Footloose Enough? Multinationals, Domestic Firms, and Job Creation in Developing Economies as Wages Rise*

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Abstract

We study the effect of a sharp increase in minimum wages in Vietnam on domestic and multinational firms' labour decisions, using establishment-level census data and a rotating panel of individual workers. Event study estimates show that domestic establishments exposed to the reform significantly reduced employment and exited at higher rates, while multinationals modestly expanded employment with little impact on exit. At the district level, we find that overall employment declined more where exposure was higher, but these losses were partly offset in districts where MNEs employed a larger share of the workforce, as foreign employers absorbed displaced workers and expanded their market share. Individual-level analysis indicates that workers displaced from domestic firms either moved to multinationals or became unemployed, while those in multinationals enjoyed more stable employment. We complement these findings with an original survey of Japanese multinationals, which shows that most firms have no plan to relocate to lower-wage countries. These findings suggest that multinationals remain a key provider of employment despite rising labour costs, while at the same time highlighting a core challenge of FDI-led industrialisation: stronger labour standards raise wages, but they may also accelerate the concentration of formal employment in foreign-owned firms, potentially constraining the long-run upgrading of domestic firms that host countries seek.

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1 Introduction

Developing countries have long been attractive destinations for multinational enterprises (MNEs) due to their low labour costs, prompting governments to compete to attract foreign direct investment (FDI). This appeal stems from the belief that MNEs embody technology and knowledge that can kickstart development processes of job creation, income growth, and structural transformation that emerging economies otherwise struggle to access. A growing body of evidence supports this view, showing that MNEs raise formal employment, increase wages, and diffuse knowledge to domestic firms (Javorcik, 2004, 2015; Alfaro-Ureña et al., 2022; Abebe et al., 2022; Mendola et al., 2024).

The end game for host economies, however, is to build domestic capacity for job creation, productivity growth, and industrial upgrading. This has become increasingly urgent in a world where reliance on foreign investors exposes host countries to strategic choices made abroad, often driven by corporate or geopolitical agendas that do not necessarily align with local development goals. These tensions have escalated in recent years, as trade and FDI policy have become more politicized and MNEs face pressure to align with home-country strategic priorities (Fajgelbaum et al., 2019; Bai et al., 2022; Goldberg and Reed, 2023; Fajgelbaum et al., 2024). From the perspective of Vietnam, a quintessential case of FDI-led industrialization and our focus in this paper, the key question is not only how MNEs affect aggregate outcomes such as jobs and income, but more importantly, how they influence the capacity of domestic firms as wages rise and development advances. Understanding this dynamic is essential for evaluating the long-term sustainability of FDI-dependent growth strategies.

In this paper, we tackle this question by exploiting a major minimum wage reform in Vietnam that unified wage floors for foreign and domestic firms and reclassified many districts into higher wage categories. The reform is ideal because it captures two dynamics that speak directly to our research question. First, it allows us to estimate the causal effect of rising wages, which is a natural feature of development but one that is otherwise difficult to isolate empirically because wage increases typically occur alongside other changes as economies grow. Second, it captures a common feature of industrial policy in later-stage FDI relationships, where governments seek to accelerate domestic firms to catch up by

increasing minimum wages, formalisation mandates, or local content requirements.

We use a rich combination of data sources to examine these questions. First, we use establishment-level panel data from the Vietnamese Enterprise Survey (VES) to analyse how establishments adjust employment and exit in response to the reform. Second, we use individual-level data from the Labour Force Survey (LFS) to study job transitions before and after the reform. Finally, we supplement our empirical analysis with an original survey of Japanese MNEs to better understand how multinationals perceive long-term wage increases and make investment decisions.

Our empirical analysis begins at the establishment level, where we find that domestic establishments whose pre-reform average labour costs were binding under the minimum wage reform reduced employment and exited at higher rates, while MNEs maintained employment levels and did not face higher exit rates. On productivity, we estimate the total factor productivity (TFP) and find that MNEs experienced a modest TFP increase, while domestic establishments exhibit a decline in TFP. In addition, we examine the heterogeneity across pre-reform establishment and district characteristics. We find that domestic establishments relying more on low-skilled labour reduced employment more, while MNEs with similar workforce composition expanded, which is consistent with the reallocation of displaced workers toward MNEs.

We then turn to the district-level analysis to capture broader adjustment margins in employment and firm composition, which may not be visible at the establishment level. We find that total employment fell more sharply in districts with greater exposure to the reform, driven primarily by domestic employment losses. In contrast, MNE employment remained stable or increased slightly, suggesting a reallocation of workers within local labour markets. In these districts that are more bound by the reform, both foreign and domestic employers raised labour costs per worker, indicating widespread wage adjustments consistent with compliance to the new wage floors. At the same time, we find no clear aggregate effects on district-level productivity. This differs from the establishment-level domestic decline because two opposing forces are in play at the aggregate level. While weaker domestic establishments exited, surviving domestic establishments faced adjustment pressures that lowered within-firm productivity.

To better understand the competition between the two ownership types, we ex-

amine the role of local labour market competition from MNEs. In districts with a higher pre-reform concentration of MNE employment, domestic employers were more likely to exit, while MNEs expanded strongly, absorbing displaced workers and market share. At the aggregate level, combining both types of establishments, these countervailing forces muted the negative employment impacts and produced modest productivity and revenue improvements in districts where MNEs dominated local labour markets.

At the individual level, we show that workers employed by domestic firms before the reform were more likely to move into MNEs or state enterprises or become unemployed. In contrast, those employed in MNEs exhibited greater employment stability. Using a difference-in-differences specification, we find that wages increased for workers in both domestic and foreign firms by similar margins, even though domestic firms were subject to larger mandated hikes in minimum wages. This suggests that MNEs may have increased wages beyond the regulatory minimum, possibly to retain workers or keep pace with rising local wage expectations.

Finally, to shed light on the mechanisms underlying these patterns, we conducted a survey of Japanese MNEs with subsidiaries in Asian countries. Japan is the second-largest source of FDI outflows (UNCTAD, 2024) and the third-largest investor in Vietnam. A large share of firms reported that low labour costs were a key factor in their initial location decisions, particularly in the manufacturing sector. However, despite rising wages, most firms reported that they did not plan to relocate to lower-wage countries or to downsize foreign investment. Smaller firms often lacked specific strategies to address labour cost increases, while larger firms made cost adjustments at the intensive margin. These responses suggest that while labour costs are the primary motives for initial investment decisions, shrinking wage differentials do not automatically trigger responses at the extensive margin, a pattern consistent with findings from Muendler and Becker (2010).

Together, our findings highlight significant heterogeneity in responses to the wage shock. Although both domestic firms and MNEs raised wages by similar amounts, domestic firms, facing steeper wage hikes, responded by cutting employment and exiting at higher rates. In contrast, MNEs maintained or modestly expanded employment and exhibited greater resilience to cost shocks. These patterns indicate that MNEs are not as footloose as expected and continue to play an important role in employment even as

host-country wages rise. At the same time, these findings may highlight a core challenge of FDI-led economic growth. We observe a shift in employment away from domestic firms and toward MNEs, consistent across establishment-, district-, and individual-level analyses. As job opportunities become concentrated in foreign-owned firms, domestic enterprises may struggle to retain workers, scale up, or obtain productivity gains. This dynamic could potentially undermine the long-run upgrading of the domestic firms that many developing countries seek to achieve.

Our work contributes to several strands of literature. First, it closely relates to studies on the effects of FDI inflows in developing countries. A large body of evidence finds that multinationals benefit host countries by creating employment opportunities with higher wages (Brown et al., 2004; Sjöholm and Lipsey, 2006; Hijzen et al., 2013; Javorcik, 2015; Mendola et al., 2024; Alfaro-Ureña et al., 2022), by transferring technology and knowledge to domestic firms (Javorcik, 2004; Alfaro-Ureña et al., 2021; Abebe et al., 2022; Verhoogen, 2023; Bai et al., 2022), and by introducing better managerial practices (Bloom et al., 2012). Recent studies, however, highlight heterogeneity and potential downsides, such as higher prices charged to consumers (Alfaro-Ureña et al., 2025), regressive distribution of benefits (Atkin et al., 2018), and land exploitation (Sonno, 2025).[1]

We extend this debate by examining a potential trade-off between the static benefits that MNEs bring and the long-term risks of relying on foreign-owned firms. Although wage differentials and labour substitution opportunities are key motivations for MNEs to invest in low-income countries (Grossman and Rossi-Hansberg, 2008; Muendler and Becker, 2010; Harrison and McMillan, 2011), the presence of multinationals can itself raise wage levels, thereby making the host economy less attractive and potentially encouraging MNEs to relocate. Our study contributes to unfold this dynamic by analysing MNEs' responses to an exogenous wage shock in the destination country. The study closest to ours is Harrison and Scorse (2010), who find that a real wage increase in Indonesia, driven by anti-sweatshop campaign, had little effect on MNE employment. Consistent with their findings, we show that Vietnam's large minimum wage hike had minimal or even positive

[1] In a related context, Wiltshire (2023) argues that the entry of Walmart Supercentre resulted in monopsony in the local labour market and resulted in decline in employment and earnings.

effects on MNE employment and exit, suggesting that multinationals continue to provide job opportunities even as wages rise. Our findings also align with evidence that wage differentials affect MNE employment largely on the extensive, rather than the intensive margin (Konings and Murphy, 2006; Muendler and Becker, 2010).

Second, this paper contributes to the literature on minimum wage policies and their labour market outcomes (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 document negative effects on manufacturing employment (Cengiz et al., 2019; Gopalan et al., 2021; Harasztosi and Lindner, 2019). Our results are consistent with the latter; domestic manufacturing firms in Vietnam significantly reduced employment in response to the reform. We further contribute to the literature by exploring the heterogeneous responses between MNEs and domestic firms[2], adding to debates on wage inequality (Autor et al., 2016; Bossler and Schank, 2023). We find that displaced workers often moved into MNEs, consistent with Dustmann et al. (2021), which show that minimum wage increases reallocate workers toward higher-productivity firms. However, our findings raise concerns specific to developing economies, where high-productivity firms are often foreign-owned. This reallocation may risk deepening structural dependence on MNEs in the long run.

Vietnam offers an ideal and unique setting for the analysis. In Vietnam, trade liberalisation since the early 2000s and the expansion of special economic zones (SEZs) have spurred a surge in foreign manufacturing firms (McCaig et al., 2024; McCaig et al., 2025; Drozdoff et al., 2024; Tafese et al., 2025). Multinational enterprises (MNEs) now play a central role in formal employment, employing nearly twice as many workers as domestic firms in manufacturing. Within this context, the sharp and unprecedented 2011 minimum wage reform, raising wages by 50–100% across the country, provides a rare opportunity to disentangle policy-driven labour cost shocks from wage growth endogenously driven

[2]There is limited evidence on the effects of minimum wage policy on foreign-owned firms. Harrison and Scorse (2010) finds that MNEs complied with minimum wage increases in Indonesia with minimal employment loss. In contrast, Ahn et al. (2025) shows that MNEs in South Korea responded more strongly than domestic firms by cutting employment, possibly reflecting their greater ability to shift production across borders.

by MNE presence. Despite its significance, evidence on such large-scale reforms is scarce (Harasztosi and Lindner, 2019; Giupponi et al., 2024), and few studies have explored the Vietnamese case beyond product-market responses (Nguyen, 2023). More broadly, limited work exploits firm-level exposure to minimum wage policy (Machin et al., 2003; Draca et al., 2011; Rao and Risch, 2024), especially in low- and middle-income countries (Broecke et al., 2017; Higashigata, 2021; Neumark and Munguía Corella, 2021). Our study contributes to this gap by leveraging linked establishment- and worker-level data to examine how dependence on foreign enterprises shapes domestic upgrading and long-term development.

The remainder of this paper is organized as follows: Section 2 provides background on Vietnam's FDI regime and the 2011 minimum wage reform and describes the datasets used in our analysis. Section 3 presents the establishment-level results. Section 4 provides district-level evidence. Section 5 turns to the individual-level data. Section 6 presents results from our survey of Japanese MNEs. Section 7 concludes.

2 Institutional Context and Data

2.1 Minimum wage policies in Vietnam

Vietnam first introduced minimum wages for foreign enterprises in 1992 and general minimum wages for employees in public bodies in 1995.[3] 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).

A major institutional shift occurred in 2008, when Vietnam adopted a regional minimum wage system based on district-level classifications.[4] Districts were grouped into four regions, with Region I (e.g., Hanoi and Ho Chi Minh City) assigned the highest minimum wage and Region IV covering the most rural areas.[5] Domestic private firms were legally required to follow these regional wage floors, though the statutory minimum

[3] 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)

[4] Vietnam has 708 districts as of 2020.

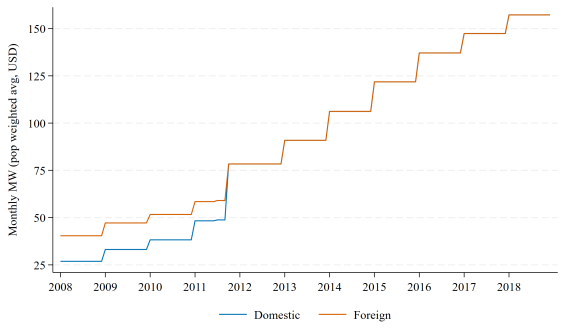
[5] As of 2020: Region I had 78 districts, Region II had 87, Region III had 178, and Region IV had 365.

for domestic firms remained below that of foreign firms in the same region until 2011[6]. The government updates minimum wages annually through formal decrees, which also determine the classification of districts. While districts can be upgraded to a higher wage category, no district has ever been downgraded. Upgraded districts experience larger increases in minimum wages than those remaining in the same category.

In October 2011, Vietnam implemented a landmark minimum wage reform with two major components. First, it unified the dual minimum wage system that had previously imposed higher statutory wage floors on foreign firms than on domestic firms within the same region. Previously, 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. The unification raised the statutory minimum wages to 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, equalizing rates across ownership types.

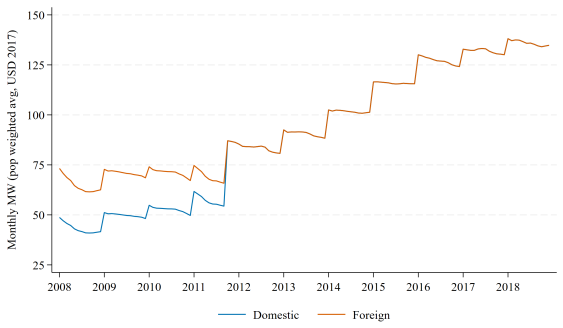
Figure 1 shows the trends in population-weighted average minimum wages for domestic and foreign firms between 2008 and 2018. The left panel reports nominal USD values and highlights the sharp 2011 increase, particularly for domestic firms, when wage schedules were unified. The right panel adjusts for inflation using 2017 real USD. While real wages also rose after the reform, the increase is more moderate once inflation is accounted for.

(a) Nominal Change



Note: Nominal terms. Population-weighted average across districts. Converted to USD (1 USD = 20,515 VND).

(b) Real Change



Note: Real terms in 2017, adjusted by monthly CPI and converted to USD. Population-weighted average across districts.

Figure 1: Minimum wage schedule over time

[6]State-owned enterprises follow a different minimum wage standard.

Second, 2011 saw the largest number of districts upgraded to higher wage categories. Appendix Figure A.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.

The reform led to sharp increases in minimum wages for both domestic private firms and foreign firms, with domestic firms experiencing a much larger adjustment. Appendix Figure A.2 illustrates the distribution of real minimum wage changes by district. Foreign firms saw an average increase of 40% in real minimum wages, while domestic firms experienced an average rise of 79%. This was the largest single-year jump in Vietnam's minimum wage history. This unusually large policy shock provides a rare opportunity to examine how firms and workers respond to rising labour costs.

2.2 Data

This study combines several data sources to examine the effects of minimum wage reform on firms and workers in Vietnam. First, we use the Vietnamese Enterprise Survey (VES) to analyze establishment-level and district-level responses to the policy change. Second, we draw on the 2011 round of the Vietnamese Labor Force Survey (LFS) to study individual-level labour market transitions surrounding the reform. Finally, we supplement our analysis with original survey data from Japanese MNEs, which sheds light on the mechanisms through which foreign firms respond to wage increases in host countries. This section describes the datasets used in our empirical analysis.

Vietnamese Enterprise Survey. Our establishment-level and district-level analyses are based on the Vietnamese Enterprise Survey (VES) from 2006 to 2018. 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 establishment-level information such as 10-digit tax ID (*mathue*), geographical location, shareholdings by

country, and key balance sheet items. We restrict our samples to the manufacturing industry, which accounts for the majority of foreign-invested enterprises in Vietnam.

Vietnamnese Labor Force Survey. Our individual-level analyses are from the Labor Force Survey (LFS). The LFS is a nationally representative rotating panel survey that collects rich labor market information, including individuals' age, gender, employment status (e.g., state-owned, domestic private, foreign-invested, or informal employment), monthly salary, and hours worked. We focus on the 2011 survey round, during which the panel structure allows us to observe some individuals more than once within the year, and restrict the sample to those who were aged above 15 and were employed in domestic or foreign firms before October 2011. This enables us to track labour market transitions surrounding the minimum wage reform, including transitions between employment types and into or out of the labour force.

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 data collected by *Toyokeizai* and the Basic Survey on Overseas Business Activities (BSOBA) 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. 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). In this paper, we present some of the results with a focus on their responses on wage increases in subsidiaries. This survey is aimed at supplementing our main analysis with administrative data.

2.3 Descriptive Statistics

We begin by providing descriptive statistics to contextualize Vietnam's manufacturing sector and the evolving role of foreign-owned firms. Appendix Figure A.3 presents trends

in manufacturing employment by firm ownership type from 2001 to 2020. Over this period, foreign-owned firms experienced rapid growth in employment, surpassing both private domestic and state-owned enterprises by the mid-2010s. By 2020, foreign firms employed nearly twice as many workers as domestic firms in the manufacturing sector. In contrast, state-owned manufacturing employment declined steadily, reflecting broader structural changes in Vietnam's economy.

Appendix Figure A.4 shows the evolution of foreign employment shares by country of origin. The dominant sources of FDI-related employment in Vietnam are more advanced Asian economies, particularly South Korea, Japan, and Taiwan. Since the mid-2010s, South Korea has overtaken other countries to become the largest contributor to foreign employment, followed by Japan and Taiwan. China's role has expanded since 2013 but remains smaller in scale compared to the top three. These trends highlight the shifting composition of foreign investors in Vietnam and underscore the importance of regional integration and supply chain linkages with East Asian economies in shaping Vietnam's formal labour market.

3 Impact of the Minimum Wage Reform: Establishment level

3.1 Empirical Strategy

We construct our sample from establishments that were active in 2010, the year before the minimum wage reform. We exclude state-owned enterprises, which follow different minimum wage floors, and drop establishments with fewer than 5 employees. This yields 42,096 establishments, of which 4,565 are MNEs (10.8%) and 37,531 are domestic (89.1%).

To identify the causal effect of the reform, we estimate a dynamic event-study specification that tracks outcomes of these establishments over time and allows for differential responses by ownership type. We follow the approach commonly used in the minimum wage literature (Draca et al., 2011; Cengiz et al., 2019; Rao and Risch, 2024)

and estimate:[7]

$$y_{it} = \sum_{o \in \{\text{MNE,Domestic}\}} \sum_{k \neq 2010} \beta_k^o \cdot D_i^o \cdot \mathbf{1}[t = k] + \alpha_i + \gamma_{ot} + \tau_{dt} + \varepsilon_{it} \tag{1}$$

where y_{it} denotes the outcome of interest for establishment i in year t. The variable D_i^o is a binary indicator for whether establishment i, owned by type $o \in \{\text{MNE}, \text{Domestic}\}$, is considered "binding" to the minimum wage reform. The establishment is defined as binding if its average labor cost per worker over the period 2008–2010 was below the 2011 minimum wage assigned to its district. That is, $D_i^o = \mathbf{1}\left[\overline{LaborCostPerWorker}_i^{2008\text{–}2010} < \text{MW}_{d(i)}^{2011}\right]$, where $d(i)$ denotes the district in which establishment i is located. The coefficients β_k^o capture the dynamic treatment effects for each ownership type relative to the baseline year 2010. We include establishment fixed effects α_i, district-by-year fixed effects τ_{dt}, and preform-ownership-by-year fixed effects γ_{ot}. These account for time-invariant establishment characteristics, differential macro-economic shocks across districts, and general time trends by establishment ownership type. By construction, these also absorb the smaller minimum wage adjustments before and after 2011. Standard errors are clustered at the establishment level.

Table 1 presents descriptive statistics for MNE and domestic establishments, disaggregated by treatment status. Among MNEs, a relatively smaller share is classified as binding, whereas about one-fifth of domestic establishments fall into the binding group. Binding MNEs employ substantially more workers than non-binding ones, while the difference between binding and non-binding domestic establishments is minimal. For both ownership types, non-binding establishments report higher monthly compensation, assets, and revenues. Average monthly wages are also higher among non-binding establishments.

[7] In our setting, the shock is not staggered and all the establishments received the shock in the same year. 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). While our data is unbalanced, i.e. some establishments may have missing entries in some years, the efficiency of the estimator is still preserved (Harmon, 2024)

Table 1: Establishment characteristics by binding status

	Foreign		Domestic	
	Binding	Not binding	Binding	Not binding
Total Employment	1834.4	302.0	56.64	55.63
	(5061.2)	(494.8)	(360.3)	(176.2)
Total monthly compensation (million VND)	1231.3	940.4	59.44	158.3
	(1839.0)	(1208.4)	(269.7)	(459.8)
Average monthly compensation (million VND)	1.163	3.896	1.183	2.918
	(0.566)	(2.071)	(0.522)	(1.300)
Total asset (billion VND)	148.3	117.7	10.93	23.85
	(222.5)	(172.6)	(45.59)	(74.44)
Net turnover (billion VND)	167.7	131.8	10.34	25.89
	(295.4)	(212.8)	(52.02)	(91.19)
Hanoi City (%)	6.569	6.837	11.77	17.41
	(24.80)	(25.24)	(32.23)	(37.92)
Ho Chi Minh City (%)	17.03	18.39	9.793	37.23
	(37.64)	(38.75)	(29.72)	(48.34)
Number of establishments	411	4,154	7,567	29,964

3.2 Employment Effects and establishment Exit

3.2.1 Results

Employment. Panel A of Figure 2 shows the effect of minimum wage reform on employment, separately for domestic establishments and MNEs. The dependent variable is the log of total employment as reported in December of each year. After the reform, domestic establishments experienced a sustained and significant decline in employment relative to less-exposed establishments, with estimates stabilizing around a reduction of 15% to 20%. In contrast, MNEs show no such decline. In fact, employment among more-exposed MNEs increased in the years following the reform, reaching 20% of an increase by 2018.

Exit. To assess extensive-margin adjustments, we examine establishment exit. We define an establishment being exited in year t if it reports positive revenues in year $t-1$ but disappears from the dataset thereafter. Panel B of Figure 2 displays the event study estimates for exit. The results show a sharp and persistent increase in exit probability

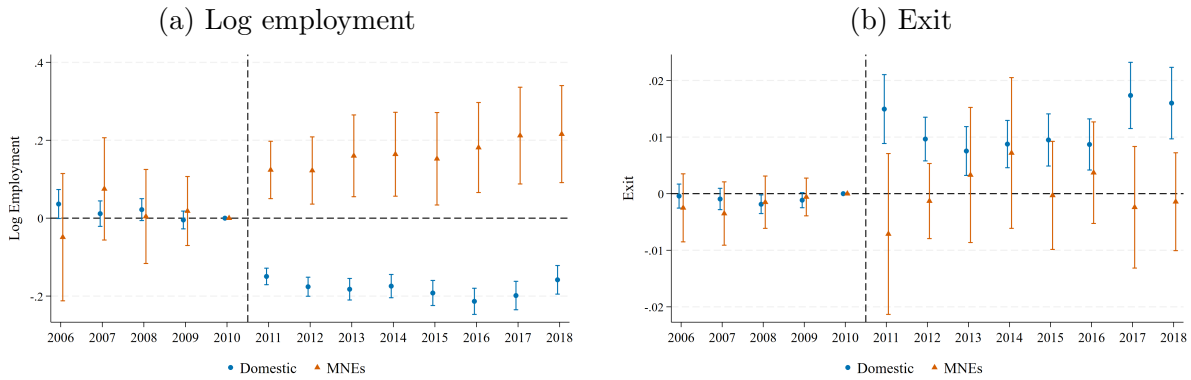


Figure 2: Effect on employment and establishment exit

Notes: This figure shows the effect of the minimum wage reform on establishments' outcomes. Panel (a) presents the effect on the logarithm of employment, and Panel (b) presents the effect on establishment exit.

for domestic establishments following the reform. The effect appears immediately after 2011 and persists throughout the sample period, with an increase of roughly 1 to 2 percentage points in exit likelihood. In contrast, the estimates for MNEs remain statistically insignificant and close to zero in all post-reform years. This suggests that while rising minimum wages may have driven some domestic establishments out of the market, MNEs were not affected at the extensive margin.

Overall, the results suggest that the reform in 2011 resulted in heterogeneous responses between domestic and foreign establishments, both at the intensive margin and extensive margin. Domestic establishments, which faced a more binding increase in wage floors, responded by cutting employment and exiting the market at higher rates. These adjustments reflect both limited flexibility in absorbing higher labour costs and potentially weaker competitive positions in the face of tightening wage regulations. In contrast, MNEs were less affected at both margins. They did not reduce employment and showed no increase in exit.

These findings point to a potential reallocation process triggered by the reform, in which formal employment gradually shifted from domestic to foreign establishments. As domestic establishments contracted, foreign establishments maintained or expanded their presence. We will investigate this reallocation mechanism further on a district-level in Section 4 and on an individual-level in Section 5.

Own-wage elasticities. To benchmark our findings against the literature on minimum wages, we estimate the own-wage elasticity (OWE) of employment separately for foreign and domestic establishments using a two-stage approach following Dube and Zipperer (2024). Specifically, we modify our baseline specification in Equation (1) by replacing the dependent variable with log labour cost per worker. In the reduced form, we estimate the same specification where the dependent variable is log employment. The OWE for each establishment type is then calculated as the ratio of the reduced-form estimate to the first-stage estimate, which could be interpreted as with 1% change in wages how employment changes in %.

We compute both mid-run and long-run elasticities. The mid-run estimates refer to effects within the first two years following the reform, while the long-run estimates include all years up to eight years after. For domestic establishments, we find a mid-run elasticity of –0.51 (s.e. 0.03) and a long-run elasticity of –0.48 (s.e. 0.03). In contrast, for foreign establishments, the mid-run elasticity is 0.32 (s.e. 0.10) and the long-run elasticity is 0.40 (s.e. 0.11).

Figure 3 compares our estimates with those in the literature. Prior work has produced a wide spectrum of elasticities from strongly negative to strongly positive, ranging from nearly –1.5 (e.g., Sabia 2009) to +1.5 (e.g., Card 1992). Our findings help reconcile this variation by highlighting the importance of establishment heterogeneity. We show that domestic establishments exhibit negative employment responses to rising wages, while MNEs appear more resilient, even expanding employment. These contrasting responses suggest that part of the dispersion in elasticity estimates across studies may partly reflect differences in establishment composition across contexts. By allowing heterogeneous responses from domestic and MNEs, we highlight the importance of accounting for establishment heterogeneity when assessing the labour market consequences of minimum wage policies.

3.2.2 Robustness Checks

Continuous gap measure. Our baseline specification relies on a binding dummy to compare changes in outcomes for binding and non-binding establishments within MNE and domestic ownership groups, net of district- and ownership-specific shocks. In Ap-

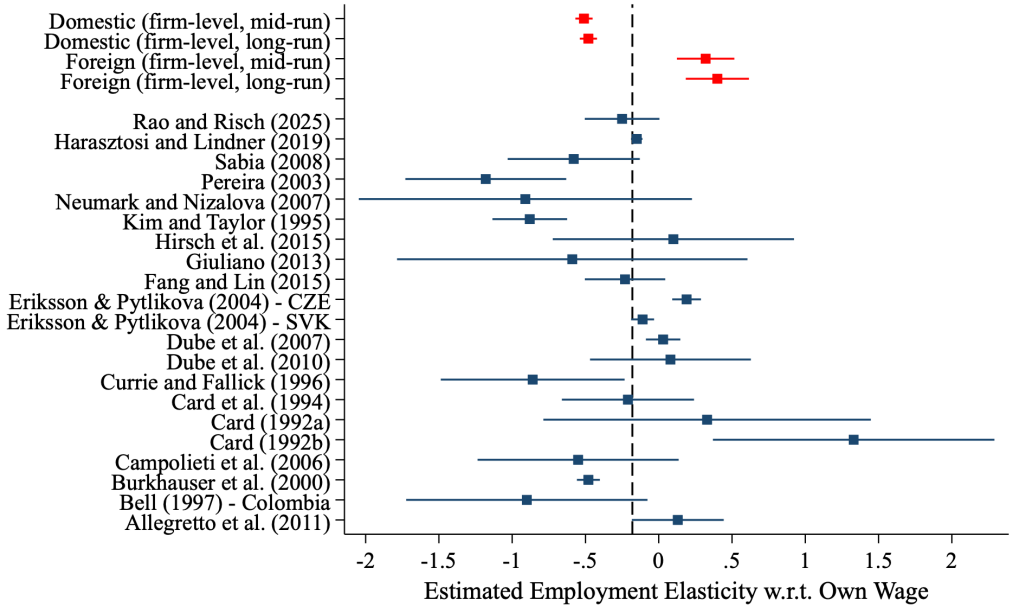


Figure 3: Elasticity comparison to literature

pendix Section B.1, we replicate the analysis using a continuous treatment measure based on the size of the gap between pre-reform wages and the 2011 minimum wage. The results are very similar, confirming that our findings are not driven by the binary treatment definition.

Magnitude of minimum wage shocks. Since domestic establishments experienced larger minimum-wage hikes than MNEs, a potential concern is that the observed heterogeneity in responses simply reflects the differing magnitudes of those shocks. To address this, we compare estimated effects at the province level. Appendix Figure B.7 plots the change in real minimum wages against estimated impacts on (a) log employment and (b) establishment exit. For both MNEs and domestic establishments, the slope coefficients are statistically insignificant, indicating that the magnitude of the minimum wage increase does not predict the estimated effects. These results indicate that the heterogeneous responses arise from ownership status rather than the size of the shock.

3.3 Costs, Revenues, and Productivity

To better understand the margins of adjustment and the implications of total factor productivity (TFP) induced by the reform, we estimate the baseline Specification (1) by

collapsing the event dummies into a post dummy and replacing the dependent variable with labour cost per worker, revenues, capital stock, input costs, and TFP. Due to data limitations in the VES, information on capital stock and input costs is available only between 2008 and 2015. Since TFP estimation relies on these inputs, the TFP measures are likewise restricted to this period.

Table 2 shows the results. Column (1) implies that labour costs per worker rose sharply for both MNEs and domestic firms by almost 40%, which reflects the mechanical compliance with the new minimum wage. In Column (2), MNEs experienced revenues gains of around 57.8% after the reform, while domestic establishments have their revenues dropped by around 3.2%. The difference between the two could indicate a reallocation of demand and market share, with MNEs expanding while domestic establishments struggle to adjust.

Column (3) and (4) display the results of capital stock and input costs, where the proxies are fixed assets and cost of goods sold in the data. Domestic establishments increased their capital stock by around 4.4%, suggesting some reallocation in their input mix that could reflect capital-labour substitution as they reduce employment as shown previously. By contrast, MNEs show no statistically significant change in capital stock. In terms of input costs, the pattern reverses. MNEs significantly expand their spending on intermediate inputs by around 62.1%, consistent with scaling up production, while domestic establishments only increase slightly at around 6.8%.

We estimate TFP in Column (5) and (6). Using Levinsohn and Petrin (2003) approach, MNEs increased productivity by around 3%, while domestic establishments experienced a decline of roughly 1%. When using Ackerberg et al. (2015), however, the effects are not statistically significant for either group.

To summarize, these results highlight a divergence between MNEs and domestic establishments' adjustments. MNEs absorbed higher labour costs while simultaneously expanding revenues, inputs, and to some extent, productivity; however, domestic establishments faced shrinking revenues, modest capital adjustments and to some extent, declining productivity.

Table 2: Effects of the Reform on Costs, Revenues, and Productivity

	(1) Log Avg Labour Cost	(2) Log Revenues	(3) Log Capital	(4) Log Input Costs	(5) TFP (LP)	(6) TFP (ACF)
Binding × MNE × Post	0.373***	0.578***	-0.006	0.621***	0.030**	0.003
	(0.032)	(0.069)	(0.037)	(0.066)	(0.014)	(0.012)
Binding × Domestic × Post	0.392***	-0.032*	0.044***	0.068***	-0.012***	0.001
	(0.007)	(0.018)	(0.016)	(0.018)	(0.003)	(0.003)
Observations	379,734	371,218	238,871	212,139	233,425	233,425

Notes: Each column reports estimates from Specification (1). Columns (3) - (6) are restricted to 2008–2015 due to data availability. Standard errors are clustered at the establishment level. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively.

3.4 Heterogeneity

We further explore the heterogeneous responses in employment and exit decision by interacting the binding treatment with pre-reform establishment and district characteristics. At the establishment level, we examine firms' workforce composition through (i) the share of directed labour and (ii) the share of workers without college education, both capturing reliance on lower-skilled workers, and (iii) exporter status, defined as establishments with export revenues above 50% of total revenues, indicating global market exposure. At the district level, we analyse (iv) the share of employment in MNE, measuring local competitive pressure from MNEs.[8]

Share of directed labour. Panel A of Table 3 examines heterogeneity by the share of directed labour, which proxies for reliance on lower-skilled workers. Column (1) and (2) correspond to the employment change of domestic establishments and MNEs, respectively. Domestic employers with a higher share of low-skilled labour experience significantly larger decline in employment, which is consistent with these workers being most directly affected by the minimum wage change. In contrast, MNEs with a higher share of directed labour expand their employment more. The opposing directions suggest that MNEs with a higher share of directed labour are absorbing displaced lower-skilled workers from the domestic establishments. As for exits, the final two columns indicate that MNEs with a higher share of directed labour are less likely to exit, while domestic firms show no

[8]The timing of our heterogeneity variables reflects data availability in the VES: workforce composition measures (directed labour and education shares) come from 2009, the only year when detailed occupational and educational breakdowns are reported before the reform, while exporter status and district-level MNE employment shares are measured in 2010.

significant relationship between directed labour intensity and exit.

Share of noncollege labour. Panel B considers the share of workers without college education as another measure of low-skill intensity. Domestic establishments with more noncollege workers do not show differential employment responses, but MNEs with less-educated workforces expand employment significantly more. This pattern again suggests that MNEs serve as an absorbing margin for less-educated workers leaving domestic firms. In terms of exit, MNEs with a larger share of noncollege workers are less likely to close, while no significant effects appear for domestic firms.

Exporter status. Panel C turns to exporter status. The coefficients for employment show no systematic heterogeneity in employment responses for either domestic or foreign establishments. However, the exit margin implies that domestic exporters are less likely to exit after the reform. One possible explanation is that domestic exporters tend to be larger, more productive, and more salient, which could explain their lower exit rate.

Share MNE employment. Panel D examines whether establishments in districts with higher MNE employment shares show differential responses. The motivation comes from our earlier findings that suggest labour reallocation between domestic and foreign employers. If the mechanism is indeed at work, we would expect the pattern to be more salient in districts where MNEs have a stronger presence and thus greater power to attract workers from domestic counterparts. The results show that domestic establishments in such districts do not significantly adjust employment or exit, while MNEs expand employment substantially more. This aligns with MNEs leveraging their position in more concentrated labour market to absorb displaced workers, a possibility we explore further in Section 4.

Overall, the heterogeneity analysis underscores how the reform induced heterogeneous responses across establishments and districts. Domestic establishments who rely more on low-skilled labour reduced employment at a larger scale, while MNEs absorbed those workers and expanded. Domestic establishments who were more exposed to the global market as exporters proved more salient and were less likely to exit. Finally, MNEs in districts where they already held a monopsony power expanded more substantially, highlighting the role of local competitive pressure. These findings reinforces the story

of a reallocation of labour and market share from vulnerable domestic establishments toward MNEs.

Table 3: Heterogeneous Effects of the Reform

	(1)	(2)	(3)	(4)
	Log Employment		Exit	
	Domestic	Foreign	Domestic	Foreign
Panel A: Share Directed Labour				
	-0.333***	0.545**	-0.012	-0.110*
	(0.093)	(0.248)	(0.013)	(0.057)
Panel B: Share Noncollege Labour				
	0.051	1.058***	-0.013	-0.159**
	(0.121)	(0.276)	(0.017)	(0.078)
Panel C: Exporter				
	-0.023	0.037	-0.012**	-0.000
	(0.064)	(0.086)	(0.005)	(0.009)
Panel D: Share MNE Employment				
	-0.054	0.620***	0.002	-0.025
	(0.042)	(0.160)	(0.005)	(0.018)

Notes: This table reports the triple-difference coefficients and their standard errors from an extension of Specification (1) where the event dummies are collapsed to a single post dummy and the triple term is pre-reform characteristics. For the district-level analysis, we modify our specification by excluding district-year fixed effects to preserve variation in MNE employment shares across districts. All other specifications include establishment, district-year, and ownership-year fixed effects as in our baseline model. Standard errors in parentheses. *, **, *** denote significance at the 10%, 5%, and 1% levels.

4 Impact of the Minimum Wage Reform: District-level

To examine how labour market outcomes evolved at a more aggregated level, we turn to district-level analysis. While the establishment-level results capture how individual establishments adjust, they do not show if these micro changes add up to broader gains or losses in employment at the district level. The district perspective allows us to capture these aggregate adjustment margins, including reallocation across establishments within the same labour market (Dustmann et al., 2021).

4.1 Empirical Strategy

Our context includes 673 districts, providing substantial variation in pre-reform wage exposure and allowing us to estimate differential impacts across geographical locations.

We estimate the following event study specification:

$$y_{dt} = \alpha_d + \delta_t + \sum_{k \neq 2010} \beta_k \overline{GAP_d} \cdot \mathbf{1}\left[t = k\right] \; + \epsilon_{dt} \tag{2}$$

$$\overline{GAP_d} = \frac{1}{3} \sum_{t=2008}^{2010} GAP_{dt}$$
$$GAP_{dt} = \frac{\sum_{i \in d} \max\{0, MW_{dt} - LaborCostPerWorker_{it}\}}{\sum_{i \in d} LaborCostPerWorker_{it}}$$

where y_{dt} denotes district-level outcomes in district d and year t. The key variable of interest, $\overline{GAP}_d$, measures the pre-reform exposure of each district d to the 2011 minimum wage increase. It is calculated as the three-year average (2008-2010) of the proportional gap between the 2011 minimum wage and the labour cost per worker, aggregated across all establishments in the district. In other words, it reflects how far below the 2011 minimum wage the average labour costs were in each district before the reform. We weight the regression by the district-level pre-reform log employment and cluster the standard errors at the district level.

4.2 Employment Effects and Exits

Employment. Panel (a) to (c) in Figure 4 shows the effect of the reform on employment at the district level. We find that total employment declined more in districts with higher exposure to the minimum wage increase, driven entirely by a reduction in domestic employment. In contrast, employment in MNEs remained stable or slightly increased. These patterns mirror the establishment-level findings presented earlier in Section 3, resonating that domestic establishments were more sensitive to rising labour costs, while MNEs were largely insulated from the shock.

The stability of MNE employment despite broader employment declines suggests potential reallocation of workers across establishment types. Workers displaced from domestic establishments may have been partially absorbed by MNEs. At the same time, the fact that overall employment still fell implies that some workers exited employment altogether, possibly moving into unemployment or informal work. These dynamics high-

light the importance of tracking individual-level transitions, which we explore in Section 5 using an individual-level approach.

Number of establishments. We next examine the number of operating establishments to capture extensive margin adjustments. As shown in Panel (d) to (e) in Figure 4, we find that the number of MNEs increased in more-exposed districts, while the number of domestic establishments declined. This suggests that the reform may have accelerated market exit among domestic establishments, while foreign establishments maintained or expanded their presence in the local economy, consistent with their more stable employment levels.

Exit rates. We measure the exit rate of establishments as the number of exits divided by the total establishment counts in the previous year. Panel (g) to (i) in Figure 4 present the results. The average exit rate of districts more exposed to the reform increased by about 1 percentage point in 2011. When broken down by ownership, this aggregate pattern is driven almost entirely by domestic establishments. In bound districts, domestic exit rates jumped by about 1.1 percentage points in the first year after the reform (Panel i), whereas foreign establishments saw no comparable rise. In fact, MNE exit rates fell by about 1.4 percentage points in 2011 (Panel h), suggesting that foreign establishments were relatively shielded from the shock.

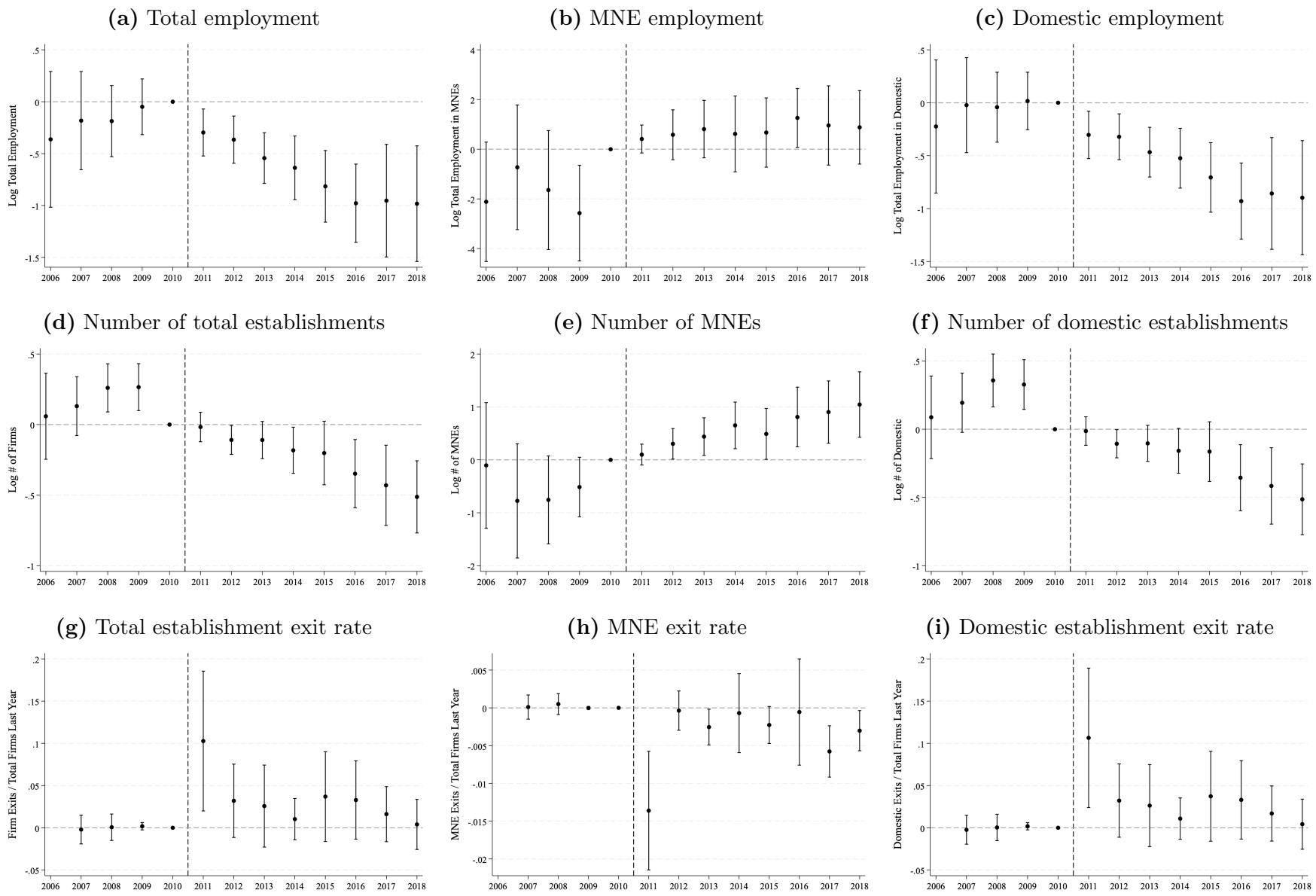


Figure 4: District-level employment, establishment counts, and exit rate by ownership type

4.3 Costs, Revenues, and Productivity

We further inspect other outcomes to understand the margins of adjustments and the implications for productivity. We collapse the event-time dummies in Specification (2) into a single post dummy and report the estimates in Table 4. Panel A shows that average labour costs per worker rose substantially after the reform, potentially reflecting compliance with the new minimum wage. Both domestic establishments and MNEs increased their labour cost per worker, with the effect especially salient among MNEs.

Panels B and C examine capital stock and input costs. Domestic establishments moderately expanded their capital stock, while MNEs show no systematic change. The positive response of domestic establishments suggests some reallocation in their input mix, which may reflect capital–labour substitution, where establishments invest in capital to replace more expensive labour after the reform. As for input costs, MNEs exhibit substantial increases in input costs, potentially coming from a scale effect, while domestic establishments do not significantly adjust their input spending.

Panel D shows that revenues rose significantly among MNEs, while domestic establishments' revenues did not change. The increase in MNE revenues suggests that they expanded their market presence after the reform, likely absorbing displaced labour and capturing market share as weaker domestic establishments exited. The null effect for domestic establishments points to limited revenue growth opportunities among survivors despite cost adjustments.

Panels E and F present results for TFP. Across both measures, there is no clear evidence of productivity changes among either domestic establishments or MNEs on the district level. The absence of aggregate productivity effects likely reflects two opposing forces. On the one hand, at the establishment level, we showed in Section 3 that surviving domestic establishments experienced, to some extent, declines in productivity after the reform, likely due to compliance costs or adjustment frictions. On the other hand, at the district level, weaker establishments exited altogether, leaving behind stronger survivors that are, on average, more productive. These two forces offset one another, producing a null effect in the district-level averages. To better understand the offsetting forces, we explore heterogeneity by local labour market competition. We test whether bound

districts facing stronger MNE presence display different adjustment patterns relative to bound districts with weaker competition.

Table 4: District-level costs, revenues, and productivity by ownership

	(1) All establishments	(2) MNEs	(3) Domestic
Panel A: Log Avg Labour Cost			
Gap×Post	0.470***	0.727***	0.470***
	(0.102)	(0.244)	(0.102)
Obs	8,143	3,332	8,131
Panel B: Log Fixed Assets			
Gap×Post	0.440**	-0.059	0.416**
	(0.171)	(0.527)	(0.170)
Obs	5,089	2,110	5,084
Panel C: Log Input Costs			
Gap×Post	-0.065	1.342*	-0.088
	(0.203)	(0.750)	(0.199)
Obs	4,435	1,859	4,427
Panel D: Log Revenues			
Gap×Post	0.051	1.704*	-0.028
	(0.347)	(0.989)	(0.335)
Obs	8,128	3,317	8,114
Panel E: TFP (LP)			
Gap×Post	-0.041	0.129	-0.026
	(0.045)	(0.114)	(0.045)
Obs	5,073	2,094	5,068
Panel F: TFP (ACF)			
Gap×Post	0.028	0.130	0.043
	(0.033)	(0.095)	(0.033)
Obs	5,073	2,094	5,068

Notes: Each cell reports estimates from Specification (2). Standard errors clustered at the district level. Columns split by all establishments, MNEs, and domestic establishments. Panels B (fixed assets), C (input costs), and E–F (TFP outcomes) are restricted to 2008–2015 due to data availability. *, **, *** denote significance at the 10%, 5%, and 1% levels.

4.4 Heterogeneity: Local Labour Market Competition

Our results so far are consistent with a reallocation of workers from domestic employers to MNEs. This raises the question of whether the strength of this reallocation depends on the degree of MNE presence in the local labour market. In districts where MNEs employ a larger share of workers and have greater monopsonistic power, domestic employers

might struggle to retain labour or even stay in the market after the reform. To test the idea, we examine if bounded districts with high MNE labour-market competition exhibit differential responses relative to districts with lower MNE labour market competition.

Identification strategy. We adapt the design in Derenoncourt and Weil (2025) to our setting and estimate:

$$\begin{aligned} Y_{dt} = \beta_1\big(DomesticGap_d \times \text{Post}_t\big) + \beta_2\big(MneCompetition_d \times Post_t\big) \\ + \beta_3\big(DomesticGap_d \times MneCompetition_d \times Post_t\big) + \delta_d + \gamma_t + \varepsilon_{dt} \end{aligned} \tag{3}$$

where Y_{dt} is a district–year outcome, δ_d and γ_t are district and year fixed effects. The two key exposure measures are defined as follows:

$$DomesticGap_d = \frac{1}{3}\sum_{t=2008}^{2010} \sum_{i \in \text{domestic in } d} GAP_{it}$$

$$MneCompetition_d = \frac{1}{3}\sum_{t=2008}^{2010} \sum_{i \in \text{MNE in } d} GAP_{it} \cdot \frac{Employment_{idt}}{TotalEmployment_{dt}}$$

GAP_{it} denotes the establishment-level minimum-wage gap. $DomesticGap_d$ captures how far below the new minimum wage domestic establishments in district d were before the reform. $MneCompetition_d$ captures the competitive pressure from MNEs, weighting each MNE's wage gap by its share of district employment. This weighting reflects both the wage increase required at MNEs and their importance as local employers.

Domestic. Panel A of Table 5 presents the district-level average outcomes of domestic establishments. The triple interaction term shows that bound districts with high MNE competition experienced a sharper decline of 9.1% in the number of domestic establishments, as presented in Column (1). This points to selective exit pressures that are stronger when MNEs represent a significant share of local employment. In contrast, Column (2) finds no significant interaction effect on domestic employment, which suggests that the employment loss does not differ between high and low MNE competition districts. Column (3) shows that surviving domestic establishments raised labour cost per worker less in high-competition districts, which could reflect either the loss of higher-paid workers to MNEs or a shift in the composition of jobs toward lower-wage directed

labour within these establishments. Column (4) indicates that the revenues of surviving domestic establishments in high-competition districts rose by 7.5%. Columns (5) and (6) turn to TFP, showing improvements in domestic establishments' productivity by around 0.7% to 0.9%, depending on the method used. These revenue and productivity gains likely reflect compositional change, as the less productive establishments exit and the stronger survivors remain.

MNEs. Panel B of Table 5 reports the outcomes for MNEs. The triple interaction term in Column (1) shows no significant change in the number of MNE establishments in higher MNE competition districts. Column (2) shows that in bound districts with higher MNE competition, MNEs expanded employment by 18.4% more strongly, consistent with domestic establishments exiting and workers reallocating into MNEs where they represent a large share of local employment. Column (3) indicates that MNEs raised labour cost per worker by 10.2% more in high-competition districts, suggesting that they not only complied with the minimum wage but also offered higher pay to attract workers from domestic employers. Column (4) shows that MNE revenues increased 21.6% more in bound districts with higher MNE competition. Columns (5) and (6) show no clear productivity gains, which suggests that the revenue expansion of MNEs is perhaps a scale effect driven by absorbing displaced labour rather than improvements in efficiency.

Aggregate outcomes. Panel C of Table 5 presents the district-level aggregate results for all establishments combined. The triple interaction term in Column (1) shows that districts with higher domestic bindingness and higher MNE competition experienced larger net establishment exits by 7.2%. However, the negative effect on total employment in Column (2) is offset in high-competition districts, reflecting the reallocation of workers from exiting domestic establishments into MNEs. Column (3) shows little change in aggregate labour costs per worker, suggesting that wage pressures at MNEs and weaker increases among surviving domestic establishments balance out. Column (4) indicates modest aggregate revenue gains, while Columns (5) and (6) show small improvements in productivity. Together, these findings suggest that at the aggregate level, the adverse employment effects on domestic establishments were partially mitigated by MNE expansion, leading to modest overall productivity and revenue gains at the district level.

Overall, the evidence indicates that districts with a higher MNE presence played a central role, as their dominance in local labour markets amplified domestic firm exits and facilitated the reallocation of workers into MNEs. In these districts, domestic employers exited at higher rates while MNEs expanded, absorbing displaced workers and revenue share. At the aggregate level, these offsetting forces muted the negative employment impacts and produced modest productivity and revenue improvements.

Table 5: Heterogeneous effect of the reform on district-level outcomes

	(1) Log # establishments	(2) Log Employment	(3) Log Avg Labour Cost	(4) Log Revenue	(5) TFP LP	(6) TFP ACF
Panel A: Domestic						
DomesticGap×Post	-0.095***	-0.117***	0.105***	0.014	-0.005	0.009
	(0.020)	(0.030)	(0.021)	(0.068)	(0.009)	(0.006)
MneCompetition×Post	-0.007	0.023*	-0.004	0.019	0.005***	0.003
	(0.013)	(0.012)	(0.005)	(0.019)	(0.002)	(0.002)
DomesticGap×MneCompetition×Post	-0.091***	-0.024	-0.032**	0.075*	0.009**	0.007**
	(0.032)	(0.032)	(0.013)	(0.043)	(0.004)	(0.003)
Obs	8,114	8,149	8,131	8,114	5,068	5,068
Panel B: MNEs						
DomesticGap×Post	0.086*	0.185*	0.035	0.065	0.010	0.003
	(0.049)	(0.104)	(0.046)	(0.112)	(0.024)	(0.024)
MneCompetition×Post	0.008	0.099*	0.042**	0.077**	0.006	0.005
	(0.023)	(0.058)	(0.019)	(0.035)	(0.007)	(0.007)
DomesticGap×MneCompetition×Post	0.024	0.184*	0.102**	0.216***	0.015	0.015
	(0.051)	(0.111)	(0.047)	(0.081)	(0.018)	(0.017)
Obs	3,317	3,339	3,332	3,317	2,094	2,094
Panel C: All						
DomesticGap×Post	-0.082***	-0.091***	0.099***	0.009	-0.005	0.008
	(0.018)	(0.035)	(0.020)	(0.065)	(0.009)	(0.006)
MneCompetition×Post	-0.013	0.078*	-0.003	0.062*	0.006***	0.004**
	(0.008)	(0.045)	(0.010)	(0.033)	(0.002)	(0.002)
DomesticGap×MneCompetition×Post	-0.072***	0.047	-0.015	0.124	0.009	0.007*
	(0.013)	(0.092)	(0.014)	(0.079)	(0.006)	(0.004)
Obs	8,128	8,161	8,143	8,128	5,073	5,073

Notes: Each column reports estimates from Specification (3). Panel A reports outcomes for domestic establishments: Column (1) is the logarithm of the number of domestic establishments, Column (2) is the logarithm of total domestic employment, Column (3) is the logarithm of domestic establishments' labour cost per worker, Column (4) is the logarithm of domestic establishments' revenues, Column (5) estimates TFP using the method proposed by Levinsohn and Petrin (2003), and Column (6) estimates TFP using the method proposed by Ackerberg et al. (2015). Panel B reports the corresponding outcomes for MNEs. Panel C reports the corresponding aggregate outcomes for all establishments in the district. Columns (5) and (6) are estimated only for the years 2008–2015 due to data parameter availability for TFP estimation. Standard errors are clustered at the district level. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively.

5 Impact of the Minimum Wage Reform: Individual-level

The establishment-level analysis in Section 3 and district-level analysis in Section 4 indicate that the minimum wage reform led to employment losses concentrated among domestic firms, while MNEs maintained or slightly expanded employment. These patterns suggest potential reallocation dynamics, where workers displaced from domestic

firms may have moved into other employment statuses, including jobs in MNEs or other forms. In this section, we use individual-level data to examine how workers' employment trajectories evolved before and after the reform.

Our analysis is based on the Vietnamese Labour Force Survey (LFS), a rotating panel survey conducted by the General Statistics Office. In this dataset, individuals may appear more than once in a given year, allowing us to observe employment transitions. The data includes information on age, gender, province of residence, industry, firm ownership type, employment status, salary, and hours worked. We focus on the year 2011, the year of the reform, and restrict the sample to individuals aged 15 or older who were employed in either a domestic firm or a foreign-owned firm prior to the reform's implementation in October.

5.1 Transitions Across Employment Statuses

To assess how workers adjusted to the minimum wage reform, we examine transitions across employment statuses before and after the policy took effect. This analysis helps identify whether displaced workers from domestic firms moved into MNEs, state-owned or informal jobs, or exited employment entirely, and whether MNE workers were more likely to retain their positions.

We categorize each individual's employment status at the time of each survey into five mutually exclusive outcomes: (1) employed in a domestic firm, (2) employed in a multinational enterprise (MNE), (3) employed in a state-owned enterprise, (4) employed informally, and (5) unemployed. An individual is considered employed if they report having an income-generating activity in the past seven days of the survey date. Informal employees are those who work in a farm household or those reported as own-account individuals.

The treated group consists of transition periods that end in the fourth quarter of 2011, when the reform was implemented. The control group includes transitions between earlier quarters of the same year (e.g., Q1 to Q2, Q2 to Q3, or Q1 to Q3). To avoid capturing anticipatory adjustments, we exclude observations from individuals surveyed in September, the month immediately following the reform announcement.[9]

[9]The minimum wage reform was announced on 22nd August, 2011, and implemented on 5th October,

We compute transition matrices by original firm type (domestic or MNE) and compare transition probabilities between treated and control groups. Table 6 reports the estimated transition probabilities and differences between groups. The Pearson chi-squared test confirms a significant difference in the overall distribution of transitions across employment outcomes. When comparing transitions that occurred after the reform to those observed earlier in the year, we find that the share of individuals who began in a domestic firm and remained in a domestic firm declined by 1.7 percentage points. These individuals were instead more likely to move into MNEs (+0.6 pp), state-owned enterprises (+0.6 pp), or become unemployed (+0.5 pp). In contrast, workers initially employed in MNEs were more likely to remain with an MNE after the reform (+2.5 pp), and less likely to move to domestic firms (-2.0 pp), with no significant changes in other transition categories.

The individual-level transitions complement the previous establishment- and district-level analyses in Section **??** and 4 by showing how workers responded to the minimum wage shock: those employed in domestic firms were more likely to transition to MNEs, state-owned enterprises, or unemployment, while workers in MNEs exhibited greater employment stability. Together, the evidence suggests that the reform accelerated a reallocation of labour away from vulnerable domestic firms toward more resilient MNEs, highlighting the unequal capacity of firms to absorb rising labour costs.

5.2 Empirical Strategy

To further estimate the individual-level effects of the reform, we construct a binary treatment indicator for whether an individual was "binding" defined as having a pre-reform salary below the province-level minimum wage in October 2011. We distinguish between individuals employed in domestic and foreign firms prior to the reform and estimate the following difference-in-differences specification:

$$\begin{aligned} Y_{it} = \beta_1 \, Binding_i \times Domestic_i \times Post_t \\ + \beta_2 \, Binding_i \times MNE_i \times Post_t + \alpha_i + \delta_t + \varepsilon_{it} \end{aligned} \tag{4}$$

2011.

where $Binding_i$ is an indicator equal to one if individual i's pre-reform salary is below the province-level minimum wage in effect as of October 2011. Because the LFS does not contain district information, we construct a province-level minimum wage by computing the population-weighted average of district-specific minimum wages within each province. Formally, $Binding_i = 1[Salary_i^{PreOct2011} < MW_p^{Oct2011}]$ where MW_p^{Oct2011} is the weighted average of 2011 district minimum wages in individual i's province. $Domestic_i$ and $Foreign_i$ indicate whether the individual was employed in a domestic or MNE before the reform. $Post_t$ is 1 if t is after the reform. α_i and δ_t are individual and year fixed effects.

Appendix Table C.2 presents the distribution of individuals classified as treated (binding) and untreated (non-binding) across firm ownership types. Treated individuals are defined as those whose pre-reform salary fell below the province-level minimum wage. Among them, 72% were employed in domestic firms and 28% in MNEs. In the non-binding group, 76% worked in domestic firms and 24% in MNEs. This suggests that low-wage workers were more concentrated in domestic firms prior to the reform.

Table 6: Transition probabilities across employment statuses

Transition	Treated (%)	Control (%)	Diff (%)	p-value
Domestic → Domestic	72.4	74.1	–1.7***	0.000
Domestic → MNE	3.0	2.4	+0.6***	0.000
Domestic → State	5.6	5.0	+0.6**	0.006
Domestic → Informal	14.9	14.9	–0.0	0.982
Domestic → Unemployed	4.1	3.6	+0.5*	0.011
MNE → Domestic	9.6	11.6	–2.0***	0.000
MNE → MNE	80.9	78.3	+2.5***	0.001
MNE → State	1.6	2.0	–0.3	0.169
MNE → Informal	4.8	4.9	–0.1	0.789
MNE → Unemployed	3.2	3.2	–0.1	0.842

5.3 Results

Table 7 reports the effects of binding exposure to the minimum wage reform on several worker outcomes. Column 1 shows that log monthly salary increased significantly for both groups. Among domestic firms, monthly earnings rose by 24.4%, and among MNEs by 24.8%. Interestingly, the magnitude of salary increases is nearly identical across firm types, even though domestic firms faced a much larger mandated increase in minimum wages. This pattern, along with our establishment-level and district-level findings, suggests that MNEs may have raised wages not only in response to the policy but also due to broader labour market dynamics. These could include efforts to retain workers or respond to rising wage expectations in the local market, even though their regulatory exposure was comparatively lower.

Table 7: Effects of binding minimum wage exposure on individual outcomes

	(1) Log monthly salary	(2) Log hours worked	(3) Employed
$Binding_i \times Domestic_i \times Post_t$	0.244***	0.0263**	–0.0253**
	(0.0170)	(0.00911)	(0.00857)
$Binding_i \times MNE_i \times Post_t$	0.248***	0.0384***	0.0134
	(0.0157)	(0.00845)	(0.0103)
N	23,504	26,460	27,414

Column 2 examines changes in hours worked. We find a modest but statistically significant increase in working hours for both domestic and foreign firm workers exposed to the reform. For domestic firms, average hours worked rose by 2.6%, while for MNEs the increase was slightly higher at 3.8%. These increases suggest that part of the rise in monthly earnings may have been driven by adjustments on the intensive margin. In other words, firms may have responded to higher wage costs by increasing hours per worker, though the magnitude of these changes remains modest.

Column 3 considers the probability of being employed after the reform. We observe a small but statistically significant decline in employment among workers in domestic firms (–2.5%), while there is no statistically significant change for MNE workers. This result is consistent with our earlier findings from establishment- and district-level analyses, which showed that domestic firms reduced employment following the reform while foreign firms maintained or slightly expanded their workforce. Together, these patterns reinforce the view that domestic firms were more sensitive to the cost pressures imposed by the minimum wage policy, while MNEs exhibited greater resilience in their employment outcomes.

6 Survey-Based Evidence

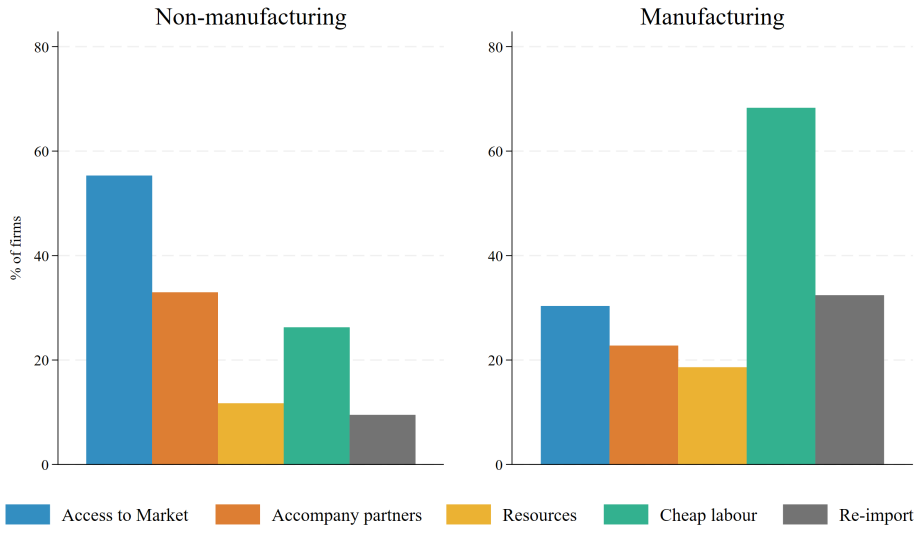
To complement our empirical analysis, we designed and implemented an original survey of Japanese MNEs with operations in Asia, with a particular focus on their wage-setting behaviour and location strategies in response to rising labour costs. The survey was conducted in November 2024 and targeted 8,000 Japanese firms with FDI experience in Asia. This included all currently investing 6,480 firms and a random sample of 1,520

firms that had previously invested in Asia. We received 1,388 valid responses (17.4% response rate), including 303 firms with active subsidiaries in Vietnam. We restrict our analysis to this Vietnam subsample.

Japan is the second-largest source of global FDI (UNCTAD, 2024) and has long-standing manufacturing ties across Asia. Vietnam is Japan's third-largest FDI destination in Asia after China and Thailand. Against a backdrop of stagnant domestic wages in Japan and rapid wage growth in Vietnam, these firms are well-positioned to provide insights into how MNEs adjust to rising labour costs in developing host countries.

The survey responses highlight three key findings. First, when asked about their motivations for investing in Vietnam, firms with the manufacturing subsidiaries most frequently cited low labour costs as a primary factor, followed by access to a growing domestic market and the availability of skilled labour (Figure 5). In contrast, firms with non-manufacturing subsidiaries selected access to market as the primary motivation for investment. This affirms the canonical view that cost considerations remain central to MNE location decisions in vertical FDI, particularly in labour-intensive sectors.

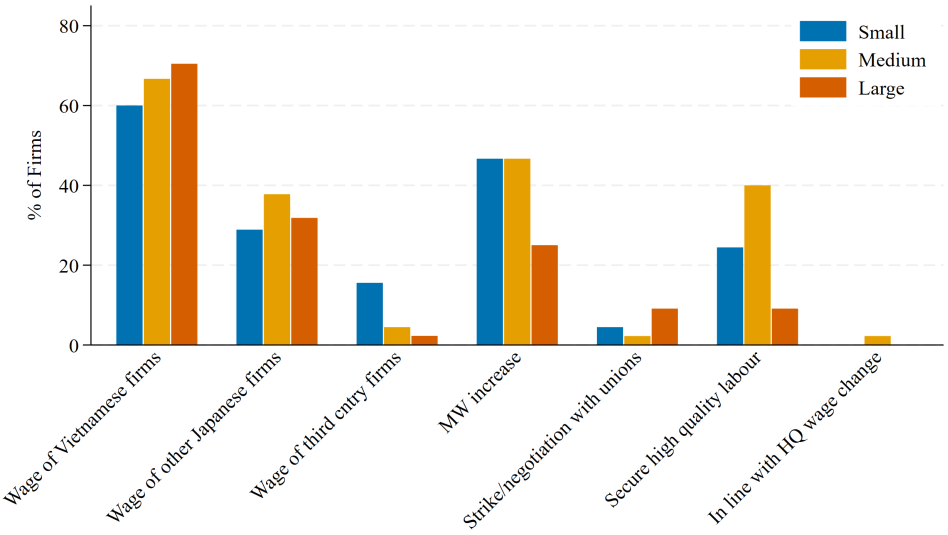
Figure 5: Motivation for investment in Vietnam



Notes: The question asks firms to select a maximum of three important purposes of investment. The options include: "Resources, raw materials, parts, etc.", "Cheap labour", "Cheap local capital (land, facilities, etc.)", "Re-import to Japan", "Exports to third countries", "High demand for products/development of local markets", "International production and distribution networks", "Difficulty in securing human resources in Japan due to ageing population, etc.", "Excellent record of other Japanese companies", "Accompanying business partners", "Tax and financing incentives", and "Other". We only select the five most popular reasons for display. The result is for only firms investing in Vietnam.

Second, we asked about the MNEs' recent experience in changing the wage levels of their subsidiaries abroad. 95% of surveyed firms reported increasing wages for their Vietnamese subsidiaries over the past two to three years. Figure 6 shows the reasons of increasing subsidiary wages among these firms. The most common reasons given for wage increases were the wage levels of Vietnamese-owned firms, suggesting that Japanese MNEs faced pressure to pressure to retain employees in the face of local labour competition. Government-mandated minimum wage hikes and securing high quality labour force rank as the second and third important reasons for small and medium-sized firms. This result suggests that MNEs not only react to the minimum wage increase, but also to labour market competition and worker retention, consistent with our findings that MNEs increase wages more than the statutory minimum wage hike.

Figure 6: Reasons for increasing subsidiary wages in Vietnam

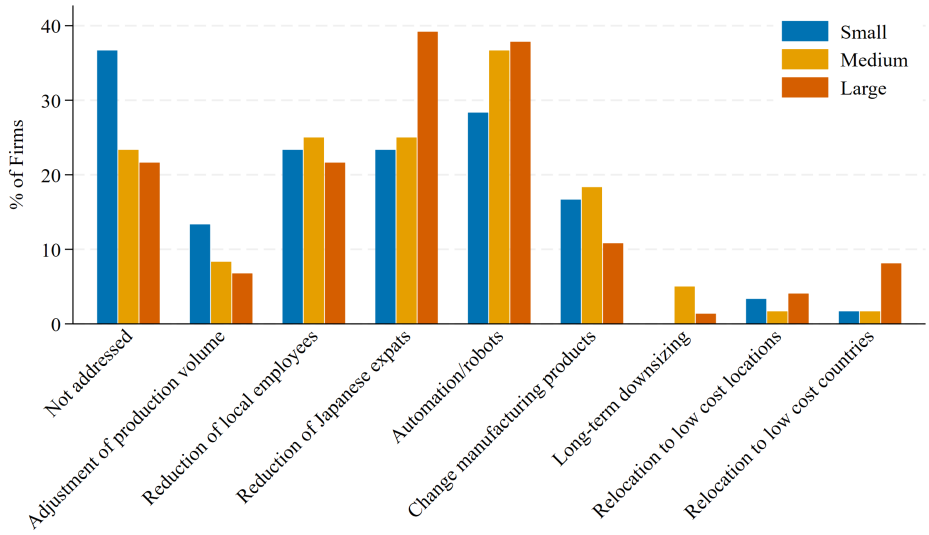


Notes: Multiple choice question, only firms with manufacturing subsidiaries in Vietnam. By parent firm's size: small (1-99 employees), medium (100-299), large (300+)

Third, when asked about their long-term strategies for dealing with rising labour costs, only a small share of firms, even the large investing firms, indicated plans to shift production out of Vietnam or relocate to lower-wage regions within Vietnam (Figure 7). Smaller firms typically do not have specific adaptation strategies, while larger firms react at the intensive margin by reducing Japanese expats or introducing industrial robots in their production process. This suggests that while labour cost considerations are

important in their investment decisions, they are not the sole or decisive factor in location decisions, particularly once firms have made substantial investments in local operations. This 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.

Figure 7: Long-term strategy for increasing labour costs



Notes: Multiple choice question, only firms with manufacturing subsidiaries in Vietnam. By parent firm's size: small (1-99 employees), medium (100-299), large (300+)

Taken together, the survey results reinforce our empirical findings. Although foreign firms in Vietnam responded to rising minimum wages by raising compensation, they did not reduce employment or exit to the same extent as domestic firms. Moreover, the survey evidence shows that most MNEs do not consider relocation in response to the wage increases and either absorb the cost or try to adjust the labour cost at the intensive margin. This challenges the common assumption that MNEs are uniformly footloose and suggests a more nuanced pattern of firm behaviour as developing countries raise labour standards.

7 Conclusion

This paper examines how foreign and domestic firms in Vietnam responded to a sharp increase in minimum wages introduced in 2011. Using establishment-, district-, and individual-level analyses, we find consistent patterns: domestic firms that were more exposed to the reform significantly reduced employment and were more likely to exit, while MNEs showed no such contraction. Instead, MNEs maintained or even expanded employment. Individual-level evidence confirms that workers in domestic firms were more likely to lose their jobs or transition to MNEs, whereas workers in MNEs remained stably employed. Although MNEs faced a smaller increase in statutory wage floors, individuals who were previously employed in MNEs had their wages raised by a similar amount as those employed in domestic firms. This suggests that competitive labour market dynamics, such as the need to retain workers, may have influenced their responses beyond formal regulatory pressure.

These patterns point to a reallocation of employment away from domestic firms and toward MNEs following the reform. While this shift may reflect differences in productivity or financial capacity, it also underscores the uneven ability of firms to absorb rising labour costs. If formal employment becomes increasingly concentrated in MNEs, domestic firms may have fewer opportunities to grow and contribute to productivity and wage gains within the local economy. For countries that rely on FDI-led development, our findings highlight the need to consider how labour regulations affect different types of firms and whether rising standards may unintentionally widen gaps in labour market outcomes.

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Online Appendix

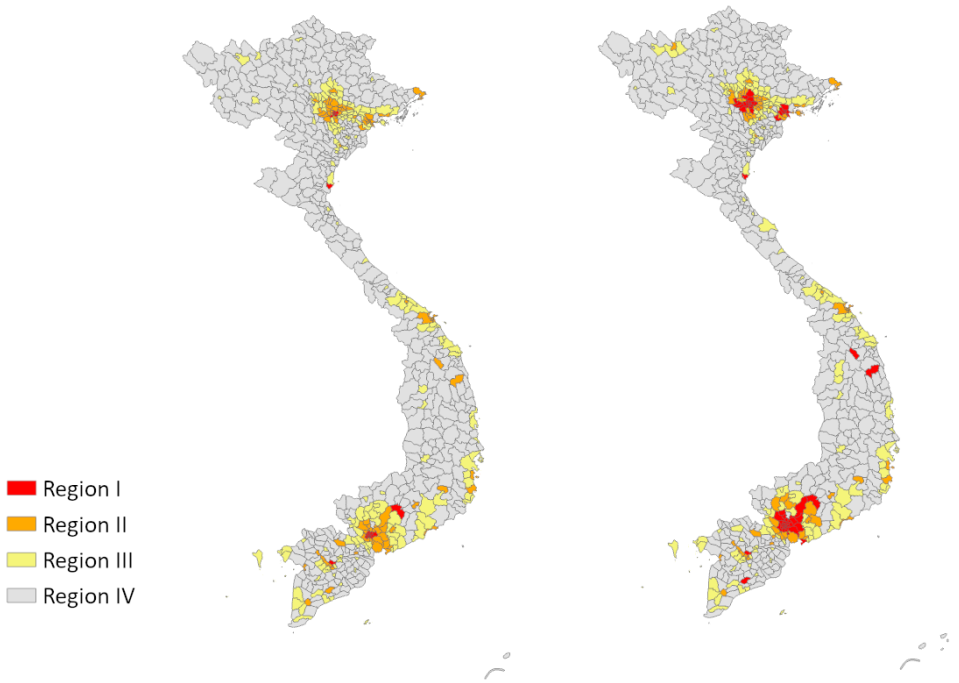
A Appendix to Section 2: Institutional Context & Data

A.1 Minimum Wage Transition Table

Table A.1: 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 A.1: Regional categories of minimum wage

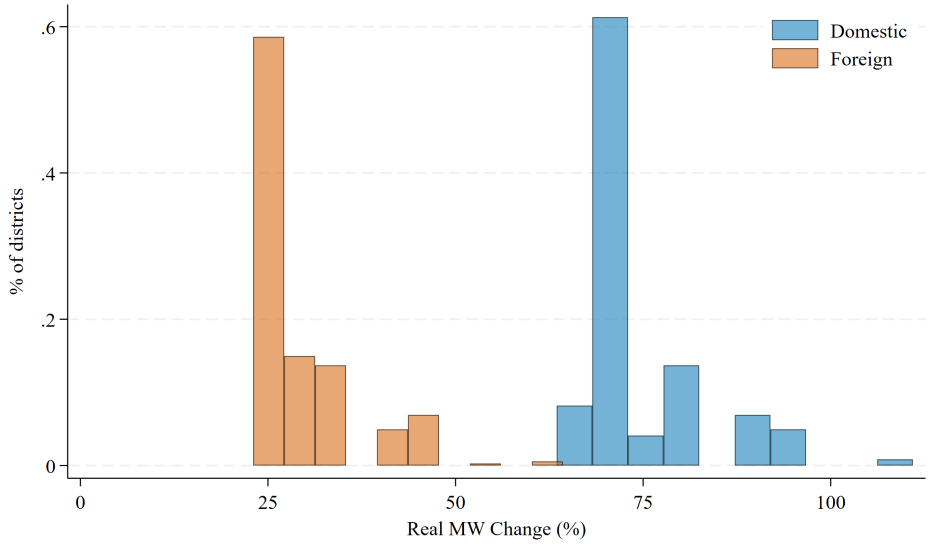


(a) December 2010 (b) December 2011

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.

A.2 Distribution of real minimum wage changes by district

Figure A.2: Distribution of real minimum wage changes by district



A.3 Descriptive Statistics of Vietnamese FDI

Figure A.3: Employment by Firm Ownership Type in Manufacturing (2001–2020)

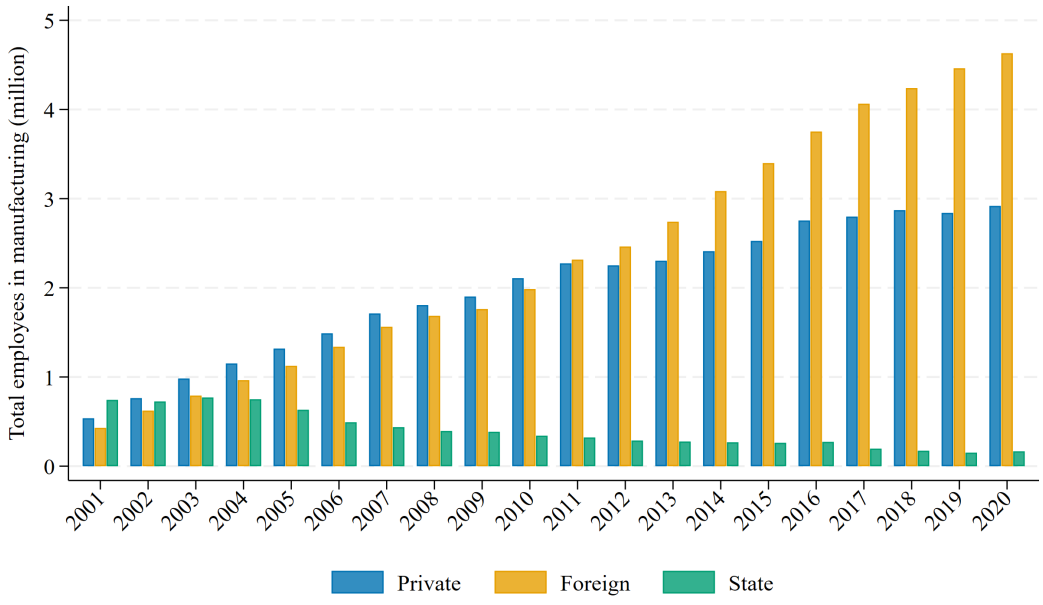
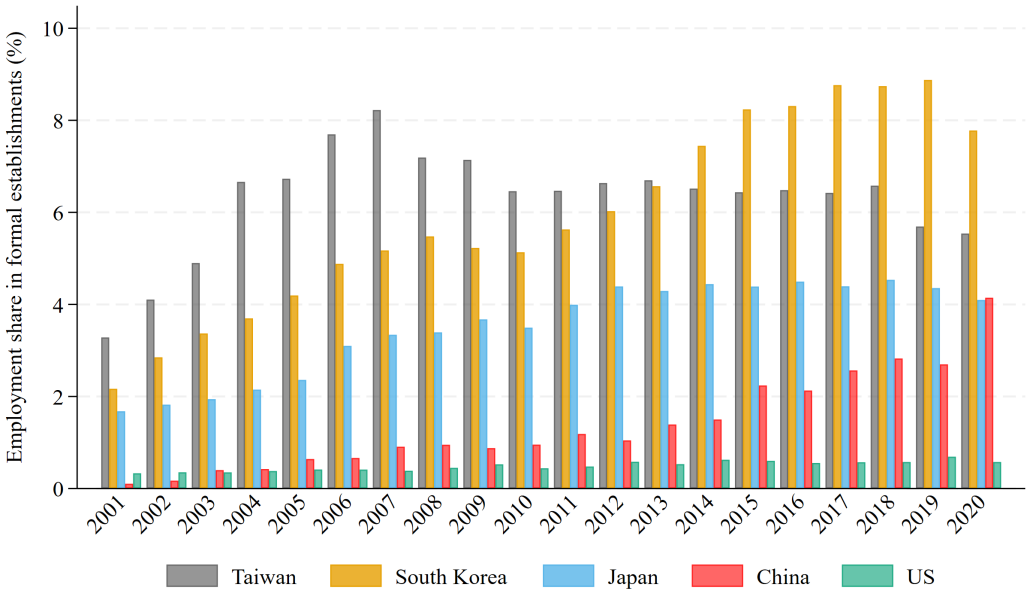


Figure A.4: Manufacturing Employment by Country of Origin (2001–2020)



B Appendix to Section 3: Impact of the Minimum Wage Reform: Establishment level

B.1 Continuous gap measure

To assess the robustness of our baseline findings, we re-estimate the effects of the minimum wage reform using a continuous treatment variable that captures the intensity of establishments' exposure to the reform. Specifically, we replace the binary treatment indicator for binding status with a continuous gap measure, which reflects the proportional shortfall between an establishment's average pre-reform labour cost and the applicable 2011 minimum wage in its district.

The gap measure is defined as:

$$GAP_i = \frac{\max\left\{0, MW_{d(i)}^{2011} - \overline{LaborCostPerWorker}_i^{2008\text{–}2010}\right\}}{\overline{LaborCostPerWorker}_i^{2008\text{–}2010}}$$

where i indexes establishments and $d(i)$ denotes the district in which establishment i is located. $\overline{LaborCostPerWorker}_i^{2008-2010}$ is the average labour cost per worker for establishment i over the pre-reform period (2008–2010). $MW_{d(i)}^{2011}$ is the statutory minimum

wage in district $d(i)$ as of 2011.

Figure B.5: Effect of reform on employment (gap measure)

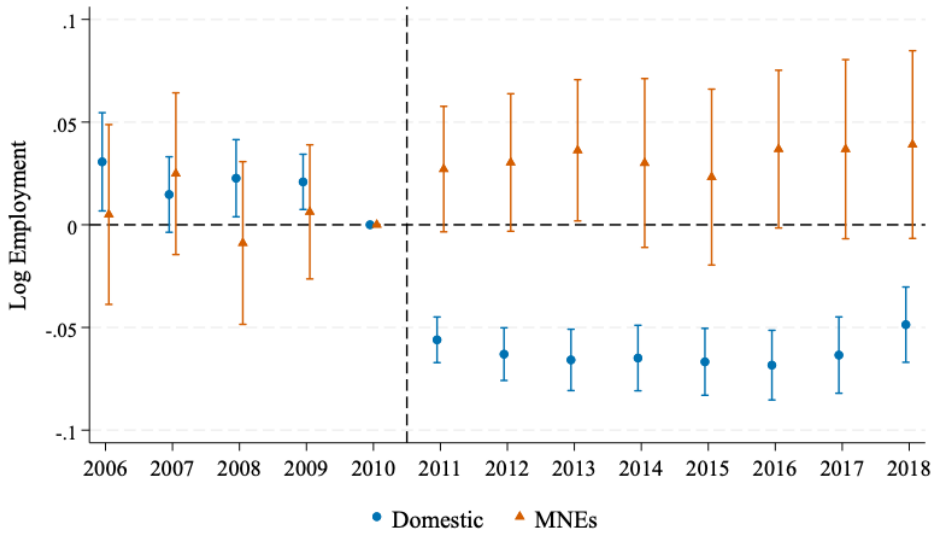
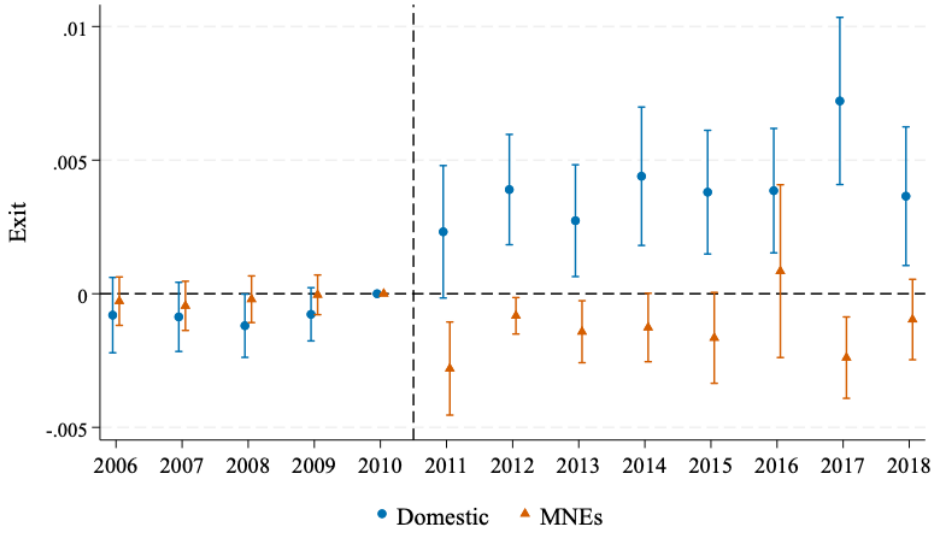


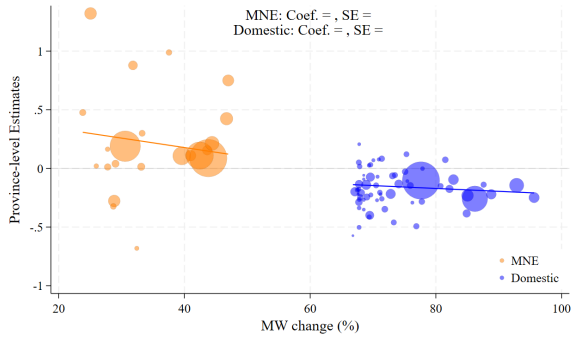
Figure B.6: Effect of reform on exit (gap measure)



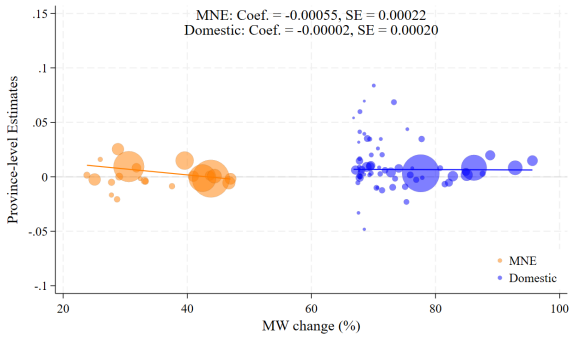
B.2 Magnitude of Minimum Wage

Figure B.7: Province-level estimates

(a) Log employment



(b) Exit



Notes: This figure presents the effects of the minimum wage reform in Equation (1) for each province. The province-level minimum wages were calculated as the population-weighted average of district-level minimum wages, which was then converted to real term. Only provinces with 15 firms in each ownership category are presented. The size of the circle represents the number of firms in the province, and the coefficient is calculated by weighting the regression by the number of firms.

C Appendix to Section 5: Impact of the Minimum Wage Reform: Individual-level

C.1 Distribution of treatment by ownership

Table C.2: Distribution of treated and untreated individuals by firm type

	Binding	Non-binding
Domestic	1,861 (72%)	8,488 (76%)
MNE	709 (28%)	2,649 (24%)
Total	2,570 (100%)	11,137 (100%)