.6	3.4	6.1	1.1	8.2
Main occupation							
Professionals/Technicians	22.3	180.8	3.2	1.5	5.6	3.8	10.0
Clerks/Service Workers	16.6	205.6	8.8	3.8	14.3	10.9	23.2
Agriculture	28.7	114.0	5.1	2.0	7.0	6.1	14.3
Skilled Workers	13.1	198.6	6.9	2.4	10.8	7.5	18.3
Unskilled Workers	16.3	186.7	8.1	3.2	12.3	9.2	22.3
Industry							
Agriculture	28.5	114.8	5.1	2.1	7.2	6.1	14.6
Mining & manufacture	14.9	192.6	6.9	2.4	10.7	7.4	18.5
Construction	13.7	184.5	5.9	1.8	8.6	6.5	15.2
Trade	15.8	207.9	8.4	3.2	14.1	9.9	23.2
Transport & hotel	17.9	205.5	8.1	3.6	13.3	10.0	22.3
Others	21.4	177.3	5.2	2.5	8.1	6.2	14.1
Total	20.3	169.4	6.3	2.5	9.7	7.3	17.2

Note: The government poverty line is 400 and 500 thousand VND/person/month in rural and urban areas, respectively. The WB-GSO poverty line is 653 thousand VND/person/month.

Source: Authors' estimation using VHLSS 2010.

Table 6: The Incidence of Workers below Minimum Wages and Different Living Standard Thresholds by Geographic Variables in 2010

	Hourly wages (thousand VND)	Number of monthly working hours	% workers below current MW	% workers between ±10%* MW	% workers below new MW	% workers below double gov.pov. line	% workers below double WB-GSO pov. line
Urban/rural							
Rural	19.8	153.4	6.8	2.7	9.6	7.4	17.8
Urban	21.0	193.7	5.5	2.2	9.8	7.1	16.3
Geographical regions							
Red River Delta	23.2	166.2	5.5	1.7	7.9	5.7	13.2
North East	21.2	158.9	3.6	1.5	5.2	4.7	12.6
North West	20.3	151.5	7.0	1.8	8.3	8.1	15.9
North Central Coast	23.7	147.9	4.8	2.3	7.3	6.6	15.3
South Central Coast	18.4	167.1	5.7	2.9	9.7	7.5	16.9
Central Highlands	16.4	160.7	6.3	3.1	9.2	8.9	18.3
South East	19.5	196.8	5.6	2.5	11.0	5.7	17.5
Mekong River Delta	17.4	155.7	10.0	3.7	13.2	12.3	24.7
Minimum wage zones							
1	24.3	210.0	4.5	2.0	10.0	4.3	12.8
2	18.3	194.6	5.3	2.3	10.4	4.8	13.5
3	20.0	173.7	6.5	2.3	10.6	7.8	17.4
4	19.9	148.4	6.9	2.7	9.0	8.7	19.5
Total	20.3	169.4	6.3	2.5	9.7	7.3	17.2

Note: The government poverty line is 400 and 500 thousand VND/person/month in rural and urban areas, respectively. The WB-GSO poverty line is 653 thousand VND/person/month.

Source: Authors' estimation using VHLSS 2010.

Table 7: Probit Regression of Probability of Receiving Wages below Minimum Wages

	Below current minimum wages	Below new minimum wages	Below double WB-GSO poverty line	Below double government poverty line
Age	-0.0002	-0.0021*	-0.0062***	-0.0009
	(0.0012)	(0.0011)	(0.0009)	(0.0011)
Male (yes=1)	-0.0765***	-0.0771***	-0.1121***	-0.0736***
	(0.0288)	(0.0256)	(0.0220)	(0.0276)
Ethnic minorities	0.1428**	0.1452***	0.0973**	0.1489***
	(0.0566)	(0.0499)	(0.0454)	(0.0527)
< Primary	Omitted			
Primary	-0.0796*	-0.0643	-0.0738**	-0.0716*
	(0.0440)	(0.0413)	(0.0346)	(0.0418)
Lower-secondary	-0.1288***	-0.1504***	-0.1987***	-0.1300***
	(0.0455)	(0.0415)	(0.0350)	(0.0439)
Upper-secondary	-0.1796***	-0.2184***	-0.2372***	-0.1873***
	(0.0499)	(0.0468)	(0.0396)	(0.0483)
Post-secondary	-0.3286***	-0.4048***	-0.4395***	-0.3271***
	(0.0798)	(0.0751)	(0.0637)	(0.0737)
Urban (yes =1)	0.0238	0.0525	0.1634***	0.2464***
	(0.0389)	(0.0339)	(0.0284)	(0.0356)
Minimum wage zone 1	Omitted			
Minimum wage zone 2	0.0184	-0.0476	0.0453	0.1134
	(0.0746)	(0.0604)	(0.0563)	(0.0762)
Minimum wage zone 3	0.0754	-0.0830	0.1775***	0.3149***
	(0.0688)	(0.0562)	(0.0520)	(0.0683)
Minimum wage zone 4	0.0717	-0.2171***	0.2738***	0.4086***
	(0.0681)	(0.0567)	(0.0519)	(0.0674)
Formal sector	-0.8757***	-0.8185***	-0.7971***	-0.9518***
	(0.0438)	(0.0370)	(0.0316)	(0.0418)
Professionals/Technicians	Omitted			
Clerks/Service Workers	0.2004***	0.2268***	0.2265***	0.2335***
	(0.0664)	(0.0608)	(0.0504)	(0.0612)
Agriculture/Forestry/Fishery	-0.2646***	-0.2775***	-0.3102***	-0.2760***
	(0.0695)	(0.0655)	(0.0539)	(0.0647)
Skilled Workers	0.0502	0.0366	0.0182	0.0137
	(0.0674)	(0.0619)	(0.0501)	(0.0625)
Unskilled Workers	0.0331	0.0241	0.0388	-0.0029
	(0.0736)	(0.0677)	(0.0556)	(0.0684)
Constant	-1.1885***	-0.6740***	-0.4435***	-1.3931***
	(0.1057)	(0.0984)	(0.0839)	(0.1009)
Observations	25411	25411	25411	25411
R-squared	0.08	0.08	0.09	0.10

Robust standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Source: Authors' estimation using VHLSS 2010.

Table 8: The Effects of Min. Wage Changes on Log of Employment: Domestic Industries

	(1)	(2)	(3)	(4)
Log(real min. wage)	-1.305	-0.500	-0.597	-0.293
	(0.154)***	(0.099)***	(0.067)***	(0.069)***
Constant	10.024	5.313	5.886	3.989
	(0.903)***	(0.579)***	(0.389)***	(0.406)***
Fixed effects	None	Province	District	Firm
Observations	710160	710160	710160	710160
R-squared	0.010	0.054	0.081	0.870

Notes: All specifications include a set of year fixed effects. Sample includes only private domestic firms consistently observed over the sample period 2006-2010. Real minimum wage adjusted based on provincial CPI.

Table 9: The Effects of Min. Wage Changes on Log of Employment by Industry

	(1) Construct.	(2) Heavy Manu.	(3) Light Manu.	(4) High-end Service	(5) Retail & Wholesale	(6) Transport., Hotel & Rest.
Log(real min. wage)	-0.556	-0.174	-0.378	-0.333	-0.281	-0.095
	(0.129)***	(0.105)*	(0.102)***	(0.128)***	(0.075)***	(0.121)
Constant	5.946	3.849	5.089	3.924	3.551	2.937
	(0.755)***	(0.617)***	(0.593)***	(0.751)***	(0.437)***	(0.710)***
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	98789	54287	101639	94933	301045	59467
R-squared	0.783	0.915	0.899	0.836	0.822	0.869

Notes: All specifications include a set of year fixed effects. Sample includes only private domestic firms consistently observed over the sample period 2006-2010. Real minimum wage adjusted based on provincial CPI.

Table 10: The Effect of Min. Wage Changes on Log of Formal Employment: All Industries

	(1)	(2)	(3)	(4)
Log regional minimum wage	-2.344	1.106	1.039	0.737
	(0.265)***	(0.223)***	(0.189)***	(0.104)***
Constant	15.139	-5.093	-4.695	-3.165
	(1.550)***	(1.309)***	(1.115)***	(0.608)***
Fixed effects	District	District	Firm	Firm
Observations	376908	376908	376908	376908
R-squared	0.019	0.079	0.113	0.903

Notes: All specifications include a set of year fixed effects. Sample includes only private domestic firms consistently observed over the sample period 2006-2010. The sample size differs between formal and informal employment because some firms do not have formal employees. Real minimum wage adjusted based on provincial CPI.

Table 11: The Effect of Min. Wage Changes on Log of Formal Employment by Industry

	(1) Construct.	(2) Heavy Manu.	(3) Light Manu.	(4) High-end Service	(5) Retail & Wholesale	(6) Transport., Hotel & Rest.
Log(real min. wage)	0.382	0.179	0.069	0.959	0.973	0.821
	(0.223)*	(0.200)	(0.188)	(0.174)***	(0.192)***	(0.236)***
Constant	-1.030	0.894	1.704	-4.710	-4.959	-3.024
	(1.318)	(1.174)	(1.106)	(1.024)***	(1.125)***	(1.380)**
Observations	53280	27564	48104	63416	165675	18869
R-squared	0.889	0.936	0.937	0.865	0.850	0.907

Table 12: The Effect of Min. Wage Changes on Log of Informal Employment: All Industries

	(1)	(2)	(3)	(4)
Log regional minimum wage	-2.040	-1.391	-1.563	-1.055
	(0.191)***	(0.103)***	(0.088)***	(0.092)***
Constant	13.907	10.109	11.121	8.081
	(1.108)***	(0.605)***	(0.513)***	(0.537)***
Fixed effects	District	District	Firm	Firm
Observations	486941	486941	486941	486941
R-squared	0.028	0.076	0.100	0.813

Notes: All specifications include a set of year fixed effects. Sample includes only private domestic firms consistently observed over the sample period 2006-2010. The sample size differs between formal and informal employment because some firms do not have formal employees. Real minimum wage adjusted based on provincial CPI.

Table 13: The Effect of Min. Wage Changes on Log of Informal Employment by Industry

	(1) Construct.	(2) Heavy Manu.	(3) Light Manu.	(4) High-end Service	(5) Retail & Wholesale	(6) Transport., Hotel & Rest.
Log(real min. wage)	-1.546	-1.324	-0.843	-1.092	-0.973	-0.512
	(0.200)***	(0.205)***	(0.146)***	(0.177)***	(0.100)***	(0.294)*
Constant	11.342	10.149	7.486	8.052	7.330	5.111
	(1.166)***	(1.210)***	(0.852)***	(1.036)***	(0.583)***	(1.729)***
Observations	64702	32207	54730	74896	233414	26992
R-squared	0.781	0.855	0.846	0.747	0.719	0.807

Notes: All specifications include a set of year fixed effects. Sample includes only private domestic firms consistently observed over the sample period 2006-2010. The sample size differs between formal and informal employment because some firms do not have formal employees. Real minimum wage adjusted based on provincial CPI.

Table 14: The Effect of Min. Wage Changes on Log of Real Average Salary: All Industries

	(1)	(2)	(3)	(4)
Log regional minimum wage	3.453	1.346	0.826	0.482
	(0.100)***	(0.139)***	(0.120)***	(0.134)***
Constant	-17.624	-5.282	-2.240	-0.263
	(0.583)***	(0.816)***	(0.709)***	(0.793)
Fixed effects	None	Province	District	Firm
Observations	700867	700867	700867	700867
R-squared	0.302	0.357	0.386	0.733

Notes: All specifications include a set of year fixed effects. Sample includes only private domestic firms consistently observed over the sample period 2006-2010. Real minimum wage adjusted based on provincial CPI.

Table 15: The Effect of Min. Wage Changes on Log of Real Average Salary by Industry

	(1) Construct.	(2) Heavy Manu.	(3) Light Manu.	(4) High-end Service	(5) Retail & Wholesale	(6) Transport., Hotel & Rest.
Log(real min. wage)	-0.365	0.070	0.342	0.493	0.767	0.023
	(0.113)***	(0.102)	(0.109)***	(0.172)***	(0.206)***	(0.123)
Constant	4.832	1.903	0.130	-0.135	-1.838	2.338
	(0.663)***	(0.599)***	(0.631)	(1.009)	(1.215)	(0.724)***
Observations	97371	53070	98206	94005	299292	58923
R-squared	0.580	0.753	0.775	0.716	0.725	0.670

Notes: All specifications include a set of year fixed effects. Sample includes only private domestic firms consistently observed over the sample period 2006-2010. Real minimum wage adjusted based on provincial CPI.

Table 16: The Effect of Min. Wage Changes in Foreign Firms

	(1) Log(employment)	(2) Log(formal emp.)	(3) Log(inf. emp.)	(4) Log(ave. salary)
Log(real min. wage)	0.200	0.014	0.615	-0.068
	(0.285)	(0.373)	(0.575)	(0.221)
Constant	3.042	4.094	-1.017	3.585
	(1.801)*	(2.363)*	(3.633)	(1.397)**
Observations	25674	23319	16062	25596
R-squared	0.947	0.947	0.817	0.755

Notes: All specifications include a set of year fixed effects. Sample includes only foreign firms consistently observed over the sample period 2006-2010. Real minimum wage adjusted based on provincial CPI.

Table 17: The Effect of Minimum Wages on Individual Employment and Wages

Explanatory variables	Dependent variables					
	Have job (yes=1)	Have formal job (yes=1)	Have wage job (yes=1)	Self-employed (yes=1)	Log of hourly wages	Log of working hours
Log of regional minimum	-0.0361	-0.0732***	-0.2034***	0.1673***	0.2386**	0.0203
	(0.0243)	(0.0279)	(0.0323)	(0.0334)	(0.1041)	(0.0545)
Male	0.0493***	0.0037	0.0884***	-0.0392***	0.1326***	0.0624***
	(0.0028)	(0.0028)	(0.0034)	(0.0037)	(0.0115)	(0.0055)
Age	0.0751***	0.0123***	0.0263***	0.0487***	0.0217***	0.0737***
	(0.0008)	(0.0006)	(0.0007)	(0.0008)	(0.0037)	(0.0019)
Age squared	-0.0009***	-0.0002***	-0.0004***	-0.0005***	-0.0002***	-0.0010***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0000)
Ethnic minorities	0.0575***	-0.0243***	-0.0290***	0.0864***	-0.0814***	-0.0506***
	(0.0066)	(0.0059)	(0.0090)	(0.0106)	(0.0299)	(0.0159)
Without education degree	Omitted					
Primary degree	0.0549***	0.0199***	-0.0150***	0.0699***	0.0394**	0.0480***
	(0.0048)	(0.0036)	(0.0057)	(0.0064)	(0.0193)	(0.0095)
Lower secondary degree	-0.0102*	0.0402***	-0.0392***	0.0290***	0.0883***	0.0402***
	(0.0053)	(0.0043)	(0.0063)	(0.0069)	(0.0213)	(0.0105)
Upper secondary degree	-0.1449***	0.0784***	-0.0545***	-0.0904***	0.1510***	0.0568***
	(0.0071)	(0.0058)	(0.0075)	(0.0083)	(0.0246)	(0.0135)
Technical degree	0.0624***	0.2721***	0.1896***	-0.1272***	0.2620***	0.1862***
	(0.0066)	(0.0078)	(0.0089)	(0.0094)	(0.0244)	(0.0132)
Post secondary degree	0.0911***	0.4523***	0.3114***	-0.2203***	0.6388***	0.1311***
	(0.0080)	(0.0115)	(0.0112)	(0.0114)	(0.0259)	(0.0143)
Urban	-0.0717***	0.0238***	0.0219***	-0.0936***	0.0311*	0.1797***
	(0.0053)	(0.0052)	(0.0070)	(0.0078)	(0.0186)	(0.0128)
Year 2008	-0.0077**	-0.0139***	-0.0087*	0.0010	0.1150***	-0.0197**
	(0.0039)	(0.0041)	(0.0051)	(0.0053)	(0.0133)	(0.0094)
Year 2010	-0.0013	-0.0124***	-0.0567***	0.0554***	0.4190***	-0.0361***
	(0.0038)	(0.0034)	(0.0048)	(0.0055)	(0.0199)	(0.0100)
Constant	-0.3278**	0.3230*	1.0697***	-1.3975***	-0.6047	5.7285***
	(0.1490)	(0.1710)	(0.1978)	(0.2048)	(0.6336)	(0.3328)
Observations	76156	76156	76156	76156	18484	61302
R-squared	0.32	0.20	0.16	0.24	0.29	0.23

Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.
Source: Authors' estimation from VHLSSs 2006, 2008 and 2010.

Table 18: The Effect of Minimum Wages on Poverty, Income, Consumption and Saving

Explanatory variables	Dependent variables					
	Being poor (yes=1)	Log of per capita expenditure	Log of per capita income	Wage income per capita	Non-wage income per capita	Ratio of saving to income
Log of regional minimum wages	-0.0891***	0.1942***	0.5544***	6,609.3***	4,208.8***	0.4813***
	(0.0320)	(0.0598)	(0.0649)	(883.3)	(1,598.6)	(0.0943)
Household size	0.0188***	-0.0536***	-0.0456***	-120.6***	-493.5***	0.0022
	(0.0015)	(0.0023)	(0.0026)	(26.5)	(48.9)	(0.0046)
Proportion of children below 15	0.2529***	-0.5370***	-0.5868***	-2,641.1***	-1,880.3***	-0.0786**
	(0.0118)	(0.0163)	(0.0206)	(185.1)	(602.4)	(0.0355)
Proportion of elderly above 60	0.0972***	-0.2026***	-0.2492***	-3,043.4***	866.5*	-0.0084
	(0.0094)	(0.0149)	(0.0182)	(192.7)	(451.4)	(0.0578)
Head without education degree	Omitted					
Head with primary degree	-0.0942***	0.1520***	0.1653***	-132.3*	1,460.7***	0.0477
	(0.0070)	(0.0093)	(0.0110)	(74.9)	(188.7)	(0.0324)
Head with lower secondary degree	-0.1553***	0.2758***	0.2997***	158.4*	2,509.6***	0.0647**
	(0.0074)	(0.0101)	(0.0123)	(95.5)	(231.8)	(0.0289)
Head with upper secondary degree	-0.1700***	0.4009***	0.4382***	489.9***	4,077.9***	0.0879***
	(0.0085)	(0.0153)	(0.0184)	(158.4)	(511.8)	(0.0311)
Head with technical degree	-0.1924***	0.5117***	0.5856***	2,490.0***	4,109.5***	0.1242***
	(0.0076)	(0.0128)	(0.0156)	(146.4)	(879.4)	(0.0290)
Head with post secondary degree	-0.1909***	0.7624***	0.8595***	9,579.1***	2,352.4***	0.1506***
	(0.0076)	(0.0167)	(0.0194)	(467.7)	(669.1)	(0.0344)
Ethnic minorities (yes=1)	0.2457***	-0.3307***	-0.3088***	-520.3***	-1,334.3***	0.0107
	(0.0134)	(0.0154)	(0.0184)	(106.5)	(203.1)	(0.0227)
Urban (yes=1)	-0.0306***	0.1187***	0.0704***	91.8	-239.9	-0.0890***
	(0.0068)	(0.0116)	(0.0144)	(110.1)	(408.5)	(0.0209)
Year 2008	-0.0109**	-0.0146	0.0088	617.9***	406.5**	0.0701***
	(0.0052)	(0.0090)	(0.0100)	(119.3)	(205.0)	(0.0173)
Year 2010	0.0927***	0.2973***	0.1637***	1,210.8***	330.2*	-0.1424***
	(0.0067)	(0.0086)	(0.0106)	(64.8)	(193.9)	(0.0201)
Constant	0.6206***	7.4776***	5.5162***	-36,959***	-19,140**	-2.5426***
	(0.1953)	(0.3663)	(0.3972)	(5,425.7)	(9,758.0)	(0.5704)
Observations	26997	26997	26997	26997	26997	26997
R-squared	0.31	0.59	0.48	0.37	0.05	0.05

Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.
Source: Authors' estimation from VHLSSs 2006, 2008 and 2010.

Table 19: The Effect of Minimum Wages on Households' Consumption Pattern

Explanatory variables	Dependent variables							
	Log of per capita food expenditure	Log of per capita non-food expenditure	Log of per capita education expenditure	Log of per capita healthcare expenditure	Share of food expenditure	Share of non-food expenditure	Share of education expenditure	Share of healthcare expenditure
Log of regional minimum wages	0.1238**	0.4797***	0.6590***	0.1530	-0.1045*	1.5004***	0.0313	0.0043
	(0.0601)	(0.0782)	(0.1342)	(0.1751)	(0.0629)	(0.1621)	(0.0348)	(0.0383)
Household size	0.1859***	0.2045***	0.1279***	0.1963***	0.4964***	0.5705***	0.0718***	0.0557***
	(0.0024)	(0.0038)	(0.0066)	(0.0071)	(0.0043)	(0.0059)	(0.0020)	(0.0023)
Proportion of children below 15	-0.2475***	-0.6103***	-1.9951***	-0.3065***	0.3712***	-0.4070***	-0.1569***	-0.0105
	(0.0147)	(0.0225)	(0.0406)	(0.0518)	(0.0196)	(0.0364)	(0.0122)	(0.0121)
Proportion of elderly above 60	-0.3263***	-0.4061***	-0.7614***	0.6898***	0.0805***	0.0642**	-0.1430***	0.1421***
	(0.0129)	(0.0222)	(0.0707)	(0.0435)	(0.0141)	(0.0253)	(0.0066)	(0.0096)
Head without education degree	Omitted							
Head with primary degree	0.1139***	0.2486***	0.2835***	0.0909***	-0.1227***	0.1255***	0.0354***	0.0003
	(0.0081)	(0.0133)	(0.0244)	(0.0270)	(0.0114)	(0.0155)	(0.0052)	(0.0074)
Head with lower secondary degree	0.2064***	0.4289***	0.4213***	0.1427***	-0.2202***	0.2513***	0.0814***	-0.0097
	(0.0090)	(0.0148)	(0.0256)	(0.0308)	(0.0118)	(0.0200)	(0.0061)	(0.0078)
Head with upper secondary degree	0.2856***	0.6162***	0.5998***	0.1425***	-0.3017***	0.4232***	0.1132***	-0.0318***
	(0.0130)	(0.0215)	(0.0345)	(0.0443)	(0.0160)	(0.0379)	(0.0100)	(0.0098)
Head with technical degree	0.3750***	0.7199***	0.6531***	0.2359***	-0.3207***	0.3188***	0.0900***	-0.0413***
	(0.0109)	(0.0180)	(0.0326)	(0.0380)	(0.0137)	(0.0242)	(0.0080)	(0.0089)
Head with post secondary degree	0.5355***	1.0223***	0.8296***	0.3877***	-0.4302***	0.4103***	0.0888***	-0.0470***
	(0.0148)	(0.0223)	(0.0424)	(0.0526)	(0.0177)	(0.0410)	(0.0108)	(0.0104)
Ethnic minorities (yes=1)	-0.2078***	-0.4988***	-0.6022***	-0.5884***	0.3517***	-0.3610***	-0.0640***	-0.0763***
	(0.0133)	(0.0235)	(0.0402)	(0.0429)	(0.0193)	(0.0249)	(0.0079)	(0.0106)
Urban (yes=1)	-0.0014	0.2225***	0.2645***	0.0773**	-0.2193***	0.2164***	0.0376***	-0.0045
	(0.0105)	(0.0176)	(0.0271)	(0.0331)	(0.0139)	(0.0231)	(0.0075)	(0.0077)
Year 2008	-0.0595***	0.0525***	0.0572***	0.1171***	-0.0923***	0.2118***	0.0130**	0.0353***
	(0.0088)	(0.0124)	(0.0214)	(0.0282)	(0.0110)	(0.0167)	(0.0060)	(0.0069)
Year 2010	0.4343***	0.5633***	0.1548***	0.2478***	0.2552***	0.6034***	-0.0167***	-0.0050
	(0.0081)	(0.0121)	(0.0214)	(0.0266)	(0.0107)	(0.0165)	(0.0053)	(0.0061)
Constant	7.5213***	5.1895***	2.6298***	4.3365***	0.7209*	-9.5545***	-0.2676	-0.0337
	(0.3680)	(0.4797)	(0.8214)	(1.0743)	(0.3857)	(1.0014)	(0.2137)	(0.2352)
Observations	26997	26997	17642	25981	26997	26997	26997	26997
R-squared	0.63	0.60	0.49	0.17	0.76	0.59	0.23	0.10

Robust standard errors in parentheses.
* significant at 10%; ** significant at 5%; *** significant at 1%.
Source: Authors' estimation from VHLSSs 2006, 2008 and 2010.

References

Addison, J. T. and M. L. Blackburn (1999). "Minimum Wages and Poverty." *Industrial and Labor Relations Review*, Vol. 52, No. 3 (Apr., 1999), pp. 393-409.

Alatas, V. and Cameron, L. (2008). "The Impact of Minimum Wages on Employment in a Low Income Country: A Quasi-Natural Experiment in Indonesia." *Industrial and Labor Relations Review,* Vol. 61, No. 2, pp. 201-223.

Alaniz Enrique, T. H. Gindling, Katherine Terrell (2011). "The Impact of Minimum Wages on Wages, Work and Poverty in Nicaragua." IZA DP No. 5702.

Arango C, Panchon A. (2004). "Minimum Wages in Colombia: Holding the Middle with a Bite on the Poor." Colombian Central Bank unpublished paper; Bogotá; 2004.

Bell, L. (1997). "The Impact of Minimum Wages in Mexico and Colombia." *Journal of Labor Economics*, 15(3), 102-135.

Burkhauser, Richard V and Kenneth Couch and David Wittenburg (2000). "A Reassessment of the New Economics of the Minimum Wage Literature with Monthly Data from the Current Population Survey." *Journal of Labor Economics* 18(4) 653-80.

Card, David & Alan Krueger (1994). "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania." *American Economic Review* 84(4), pages 772-93.

Del Carpio, X., Nguyen, Ha and Wang, Liang Choon (2012). "Does the Minimum Wage Affect Employment? Evidence from the Manufacturing Sector in Indonesia." *The World Bank Research Working Paper Series*. The World Bank.

Gindling TH, Terrell K. (2010). "Minimum Wages, Globalization and Poverty in Honduras." *World Development*; 38(6); 908-918.

Fields, G. S., B. Han R. Kanbur (2007). "Poverty Effects of the Minimum Wage: The Role of Household Employment Composition." Paper presented at the Annual Convention of the Society of Labor Economists, Chicago, IL, May, 2007.

Fields, Gary S. and Ravi Kanbur (2007). “Minimum Wages and Poverty with Income Sharing.” *Journal of Economic Inequality* 5, 135-147, 2007.

Katz, Lawrence & Alan B. Krueger, 1992. "The Effect of the Minimum Wage on the Fast-Food Industry." *Industrial and Labor Relations Review*, vol. 46(1), pages 6-21, October.

Kristensen, N. and W. Cunningham (2006). “Do Minimum Wages in Latin America and the Caribbean Matter? Evidence from 19 Countries.” *World Bank Research Working Paper*, WPS3870.

Maloney, W. and J. Nunez (2004). “Minimum Wages in Latin America,” in *Law and Employment: Lessons from Latin America and the Caribbean*, by J. Heckman and C. Pag_Es (eds.), Cambridge, MA.

Neumark, David and William Wascher (2002). "Do Minimum Wages Fight Poverty?" *Economic Inquiry*, 2002, v40(3,Jul), 315-333.

Nguyen, Viet Cuong (2013), “Impact of Minimum Wage Increase on Employment, Wages and Expenditures in Vietnam”, *Economics of Transition*, Vol. 21(3), 583-615.

Nguyen, Viet Cuong (2011). “Do Minimum Wage Increases Cause Inflation? Evidence from Vietnam.” *ASEAN Economic Bulletin*, Vol. 28(3), pp. 337–59.

Rama, M. 2001. “The Consequences of Doubling the Minimum Wage: The Case of Indonesia.” *Industrial and Labor Relations Review*, 54(4), 864-881.

Sagat C. (2001). “Is the Minimum Wage an Effective Tool to Promote Decent Work and Reduce Poverty? The Experience of Selected Developing Countries.” ILO Employment Paper 2001/13: Geneva; 2001.