Who Is Affected from a National Minimum Wage Hike in Thailand? Evidence from the 300-Baht Minimum Wage Policy

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This paper investigates the short- and long-term impacts of a national minimum wage hike in Thailand stemming from the 300-baht minimum wage policy. Contrasting pilot and non-pilot provinces, I find wage increases in the short run for low-earning workers such as low-educated, young, and informal workers. Exploiting the provincial variation in minimum wage bite to examine the long-term effects, the study finds the policy raises average wage with significant and sizable effects among vulnerable groups, especially informal workers. The policy also improves wage inequality by lifting the bottom half of wage distribution. Finally, despite no impacts on overall extensive and intensive margins, there are significant disemployment effects among the elderly in both time horizons.

I. Introduction

Minimum wage has been widely implemented in developed and developing countries as a tool to tackle poverty and income inequality. According to the classic demand-supply model, the side effect of minimum wage exists in the labor demand side, which employers suffer from higher wage cost and may decide to hire fewer workers. However, monopsonistic and two-sector model, for example, predict such intervention could lead to higher employment. Empirically, there has been a long debate on the effects of this policy, particularly the disemployment effect (e.g., Card and Krueger (1993); Neumark and Wascher (2000)), and the consensus has not been reached yet. In Thailand, recent studies indicate that the effects of minimum wage on overall disemployment

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are minimal (Del Carpio et al. (2014); Lathapipat and Poggi (2016)), but stronger for vulnerable workers, which is similar to findings in emerging economies (Broecke et al. 2017). In terms of hours worked, their findings are rather mixed.

The empirical findings regarding the wage effect of minimum wage are less debatable in Thai context as a consensus has emerged on the effect on average wage. Nonetheless, the evidence for the effectiveness of the policy in income equality reduction is still inconclusive. Leckcivilize (2015) finds minimum wage reduces wage inequality for large establishment workers in the covered sector, but not overall wage inequality. By contrast, results from Del Carpio et al. (2019) and Lathapipat and Poggi (2016) suggest overall wage inequality is improved; however, the impact on lowest-wage workers is small due to the substantial non-compliance.

A significant and controversial change in minimum wage occurred in 2012-2013 when all provinces in Thailand were encountered with the daily 300-baht minimum wage. The biggest hike in a history (70 percent from 2011 level) offers a research opportunity similar to the highest national minimum wage increase in the United States caused by the 1966 Fair Labor Standards Act (FLSA). Bailey et al. (2020) finds such change led to wage increases and minimal disemployment with larger impacts in African-American men.

It is interesting to know how the so-called 300-baht minimum wage policy plays a role in Thai labor market and who is affected from it. Still, there is not much research on the policy's effects, only a few studies such as Thangstapornpong and Porananond (2017), Lathapipat and Poggi (2016), and Ariga (2015) managed to explain some short-run effects. With more available data, this paper thus complements previous literature by seeking to study the longer-term impact of a national minimum wage hike using the evidence from the 300-baht minimum wage policy.

The study begins to exploit the first launch of the policy in seven pilot provinces to examine the short-term effects. Unlike Thangstapornpong and Porananond (2017) which study short-run effect (one year after the law was enacted to the whole country) regardless of pilot implementation, this paper contrasts pilot and non-pilot provinces in the year of project testing. Applying difference-in-differences with the labor force survey data on individuals aged 15-65, I find no significant impact on overall wages, employment and hours worked. However, wages significantly increase for low-wage workers including low-educated, young and informal workers. The last group's effect is potentially from the lighthouse effect from higher wage in covered sector.

Interestingly, the elderly appears to be the most affected group in the short run from lower wage and employment.

With the provincial variation in minimum wage, a national minimum wage hike to a single level of 300 baht can potentially have different bite across provinces. Accordingly, the policy should have a larger impact in low-wage provinces than high-wage provinces. This concept allows me to do the dose-response analysis using as a measure of bite the fraction of workers earning below 300 baht per day before the legislation (fraction affected). Following Baily et al. (2020), I perform a province-year level regression including difference-in-differences variable interacted with fraction affected to evaluate the long-term impacts. The estimates suggest that the policy increases the average monthly wage by 3.3 percent and the more affected provinces (higher fraction affected) like Chiang Mai have a 1.2 percent larger wage increase compared to the less affected provinces (lower fraction affected) like Phuket. There is a significant wage increase for low-educated, female, young and prime-aged workers; yet, the effect is sizable in informal sector. Once again, there is no evidence for overall disemployment in the long run, but the senior is the only group undergoing lower employment rate due to the hike.

Furthermore, this paper performs an event-study estimation with fraction affected to investigate the dynamic responses to the great hike. I find the wage effects rise steadily after the policy and start to fall in the fourth year. Also, a clear downward trend in working hours after the intervention is observed for almost all subgroups. In fact, the results of post-policy responses support the findings from difference-in-differences approach.

The final analysis examines the distributional effects on wage. Employing unconditional quantile partial effect technique proposed by Firpo et al. (2009), the results imply the policy alleviates overall wage inequality. Specifically, it lifts the bottom half of wage distribution while zero to negative effects are detected on the upper half of distribution.

There are three main contributions of the paper. First, while a few previous studies could evaluate merely short-run effects, this paper exploits the latest data to investigate the longer-term impacts of the policy. Second, the research designs applied in this paper are new in Thai context. Specifically, to the best of my knowledge, event study approach, dose-response analysis, and comparison between pilot and non-pilot provinces have not been employed to study the impact of minimum wages in Thailand. Third, the results provide supportive evidence that vulnerable groups are more affected from the rapid change in minimum wage.

The remaining of the paper is structured as follows. Section 2 describes Thai minimum wage history. Section 3 discusses data, empirical strategies, and economic predictions. Section 4 reports main findings followed by the conclusion in section 5.

II. Thai History of Minimum Wage

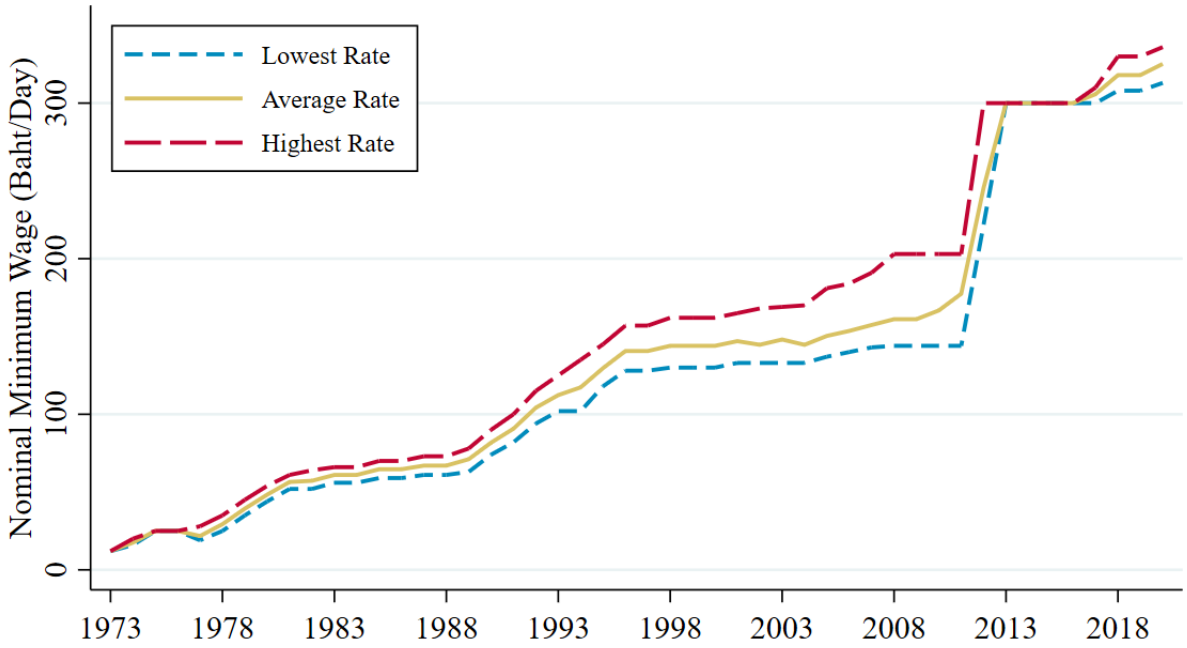
Thailand is an upper-middle-income country where agricultural sector is dominant. The high proportion of agricultural workers results in very low unemployment rates with an average of one percent since those working in agriculture generally do another job during off-season period. The large informal sector also leads to low unemployment. According to the National Statistical Office (NSO), Thailand has 20.4 million informal workers[2] which accounts for 54.3 percent of total employed people in 2019. Those who work in the informal sector mostly earn lower wages and are not covered by the Labor Protection Act and minimum wage.

Like many other countries, the minimum wage is one of the policies for poverty reduction in Thailand. Since its introduction in 1973, the minimum wage is set as daily rate and varies by geographic region owing to different socio-economic condition, inflation, and living cost. The highest rates are offered in Bangkok and adjacent provinces, eastern provinces, and Phuket. The National Wage Committee generally raises minimum wages once a year, but for some years more than one adjustment was made (Lathapipat and Poggi 2016).

During 2012-2013, there was the biggest jump in a history of the minimum wage. The 300-baht minimum wage policy was proposed by Pheu Thai Party, which led to a huge debate as some believe the rate exceeds workers' productivity and could harm the economy. After winning the 2011 general election, the government first launched the policy in seven pilot provinces (Phuket, Bangkok, Nonthaburi, Samut Prakan, Pathum Thani, Nakhon Pathom, and Samut Sakhon) in April 2012. Afterwards, the legislation was applied to the whole kingdom in January 2013. It covered those working in formal sector while those agricultural and fishery workers, government officers, homeworkers, and domestic workers are not covered by the law (Thangstapornpong and Porananond 2017). This unique hike, almost 70 percent from 2011 or 40 percent from 2012, presents an intriguing opportunity to study its effects on Thai labor market outcomes.

[2] The NSO defines informal workers as the workers who are not protected by the Social Security Scheme.

Figure 1—History of Minimum Wage in Thailand



Note: This figure plots daily nominal minimum wage (baht) in 1973-2020. As the minimum wage varies by provinces, the rates shown here are the lowest, highest, and average minimum wage of each year. The data is from the Ministry of Labor.

III. Data and Empirical Approach

A. Data

This paper exploits the data from the Labor Force Survey (LFS) in 2006-2019 provided by the NSO. The sample is restricted to working age population (aged 15-65). Despite the absence of wage and hour worked data for employers, self-employed and unpaid family workers, I include them to analyze the employment effect. To study the impact on wage, employment, and hour worked, the province-year level data is employed whereas the analysis of distributional effect on wage uses individual level data. It is worth noting that there are currently 77 provinces in Thailand; however, the newest province, Beung Kan, was separated from Nong Khai in 2011. For simplicity, I analyze data on 76 provinces treating Beung Kan as a part of Nong Khai. Moreover, this paper

includes yearly Gross Provincial Product[3] (GPP) per capita to control for variability in economic conditions across provinces in all analyses.

B. Empirical Approach

As the 300-baht minimum wage policy was first applied to seven pilot provinces in 2012, this paper aims investigate the short-run impact of it by the difference-in-differences strategy which contrasts the pilot (treatment) and non-pilot (control) provinces[4]. I estimate equation 1 where Y_{pt} are the average outcomes of interest in province p and year t, consisting of log monthly wages[5], employment rates (employment-to-labor-force ratio), and log weekly hours worked. X_{pt} denotes the difference-in-differences variable which is equal to one for seven pilot provinces in 2012, and zero otherwise. Z_{pt} are covariates including sex, age, education, marital status, municipal area (dummy variable indicating whether an individual lives in municipal area or not). Province and year fixed effects (θ_p and δ_t) are included to account for unobserved heterogeneity for each province and year. Finally, log GPP per capita is also added to account for the difference in economic activity and cost of living across provinces.

$$Y_{pt} = \alpha + \beta X_{pt} + \gamma Z_{pt} + \theta_p + \delta_t + \varepsilon_{pt} \quad (1)$$

It has been more than six years since the policy was applied to all provinces in 2013. To examine the long-run impact of it, this paper exploits the variation in minimum wages across provinces and conduct the dose-response analysis. My research design follows Bailey et al. (2020) which study the impacts of a national minimum wage increase from the 1966 FLSA in the United States by adapting methodology from Card (1992). The strategy is based on the idea that the national minimum wage increase should have a larger impact (bite) in provinces with lower wage (higher fraction of workers earning below 300 baht) than those with higher wage (lower fraction of workers earning below 300 baht). I then estimate equation 2 which is close to equation 1 as it

[3] The GPP data provided by the Office of National Economic and Social Development Council (NESDC) is available until 2018. I thus construct 2019 data by assuming that the GPP per capita for each province grew at the constant rate from the previous year.

[4] Figure A1 provides the overview of pre-trend assumption which seems to hold for all outcomes.

[5] I use monthly wage because the data is available for almost all employed workers (the question asks directly monthly compensation) while hourly, daily, and weekly wage are applicable for some workers in the LFS.

includes demographic covariates, GPP per capita, and two-way fixed effects. However, the difference-in-differences variable in this case, D_{pt} , equals one for six years after the implementation and is interacted with F_p or "fraction affected" which is defined as the share of workers earning below 300 baht per day in province p before the policy. Intuitively, F_p reflects the difference in the minimum wage bite across provinces. This empirical method allows this study to contrast the impact between potentially more affected (treatment) and less affected (control) provinces.

$$Y_{pt} = \alpha + \beta(D_{pt} \times F_p) + \gamma Z_{pt} + \theta_p + \delta_t + \varepsilon_{pt} \quad (2)$$

Table A1 in Appendix presents the fraction affected, the share of employees paid below 300 baht per day before the policy enactment, for 76 provinces[6]. Panel A of Figure A2 visualizes the same data in map. The fraction affected are considered high as the wages in Thailand had been kept low for long. Noticeably, the potentially less affected provinces are mostly located in the southern part where is Thailand's tourist destination. Tak is the province with highest fraction affected of 94.4 percent while Phatthalung has the lowest with 51.9 percent. On average, Thailand has 77.3 percent of workers paid less than 300 baht daily before the law.

In addition to the long-term impacts of the policy, it is worth looking at how the impacts behave over time. To measure the dynamic effects of the legislation, I employ event-study strategy, following Bailey et al. (2020), to investigate the impact six-year before and after the policy. The specification is analogous to equation 2, but the difference-in-differences dummy is now replaced with event-study dummies. As presented in equation 3, $1(t = k)$ are event-study dummies (indicator functions) which are equal to one if years since the policy implementation is k. These dummies are interacted with the fraction affected, F_p, which is again the fraction of workers paid less than 300 baht prior to the law. To avoid collinearity, β_{-1} (the effect one year before the policy) is normalized to zero. Theoretically, the average estimated effects after the policy should coincide with the difference-in-differences estimate from equation 2.

[6] For the pilot provinces, the fraction affected is the share of workers paid below 300 in 2011. Whereas for the remaining provinces, it is calculated from 2012 data.

(3) $$Y_{pt} = \alpha + \sum_k \beta_k 1(t = k) \times F_p + \gamma Z_{pt} + \theta_p + \delta_t + \varepsilon_{pt}$$

Apart from the effects on labor market outcomes, this paper aims to examine the impact of the policy on wage distribution since many studies have found the evidence that minimum wage mitigates income inequality. To do so, I follow Dube (2019) which studied the effect of the minimum wage on family income distribution in the United States using Unconditional Quantile Partial Effects (UQPE) strategy proposed by Firpo et al. (2009).

On one hand, Conditional Quantile Partial Effect (CQPE) implies the effect of the minimum wage hike on different quantiles of wages conditional on covariates like education. It suggests the policy impact on low-wage workers within the same educational level, for example, the impact on the highly educated who earn low wages relative to other highly-educated workers, which is not interesting in this context. UQPE, on the other hand, is more appropriate as it controls for covariates like education but does not condition the wage distribution on them. In other words, it defines low wages regardless of (unconditional on) covariates. Therefore, it informs the policy effect on the lower centiles of the marginal distribution (Dube 2019).

Conducting the unconditional quantile regression to estimate the effect of the policy on wage distribution, this paper uses the Recentered Influence Function (RIF) as suggested in Firpo et al. (2009). The RIF is defined as in equation 4 where Y_{ipt} is log monthly wage for individual i in province p and year t. Q_τ is the value of log wage at the τ^{th} quantile. $f(Q_\tau)$ is the density function of Y at Q_τ. $1(Y_{ipt} < Q_\tau)$ is the indicator function indicating whether the value of Y_{ipt} is less than Q_τ.

(4) $$\text{RIF}(Y_{ipt}, Q_\tau) = \left[Q_\tau + \frac{\tau}{f(Q_\tau)}\right] - \frac{1(Y_{ipt} < Q_\tau)}{f(Q_\tau)}$$

After that, I perform the difference-in-differences regression using as dependent variables the estimated RIFs for each quantile. The so-called RIF-DiD regression with fixed effects is presented in equation 5.

(5) $$\text{RIF}(Y_{ipt}, Q_\tau) = \alpha + \beta(D_{ipt} \times F_p) + \gamma Z_{ipt} + \theta_p + \delta_t + \varepsilon_{ipt}$$

As usual, I include difference-in-differences interacted with fraction affected, demographic covariates, log GPP per capita, and province and year fixed effects in the specification. The micro-level LFS data is utilized in this part. This strategy is applied in Lathapipat and Poggi (2016) and Del Carpio et al. (2019) as well. Unlike this paper, they perform RIF-OLS regression to investigate the effects of minimum wages (level) on wage distribution in Thailand.

C. Economic Predictions of Minimum Wage Increases

There has been an ongoing debate in the minimum wage literature, especially its effect on employment. Theoretically, the classic supply-demand model predicts the disemployment effect of minimum wage increases. According to Stigler (1946), the model assumes perfectly competitive labor market and homogeneous workers. When the minimum wage is set above the equilibrium wage, firms (as a price taker in both labor market and good market) move up along their demand curve and employment falls. The short-run effect when firms cannot adjust to higher labor cost is that some workers become unemployed. Additionally, people may be induced by higher wage to join the market, but those failing to find jobs will be unemployed. In the long run, employers may substitute away from higher cost by, for example, using more capital or productive labor.

However, many factors can lead to the deviation from the above model. Incomplete coverage is one of those. If there is a sizeable informal sector (uncovered sector) as in some Latin American and Southeast Asian countries including Thailand, the disemployment effect may change. The displaced workers (from covered sector) might migrate to uncovered sector, then the wage in uncovered sector is lower and the employment is higher. The opposite case may happen when the workers move to covered sector if they wish to find new jobs with the new minimum wage (Borjas 1996; Fortin 2020).

Monopsony is another possible factor affecting the disemployment effect. The monopsonistic model, where firms are not price takers and the marginal cost curve lies above the labor supply curve, predicts that increasing minimum wage up to the perfectly competitive wage could raise employment to the perfectly competitive level. However, raising minimum wage above the perfectly competitive level would reduce employment. In sum, both demand-supply and monopsonistic model imply too high minimum wage could harm employment (Bailey et al. 2020).

The less debatable effect of minimum wage appears on average wage as the price floor should increase price. However, the effects may vary across subgroups; this paper thus seeks to explain it in Thai context. Moreover, existing literature provides evidences that minimum wage policy help address income inequality. For example, in the United States., higher minimum wage improves wage distribution especially on the lower tail (Autor et al. 2016), and family income inequality (Dube 2019). Similarly, previous studies suggest wage inequality in Thailand is alleviated through minimum wage (Del Carpio et al. (2019); Lathapipat and Poggi (2016)).

IV. Results

A. Short-Run Impact

Table 1 displays the short-term impact of the minimum wage hike on the seven pilot provinces. The estimates are the difference-in-differences coefficients from equation 1 in which demographic covariates, GPP per capita, and year and province fixed effects are controlled[7]. The coefficients for all sample suggest that the policy has no significant effects on wages, employment and weekly hours worked in the short run. However, the estimates by subgroup suggest interesting results.

In terms of wage effects, the policy raises average wages in pilot provinces by 0.3 percent (the estimate is not statistically significantly different from zero). The small effect is possibly due to non-compliance. That is, the average share of workers paid below 300 baht in 2012, the year of enactment, for pilot provinces is 33.9 percent. Although it dropped dramatically from 78.1 percent in the prior year, it is still considered high. Workers who completed high school or less experience a 9.8 percent rise in wages, the effect is much larger than that of high-skilled workers (above high school graduates). The estimate also suggests wages in informal sector[8] increased by 6.3 percent. As expected, those low-skilled and informal workers who worked for low-paid jobs earn higher wages due to the policy. Specifically, the significant wage-increase in informal sector possibly

[7] The results from other specifications are presented in Table A2.

[8] I define informal sector following Lathapipat and Poggi (2016) as a sector consisting of self-employed workers, unpaid family workers, and workers in micro enterprise (firms with less than five employees). Note that the LFS data do not allow this paper to classify informal workers by the NSO's definition.

stemmed from the so-called "lighthouse effect", higher informal sector's wage signaled from formal sector's, as well as the sorting of workers by skill in both sectors (Boeri et al. 2010). Considering the effects by age group, the estimates show that workers aged 15-24 were paid 7.9 percent higher as a result of the policy whereas, interestingly, those aged 45-65 earn 6.5 percent less. The plausible reason behind these is that youth, in general, have relatively lower skills or experiences, and thus receive low wages (below minimum wage). In order to comply to the laws, firms raise wages for young workers and reduce wages for senior ones who, in general, paid above the minimum wage.

Table 1— Short-Run Effects of the 300-Baht Minimum Wage Policy

	(1) Log Monthly Wages	(2) Employment Rates	(3) Log Weekly Hours Worked
A. All	0.0029	0.1233	-0.0259
	(0.0278)	(0.1815)	(0.0198)
B. Gender			
Female	0.0403	0.0852	-0.0259
	(0.0411)	(0.2823)	(0.0226)
Male	0.0230	0.1509	-0.0188
	(0.0278)	(0.1611)	(0.0167)
C. Education			
High school or less	0.0975***	-0.0309	-0.0040
	(0.0275)	(0.1252)	(0.0128)
Above high school	0.0083	0.2013	-0.0208
	(0.0449)	(0.4335)	(0.0133)
D. Formal/Informal			
Formal workers	0.0253	0.0229	-0.0019
	(0.0267)	(0.1865)	(0.0113)
Informal workers	0.0632**	-0.1462	-0.0196
	(0.0295)	(0.0892)	(0.0168)
E. Age			
15-24	0.0794***	-0.2587	0.0086
	(0.0232)	(0.4534)	(0.0154)
25-44	0.0338	0.0838	-0.0136
	(0.0206)	(0.1511)	(0.0184)
45-65	-0.0653**	-0.1418**	-0.0079
	(0.0288)	(0.0642)	(0.0153)
F. Industry			
Agriculture	-0.2145	0.4736	-0.0357
	(0.2016)	(0.3333)	(0.0294)
Manufacturing	0.0371	-0.5523*	-0.0029
	(0.0373)	(0.3235)	(0.0195)
Construction	-0.0256	-0.5735	0.0213
	(0.0223)	(0.5252)	(0.0260)
Trade	0.0639	-0.0908	-0.0037
	(0.0497)	(0.1547)	(0.0129)
Services	0.0443	-0.0619	-0.0054
	(0.0329)	(0.1769)	(0.0144)

Notes: This table displays difference-in-differences estimates from equation 1. Panel A shows estimates for all sample while panel C-F refer to those for subgroups. Column 1-3 refer to dependent variables. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Overall, the 300-baht minimum wage policy has no significant impact on short-term employment despite the positive but small magnitude which is consistent with Ariga (2015). This results mainly from higher employment for male, high-skilled and agricultural workers. Nonetheless, the estimates for subgroups imply disemployment effects among elderly and manufacturing workers. That is, employment rates for the elderly contract by 0.1 percentage point while manufacturing workers experience a 0.6 percentage point fall in employment. All pilot provinces except Phuket are hubs for manufacturing sector with many factories located in. That is why the minimum wage hike in these provinces seems to have an apparent negative impact on manufacturing workers. As for employee's hours worked, there is no statistically significant effect on the full sample and subgroups. The estimation yields negative coefficients for all subgroups except youths and construction workers.

In summary, elderly workers appear to be affected the most in the short run from the rapid increase in minimum wage as both their wages and employment decline. One caveat is that the legislation is effective on April 1st, 2012. Therefore, the estimates actually account for three quarters after the policy.

B. Long-Run Impact

Table 2 column 1 presents the longer run (six years) impacts of the policy on wages. They are the difference-in-differences coefficients from equation 2 which includes demographic covariates, GPP per capita, and year and province fixed effects[9]. As the average fraction affected for all provinces is 77.3 percent and the difference-in-differences estimate is 0.0431, the policy raises the average monthly wages by 3.3 (0.0431× 0.7733) percent nationally. The estimate also implies that the more affected provinces like Chiang Mai (87.9 percent of workers paid below 300 baht per day) experience a 1.2 percent larger[10] increase in average wages relative to the less affected provinces like Phuket (59.7 percent fraction affected).

Considering the wage effects by subgroup, the estimates show the policy leads to an 8.8 percent rise in wages for less-educated workers (77.5 percent fraction affected). The effect is much larger as compared to those with high education (69.8 percent fraction affected) whose wages

[9] The results from other specifications can be found in Table A3.

[10] 1.2 percent is calculated from the wage coefficient (0.0431) times the difference in fraction affected between two provinces (0.2817)

increase by 0.6 percent. Women undergo a 4.2 percent rise in wages while the effect for men is halved and insignificant. Informal workers appear to benefit the most from the policy as their wages go up by 17.1 percent. Moreover, the policy causes the wages for young and prime-aged workers to increase by 11.8 percent and 9.7 percent, respectively. Similar to the short-term effects, most of those affected groups like the less-educated, youth, and informal workers are generally compensated with low wages; hence, the policy play a vital role in lifting their wages. Noticeably, the effect is largest among informal workers, but insignificant for formal workers. This stronger impact on informal sector is also found in Argentina (Khamis 2013). In terms of heterogeneous impact across industry, the minimum wage hike escalates the wages for those working in all main industries except services. The magnitudes are largest among trade workers (16.9 percent) and agricultural workers (15.0 percent), which the latter is the industry with highest fraction affected (85.2 percent). Notably, daily-paid workers appear to be directly affected from the policy as the estimate for this group is highly statistically significant.

Regarding the long-term employment effects, the estimates in Table 2 column 2 shows the minimal insignificant positive impact on employment rate. That is the policy raises average employment rate by 0.004 percentage point, which is much smaller than the short-term effect. Regardless of statistical significance, the policy results in disemployment effect for some subgroups. Those are women, the less-educated, youths, seniors, informal workers, and trade workers. The disemployment effect seems most severe for informal workers with 0.1 percentage point fall in employment rates. One possible explanation is that those informal workers (not covered by the minimum wage laws) migrated to formal sector to gain the benefit from higher minimum wage. Therefore, employment is lower, and wage is higher in that sector. However, the elderly is the only group that endures the significantly negative impact on employment, with 0.1 percentage point decline. Elderly workers in certain jobs such as jobs that require physical strength are relatively vulnerable. Another intuition is that seniors typically experience much lower wage-increase which is not enough to compensate for the minimum wage hike; thus, they are more likely to be laid off (Puente 2019).

Table 2— Long-Run Effects of the 300-Baht Minimum Wage Policy

	(1) Log Wages	(2) Employment Rates	(3) Log Weekly Hours Worked
A. All	0.0431*	0.0058	-0.0036
	(0.0253)	(0.1536)	(0.0129)
B. Gender			
Female	0.0470*	-0.0640	-0.0023
	(0.0241)	(0.1646)	(0.0107)
Male	0.0296	0.1332	0.0037
	(0.0291)	(0.1760)	(0.0145)
C. Education			
High school or less	0.1135***	-0.0946	0.0159
	(0.0298)	(0.1213)	(0.0132)
Above high school	0.0079	0.2554	-0.0031
	(0.0165)	(0.2432)	(0.0073)
D. Formal/Informal			
Formal workers	0.0105	0.0173	0.0031
	(0.0218)	(0.2235)	(0.0099)
Informal workers	0.2261***	-0.1401	0.0243
	(0.0544)	(0.0865)	(0.0166)
E. Age Group			
15-24	0.1407***	-0.0416	-0.0171
	(0.0325)	(0.5941)	(0.0134)
25-44	0.1279***	0.0811	-0.0270**
	(0.0210)	(0.1222)	(0.0135)
45-65	-0.0077	-0.1347*	-0.0014
	(0.0213)	(0.0691)	(0.0137)
F. Industry			
Agriculture	0.1761*	0.2095	0.0365*
	(0.0915)	(0.2490)	(0.0209)
Manufacturing	0.1198***	0.3519	-0.0099
	(0.0340)	(0.3180)	(0.0142)
Construction	0.0764**	0.2490	-0.0379***
	(0.0310)	(0.4197)	(0.0134)
Trade	0.2154***	-0.0312	0.0105
	(0.0385)	(0.1656)	(0.0111)
Services	-0.0162	0.0198	0.0179*
	(0.0273)	(0.1280)	(0.0099)
G. Wage Type			
Hourly	0.3205		0.0893
	(0.2456)		(0.1454)
Daily	0.1511***		-0.0281**
	(0.0259)		(0.0134)
Weekly	-0.0513		-0.0947
	(0.2403)		(0.0852)

Notes: This table displays difference-in-differences estimates from equation 2. Panel A shows estimates for all sample while panel C-E refer to those for subgroups. The employment rate for each wage type group is unavailable as only the employed report their wage in the survey. Column 1-3 refer to dependent variables. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Column 3 of Table 2 displays the effects on hours of working. The results show a slight decline in weekly hours worked (0.3 percent without statistical significance). The effect is 0.1 percent larger in more affected provinces like Chiang Mai relative to less affected provinces like Phuket. Tracing the impact by subgroup, working hours appear to decrease in all age groups.

However, the largest and only significant fall is observed in workers aged 25-44 (2.1 percent drop). Not surprisingly, the estimate for daily-paid workers suggest that their hours worked significantly decrease by 2.2 percent owing to the hike. The policy has mixed results across industry. That is, although hours worked contract in construction sector, they expand in agricultural and trade sector. This sounds sensible as construction jobs in Thailand are mostly paid daily; therefore, it is likely that they are more affected by the policy.

C. Dynamic Response

Apart from the long-run impact of the policy, it is worth examining the dynamic responses throughout six years pre- and post-policy. Figure 2 plots event-study coefficients from equation 3 along with the 95-percent confidence intervals against years since enactment. In each panel, I present two specifications (with and without log GPP per capita) in comparison. According to the graphs, GPP per capita can explain certain parts of dependent variables, especially wages and employment rates.

In panel A, as expected, the policy increases wage steadily after the introduction and the positive effects gradually dissipate since the fourth year after enactment. In terms of employment effect, there appears to be little to no impact during the first four years, but a minimal positive sign in the last two years. Unlike effects on wage and employment, those for weekly hours worked are clearly negative and persistent. The magnitudes of the estimates also increase over time.

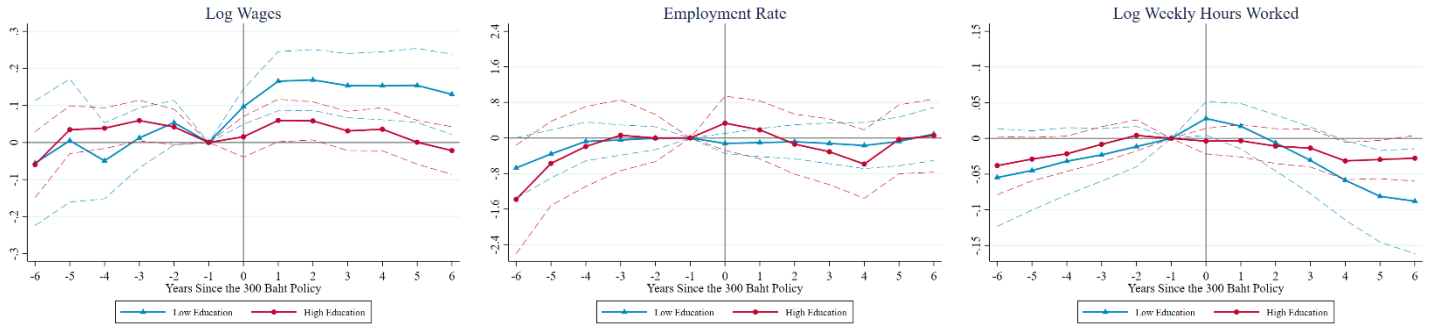
Figure 3 displays heterogeneity in effects of the policy by education, sector, age group, and industry. Each panel demonstrates the event-study coefficients from the estimation of equation 3 for each subgroup separately. The wage effects for high-skilled workers (implied by education) are smaller compared to low-skilled workers. Similarly, whereas wage effects for formal workers are minimal and decrease over time, those for informal workers are much larger and persistently rises. Remarkably, the disemployment effects are visible in low education, informal, and young workers. The event-study estimates for these groups are negative for almost all period after the policy. These results are predictable because they are relatively vulnerable workers. Finally, the graphs imply that less educated, informal, agricultural and construction workers experience a rise in working hours in the year of minimum wage hike and a gradual fall thereafter.

Figure 2—Dynamic Effects of the 300-Baht Minimum Wage Policy on Wage, Employment and Hour Worked

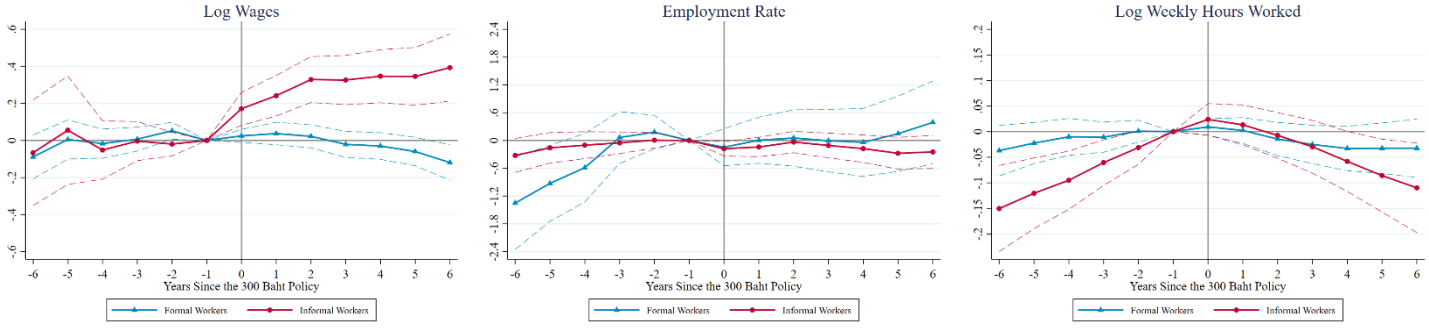
Note: This figure plots event-study estimates (solid) from equation 3 with 95-percent confidence intervals (dash). X-axis indicates years since the policy implementation. Panel titles refer to dependent variables in equation 3. In each panel, Model 1 includes event-study dummies interacted with fraction affected, demographic covariates, and year and province fixed effects while Model 2 adds log GPP per capita.

Figure 3—Dynamic Effects of the 300-Baht Minimum Wage Policy by Subgroup

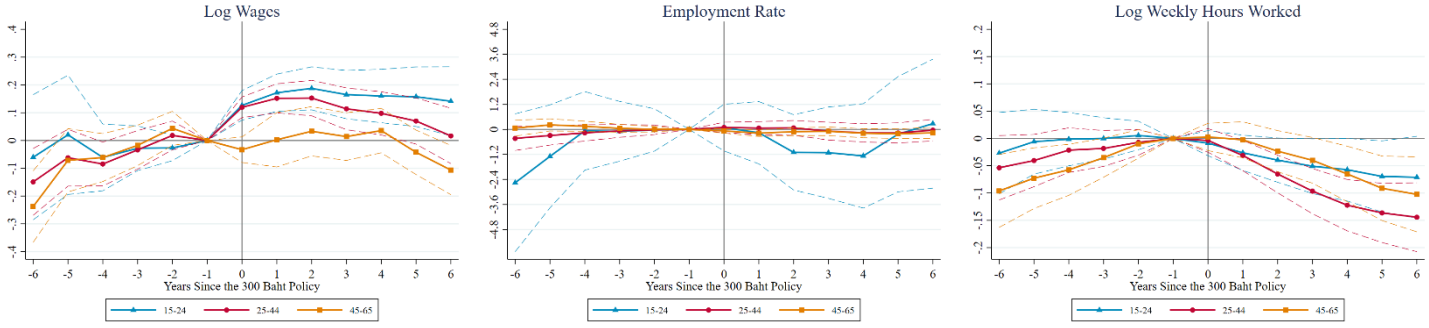
A. Education



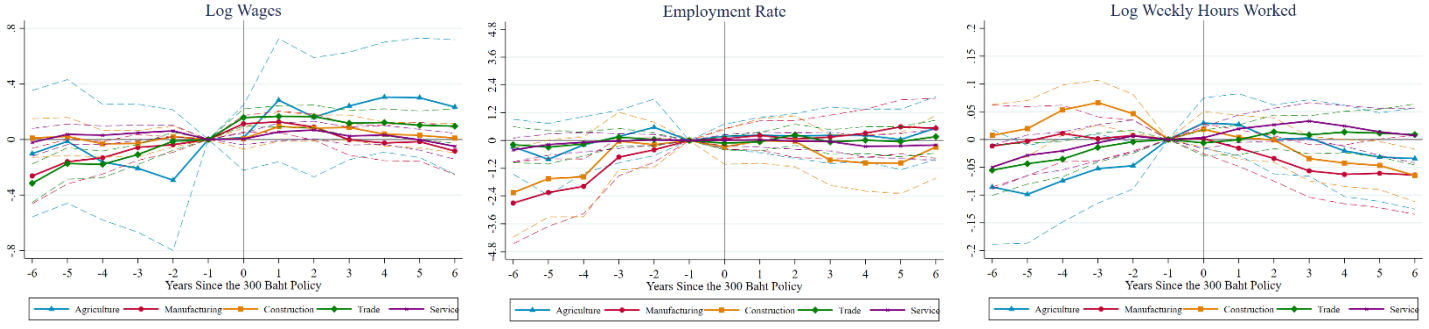
B. Formal/Informal



C. Age Group



D. Industry

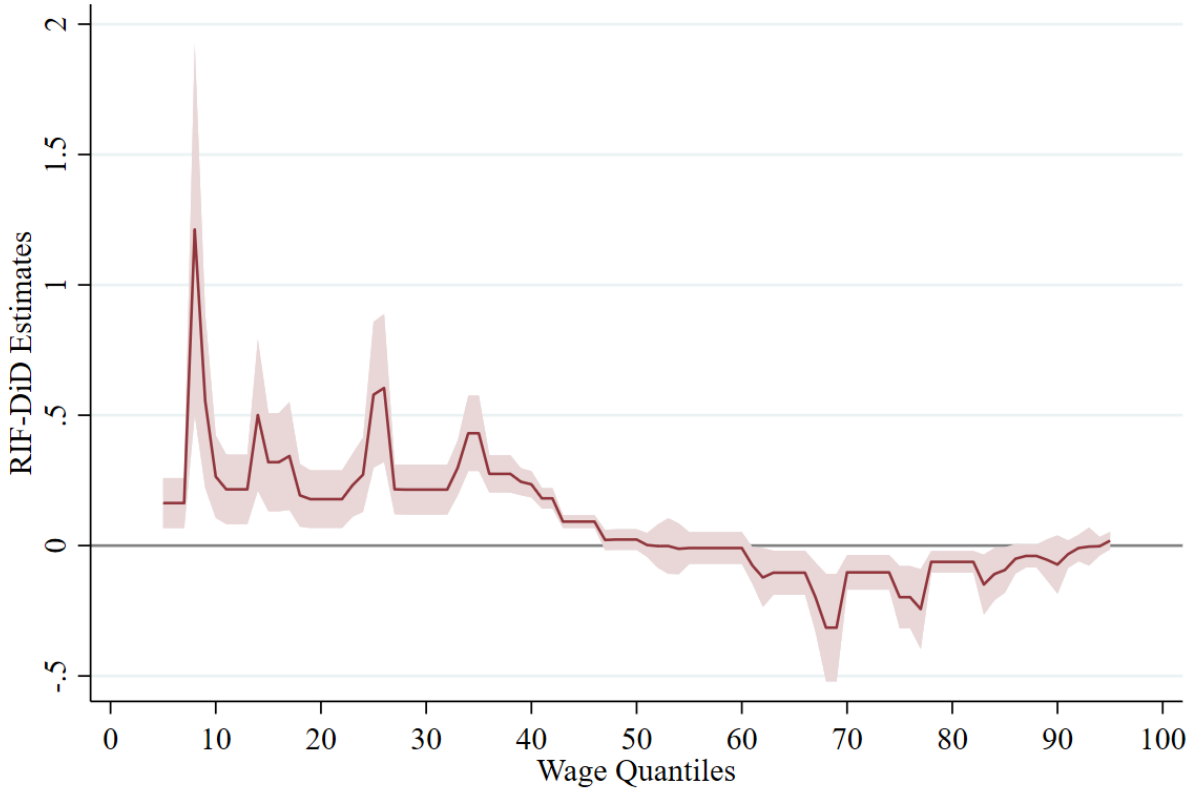


Note: This figure plots event-study estimates (solid) from equation 3 with 95-percent confidence intervals (dash) by subgroup against years since the legislation on X-axis. Panel titles refers to subgroups. The model includes event-study dummies interacted with fraction affected, demographic covariates, log GPP per capita, and year and province fixed effects

D. Impact on Wage Distribution

The 300-baht minimum wage policy is believed to help lower income inequality in Thailand as large fractions of workers earn very low wages before that. To see whether this is the case, let us consider the estimation results of equation 4 and 5 presented in Figure 4. It plots the unconditional quantile partial effects of the policy along with 95-percent confidence intervals (shaded area) against the wage quantiles starting from 5th to 95th. The policy appears to improve wage distribution as there are larger positive effects on the bottom half of wage distribution but zero to negative effects on the upper half.

Figure 4—Unconditional Quantile Partial Effects



Note: This figure plots RIF-DiD estimates (unconditional quantile partial effects) in equation 5 along with 95-percent confidence intervals (shaded area). X-axis refers to log monthly wage quantiles from 5th to 95th percentiles. The standard errors in this model are clustered at province-year level

Focusing on the bottom half, the effects are large at the 8th, 9th, 14th, 25th, 26th, 34th and 35th quantile and begin to drop since the 36th quantile. This indicates that overall, the policy affects

low-wage workers even those at the lowest tail whereas Lathapipat and Poggi (2016) found that the very-low-paid workers are not significantly affected due to the possibility of non-compliance. However, they studied the short-run effects in 2011-2013, using hourly wage and minimum wage levels rather than the difference-in-differences dummy. Therefore, this paper suggests in the long run workers at the bottom benefit from the hike because of the possible lighthouse effect and better compliance.

I also consider the effects on daily wage distribution since daily wages prone to be directly influenced from the policy. As presented in Figure A3, the unconditional quantile partial effects are sizable at the bottom half and reach its peak at around the 40^{th} percentile. This implies daily wage inequality is reduced by the policy as well. The conclusion is consistent with the declining share of employees earning below 300 baht after the policy (see Figure A2). This result is also in line with Del Carpio et al. (2019) even though they studied the effect of minimum wage level, not a hike.

In addition, as a robustness check, I perform a simpler analysis on wage distribution using the average province-year level data and different quantiles of wages. Specifically, I estimate equation 2 using wage quantiles as dependent variables, rather than average wage, for each province and year. The results are shown in Figure A4, the effect is largest at the 20^{th} percentile. Furthermore, it can be seen that the higher quantiles, the smaller positive effects on wages. These re-affirm the above conclusion.

V. Conclusion

This paper examines the impact of the 300-baht minimum wage policy which led to the biggest jump in the national minimum wage in Thailand. I first exploit the pilot launch to look at the short-term effect. The estimates suggest that the policy has no impact on wage, employment, and working hour. However, low-earning workers like the less-educated, youths and informal workers experience a significant rise in wage whereas the elderly suffer from lower wage and employment in the short run.

Complementing the existing literature, this study explores the long-term and dynamic effects of the hike using the variation in minimum wage bite across provinces. The result implies

earnings in low-wage provinces like Chiang Mai rise 1.2 percent more than that in high-wage provinces like Phuket. Nationally, the policy raises average wages by 3.3 percent. The wage effects grow continuously and begin to fall in the fourth year. Interestingly, informal workers enjoy the largest wage increase due possibly to the movement between two sectors and the lighthouse effect while effects on women, low-skilled, young and prime-age workers are less sizable. In terms of employment and hours worked, the policy has no statistically significant impact on those in the long run. Nevertheless, I find disemployment effects for senior employees and lower intensive margins for prime-aged and daily-paid workers.

Finally, this paper evaluates the role of the policy in wage inequality reduction. The result shows positive effects on the bottom half of wage distribution, but zero to negative effects on the upper quantiles. The evidence supports the intervention's effectiveness in tackling income inequality implied by previous studies. In summary, the well-known hike elevates average wage without overall disemployment and appears to be an effective tool to alleviate poverty. Despite that, there are some groups adversely affected from the policy, particularly the elderly whose employment is lower in both short run and long run.

Appendix

Table A1—Share of Workers Paid Less Than 300 Baht Per Day Before the Policy Implementation

Provinces	Fraction Affected	Provinces	Fraction Affected
Tak	0.9443	Samut Prakan	0.7991
Mae Hong Son	0.9223	Prachin Buri	0.7988
Samut Sakhon	0.9067	Nakhon Sawan	0.7935
Kamphaeng Phet	0.8902	Sing Buri	0.7930
Chaiyaphum	0.8879	Prachuap Khiri Khan	0.7919
Yala	0.8848	Roi Et	0.7913
Chiang Mai	0.8789	Udon Thani	0.7909
Yasothon	0.8767	Loei	0.7907
phetchabun	0.8754	Surin	0.7827
Uttaradit	0.8746	Sa Kaeo	0.7825
Sakon Nakhon	0.8741	Nong Khai	0.7773
Lamphun	0.8730	Nonthaburi	0.7654
Kalasin	0.8725	Ratchaburi	0.7555
Nong Bua Lam Phu	0.8631	Suphan Buri	0.7542
Pattani	0.8578	Narathiwat	0.7521
Amnat Charoen	0.8570	Trat	0.7399
Si Sa Ket	0.8558	Uthai Thani	0.7166
Mukdahan	0.8550	Bangkok Metropolis	0.7087
Lampang	0.8541	Trang	0.7076
Sukhothai	0.8532	Ranong	0.7044
Maha Sarakham	0.8524	Ang Thong	0.6720
Pathum Thani	0.8521	Chachoengsao	0.6710
Buri Ram	0.8469	Saraburi	0.6658
Phayao	0.8452	Chanthaburi	0.6562
Chai Nat	0.8387	Satun	0.6398
Phrae	0.8379	Samut Songkhram	0.6354
Nakhon Pathom	0.8362	Songkhla	0.6329
Phitsanulok	0.8358	Chon Buri	0.6290
Ubon Ratchathani	0.8304	Krabi	0.6172
Phichit	0.8276	Nakhon Nayok	0.6136
Chiang Rai	0.8262	Surat Thani	0.6022
Khon Kaen	0.8244	Phuket	0.5971
Nan	0.8211	Rayong	0.5922
Nakhon Phanom	0.8095	Phra Nakhon Si Ayutthaya	0.5916
Kanchanaburi	0.8067	Nakhon Si Thammarat	0.5692
Nakhon Ratchasima	0.8062	Chumphon	0.5662
Lop Buri	0.8036	Phangnga	0.5410
Phetchaburi	0.8026	Phatthalung	0.5192
		Average	**0.7733**

Note: The table presents the share of workers paid less than 300 baht per day before the policy implementation for each province, from largest to smallest. I calculate the fraction using daily wage data and the survey weights. It is the share in 2011 for pilot provinces and 2012 for non-pilot provinces.

Table A2—Short-Run Effects of the 300-Baht Minimum Wage Policy

Dependent Variables	**(1)**	**(2)**	**(3)**
A. Log Monthly Wages	0.1415***	0.0054	0.0029
	(0.0380)	(0.0271)	(0.0278)
B. Employment Rate (%)	-0.0389	0.0906	0.1233
	(0.0974)	(0.1514)	(0.1815)
C. Log Weekly Hours Worked	0.0058	-0.0272	-0.0259
	(0.0088)	(0.0206)	(0.0198)
Province and Year Fixed Effects	Yes	Yes	Yes
Demographic Covariates		Yes	Yes
Log GPP Per Capita			Yes
Province-Year Observations	152	152	152

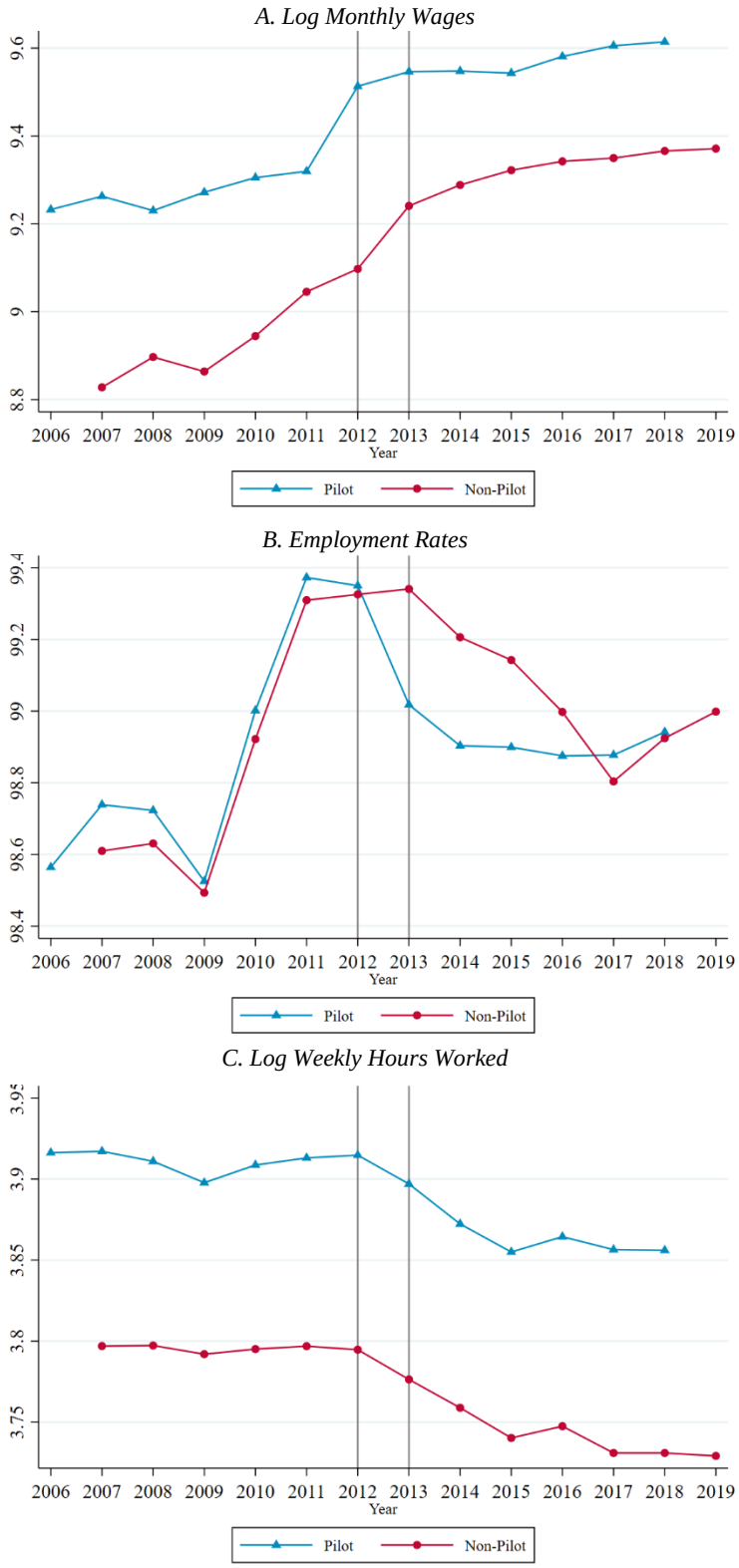
Notes: This table displays difference-in-differences estimates from equation 1. Panel A-C refer to outcomes of interest. Column 1-3 refer to different specifications. The result from the last specification (with year and province fixed effects, demographic covariates, and GPP per capita) is presented in the main paper. the Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table A3—Long-Run Effects of the 300-Baht Minimum Wage Policy

Dependent Variables	**(1)**	**(2)**	**(3)**	**(4)**
A. Log Monthly Wages	0.1962***	0.0430	0.0431*	0.0385
	(0.0308)	(0.0266)	(0.0253)	(0.0240)
B. Employment Rate (%)	0.2520**	-0.0204	0.0058	0.0052
	(0.1229)	(0.1585)	(0.1536)	(0.1386)
C. Log Weekly Hours Worked	-0.0240**	-0.0038	-0.0036	0.0075
	(0.0122)	(0.0129)	(0.0129)	(0.0121)
Province and Year Fixed Effects	Yes	Yes	Yes	Yes
Demographic Covariates		Yes	Yes	Yes
Log GPP Per Capita			Yes	Yes
Province-Specific Linear Trends				Yes
Province-Year Observations	988	988	988	988

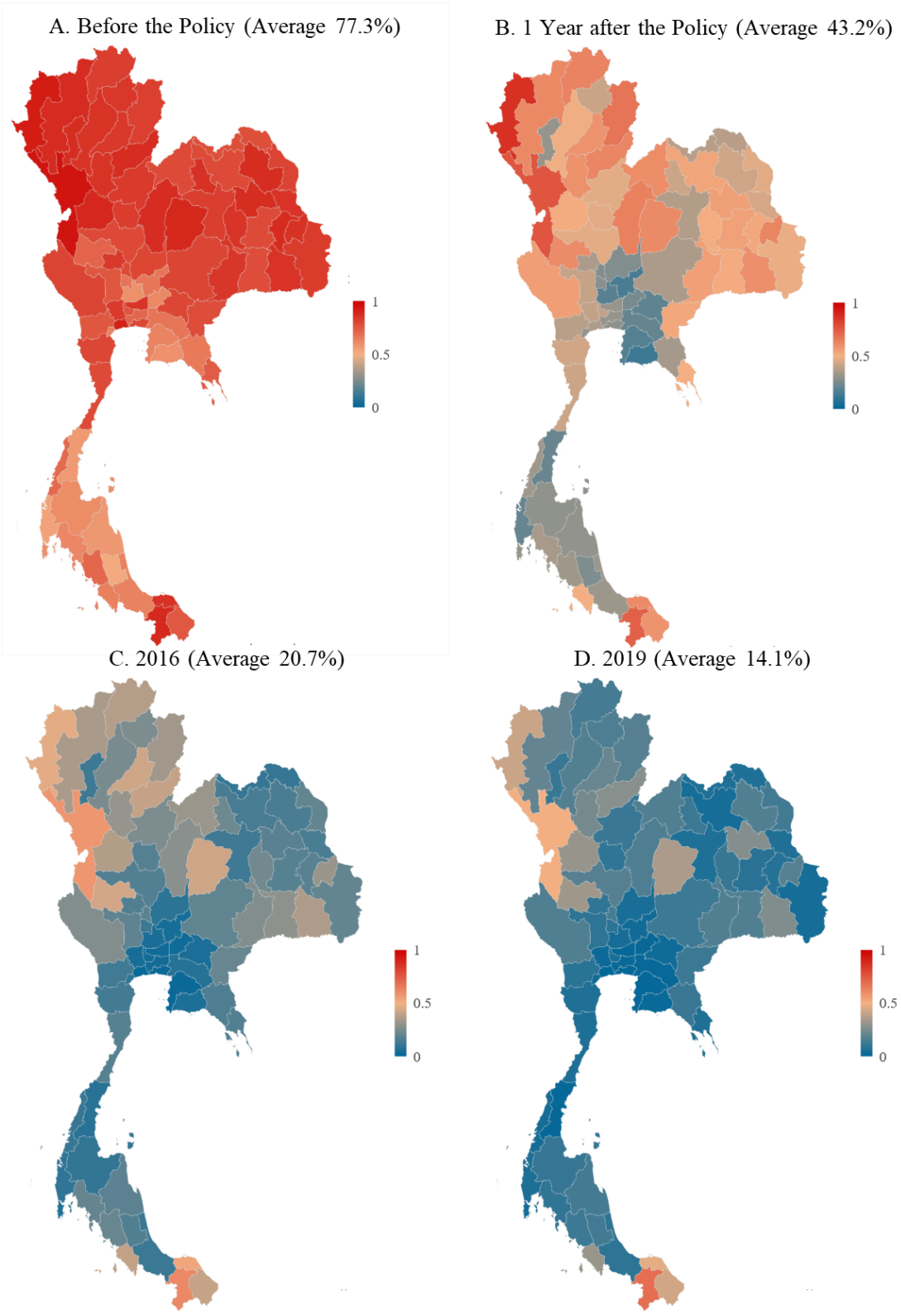
Notes: This table displays difference-in-differences estimates from equation 2. Panel A-C refer to outcomes of interest. Column 1-4 refer to different specifications. The result from the third specification (with year and province fixed effects, demographic covariates, and GPP per capita) is presented in the main paper. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Figure A1—Average Labor Market Outcomes Before and After the Policy



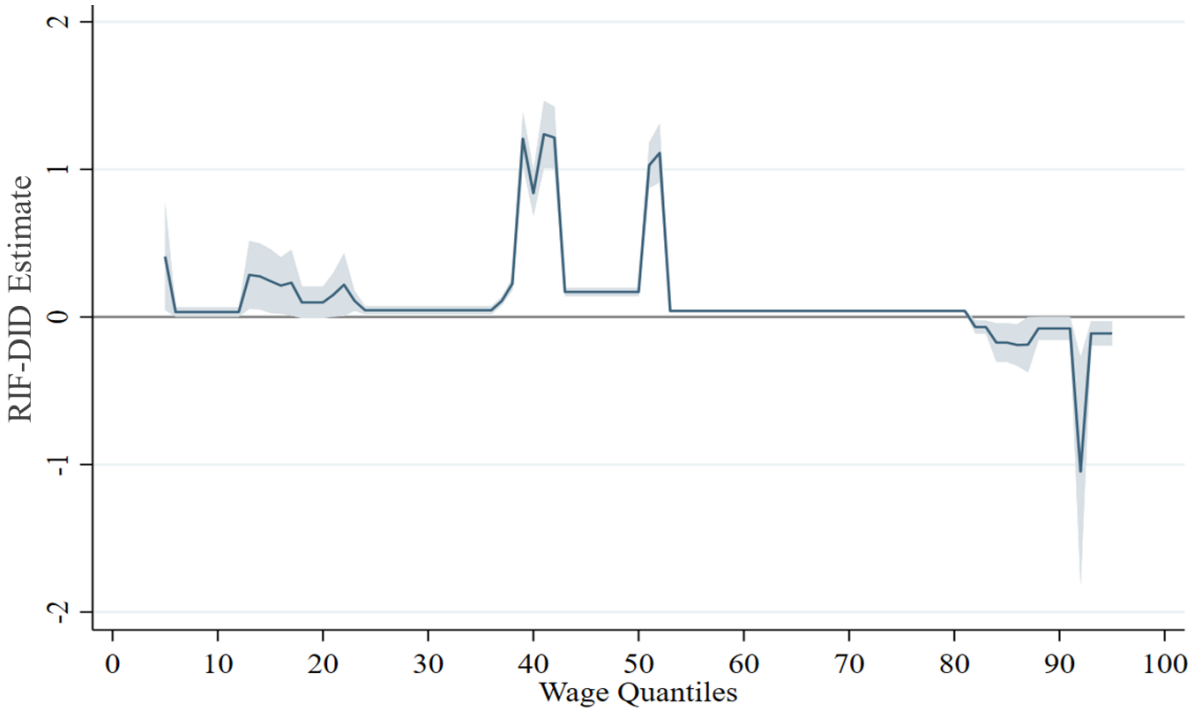
Note: The figure plots average value of the outcomes of interest: log monthly wages in panel A, employment rates in panel B, and log weekly hours worked in panel C. The comparison between pilot and non-pilot provinces is presented in each panel. The vertical lines indicate minimum wage hike: the first line in 2012 for pilot provinces and the second line in 2013 for non-pilot provinces.

Figure A2—Share of Workers Earning Less Than 300 Baht Per Day



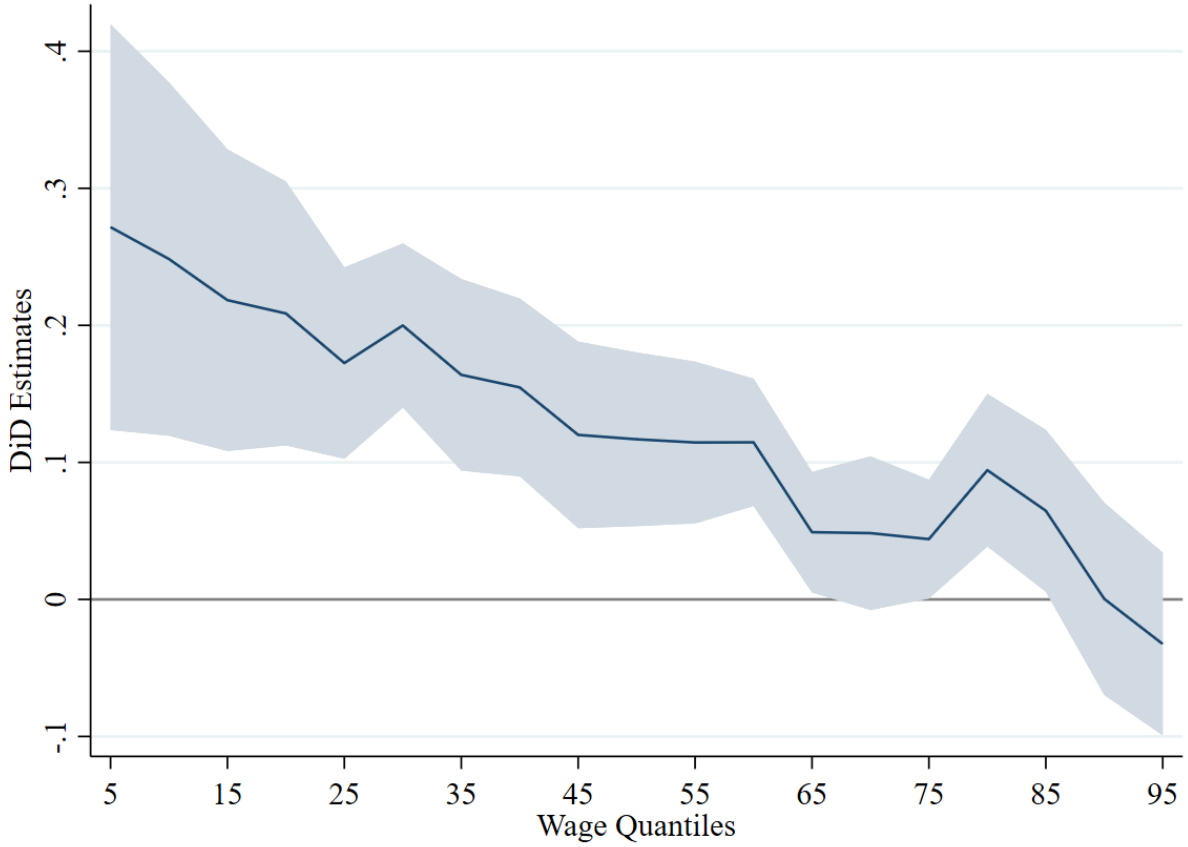
Note: The figure presents geographic variation of the fraction of workers earning below 300 baht per day. Panel titles refer to the time measuring the data. Note that panel A visualize the same data (fraction affected) as in Table A1.

Figure A3—Unconditional Quantile Partial Effects (Daily Wage)



Note: The figure plots RIF-DiD estimates (unconditional quantile partial effects) in equation 5 along with 95-percent confidence intervals (shaded area). X-axis refers to log daily wage quantiles from 5th to 95th percentiles. The standard errors in this model are clustered at province-year level

Figure A4—The Effects of Minimum Wage Hike on Wage Quantiles



Note: The figure plots difference-in-differences estimates from equation 3 using each log monthly wage quantile as the dependent variable. It suggests the impact of the 300-baht minimum wage policy on different percentiles of wage.