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Minimum Wage and Lives of the Poor: Evidence from Thailand

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Studying how the poor respond to the minimum wage policy in Thailand, I find that a notable increase in the minimum wage has no significant impact on employment among the poor even though wage plays a vital but heterogeneous role in determining employment. Also, this policy can significantly boost expenditure among the poor residing in provinces where the minimum wage is adjusted dramatically. Surprisingly, food does not account for the most significant share of consumption as the income of the poor rises. The results are still robust to additional controls and redefinition of the poverty. (JEL E24, J31, J38, I38)

KEYWORDS: Minimum wage, employment, poverty

I. INTRODUCTION

There are two types of policy which can tackle poverty and income inequality including a policy which can influence markets to generate income and policy which can distribute the outcomes from markets (Ravallion 2016).

Since the first introduction of minimum wage in New Zealand in 1894, other countries adopted minimum wage legislation, for instance, British (1909), the United States (1912)[2], France (1915), Norway (1918), and Germany (1923). The primary purposes of this laws were to prevent the payment of unduly low wages to the workers and to eliminate of unfair competition among employers through wages (International Labor Office 1927; Starr 1981). Then, a very long debate about the effects of this policy exists evidently. At first glance, it is likely to lift the life among the unskilled labors up through setting the wage rate generally paid to workers; it can more or less harm industries by raising the cost of production intermediately. The results seem to be context-specific relied on the conditions among agents and institutions in the labor market. Moreover, a successful story in one country is hardly believed to yield the same result in another. However, it is more interesting in the analysis of the poor. As labor is primary, sometimes merely, a factor of production of the poor; hence, earning from labor accounts for a significant share of household income which ultimately determines household consumption and their living standard. The effects borne by the poor from a change in the minimum wage is challenging to study, and it is more appealing under the context of the developing countries posing unique characteristics which are different almost entirely from the developed world.

When low unemployment is one of the primary macroeconomic goals, Thailand is likely to achieve this target apparently because an unemployment rate, the number of the unemployed relative to total labor force, is impressively low in the range between 0.66 percent

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[2] Minimum wage laws was introduced in the United States with the enactment of the Massachusetts law of June 4, 1912 and it came into effect in 1913. At that time, the laws was applicable only for women and minors. This legislation then was followed by several states across country (Verrill, 1915).

and 1.49 percent for the last ten years (National Statistical Office of Thailand[3] 2016). Also, it is one of the developing countries using the minimum wage system since 1973. Initially, this guaranteed payment is restricted to only four provinces around Bangkok. Nowadays, it is implemented across the country in almost all sectors (Thailand Ministry of Labor 2017). Due to a slow increase in the minimum wage between 2008 and 2011, a reform in the minimum wage campaigned by the Pheu Thai Party is one of the key factors to win the 2011 general election. It can be seen as the biggest jump in the minimum wage in history spurring both agreements and oppositions, especially from the small and medium-sized enterprises. Initially, the minimum wage is dramatically different in each province ranging from THB159 to THB221 by the difference in economic and social status. Within two years, wages are legally reformed to THB300 in all provinces. Labor living in areas where the minimum wage is raised significantly are expected to face an immediate change in living standard while labor residing in areas where it is raised relatively lower may not observe a significant difference pre- and post-policy. However, migration may not be a critical issue because labor who decides to participate in the market will receive the same wage.

Five years after the most significant jump in the minimum wage, Thailand's labor market looks sluggish. The unemployment rate has increased continuously from 2012 to 2016 (NESDB 2016). Wage policy seems to be a potential cause. This study focuses on the poor household living in the different area across Thailand. The poor are defined by the national poverty line calculated by Thailand's National Economic and Social Development Board (NESDB). An immediate and significant change in their primary source of income, in short run, could change their decision to work and spend money. A possible channel for the low-income family which is expected to be an extended family is that when the minimum wage has been raised, an opportunity cost for rearing children is increasing. It may attract mother not to allocate her time to children and to enter the labor market. Also, she may be pressured or forced unintentionally to take this opportunity. Under this scenario, employment is likely to increase. However, employment may be negatively affected based on the law of demand and supply in labor market. Also, an infant industry may not be able to bear this higher cost and decide to cut the employment. With relatively low productivity, the poor are more vulnerable in this situation. The first research question is whether the poor negatively or positively benefits from the minimum wage adjustment. Under the situation that employment is neither negatively affected nor structurally changed after an introduction of new minimum wage, household expenditure is likely, in general, to increase as income rises. However, an allocation of expenditure among the poor household is unusual because there is a particular view, namely stereotype, of the poor that they will spend an entire amount of money on foods. The second research question is whether the poor spend mostly on food when their income increases.

Using a cross-sectional data from the Household Socio-economic survey in 2013 collected by NSO, the total sample is 42,738 households. The results from pooled OLS regression suggest that the wage is significantly associated with employment and household expenditure. However, the influence of wage is heterogeneous across the sample. For the poor household residing in highly-adjusted wage province where a change rate of its minimum wage is higher than an average between 2011 and 2013, it is found that a massive increase in the minimum wage does not encourage employment among the poor. However, it has a potential to boost consumption, especially non-consumption expenditure. Interestingly, food is not the main target of the poor as income rises which is consistent with Engel's law stating the less importance of food, relatively to other expenditures, with an additional income, even in the

[3] Thereafter, NSO

poor family. The results are still robust with more controls on household characteristics, other sources of income, and socio-economic class. Furthermore, there is no significant change in tobacco consumption and debt repayment among the poor.

The remainder of the paper is organized as follows. Section II presents the previous literature on minimum wage. Section III describes the minimum wage policy in Thailand. Section IV explains data. Section V presents the empirical strategy. Section VI provides the results. Section VII concludes.

II. LITERATURE

Despite a large body of research on the impacts of the minimum wages, a consensus whether the minimum wages yield a positive or negative impact on employment has not been reached. From the conventional theory of demand and supply in the labor market, a rise in the minimum wage leads to an increase in labor supply and a decrease in labor demand. Employers tend to reduce their employment due to a rise in the marginal cost of hiring a new worker (Stigler 1946). However, a higher minimum wage also induces the unemployed to put more effort to search for a job; this would improve matching between labors and employers in the market. A new setting in the minimum wage; hence, can cause job creation. Thus, the prediction from theory is ambiguous (Meer and West 2016).

Consider the two-sector labor-surplus model first developed by Lewis (1954) and later formulated by Fei and Ranis (1964), rural wages in the agriculture sector are assumed not, in all labor surplus models, to be lower than the minimum wage to ensure that it can attract people to work outside their home. It is different from a standard neoclassical model which assumes that the wage rate equals the Marginal Product of Labor (MPL). However, when the MPL rises above this wage rate, agricultural wages rise as more labor is drawn from agriculture sector to modern sector. Firm in the modern sector must pay at least as much as the workers are receiving from agricultural sector for attracting them. This would make a wage in modern sector usually higher than in agriculture sector. Thus, any changes in the institutionally fixed wage can be implied to generate the effects on labor market because it indirectly increases the opportunity cost for labor to migrate to the modern sector and it directly raises the production cost for growing manufacturing sector, especially in the developing countries where the dual-sector economy is more likely to be found.

An increase in the minimum wage is more likely to occur in all sectors. For example, in the United States, the federal government imposes a nationwide minimum wage of $US7.25 per hour. There are 29 states[4] with the minimum wage rates impose higher than the federal minimum wage (United States Department of Labor 2017). In the United Kingdom, the minimum wage is different because the hourly rate for the minimum wage us set differently depending on age and whether employees are an apprentice. For example, 25-year-old labor will receive the national living wage which is higher than the minimum wage applied for workers aged 24 and under (United Kingdom Department for Business, Energy & Industrial Strategy 2017).

[4] There are 29 States and the District of Columbia set a minimum wage higher than the federal requirement, for example, California, Oregon, Washington, and New York. There are 14 states set a minimum wage equal to the federal requirement, for example, Utah, Texas, and Oklahoma. There are 2 states set a minimum wage lower than the federal requirement which must follow the federal minimum wage rate including Wyoming and Georgia. Lastly, there are 5 states which no minimum wage law exists including Louisiana, Mississippi, Alabama, Tennessee, and South Carolina.

Thus, the difference in the minimum wage system and a different set of data can lead to the different outcome from an increase in the minimum wage. Neumark and Wascher (1992) using the panel data from the Current Population Surveys (CPS) between 1973 and 1989 finds that a 10 percent increase in the minimum wage decreases employment among teenagers by 1 to 2 percent while among young adults by 1.5 to 2 percent. Their results are likely to be contradicted by Card and Krueger (1994) which examine the impact of raising the minimum wage in New Jersey using the difference-in-differences method and they find that the rise in the minimum wage does not reduce employment which is contrary to the prediction of the standard model but consistent with other studies at that time (Katz & Krueger 1992; Machin & Manning 1994). Neumark and Wascher have re-estimated their model using the different sets of data and still find the negative impact of the minimum wage on employment (Neumark & Wascher 1996, 2000; Neumark et al. 2013). Their negative relationship is consistent with other literature in several countries, for instance, the United Kingdom (Machin et al. 2003; Stewart & Swaffield 2008, Dickens et al. 2015), Australia (Mangan & Johnston 1999; Leigh 2004) and Indonesia (Harrison & Scorse 2005; Alatas & Cameron 2003).

For Thailand, the early research project on the impacts of a new minimum rate applied in 2012 and 2013 was conducted by Thailand Development Research Institute (2012). The scope covers impact evaluation of this policy on employers and firm response. The results reveal that this policy helps all labors across the country earn more income at least up to 300 Baht a day. It helps improve their living status, and they will be able to spend more money in the market. Approximately 3.2 million labors enjoy the benefit from this program. However, this policy does not affect the ratio of employment to population and labor force participation. On the other hand, this policy directly increases the burden to firms, especially the labor-intensive industries, for example, textiles sale and wholesale, and rubber, which might reduce Thailand's competitiveness. However, the limitation of this study is mainly about its estimation. The three sources of Endogeneity including omitted variables, reverse causality, and measurement error is not discussed extensively. The impact on employment in different sectors are employed using the fixed effect model, but there is no interaction term to identify the treated and control group. Even though the results are likely to consistent with the qualitative results, it can be either over- or under-estimated. [5] Additionally, this policy can reduce Thai's GDP by 1.7 percent if firms cannot raise labor productivity and manufacturing capacity using the Computable General Equilibrium (CGE) model (Bank of Thailand, 2012). For comparative advantage, this policy makes Thailand's minimum wage higher than other ASEAN's countries which will attract foreign labors to the countries. For welfare analysis, Del Carpio, Messina, and Sanz-de-Galdeano (2014) revealed that an increase in the minimum wage in Thailand caused an increase in weekly working hours. This effect is due primarily to an increase in hours worked for men. They also suggested that this policy led to a rise in per capita consumption and a reduction in poverty.

[5] Instrumental variable estimation is also examined but there is no clear explanation about the exclusion restriction.

III. THAILAND LABOR MARKET AND POLICY DESIGN

Thailand minimum wage reform is the primary interest of this study. In 2012, the number of employed persons in Thailand was 38.94 million accounting for 98.79 percent of total labor force. The primary occupation among Thai people was skilled agricultural and fishery workers[6], followed by service and sales workers and elementary occupations[7]. Interestingly, Thailand's unemployment rate has increased moderately every year from 0.66 percent in 2012 to 0.99 in 2016[8]. During this period, the number of employed persons shrank by 3.23 percent. However, the number of skilled agricultural and fishery workers declined the most by 23.39 percent, roughly 436 thousand persons gone from this sector (NSO 2016). This phenomenon leaves a large research avenue among scholars.

One of the main policies contributing to the success of the Pheu Thai Party in Thailand's general election taken place on 3 July 2011 was to raise the minimum daily wage to 300 Baht[9] throughout the country (Na Thalang 2011). The National Wage Committee (NWC) is responsible for setting the minimum wage in each province. The key concept of the minimum wage is the wage rate which is sufficient for an unskilled labor to live properly under the different economic and social condition, and to have the standard of living which is appropriate to local business capacity of each province. Also, there is a provincial subcommittee whose duties are to study and collect the information about Consumer Price Index (CPI), inflation, cost of production, standard of living, price level of goods and services, business capacity, labor productivity, Gross Domestic Product (GDP), and economic and social condition. On 2 November 2011, the NWC announced the notification on minimum wage (No.6) which came into effect on 1 April 2012 which was the first notice on minimum wage under this government. The 300 Baht minimum wage was applied to 7 pilot provinces including Phuket, Bangkok, Nakhon Pathom, Nonthaburi, Pathum Thani, Samut Prakarn, and Samut Sakhon while the minimum wages in other provinces were raised by 39.5 percent (National Wage Committee 2011). These pilot provinces were deemed ready due to the current high minimum wage compared to other provinces (Sasomsub 2011).

On 10 October 2012, the NWC issued the notice on minimum wage (No.7). Under this notice, the minimum wage in all provinces was set to 300 Baht across the country from 1 January 2013 onwards (National Wage Committee 2012). To the extent that the minimum wage is widely used in every province, it is not implemented in several sectors, for example, government officer, officers in government-owned companies, maid, employees working with non-profit seeking businesses, employees in the fishing sector and casual employees in the agricultural sector. Table A.I in the Appendix provides a big jump in Thailand's minimum wage in each province across the country between 2011 and 2013. Additionally, even though every province has the same minimum wage, a change rate varies between 2011 and 2013 from 35.75 percent to 88.68 percent. An average rate of change is 70.72 percent. The minimum wage among almost all provinces in the Southeast region, the most impoverished region in Thailand,

[6] It is the sixth group of occupations based on ILO's International Standard Classification of Occupations (ISCO). Examples of jobs are market gardeners and crop growers, animal producers, forestry and related workers, and subsistence farmers, fishers, hunters and gatherers.

[7] For example, cleaners and helpers; agricultural, forestry and fishery laborers; laborers in mining construction, manufacturing and transport; food preparation assistants; street and related sales and service workers and refuse workers.

[8] The latest unemployment rate is 1.1 percent collected data in February 2017. The unemployed has increased by almost 100 thousand compared to the same period last year (NSO 2017).

[9] The Thai Baht (THB) is the currency of Thailand. According to XE currency converter, US$1 = THB33.2813 (29 October 2017).

has been raised more than the average. The lowest increase in the minimum wage is Phuket, one of the wealthiest provinces of Thailand. This variation in an increase in the minimum wage may generate either positive or negative impact borne by the poor residing differently across the country.

IV. DATA

The microdata from the Household Socio-economic Survey 2013 provided by NSO is analyzed. I focus on employment and expenditure among the poor household defined by the national poverty line calculated by NESDB.[10] There are 42,738 households in the sample. Also, there are 5,747 households whose monthly consumption expenditure is below the poverty line and defined as a poor household, accounting for 13.45 percent of the sample. There are 36,991 households which are defined as non-poor household, accounting for 86.55 percent of the sample. Household characteristics are shown in Table 1.

An average monthly wage for all households is 10,408 Baht. An average monthly wage among the non-poor household is higher than the poor household by four times. It is evident that the non-poor household tends to have other reliable sources of money income more than the poor household, except for the elderly and disability assistance from the government. For example, the poor household receive unpaid foods and beverage per month more than the non-poor household. It is evident that the poor household has all kinds of expenditure significantly lower than the non-poor household. However, the number of a worker in household among the poor household is higher than the non-poor family.

TABLE I
HOUSEHOLD CHARACTERISTICS

	(1) Full Sample	(2) Poor Household	(3) Non-poor Household
Sources of income (Thai Baht)			
Wage	10,407.87	3,096.55	11,543.77
Net profit from business	5,397.45	1,214.96	6,047.25
Net profit from farming	3,197.03	2,781.88	3,261.53
Pensions and annuities	741.10	18.03	853.44
Work compensations	12.59	0.84	14.42
Money assistance outside household	1,580.36	1,196.47	1,640.01
Elderly and disability assistance	374.79	579.26	343.02
Rent of house, land other properties	198.67	32.21	224.53
Saving interests, shares, bonds, and stocks	157.35	6.71	180.75
Interests of individual lending	19.45	0.22	22.44
Total money income	22,086.64	8,927.11	24,131.13
Source of other receipts (Thai Baht)			
Rental estimation of free-occupied house	1,860.24	1,045.77	1,986.78
Unpaid of goods and services	401.27	210.27	430.94
Unpaid of foods and beverages	883.44	1,192.72	835.39
Education scholarship	4.56	3.06	4.79
Inheritance and gifts	105.20	5.09	120.75
Proceeds from insurance	66.07	6.75	75.28

[10] Household poverty is measured using an average monthly consumption expenditure per household which is below the national poverty line. Poverty line is calculated by NESDB. In 2013, the national poverty line is 2,572THB per month (consumption expenditure) which is equal to 77.28USD while in 2017, the national poverty line is 2,667THB per month (NESDB 2017).

	(1) Full Sample	(2) Poor Household	(3) Non-poor Household
Other receipts	177.82	46.68	198.20
Total other money receipt	3,498.59	2,510.33	3,652.13
Expenditures (Thai Baht)			
Consumption expenditure	8,128.35	2,356.68	9,025.05
Non-consumption expenditure	2,262.09	680.16	2,507.86
Food expenditure	5,508.10	3,164.06	5,872.27
Total expenditure	10,278.00	913.00	10,323.00
Employment			
Number of workers in household	1.72	2.01	1.67
Observations	42,738	5,747	36,991

Notes: Statistics reported are means. The data source is Thailand's Household Socio-economic Survey 2013 collected by NSO. The number of sample in each household category is reported at the foot of the table. Income from work compensations includes terminated payment. Rent of house includes license and copyrights. Receipt of rental estimation includes own house estimation. Proceeds from insurance include health, accident, fire, and life insurance. Other receipts include lottery winnings, commissions, and gambling. Consumption expenditure is expenditure on housing, household operation and equipment, clothes, footwear, personal and health care, transportation, communication, education, and recreation. Non-consumption expenditure is expenditure on taxes, charges, fees, career membership expense, insurance premiums, interest payment and other expenses. The "poor household" is household whose average monthly consumption expenditure is less than 2,752 Baht. The "non-poor household" is household whose average monthly consumption expenditure is greater than or equal to 2,752 Baht. All monetary amounts are Thai Baht (THB), US$1 = THB 33.2813 (29 October 2017).

V. EMPIRICAL STRATEGY

To examine whether a significant increase in the minimum wage among provinces in Thailand between 2011 and 2013 affects the living standard of the poor, the difference-in-differences estimation is employed. An increase in the minimum wage is different across provinces throughout the country from 35.75 percent to 88.68 percent within three years[11]. An average of changes in the minimum wage is 70.72 percent. Thus, provinces are divided into two groups including 1) provinces whose changes in the minimum wage are more significant than an average and 2) provinces whose changes in the minimum wage are less than an average.[12] Practically, I assign the provincial minimum wage in each household based on the data shown in Table A.I in the Appendix. Also, to assess the impact borne by the poor, households are classified into poor and non-poor household using national poverty line.

A linear approximation using the double-difference method of the estimated model can be expressed as follows:

$$(1) \qquad y_{ij} = \alpha_0 + \alpha_1 P_i + \alpha_2 M_j + \alpha_3 (P_i M_j) + \delta X_i + \epsilon_{ij}$$

where y_{ij} is log of the employment-related (i.e. the number of members who earned from wages and salaries) and consumption-related (i.e. average monthly consumption and non-consumption expenditure[13]) measures for household i in province j, P_i is a dummy indicating

[11] The difference in percentage change of wage across provinces is due to the initial wage rates which are set differently. As the minimum wage is then set to the same 300 Baht, changes are not identical as shown in Table A.1 in the Appendix.

[12] This empirical strategy is closed to Duflo (2001) which a program intensity is different across countries.

[13] Consumption expenditure is an expenditure on housing, household operation and equipment, clothes, footwear, personal and health care, transportation, communication, education, and recreation. Non-consumption expenditure

whether the household belongs to the "poor" cohort in the sample, α_0 is a constant, and ϵ_{ij} is an error term. Difference regression (1) also includes control variables (X_i) for changes in household characteristics (i.e. sex and education of the head of household, number of the disabled, number of member who the is young than 15). I further control for changes from other incomes (i.e. government, grants, inheritance and gift, interests from lending, and other receipts). Lastly, I control for change in the socio-economic status[14]. The interpretation of the effect on the outcome of interest for household i in province j is discussed below.

Firstly, there may be an effect from the minimum wage on employment and consumption, α_1, of being poor household, P_i=1 (otherwise zero). When the minimum wage is risen across country, a poor household is likely to disproportionately receive the benefit, suggesting that α_1 would be positive[15]. However, this parameter includes the effect from unobservable factors other than the minimum wage. Secondly, there may be an effect, α_2, of living in provinces which the minimum wage has been significantly increased, M_j =1 (otherwise zero). However, this parameter does not classify the heterogeneous effect borne by the rich and poor household. Even though there is no consensus whether the minimum wage encourages employment because it depends on economic and social conditions. Labor market in Thailand is unique. In 2008, Thailand amended the Working of Alien Act[16] which provides the legal framework for foreign employment in Thailand and also provides the framework for MOUs with Laos, Cambodia, Myanmar, and Vietnam. There are 1,788,964 alien workers from four countries currently (Thailand Foreign Workers Administration Office, 2017)[17]. Even though wage rate for these labors must be equal to Thai, there are many evidences shown that employers always pay a lower wage rate to these workers (Thailand Ministry of Labor 2012). When the minimum wage has been raised, it is possible that firm may turn from Thai labor to alien labor, especially among the unskilled labors, suggesting that α_2 would be negative. An interaction term defined as the outcome of being poor household and living in the high-adjusted wage area, $P_i M_j$, would highlight the effect on interested outcome, α_3, which addresses changes in employment and expenditure of the poor in the different adjusted wage province under the hypothesis that a big jump in the minimum wage generates the heterogeneous effect among the poor.

Table II illustrates the stratification of the effects.

is an expenditure on taxes, charges, fees, career membership expense, insurance premiums, interest payment and other expenses.

[14] Socio-economic status is consistent with the industry which each household get involved, for example, farming, non-agricultural business, professional, technician and manager. As the minimum wage is not varied based on industry, this variable should be further controlled.

[15] Another possible explanation is that when the minimum wage increase, the poor tend to have more incentive to find jobs. With low productivity, the employers can set minimum cost of labor equal to 300 Baht if at the end they decide to hire these poor workers.

[16] The Working of Alien Act, b.e. 2551 (2008), promulgated on the 22nd February 2008

[17] Accounting around 5 percent of total labor force.

TABLE II
SCHEMATIC COMPARISON OF THE HOUSEHOLD AFFECTED FROM THE MINIMUM WAGE

	Economic Status of Households	
Minimum Wage Locality	Non-poor Household	Poor Household
Low-adjusted wage province	Y_{11}	Y_{01}
High-adjusted wage province	Y_{10}	Y_{00}

The first hypothesis is tested by the difference estimator as follows;

$$H_1 \quad D_1 = (Y_{11} - Y_{01}) > 0$$

It measures the difference of interested outcome between non-poor and poor household residing in the low-adjusted wage locality.

$$H_2 \quad D_2 = (Y_{10} - Y_{00}) > 0$$

It measures the difference of outcome between non-poor and poor household living the in high-adjusted wage locality.

$$H_3 \quad DD_1 = (D_1 - D_2) > 0$$

It captures the effect of the minimum wage in high wage adjustment provinces borne by the poor relative to the poor in the low wage adjustment province. The allocation of provinces across four categories is shown in Table III.

TABLE III
ALLOCATION OF HOUSEHOLD, BY ECONOMIC STATUS AND WAGE ADJUSTMENT

	Non-poor household	Poor household	Total
Low-adjusted wage province	12,453	702	13,155
High-adjusted wage province	24,538	5,045	29,583
Total	36,991	5,747	42,738

NOTES: The "poor household" is household whose average monthly consumption expenditure is less than 2,752 Baht. All monetary amounts are Thai Baht (THB), US$1 = THB฿33.2813 (29 October 2017). The "non-poor household" is household whose average monthly consumption expenditure is greater than or equal to 2,752 Baht. The "low-adjusted wage provinces" is a province which the minimum wage has been set lower than the average of changes across the country. The "high-adjusted wage provinces" is a province which the minimum wage has been set higher than the average of changes across the country. The average of changes is 70.72 percent.

VI. RESULTS

A. Basic Results

Before examining the effect of the minimum wage on the poor household's employment and consumption, the relationship between an average monthly wage and employment and household expenditure is employed shown in Table A.II in the Appendix[18]. The results, in all specifications, suggest that wage is associated with the number of a worker

[18] A relationship is estimated using log-log model (OLS estimation) with pooled sample. Model specification is $y_i = \alpha_0 + \alpha_1 W_i + \delta X_i + \epsilon_{ij}$ where y_{ij} and controls variable are similar to estimating specification (1). The main regressor of interest is W_i which is log of an average monthly wage received in each household.

per household and also household consumption, non-consumption, and food expenditure. However, with the limitation of standard linear regression providing only the average relationship, I conduct a quantile regression[19] to examine further whether the influence of wage is the same across the household. The hypothesis is that the effect of wage is heterogeneous depending on unobservables such as the difference in the marginal utility of additional income among the rich and the poor. It is found that there is a significant but heterogeneous effect of wage on employment and household expenditure. This result supports the study of the specific effect of an increased minimum wage on the poor household.

Table IV, Panel A reports the results of equation (1), incrementally including the more control variables. Without any controls, the suggested effect is that one percent increase in the minimum wage would yield a 6.59 percent increase in the number of workers in the poor household[20]. Interestingly, with additional controls, there is no significant impact on employment from an increase in the minimum wage even though the R^2 raises considerably. In Panel B, C, and D, it apparently shows the robust effects of the minimum wage on consumption expenditure, non-consumption expenditure, and food expenditure among the poor household. The result is strongly robust as it reveals that one percent increase in the minimum wage could lead to a 16.74 and 26.04 percent increase in consumption and non-consumption expenditure, respectively. Interestingly, the poor are likely to spend a certain amount of this new wage on non-consumption goods and services more than food. The inclusion of control leads to an increase in the R^2.

B. Further Tests

Also, I redefine the poor household from using the national poverty line to the international poverty line of $1.90 a day defined by the World Bank (2017).[21] This kind of poverty is referred to extreme poverty. Using the same set of sample, there are 1,850 households in Thailand living, on average, below this poverty line, accounting for 4.33 percent of total household. I re-examined the estimating specification (1), and the results are shown in Table V.

Among the poorest group of household residing across the country, the result is consistent with the poor cohort presented in Table IV. Even though the minimum wage could attract member in the poorest household to work more, the effect is not significant. The effect of the minimum wage on consumption and non-consumption expenditure is almost identical, where the latter has smaller R^2. For food consumption, it suggests that the poorest household, on average, does not spend an entire amount of additional income on food because the estimated coefficient is lower than other types of expenditure. This result is consistent with Duflo (2007). Overall, the effect borne by the poorest group of household is still significant but less robust compared to the poor group.

[19] Quantile regression is a statistical technique which offers an estimation using conditional median function. It describes the relationship at the different point based on the distribution of the dependent variable (Koenker & Hallock 2001).

[20] To conserve space, I present the coefficients on controls to the Appendix. Overall, the coefficients on controls are positive, especially other sources of household income.

[21] According to XE currency converter, US$1 = THB33.2813 (29 October 2017), US$1.90 a day is equal to THB63.2345.

TABLE IV

EFFECT OF THE MINIMUM WAGE ON EMPLOYMENT AND CONSUMPTION AMONG THE POOR: COEFFICIENTS OF THE INTERACTIONS BETWEEN THE COHORT DUMMIES AND THE NUMBER OF WORKERS IN HOUSEHOLD AND THREE TYPES OF CONSUMPTIONS

	(1)	(2)	(3)	(4)	(5)
Panel A: Effect of the minimum wage on employment among the poor household					
Dependent variable: log(number of households earning a wage)					
Net minimum wage effect	0.0659***	0.0296	0.0289	0.0214	0.0032
	(0.0183)	(0.0217)	(0.0202)	(0.0212)	(0.0136)
R^2	0.0403	0.0956	0.1291	0.1389	0.6498
Panel B: Effect of the minimum wage on consumption expenditure among the poor household					
Dependent variable: log(household consumption expenditure)					
Net minimum wage effect	0.3443***	0.2565***	0.2579***	0.2187***	0.1674***
	(0.0439)	(0.0429)	(0.0426)	(0.0416)	(0.0373)
R^2	0.140	0.3138	0.3243	0.3581	0.4844
Panel C: Effect of the minimum wage on non-consumption expenditure among the poor household					
Dependent variable: log(household non-consumption expenditure)					
Net minimum wage effect	0.5798***	0.4314***	0.4322***	0.3576***	0.2604***
	(0.0628)	(0.0674)	(0.0665)	(0.0656)	(0.0601)
R^2	0.0622	0.1146	0.1366	0.1624	0.2993
Panel D: Effect of the minimum wage on food expenditure among the poor household					
Dependent variable: log(household food expenditure)					
Net minimum wage effect	0.2579***	0.2157***	0.2163***	0.2137***	0.1832***
	(0.0362)	(0.0365)	(0.0364)	(0.0350)	(0.033)
R^2	0.0847	0.2085	0.2125	0.2725	0.3593
Household characteristics		Yes	Yes	Yes	Yes
Source of other money income			Yes	Yes	Yes
Source of other receipts				Yes	Yes
Socio-economic class					Yes
Observations	42,738	40,257	40,257	40,257	40,257

NOTES: The "poor household" is household whose average monthly consumption expenditure is less than THB 2,752. All monetary amounts are Thai Baht (THB), US$1 = THB 33.2813 (29 October 2017). Consumption expenditure is expenditure on housing, household operation and equipment, clothes, footwear, personal and health care, transportation, communication, education, and recreation. Non-consumption expenditure is expenditure on taxes, charges, fees, career membership expense, insurance premiums, interest payment and other expenses. Controls of household characteristics are sex and education of head of household, the number of members younger than 15 years and older than 60 years, and the number of the disabled. Controls of the source of other money income are a pension, work compensation, money from other households, elderly and disability assistance, rent of house and other properties, interest from saving and lending. Controls of the source of other receipts are a rental estimation, unpaid amount of goods, services, food, and beverages, education scholarship, inheritance and gifts, proceeds from all kinds of insurance, and other receipts, for example, lottery winning and commissions. Standard errors in parentheses. $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.1$.

TABLE V

EFFECT OF THE MINIMUM WAGE ON EMPLOYMENT AND CONSUMPTION AMONG THE POOREST: COEFFICIENTS OF THE INTERACTIONS BETWEEN THE COHORT DUMMIES AND THE NUMBER OF WORKERS IN HOUSEHOLD AND THREE TYPES OF CONSUMPTIONS

	(1)	(2)	(3)	(4)	(5)
Panel A: Effect of the minimum wage on employment among the poorest					
Dependent variable: log(number of households earning a wage)					
Net minimum wage effect	0.1667***	0.1043*	0.0986*	0.0891*	0.0114
	(0.0345)	(0.0426)	(0.0418)	(0.0416)	(0.0266)
R^2	0.0396	0.0953	0.1285	0.1386	0.6499
Panel B: Effect of the minimum wage on consumption expenditure among the poorest					
Dependent variable: log(household consumption expenditure)					
Net minimum wage effect	0.5595***	0.3477***	0.3541***	0.3050***	0.2599***
	(0.0790)	(0.0869)	(0.0862)	(0.0838)	(0.0749)
R^2	0.0905	0.2670	0.2794	0.3194	0.4582
Panel C: Effect of the minimum wage on non-consumption expenditure among the poorest					
Dependent variable: log(household non-consumption expenditure)					
Net minimum wage effect	0.7517***	0.3878**	0.3836**	0.3013*	0.2520*
	(0.1109)	(0.233)	(0.1313)	(0.1292)	(0.1181)
R^2	0.0427	0.0998	0.1219	0.1508	0.2935
Panel D: Effect of the minimum wage on food expenditure among the poorest					
Dependent variable: log(household food expenditure)					
Net minimum wage effect	0.3109***	0.1716*	0.1735*	0.1507*	0.1139*
	(0.0639)	(0.0725)	(0.0723)	(0.0694)	(0.0651)
R^2	0.0687	0.1861	0.1907	0.2539	0.3468
Household characteristics		Yes	Yes	Yes	Yes
Source of other money income			Yes	Yes	Yes
Source of other receipts				Yes	Yes
Socio-economic class					Yes
Observations	42,738	40,257	40,257	40,257	40,257

NOTES: The "poorest household" is household whose average monthly consumption expenditure is less than THB 1,897.04 (US$1.90 per day). All monetary amounts are Thai Baht (THB), US$1 = THB 33.2813 (29 October 2017). Consumption expenditure is expenditure on housing, household operation and equipment, clothes, footwear, personal and health care, transportation, communication, education, and recreation. Non-consumption expenditure is expenditure on taxes, charges, fees, career membership expense, insurance premiums, interest payment and other expenses. Controls of household characteristics are sex and education of head of household, the number of members younger than 15 years and older than 60 years, and the number of the disabled. Controls of the source of other money income are a pension, work compensation, money from other households, elderly and disability assistance, rent of house and other properties, interest from saving and lending. Controls of the source of other receipts are a rental estimation, unpaid amount of goods, services, food, and beverages, education scholarship, inheritance and gifts, proceeds from all kinds of insurance, and other receipts, for example, lottery winning and commissions. Standard errors in parentheses. $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.1$.

I also estimate the effect of an increase in the minimum wage on tobacco spending and debt repayment. The results are shown in Table A.IV in the Appendix. It suggests that the minimum wage has no significant impact on both variables.

C. Channels

Even though the minimum wage does not naturally aim to promote the poor in particular, it is a pro-poor policy by nature. In the developing countries where they are in a transitional period from agricultural to the industrial sector, labor-intensive sectors are scaled up dramatically. As a difference in wage between agricultural and industrial sector is the primary factor for the rural people in deciding whether they should move to a modern sector, an increase in the minimum wage has two implications in case of Thailand.

Firstly, an increase in the minimum wage does not significantly affect the decision among the poor household partly because this wage, in real money term, is applied equally across sectors. It means that the poor do not need to change their job to get a higher wage. They can enjoy this new wage rate as they are in the same sector. To change jobs, it is costly for the poor because it requires a set of specialization. To gain this expertise, the poor need education, and training. When they weight an additional cost in exchange for the same benefit they could get from the same job, it may not be worthwhile to do so. If it is expected to worthwhile, it is possible that other idle member of the household may enter the job market and receives the new wage.

On the other hand, an increase in the minimum wage poses a risk to the poor as well. As they tend to hold less specific expertise, firms with a higher cost from the policy may decide not to hire the poor and put pressure on more skilled labor. Another possible explanation may arise from the situation that the minimum wage announced by NWC is less than the real wage[22] paid to labor; thus, an increase in the minimum wage should not affect employment among the poor. Nonetheless, as the minimum wage covers only labors who newly participate the labor market (not cover to more experienced and productive labor), an increase in the minimum wage could be considered to lure the idle member in the poor family. Thus, it is not about the real wage in the market but the decision among the poor and firm. With these forces, it is possible to observe no significant effect on employment.

Secondly, an increase in the minimum wage positively contributes to consumption, non-consumption, and food expenditure. In fact, this is not a surprising result. A minimum wage is considered to be a leading source of income among the poor. When the income goes up, people, not only the poor, generally spend much more on goods and services. It can reduce poverty and income inequality in society which is argued by Ravallion (2016). However, the allocation of expenditure among the poor is unusual because they do not spend the majority of an additional income on foods, but non-consumption goods, for example, housing equipment, health care, and education. Nevertheless, among the poorest group of household, they consume more on food. This is consistent with an Engel's law observing that the proportion of income spent on food fall as income rises.

Also, the result of employment from this study stating that an increase in the minimum wage does not affect employment significantly, especially among the poor, is likely to be consistent with the data. One year after implementation of new minimum wage on 1 April

[22] Real wage here is referred to the market wage which is paid to labor in reality.

2012, the number of employed persons decreased from 38,939,130 to 39,906,889 (NSO 2016). The most affected sector is elementary occupations[23] which the number of the employed decreased by 6.76 percent, followed by clerks (6.38 percent) and skilled agricultural and fishery workers (3.45 percent). However, the poverty rate declined from 12.64 percent in 2012 to 10.94 percent in 2013 which implies a general improvement in well-being among the poorest population (NESDB 2017). These two confounding effects can potentially lead to a stable level of living standard of the poor, on average. Even though it should be noted with cautions that a reduction in the employed persons mentioned above may be a result of other unobserved factors. Simply put, wage can be one of the potential factors, but it should not be taken as a single factor.

D. Limitations

However, the results from Table IV and V (also Table A.IV) should be interpreted with cautions. Even though the difference-in-difference estimation is one of the alternative tools to deal with the nonrandomized treated and control groups, the limitation of cross-sectional data used in this study reveals another critical problem whether an increase in the outcome of interest is a causal impact of the minimum wage. An increase in food consumption may come from other sources of income and government schemes occurred during the period of study. One of the possible explanation for this estimation is that the component of income among the poor and non-poor household is different. Even though wage is not the only source of income among the poor, they are likely to rely on their daily wage, instead of another source of income shown in Table I. Thus, an increase in the minimum wage is believed to more or less affect the lives of the poor. Moreover, a significant assumption for the difference-in-differences estimation is that there are no omitted time-varying unobserved characteristics which can affect the intervention. The allocation of the minimum wage in each province is based on many factors as described in section III. Many specifications with additional control should help to lessen the bias from unobserved factors.

For further study, other techniques should be employed. The possible impact evaluation tool is Propensity Score Matching (PSM) using a repeated cross-sectional data. Household socio-economic survey 2011 can be used as a baseline to compare the difference in outcome among the poor household. This can provide a more precise explanation of the difference-in-difference method using cross-sectional data in one year.

VII. CONCLUSIONS

In 2013, there is a most significant jump in the minimum wage in Thailand promoted by a new government led by the Pheu Thai Party. On average, the minimum wage is increased by 70.72 percent among 77 provinces.

The purpose of this study is to examine the effect of the minimum wage in Thailand among the poor. The poor household is focussed because the minimum wage disproportionately helps the poor because it guarantees, under the effective law enforcement and monitoring system, the subsistent living standard among the poor. It is increased to the same level, THB 300, from 2011 to 2013. This leads to a differently significant jump in the guaranteed wages in many provinces. The poor are expected to be affected differently based on their location. Using the double-difference method, the study suggests that an increase in

[23] See 7th footnote.

the minimum wage in 2011 does not affect employment among the poor. The estimates also suggest that this policy leads to a significant increase in the poor household's expenditure, especially non-consumption goods and services. Interestingly, food does not share a high proportion of expenditure from an additional income gained from a new wage rate. The results are still robust with the inclusion of more control variables. Also, there is no significant impact on tobacco expenditure and debt repayment.

The findings provide a more understanding of the labor market of Thailand. To encourage employment and labor participation among the poor, the minimum wage is not the only important factor. However, an increase in the minimum wage helps lift the lives of the poor by expanding their purchasing power.

REFERENCES

Alatas, V & 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.

Bank of Thailand 2012, *Thai labor market, wages, and implications on macroeconomic policies*, Bank of Thailand, Bangkok, viewed 30 October 2017, <https://www.bot.or.th/Thai/MonetaryPolicy/ArticleAndResearch/DocumentEconomicSeminar/ThaiLabor_23Mar12.pdf>.

Card, D & Krueger, A 1994, 'Minimum wages and employment: a case study of the fast-food industry in New Jersey and Pennsylvania', *American Economic Review*, vol. 84, no. 4, pp. 772-793.

Del Carpio, X, Messina, J & Sanz-de-Galdeano, A 2014, 'Minimum wage: does it improve welfare in Thailand?', IZA DP No. 7911, The Institute for the Study of Labor, Bonn, viewed 30 October 2017, < http://ftp.iza.org/dp7911.pdf>.

Dickens, R, Riley, R & Wilkinson, D 2015, 'A re-examination of the impact of the UK national minimum wage on employment', *Economica*, vol. 82, pp. 841-864.

Duflo, A 2007, 'The economic lives of the poor', *Journal of Economic Perspectives*, vol. 21, no. 1, pp. 141-168.

Fei, J & Ranis G 1964, *Development of the labor surplus economic: theory and policy*, Richard A. Irwin, INC, Homewood, Illinois.

Harrison, A & Scorse, J 2004, 'Moving up or moving out? Anti-sweatshop activists and labor market outcomes', NBER Working Paper No. 10492, The National Bureau of Economic Research, Cambridge, MA, viewed 30 October 2017, < http://www.nber.org/papers/w10492>.

International Labor Office 1927, *Minimum wage-fixing machinery*, International Labor Office, Geneva, viewed 5 November 2018, < http://staging.ilo.org/public/libdoc/ilo/ILO-SR/ILO-SR_D17_engl.pdf>.

Katz, L & Krueger, A 1992, 'The effect of the minimum wage on the fast food industry', *Industrial and Labor Relations Review*, vol. 46, no. 1, pp. 6-21.

Koenker, R & Hallock, K 2001, 'Quantile regression', *Journal of Economic Perspectives*, vol. 15, no. 4, pp. 143-156.

Leigh, A 2004, 'Employment effects of minimum wages: evidence from a quasi-experiment-erratum', *The Australian Economic Review*, vol. 37, no. 1, pp. 102-105.

Lewis, A. 1954, 'Economic development with unlimited supplies of labor', *The Manchester School*, vol. 22, no. 2, pp. 139-191.

Machin, S & Manning, A 1994, 'Minimum wages, wage dispersion and employment: evidence from the UK wages councils', *Industrial and Labor Relations Reviews*, vol. 47, no. 2, pp. 319-329.

——, Manning, A & Rahman, L 2003. 'Where the minimum wage bites hard: introduction of minimum wages to a low wage sector', *Journal of the European Economic Association*, vol. 1, no. 1, pp. 154-80.

Mangan, J & Johnston, J 1999, 'Minimum wages, training wages and youth employment', *International Journal of Social Economics*, vol. 26, no. 1, pp. 415-429.

Meer, J & West, J 2016, 'Effects of the minimum wage on employment dynamics', *Journal of Human Resources*, vol. 51, no. 2, pp. 500-522.

Na Thalang, C 2012, 'Parliamentary elections in Thailand, July 2011', *Electoral Studies*, vol. 31, no. 3, pp. 633-636.

National Statistical Office of Thailand 2016, *Employed persons 15 years and over by occupation and sex, whole kingdom: 2007 – 2016*, National Statistical Office of Thailand, Bangkok, viewed 30 October 2017,
< http://service.nso.go.th/nso/web/statseries/statseries03.html>.

—— 2017, *Labor force survey (February 2017)*, National Statistical Office of Thailand, Bangkok, viewed 30 October 2017,
< http://service.nso.go.th/nso/nsopublish/themes/files/lfs60/reportFeb.pdf>.

National Wage Committee Number 6 2011 The Notification of the Minimum Wage (Thailand).

National Wage Committee Number 7 2012 The Notification of the Minimum Wage (Thailand).

Neumark, D & Washer, W 1992, 'Employment effects of minimum and subminimum wages: panel data on state minimum wage laws', *Industrial and Labor Relations Review*, vol. 46, no. 1, pp. 55-81.

—— 1996, ‘Minimum wage effects on employment and school enrolment: reply to Evans and Turners’, FEDS Working Paper 1996-28, Board of Governors of the Federal Reserve System, viewed 30 October 2017, <https://www.federalreserve.gov/pubs/feds/1996/199628/199628pap.pdf>.

—— 2000, ‘The effect of New Jersey’s minimum wage increase on fast-food employment: a reevaluation using payroll records’, *American Economic Review*, vol. 90, no. 5, pp. 1362-1396.

Neumark, D, Salas, JM & Wascher W 2013, ‘Revisiting the minimum wage-employment debate: throwing out the baby with the bathwater?’, IZA DP No. 7166, The Institute for the Study of Labor, Bonn, viewed 30 October 2017, <http://ftp.iza.org/dp7166.pdf>.

Ravaliion, M 2016, *The economics of poverty: history, measurement, and policy*, Oxford University Press, New York, NY.

Sasomsub, P 2011, *Labor ministry insists: reader to hear all problems/ comments for solutions of baht 300 wage policy*, Thailand Ministry of Labor, viewed 30 October 2017, <http://www.mol.go.th/en/content/labor-minister-insists-ready-hear-all-problems-comments-solutions-baht-300-wage-policy>.

Starr, G 1981, *Minimum wage fixing: an international review of practice and problems*, International Labor Office, Geneva, viewed 30 October 2017, < http://www.ilo.org/public/libdoc/ilo/1981/81B09_266_engl_1993.pdf>.

Steward, M & Swaffield, J 2008, ‘The Other margin: do minimum wages cause working hours adjustments for low-wage workers?’, *Economica*, vol. 75, pp. 148-167.

Stigler, G 1946, ‘The economics of minimum wage legislation’, *American Economic Review*, vol. 36, no. 3, pp. 358-365.

Thailand Development Research Institute 2012, *A study on impacts of implementing minimum 300 Baht income per day and 15,000 salary per month policies on structure of Thai economy*, National Research Council of Thailand, Bangkok, viewed 30 October 2017, <https://tdri.or.th/wp-content/uploads/2012/12/300.pdf>.

Thailand Foreign Workers Administration Office 2017, *Current situation of alien labor in Thailand*, Foreign Workers Administration Office, Department of Employment, viewed 5 November 2017, <https://www.doe.go.th/prd/alien/statistic/param/site/152/cat/82/sub/76/pull/sub_category/view/list-label >.

Thailand Ministry of Labor 2012, *Over 100 complaints received at Ministry of Labor’s complaint center*, Thailand Ministry of Labor, viewed 5 November 2017, <http://www.mol.go.th/anonymouse/news/21253>.

—— 2017, *Thailand’s minimum wage from 1973 to 2016*, Thailand Ministry of Labor, viewed 5 November 2017, <http://www.mol.go.th/employee/interesting_information/4131>.

Thailand National Economic and Social Development Board 2017, *Thailand poverty rate and poverty line*, Thailand National Economic and Social Development Board, viewed 5 November 2017, <http://social.nesdb.go.th/SocialStat/StatSubDefault_Final.aspx?catid=13>.

Verrill, C 1915, *Minimum-wage legislation in the United States and foreign countries*, Bulletin of the United States Bureau of Labor Statistics No. 167, viewed 30 October 2017, <https://fraser.stlouisfed.org/scribd/?title_id=3825&filepath=/files/docs/publications/bls/bls_0167_1915.pdf>.

United Kingdom Department for Business, Energy & Industrial Strategy 2017, *National minimum wage and national living wage: calculating the minimum wage*, United Kingdom Department for Business, Energy & Industrial Strategy, viewed 30 October 2017, <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/605397/nmw-nlw-calculating-minimum-wage-guidance.pdf>.

United States Department of Labor 2017, *Wage and hour division (WHD)*, United States Department of Labor, viewed 30 October 2017, <https://www.dol.gov/whd/minwage/america.htm>.

World Bank 2017, *The 2017 global poverty update from the World Bank*, World Bank, viewed 5 November 2017, <http://blogs.worldbank.org/developmenttalk/2017-global-poverty-update-world-bank>.

APPENDIX

TABLE A.I
THE MINIMUM WAGE RATE IN THAILAND

No.	Provinces	(1) Initial rates (Notification no.5)	New minimum wage (2) Notification (no.6) % change	final Rate	(3) Notification (no.7) % Change	Final rate	% change no.5-no.7
1	Phuket	221	35.7	300	0	300	35.75
2	Bangkok, Nakorn Pathom, Nonthaburi, Pathum Thani, Samut Prakarn, Samut Sakorn	215	39.5	300	0	300	39.53
3	Chonburi	196	39.5	273	9.70	300	53.06
4	Chachoengsao, Saraburi	193	39.5	269	11.40	300	55.44
5	Ayuthaya	190	39.5	265	13.20	300	57.89
6	Rayong	189	39.5	264	13.80	300	58.73
7	Phangnga	186	39.5	259	15.60	300	61.29
8	Ranong	185	39.5	258	16.20	300	62.16
9	Krabi	184	39.5	257	16.90	300	63.04
10	Nakhorn Ratchasima, Prachinburi	183	39.5	255	17.50	300	63.93
11	Lopburi	182	39.5	254	18.20	300	64.84
12	Kanchanaburi	181	39.5	252	18.80	300	65.75
13	Chiang Mai, Ratchaburi	180	39.5	251	19.50	300	66.67
14	Chanthaburi, Petchaburi	179	39.5	250	20.10	300	67.60
15	Songkhla, Singburi	176	39.5	246	22.20	300	70.45
16	Trang	175	39.5	244	22.90	300	71.43
17	Nakhonsithummarat, Ang Thong	174	39.5	243	23.60	300	72.41
18	Chumphon, Phatthalung, Loei, Satun, Srakaeo	173	39.5	241	24.30	300	73.41
19	Prachuabkhirikhan, Yala, Samut Songkram, Surat Thani	172	39.5	240	25.00	300	74.42
20	Narathiwat, Udon Thani, Ubon Ratchathani	171	39.5	239	25.80	300	75.44
21	Nakhon Nayok, Patthani	170	39.5	237	26.50	300	76.47
22	Trat, Lamphun, Nong Khai, Bueng Kan	169	39.5	236	27.30	300	77.51
23	Kamphaeng Phet, Uthai Thani	168	39.5	234	28.00	300	78.57
24	Kalasin, Khon Kaen, Chai Nat, Suphan Buri	167	39.5	233	28.80	300	79.64

No.	Provinces	(1) Initial rates (Notification no.5)	New minimum wage (2) Notification (no.6) % change	final Rate	(3) Notification (no.7) % Change	Final rate	% change no.5-no.7
25	Chiang Rai, Nakhon Sawan, Buriram, Phetchabun, Yasothon, Roi Et, Sakon Nakhon	166	39.5	232	29.60	300	80.72
26	Chaiyaphum, Mukdahan, Lampang, Sukhothai, Nong Bua Lam Phu	165	39.5	230	30.30	300	81.82
27	Nakhon Phanom	164	39.5	229	31.10	300	82.93
28	Phichit, Phitsanulok, Phrae, Maha Sarakham, Mae Hong Sorn, Amnat Charoen, Uttaradit	163	39.5	227	31.90	300	84.05
29	Tak, Surin	162	39.5	226	32.70	300	85.19
30	Nan	161	39.5	225	33.60	300	86.34
31	Si Sa ket	160	39.5	223	34.40	300	87.50
32	Phayao	159	39.5	222	35.30	300	88.68
	Average	175.73	39.50	69.00	25.50	300	70.72

Notes: The National Wage Committee's Notification on minimum wage (No.5) came into effect on 1 January 2011, No.6 came into effect on 1 April 2012 and No.7 came into effect on 1 January 2013.

TABLE A.II

A RELATIONSHIP BETWEEN WAGE RECEIVED AND HOUSEHOLD EMPLOYMENT AND EXPENDITURES ACROSS COUNTRY

	(1)	(2)	(3)	(4)	(5)
Panel A: Effect of the minimum wage on Employment					
Dependent variable: log(number of households earning a wage)					
Δlog (wage)	0.0943***	0.0955***	0.0954***	0.0953***	0.0930***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)
Panel B: Effect of the minimum wage on consumption expenditure					
Dependent variable: log(household consumption expenditure)					
Δlog (wage)	0.0792***	0.0492***	0.0536***	0.0489***	0.0632***
	(0.0011)	(0.0010)	(0.0010)	(0.0010)	(0.0016)
Panel C: Effect of the minimum wage on non-consumption expenditure					
Dependent variable: log(household non-consumption expenditure)					
Δlog (wage)	0.1060***	0.0849***	0.0828***	0.0785***	0.0827***
	(0.0015)	(0.0015)	(0.0015)	(0.0015)	(0.0025)
Panel D: Effect of the minimum wage on food expenditure					
Dependent variable: log(household food expenditure)					
Δlog (wage)	0.0661***	0.0502***	0.0526***	0.0473***	0.0499***
	(0.0009)	(0.0008)	(0.0009)	(0.0008)	(0.0014)
Household characteristics		Yes	Yes	Yes	Yes
Source of other money income			Yes	Yes	Yes
Source of other receipts				Yes	Yes
Socio-economic class					Yes
Observations	42,738	40,257	40,257	40,257	40,257

NOTES: Controls of household characteristics are sex and education of head of household, the number of members younger than 15 years and older than 60 years, and the number of the disabled. Consumption expenditure is expenditure on housing, household operation and equipment, clothes, footwear, personal and health care, transportation, communication, education, and recreation. Non-consumption expenditure is expenditure on taxes, charges, fees, career membership expense, insurance premiums, interest payment and other expenses. Controls of the source of other money income are a pension, work compensation, money from other households, elderly and disability assistance, rent of house and other properties, interest from saving and lending. Controls of the source of other receipts are a rental estimation, unpaid amount of goods, services, food, and beverages, education scholarship, inheritance and gifts, proceeds from all kinds of insurance, and other receipts, for example, lottery winning and commissions. Standard errors in parentheses. $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.1$.

TABLE A.III

RELATIONSHIP BETWEEN WAGE RECEIVED AND HOUSEHOLD EMPLOYMENT AND EXPENDITURES ACROSS COUNTRY USING QUANTILE REGRESSION

	Dependent Variables (log)			
	(1) Employment	(2) Consumption Expenditure	(3) Non-consumption expenditure	(4) Food expenditure
q20	0.0725***	0.0943***	0.1082***	0.0748***
	(0.0001)	(0.0008)	(0.0024)	(0.0010)
q40	0.0783**	0.0770***	0.0955***	0.0593***
	(0.0001)	(0.0011)	(0.0013)	(0.0007)
q60	0.1022***	0.0660***	0.1045***	0.0515***
	(0.0004)	(0.0011)	(0.0015)	(0.0010)
q80	0.1146***	0.0615***	0.1059***	0.0440***
	(0.0002)	(0.0015)	(0.0014)	(0.0007)
Observations	42,738	42,738	42,738	42,738

NOTES: All specifications are examined based on the specification of Table A.II without any controls. Standard errors in parentheses. $*** p < 0.01, ** p < 0.05, * p < 0.1$.

TABLE A.IV

	(1)	(2)	(3)	(4)	(5)
Panel A: Effect of the minimum wage on tobacco expenditure					
Dependent variable: log(household tobacco expenditure)					
Net minimum wage effect	0.1275	0.1813	0.1789	0.1902	0.2067
	(0.1004)	(0.1120)	(0.1118)	(0.1118)	(0.1108)
Panel B: Effect of the minimum wage on debt repayment					
Dependent variable: log(household debt repayment)					
Net minimum wage effect	0.3251	0.1421	0.1410	-0.0031	-0.0966
	(0.1732)	(0.1918)	(0.1916)	(0.1905)	(0.1838)
Household characteristics		Yes	Yes	Yes	Yes
Source of other money income			Yes	Yes	Yes
Source of other receipts				Yes	Yes
Socio-economic class					Yes
Observations	42,738	40,257	40,257	40,257	40,257

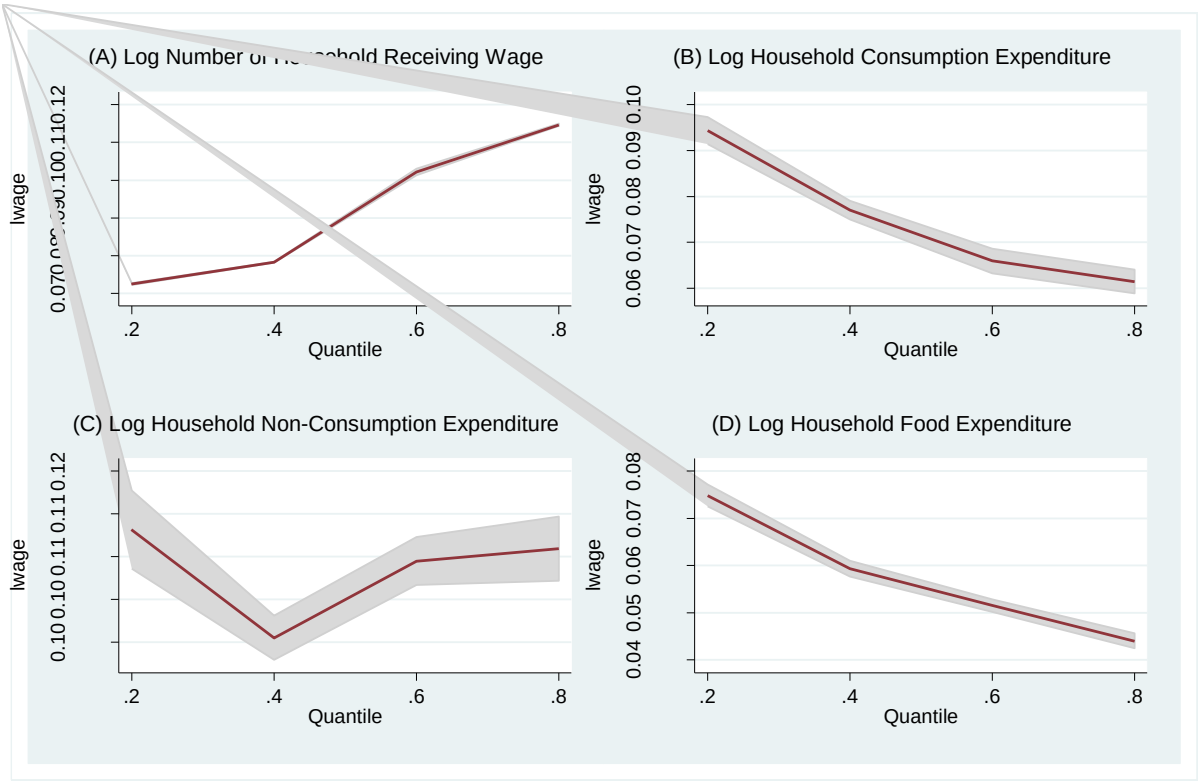

FIGURE A.I
HETEROGENOUS ESTIMATED COEFFICIENTS USING QUANTILE REGRESSION

Notes: The estimated coefficients between wage and log of household non-consumption expenditure in Figure A.I, panel C suggest that it is not different from quantile 20 and 80. However, using quantile 10 and 90, the result shows a significant difference.