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FOREIGN DIRECT INVESTMENT LOCATION AND TRADE DYNAMICS IN VIET NAM AFTER THE US-PRC TRADE DISPUTE

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ABSTRACT

In developing economies, foreign direct investment (FDI) plays a crucial role by providing resources that facilitate participation in international trade and support economic development. Focusing on Viet Nam as a case study, this research aims to quantify the distributional effects of the United States–People’s Republic of China trade dispute across different regions in Viet Nam. By utilizing detailed firm-level and customs data, we demonstrate that FDI in Viet Nam is geographically concentrated in the northern, central, and southern regions. Access to road and port networks significantly influences the choice of FDI locations. Furthermore, we highlight the important role that the foreign affiliates of multinational firms from East Asia and the United States have played in reshaping Viet Nam’s trade flows in the aftermath of the trade dispute between the United States and the People’s Republic of China. This study sheds light on the interplay between transport infrastructure, FDI, and international trade.

Keywords: trade, ports, roads, US–PRC trade dispute, Viet Nam, PRC

JEL codes: R40, R41, F10 , F13, F14

1 INTRODUCTION

Foreign direct investment (FDI) brings valuable resources to developing economies. When there is a surge in foreign demand, foreign firms that have better connections internationally can facilitate regional participation in international trade and thus support economic development. In this paper, we use the trade dispute between the United States (US) and the People's Republic of China (PRC) as a natural experiment to examine how important is the channel of foreign affiliates in shaping the response of Viet Nam's economy.

We start by documenting the response of the Vietnamese economy to the trade dispute's shocks at the district level. We exploit the fact that industrial compositions differ across Vietnamese districts, and that US tariffs on the PRC are industrial shocks in nature, to construct a measurement of district-level trade dispute shocks as the weighted average of the US–PRC tariffs. The empirical strategy follows Borusyak et al. (2022) and has been used in similar studies like Autor et al. (2013). Our estimates show the significant aggregate impacts of trade dispute shocks on regional development. A one percentage point increase in US tariffs leads to a 1.9% increase in district-level sales, a 2.1% increase in district-level employment, a 2.5% increase in the number of firms, a 6.7% increase in export values, and a 5.0% increase in import values. Moreover, the effect on district-level FDI in the manufacturing sector is much higher than for other sectors.

The responses are not homogeneous across industries and regions. Applying a difference-in-difference (DID) framework to compare the industries that are directly affected by the US tariffs with industries that are not directly affected, we found that the affected industries have a larger increase in export and import values after the effective dates of the tariffs. Moreover, while the increase in exports is found to all destinations, the increase in imports from within East Asia is highest, consistent with a regional supply chain that originates in East Asian economies like the PRC and culminates in the US and other developed regions in the world. Across Vietnamese provinces, we see that the existing conditions in market access drive the spatial distribution of responses to the trade dispute shocks. Districts that on average have greater market access to other Vietnamese districts are more responsive to the trade dispute shocks.

Finally, we explore the role of foreign affiliates in determining the responses of Viet Nam to the trade dispute shocks. Using firm survey data, we find that firms with foreign connections are much bigger, accounting for around 20% of total employment in 2011 and more than 30% of employment in 2021, while only accounting for about 3% of all

firms in both years. Connecting the firm survey to customs data, we also show that foreign affiliates accounted for more than 50% of Viet Nam's international trade value in 2018, and this share increased to 60% in 2021. Moreover, we find that the existing transport infrastructure and related policies affect the location choices of foreign affiliates: They tend to concentrate in those districts with greater market access and more industrial zones, and in proximity to ports. Through firm-level DID regressions, we verify that foreign affiliates have very different responses to trade dispute shocks: Foreign firms in the affected industries have higher sales, employment, foreign capital, export values, and import values, while these estimates are not significantly different from zero for domestic firms. Overall, our results show the importance of existing infrastructure in terms of market access, transportation, and development-oriented policies in determining the spatial distribution of growth when facing an exogenous demand shock, providing evidence that participation in global value chains is a crucial mechanism underlying the process.

Related literature. Our paper closely relates to the literature investigating the US–PRC trade dispute's effects on Viet Nam. Previous studies already noted the spillover effects to Viet Nam (see, for example, Fajgelbaum et al. 2021). Ngoc and Wie (2023) also use Viet Nam Employment Survey data to show that the increase in Vietnamese exports to the US is partially driven by the entry of new exporters, in particular foreign affiliates. Using tariffs as the instrument, they show that exporting increases those firms' productivity. Rotunno et al. (2023) use labor force survey data to investigate the US–PRC trade dispute's effects on labor market outcomes in Viet Nam. They confirmed that Vietnamese exports to the US of affected products increased after the trade dispute, and this export expansion led to more jobs and longer working hours. Moreover, they document evidence suggesting a narrower gender difference in wages after the shock. Our paper differentiates from the current literature in two aspects. Firstly, we focus on the distribution of the trade dispute shock across regions of Viet Nam. Secondly, we use transaction-level customs data to document finer responses to the trade dispute shocks.

Using the trade liberalization between Viet Nam and the US as the quasi-experiment, McCaig and Pavcnik (2018) and McCaig et al. (2022) explore the effects of openness on the transition between formal and informal employment and the long-term effects of trade liberalization on the growth in the developing economy. While our study uses the shock from the trade conflicts between the PRC and the US, their results serve as an important background in understanding the Viet Nam economy.

By documenting how the growth of firm-level activities distributed across Viet Nam depends on industrial zone policy and existing infrastructure, our paper contributes to two strands of the literature in spatial economics. The first strand studies the spatial distribution of economic activity and how place-based policies affect the sorting of firms (Gaubert, 2018). The second strand of the literature studies the path-dependence of the economic activities (Davis and Weinstein, 2002; Miguel and Roland, 2011).

The results we found can also have meaningful policy implications. Given the importance of the agglomeration of firms with industrial linkages, locations that are attractive to foreign investment will become even more attractive over time. Therefore, policymakers face a trade-off between efficiency and equality in general.

2 DATA AND EMPIRICAL MEASURES

This section describes the data and key empirical measures used in our analysis. To measure the impact of the trade dispute, we use tariff line data from Fajgelbaum et al. (2020), which records the tariffs imposed by the US on Chinese exports at the Harmonized System (HS) 10 level, along with the month-level start dates. To connect these tariff data to the customs data, we take averages across all HS10 codes under the same HS6 code, since HS codes are only comparable across economies at the HS6 level. Figure 1 illustrates the time trends of US tariffs on exports from the PRC and Viet Nam across different HS sectors over time. The vertical axis represents the average tariff rates across 6-digit HS codes within each sector, showing that both the magnitude and timing of tariff increases vary by sector. The “electrical equipment and appliances” sector experienced the earliest and largest tariff hikes. Additionally, the figure highlights that the range of sectors affected in the PRC is much broader compared to Viet Nam. Figure 2 shows that the number of affected products is significantly higher for the PRC. Overall, the impact of US tariffs has been much more substantial on the PRC than on Viet Nam.

Trade dispute shocks can be considered industry-specific shocks, as demonstrated in Figures 1 and 2, where US tariffs are particularly high in sectors such as machinery, chemicals, base metals, plastics, and textiles. This suggests an identification strategy that leverages variations in industry exposure due to spatial specialization, which we employ in later sections. Due to input–output linkages across industries, the effects of tariff increases may extend beyond the directly impacted sectors.

Figure 3 illustrates the composition of Vietnamese exports for HS codes affected and unaffected by US tariffs. Export values across HS6 codes are aggregated within each sector, with the share of export values plotted for the control group on the left and the

treated group on the right. The left side of the figure shows that the control group consists of a diverse range of sectors, while the right side of the figure reveals that in 2018, the initial year of the US–PRC trade dispute, most of the export value for the treated group is concentrated in the textiles sector.

To measure the effects of tariff hikes on district and firm outcomes, we need to align the industries affected by the tariffs with the industries reported in the Vietnamese firm survey. The US tariffs are recorded at the HS10 code level, while the industries in the firm surveys are measured according to the Viet Nam Standard Industrial Classification. To map these two classifications of industries, we use data from Pierce and Schott (Pierce and Schott), which links HS codes to NASIC industries using US import and export records that classify products by both HS codes and US industrial classification. We use their mapping in 2017 to ensure that the mapping is not affected by product-switching behavior induced by the tariffs. We then use data from the United Nations to convert NASIC codes to ISIC version 4 codes at the 4-digit level, following the international standard for industry classification.¹ Using this approach, we connect the US tariffs imposed on the PRC to Viet Nam’s industries. Figure 4 plots the composition of employment for firms unaffected and affected by the tariffs. The left side of the figure shows that unaffected firms are primarily in the wholesale, retail, repair services, construction, and transportation and logistics sectors, while the right side of the figure indicates that affected firms are predominantly in the manufacturing sector.

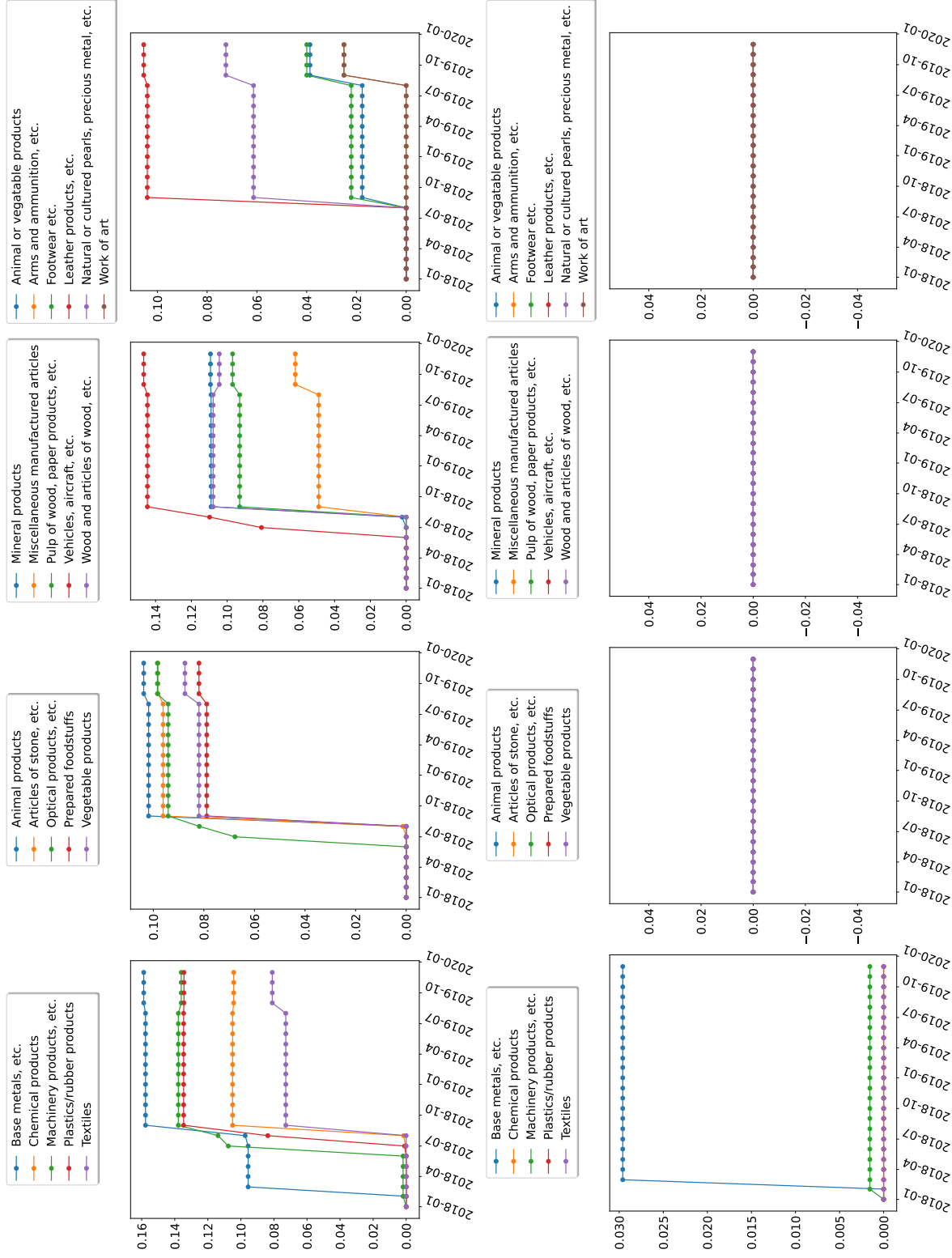
To understand how geographical factors influence the spatial distribution of trade dispute effects, we measure market access and port access for each Vietnamese district as follows. We model all Vietnamese districts as a graph, where the nodes represent the economic centers of each district, identified by the coordinates of the People’s Committee Office. We first calculate the least-cost distance between neighboring districts using the 2016 road network. To move from one district to another that is not adjacent, it is necessary to pass through neighboring districts of the origin district, and the least-distance path is again selected from all possible routes that connect the origin to the destination. Additionally, we use this road network to calculate the routes from each district’s economic center to the nearest port, if a port exists in that district. To get the distance to the port for a district that does not have a port, it is assumed that one must first reach the economic center of a district containing the port and then proceed to the port, then the nearest port is selected across all ports.

¹ The Viet Nam Standard Industrial Classification is very similar to the ISIC, and we treat them as equivalent.

To measure each district's market access, we calculate the employment-weighted average of inverse distances, using each district's total employment as recorded in the 2016 Viet Nam Enterprise Survey data. Figure 5 shows the spatial distribution of market and port access across Vietnamese districts. Alongside these access measures, we also gather data on the location and establishment years of industrial zones in Viet Nam from the Japan External Trade Organization. Figure 6 illustrates the spatial distribution of industrial zones as of 2022.

The firm-level variables used in this study are derived from the Viet Nam Enterprise Survey, covering the period from 2010 to 2021. Specifically, we utilize data on foreign capital by source economy, available from 2017 to 2020, to examine the role of foreign affiliates in shaping Viet Nam's response to the US–PRC trade dispute. Additionally, we integrate the firm-level survey data with Vietnamese customs data for 2018–2023 to analyze international trade responses following the trade dispute. Table 1 presents the summary statistics at the firm-year level. The average firm in the sample employs 24 workers and has annual sales of roughly \$1 million. About 16.3% of observations are in the industries affected by US tariffs, and about 33.4% of observations are in districts with industrial zones.

Figure 1: Time Trends of Tariffs Implemented by the United States

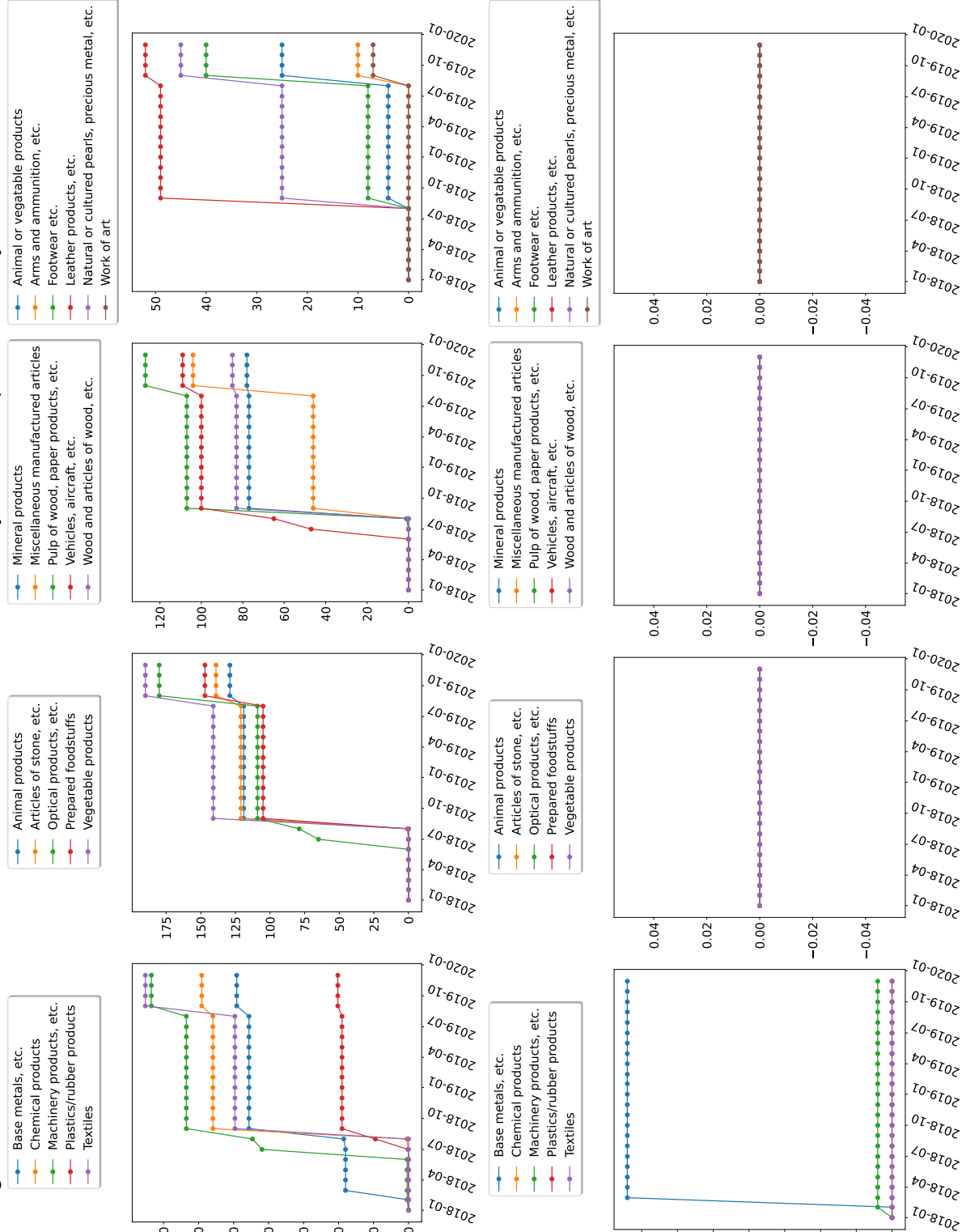


HS = Harmonized System, PRC = People's Republic of China.

Note: The tariff measures are averaged across tariffs imposed on HS-10 codes within each HS sector.

Source: Fajgelbaum et al. (2020) and authors' calculation.

Figure 2: Time Trends of the Number of Products Affected by Tariffs Implemented by the United States

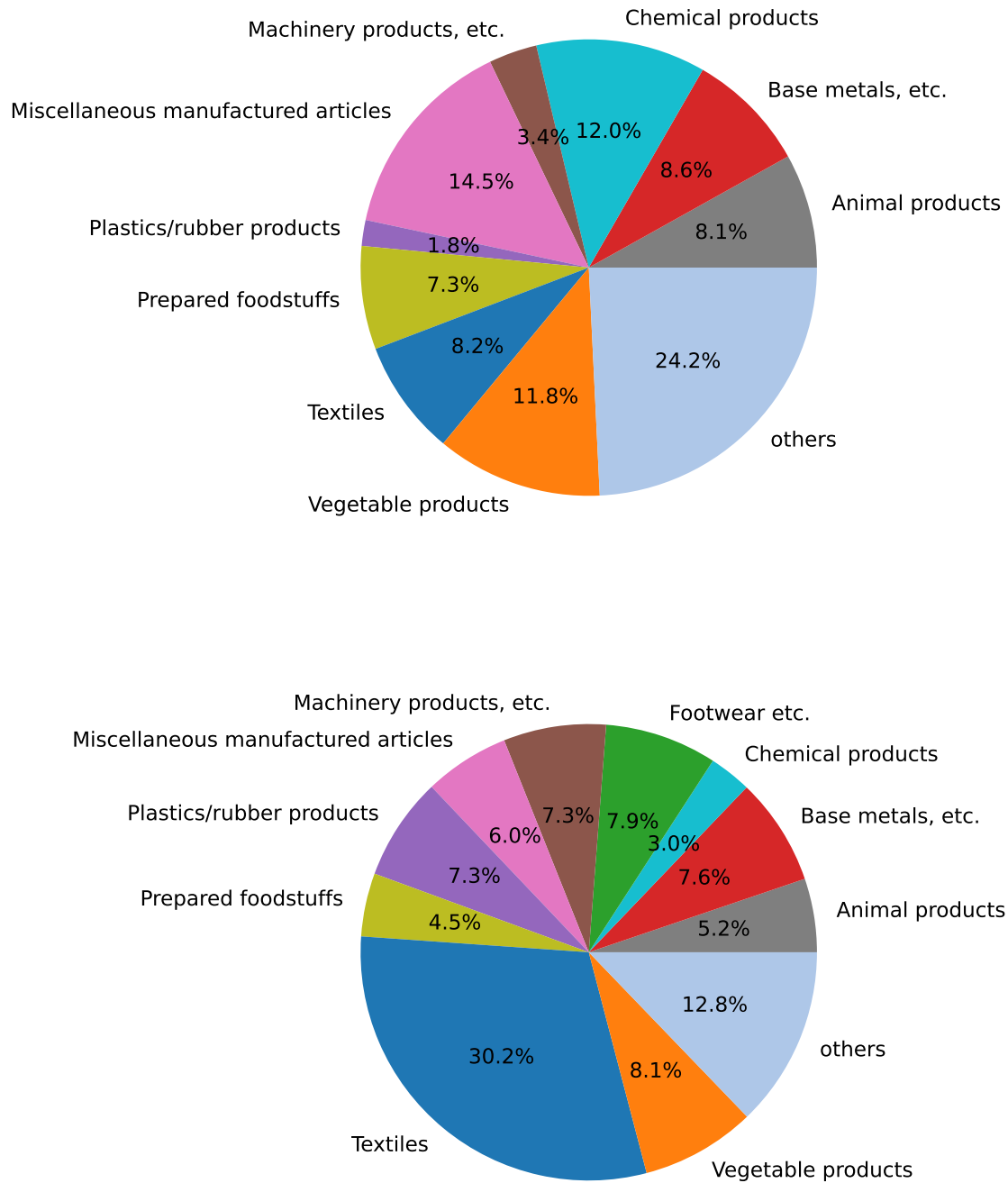


HS = Harmonized System, PRC = People's Republic of China.

Note: The numbers represent unique HS codes.

Source: Fajgelbaum et al. (2020) and authors' calculation.

Figure 3: Harmonized System Sector Composition of Treated and Control Groups

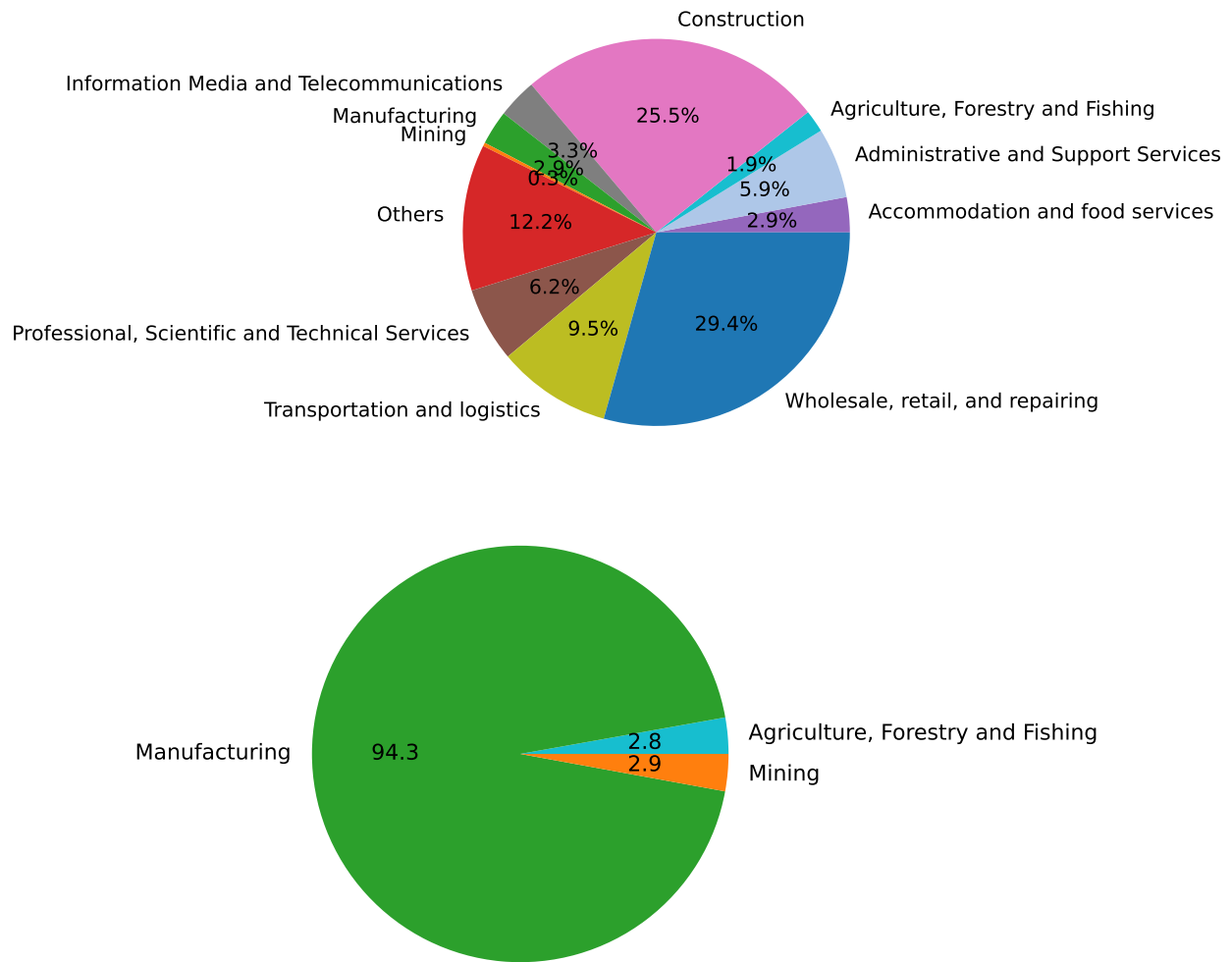


HS = Harmonized System.

Note: The top panel plots the HS sector composition for the control group in terms of total export value in 2018; the bottom panel plots the same composition for the treated group. A HS code is in the treated group if it is assigned positive tariff by the US on the PRC.

Source: Viet Nam's customs data and authors' calculation.

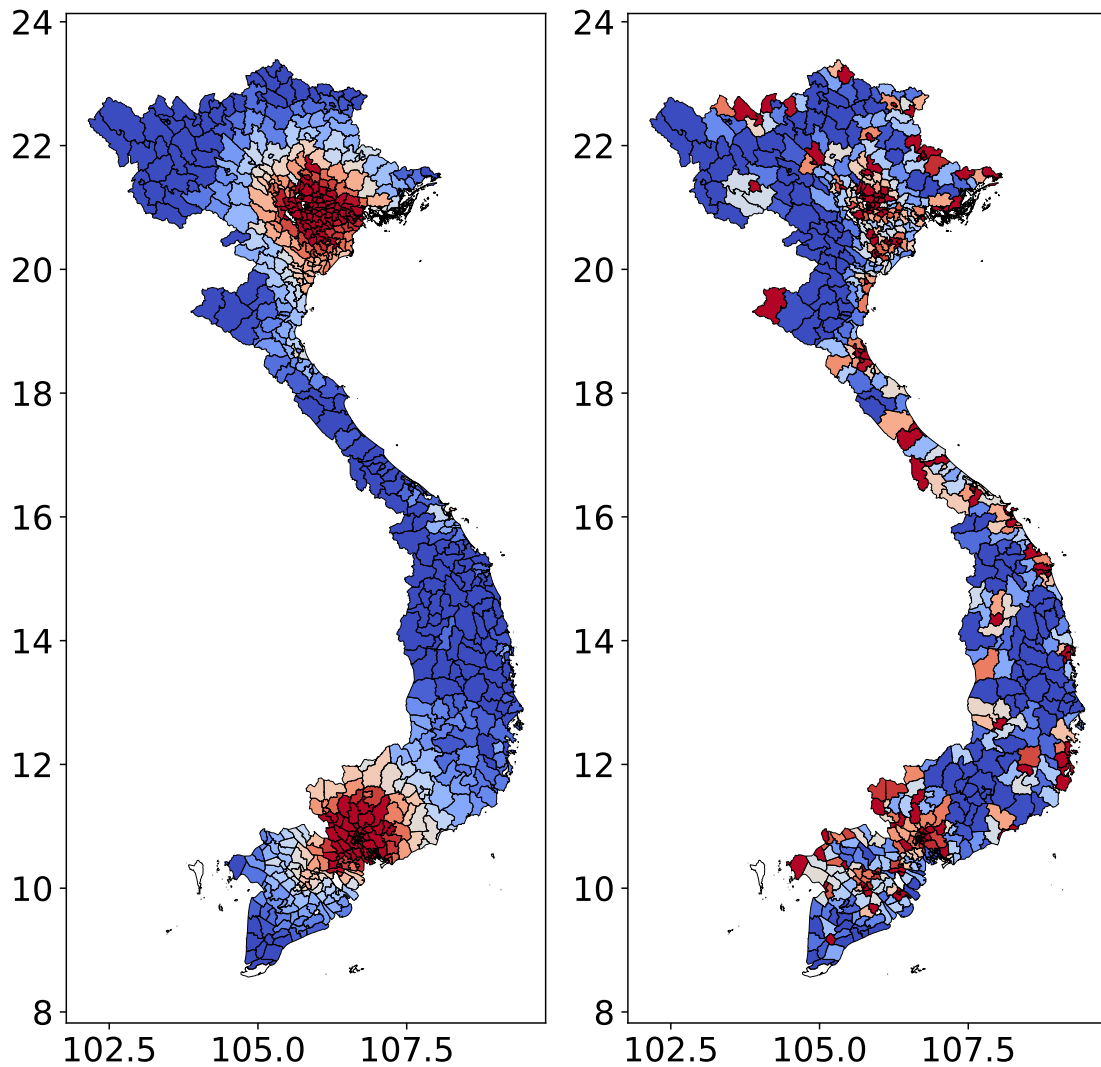
Figure 4: Industry Composition of Treated and Control Groups



Note: The top panel plots the industry composition for the control group in terms of total employment in 2017; the bottom panel plots the same composition for the treated group. A firm is in the treatment group if its industry is assigned positive tariff by the US on the PRC.

Source: Viet Nam Enterprise Survey data and authors' calculation.

Figure 5: Market Access and Port Proximity

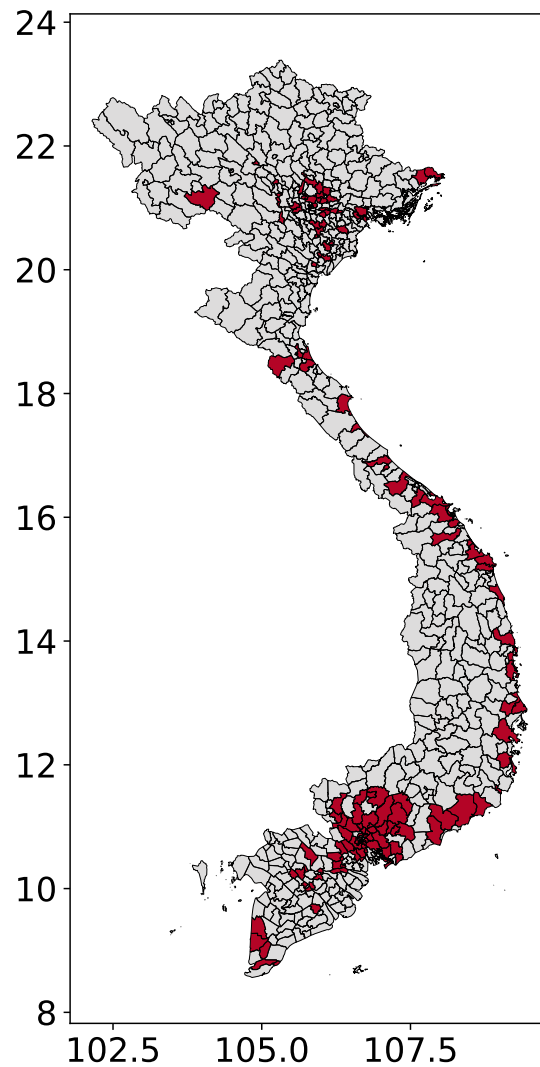


Note: Left panel plots market access, right panel plots port access in 2016.

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Source: The National Geospatial Information Authorities and authors' calculation.

Figure 6: Location of Industrial Zones



Note: The boundaries, colors, denominations, and any other information shown on this map do not imply, on the part of the Asian Development Bank, any judgment on the legal status of any territory, or any other endorsement or acceptance of such boundaries, colors, denominations, or information.

Source: Japan External Trade Organization and authors' calculation.

Table 1: Summary Statistics at Firm-Year Level

	count	mean	std	min	25%	50%	75%	max
Emp_{ft}	5966112	24.760	282.142	0.000	2.000	5.000	10.000	87279.000
$Sales_{ft}$	5966112	1.062	32.464	0.000	0.004	0.040	0.217	17730.335
$Tar_{ft}^{US,CN}$	5966112	0.005	0.021	0.000	0.000	0.000	0.000	0.188
$Treated_{ft}$	5966112	0.163	0.369	0.000	0.000	0.000	0.000	1.000
$InIndZone_{ft}$	5966112	0.332	0.471	0.000	0.000	0.000	1.000	1.000
$Access_{ft}$	5709062	259.799	183.927	19.211	70.174	261.527	422.444	616.032

Note: The table shows summary statistics for employment, deflated sales, the tariffs, treatment industry dummy, in the industrial zone dummy, and market access. Refer to the text for the details of how the variables are calculated. The unit of observation is firm-year. The sample is from 2010 to 2021.

Source: Authors' calculations based on the Viet Nam Enterprise Survey.

3 THE TRADE DISPUTE IMPACTS

3.1 Shift-Share Estimates of Trade Dispute Impacts

In this section, we characterize the impact of the US–PRC trade dispute on regional development outcomes using a shift-share design, following the method described in Borusyak et al. (2022). Firstly, we use the share of employment for each industry in each district in 2016 as the measure of exposure of each district to industrial level shocks, then we calculate the employment-weighted average of tariffs across industries as the measure of trade dispute shocks for each district, namely we define variable $TDShock_{it} = \sum_n EmpShare_{ni,2016} Tar_{int}$, where $EmpShare_{ni,2016}$ is the employment share for industry n in district i in 2016. Using the employment share 2 years before the trade dispute started avoids the possibility that the exposure was affected by the trade dispute, but may reduce the correlation between our shock measure with the district-level outcomes. Secondly, since the US tariffs do not intend to affect regional development in Viet Nam, they are plausibly exogenous shocks to Vietnamese firms. Therefore, we regress the shocks directly on the regional outcomes to estimate the trade dispute effects on Vietnamese regional development:

$$\ln y_{it} = \beta_0 + \beta_1 TDShock_{it} + \beta_2' x_{it} + \phi_i + \phi_t + \varepsilon_{it}, \quad (1)$$

where y_{it} includes total employment in district i year t , Emp_{it} , the deflated sales in district i year t , $Sales_{it}$, and the number of firms in district i year t , $NumFirm_{it}$. The control variables include the share of manufacturing employment in the last period, $ManShare_{it-1}$, the number of industrial zones in district i that have been established before period t , $IndZone_{it}$, the province and district fixed effect, ϕ_i , and the year fixed effect, ϕ_t . The regressions are weighted by the district's employment share in Viet Nam and lagged (i.e., $t - 1$). The standard errors are clustered at the province level. Importantly, since the shocks concentrate in the manufacturing sector, controlling for the share of manufacturing employment in the last period is necessary to ensure that the identification comes only from the random shocks.

Results from estimating regression (1) using the sample of data from 2016 to 2020 are reported in Table 2. The trade dispute shock is found to positively increase district sales, employment, and the number of firms. Quantitatively, since the average and the standard deviation of our trade dispute shock measure $TDShock_{it}$ is 0.019 and 0.023, our estimates imply that the districts receiving average impacts lead to 3.5% increase in district sales, 3.3% increase in district employment, and 4.3% increase in the number of firms. One

standard deviation increase in the trade dispute shock will further lead to a 4.5% increase in district sales, a 4.2% increase in district employment, and a 5.6% increase in the number of firms. The employment share in the last period is a strong explanatory variable for district sales and employment, but has no significant correlation with the number of firms. The number of industrial zones is positively correlated with regional outcomes, but the estimates are not significant, possibly due to a lack of variation during the short review period. Finally, we note that the regression including district and year fixed effects explain almost all the variations in the outcome variables.

In Table 3, we repeat the same regression using district total FDI, FDI_{it} , and total FDI in the manufacturing sector, $ManFDI_{it}$, as the outcome variables, and use the data from 2017 to 2020 (due to the availability of FDI information). The estimates of trade dispute shocks are much higher for FDI in the manufacturing sector, but both estimates are not significant under the usual standard.

In Table 4, we run the same regression but replace the outcome variables with district total export values, $Export_{it}$, and import values, $Import_{it}$. We find a strong trade-promoting effect of the trade dispute. The estimated coefficient of the trade-dispute-effect export value is more than three times higher than the effect on sales, implying that the districts receiving the average trade dispute shock have a 12.0% increase in exports, 8.6% increase in imports, and a one standard deviation increase in the trade dispute shock further leads to a 15.5% increase in district export values, and a 11.2% increase in district import values.

The estimates in the regressions demonstrate the aggregate effects of the trade dispute on Viet Nam's regional development. Depending on whether US tariffs directly affect an industry, the US–PRC trade dispute may have varying impacts across sectors. Next, we explore this heterogeneity. Table 5 employs the same shift-share regression as in equation (1), but with employment in the manufacturing sector, $ManEmp_{it}$, and nonmanufacturing sectors, $NonManEmp_{it}$, as the outcome variables. The results indicate that the trade dispute shock positively impacts all industries, with the increase in nonmanufacturing employment surpassing that of the manufacturing sector, suggesting a significant indirect effect through inter-industry linkages.

Table 2: Shift-Share Estimates of Trade Dispute Effects on Regional Development

	$\ln(Sales_{it})$	std	$\ln(Emp_{it})$	std	$\ln NumFirm_{it}$	std
$TDShock_{it}$	1.916	0.844	2.054	0.786	2.529	0.559
$ManShare_{it-1}$	0.631	0.199	0.736	0.131	-0.038	0.186
$IndZone_{it}$	0.077	0.077	0.068	0.039	0.035	0.057
FE	Dist, Year		Dist, Year		Dist, Year	
Obs.	3388		3388		3388	
Adj. R^2	0.986		0.989		0.990	

FE = fixed effects.

Notes: Observations are weighted by the district's employment share in the previous year, standard errors are clustered at the province level. The outcomes include logarithmic values of deflated sales, $Sales_{it}$, employment, Emp_{it} , and number of firms, $NumFirm_{it}$. The independent variables include trade dispute shocks, $TDShock_{it}$, lagged manufacturing employment share, $ManShare_{it-1}$, and number of industrial zones, $IndZone_{it}$.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

Table 3: Shift-Share Estimates of Trade Dispute Effects on Regional Development and Foreign Direct Investment

	$\ln(FDI_{it} + 1)$	std	$\ln(ManFDI_{it} + 1)$	std
$TDShock_{it}$	-1.448	4.629	5.923	3.875
$ManShare_{it-1}$	1.359	1.000	1.737	1.130
$IndZone_{it}$	0.279	0.137	0.213	0.125
FE	Dist, Year		Dist, Year	
Obs.	2721		2721	
Adj. R^2	0.926		0.927	

FE = fixed effects.

Notes: Observations are weighted by the district's employment share in the previous year, standard errors are clustered at the province level. The outcomes include logarithmic values of foreign direct investment, FDI_{it} , foreign direct investment in the manufacturing industries, $ManFDI_{it}$. The independent variables include trade dispute shocks, $TDShock_{it}$, lagged manufacturing employment share, $ManShare_{it-1}$, and number of industrial zones, $IndZone_{it}$.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

Table 4: Shift-Share Estimates of Trade Dispute Effects on Regional Development and Trade

	$\ln (Export_{it})$	std	$\ln (Import_{it})$	std
$TDS_{shock_{it}}$	6.738	1.752	4.964	2.348
$ManShare_{it-1}$	0.467	0.669	0.212	0.504
$IndZone_{it}$	0.066	0.052	0.035	0.071
FE	Dist, Year		Dist, Year	
Obs.	1650		1650	
Adj. R^2	0.967		0.969	

FE = fixed effects.

Notes: Observations are weighted by the district's employment share in the previous year, standard errors are clustered at the province level. The outcomes include logarithmic values of exports value, $Export_{it}$, imports value, $Import_{it}$. The independent variables include trade dispute shocks, $TDS_{shock_{it}}$, lagged manufacturing employment share, $ManShare_{it-1}$, and number of industrial zones, $IndZone_{it}$.

Source: Author's calculations based on the Viet Nam Enterprise Survey and customs data.

Table 5: Heterogeneous Trade Dispute Effects on Regional Development

	$\ln (ManEmp_{it})$	std	$\ln (NonManEmp_{it})$	std
$TDS_{shock_{it}}$	2.026	0.579	2.753	0.885
$ManShare_{it-1}$	1.722	0.159	-0.321	0.140
$IndZone_{it}$	0.077	0.039	0.082	0.028
FE	Dist, Year		Dist, Year	
Obs.	3388		3388	
Adj. R^2	0.983		0.989	

FE = fixed effects.

Notes: Observations are weighted by the district's employment share in the previous year, standard errors are clustered at the province level. The outcomes include logarithmic values of employment in manufacturing industries, $ManEmp_{it}$, and employment in nonmanufacturing industries, $NonManEmp_{it}$. The independent variables include trade dispute shocks, $TDS_{shock_{it}}$, lagged manufacturing employment share, $ManShare_{it-1}$, and number of industrial zones, $IndZone_{it}$.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

3.2 Difference-in-Difference Estimates of Trade Dispute Impacts

As a complement to the shift-share estimates, we also estimate the trade dispute impacts using the DID method. This is in line with other studies on the impact of the US–PRC trade dispute and thus facilitates comparison across studies. However, since DID estimators identify the causal effect of trade dispute shocks through the differences across affected and unaffected industries, it may subject to the bias due to spillover across industries. To implement the DID estimation, we classify industries as either treated or control based

on whether they were affected by US tariffs during 2018–2019. Figure 7 illustrates the time trends in deflated sales, employment, and the number of firms for both the treated and control industries. The figure shows a noticeable shift in trends around 2018–2019. For the treated group, growth in sales, employment, and the number of firms slowed after 2019, despite a significant jump in employment in 2018. However, FDI in these industries continued to grow at a faster rate post-2018. In contrast, the control group experienced faster growth in sales and the number of firms after 2018, though employment growth slowed. Further, the treated group exhibited a different pre-trend in employment before 2018. Overall, the evidence suggests that the trade dispute shock impacted all industries, with the comparison between treated and control industries revealing a net effect that combines the direct impact on treated industries and the indirect effect on the control group.

Figures 8 and 9 illustrate the time trends for international trade values and the number of firms participating in international trade, categorized by whether the involved HS codes were affected by US tariffs. We classify trade partner by location into the US; East Asia—including the PRC; Hong Kong, China; Japan, the Republic of Korea; and Taipei, China; and others. For exports to the US and East Asia, there is a significant spike in trade values in 2019. A similar pattern is observed in the number of exporting firms, indicating that the extensive margin plays a key role in explaining changes in trade value. The plots also reveal that the US and East Asia are Viet Nam’s major export destinations despite having a smaller number of exporting firms compared to other regions. While exports to other destinations also increased, the growth is more gradual, and the number of exporting firms does not show a significant rise. On the import side, trade values with all partner regions increased after 2019, but the changes are less pronounced and more uniform across regions. The number of importing firms remained relatively unchanged.

We next apply a DID framework to estimate whether the directly affected industries experienced different growth patterns. The regression specification is as follows:

$$\ln y_{igt} = \beta_0 + \beta_1 \text{Tariff}_{gt}^{US,CN} + \phi_g + \phi_{it} + \varepsilon_{igt}, \quad (2)$$

where the outcome variables include the total deflated sales, Sales_{igt} , in district i , 4-digit industry g , year t , the total employment, Emp_{igt} , and the total number of firms, NumFirm_{igt} . The regression sample uses the data from 2013 to 2021. The US tariff measure, $\text{Tariff}_{gt}^{US,CN}$, is set to zero before the tariff’s effective year, making it similar to an interaction term between the treatment and time dummies in a classical DID

regression. We control for industry and district-year fixed effects to absorb irrelevant factors that affect regional outcomes.

A key issue in estimating equation (2) is accounting for the extensive margin created by firm entry and exit in response to the shock. In each district, growing industries are likely to attract new firms, and excluding industries that had no observations before the shock but show positive observations after the shock could introduce bias into the estimates. For instance, consider a district with two industries, A and B. Before the shock, industry B is excluded from the data due to having no FDI, while industry A has 100 units of FDI. After the shock, industry B records 1 unit of FDI, and thus is included. The average FDI across both industries would appear to decrease from 100 to 50.5 (i.e., $101 / 2$). This effect tends to be more substantial when we focus on a finer unit of region. To properly account for this, we add zeros to the outcome variables for industries that have at least one positive observation over the years in each district.

In similar regressions, we report estimated results using total FDI, FDI_{igt} , but limit the analysis to 2017–2020 due to data availability. We also provide DID estimates of the trade dispute's effects on international trade, utilizing Vietnamese customs data and restricting the time period to 2018–2022 for the same reason. In the DID regressions of trade value, we use 4-digit HS codes to define industries and aggregate trade values for provinces; then we pad zeros using the procedure similar in regional regressions. Aggregating trade flows into a coarser unit of observation helps to alleviate the potential bias introduced by omitting zeros in the data. The US tariffs are averaged across 6-digit HS code levels. Consistent with previous plots, we aggregate trade destinations into three categories: the US, East Asia, and other regions.

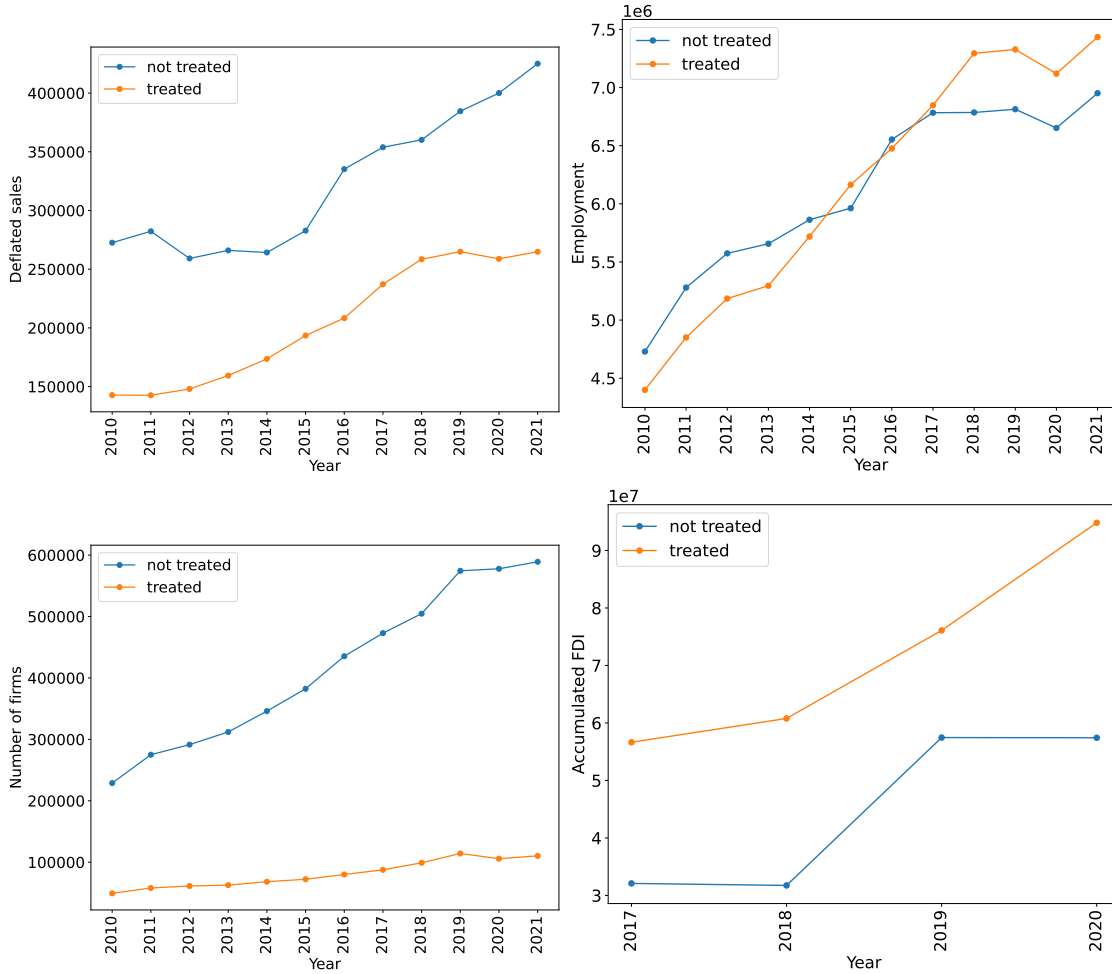
Table 6 present the estimation results of the DID regressions using regional outcomes. As expected, the DID estimates, which capture the net effect of the trade dispute, are generally smaller than the estimates from the shift-share regressions. The results in Table 6 indicate that the directly affected industries experience a decrease in the employment and in the number of firms. The estimate of FDI shows that the treated industries received a modest larger capital flows after the trade dispute. To check the parallel assumptions underlying the DID regressions, we report the event study estimates in Figure 10. Specifically, we interact the year dummy with the treated industry dummy and report the estimates for these interaction terms. Due to data constraints for FDI, we can only compare the difference relative to 2017, which is positive from 2018 to 2020. For other regional employment and the number of firms, we see evidence that the treated industries are already growing at a faster speed before the trade conflict.

Interestingly, the time trends of estimates for both variables jumped during 2018 to 2019 period, showing a temporal effect of the trade dispute.

The coefficients in Table 7 are significantly positive across all regressions, indicating an increase in exports between Viet Nam and its major trade partners for those products affected by US tariffs. The coefficients in Table 8 are mixed. Imports from the US decrease, while imports from East Asian economies and other regions increase, and the import increase is much higher from East Asian economies. The increase in exports and imports with other East Asia economies is consistent with intensified global value chain activities. Together with the increase in exports to the US and other regions, it suggests that the flow of these global value chains likely moves from East Asian economies to Viet Nam, and then to other regions around the world.

The data availability restricts our ability to test the parallel trend assumption for trade flow regressions. To provide some evidence regarding the time trend of Vietnamese trade flows before the trade dispute, we use the annual total exports and imports at the HS4 code level obtained from the UN Comtrade database for 2011–2022 to conduct event study regressions. To implement the regression, we interact year dummies with the treatment dummies, where the HS4 code is regarded as treated if any of the HS6 code under it is affected by US tariffs on the PRC. Plots for the estimates of the interaction terms are reported in Figure 11. Vietnamese exports for the treated products increase faster after 2018, although the accelerating trend started as early as 2016. For imports, there is no substantial difference between the treated and the control groups. This is consistent with the diverging signs for the estimates across regions, as we saw in Table 8.

Figure 7: Time Trend of Trade Dispute Shocks and Regional Outcomes



Notes: The variables on the vertical axes from the upper left to lower right panels are deflated sales, employment, number of firms, and foreign direct investment (FDI). A firm is treated if its HS4-digit industry has a positive tariff in any year during the sample period.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

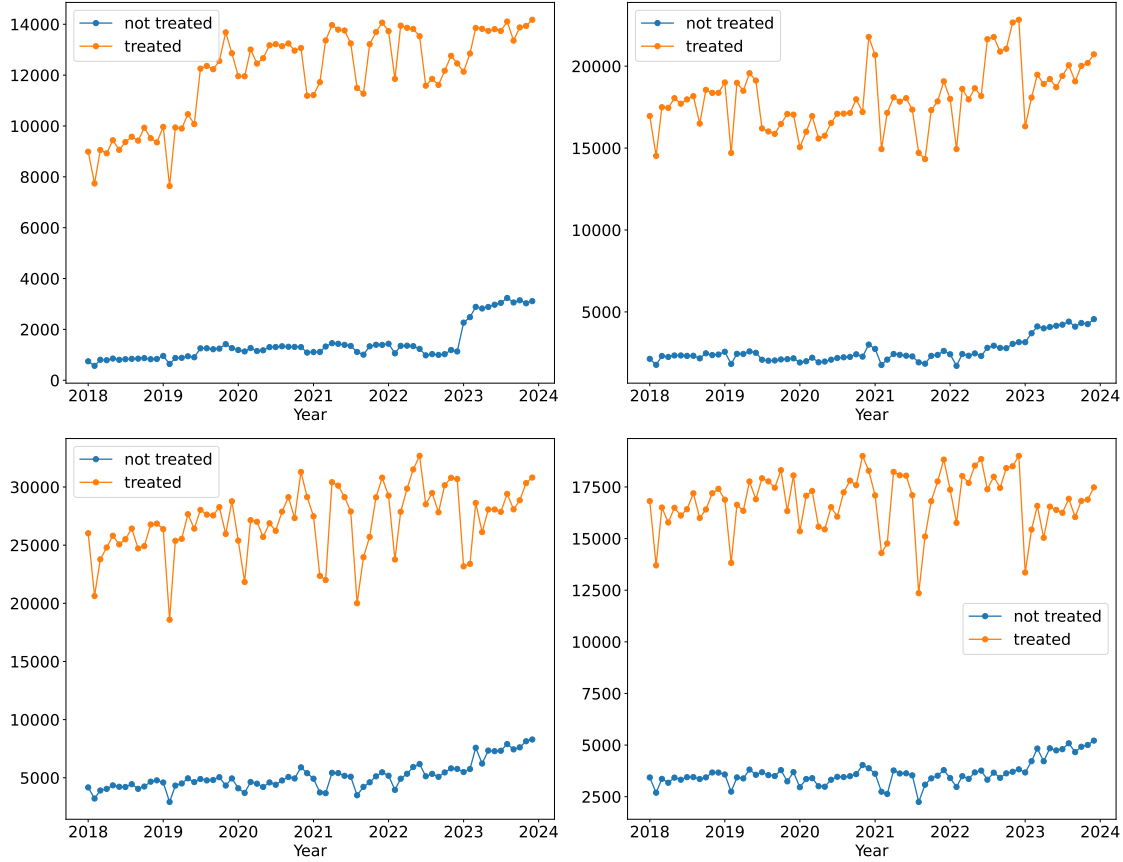
Figure 8: Time Trend of Vietnamese Trade Values



Notes: The upper left panel plots the total export values to the United States and East Asia; the upper right panel plots the total export values to other destinations. The lower panels plot the corresponding figures for imports.

Source: Author's calculations based on Vietnamese customs data.

Figure 9: Time Trend of Number of Vietnamese Exporting Firms



Notes: The upper left panel plots the number of firms exporting to the United States and East Asia, the lower right panel plots the number of firms exporting to other destinations. The lower panels plot the corresponding figures for imports.

Source: Author's calculations based on Vietnamese customs data.

Table 6: Difference-in-Difference Estimates of Trade Dispute Effects on Regional Development

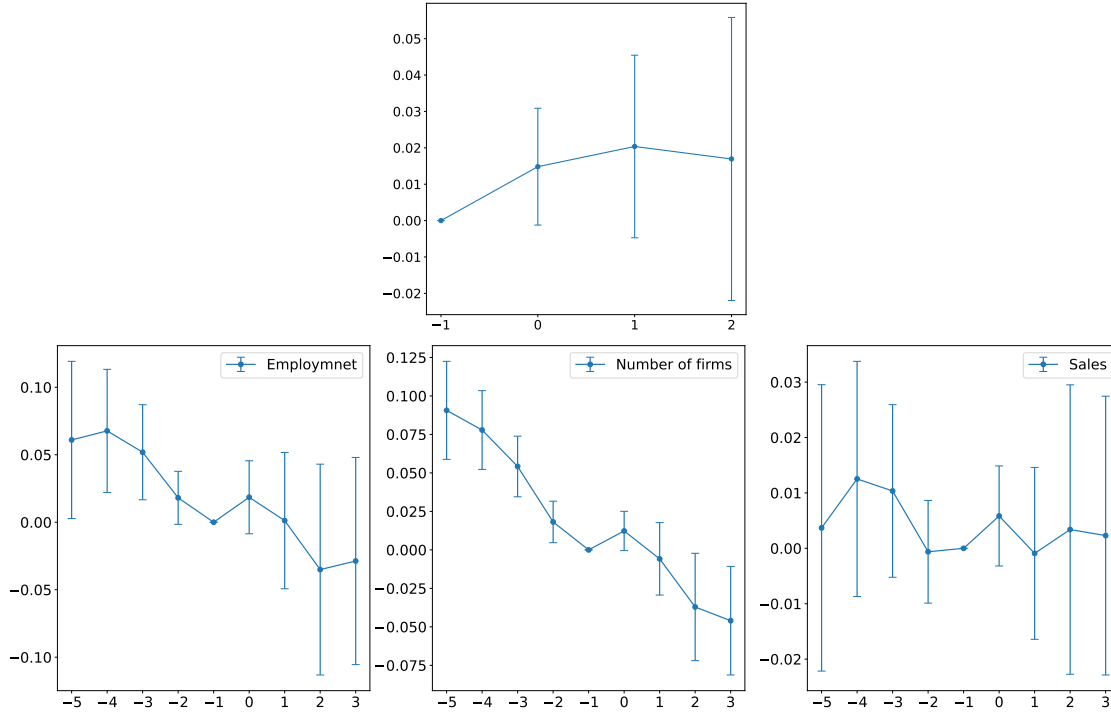
	$\ln(Sales_{igt} + 1)$	std	$\ln(Emp_{igt} + 1)$	std
$Tari_{gt}^{US,CN}$	-0.039	0.137	-0.776	0.353
FE	Dist-Ind, Dist-Year		Dist-Ind, Dist-Year	
No. obs	849096		849096	
	$\ln(NumFirm_{igt} + 1)$	std	$\ln(FDI_{igt} + 1)$	std
$Tari_{gt}^{US,CN}$	-0.859	0.155	0.221	0.160
FE	Dist-Ind, Dist-Year		Dist-Ind, Dist-Year	
No. obs	849096		376067	

FE = Fixed Effects.

Note: Standard errors are clustered at industries level.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

Figure 10: Event Study Estimates of Trade Dispute Effects on regional Development



Notes: The upper figure shows the event study estimates for foreign direct investment (FDI); the lower figures show the event study estimates for employment, number of firms, and sales.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

Table 7: Trade Dispute Impacts on Vietnamese Exports

	$\ln(Value_{gt} + 1)$	std	$\ln(Value_{gt} + 1)$	std	$\ln(Value_{gt} + 1)$	std
$Tari_{gt}^{US,CN}$	0.491	0.147	1.141	0.203	0.644	0.169
Direction	VN to US		VN to EA		VN to other regions	
No. Obs.	1537970		1728940		1722923	

EA = East Asia, US = United States, VN = Viet Nam.

Notes: Regressions also control for province-month and province-product fixed effects. Standard errors are clustered at the products level.

Source: Author's calculations based on Vietnamese customs data.

Table 8: Trade Dispute Impacts on Vietnamese Imports

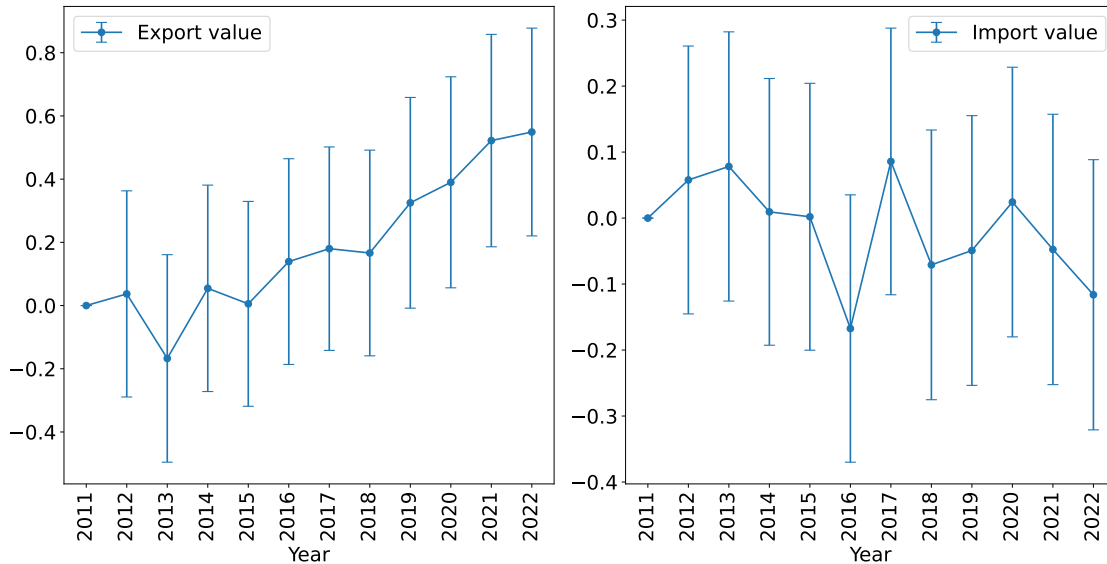
	$\ln(Value_{gt} + 1)$	std	$\ln(Value_{gt} + 1)$	std	$\ln(Value_{gt} + 1)$	std
$Tari_{gt}^{US,CN}$	-2.732	0.223	1.128	0.149	0.231	0.085
Direction	VN from US		VN from EA		VN from other regions	
No. Obs.	2083070		2322631		2167305	

EA = East Asia, US = United States, VN = Viet Nam.

Notes: Regressions also control for province-month and province-product fixed effects. Standard errors are clustered at the products level.

Source: Author's calculations based on Vietnamese customs data.

Figure 11: Event Study Estimates of Trade Dispute Effects on Trade Flows



Notes: Controlled fixed effects include year and products.

Source: Author's calculations based on UN Comtrade data.

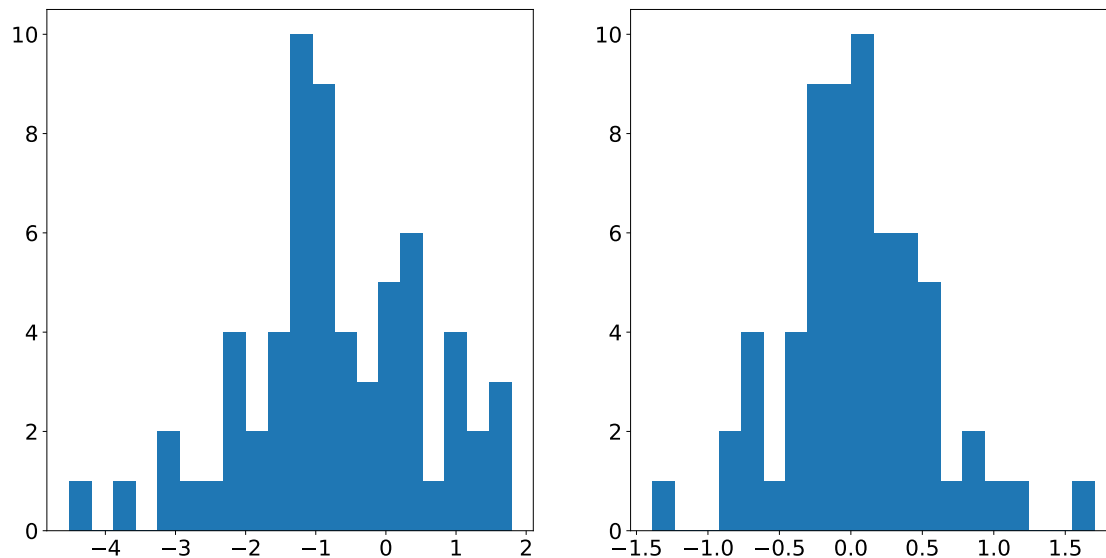
3.3 Heterogeneous Effects Across Viet Nam's Different Regions

In this subsection, we explore the potential of heterogeneous effects of the US–PRC trade dispute across different regions in Viet Nam. To do this, we firstly estimate equation (2) separately for each Vietnamese province, therefore allowing the trade dispute impact and other coefficients to differ across provinces, then we use the market access measure and the average number of industrial zones to explain the differential impacts of trade dispute. The two measures we use allow us to characterize how the existing transport infrastructure and related policies affect the distribution of shocks over space.

Figure 12 shows the distribution of the DID estimates across Vietnamese provinces. While the average effect is zero or negative for both employment and sales there is

substantial heterogeneity across provinces. To visualize the spatial distribution of the trade dispute impacts, Figure 13 further plots the provincial coefficients for employment and sales in a map. The provinces centered in the north, middle, and south of Viet Nam experience positive impacts, while the regions in between tend to experience a negative effect. Table 9 reports results for the regression that uses average access to other markets across districts in 2016 to explain the estimated DID coefficients for each province. The positive correlation with the DID estimates shows that provinces with better transport infrastructure connecting to larger markets tend to experience a larger impact from shocks in the environment.

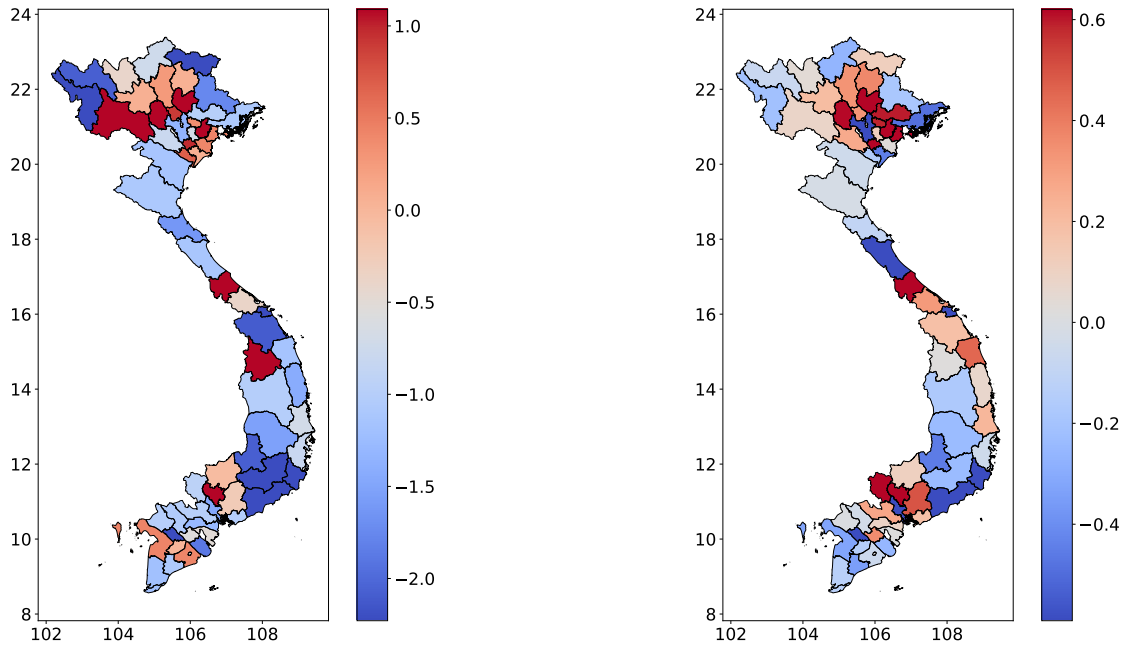
Figure 12: Distribution of Difference-in-Difference Estimates Across Vietnamese Provinces



Notes: The left panel plots the difference-in-difference estimates of tariffs' effect on employment across Vietnamese provinces; the right panel plots the corresponding estimates on sales.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

Figure 13: Spatial Distribution of Difference-in-Difference Estimates Across Provinces



Notes: The left panel plots the difference-in-difference estimates of tariffs' effect on employment across Vietnamese provinces; the right panel plots the corresponding estimates on sales.

The boundaries, colors, denominations, and any other information shown on this map do not imply, on the part of the Asian Development Bank, any judgment on the legal status of any territory, or any other endorsement or acceptance of such boundaries, colors, denominations, or information.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

Table 9: Heterogeneity of Tariff Effects

	β_i^{Emp}	std	β_i^{Sales}	std
$\ln Access_i$	0.514	0.251	0.199	0.099
No. Obs	63		63	
Adj. R^2	0.049		0.046	

Source: Author's calculations based on the Viet Nam Enterprise Survey.

4 THE NEXUS OF FOREIGN DIRECT INVESTMENT, TRADE, AND REGIONAL DEVELOPMENT

In this section, we explore the role of FDI in the responses of Vietnamese firms to trade dispute shocks. Figure 14 plots the sales, employment, and firm shares of foreign affiliates from 2011 to 2021. The economic significance of foreign affiliates steadily increased over the review period, with their shares of sales and employment increasing from around 20% in 2011 to 30% or higher in 2021. In contrast, during the same period, the number of

foreign affiliates held stable at around 3% of all firms. The importance of foreign firms is further confirmed by Figure 15, which shows that the foreign firms accounted for more than 50% of Vietnamese exports and imports in 2018, and the share further increased to 60% in 2021. Together, the evidence shows that the foreign firms tend to be much bigger and more influential in international trade. This is consistent with the evidence documented from a variety of other data.

Our findings reveal that the distribution of foreign firms is far from even across different regions in Viet Nam. Across district-years, the average share of employment for foreign affiliates is 13.1%, while the median is only 0.7%. To further explore the determinants of the location of foreign firms, we run the following regression:

$$ShareEmpFor_{it} = \beta_0 + \beta_1 \ln Access_i + \beta_2 NoIndZone_{it} + \beta_3 \ln ProxPort_i + \phi_i^{prov} + \phi_t + \varepsilon_{it}, \quad (3)$$

where $ShareEmpFor_{it}$ is the employment share for district i year t , $Access_i$ and $ProxPort_i$ is the market access and the proximity to the port, or the inverse of the distance to the nearest port, calculated using transport network in Viet Nam in 2016, $NoIndZone_{it}$ is the number of industrial zones in district i year t . Province and year fixed effects are also controlled; therefore, the coefficients capture the variation across districts within each province. Since we use the 2016 transport network data to calculate the explanatory variables, and to avoid the influence by the trade dispute, we restrict the sample period to 2015–2017 in this regression.

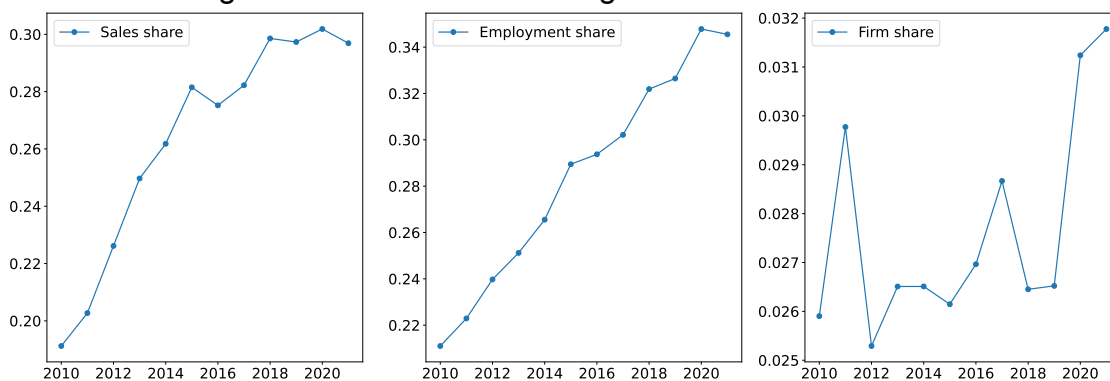
Table 10 reports the estimation results. Market access and policy and transport infrastructure are all found to help explain the location choices of foreign affiliates. To facilitate comparison across different factors, the explanatory variables are normalized to zero mean and one unit standard deviation. Industrial zone policy is found to have the largest impact and most precise estimate, with a one standard deviation increase associated with a 7.6% higher employment share for foreign affiliates. Districts with a one standard deviation increase in market access were found to have a 7.4% increase in the employment share of foreign affiliates, and a one standard deviation increase in port proximity was found to increase foreign firm's employment share by 1.6%.

Because foreign affiliates have greater participation in international markets, it is likely that they would respond to the trade dispute differently than domestic firms. To explore this dimension of heterogeneity, we estimate the DID regression for equation Equation (2) using firm-level data separately for the foreign affiliates and domestic firms. We exclude firms that report either zero employment or zero sales as these firms were likely to be inactive during the review period. In the regression using employment and

sales as outcomes, we use the sample from 2016 to 2020; in the regression using FDI as an outcome, we use the sample from 2017 to 2020; and in the regression using trade value as outcome, we use the sample from 2018 to 2022.

Table 11 to Table 14 report the estimates of firm-level responses to the trade dispute shock. We see a remarkable difference between foreign affiliates and domestic firms. For the foreign affiliates, a one percentage point increase in US tariffs increased sales by 3.0%, the employment share by 2.16%, FDI by 3.6%, annual export values by 8.1%, and annual import values by 3.0%. While for domestic firms, most of the responses were not significantly different from zero, except for the employment, which had a negative response to the trade dispute shock, showing a larger indirect effect.

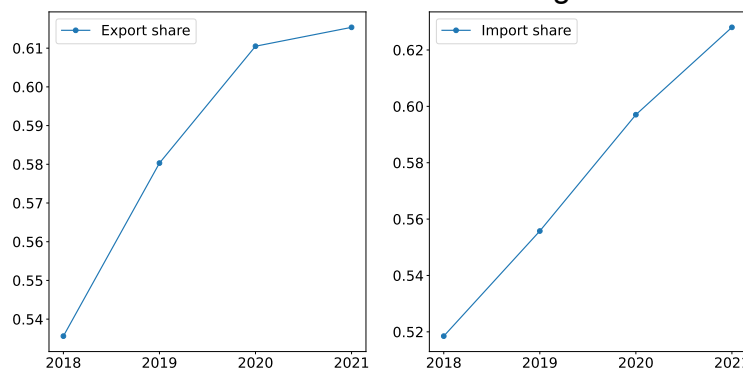
Figure 14: Presence of Foreign Affiliates in Viet Nam



Note: From left to the right, the figure plots the aggregate shares of sales, employment, and number of firms for foreign affiliates in Viet Nam.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

Figure 15: International Trade Presence of Foreign Affiliates in Viet Nam



Notes: The left side of the figure plots the aggregate share of export values for foreign affiliates in Viet Nam; the right side plots the share of import values.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

Table 10: Spatial Distribution of Foreign Affiliates in Viet Nam

	$ShareEmpFor_{it}$	std
$\ln Access_i$	0.074	0.015
$NoIndZone_{it}$	0.076	0.007
$\ln ProxPort_i$	0.016	0.004
Obs.	1965	
Adj. R^2	0.433	

Notes: The table reports regression of share of employment by foreign firms, $ShareEmpFor_{it}$, on market access, $\ln Access_i$, number of industrial zones, $NoIndZone_{it}$, and port proximity, $\ln ProxPort_i$. The province and year fixed effects are controlled. The standard errors are heteroscedasticity robust. Explanatory variables are normalized to zero mean and unit standard deviation.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

Table 11: Firm-Level Responses to Trade Dispute Impacts among Foreign Affiliates

	$\ln (Sales_{ft})$	std	$\ln (Emp_{ft})$	std	$\ln (FDI_{ft} + 1)$	std
$Tar_{gt}^{US,CN}$	3.025	0.428	2.157	0.289	3.552	0.541
FE	Dist-Ind, Year		Dist-Ind, Year		Dist-Ind, Year	
Obs.	72669		72669		60782	

FE = fixed effects.

Note: The outcomes include logarithmic values of deflated sales, $Sales_{ft}$, employment, Emp_{ft} , and FDI, FDI_{ft} . The independent variables include the US tariffs on PRC. Standard errors are clustered at the industry level.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

Table 12: Firm-Level Trade Responses to Trade Dispute Impacts among Foreign Affiliates

	$\ln (Export_{ft})$	std	$\ln (Import_{ft})$	std
$Tar_{gt}^{US,CN}$	8.147	2.012	2.987	1.522
FE	Dist-Ind, Year		Dist-Ind, Year	
Obs.	47390		47390	

FE = fixed effects.

Note: The outcomes include logarithmic values of exports, $Export_{ft}$, and imports, $Import_{ft}$. The independent variables include the US tariffs on PRC. Standard errors are clustered at the industry level.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

Table 13: Firm-Level Responses to Trade Dispute Impacts Among Domestic Firms

	$\ln(Sales_{ft})$	std	$\ln(Emp_{ft})$	std
$Tari_{gt}^{US,CN}$	-0.105	0.263	-0.862	0.238
FE Obs.	Dist, Ind, Year 2288540		Dist, Ind, Year 2288540	

FE = fixed effects.

Note: The outcomes include logarithmic values of deflated sales, $Sales_{ft}$, employment, Emp_{ft} . The independent variables include the US tariffs on PRC. Standard errors are clustered at the industry level.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

Table 14: Firm-Level Trade Responses to Trade Dispute Impacts Among Domestic Firms

	$\ln(Export_{ft})$	std	$\ln(Import_{ft})$	std
$Tari_{gt}^{US,CN}$	-0.425	0.307	-0.162	0.339
FE Obs.	Dist, Ind, Year 1471076		Dist, Ind, Year 1471076	

FE = fixed effects.

Note: The outcomes include logarithmic values of exports, $Export_{ft}$, and imports, $Import_{ft}$. The independent variables include the US tariffs on PRC. Standard errors are clustered at the industry level.

Source: Author's calculations based on the Viet Nam Enterprise Survey.

5 CONCLUSION

In this paper, we explore the spatial distribution of the trade shock in Viet Nam that resulted from the US–PRC trade dispute. Exploiting detailed data and different econometric methods, we show that Vietnamese districts with higher exposure to the trade dispute shocks increase more in terms of sales, employment, and the number of firms. While exports increase to all major destinations, the changes in imports differ across trade partners. Our results highlight the important difference between direct and indirect effects of trade dispute. The distribution of trade increases depends on the region's connectivity to other regions that depend on transportation infrastructure and industrial policies. We also point to the importance of foreign affiliates in determining the changes after the shocks.

While outside the scope of this paper, several avenues remain for further consideration. First, the structure of internal trade costs warrants further investigation, particularly the potential existence of a cost threshold beyond which the trade-harming effect may exhibit a discontinuous jump. Identifying such a threshold could clarify the

concentration of responses observed in the trade dispute. Second, while this study focuses on the number of industrial zones, examining the qualitative differences between them could provide insights into the optimal design of industrial policies. Finally, although seaports are included in our current analyses, extending the examination to the impact of airport infrastructure investments and availability may add value and facilitate a deeper understanding.

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Foreign Direct Investment Location and Trade Dynamics in Viet Nam After the US–PRC Trade Dispute

This paper aims to quantify the distributional effects of the United States–People’s Republic of China trade dispute across different regions in Viet Nam. By utilizing detailed firm-level and customs data, the results show that foreign direct investment (FDI) in Viet Nam is geographically concentrated in the northern, central, and southern regions with well-developed road infrastructure. The findings also highlight the important role played by multinational firms from East Asia and the United States in reshaping Viet Nam’s trade flows in the aftermath of the trade dispute. The paper sheds light on the interplay between transport infrastructure, FDI, and international trade.

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