ICES

Minimum Wage and Multinational Activity

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2024.8

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Abstract

While there have been extensive discussions on the location determinants of affiliates from the perspective of host countries, few papers have investigated how multinational affiliates respond to changing economic conditions of the host countries. This paper exploits the large variations in the minimum wage policies across regions and time in China and analyzes various margins that Japanese multinationals' affiliates located in China adjust to the changes in minimum wages. We combine the confidential establishment-level data of affiliates of Japanese multinational firms with data on monthly minimum wages at the prefecture level in China. Our result shows that a 10% increase in the prefectural minimum wage significantly raises the average wage level by 2.3% for Japanese affiliates located in China, while it also reveals a seemingly "labor cost insensitivity puzzle" that, on average, the change in minimum wage has no significant impacts on employment size, exit rate, productivity, and the cost structure of Japanese affiliates. We provide evidence that this puzzle can be explained with other margins of adjustment of multinational firms, which include the sourcing strategy and vertical specialization pattern and transmission of shocks through the internal network of each multinational firm.

1.   Introduction

The dynamics of multinational firms over time and space is a long-standing question in economics that has grown in policy importance, as multinationals play a vital role in explaining trade patterns, as well as capital flows and technology transfers across borders. While there have been extensive discussions on the location determinants of affiliates from the perspective of host countries, few papers have investigated how multinational affiliates respond to changing economic conditions and/or economic policies of the host countries. When an affiliate experiences adverse cost shocks, would MNEs reduce their employment or even pull out from the host country and reallocate to other countries? Would MNEs change their export and import behavior? Do different types of affiliates exploit different margins to adapt to changes in economic conditions?

To answer these questions, this paper exploits the large variations in the minimum wage policies across regions and time in China and analyzes various margins that different types of Japanese multinationals' affiliates located in China adjust to the changes in minimum wages. We combine the confidential establishment-level data from the Research and Statistics Department of the Japanese Ministry of Economy, Trade and Industry (METI), which

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provide detailed information for the overseas affiliates of Japanese multinational firms, with data on monthly minimum wages at the prefecture level in China. The great advantage of the Japanese firm data is that we can observe the route of overseas affiliates' sourcing and selling behavior. For example, the following information is provided: parent-affiliate interaction (source from parent firm, sales to parent firm), sourcing/sales to the local market or the third country, etc. There is no uniform data source for the minimum wage information in China, so we collect the monthly minimum wage data for each prefecture in China from the official prefectural government websites.

We pursue several estimation strategies to address the potential endogeneity of minimum wage policies. First, we include a number of prefecture-level and establishment-level controls in the analysis. Second, the panel data allow our estimation to be conditional on a set of fixed effects that absorb various factors that might affect the behavior of affiliates, including the establishment fixed effects, industry-year fixed effects, and regional-year fixed effects. In addition, we include prefecture-specific linear time trends and two-year lags. We also control for the interaction between the prefecture dummy and an indicator for recession years following Dube (2018). Moreover, the causal interpretation is further supported with the inclusion of the lead term of minimum wages and its insignificant coefficient. Last, we compare the impacts of minimum wages by groups of establishments based on their exposure to policy changes, which is analogous to a difference-in-difference analysis.

Our results show that a 10% increase in the prefectural minimum wage significantly raises the average wage level by 2.3% for Japanese affiliates located in China. The average wage (labor cost share) effect is consistent with Chinese domestic firms in the literature (Mayneri et al., 2018). However, different from Chinese domestic firms, we find that on average the change in minimum wage has no significant impacts on employment size, exit rate and productivity of Japanese affiliates. The cost structure does not respond much to changes in minimum wages either. Although an increase in minimum wages significantly reduces the employment for establishments with average wages lower than 1.5 times the local minimum wages, the insensitivity in the establishment response exists when we examine the effects of minimum on affiliates by groups based on a set of other features, including the share of labor cost, unskilled labor intensity, firm size, and number of sibling establishments. It seems that Japanese multinational affiliates in China incur a "labor cost insensitivity puzzle" given that the low labor cost is always considered China's main advantage when multinationals choose their affiliates locations. In addition, if affiliates do show few responses in all margins, it is difficult to explain the insignificance of the impacts of minimum wages on firms' survival possibilities and profit margins.

We argue in this paper that this seemingly "labor cost insensitivity puzzle" can be explained with other margins of adjustment, which can hardly be exploited by domestic firms. This includes the sourcing strategy and vertical specialization pattern, as well as the transmission of shocks through the internal network of each multinational firm. To examine the impacts of the minimum wage on multinationals' sourcing and sales strategies, we further categorize the Japanese affiliates into four different types according to their trade behaviors following Baldwin

and Okubo (2014). Processing-trade affiliates (high imports and high exports), localization affiliates (low imports and low exports), market-oriented affiliates (high imports and low exports) and cost-oriented affiliates (low imports and high exports) choose completely different sourcing and sales strategies in response to the increase in the minimum wages. Instead of making exit decisions or adjusting employment size, different types of Japanese affiliates expand their corresponding input sourcing and output sales advantages to mitigate the exogenous negative labor cost shock. Multinationals show a better ability to swiftly adapt to changing economic conditions to survive in bad times (Cestone et al., 2018).

In addition to the within-affiliate adjustments, we explore whether the entry or exit of affiliates of a Japanese multinational firm, as well as the employment size, responds to the minimum wage changes in other regions nationwide in China and/or internationally. To mitigate the negative labor cost shock due to the increase in the minimum wage in China, we find that a Japanese multinational firm chooses to increase total employment in countries with low labor costs, such as Southeast Asian and Sub-Saharan African countries, and in regions with medium wage levels in China. Our analysis suggests that economic condition shocks spill over nationally and internationally through multinationals' internal networks (Giroud and Mueller, 2019; Becker and Henderson, 2000).

The paper contributes to several strands of literature. First, it adds evidence to the existing studies that focus on the economic impact of minimum wage variation in China. The increase in the minimum wage in China has negative impacts on employment, the survival rate and exports (Long and Yang, 2016; Gan et al., 2016; Bai et al., 2021) but improves productivity and management practices (Mayneri et al., 2018; Hau et al., 2020) and encourages Chinese firms' probability of conducting outward FDI (Fan et al., 2018). However, these analyses focused on the performance of domestic firms in China. In this paper, we analyze various margins that different types of Japanese multinationals' affiliates located in China adjust to the changes in minimum wages and fill in the gap in investigations on how MNEs respond to negative cost shocks in the context of China.

The paper also refers to the literature on multinational firms' complex global strategies. The conventional ways to conduct FDI consist of horizontal, vertical and export platforms (Ramondo et al., 2016). However, with the development of global value chains, firms can save production costs by fragmenting with the service costs of linking geographically separated production modules (Kimura and Ando, 2005), which leads to the formation of so-called "networked FDI" by Baldwin and Okubo (2014). Depending on the different strategies in allocating factor endowments, multinational affiliates' export/import intensities may differ from one another and thus affect their adjustment strategies in response to the cost shock in the host country. We follow Baldwin and Okubo (2014) and categorize Japanese multinational affiliates by their trade intensities and examine the heterogeneous impacts of the minimum wage among different types of affiliates to reveal the advantageous survival strategies that multinationals are able to adopt.

The third strand of literature explores multinational firms' decision-making on overseas expansion. Thomas and Bernard (2021) give a thorough review on the motivations of multinationals' entry and expansion from both

theoretical and empirical perspectives. In addition, Chen (2011) examines the effect of existing production networks on multinationals' entry decisions. They find strong horizontal and vertical interdependence across multinationals foreign production locations, but weak relationship between home and foreign production, which highlights the importance of multinational production networks. The paper also takes into account the multinational production networks and extends the literature by exploring the location spillovers through multinational parent firms' networks both nationally and internationally in response to economic condition shocks.

The remainder of the paper is structured as follows. The next section (Section 2) presents the data we use in this paper. Section 3 describes the Chinese minimum wage system and some stylized facts on Japanese firms' FDI decisions on minimum wage surges. Section 4 discusses our empirical strategy, and Section 5 presents the wage effects of the minimum wage. We explore the Japanese affiliates' margins of adjustment toward the negative labor cost shock caused by the minimum wage increase in Section 6. The last section (Section 7) concludes.

2. Data

Japanese firm data

Our data include extensive firm-level information on Japan's foreign affiliates called "The Survey on Overseas Business and Activities (SOBA)" prepared by the Research and Statistics Department of the Japanese Ministry of Economy, Trade and Industry (METI). The yearly survey is conducted by METI using a questionnaire based on survey forms and covers all Japanese firms that have at least one business enterprise in a foreign country. The parent firm and each foreign affiliate are surveyed separately. We mainly focus on the information provided by the foreign affiliates, and our sample period covers 1995-2017. The survey includes both manufacturing and nonmanufacturing sectors but excludes firms in the finance, insurance, and real estate sectors. In these surveys, a foreign affiliate is defined as follows:

• A foreign affiliate in which a Japanese corporation has invested capital of 10% or more;

• A foreign affiliate in which a "subsidiary," funded over 50% by a Japanese corporation, has invested capital of over 50%; and

• A foreign affiliate in which a Japanese corporation and a subsidiary funded over 50% by a Japanese corporation has invested capital of over 50%.

The survey questions asked cover a very broad range of economic issues, including establishment year, the number of employees, assets, sales and purchases by destination country, and some intellectual property indicators. While the basic questions are constant across years, there are some annual variations in a subset of questions. The trend has been for the survey to be simplified in recent years. The sector classifications used in

the survey do not correspond to international practices (e.g., UNIDO or OECD classifications), and they changed slightly in 2002 and 2008. We thus use the concordance table provided by the Research Institute of Economy, Trade and Industry (RIETI) and aggregate them into 30 sectors in total.

To construct the panel data at the affiliate level, we use the confidential data of individual questionnaires from the SOBA, namely, the parent firm ID, affiliate firm ID and grandson affiliate firm ID, to form a unique plant ID across year. To make a consistent number for each foreign affiliate, the same foreign affiliate in different survey years is identified by the information on their parent firm, host country, and industry code following Matsuura and Tanaka (2011).

Minimum wage

The minimum wage data at the prefecture level come from various official websites, including local government websites. The data contain monthly minimum wages for full-time employees and hourly minimum wages for parttime employees by prefecture and year from 1998 to 2007. Since we do not have information on the total number of hours worked, we use only the former in our regression analysis. Prefecture-level minimum wages can be adjusted multiple times in a given year. We define the prefecture-level minimum wage in a year as the highest value of the minimum wage in that year and prefecture.

Data merging and summary statistics

To match the firm data with the minimum wage, we first use prefecture information provided by METI as the identifier. For those observations that do not match, we make use of the name of the firm, together with the province code, to manually construct the prefecture where the firm is located. This gives us a matched sample of … obs.

3.   Institutional Context and Motivating Facts

3.1   Minimum wage policies in China

The minimum wage regime was first introduced to China in the early stage of the economic reform back in 1984 in accordance with the International Labor Organization's "Minimum Wage Treaty". Following such practice, several coastal cities led in the implementation of local minimum wage regulations, including Zhuhai, Shenzhen and Guangzhou (Fang and Lin, 2015). However, it was not until 1994 that the Chinese government officially added legislation to the Chinese Labor Law (Lin and Yun, 2016). Due to the heterogeneous living standards that can vary substantially among Chinese regions, each provincial or municipal government can be authorized to set its own minimum wage based on the actual living conditions, taking into account the cost of living, labor productivity, employment, and economic development level.

In 2004, the minimum wage regulation was reinforced. Under the revision, apart from the existing monthly minimum wages set for full-time workers, new rules were applied to part-time workers as well. One

fundamental difference compared to the previous waves of regulations was that the 2004 reform significantly increased the penalties for violations, from 20-100% to 100-500% of the owed wage (Gan et al. 2016). It also clarified the overtime pay and made the regulations more transparent, such as mandate publication of the minimum wage rate in case of any changes. The additional efforts thus strengthened the compliance rate of the regulations, which led to an overall rise in prefecture-level minimum wages. For the impact of the reform, please see Mayneris et al. (2018) for more detailed descriptions. Figure 1 shows the average changes in minimum wages by prefecture groups.
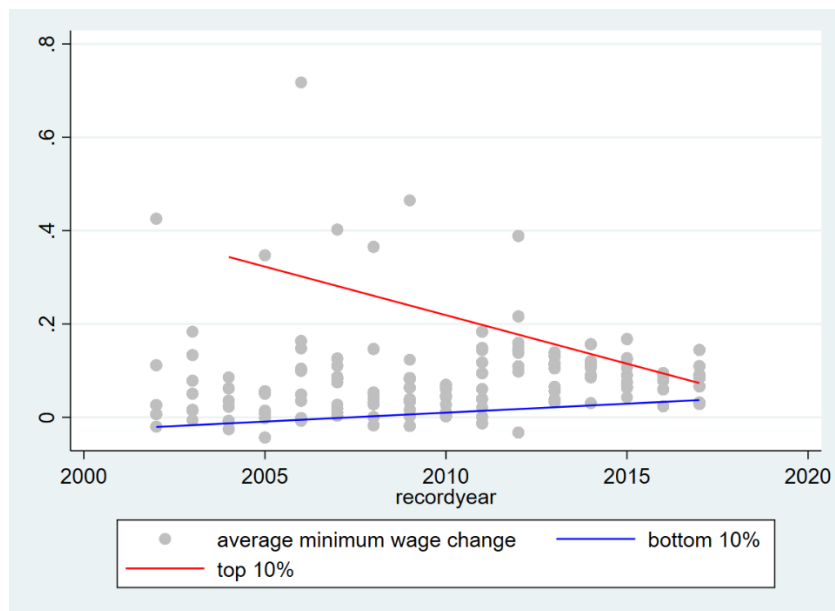

Figure 1 Change in the minimum wage by prefecture group (top 10% v.s. bottom 10%)

3.2   Types of Japanese affiliates

As shown in Figure 2, we draw the bar graph of the aggregated number of Japanese affiliates for the top 5 industries by each trade category as previously defined. Wholesale and retail have the largest number of affiliates among all categories except for high exports and low imports (i.e., export-intensive but not for import). In the high export and high import category, electronics stands out. Meanwhile, in the high export and low import category, textiles are dominant. Since the number of firms is also an indicator of market power in a particular industry, this gives us the incentive to explore the between-industry heterogeneity of Japanese affiliates' performance in response to the policy change that can affect their cost structure.

When we focus on sourcing and sales patterns, heterogeneity exists as well. Imports from parent firms and purchases from local firms are weighted by total cost, whereas local sales and exports to parents are weighted by total revenue. As shown in Figure 3, the amount of intrafirm trade is in accordance with the categorization. Concerning the local revenue, it is the highest among low export categories, which seems to make sense. For local purchasing, we need more verification to determine the mechanism behind the phenomenon.
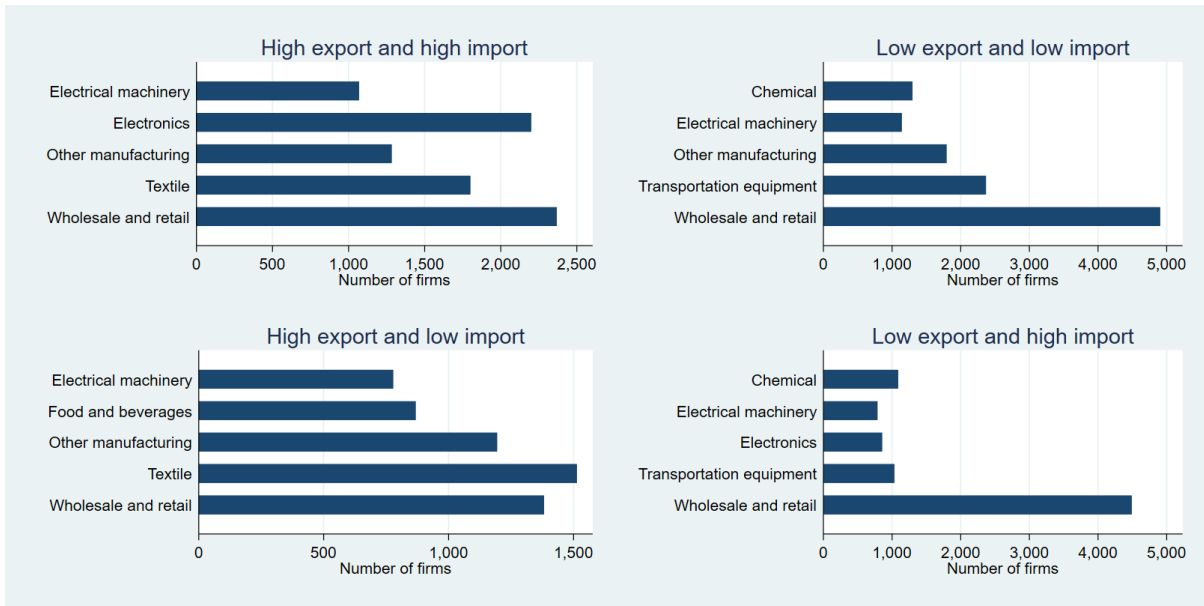
Figure 2 Number of firms for the top 5 industries by category
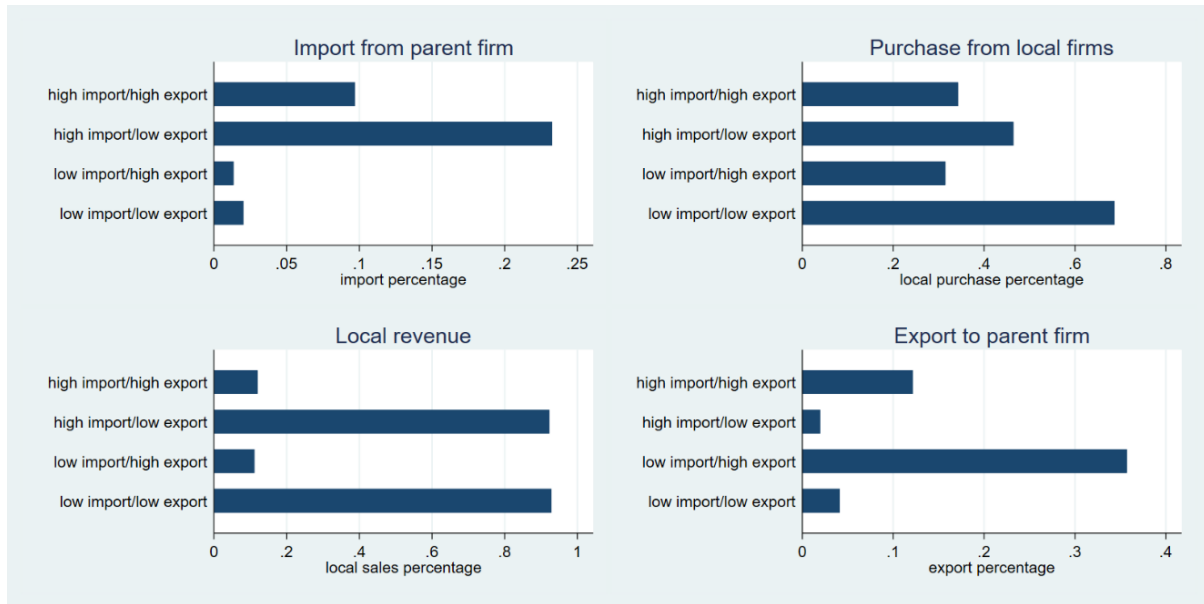
Figure 3 Sourcing and sales by category

3.3   Network distribution of Japanese affiliates

In Figure 4, we take a glance at the distribution of Japanese oversea affiliates among different geographical regions and compare the statistics between 2001 and 2016. Taking Figure 4 as an example, we find that on average, the number of Japanese affiliates located in Asian countries is larger than that of those located in European and North American countries. By taking a deeper look into the situation within each region, we can

easily tell that the large number of Asia-based Japanese affiliates are mainly driven by large-scale investment in China or Southeast Asian countries. Especially with China being the world factory, we believe that the minimum wage volatility will influence the decision-making of Japanese investors who have expected to exploit cheap labor in China.
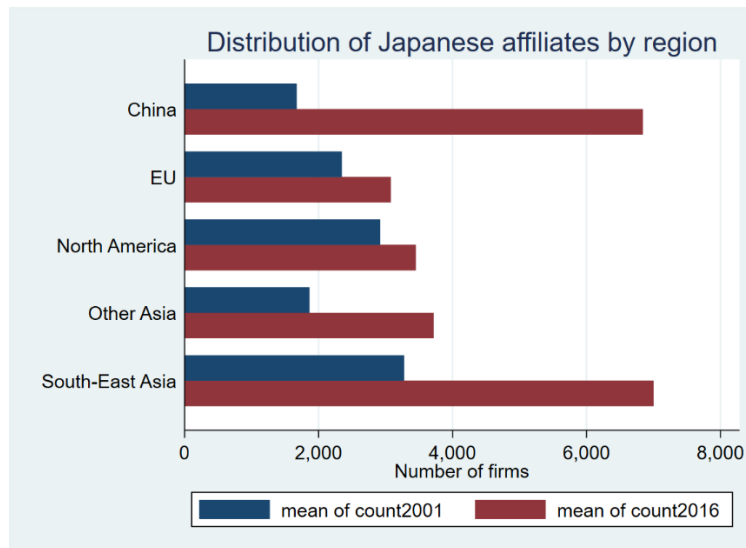
Figure 4 Number of Japanese affiliates by region (international) 2001 v.s. 2016

In Figure 5, we also graph the distribution of Japanese affiliates within China by GDP level, namely, high GDP region and low GDP region. Although the number was almost the same in 2001, there are far more Japanese affiliates that enter the low GDP region. We assume that this is due to the cost advantage of the low GDP regions that attract Japanese investors to come.
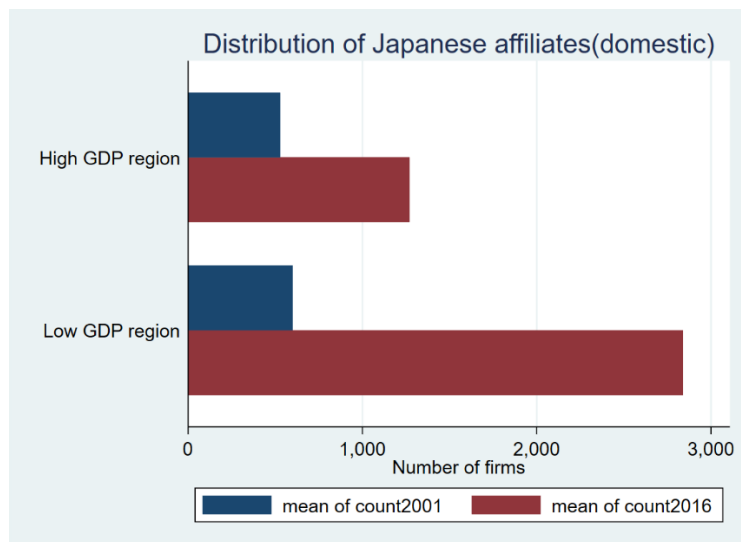
Figure 5 Number of Japanese affiliates by GDP level (domestic) 2001 v.s. 2016

4. Identification strategy

To estimate the impacts of the minimum wage, we employ the classic two-way fixed effects regression as follows:

$$y_{ijct} = \beta_0 + \beta_1 ln(MNW_{ct}) + Z'_{it}\Gamma_1 + X'_{ct}\Gamma_2 + \lambda_i + \lambda_t + \varepsilon_{irt} \quad (1)$$

where y_{ijct} is the average wage of establishment i of firm j in prefecture c in year t. MNW denotes the log value of monthly MNW multiplied by 12. X_{ct} is a vector of the prefecture-level characteristics, including log city population and log GDP per capita, to account for common economic shocks within each prefecture. Z_{it} is a vector of the establishment-level control variables, in which we control for the establishment's age. Closely following Mayneris et al. (2018), we also include the log of employment, labor productivity, capital-labor ratio, and profit over output in t-1 to control for their impacts on the establishment's subsequent performance. We use the establishment fixed effects λ_i and year fixed effects λ_t to capture unobserved time-invariant establishment features and time-varying national-wide changes, respectively. Standard errors are clustered at the prefecture level to account for the possible error correlation across firms within a prefecture.

There might still be concerns that the level of MNW depends on unobserved local fundamentals and other omitted variables. For example, the standard of living in a particular prefecture. To address the potential endogeneity issue, we adjust the classic two-way effects specification in equation () with the inclusion of the following terms. First, we include in the regression the regional-year fixed effects λ_{rt} to remove any time-varying shocks at the regional level, such as GDP per capita and the GINI coefficient, and the industry-year fixed effect λ_{kt} to account for time-varying national shocks at the industry level. Second, our estimation might simply capture the trending omitted variables that are correlated with both the changes in minimum wage policies and the outcomes of our concern. Therefore, we add prefecture-specific time trends into equation (1) as in Autor et al. (). We also control for the interaction between the prefecture dummy and an indicator for recessions, which is prefecture-time-variant and captures the heterogeneous impacts of business cycles across different prefectures. Last, as argued in Dube (2018), with prefecture trends, a delayed impact can lead to a misestimation of the prefecture trends, which attenuates the measured effects of the treatment. A solution is to include lagged treatment in the regression, and we add two-year lags into equation (1). Our baseline regression is specified as follows:

$$y_{ijct} = \beta_0 + \sum_{k=0}^{2}\beta_1 ln(MNW_{ct-k}) + Z'_{it}\Gamma_1 + X'_{ct}\Gamma_2 + \lambda_i + \lambda_{kt} + \lambda_{rt} + \rho_c t + \varepsilon_{irt} \quad (2)$$

5. Wage Effects of the Minimum Wage

In this section, we examine the effectiveness of the minimum wage by estimating the impacts of the minimum wage increase on the wages of Japanese multinationals. Table 1 reports the results of the estimation of equation (2). The coefficient of the log of minimum wage is positive and statistically significant across all specifications, suggesting that the minimum wage policy is binding for our sample firms. The magnitude of the coefficient before the minimum wage does not change much with the inclusion of establishment controls

(shown in column 2), prefecture controls (column 3) and region-year fixed effects (column 4). The inclusion of prefecture-specific time trends significantly raises the magnitude and significance of the coefficient, as shown in columns (5)-(8), which implies that the trending unobserved factors are important in explaining changes in minimum wage policies. The result in column (5) is robust to the inclusion of lagged average wages and the prefecture-recession fixed effects. Our preferred estimation in column (7) shows that a 1% increase in minimum wages raises the establishment-level average wages by 0.233%.

The coefficients of the lagged term in columns (6) and (7) are economically and statistically insignificant, suggesting that on average, there are no long-run effects of changes in minimum wage policies. In column (8), we add into the regression the minimum wage 1 year prior to t. If its coefficient is significant, one might be concerned that our findings of positive elasticity only capture trends. Our result shows an insignificant and negative coefficient of the lead term, which provides support for the causal interpretation of our estimation of the impacts of minimum wages.

Table 1 Effects of minimum wage on labor cost

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
lnmin_wage	0.143*	0.138*	0.148*	0.158***	0.216***	0.217***	0.233***	0.408***
	(0.079)	(0.081)	(0.084)	(0.051)	(0.078)	(0.079)	(0.078)	(0.113)
L.lnmin_wage						0.003	-0.022	0.003
						(0.103)	(0.124)	(0.126)
L2.lnmin_wage						-0.017	-0.044	-0.006
						(0.106)	(0.117)	(0.096)
F.lnmin_wage								-0.120
								(0.113)
Establishment controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Region-year FE	No	No	No	Yes	Yes	Yes	Yes	Yes
Prefecture trends	No	No	No	No	Yes	Yes	Yes	Yes
Prefecture-recession FE	No	No	No	No	No	No	Yes	Yes
Obs.	22312	22312	22312	22312	22312	22312	22312	16996
R-squared	0.81	0.81	0.81	0.81	0.82	0.82	0.82	0.83

6.   Affiliates' Margins of Adjustment

In the previous section, we provide support for the impacts of MNW on the wage cost of Japanese multinational affiliates in China. How do firms respond to the increase in labor cost? In this section, we examine various

margins of firm adjustment to better understand whether multinational firms behave differently than domestic firms when facing adverse cost shocks.

6.1   Labor cost insensitivity puzzle

Overall sample

In Table 2, we first check the impact of minimum wage hikes on firm size, which is measured as the log of total employment. Long and Yang (2016) find that private firms in China respond to a minimum wage increase by laying off low-skilled workers and short-term workers, and Hau et al. (2020) show that minimum wage hikes in China accelerate the input substitution from labor to capital and reduce employment growth. Harasztosi and Lindner (2019) also find negative employment elasticities with a sample from Hungary. However, our result finds no support for the negative impacts of minimum wages on establishment-level employment for affiliates of Japanese multinational firms. In particular, although column (1) shows a significantly negative coefficient of the minimum wage, its statistical significance and magnitude decrease dramatically with the inclusion of additional controls in other columns. The coefficient becomes insignificant even at the 10% level when adding the prefecture trends in columns (4)-(8). The significant and negative coefficient of the lead term in column (8) suggests that the estimation in column (1) might simply capture the negative trends in employment.

Table 2 Effects of minimum wage on Employment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
lnmin_wage	-0.157***	-0.046**	-0.051**	-0.054*	-0.015	-0.018	0.003	-0.004
	(0.043)	(0.023)	(0.025)	(0.031)	(0.045)	(0.038)	(0.047)	(0.048)
L.lnmin_wage						0.001	0.024	0.028
						(0.052)	(0.062)	(0.046)
L2.lnmin_wage						0.016	0.008	-0.010
						(0.085)	(0.092)	(0.092)
F.lnmin_wage								-0.102**
								(0.041)
Firm controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Regional-year FE	No	No	No	Yes	Yes	Yes	Yes	Yes
Prefecture trends	No	No	No	No	Yes	Yes	Yes	Yes
Prefecture-recession FE	No	No	No	No	No	No	Yes	Yes
Obs.	22312	22312	22312	22312	22312	22312	22312	16996
R-squared	0.96	0.97	0.97	0.97	0.97	0.97	0.97	0.98

We further check other margins of adjustment of firms discussed in the literature. For example, Mayneris et al. (2018) find that a higher minimum wage significantly reduces the survival probability of firms in China and forces firms to improve productivity with better inventory management and greater investment in capital. Columns (1) and (2) of Table Table 3 present the impacts of the minimum wage on the enter and exit rates, respectively. We find no significant changes in these two outcomes in the year of minimum wage changes. The coefficients become statistically significant one year later, but only at the 10% level. Column (3) examines the impacts on the profit-to-cost share, and columns (5)-(6) check the impacts on productivity, none of which show significant effects of the minimum wages. In columns (6)-(10), we look at the structure of the total cost, including the cost of labor, sales, rent of capital, purchase of intermediates, and R&D. Our results show no significant effects on most elements of the total cost, except for labor. The positive and significant coefficient on the share of labor cost is consistent with our conclusion based on Table X that on average, the minimum wage is binding for establishments in our sample.

Table 3 Effects of minimum wage on other margins

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
						Cost structure				
	Enter	Exit	Profit/Cost	TFP	Labor productivity	Labor	Sales	Rental	Purchase	R&D
lnmin_wage	-0.000	0.001	-0.017	-0.054	-0.113	0.021**	0.008	-0.004	0.258	0.001
	(0.000)	(0.004)	(0.032)	(0.057)	(0.077)	(0.010)	(0.015)	(0.003)	(0.643)	(0.002)
L.lnmin_wage	-0.001*	0.011*	-0.003	0.009	-0.005	0.009	-0.038***	0.006	-1.279	-0.001
	(0.000)	(0.006)	(0.026)	(0.079)	(0.100)	(0.013)	(0.013)	(0.009)	(1.088)	(0.003)
L2.lnmin_wage	0.000	-0.014*	-0.013	-0.011	-0.018	0.020	0.013	-0.011	0.962	0.002
	(0.000)	(0.009)	(0.029)	(0.067)	(0.087)	(0.015)	(0.015)	(0.007)	(0.645)	(0.004)
Obs.	22312	22312	22247	14055	22312	22312	22312	22312	22312	22312
R-squared	0.17	0.31	0.21	0.64	0.66	0.49	0.76	0.63	0.46	0.50

Heterogeneity

Our results in Table 2 and Table 3 find no significant impacts of minimum wages on most establishment-level outcomes, in contrast to the findings in the literature on domestic firms. What are the reasons that explain the departure of our results from the literature? Another potential reason responsible for the insignificance of MNW's impacts might be the heterogeneity in the behavioral response across affiliates with different features. Huang et al. (2014), for instance, document that firms with high wages or large profit margins increase

employment, while those with low wages or small profit margins decrease employment. Hau et al. (2020) argue that firms with different ownership have heterogeneous responses to minimum wage changes due to differences in management practices. In addition, firms may differ. In Table 4, we examine the impacts of minimum wages on establishment-level employment and survival probability by groups based on a set of firm features. Only the result of the short-run effects is reported to save space.

Table 4 Impacts of minimum wages by groups

	(1)	(3)
	lnsize	exit
A. _Wage_		
Low	-0.105*	0.004
	(0.060)	(0.005)
Middle	-0.109*	0.006
	(0.059)	(0.005)
High	-0.026	0.006
	(0.049)	(0.005)
B. _Labor share_		
Low	0.007	0.005
	(0.045)	(0.004)
High	-0.003	0.005
	(0.058)	(0.005)
C. _Unskilled labor intensity_		
Low	-0.003	0.007
	(0.042)	(0.006)
High	-0.017	0.007
	(0.057)	(0.005)
D. _Size_		
Small	0.061	0.006
	(0.063)	(0.005)
Large	-0.017	0.004
	(0.061)	(0.004)
E. _Multiplant_		
Multiplant firm	0.005	0.005
	(0.047)	(0.004)
Single-plant firm	-0.060	0.009
	(0.066)	(0.006)

Theoretical studies predict that multinationals set up affiliates in labor-abundant countries, such as China, to take advantage of the low cost and locate their low-skilled labor-intensive production stages in host countries (), which are expected to be significantly affected by MNW. However, a number of papers have discussed the existence of wage premiums for multinational enterprises. Glass and Saggi (2002), for example, show that MNEs pay a wage premium to prevent local firms from "stealing" their high-skilled workers. In fact, we find that there

exist large variations in the average wage[2] level across the Chinese affiliates of Japanese multinationals in our sample, ranging from ….to ……This is due to variations of multinational firms' purpose to set up affiliates in China and their position along the GVC. Since minimum wages should have larger impacts on firms with average wages lower than or close to MNW, we divide the wage distribution into different parts following Long and Yang (2016) and construct dummy variables for each category. We then examine the heterogeneity in the affiliate's adjustment across wage levels by adding the interaction terms of the MNW and these dummy variables into regression specification (2).

The first three rows of Table 4 report the results. Consistent with our expectation, although the average impact of MNW on employment is significant for affiliates as a whole, there exist large variations across wage groups. We find significant negative impacts of minimum wages for entablements in the first and second wage category, whose average wages are lower than 1.5 times the prefecture minimum wage. For example, the point estimate in row 1 indicates that a 10% increase in the minimum wage reduces total employment by 1.05% for affiliates with an average wage lower than 0.9 times the local minimum wage. Our estimate of employment elasticity is in line with recent studies, such as Harasztosi and Lindner (2019). In contrast, the impact is negative but insignificant for affiliates in the group with high wages. The heterogeneity in the impacts of the minimum wage on employment across wage groups provides further support for the causal interpretation of our main results. The exit rates show no response for all wage groups.

In addition to the wage level, we further explore a number of other factors that might also lead to heterogeneity in the affiliate's responses to minimum wage increases. For example, it might be easier for firms to substitute labor for capital when the labor share is higher, so we classify firms according to their share of labor cost. We also check the impacts of minimum wages by firms' employment size (Panel D) following Dustmann et al. (2021), who find that the MNW policies force workers to move to firms with larger size and higher productivity. In the exercise in panel E, we examine whether being a multi-plant firm helps alleviate the negative impacts of a cost shock, and our results are consistent with the literature (Giroud and Mueller, 2019). Unfortunately, we find no significant effects of minimum wages for any groups.

It seems that the affiliates of Japanese multinational firms in China are insensitive to negative labor cost shocks. They are not downsized or adjusting their cost structure. We find no support for substitution between labor and capital or improvement in productivity level either. However, if they make no adjustment at all, how can their insensitivity in their survival probability and profit margins be understood? We argue in the following section that the labor cost insensitivity puzzle is a result of additional margins of adjustment of multinational firms, which includes their sourcing and selling behavior across countries, as well as the transfer of shocks across regions through firms' internal networks of establishments.

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[2] Average wage is calculated as total wage/total number of regular employees.

6.2 Within-affiliate adjustments: Input sourcing and output sales strategies

In this section, we explore one margin of the special behavior of multinationals compared with domestic firms and examine changes in the sourcing and exporting strategy of multinational affiliates. Garetto (2013) shows that the driving forces behind the sourcing pattern are technological heterogeneity and cost minimization. The argument for technological heterogeneity is that when sourcing from a local supplier, a final good producer can expect to have access to a potentially better technology. In the case of China, since most of the local suppliers are assumed to have less advanced technology than their Japanese counterparts, it is reasonable to rule out this possibility and focus on the production cost channel for the moment.

Table 5 presents the results by pooling all establishments together. Panel A examines the sourcing behavior of affiliates, including the share of purchase of intermediates from parent firm in total cost, the share of purchase from Japan, the share of purchase from local suppliers and the purchase from suppliers in the third countries. In panel B, we check the impacts of the minimum wage on affiliates' selling destinations and again divide all destinations into the parent firm, home country, host country and third countries. The last panel shows the share of intrafirm trade in the establishment's total imports and total exports as a measure of the vertical specialization of each firm. We find negative impacts of minimum wages on the affiliate's sourcing from the parent firm, home country and third countries, which corresponds to positive impacts on the share of local sourcing. Furthermore, the share of sales to local consumers decreases as a response to wage increases, and the share of sales to other markets increases.

Table 5 Effects of minimum wage on sourcing and sales strategies

	(1)	(2)	(3)
	Current	1-year lagged	2-year lagged
A. Sourcing behavior (share in total cost)			
Purchase from parent firm	-0.022	0.017	0.045
	(0.014)	(0.018)	(0.038)
Purchase from Japan	-0.053*	-0.024	0.056***
	(0.028)	(0.023)	(0.021)
Purchase from local suppliers	0.060	0.025	-0.007
	(0.047)	(0.027)	(0.026)
Purchase from third countries	-0.035	0.017	-0.036**
	(0.026)	(0.020)	(0.014)
B. Selling behavior (share in total sales)			
Sales back to parent firm	0.055**	0.029	-0.064**
	(0.024)	(0.028)	(0.032)
Sales back to Japan	0.034	0.044*	0.005

	(0.025)	(0.022)	(0.026)
Sales to local consumers	-0.010	-0.033	0.023
	(0.040)	(0.026)	(0.033)
Sales to third countries	-0.037	-0.006	-0.032
	(0.028)	(0.020)	(0.021)
C. Intrafirm trade			
Intrafirm purchase/total imports	-0.041	0.122*	0.015
	(0.033)	(0.064)	(0.119)
Intrafirm sales/total exports	0.053	-0.037	0.004
	(0.061)	(0.050)	(0.091)

Most of the coefficients in Table X are still insignificant. In the second exercise, we classify affiliates according to their trade behavior closely following Baldwin and Okubo (2014). In particular, we calculate the share of output sold abroad and the share of intermediates sourced from their parent firms of each establishment and divide our sample into four groups, with the mean of export share and import share within each year as the cutoff. The theoretical literature classifies the nature of multinational firms mainly into three types: horizontal (Markusen, 1984), vertical (Helpman, 1984), and export platforms. The first type is to avoid trade costs and is also called "market seeking" multinationals, while the second has production stages fragmented globally to exploit cost differences and is called the "efficiency seeking" multinational. The last type mixes the motives of the previous two. The corresponding production organization is also different to serve different goals. For horizontal multinationals, the production in overseas affiliates mainly replicates the production in the home country and is associated with a large share of sales to the local economy. In contrast, the affiliates of the vertical type hire relatively more low-wage workers and import large share intermediates from parent firms or firms in the third country. Therefore, we expect that there exist large variations in the wage structure across firms, as well as in the extent to which affiliates rely on local sourcing and local sales, which further affects the magnitude of the cost effect and market effect.

Table 6 presents the results for each group of affiliates. Only the short-run effect of the minimum wage is listed. The first two columns show subsidiaries that are less export-oriented and sell a large share of their output to the local market, and firms in both groups should be considered "market-seeking" multinationals, with replication affiliates shown in column (1), whose overseas investments replicate all activities from their parent firms and the affiliate production abroad is made entirely from local factor services, and branching affiliates shown in column (2), whose upstream activities concentrated in the home country so that the share of import from parent is relatively high. The groups shown in the last column include affiliates whose export share of output and import share of intermediates are both higher than the means. Affiliates in this group could be considered typical "efficiency seeking" firms, obtaining most of the intermediate inputs from the parent firm, conducting a small part of unskilled-labor-intensive tasks (such as assembly) in China and then selling the final

products globally. The nature of MNEs in the group shown in column (3) is more complex than the previous three, since there are various reasons for the low import share.

Table 6 Effects of minimum wage on sourcing and sales strategies (by groups)

	(1)	(2)	(3)	(4)
	Low import low export	High import low export	Low import high export	High import high export
Sourcing behavior (share in total cost)				
Purchase from parent firm	0.072**	-0.039*	0.060**	-0.061***
	(0.030)	(0.021)	(0.030)	(0.018)
Purchase from Japan	-0.070**	-0.059	-0.042	-0.066**
	(0.035)	(0.039)	(0.037)	(0.033)
Purchase from local suppliers	0.103	0.084	0.081	0.029
	(0.068)	(0.068)	(0.050)	(0.037)
Purchase from third countries	-0.052*	-0.044	-0.062**	-0.010
	(0.030)	(0.038)	(0.026)	(0.017)
Selling behavior (share in total sales)				
Sales back to parent firm	0.088**	0.003	-0.070	0.125***
	(0.041)	(0.036)	(0.047)	(0.044)
Sales back to Japan	0.024	0.052**	-0.034	0.001
	(0.024)	(0.024)	(0.044)	(0.028)
Sales to local consumers	-0.012	-0.019	0.057*	0.030
	(0.044)	(0.050)	(0.032)	(0.029)
Sales to third countries	-0.034	-0.047	-0.026	-0.041
	(0.041)	(0.053)	(0.035)	(0.039)
Intrafirm trade				
Intrafirm purchase/total imports	0.103*	-0.057*	0.056	-0.120***
	(0.060)	(0.033)	(0.059)	(0.033)
Intrafirm sales/total exports	0.125	0.008	0.115*	0.037
	(0.081)	(0.065)	(0.062)	(0.066)

A notable conclusion can be obtained from Table 6 is that all types of affiliates adjust their sourcing from their parent firms. For establishments heavily relying on intermediates provided by parent firms, they respond to the negative labor cost shocks by reducing their imports from the parent firms and relying more on local suppliers (as shown in columns 2 and 4). The share of imports from other countries is also reduced with an increase in

minimum wages. One possible explanation is that these firms adjust their sourcing suppliers to save international trade costs. This might be a result of the improvement in production technology of domestic firms due to increases in minimum wages. For the efficiency-seeking firms in column (4), a minimum wage increase also significantly raises their sales back to their parent firms and reduces the share of purchase from parent firms in total imports. These results are consistent with the argument that higher labor costs in China drive production activities in China to move up along the global value chain.

In contrast, for affiliates shown in columns (1) and (3), which have a low share of purchases from parent firms, the change in minimum wages is positively correlated with their purchases from parent firms and negatively correlated with the share of purchases from third countries. We further examine firms in particular industries to better understand the findings in Table 6. Table 7 shows the results. Column (1) examines the impacts of the minimum wage on establishment in wholesale industries. (to be completed)

Table 7 Effects of minimum wage on sourcing and sales strategies (selected industries)

	(1)	(2)	(3)	(4)
	Wholesale	Automobile	Textile	Chemical
Sourcing behavior (share in total cost)				
Purchase from parent firm	0.082***	-0.076	-0.038	0.043
	(0.019)	(0.053)	(0.106)	(0.068)
Purchase from Japan	0.200***	-0.058	-0.217	-0.145*
	(0.022)	(0.068)	(0.159)	(0.079)
Purchase from local suppliers	-0.146***	0.099	0.022	0.292**
	(0.040)	(0.073)	(0.202)	(0.129)
Purshase from third countries	-0.007	-0.020	-0.067	-0.245**
	(0.015)	(0.055)	(0.064)	(0.110)
Selling behavior (share in total sales)				
Sales back to parent firm	0.095***	-0.007	-0.392**	0.030
	(0.023)	(0.080)	(0.184)	(0.096)
Sales back to Japan	0.062**	0.207**	-0.572**	-0.137***
	(0.028)	(0.092)	(0.229)	(0.037)
Sales to local consumers	0.065**	-0.309***	0.494**	0.308***
	(0.024)	(0.104)	(0.215)	(0.063)

Sales to third countries	-0.062***	0.048	0.070	-0.161***
	(0.017)	(0.053)	(0.123)	(0.057)
Intrafirm trade				
Intrafirm purchase/total imports	-0.064	-0.308**	0.329	0.252
	(0.055)	(0.117)	(0.405)	(0.196)
Intrafirm sales/total exports	0.252***	-0.836***	-0.113	0.225
	(0.080)	(0.223)	(0.282)	(0.137)

6.3 Multinational network adjustment: Location spillovers

Giroud and Mueller (2019) use establishment-level data in the US to investigate how local demand shocks spill over to distant regions through firms' internal networks. Becker and Henderson (2000) find that as a response to the air quality regulation since 1978, there has been a significant relocation of plants from more to less polluted areas to avoid stricter regulation in more polluted areas. In this section, we explore whether the negative labor cost shocks are transmitted through the firm's internal network to establishments in other regions.

6.3.1 International spillovers

We first examine how the shocks faced by affiliates in China spill over to affiliates in other economies. Spinelli, Rouzet, and Zhang (2018) document that in 2004, two-thirds of Japanese foreign affiliates were located in Asia, while North America hosted over 15% of all its overseas affiliates. Given the significant variations in the endowment structure and market size across geographical regions, which implies that the motives of affiliates differ as well, we examine the impacts of China's regional MNW policies on affiliates in each geographical region separately. For each Japanese MNE that has at least one affiliate in China, we aggregate the total number and total employment of all its affiliates by region and replace the establishment-level outcomes in equation () with these two aggregated outcome variables.

Table 8 presents the results. The first two columns show the results for the total employment of affiliates within each region, while the last two columns are for the discussion on the total count of affiliates. We find a significant positive connection between an increase in the MNW in China and the total employment affiliates in Asia, which is mainly driven by low-income countries in Asia and, in particular, low-income countries in Southeast Asia. Among other regions, the total employment in Sub-Saharan African economies, in which the labor cost is relatively lower compared with other regions, is also raised with an increase in minimum wages in China. The estimated effects confirm the argument in the literature that the affiliates of the same MNEs in low-wage economies are substitutes and might serve the same production role in the GVC. As the comparative advantages of China evolve, the location of production activities might be switched from China to other low-

wage economies. The elasticity is much larger for economies in Southeast Asia than for those in Sub-Saharan Africa, which could be explained by proximity. The number of affiliates is less sensitive to cost shocks, suggesting that short-run adjustment mainly occurs through the intensive margin.

Table 8 International network

	Employment		Count	
	Current	2-year lagged	Current	2-year lagged
Asia (total)	0.254*	0.344**	0.039	0.002
	(0.139)	(0.148)	(0.042)	(0.024)
Asia (low-income countries)	0.277*	0.172	-0.005	-0.060*
	(0.145)	(0.217)	(0.037)	(0.033)
East Asia	-0.013	0.194	0.033**	0.023
	(0.082)	(0.124)	(0.017)	(0.018)
Southeast Asia	0.407***	0.368***	0.027	-0.020
	(0.143)	(0.139)	(0.039)	(0.025)
South Asia	-0.003	0.156	-0.020	-0.033
	(0.137)	(0.152)	(0.024)	(0.023)
Sub-Saharan Africa	0.094*	0.081	-0.005	0.021
	(0.056)	(0.061)	(0.013)	(0.013)
North Africa	-0.048	0.010	-0.008	0.003
	(0.056)	(0.047)	(0.016)	(0.008)
Latin America	0.054	0.466**	-0.020	0.038
	(0.174)	(0.211)	(0.038)	(0.046)
North America	0.185*	0.271***	0.024	0.012
	(0.108)	(0.096)	(0.026)	(0.018)
Europe	-0.031	0.162	-0.014	-0.032
	(0.121)	(0.132)	(0.015)	(0.024)
China	0.148	0.225*	-0.019	-0.007
	(0.121)	(0.117)	(0.021)	(0.022)
Other countries	0.305***	0.549***	0.048	0.030
	(0.107)	(0.154)	(0.036)	(0.025)

Low-income countries	0.260*	0.168	-0.007	-0.060*
	(0.146)	(0.219)	(0.036)	(0.033)
High-wage countries	0.947***	0.816***	0.235***	0.065
	(0.230)	(0.161)	(0.053)	(0.040)
Mid-wage countries	-0.949**	0.218	-0.295**	0.040
	(0.422)	(0.424)	(0.134)	(0.068)
Low-wage countries	-0.035	-0.094	0.009	-0.000
	(0.092)	(0.131)	(0.029)	(0.038)

6.3.2 National spillovers

We also investigate whether Japanese multinational firms respond to negative labor cost shocks in one location in China by adjusting their affiliates' activity in other regions within China. The empirical strategy is analogous to that in the previous section when we examine international transmission. We first classify regions into different categories based on their geographical locations since the average wage level varies across different locations. In addition, we consider both the GDP level and wage level of each prefecture. Theoretically speaking, an increase in MNW might lead to two opposite effects: cost effects and market effects. First, higher MNW could lead to higher labor costs. Firms may respond to this adverse shock by substituting capital for labor, laying off low-wage workers, or improving per-labor production, as documented in the literature. Meanwhile, an increase in MNW might raise workers' income, thereby increasing market size. In addition, adverse cost shocks force some firms to exist in the market. This should be considered a positive shock to surviving firms. Whether multinational firms will expand their employment in one location depends on the tradeoff between different forces. Our results provide support for this argument and reveal a significantly positive correlation between the minimum wages and the total employment of multinational firms in regions with medium-level wages.

Table 9 Internal network

	Employment		Count	
	Current	2-year lagged	Current	2-year lagged
West	0.047	-0.243**	-0.007	-0.036**
	(0.093)	(0.113)	(0.019)	(0.017)
Mid	0.137	0.028	0.016	0.014
	(0.090)	(0.148)	(0.013)	(0.022)
East	0.196	0.087	0.008	-0.025
	(0.185)	(0.148)	(0.036)	(0.034)

Northeast	0.035	0.100	-0.006	0.032
	(0.114)	(0.087)	(0.017)	(0.020)
High-GDP	-0.473**	-0.164	-0.075	-0.058
	(0.235)	(0.286)	(0.053)	(0.070)
Low-GDP	-0.032	0.434	-0.016	0.023
	(0.212)	(0.286)	(0.041)	(0.066)
High-wage	0.245	0.007	-0.025	-0.034
	(0.254)	(0.172)	(0.034)	(0.037)
Mid-wage	0.637*	0.027	0.068	0.007
	(0.338)	(0.218)	(0.045)	(0.040)
Low-wage	0.181	-0.096	0.049	-0.012
	(0.303)	(0.228)	(0.049)	(0.037)

7. Conclusion

In this paper, we exploit the large variations in the minimum wage policies across regions and time in China and investigate how Japanese multinationals' affiliates in China respond to the minimum wage changes. Detailed firm level data of Japanese multinationals combined with data on China's minimum wages are applied. The results show that the increase in the prefectural minimum wage does not necessarily increase the labor cost of the Japanese affiliates in China. On the other hand, Japanese multinational firms do make adjustments through other margins, such as sourcing and sales pattern. And different types of affiliates present various response behavior, all to mitigate the exogenous labor cost shock. Such adaptability is rarely seen among pure domestic firms.

Despite careful verification, we admit that there are still several aspects that can be further improved. First, even though we can calculate the average wage of a firm, it is not observable whether the firm complies with the minimum wage regulation or not. And if it does, we are not aware of how many workers in a firm will benefit from such regulation change. More detailed information on the wage profile of the workers will be necessary. Second, we can not actually observe the interaction among the sibling affiliates that belong to the same multinational group. This channel can also be important for multinational firms to make adjustments. Last but not least, more work can be done to further deal with the endogenous impact of the minimum wage. We will leave these for our future study.

References

Aaronson, Daniel and Eric French. 2007. "Product Market Evidence on the Employment Effects of the Minimum Wage." *Journal of Labor economics*, 25(1), 167-200.

Aaronson, Daniel and Brian J Phelan. 2017. "Wage Shocks and the Technological Substitution of Low-Wage Jobs." *The Economic Journal*, 129(617), 1-34.

Autor, David H.; William R. Kerr and Adriana D. Kugler. 2007. "Does Employment Protection Reduce Productivity? Evidence from Us States." *The Economic Journal*, 117(521), F189-F217.

Bai, John; Douglas Fairhurst and Matthew Serfling. 2019. "Employment Protection, Investment, and Firm Growth." *The Review of Financial Studies*, 33(2), 644-88.

Bai, Xue; Arpita Chatterjee; Kala Krishna and Hong Ma. 2021. "Trade and Minimum Wages in General Equilibrium: Theory and Evidence." *Journal of International Economics*, 133, 103535.

Becker, Randy and Vernon Henderson. 2000. "Effects of Air Quality Regulations on Polluting Industries." *Journal of Political Economy*, 108(2), 379-421.

Bilir, L. Kamran; Davin Chor and Kalina Manova. 2019. "Host-Country Financial Development and Multinational Activity." *European Economic Review*, 115, 192-220.

Chen, Maggie Xiaoyang. 2011. "Interdependence in multinational production networks." *Canadian Journal of Economics/Revue canadienne d'économique*, 44 (3), 930-956.

Clemens, Michael A.; Steven Radelet; Rikhil R. Bhavnani and Samuel Bazzi. 2011. "Counting Chickens When They Hatch: Timing and the Effects of Aid on Growth." *The Economic Journal*, 122(561), 590-617.

Collier, Paul and Anke Hoeffler. 2004. "Aid, Policy and Growth in Post-Conflict Societies." *European Economic Review*, 48(5), 1125-45.

Denizer, Cevdet; Daniel Kaufmann and Aart Kraay. 2013. "Good Countries or Good Projects? Macro and Micro Correlates of World Bank Project Performance." *Journal of Development Economics*, 105, 288-302.

Dosi, Giovanni; Maria Enrica Virgillito and Xiaodan Yu. 2020. "The Wage-Productivity Nexus in the World Factory Economy." *World Development*, 129, 104875.

Du, Pengcheng and Shuxun Wang. 2020. "The Effect of Minimum Wage on Firm Markup: Evidence from China." *Economic Modelling*, 86, 241-50.

Dube, Arindrajit; T William Lester and Michael Reich. 2010. "Minimum Wage Effects across State Borders: Estimates Using Contiguous Counties." *The Review of Economics and Statistics*, 92(4), 945-64.

Dustmann, Christian; Attila Lindner; Uta Schönberg; Matthias Umkehrer and Philipp Vom Berge. 2022. "Reallocation Effects of the Minimum Wage." *The Quarterly Journal of Economics*, 137(1), 267-328.

Fan, Haichao; Faqin Lin and Lixin Tang. 2018. "Minimum Wage and Outward Fdi from China." *Journal of Development Economics*, 135, 1-19.

Fang, Tony and Carl Lin. 2015. "Minimum Wages and Employment in China." *IZA Journal of Labor Policy*,

4(1), 22.

Feeny, Simon and Vu Vuong. 2017. "Explaining Aid Project and Program Success: Findings from Asian Development Bank Interventions." *World Development*, 90, 329-43.

Gan, Li; Manuel A. Hernandez and Shuang Ma. 2016. "The Higher Costs of Doing Business in China: Minimum Wages and Firms' Export Behavior." *Journal of International Economics*, 100, 81-94.

Giuliano, Laura. 2013. "Minimum Wage Effects on Employment, Substitution, and the Teenage Labor Supply: Evidence from Personnel Data." *Journal of Labor economics*, 31(1), 155-94.

Griffith, Rachel and Gareth Macartney. 2014. "Employment Protection Legislation, Multinational Firms, and Innovation." *The Review of Economics and Statistics*, 96(1), 135-50.

Hau, Harald; Yi Huang and Gewei Wang. 2020. "Firm Response to Competitive Shocks: Evidence from China's Minimum Wage Policy." *The Review of Economic Studies*.

Howell, Anthony. 2020. "Minimum Wage Impacts on Han-Minority Workers' Wage Distribution and Inequality in Urban China." *Journal of Urban Economics*, 115, 103184.

Jones, Sam and Finn Tarp. 2016. "Does Foreign Aid Harm Political Institutions?" *Journal of Development Economics*, 118, 266-81.

Kong, Dongmin; Ni Qin and Junyi Xiang. 2021. "Minimum Wage and Entrepreneurship: Evidence from China." *Journal of Economic Behavior & Organization*, 189, 320-36.

Li, Shi and Xinxin Ma. 2015. "Impact of Minimum Wage on Gender Wage Gaps in Urban China." *IZA Journal of Labor & Development*, 4(1), 20.

Long, Cheryl and Jin Yang. 2016. "How Do Firms Respond to Minimum Wage Regulation in China? Evidence from Chinese Private Firms." *China Economic Review*, 38, 267-84.

MaCurdy, Thomas. 2015. "How Effective Is the Minimum Wage at Supporting the Poor?" *Journal of Political Economy*, 123(2), 497-545.

Magruder, Jeremy R. 2013. "Can Minimum Wages Cause a Big Push? Evidence from Indonesia." *Journal of Development Economics*, 100(1), 48-62.

Maksimovic, Vojislav and Gordon Phillips. 2002. "Do Conglomerate Firms Allocate Resources Inefficiently across Industries? Theory and Evidence." *The Journal of Finance*, 57(2), 721-67.

Manning, Alan. 2021. "The Elusive Employment Effect of the Minimum Wage." *Journal of Economic Perspectives*, 35(1), 3-26.

Marjit, Sugata; Shrimoyee Ganguly and Rajat Acharyya. 2020. "Minimum Wage, Trade and Unemployment in General Equilibrium," CESifo Group Munich,

Mayneris, Florian; Sandra Poncet and Tao Zhang. 2018. "Improving or Disappearing: Firm-Level Adjustments to Minimum Wages in China." *Journal of Development Economics*, 135, 20-42.

Poncet, Sandra; Florian Mayneris and Tao ZHANG. 2014. "The Cleansing Effect of Minimum Wages-Minimum Wages, Firm Dynamics and Aggregate Productivity in China,"

Sorkin, Isaac. 2015. "Are There Long-Run Effects of the Minimum Wage?" *Review of Economic Dynamics*, 18(2), 306-33.

Soundararajan, Vidhya. 2019. "Heterogeneous Effects of Imperfectly Enforced Minimum Wages in Low-Wage Labor Markets." *Journal of Development Economics*, 140, 355-74.

Thomas, Catherine and Bernard, Andrew. 2021. "Multinational firms' market entry and expansion, with evidence from Eastern Europe." In: Foley, C. Fritz, Hines, James and Wessel, David, (eds.) Global Goliaths: Multinational Corporations in the 21st Century Economy. Brookings Institution. Press, Washington, DC, 89 - 128. ISBN 9780815738558