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Wage and Employment of Japanese Multinational Enterprises in Vietnam[1]

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Abstract

This paper explores the impact of a quasi-experimental wage shock triggered by Vietnam's 2011 minimum wage reform. Using rich firm-level administrative data, we find that the minimum wage hike led to a significant decline in employment for Vietnamese-owned firms, whereas its impact on employment of multinational enterprises (MNEs) was minimal but positive. At the extensive margin, more exposed Vietnamese firms exit from the market, while MNEs remain unaffected. Furthermore, by constructing a comprehensive firm-level dataset that links Japanese headquarters with their Vietnamese subsidiaries, we find no evidence of labour substitution in response to the wage increase. A survey of Japanese MNEs helps explain this finding that multinationals typically absorb increased labour costs in their foreign subsidiaries. Overall, our findings suggest that MNEs remain an important driver of job creation in developing countries, even amid rapid wage growth

Keywords: foreign direct investment (FDI), multinational enterprises (MNEs), wage, employment
JEL classification: F23, J31, J21

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1 Introduction

Foreign direct investment (FDI) is one of the key drivers of economic development and structural transformation. A growing number of multinational enterprises (MNEs) operate in developing countries, creating employment opportunities and facilitating technology and knowledge transfer. Such foreign investments are crucial for the economic development of low- or middle-income countries, as it helps domestic firms to achieve upgrading with the benefit of the advanced technologies, products, and economies of scale (Verhoogen, 2023). In fact, policies designed to encourage firm upgrading — such as formalisation incentives, minimum wages, export promotion — are typically implemented alongside efforts to attract multinational enterprises (MNEs).

Although the incentives for FDI vary across firms and depend on the economic conditions of both the home and destination countries, outsourcing represents a primary reason for investment. This is particularly relevant for manufacturing firms with labour-intensive production process. Vertical FDI often takes advantage of wage differentials between home and destination countries, allowing MNEs to outsource production processes at lower labour costs. Thus, offshoring to low-wage countries frequently substitutes for domestic manufacturing employment in high-wage countries (Harrison and McMillan, 2011; Muendler and Becker, 2010).

While wage gaps attract MNEs, low- and middle-income countries have experienced faster wage growth than high-income countries. Between 2016 and 2019, real wages grew by 3.5–4.5% annually in emerging G20 economies, compared to slower growth of 0.4-0.9% in advanced G20 countries (ILO, 2021). Despite these trends, little is known about how MNEs adapt to rising wages of host countries over the long run. With the wage differentials being an important incentive for MNEs' investment, do they stay and continue providing employment opportunities even in the face of shrinking wage gaps? Or are they "footloose"[1] enough to withdraw from the host country and move on to the lower labour cost countries? Even without withdrawal, another scenario of footloose production involves the downsizing of MNE operations. The purpose of this paper is to explore the employment dynamics of multinationals and its interactions with domestic

[1]The idea of multinational enterprises being "footloose" is discussed, for example, in Beladi and Mukherjee (2012); Van Beveren (2007).

firms amid wage increases of host countries .

This paper addresses these questions by analysing Vietnam's 2011 minimum wage reform and its impact on foreign and domestic firms. We extend our analysis to labour substitution of multinationals by focusing on Japanese firms investing in Vietnam. Since the bilateral trade liberalisation with the United States in 2001, Vietnam has attracted a growing number of foreign enterprises. MNEs, particularly from East Asian countries, have significantly expanded their investments in Vietnam, contributing to the growth of formal employment in the manufacturing sector (McCaig and Pavcnik, 2018, 2023). Japan is an important player in FDI and its role in the development of Asia, as it contributes to the 11.8% of total global FDI outflows, following the United States (UNCTAD, 2024). Japan ranks third in terms of the number of subsidiaries operating in Vietnam. While Vietnam has experienced rapid wage growth in recent decades, Japan's wages have remained stagnant. This disparity creates a unique setting to examine MNE responses when only host-country wages increase.

In 2011, Vietnam introduced a minimum wage reform, leading to a significant increase in minimum wages for foreign and domestic firms. Prior to the reform, foreign firms were required to comply with higher minimum wages than domestic ones, which was unified for both groups. The reform also reclassified a large fraction of districts into higher wage categories. As a result, both domestic and foreign firms experienced substantial wage increases, with domestic firms facing a greater impact. On average, minimum wages increased by 49.7% for foreign firms and 102.7% for domestic firms in one year. These increases were significantly larger than prior and posterior annual changes, which typically did not exceed 20%.

We identify the impact of this quasi-experimental wage shock through three approaches. First, we leverage rich firm-level administrative data in Vietnam to estimate heterogeneous effects on foreign and domestic firms over a ten-year period following the reform. We exploit firm-level exposure to minimum wage shock, defined by pre-reform average wages, and use an event study method with two-way fixed effects. The results indicate that both foreign and domestic firms significantly increased their labour costs following the reform. However, there is a significant variation in their employment responses; domestic firms mitigated the impact by significantly reducing employment,

whereas MNEs showed positive but minimal employment adjustments. These effects persisted over time. Moreover, while domestic firms experienced a higher probability of exit, while MNEs remained unaffected. The different responses may be explained by the labour market competition and labour force reallocation discussed in Dustmann et al. (2021). Overall, these findings suggest that foreign firms absorbed labour cost increases, while domestic firms adjusted the labour cost by reducing employment.

Second, by constructing a comprehensive panel dataset linking labour market outcomes of Vietnamese subsidiaries to their Japanese headquarters, we investigate the long-term impacts on home-country labour substitution. A similar event-study approach shows that an increase in subsidiaries' labour costs in Vietnam did not lead to changes in employment at Japanese headquarters. We find no evidence of spillover effects, suggesting that MNEs do not adjust their labour substitution dynamics even in response to significant labour cost increases. The finding is consistent with Muendler and Becker (2010) that MNEs' employment decisions primarily takes place at the extensive margin (upon entry/exit) in response to the wage differentials, whereas adjustments at the intensive margin (within existing affiliates) may be limited in low-wage locations.

Finally, we conduct an original survey of Japanese MNEs to understand the mechanisms through which they respond to the wage increases in the destination country. The survey reveals that MNEs increase the wage levels of subsidiaries in response to the wage increases of local domestic firms. Furthermore, while the automation and introduction of industrial robots were among the most popular strategy, approximately 30% of MNEs investing in Vietnam reported taking no action in response to rising wage levels. A smaller fraction of firms answered the reduction of local employees as their longer-term strategies, confirming that the employment effect is limited. As a result, more than 40% of surveyed firms reported long-run profit losses in their subsidiaries due to increased labour costs. Our findings highlight the limited extent of MNEs' employment adjustments at the intensive margin.

This study contributes to two strands of literature. First, it extends the FDI literature by examining the labour market implications of MNE operations. Prior research highlights the role of MNEs in increasing local employment and wages through both direct and indirect effects. The direct effect arises from providing job opportunities (Mendola

et al., 2024), while the indirect effect stems from knowledge and technology transfers, etc. (Jiang et al., 2018; Keller, 2021; Setzler and Tintelnot, 2021; Abebe et al., 2022)[2]. MNEs generally offer higher wages than domestic firms and attract workers from local enterprises (Hijzen et al., 2013; Javorcik, 2015)[3]. While most studies in this area have analysed the impact of MNE entry and operations on local labour markets, this paper stands out by exploiting a local policy shock to investigate how MNEs respond to external wage increases in the host countries [4]. Our findings highlight that MNEs do not significantly adjust to wage increases through employment, instead passively absorb the wage changes.

Second, the paper contributes to the literature on minimum wage policies and their labour market effects (see Dube and Lindner, 2024 for review). Previous research has found minimal employment effects in various contexts (see, for example, Card and Krueger, 1994; Aaronson and French, 2007; Harasztosi and Lindner, 2019; Rao and Risch, 2024), while several studies show the negative effects on manufacturing employment (Cengiz et al., 2019; Gopalan et al., 2021; Harasztosi and Lindner, 2019). Our results suggest that domestic manufacturing enterprises experience significant employment reduction, which is consistent with the literature. Additionally, we extend the discussion by exploring the heterogeneity between MNEs and domestic firms, contributing to debates on wage inequality(Autor et al., 2016; Bossler and Schank, 2023). Vietnam's 2011 reform offers a unique case due to its magnitude [5], coverage and the differing impacts on domestic and foreign firms. Few literature has explored this reform, except for Nguyen (2023) that examines the impact of minimum wage reform in Vietnam on firms' product switching. Moreover, there is limited evidence that exploits firm-level exposure to the minimum wage (Machin et al., 2003; Draca et al., 2011; Rao and Risch, 2024) and cases

[2]MNEs' entry does not necessarily result in positive impact in the local labour market. Alfaro-Ureña et al. (2022) argues that the responsible sourcing standard of MNEs resulted in positive gains for low-wage workers exposed in the supply chain, the majority of low-wage workers experienced negative effect due to indirect effect and price index.

[3]Several factors contribute to this wage premium, including higher hiring and training costs (Alfaro-Ureña et al., 2022) and superior management practices (Bloom et al., 2012). Moreover, shocks in MNEs' home countries can significantly influence wages in host countries (Hjort et al., 2022).

[4]The effect on the employment of home countries is analysed by Alviarez et al. (2022) and Lin et al. (2024), while the shocks they exploit rather affect FDIs at the extensive margin (entry/exit), while the minimum wage shock that we study concerns firms' adjustment at the intensive margin.

[5]Most literature studies the impact of rather small-scale minimum wage changes, while the shocks we see accounts for 50-100% increase in minimum wages. There is limited number evidence on such large shock, namely Harasztosi and Lindner (2019) and Giupponi et al. (2024).

from low- or middle-income countries (Broecke et al., 2017; Higashigata, 2021; Neumark and Munguía Corella, 2021). While further research is necessary to explore mechanisms such as labour reallocation[6], our findings expands the discussion of heterogeneous impact of minimum wage changes.

The remainder of this paper is organised as follows: section 2 discusses the 2011 minimum wage reform, section 3 describes the datasets and construction of the merged panel, section 4 presents the results for firms in Vietnam, and section 5 examines the outcomes for Japanese headquarters. The paper concludes with a discussion in section 6.

2 Context

2.1 Minimum wage policies in Vietnam

Vietnam first introduced minimum wages[7] for foreign enterprises in 1992 and general minimum wages for employees in public bodies in 1995. Domestic private firms used the state enterprises' minimum wage as a benchmark, although their wage settings were significantly lower than those of foreign firms (Nguyen, 2023). In 2006, the country introduced the current regional minimum wage system, where wage levels are determined at the district level[8] This system comprises four regional classifications for minimum wage standards. Region I, with the highest minimum wage, includes major cities such as Hanoi and Ho Chi Minh City, while Region IV covers rural areas[9]. Domestic private firms were required to adhere to regional minimum wages, but their standards remained lower than those for foreign firms at the beginning. The government updates minimum wage levels almost annually through issuing decrees, which also define the classification of districts into the four regional categories in the appendix. No district has been downgraded to a lower wage category, and districts that are upgraded experience larger increases in minimum wages compared to those remaining in the same category.

[6]Research suggests that minimum wages reallocate workers to higher-productivity firms, mitigating potential employment losses (Dustmann et al., 2021)

[7]Although the Labour Code specifies that minimum wages are set for monthly, daily, and hourly standards, stakeholders most exclusively focus on monthly wages (Schmillen and Packard, 2016)

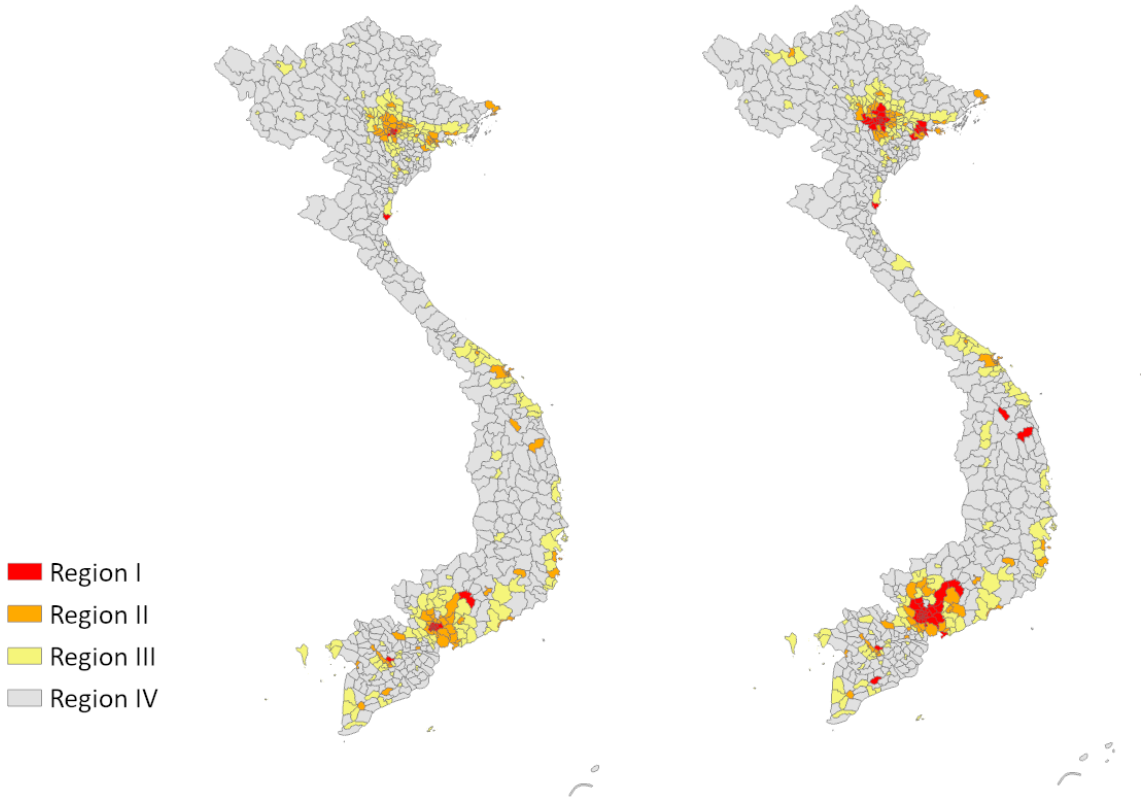
[8]Vietnam has 708 districts as of 2020.

[9]As of 2020, 78 districts were classified as Region I, 87 as Region II, 178 as Region III, and 365 as Region IV.

Vietnam introduced a minimum wage reform in 2011, which resulted in a significant increase in minimum wage standards. The reform had two key components: First, prior to the reform, foreign and domestic firms operated under different minimum wage standards, which were unified in October 2011. Until 2010, foreign firms were subject to higher minimum wages than domestic firms within the same region. Domestic private firms' minimum wages were set at approximately 75% of those for foreign firms, although domestic firms saw faster growth in minimum wages during the pre-reform period. From October 2011, minimum wages were unified at 2 million VND in Region I, 1.78 million VND in Region II, 1.55 million VND in Region III, and 1.44 million VND in Region IV. Table A1 shows the transition of minimum wages across regions.

Second, 2011 saw the largest number of districts upgraded to higher wage categories. Figure 1 highlights the expansion of districts with higher minimum wage classifications. Until 2010, 29 districts were classified as Region I, 54 as Region II, 111 as Region III, and 514 as Region IV. Following the reform, these numbers increased to 68, 70, 155, and 415, respectively. The upgrades were concentrated in the suburbs of Hanoi and Ho Chi Minh City. In just one year, 193 out of 708 districts (27.2%) experienced category upgrades. This expansion was extraordinary, as in other years, upgrades typically affected no more than 30 districts annually.

As a result of this reform, both domestic private firms and foreign firms experienced substantial increases in minimum wages, while the impact was greater for domestic firms. Figure 2 illustrates the distribution of minimum wage changes by district. Foreign firms saw an average increase of 49.7% in minimum wages, while domestic firms experienced an average rise of 102.7%. This was the largest single-year jump in minimum wages, as previous and subsequent annual increases rarely exceeded 20%. The extremely large magnitude in minimum wage increase makes the case unique setting to study the firm-level responses to the shock.



(a) December 2010 (b) December 2011

Figure 1: Regional categories of minimum wage

Note: (a) uses the minimum wage standard from decree in January 2010, which was valid until January 2011. (b) is the category defined in the decree of October 2011, which was in force until January 2013.

3 Data & Set Up

3.1 Data

This study combines several datasets. First, we rely on the rich firm-level administrative data from Vietnamese Enterprise Survey (VES) to analyse the impact of minimum wage reform on firms' labour market outcomes in Vietnam. Second, to examine the effects of wage shocks in Vietnam on Japanese headquarters, we integrate various datasets from Japan to connect headquarters information with their subsidiaries in Vietnam. Finally, we conduct our original survey of Japanese MNEs to uncover the mechanisms through which they respond to wage increases in subsidiaries. This section describes the administrative data we use in our main analysis.

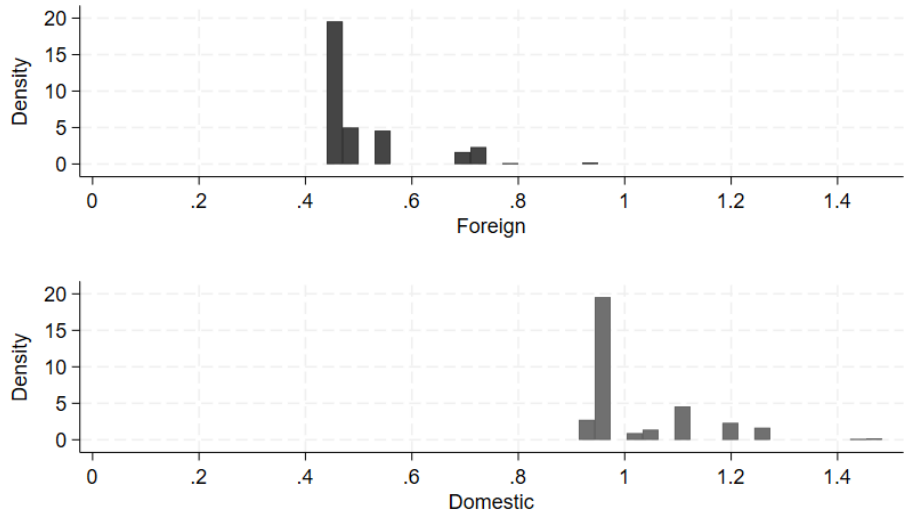


Figure 2: Distribution of minimum wage changes by district

Vietnamese Enterprise Survey [VES] To analyse firms in Vietnam, including subsidiaries of MNEs, we extensively use data from the VES. The data is available through the General Statistics Office (GSO) of Vietnam. Each year, the GSO surveys all registered businesses in Vietnam. The dataset includes firm-level information such as 10-digit tax ID (*mathue*), firms' geographical location, shareholdings by country, and key balance sheet items. Our variables of interest are namely total employment and total labour cost. We use the tax ID (*mathue*) as a firm identifier for the purpose of merging it with Japanese datasets[10].

Basic Survey on Overseas Business Activities (BSOBA) [KJ] The BSOBA is a firm-level survey of Japanese MNEs and their foreign subsidiaries. The survey is conducted annually by the Ministry of Economy, Trade and Industry in Japan, and firms

[10] *mathue* is the only consistent variable across different years, making it suitable as a firm identifier in the panel dataset. Until 2015, the VES's raw data contained both *match_file_code* and *mathue*, while neither of them was unique. *match_file_code* facilitates merging diffrent survey modules and there were relatively few duplicates. Within a *match_file_code*, there may be multiple *mathue*. From 2016 onward, *mathue* becomes the only variable for a firm identifier, although duplicates still exist. To make *mathue* a unique identifier, we dropped observations where duplicates appeared within *mathue* in variables such as employee numbers, total compensation, turnover, and assets. These omitted observations represented less than 0.5% in the dataset. For remaining duplicates with *mathue*, we summed the values in the balance sheet items, assuming each observation represents establishment-level data. Each year, more than 99.5% of *mathue* observations are unique, with only a marginal share of firms requiring this operation of removing duplicates.

report overseas subsidiaries with at least 10% shareholdings. Second-tier subsidiaries are included if headquarters' shareholdings of a first-tier subsidiary as well as the first-tier subsidiary's shareholdings of a second-tier one exceeds 50%. The survey excludes the finance, insurance, and real estate sectors. The KJ dataset includes information on parent and subsidiary firms, such as their names, industrial sectors, years of establishment, and shareholding rates.

Toyo Keizai Overseas Japanese Companies Data [TK] The private company Toyo Keizai conducts survey on Japanese MNEs and their foreign subsidiaries every year. The dataset includes subsidiaries with at least 10% shareholding rates and indirectly invested firms where cumulative shareholdings exceed 10%. TK provides rich details, including names, addresses, industrial sectors, and shareholding rates of both parent firms and subsidiaries. While both KJ and TK provide invest information of Japanese MNEs, TK includes subsidiary address information, which is absent in KJ but crucial for merging with the VES.

Basic Survey of Japanese Business Structure and Activities (BSJBSA) [KK] The BSJBSA (hereafter KK) is a firm-level survey of Japanese firms with more than 50 employees and capital exceeding 30 million Japanese yen (JPY). Conducted annually by the Ministry of Economy, Trade and Industry in Japan, KK includes detailed information on firms' name, address, balance sheet items. KK can be merged with KJ via a shared firm ID. This dataset is primarily used to analyse the labour market outcomes at Japanese headquarters, such as employment and wages.

3.2 Constructing datasets for analysis

(1) Dataset in Vietnam The VES dataset, with *mathue* as the firm identifier, forms the basis of this analysis. Since the focus is on the minimum wage reform in 2011, the sample is restricted to the years 2006–2018. The years prior to 2011 are included to ensure the parallel trend assumptions. Our baseline year is 2010, and the raw data for 2010 contains information on 279,328 firms, of which 46,784 operate in the manufacturing sector. This study centres on manufacturing firms, comparing foreign enterprises with

domestic private firms within this sector. State-owned enterprises, totalling 618, were excluded from the sample to ensure consistency with the focus on private and foreign entities. To only exploit firms that experienced the shock, we further dropped firms that stopped operation before 2010. The final sample consists of 43,338 manufacturing firms, of which 38,594 (89.1%) are domestic private firms and 4,744 (10.9%) are foreign firms. As of 2010, the largest foreign investors in the manufacturing sector were Taiwan, with 1,363 firms; South Korea, with 1,010 firms; and Japan, which ranked third with 593 firms. Figure A1 shows the share of foreign firms by ownership each year.

(2) Merged Japan-Vietnam dataset To analyse the connection between labour market variables in Japan and Vietnam, a parent-firm-specific dataset was constructed. Figure 3 shows the flow of the merging process. The goal is to link Japanese subsidiaries in the VES with their parent firms in KK, enabling us to connect subsidiaries' wages and employment to those of their headquarters every year. To bridge these datasets, we use KJ and TK, which contain investment information about Japanese firms. Section A.1 in Appendix shows the detailed step of merges.

After merging, 1,431 subsidiaries in KJ (84.7% of 1,690) were matched with VES, of which 1,149 subsidiaries (68.0%) had parent firm information in KK. Between 2006 and 2018, 4,913 firms in VES reported Japanese shareholdings above 10%. Ultimately, 1,117 firms in VES were linked to parent firms in Japan[11].

We then converted the merged datsets unique at Japanese headquarter for each year, instead of subsidiary-unique. As a result, 1,038 Japanese firms in the KK dataset were successfully linked to employment and wage information for their subsidiaries in the VES. In the merged dataset, the average number of subsidiaries in Vietnam per Japanese firm is 1.31, with 864 firms (83.2%) having only one subsidiary. As 2010 serves as the base year, the analysis focuses on 920 firms that had investments in Vietnam during this

[11]There may be several explanations for the gap in the number of Japanese subsidiaries in KJ/TK and VES. First, while VES is a census, KJ and TK are data from survey, whose response rate is around 60-75%. Second, it is likely that the VES includes Japanese firms' overseas branch offices, while KJ and TK only have subsidiaries' information. According to Ministry of Foreign Affaires, in 2017, there are 1,177 Japanese subsidiaries, 323 overseas branches of headquarters, 59 firms with Japanese entrepreneurs. The number of Japanese subsidiaries in TK and KJ are 1,063 and 908, respectively, and this is closer to the official statistics.

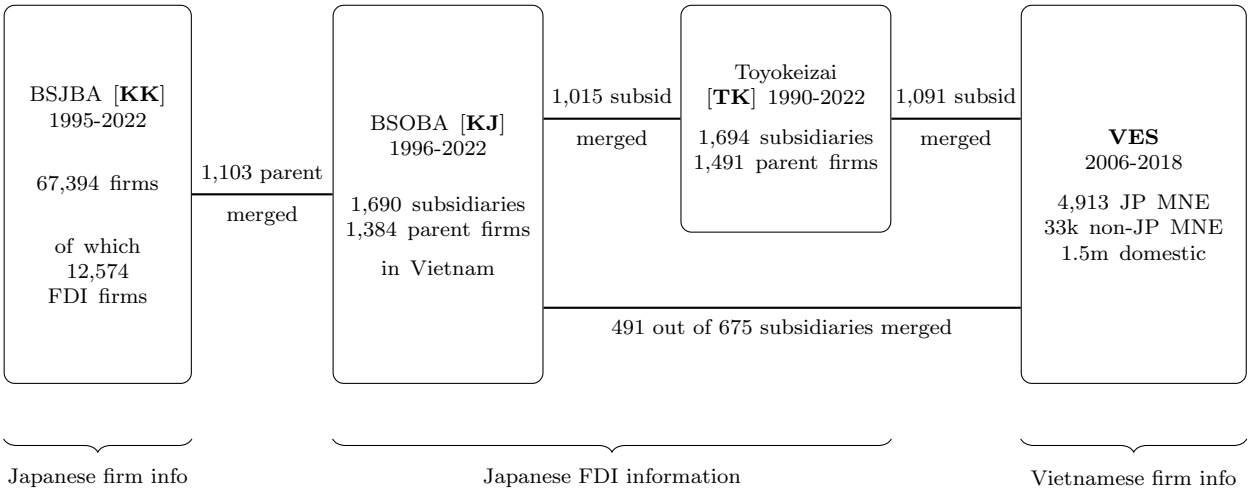


Figure 3: Merging process

period, of which 596 operate in the manufacturing sector.

(3) Survey of Japanese MNEs As an additional component of the analysis, we conducted a survey of Japanese MNEs in November 2024. We sampled 8,000 firms from Toyokeizai data for MNEs with current and previous investment history in Asian countries. The sample covers all 6,480 Japanese MNEs that hold subsidiaries in Asia in 2022, and we randomly selected 1,520 firms with past FDI history in Asia. In collaboration with a survey company, *Teikoku Databank*, we distributed a survey questionnaire to headquarters of sampled firms via mail posting, while allowing for responses both online and via mail. We received 1,388 valid responses (17.4%), of which 1,204 currently have subsidiaries in Asia, and 184 firms previously had subsidiaries in Asia. Although the survey itself does not specifically focus on Vietnam, 324 firms with subsidiaries in Vietnam are included (152 of them are in the manufacturing sector). Hjort et al. (forthcoming) will provide the full details of the survey and its results. In this paper, we present some of the results with a focus on their responses on wage increases in subsidiaries. This survey is meant to supplement our main analysis with administrative data.

4 Impact of Minimum Wage Reform in Vietnam

4.1 Pre- and post-reform wages

As discussed in section 2, the minimum wage reform in 2011 represented the largest shock in recent decades. While the employment is the main variable of interest, our interest also extends to the effect on wages. Figure 4 and Figure 5 illustrate the distribution of average wages for domestic and foreign firms (MNEs), respectively. It is clear that the distribution shifts upwards for both groups[12]. Before the reform, foreign firms generally paid higher wages than domestic firms, and a larger proportion of domestic firms paid wages below the minimum wage standard that was set after the reform.

The shifts in wage distribution confirm that the minimum wage shock translated into a significant increase in wage levels for both groups. In particular, foreign firms paying by far higher than the new minimum wage standard suggests that the minimum wage shock not only affects low-wage firms but also firms in the upper tail of the distribution. Moreover, the difference in average and median wages between foreign and domestic firms become larger[13], implying that overall MNEs reacted stronger than domestic ones. This result is notable given the minimum wages shock was larger for domestic firms.

[12]The figure shows a significant number of domestic firms still paying below the minimum wage levels after the reform. This may reflect the inclusion of part-time workers in the total employee count, which lowers the average monthly wage. Since the VES does not provide disaggregated wage data, we can only infer this from the total compensation values. Another potential reason is the non-compliance, as highlighted by Dube and Lindner (2024).

[13]The average wages prior to the reform was 2.97 million VND for foreign firms and 1.86 for domestic (difference of 1.01), which shifted to 5.33 and 3.32 million VND (difference of 2.01) after the reform. The median wages changed from 2.56 for foreign and 1.66 for domestic (difference of 0.90) to 4.77 for foreign and 3.24 for domestic (difference of 1.53).

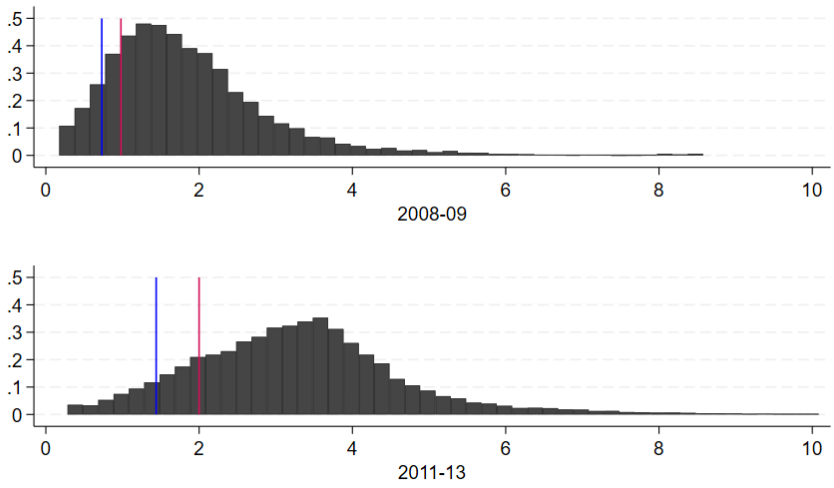


Figure 4: Distribution of average wage for domestic firms

Note: The figures show the distribution of firms by average of monthly wages (milllion VND) before and after the reform. Red line shows the highest minimum wage (Region I) and the blue line shows the lowest (Region IV) in each period.

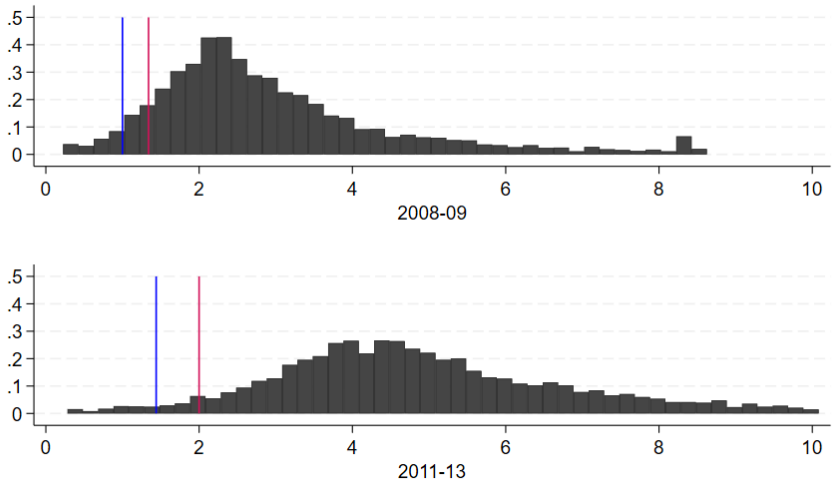


Figure 5: Distribution of average wage for foreign firms

NNote: The figures show the distribution of firms by average of monthly wages (milllion VND) before and after the reform. Red line shows the highest minimum wage (Region I) and the blue line shows the lowest (Region IV) in each period.

4.2 Estimation Method

To assess the significance of this policy change, we examine whether firms adjusted their employment following the reform. Specifically, we aim to estimate this effect

by constructing a firm-level measure that captures the intensity of exposure to the policy change. We employ a firm-level event-study (DiD) approach with two-way fixed effects. The treatment and control groups are defined based on the average per-worker compensation prior to the reform in 2011. A key caveat is that the VES does not have individual-level wage data, so we cannot directly observe the fraction of workers whose wages were below the post-reform minimum wage level. For each firm, we define the treatment dummy as follows:

$$D_i^{od} = \mathbf{1}\{AvgWagePerWorker_i^{2008-2010} < MW_{od}^{2011}\} \tag{1}$$

where for firm i of owner o (foreign or domestic) in district d, the dummy variable equals 1 if the average wage per worker between 2008 and 2010 was below the minimum wage level in district d in 2011. The post-reform minimum wage standard varies by firms' ownership being foreign or domestic. Table 1 presents the summary statistics for foreign and domestic firms, categorised by treated and control groups. Foreign firms have a relatively lower share of treated firms, while about a third of domestic firms fall into the treatment group. For both domestic and foreign firms, the control groups generally perform better on average, with higher assets and net turnover. Geographically, the proportion of firms in Ho Chi Minh City and Hanoi City is similar for foreign firms, while domestic firms in the control group are more concentrated in Ho Chi Minh City.

Although our interest would be to add another category of Japanese MNEs, the number of firms was not sufficient to conduct the analysis. There are only 64 treated firms among Japanese subsidiaries, making it difficult to estimate the effect specifically for Japanese firms. Thus, in this specification, we will only differentiate between domestic and foreign firms. We plan to extend the analysis using a district-level minimum wage exposure, for which Japanese firms may be separated from non-Japanese MNEs.

To compare the different effects on domestic and foreign firms, we employ a triple difference-in-differences approach, incorporating a dummy variable indicating whether a firm is domestic or foreign. Our explanatory variable is the triple interaction term of the binding dummy, ownership (foreign or domestic), and year. We estimate the effect of the

Table 1: Summary statistics of treated and control firms in December 2010

	Foreign		Domestic	
	Treated	Control	Treated	Control
Total employment	1,262.34	270.77	59.17	54.46
	(3,782.23)	(418.37)	(312.43)	(166.63)
Total compensation	1,166.08	924.08	80.63	167.78
	(1,685.32)	(1,177.27)	(311.75)	(476.80)
Average compensation	1.53	4.09	1.44	3.12
	(0.67)	(2.07)	(0.63)	(1.30)
Total asset	131,975	118,017	13,767	25,080
	(206,340)	(172,106)	(50,310)	(77,781)
Net turnover	145,887	133,450	13,566	27,662
	(266,154)	(213,896)	(59,507)	(95,938)
Ho Chi Minh City (%)	14.82	18.32	12.05	40.50
	(35.55)	(38.69)	(32.56)	(49.09)
Hanoi City (%)	5.42	6.80	11.43	17.96
	(22.66)	(25.17)	(31.82)	(38.38)
N	830	3,914	13,243	25,351

Note: For each item the number above shows the mean and the number in the parenthesis is the standard deviation. Total compensation and average compensation are monthly values. Total compensation, average compensation, asset and net turnover is in million VND.

minimum wage reform using an event-study analysis with two-way fixed effects[14]:

$$y_{it} = \sum_{o \in \{\text{MNE,Domestic}\}} \sum_{k \neq 2010} \beta_k^o \cdot G_i^o \cdot D_i^{od} \cdot \mathbf{1}[t = k] + \alpha_i + \gamma_{o(i),t} + \tau_{d(i),t} + \epsilon_{it} \quad (2)$$

where o denotes ownership and t is the year. y_{it} is our variable of interest, specifically the number of employees. D_i^{od} is the binding dummy defined in equation 1, which is interacted with the ownership dummy G^o in pre-reform period. α_i denotes firm-fixed effects, and $\gamma_{o(i),t}$ is the ownership-time fixed effects. Additionally, we introduce district-year fixed effects, $\tau_{d(i),t}$, to control for district-specific time trends. $\tau_{d(i),t}$ is expected to control for minimum wage increases and regional category upgrades that occurred before

[14]Our empirical approach is the standard triple difference (DDD) method with multiple time horizon, and the shock is not staggered. In this case, the simple dynamic event-study TWFE approach is suitable and the heterogeneous treatment effects by cohort as in De Chaisemartin and D'Haultfœuille (2020); Sun and Abraham (2021) are not our concern(Roth et al., 2023). A similar identification is employed by Rao and Risch (2024) with firm-level exposure to the minimum wage increases. While our data is unbalanced, i.e. some firms may have missing entries in some years, the efficiency of the estimator is still preserved (Harmon, 2024)

or after the reform [15]. Standard errors are clustered at district level. Our base year is 2010, a year before the minimum wage reform. We include years 2006 to 2009 to pre-trend verification, and estimate the effect β for each year after 2011.

4.3 Results

Figure 6 shows the effect of minimum wage reform on employment. The dependent variable is log of total employment in December each year, so that our estimates are at the intensive margin. Both domestic and foreign firms show no significant changes in employment between 2006 and 2009, suggesting there were no pre-existing trends. To ensure that our results do not violate the pretrends assumption, we follow Roth (2022) to conduct the pre-tests. Figure A2 and Figure A3 in the Appendix visualises the hypothesized trend with 50% power and expectation after pre-testing for domestic and foreign firms, respectively. It is clear that only domestic firms were negatively affected by the reform, while foreign firms remained unaffected. The point estimate for domestic firms is a 15.7% reduction in employment in 2011, which further drops to 23.2% by 2016. The results further highlight the persistence of the impact, even ten years after the reform. The coefficients on foreign firms are, on the contrary, positive with point estimates in 2011 being 3.92%. Note that there is a significant difference between the size of MNEs and domestic firms (see Table 1), so that, in the absolute number, the magnitude of positive effect is larger than the negative effect on domestic firms.

To understand the effect at the extensive margin, we also analyse the impact on firm exit. Firms are defined as exit in year t when they last report positive turnover in year $t-1$. Since our data starts from 2006, the earliest exit happens in 2007. Figure 7 shows the effect on exit and Figure A4 and Figure A5 conducts the pre-tests as in Roth (2022). The result demonstrates that only domestic firms were likely to exit the market in response to the reform, while MNEs remain unaffected. In 2011, more exposed Vietnamese-owned firms had the higer probability of exiting than less exposed ones by 1.57 percentage points. The estimates on MNEs are insignificant throughout the study period.

Overall, the results suggest the following story. The minimum wage reform in 2011

[15] The impact of small-scale minimum wage changes is the future area of research.

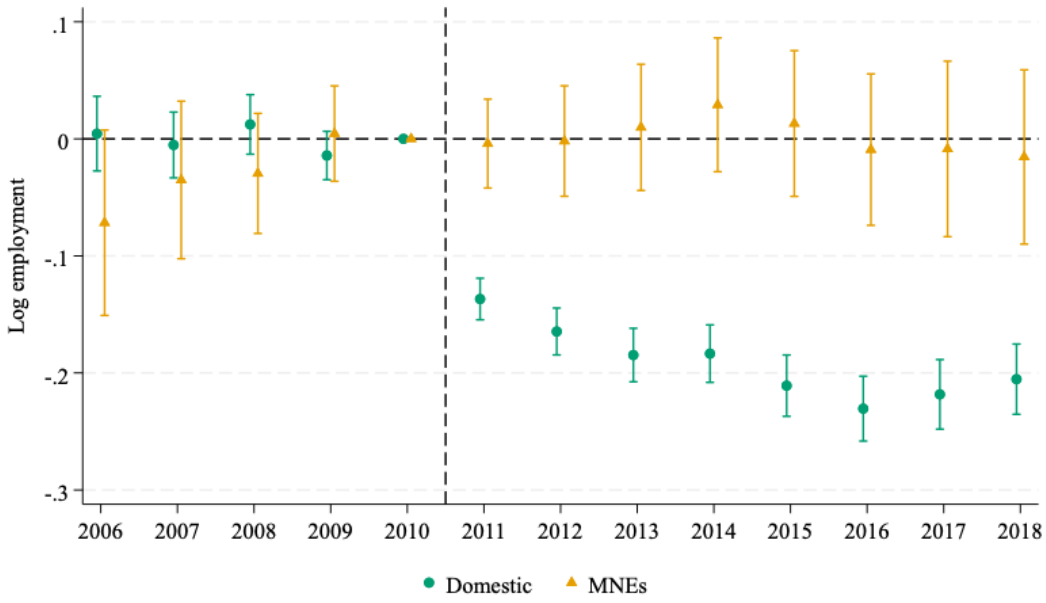


Figure 6: Effect on total employment

resulted in the heterogeneous responses between domestic and foreign firms, both at the intensive margin and extensive margin. Domestic firms mitigated the effect by reducing their workforce, however, foreign firms did not adjust their employment levels significantly with a minimal level of increase. More exposed domestic firms were more likely to exit from the market, while the probability of exit for MNEs is not significantly different between treated and control groups. The result implies that foreign firms experienced a higher increase total compensation than domestic ones, even though the increase in minimum wages was lower for them than for domestic firms.

5 Impact on Headquarters in Japan

5.1 Estimation method

The previous section demonstrated that the minimum wage reform had a significant impact on labour market outcomes for multinational enterprises (MNEs) operating in Vietnam. A natural follow-up question is whether such changes affected the headquarters of these firms. This section explores whether the minimum wage reform in Vietnam

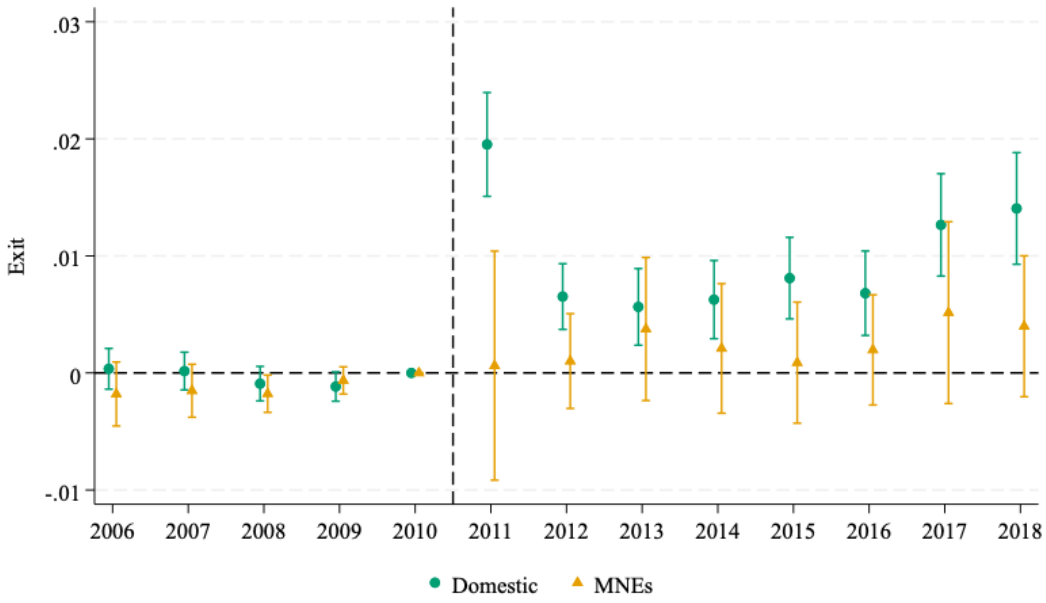


Figure 7: Effect on exit

had a meaningful impact on the parent firms, utilising the merged dataset described in section 3. Our sample consists of 562 Japanese manufacturing firms that invested in Vietnam in 2010.

The dataset is unique at headquarter-year level, and one firm can have multiple subsidiaries in Vietnam. To assess each parent firm's exposure to the wage changes in Vietnam, we sum the employment and total wages across their subsidiaries. For wages, we apply the yearly average exchange rates to convert Vietnamese Dong (VND) into Japanese yen (JPY) to capture the wage changes that the headquarters faced. We first employ the similar estimation method as equation 2 with the dependent variable being the total employment in Japan. Specifically, we estimate the following regression:

$$log\ y_{it}^{J} = \sum_{k \neq 2010} \beta_k D_i^d \times \mathbf{1}[t = k] + \alpha_i + \tau_{p(i),t} + \epsilon_{i)t}$$

where D_i^d is the same as the binding variable defined in equation 1. For firms with multiple subsidiaries, we defined the dummy as one when one of any subsidiaries are in binding. Thus, β_k estimates the treatment effect of Japanese firms that are required to respond to the minimum wage reform. y_{it}^{J} is the outcome of interest for firm i's

headquarter in Japan in year t. α_i is firm fixed effects. The subscript p indicates the prefecture in Japan, and $\tau_{p(i),t}$ captures prefecture-specific time trends. It is important to control for these prefecture-specific time trends because Japan experienced the Great East Japan Earthquake in 2011, which disproportionately affected the northern regions of the country. Including these fixed effects is crucial to minimize the impact of the earthquake and other local factors that might influence the results. In this specification, standard errors are clustered at headquarter level.

5.2 Results

Table 2 shows the summary statistics of Japanese headquarters by treatment status. Treated firms are on average larger in terms of employment in Japan and Vietnam, although the standard deviations are large due to the limited number of samples. Average compensation in headquarters are about the same level as well as the wage gap with their subsidiaries.

Table 2: Summary statistics of Japanese manufacturing firms in the merged dataset

	Treated	Control
Total employment in Japan	4957.7	2071.5
	(9213.3)	(5069.0)
Total employment in Vietnam	3771.2	405.8
	(3312.9)	(554.7)
Average compensation in Japan	4.783	4.903
	(1.609)	(1.607)
Average compensation in Vietnam	0.160	0.312
	(0.061)	(0.231)
Wage gap between Japan and Vietnam	4.634	4.687
	(1.615)	(1.616)
# subsidiaries in Vietnam	2.03	1.22
	(1.19)	(0.62)
N	34	498

Note: The statistics is for 2010. Average compensations are in million JPY for both Japan and Vietnam. Compensation in Vietnam were calculated by applying the annual exchange rate. Standard errors are in the parentheses.

Despite the difference in the firms' characteristics, Figure 8 shows that the impact of the minimum wage reform on the Japanese headquarters is minimal. Furthermore,

Figure 9 demonstrates that there was no effect on the share of full-time employees in Japan. This result suggests that MNEs do not replace their employees in their subsidiaries in Vietnam by casual workers in the headquarters.

Thus, the minimum wage reform in Vietnam did not have a significant impact on the parent companies in Japan. This is not surprising, given the persistence of large wage difference between Japan and Vietnam[16]. Even in 2017, labour costs in Vietnam accounted for only about 3 percent of the labour costs in Japan. Furthermore, the survey of Japanese MNEs confirms the finding. Among firms investing in Vietnam, more than 92.8% answered that an increase in wage levels in subsidiaries have no effect on wages and employment in Japanese headquarters. Thus, we find no evidence of labour substitution when MNEs experience wage increase from minimum wages in Vietnam.

Figure 8: Effect on total employment in Japan

[16]In our data, the annual average per worker labour cost in Vietnam was 0.30 million JPY in 2010, increasing to 0.74 million JPY in 2017, while the average labour cost at headquarters was 4.86 million JPY in 2010, rising to 5.16 million JPY in 2017. Furthermore, total labour costs in Vietnam amounted to an average of 171 million JPY in 2010 and 406 million JPY in 2017. In contrast, total labour costs in Japan remained relatively stable, at 12,475 million JPY in 2010 and 12,638 million JPY in 2017.

Figure 9: Effect on the share of full-time workers in Japan

6 Conclusion

This paper has explored the impact of Vietnam's minimum wage reform in 2011. The government's intervention led to an average increase of 49.7% in the minimum wage for foreign firms and 102.7% for domestic firms. We focus on manufacturing sector firms to compare the effects on domestic private firms and foreign firms. Our analysis reveals that firms in both groups responded by increasing their labour costs. However, domestic firms mitigated the impact by reducing employment, whereas foreign firms did not adjust their workforce. This difference in employment responses led to a larger increase in total labour costs for multinational enterprises (MNEs), despite domestic firms facing a greater exposure to the minimum wage increase. This suggests that while foreign firms absorbed the increase in labour costs, domestic firms adjusted intensively.

We extended our analysis to study the impact of the minimum wage reform on Japanese headquarters, leveraging the merged dataset. While the reform led to a substantial increase in labour costs at the subsidiaries in Vietnam, it did not translate into significant changes in labour market outcomes at the Japanese headquarters. The effects on employment was insignificant, and we find no evidence of changes in labour

substitution dynamics. These null results suggest that the wage gap between Japan and Vietnam remains substantial, allowing MNEs to absorb the increase in labour costs in the destination country without significant effects on the parent firm's operations.

Our findings suggest that foreign firms appear to passively absorb wage increases, while domestic firms adapted to the shock by adjusting on both the intensive and extensive margins. This finding may seem to contradict the prevailing literature, which often emphasises the strong influence of multinational enterprises (MNEs) on local labour markets. However, our analysis focuses on a relatively longer time horizon, and the context of the policy change suggests that MNEs were exposed to higher wage growth in the destination country compared to their home country. Thus, our findings contribute to the ongoing debate by showing that MNEs are not necessarily active drivers of local labour market dynamics, but rather, they are more likely to absorb the changes in labour costs imposed by the destination country.

There may be several reasons why foreign firms absorbed the increase in labour costs. First, foreign firms may have less flexibility in dismissing workers, as their labour force decisions could be partially determined by headquarters, and their compliance with labour laws may be stricter than that of domestic firms. Second, despite the significant increase in labour costs, the wage gap between Vietnam and the home country remains large, making continued operation in Vietnam the optimal choice. Headquarters may have factored in the higher wage growth in developing countries when deciding to invest, so that the post-reform minimum wage may have still fallen within an acceptable range. Exiting Vietnam and relocating to another country would be a costly decision, leading firms to bear the increase in costs. Third, MNEs may have benefited from the reform. Specifically, the unification of minimum wages meant that foreign firms no longer had to pay higher wages than domestic competitors to attract high-quality employees. Such competition could explain why foreign firms did not adjust their employment levels. Finally, MNEs have advantage in responding to the risk when they invest in multiple countries. Even if a cost increases in one country, they can substitute their operation in another country without incurring a lot of cost. The analysis of these different mechanisms will be explored in future extensions of this paper.

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A Appendix

Table A1: Transition of Minimum Wages

Issued	In force		Region I	Region II	Region III	Region IV
Nov 2007	Jan 2008	Domestic	620,000	580,000	540,000	
		Foreign	1,000,000	900,000	800,000	
Oct 2008	Jan 2009	Domestic	800,000	740,000	690,000	650,000
		Foreign	1,200,000	1,080,000	950,000	920,000
Oct 2009	Jan 2010	Domestic	980,000	880,000	810,000	730,000
		Foreign	1,340,000	1,190,000	1,040,000	1,000,000
Oct 2010	Jan/Jul 2011	Domestic	1,350,000	1,200,000	1,050,000	830,000
		Foreign	1,550,000	1,350,000	1,170,000	1,100,000
Aug 2011	Oct 2011		2,000,000	1,780,000	1,550,000	1,440,000
Dec 2012	Jan 2013		2,350,000	2,100,000	1,800,000	1,650,000
Nov 2013	Dec 2013		2,700,000	2,400,000	2,100,000	1,900,000
Nov 2014	Jan 2015		3,100,000	2,750,000	2,400,000	2,150,000
Nov 2015	Jan 2016		3,500,000	3,100,000	2,700,000	2,400,000
Nov 2016	Jan 2017		3,750,000	3,320,000	2,900,000	2,580,000
Dec 2017	Jan 2018		3,980,000	3,530,000	3,090,000	2,760,000
Dec 2018	Jan 2019		4,180,000	3,710,000	3,250,000	2,920,000
Nov 2019	Jan 2020		4,420,000	3,920,000	3,430,000	3,070,000
Jun 2022	Jul 2022		4,680,000	4,160,000	3,640,000	3,250,000

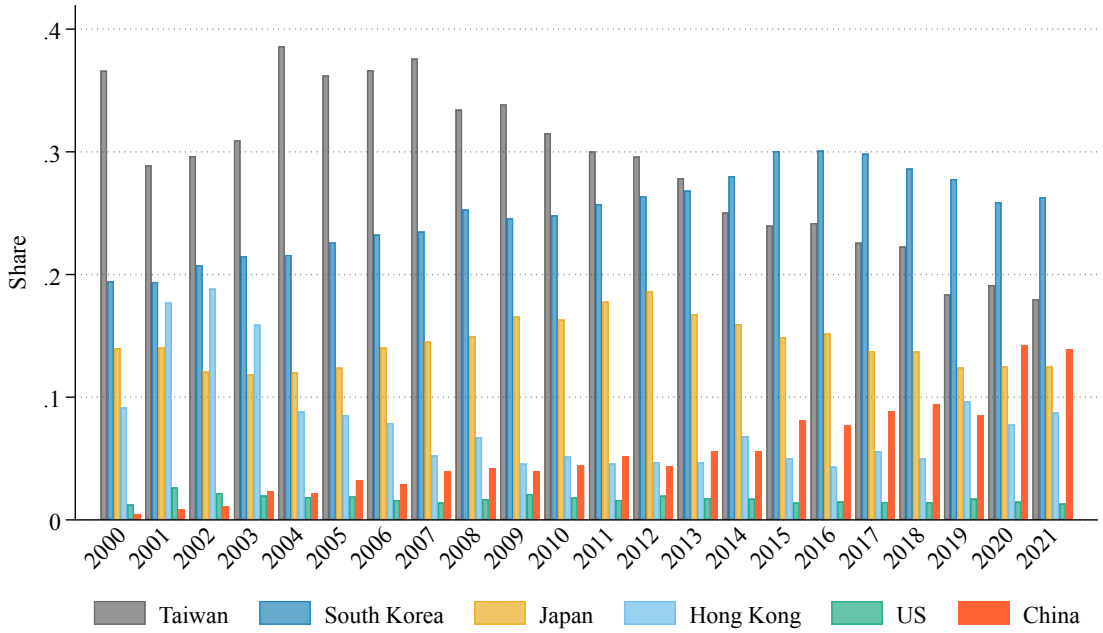

Figure A1: Share of MNEs by owner country

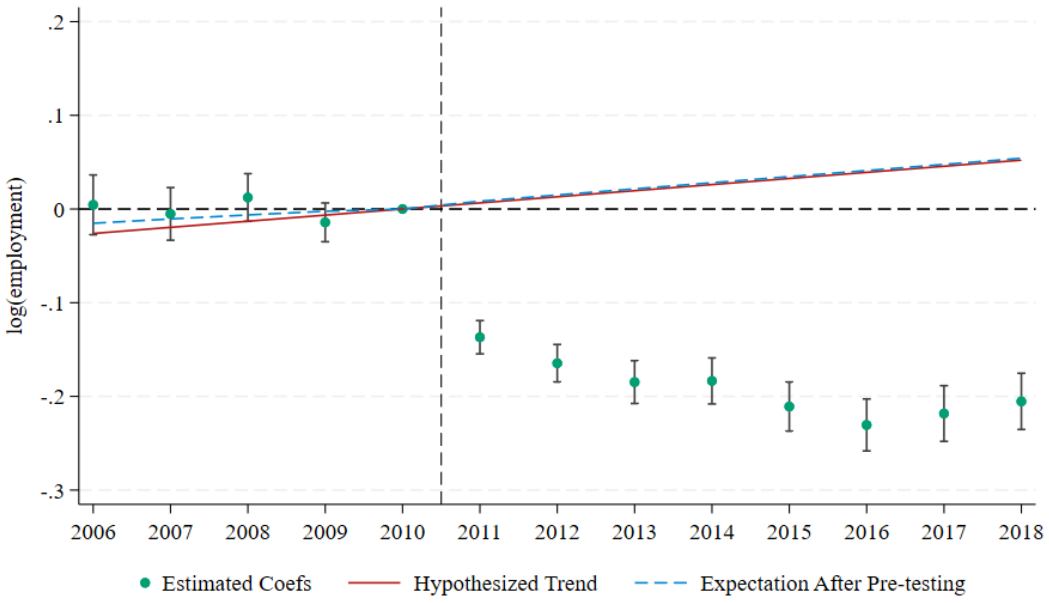

Figure A2: Pre-tests on coefficients of log(employment), domestic firms

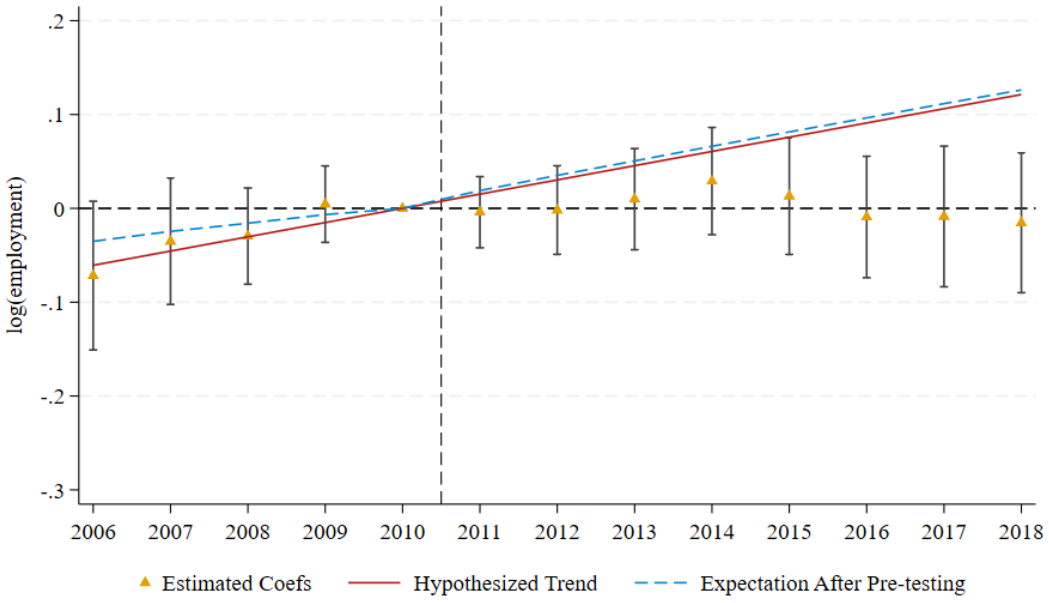

Figure A3: Pre-tests on coefficients of log(employment), foreign firms

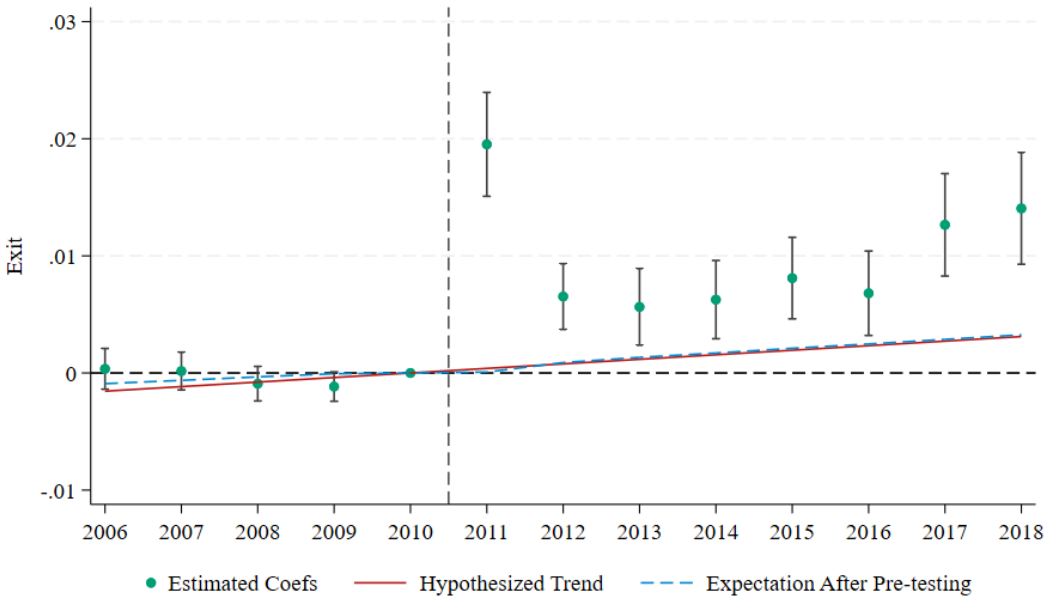

Figure A4: Pre-tests on coefficients of exit, domestic firms

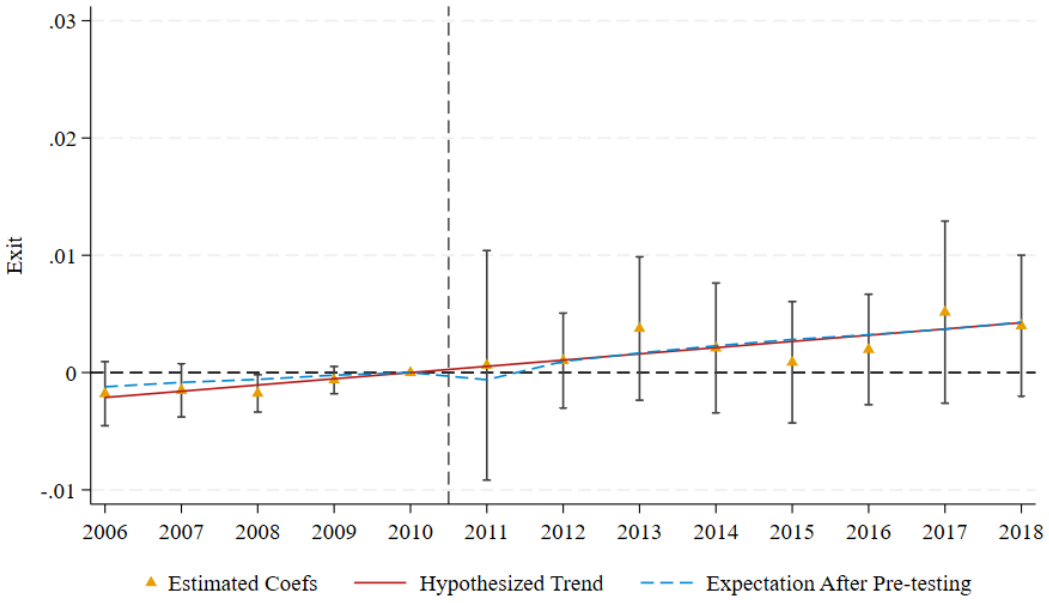

Figure A5: Pre-tests on coefficients of exit, foreign firms

A.1 Details of data merging process

Merge of KK and KJ: KJ includes a firm ID from KK, allowing direct linkage. Since KK only surveys firms with more than 50 employees and capital exceeding 30 million JPY, small firms' subsidiaries cannot be linked. Of 1,384 parent firms investing in Vietnam listed in KJ, 1,103 (79.7%) are linked to KK. Consequently, 1,378 out of 1,690 subsidiaries in Vietnam registered in KJ (81.5%) are connected to parent firm information in KK.

Merge of KJ and TK: While KJ and TK datasets overlap, they differ in sampling criteria and response rates. TK provides richer subsidiary details, such as addresses, which is absent in KJ. We first merge KJ and TK to create a comprehensive dataset that links Vietnamese subsidiaries and Japanese headquarters. The initial merge process matches parent firms based on names and locations. Subsidiaries are then matched using variables like firm names, shareholding ratios, years of establishment, employee numbers, and turnovers. Of 1,690 subsidiaries in Vietnam listed in KJ (1996–2022) and 1,694 in TK (1990–2022), 1,015 subsidiaries are successfully matched.

Merge of TK and VES: Using subsidiary names in TK, we obtained tax IDs (*mathue*) in Vietnam via search engines[17], enabling linkage with the VES. In Vietnam, firm names, addresses, CEO names and phone numbers are the public information associated with *mathue*. We obtained *mathue* by manually searching for the firm names, and cross-verified with these information, which are also available in TK. This process linked 1,091 subsidiaries between TK and VES.

Merge of KJ and VES: For 675 subsidiaries in KJ not matched with TK, we directly linked them to VES. Using search engines, we retrieved tax IDs (*mathue*) based on firm names and matched them with VES. Since KJ lacks address and phone details, we verified matches using establishment years, employee numbers, and turnovers for cross-verification. This process successfully merged 491 subsidiaries (72.7%).

[17]There are namely three websites that we utilised: https://masothue.com/, https://doanhnghiepmoi.vn/, and https://infodoanhnghiep.com/