

# Foreign Direct Investment and Trade Dynamics in Vietnam after the US–PRC Trade Dispute\*

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## Abstract

This paper develops a quantitative trade model with multinational production to study how the US-China trade dispute affected Vietnam through trade, investment, and regional development. Our first contribution verifies the trade reallocation effect of US tariffs using both bilateral and origin-production-destination-level trade data. A one percentage point increase in US tariffs on the PRC raises Vietnamese exports to the US by around 5% and imports from China by around 3%. Our second contribution shows that these changes are driven by the location choices of multinationals, particularly PRC firms, together with evidence of increasing returns to scale. Chinese multinationals experienced the largest trade growth, with new entrants accounting for much of the expansion, and their location choices were strongly influenced by access to ports, roads, and industrial zones. Our third contribution uses a shift-share design to estimate regional impacts, finding that US tariff shocks increase district-level sales, employment, firm entry, exports, and imports, with spillovers to both manufacturing and non-manufacturing sectors. Preliminary simulations of the calibrated model validate these channels and quantify the welfare impacts on the three countries involved, finding that Vietnam benefits from trade diversion while China bears the largest welfare cost.

*Keywords:* Trade, ports, roads, US-China trade dispute, Vietnam, PRC

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

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# 1 Introduction

Since 2018, the United States (US) has significantly changed its trade policy toward its major trade partners. According to the Peterson Institute, the average tariff the US imposes on the People’s Republic of China (PRC) has increased from lower than 5% to 19.3% after 2020 (Bown, 2021). Due to its proximity and industrial similarity to the PRC and competitive labor costs, Vietnam is a natural candidate location to be included in the global value chains of multinational enterprises (MNEs) to act as an export platform to the US market. Several studies have already noticed the trade diversion phenomenon after the trade dispute (Fajgelbaum et al., 2021; Alfaro and Chor, 2023). Although more attention has been paid to the increase in trade for the nonaligned third countries, or the “connectors,” less is known about the developmental consequences of the changes in trade flows. Critical remaining questions include whether altered trade flows reflect a relocation of production, how MNEs drive these shifts, and how the domestic impacts of trade disputes are distributed across regions within connector countries.

To guide our empirical analysis, we build a quantitative trade model that combines key components from the existing literature to fit the connector-country context. Three features are particularly important. First, the model features the location choice of multinational enterprises: firms originating from a source country (e.g., China) choose the optimal production location—at home, in the connector country (Vietnam), or in the destination market (the US)—to minimize the cost of serving each market, giving rise to a “connector channel” through which trade policy shocks are transmitted. Second, the model allows for returns to scale at the sector–location level, so that an inflow of production activity to a location lowers unit costs through agglomeration, amplifying the initial trade diversion effect. Third, the model incorporates internal geography within the connector country, including subnational regions, transport infrastructure, and port choice, which jointly determine the spatial distribution of multinational production and the regional incidence of trade shocks. These three features generate testable predictions linking US tariffs to bilateral trade flows, firm entry and location patterns, and regional development outcomes, which we take to the data in the following sections.

To shed new light on these questions, this paper conducts a three-level analysis utilizing multiple datasets, including conventional trade statistics, firm-level data, customs transactions, and input-output linkages. First, we provide a new estimate of the elasticity of Vietnam’s international trade flows with respect to the US tariffs on imports from PRC. Our identification strategy is built on a triple differences framework, exploiting exogenous variations in trade measures of the US since 2018 with trade partner heterogeneities.

Specifically, our estimates compare the changes in trade flows between products affected and not affected by the US tariffs between periods before and after the tariffs take effect. Furthermore, we benchmark these changes against the differences in bilateral trade flows between Vietnam-PRC (for imports), Vietnam-US (for exports), and Vietnam-other East Asian regions (i.e., Japan and South Korea, "EA"). The motivation for this identification strategy is that other East Asian regions (EA) are also major trade partners with Vietnam and, therefore, will be affected by similar shocks that impact Vietnam's domestic production process, but they are less directly affected by the US tariffs on the PRC. Introducing this third layer of comparison helps to solve the problem of different time trends between the affected products and the unaffected products before the US tariffs take effect. This problem is likely to happen since Vietnam's trade with other countries concentrates on manufacturing products, which are the main target of tariffs and are growing at different speeds. As supporting evidence that other East Asian regions (EA) serve as valid control groups, the event study estimates show that the time trends before the trade dispute are not significantly different between Vietnam-PRC or US trade and Vietnam-Other East Asian regions (EA) trade. The US tariffs are found to significantly increase Vietnam's exports to the US and imports from the PRC, compared with the changes in trade flows with other East Asian regions (EA). Our analysis shows that one percentage increase in the tariff increases the exports to the US by around 5% and the imports from PRC by around 3%.

We also provide evidence to test the hypothesis that the changes in the trade flow are simple re-routing of goods from PRC to the US. We show that Vietnam mainly imports intermediate goods from PRC and other East Asian countries (EA) and exports final goods to the US and EU, and the changes in trade flows happen together with a significant increase in FDI flows. Moreover, the economic incidence of tariffs propagates along the value chain. Specifically, U.S. tariffs on downstream consumer goods induce Vietnam to scale up its imports of intermediate and upstream inputs from the PRC. These findings support the hypothesis that the trade dispute prompted MNEs to relocate a greater share of their production to Vietnam. However, our findings also suggest a potential crowding-out effect. Following the trade dispute, Vietnam's domestic value-added share declined, while the share of value-added from the PRC increased. This shift indicates that the resulting production activities rely on a lower proportion of domestic content.

As a second contribution, we provide evidence that the observed changes in trade flows are driven by the location choices of multinational enterprises, particularly PRC firms, together with increasing returns to scale. Using Vietnam's enterprise survey data, we find that the expansion of PRC firms in affected industries is significantly driven by the extensive margin: new firm entry accounts for a substantial share of the trade growth, while domestic firms

tend to contract in the face of heightened competition. We further show that the location choices of foreign affiliates are systematically shaped by local infrastructure and policy. A one standard deviation increase in market access raises the employment share of foreign firms by 7.4%, an additional industrial zone by 7.6%, and proximity to the nearest port by 1.6%. Finally, we estimate the magnitude of external returns to scale at the district-industry level and find that a 10% increase in total industry employment raises firm productivity by approximately 0.3%, confirming that the agglomeration forces embedded in our theoretical framework are empirically relevant.

Moreover, we combine various data sources to explore the role of foreign affiliates in determining Vietnam's responses to trade dispute shocks. To begin with, foreign firms account for a significant share of the economic activities in Vietnam. Using enterprise survey data, it is found that firms with foreign connections are substantially larger than their domestic counterparts, accounting for 20% of total employment in 2011 and over 30% in 2021, despite comprising only about 3% of all firms in both years. This data highlights a significant, growing employment footprint for foreign-connected firms over the decade. Also, using the OECD Analytical Activity of Multinational Enterprises database, we find that foreign firms account for more than 23% of gross exports and 36% of gross imports before 2018, and both shares are increasing after 2018. Furthermore, the spatial distribution of foreign firms is highly uneven. Our findings indicate that existing transport infrastructure and related policies significantly influence the locational choices of foreign affiliates, which tend to cluster in districts characterized by superior market access, a higher density of industrial zones, and close proximity to ports.

To explore the role of foreign firms in driving the observed patterns of changes in trade flows, we combine the enterprise survey and Vietnam's customs data to examine the heterogeneity in firms' responses to the trade dispute shocks. Four facts emerge from this analysis. Firstly, the changes in exports to the US and imports from the PRC are larger for foreign firms than for domestic firms. Secondly, the foreign firms from the PRC have the largest increase in exports to the US and imports from the PRC after 2018. Their share of exports to the US keeps increasing and exceeds that of foreign firms from other East Asian countries (EA) in 2020. Thirdly, the PRC firms' trade flow changes are significantly driven by the extensive margin. Specifically, in 2019 and 2020, the average annual increase of exports to the US is 0.705 log points for PRC firms, and the average annual increase of imports from PRC is 0.451 log points. Out of these numbers, 0.292 log points are contributed by the entry of new PRC firms. Finally, the foreign affiliates are much more responsive to the US tariffs. Given a one percentage point increase in the tariff, the PRC firms increase exports to the US two times more than domestic firms and increase their imports from the PRC, while the

domestic firms decrease their imports from the PRC.

As a third contribution, we estimate the trade dispute’s impact on Vietnam’s regional development using a shift-share instrumental-variables (IV) design, following [Borusyak et al. \(2022\)](#): We construct a district-level trade shock as the pre-conflict weighted average of contemporaneous US–PRC tariffs. Our estimates show that a one percentage point increase in the trade dispute shock leads to a 1.9% increase in district-level sales, a 2.1% increase in district-level employment, a 2.6% increase in the number of firms, a 6.7% increase in export values, and a 5.0% increase in import values. The effects on FDI in manufacturing are substantially larger than in other sectors, confirming that the shock reallocates production toward manufacturing-intensive regions within Vietnam.

To complement the reduced-form analysis, we calibrate the quantitative general equilibrium model to match key observable moments for China and the US and simulate counterfactual tariff scenarios. The simulation validates that the mechanisms identified in the data, trade diversion through the connector channel, multinational location choice, and cross-sector spillovers, operate in the general equilibrium setting. Under a 25% increase in US tariffs on Chinese manufacturing, Vietnam’s welfare rises by 6.2%, whereas China’s falls by 5.2%. Concurrently, the ‘connector channel,’ through which Chinese firms produce in Vietnam for the US market, more than doubles, underscoring Vietnam’s role as a strategic platform for effective tariff evasion.

Overall, this paper is among the first to integrate quantitative modeling with reduced-form empirical analysis in a comprehensive study of the impacts of trade disputes on connector economies. Our analyses show that tariff effects ripple through supply chains and factor markets, revealing a new dimension of how trade disputes impact the economy. This study also examines the interplay between transport infrastructure, foreign direct investment (FDI), and international trade in shaping the spillover effects of trade disputes. It highlights how these channels jointly influence the economic resilience and competitiveness of third-party countries and how the resulting impacts are distributed globally, creating both winners and losers in the world economy.

## 2 Related literature

Our paper closely relates to the literature investigating the effects of the US-PRC trade dispute on Vietnam. Previous studies already noted the spillover effects on Vietnam (see, for example, [Fajgelbaum et al. 2021](#)), or more generally the role of connector economies in as a bridge between blocs ([Gopinath et al., 2025](#)). [Ngoc and Wie \(2023\)](#) use the Vietnam 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 tariff wedges as an instrumental variable, they show that firms transitioning into exporters increase their productivity. [Mayr-Dorn et al. \(2026\)](#) and [Rotunno et al. \(2023\)](#) use labor force survey data to investigate the US–PRC trade dispute’s effects on labor market outcomes in Vietnam. They confirmed that Vietnamese exports to the US of affected products increased after the trade dispute, and this export expansion led to more jobs, lower informal employment in traded industries, and longer working hours. Moreover, they document evidence suggesting a narrower gender difference in wages after the shock. [Nguyen and Lim \(2023\)](#) provides evidence that the trade dispute drives the structural transformation in Vietnam. Our paper differs from these papers in two aspects. First, we explore how the existing infrastructure affects the regional distribution of the trade dispute in Vietnam. Secondly, we use transaction-level customs data to document finer responses to the trade dispute shocks.

A recent paper closely related to our study is [Iyoha et al. \(2025\)](#), which uses the share of trade value that happens within the same HS code to quantify the share of re-routing exports from PRC to the US via Vietnam. Our findings complement their work by demonstrating that re-routing and genuine MNCs production activities can coexist simultaneously. [Schulze and Xin \(2025\)](#) use IO tables from the Eora Global Supply Chain Database to differentiate between re-routing and real multinational production activities. Unlike our findings on the crowding-out effect, they observe an increase in domestic value-added in Vietnam, likely due to differences in the data used. While [Wu \(2025\)](#) also highlights foreign manufacturers as key drivers of Vietnam’s trade dynamics, its analysis leaves a gap regarding how their specific geographic locations dictate the uneven spatial distribution of trade impacts. Regarding the trade liberalization between Vietnam and the US as a 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 growth in the developing country. While our study uses the shock from the trade conflicts between China and the US, their results serve as an important background in understanding the Vietnamese economy. [McCaig et al. \(2024\)](#) examines the effect of industrial zone policy in employment creation. Our analysis complements their analysis by showing that the industrial zones may direct foreign firms’ investment, and this may result in different reactions to demand shocks spatially.

By documenting how the growth of firm-level activities across Vietnam depends on industrial zone policies and existing infrastructure, our paper contributes to two strands of the spatial economics literature. The first examines the spatial distribution of economic activity and how place-based policies affect firm sorting ([Gaubert, 2018](#)). The second focuses on the path-dependence of economic activities ([Davis and Weinstein, 2002](#); [Miguel and Roland,](#)

2011; Glaeser, 2022). Further, our findings have meaningful policy implications. Because firms form critical networks through industrial linkages, regions that attract foreign investment will become progressively more competitive over time. Consequently, policymakers face a fundamental tension between maximizing aggregate economic efficiency and ensuring balanced, equitable growth.

### 3 Model

This section develops a theoretical framework to guide our empirical analysis of how US tariffs on China affect Vietnam. The model features return to scale, internal trade cost, and firms’ multinational production decisions. The world consists of internal regions of the domestic country (e.g., Vietnam) under study, whose internal regions are indexed by  $l$ , “source” countries that have a high manufacturing capability (e.g., China) indexed by  $i$ , and “destination” countries that has a high consumption capacity (e.g., the US) indexed by  $n$ . There are  $N$  locations in total. Similar to Caliendo and Parro (2015), there are two types of goods: intermediate goods and composite goods. Locations trade intermediate goods while composite goods are nontradable. Sectors are indexed by  $k, s$ . The firm’s production technology of intermediate goods is

$$y_{il,k}(\omega) = z_{il}(\omega) L_{l,k}^{\gamma_k} b_{il,k}^{\beta_b}(\omega) \prod_s (m_{il,sk}(\omega))^{\beta_{sk}}, \quad (1)$$

where  $z_{il}$  is firm-specific productivity for a firm with origin  $i$  and producing in location  $l$ ,  $L_{il}$  is the total employment in location  $i$  sector  $k$  that the firm takes as given,  $\gamma_k$  controls the return to scale in the sector  $k$ ,  $\beta_b$  is the share of labor,  $\beta_{sk}$  is sector  $k$ ’s share of composite good from sector  $s$ ,  $b_{il,k}(\omega)$  and  $m_{il,sk}(\omega)$  are the labor and intermediate inputs from the upstream sector  $s$  at firm level. We assume  $\beta_b + \sum_s \beta_{sk} = 1$ . The unit cost function is

$$(z_{il} L_{l,k}^{\gamma_k})^{-1} \left( \frac{w_{lk}}{\beta_b} \right)^{\beta_b} \prod_s \left( \frac{P_{ls}}{\beta_{sk}} \right)^{\beta_{sk}}, \quad (2)$$

where  $w_{lk}$  is labor wage,  $P_{ls}$  is the price of the composite good. The composite good is a CES aggregate of intermediate goods over available varieties, indexed by  $\omega$ , across all regions:

$$Q_{lk} = \left( \sum_j \int q_{jk}(\omega)^{\frac{\sigma_k-1}{\sigma_k}} d\omega \right)^{\frac{\sigma_k}{\sigma_k-1}}, \quad (3)$$

and the corresponding price index is given by:

$$P_{lk} = \left( \sum_j \int p_{jk}(\omega)^{1-\sigma_k} d\omega \right)^{\frac{1}{1-\sigma_k}}. \quad (4)$$

Trade between domestic regions  $l$  and the rest of the world requires choosing a port for transportation. Ports are indexed by  $o$ . International trade costs thus consist of two parts, the internal costs between domestic location and a port, and the external costs between the port and the country abroad. The trade cost between each origin location and each port is subject to a stochastic shock, and traders choose the route with minimum trade cost, as in [Allen and Arkolakis \(2022\)](#):

$$\tau_{lon} = \min_o \frac{\tau_{lo}\tau_{on}}{V_{lo}}, \quad (5)$$

where  $\tau_{lo}$  is the non-stochastic part of trade costs between origin  $l$  and port  $o$ ,  $V_{lo}$  is the cost shock that follows a Frechet distribution,  $\tau_{on}$  is the non-stochastic part of trade costs between port  $o$  and destination  $n$ . Similar to [Eaton and Kortum \(2002\)](#), the probability that port  $o$  is chosen is given by

$$\pi_{lo} = \frac{B_o \tau_{lo}^{-\theta^P}}{\sum_r B_r \tau_{lr}^{-\theta^P}}, \quad (6)$$

where  $B_o$  and  $\theta^P$  are the location and variance parameter of the distribution of  $V_{lo}$ . Letting  $\Phi_l = \sum_r B_r \tau_{lr}^{-\theta^P}$ , the average trade costs are

$$\tau_{ln} = E[\tau_{lon}] = \Phi_l^{-\frac{1}{\theta^P}} \Gamma \left( 1 + \frac{1}{\theta^P} \right)^{-1}. \quad (7)$$

Firms compete monopolistically in each market. Thus, the optimal pricing rule is

$$p_{iln,k}(\omega) = \frac{\sigma_k}{\sigma_k - 1} \frac{c_{iln,k} t_{ln,k}}{z_{il}(\omega)}, \quad (8)$$

where  $c_{iln,k} = L_{lk}^{-\gamma_k} \eta_{il} \tau_{ln} \left( \frac{w_{lk}}{\beta_b} \right)^{\beta_b} \prod_s \left( \frac{P_{ls}}{\beta_{sk}} \right)^{\beta_{sk}}$  is the part of the marginal cost shared by all firms from  $i$  that serve region  $n$  via  $l$ ,  $\eta_{il}$  represent the multinational production cost of firms originating from  $i$  producing in  $l$ ,  $\tau_{ln}$  is the iceberg trade costs,  $t_{ln,k} = 1 + \bar{t}_{ln,k}$  is one plus the ad valorem import tariffs from  $l$  to  $n$ . Entering each market requires a fixed marketing cost  $F_n$ , paid in destination labor. The cutoff marginal cost that allows a firm to cover the entering cost thus satisfies

$$c_{ln,k}^* = t_{ln,k}^{\frac{\sigma_k}{1-\sigma_k}} \left( \frac{\sigma_k w_{n,k} F_n}{X_{n,k}} \right)^{\frac{1}{1-\sigma_k}} \frac{P_{nk}}{\bar{\sigma}_k}, \quad (9)$$

where  $X_{n,k}$  is the total expenditure of market  $n$  in sector  $k$ ,  $\tilde{\sigma}_k = \frac{\sigma_k}{\sigma_k - 1}$ .

For the destination market  $n$ , each firm in the source country chooses the production location, among the domestic locations and the source country, that has the lowest cost of serving the market. Following [Arkolakis et al. \(2018\)](#), we assume that each firm draws a vector of productivity across locations from a multivariate Pareto distribution:

$$Pr(Z_1 \leq z_1, \dots, Z_N \leq z_N) = G_{ik}(z_1, \dots, z_N) = 1 - \left( \sum_{l=1}^N [T_{il,k} z_l^{-\theta}]^{\frac{1}{1-\rho}} \right)^{1-\rho}, \quad (10)$$

with support  $z_l \geq \tilde{T}_{ik}^{1/\theta}$  for all  $l$ , and  $\tilde{T}_{ik} = \left[ \sum_l T_{il,k}^{\frac{1}{1-\rho}} \right]^{(1-\rho)}$ . Assuming that firms from  $i$  choosing the location of production of serving market  $n$  by maximizing the variable profits, the probability that a firm from  $i$  will serve market  $n$  from  $l$  is

$$Pr \left( \arg \min_m \frac{\tilde{w}_{imn,k}}{Z_{imn}} = l \cap \min_m \frac{\tilde{w}_{imn,k}}{Z_{imn}} \leq c_{ln,k}^* \tilde{t}_{ln,k} \right) = \Psi_{in,k} \psi_{iln,k} (c_{ln,k}^* \tilde{t}_{ln,k})^\theta,$$

where

$$\psi_{iln,k} = \frac{[T_{il,k} (\tilde{w}_{iln,k})^{-\theta}]^{\frac{1}{1-\rho}}}{\sum_m [T_{im,k} (\tilde{w}_{imn,k})^{-\theta}]^{\frac{1}{1-\rho}}},$$

$$\Psi_{in,k} = \left\{ \sum_m [T_{im,k} (\tilde{w}_{imn,k})^{-\theta}]^{\frac{1}{1-\rho}} \right\}^{1-\rho},$$

and  $\tilde{w}_{iln,k} = \tilde{t}_{ln,k} c_{iln,k}$ , where  $\tilde{t}_{ln,k} = t_{ln,k}^{\frac{\sigma_k}{\sigma_k - 1}}$  reflects the effect of tariffs on variable profits of serving the market  $n$  from  $l$ .

The aggregate trade flow satisfies

$$X_{iln,k} = \frac{M_{i,k} \Psi_{in,k} \psi_{iln,k} \tilde{t}_{ln,k}}{\sum_i \sum_l M_{i,k} \Psi_{in,k} \psi_{iln,k} \tilde{t}_{ln,k}} \frac{X_{n,k}}{t_{ln,k}}. \quad (11)$$

The measure of firm that origin from  $i$ , produces in  $l$ , then sells to  $n$  is

$$M_{iln,k} = \left( \frac{\theta - \sigma_k + 1}{\theta \sigma_k} \right) \frac{X_{iln,k}}{w_{n,k} F_n}. \quad (12)$$

Let  $\Phi_{n,k} = \sum_i \sum_l M_{i,k} \Psi_{in,k} \psi_{iln,k} \tilde{t}_{ln,k}$ , the price index satisfies

$$P_{nk}^\theta = \left( \frac{\theta}{\theta - \sigma_k + 1} \right)^{-1} (\tilde{\sigma}_k)^\theta \left( \frac{\sigma_k w_{n,k} F_n}{X_{n,k}} \right)^{\frac{\theta - \sigma_k + 1}{\sigma_k - 1}} \Phi_{n,k}^{-1} \quad (13)$$

The worker's utility function is a Cobb-Douglas aggregate over composite goods across sectors:

$$U_i = \prod_s x_s^{\alpha_s}, \quad (14)$$

where  $\sum_s \alpha_s = 1$ . To build the labor supply decision in the model across sectors and functions (i.e., innovation and production/marketing), we extend the framework in [Arkolakis et al. \(2018\)](#) as follows. The effective unit of endowment for each worker across sectors and functions (i.e., innovation or production/marketing) are determined by a product of the deterministic part  $w_k^a$ , and a stochastic part  $v_k^a = \frac{u_k^a}{\Gamma(1-1/\theta^L)}$ , where  $u_k^a$  follows a nested Fréchet distribution:

$$F(U_k^a \leq u_k^a, \forall k, a) = \exp \left[ - \sum_{k=1}^K \left( \sum_a (u_k^a)^{-\theta^I} \right)^{\theta^L/\theta^I} \right], \quad u_k^a > 0, \quad (15)$$

where  $\theta^L > 1$ ,  $\theta^I > 1$  are dispersion parameters across segments and across functions, respectively. The share of labor that chooses sector  $k$  and function  $a$  is thus

$$\pi_{lk}^a = \frac{\left( \sum_a (w_{lk}^a)^{\theta^I} \right)^{\theta^L/\theta^I} (w_{lk}^a)^{\theta^I}}{\sum_k \left( \sum_a (w_{lk}^a)^{\theta^I} \right)^{\theta^L/\theta^I} \left( \sum_a (w_{lk}^a)^{\theta^I} \right)}. \quad (16)$$

The supply of labor to each sector and function is given by

$$L_{lk}^a = L_l \left[ \frac{\left( \sum_a (w_{lk}^a)^{\theta^I} \right)^{\theta^L/\theta^I}}{\sum_k \left( \sum_a (w_{lk}^a)^{\theta^I} \right)^{\theta^L/\theta^I}} \right]^{1-\frac{1}{\theta^L}} \left[ \frac{(w_{lk}^a)^{\theta^I}}{\sum_a (w_{lk}^a)^{\theta^I}} \right]^{1-\frac{1}{\theta^I}}. \quad (17)$$

Given  $L_{lk}^e$ , the mass of firm is given by  $M_{lk} = \frac{L_{lk}^e}{f^e}$ .

For each sector  $s$  in each location  $l$ , the labor market clearing condition is

$$\sum_n \sum_i \beta_l \frac{X_{iln,k}}{\tilde{\sigma}_k} + \left( \frac{\theta - \sigma_k + 1}{\theta \sigma_k} \right) \sum_m \sum_i X_{iml,k} = w_{lk} L_{lk}, \quad (18)$$

where the first term on the left-hand side is the expenditure from the firm's labor inputs, the second term is the marketing expenditure for firms that enter  $l$ , and we use the relationship  $\sum_m \sum_i M_{iml,k} w_{lk} F_l = \left( \frac{\theta - \sigma_k + 1}{\theta \sigma_k} \right) \sum_m \sum_i X_{iml,k}$ .

The profit that is used to pay the entry cost is given by

$$\frac{X_{iln,k}}{\sigma_k} - M_{iln,k} w_{nk} F_n = \frac{X_{iln,k}}{\theta \tilde{\sigma}_k}.$$

Thus, for the innovation function in sector  $k$ ,

$$\sum_n \sum_m \frac{X_{lmn,k}}{\theta \tilde{\sigma}_k} = w_{lk}^e L_{lk}^e,$$

where we use the relationship that  $M_{l,k} w_{lk}^e f^e = \sum_n \sum_m \frac{X_{lmn,k}}{\theta \tilde{\sigma}_k}$ .

Total expenditure includes the firms' and the households' spending on composite intermediate goods:

$$X_{lk} = \sum_n \sum_i \sum_s \beta_{sk} \frac{X_{iln,s}}{\tilde{\sigma}_s} + w_{lk} L_{lk} + w_{lk}^e L_{lk}^e + R_{lk} + \Delta_{lk}, \quad (19)$$

where  $R_{lk}$  is the tariff revenue,  $\Delta_{lk}$  is the exogenous transfer to location  $l$  sector  $k$ . Tariff revenue and transfer are allocated to each sector according to the share of expenditure share in the consumer's utility function. Tariff revenue satisfies

$$R_n = \sum_k \sum_i \sum_l (t_{ln,k} - 1) X_{iln,k} \quad (20)$$

and the welfare level becomes

$$W_n = \frac{I_n}{\prod_s P_{n,s}^{\alpha_{n,s}}}, \quad (21)$$

where  $I_n = \sum_k (w_{nk} L_{nk} + w_{nk}^e L_{nk}^e) + R_n + \Delta_n$ .

### 3.1 Equilibrium in Changes

To conduct a numerical simulation, we also define the equilibrium in changes. Denote  $\hat{x} = \frac{x'}{x}$  as the changes, then from the equations in the previous subsection, we can derive

$$\hat{w}_{iln,k} = \hat{t}_{ln,k} \hat{c}_{ilk} = (\hat{t}_{ln,k})^{\frac{\sigma_k}{\sigma_k - 1}} \hat{L}_{lk}^{-\gamma_k} \hat{\tau}_{ln} (\hat{w}_{lk})^{\beta_l} \prod_s (\hat{P}_{ls})^{\beta_{sk}}, \quad (22)$$

$$\hat{P}_{nk} = \left( \frac{\hat{w}_{n,k}}{\hat{X}_{n,k}} \right)^{\frac{\theta - \sigma_k + 1}{\theta(\sigma_k - 1)}} (\hat{\Phi}_{n,k})^{-\frac{1}{\theta}}, \quad (23)$$

$$\hat{\Phi}_{n,k} = \sum_i \sum_l \lambda_{iln,k} \hat{M}_{i,k} \hat{\Psi}_{in,k} \hat{\psi}_{iln,k} \hat{t}_{ln,k}, \quad (24)$$

$$\hat{\psi}_{iln,k} = \frac{\left(\hat{w}_{iln,k}\right)^{-\frac{\theta}{1-\rho}}}{\sum_m \psi_{imn,k} \left(\hat{w}_{iln,k}\right)^{-\frac{\theta}{1-\rho}}}, \quad (25)$$

$$\hat{\Psi}_{in,k} = \left[ \sum_m \psi_{imn,k} \left(\hat{w}_{iln,k}\right)^{-\frac{\theta}{1-\rho}} \right]^{1-\rho}, \quad (26)$$

$$\hat{M}_{i,k} = \hat{L}_{ik}^e. \quad (27)$$

Let  $\bar{w}_{lk} = \sum_a (w_{lk}^a)^{\theta^I}$ ,  $\pi_{a|lk} = \frac{(w_{lk}^a)^{\theta^I}}{\sum_a (w_{lk}^a)^{\theta^I}}$ ,  $\pi_{lk} = \frac{(\bar{w}_{lk})^{\theta^L/\theta^I}}{\sum_k (\bar{w}_{lk})^{\theta^L/\theta^I}}$ , then we have

$$\hat{L}_{lk}^a = \left[ \frac{(\hat{w}_{lk})^{\theta^L/\theta^I}}{\sum_k \pi_{lk} (\hat{w}_{lk})^{\theta^L/\theta^I}} \right]^{1-\frac{1}{\theta^L}} \left[ \frac{(\hat{w}_{lk}^a)^{\theta^I}}{\sum_a \pi_{a|lk} (\hat{w}_{lk}^a)^{\theta^I}} \right]^{1-\frac{1}{\theta^I}}. \quad (28)$$

For changes in the labor market clearing condition, we have

$$(w_{lk} L_{lk})^{-1} \left[ \sum_n \sum_i \beta_l \frac{X_{iln,k} \hat{X}_{iln,k}}{\tilde{\sigma}_k} + \left( \frac{\theta - \sigma_k + 1}{\theta \sigma_k} \right) \sum_m \sum_i X_{iml,k} \hat{X}_{iml,k} \right] = \hat{w}_{lk} \hat{L}_{lk} \quad (29)$$

and

$$\frac{\sum_n \sum_m X_{lmn,k} \hat{X}_{lmn,k}}{\sum_n \sum_m X_{lmn,k}} = \hat{w}_{lk}^e \hat{L}_{lk}^e \quad (30)$$

For total expenditure,

$$\hat{X}_{lk} = \frac{1}{X_{lk}} \left( \sum_n \sum_i \sum_s \beta_{sk} \frac{X_{iln,s} \hat{X}_{iln,s}}{\tilde{\sigma}_s} + w_{lk} L_{lk} \hat{w}_{lk} \hat{L}_{lk} + w_{lk}^e L_{lk}^e \hat{w}_{lk}^e \hat{L}_{lk}^e + R_{lk} \hat{R}_{lk} + \Delta_{lk} \hat{\Delta}_{lk} \right). \quad (31)$$

For welfare change,

$$\hat{W}_n = \frac{\hat{I}_n}{\prod_s \hat{P}_{n,s}^{\alpha_{n,s}}}, \quad (32)$$

where

$$\hat{I}_n = I_n^{-1} \left[ \sum_k \left( w_{lk} L_{lk} \hat{w}_{lk} \hat{L}_{lk} + w_{lk}^e L_{lk}^e \hat{w}_{lk}^e \hat{L}_{lk}^e \right) + R_n \hat{R}_n + \Delta_n \hat{\Delta} \right], \quad (33)$$

and for tariffs,

$$\hat{R}_n = R_n^{-1} \left[ \sum_k \sum_i \sum_l (t_{ln,k} \hat{t}_{ln,k} - 1) X_{iln,k} \hat{X}_{iln,k} \right]. \quad (34)$$

### 3.2 Model Predictions

To see how our model can generate predictions regarding the effects of US tariffs on Vietnam. Consider a version of the model where there are no internal regions within Vietnam, so we have only three countries indexed by  $C$ ,  $V$ ,  $U$ . The exports from Vietnam to the US by Chinese firms, for the affected sector  $k$  is given by

$$X_{CVU,k} = \frac{M_{C,k} \Psi_{CU,k} \psi_{CVU,k} t_{VU}^k}{\sum_i \sum_l M_{i,k} \Psi_{iU,k} \psi_{iU,k} t_{iU}^k} \frac{X_{U,k}}{t_{VU}^k}.$$

And the exports from China to the US by Chinese firms, for the affected sector  $k$  is given by

$$X_{CCU,k} = \frac{M_{C,k} \Psi_{CU,k} \psi_{CCU,k} t_{CU}^k}{\sum_i \sum_l M_{i,k} \Psi_{iU,k} \psi_{iU,k} t_{iU}^k} \frac{X_{U,k}}{t_{CU}^k}.$$

So the relative export is given by:

$$\frac{X_{CVU,k}}{X_{CCU,k}} = \frac{\psi_{CVU,k}}{\psi_{CCU,k}} = \frac{T_{CV,k}^{\frac{1}{1-\rho}} \left( L_{V_k}^{-\gamma_k} \eta_{CV} \tau_{VU} (w_{V_k})^{\beta_l} \prod_s (P_{V_s})^{\beta_{sk}} \right)^{-\frac{\theta}{1-\rho}}}{T_{CC,k}^{\frac{1}{1-\rho}} \left( L_{C_k}^{-\gamma_k} \eta_{CV} \tau_{VU} (w_{C_k})^{\beta_l} \prod_s (P_{C_s})^{\beta_{sk}} \right)^{-\frac{\theta}{1-\rho}}} \left( \frac{t_{VU}^k}{t_{CU}^k} \right)^{-\frac{\theta}{1-\rho} \frac{\sigma_k}{\sigma_k-1}} \quad (35)$$

Therefore, the model predicts that in a partial equilibrium (i.e., holding wage constant), if the US tariffs on China increase relative to Vietnam, then exports to the US that go through Vietnam will increase relative to those go through China. In addition to tariffs, the trade reallocation also depends on other factors that influence the relative marginal cost of serving the US market, like the return to scale, multinational cost, trade cost, wage for labor, and price for intermediate goods.

The model predicts that the relative extensive margin satisfies:

$$\frac{M_{CVU,k}}{M_{CCU,k}} = \frac{X_{CVU,k}}{X_{CCU,k}},$$

so that the firms that enter Vietnam would also be affected by the changes in relative tariffs.

Although in a partial equilibrium, the change in US-China tariffs does not affect Vietnam's imports from China, in the general equilibrium, as the expenditure by firms that produce in Vietnam increases, the imports from other countries increase. And if Chinese intermediate goods have cost advantages, the increase from China will be relatively higher, too.

In a version of the model that includes internal regions within Vietnam, the choice of location can be seen from the relative trade value between two Vietnamese internal regions

$l_1$  and  $l_2$ , which satisfies

$$\frac{X_{Cl_1U,k}}{X_{Cl_2U,k}} = \frac{T_{Cl_1,k}^{\frac{1}{1-\rho}} \left( L_{l_1k}^{-\gamma_k} \eta_{Cl_1} \tau_{l_1U} (w_{l_1k})^{\beta_l} \prod_s (P_{l_1s})^{\beta_{sk}} \right)^{-\frac{\theta}{1-\rho}}}{T_{Cl_2,k}^{\frac{1}{1-\rho}} \left( L_{l_2k}^{-\gamma_k} \eta_{Cl_2} \tau_{l_2U} (w_{l_2k})^{\beta_l} \prod_s (P_{l_2s})^{\beta_{sk}} \right)^{-\frac{\theta}{1-\rho}}}.$$

Therefore, the model predicts that the export value that goes through a region in Vietnam depends on the region’s productivity and cost differences that arise from various factors, including technology, return to scale, multinational production, supply chain, and wage costs.

## 4 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 levels, along with their month-level starting 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 countries at the HS6 level. [Figure 1](#) illustrates the time profiles of US tariffs on exports from the PRC and Vietnam 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. US tariffs are particularly high in sectors such as machinery, chemicals, base metals, plastics, and textiles, 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 Vietnam. [Figure 9](#) in Appendix 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 Vietnam.

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 Vietnam Standard Industrial Classification. To map these two classifications of industries, we employ data from [Pierce and Schott \(2012\)](#), 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 utilize 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.<sup>1</sup> Using this approach, we connect the US tariffs imposed on the PRC to Vietnam’s industries. Figure 2 plots the composition of employment for firms unaffected and affected by the tariffs. The upper part of the figure shows that the unaffected "control" firms are primarily in the wholesale, retail, repair services, construction, and transportation and logistics sectors, while the lower part of the figure indicates that the affected "treatment" 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 the 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.

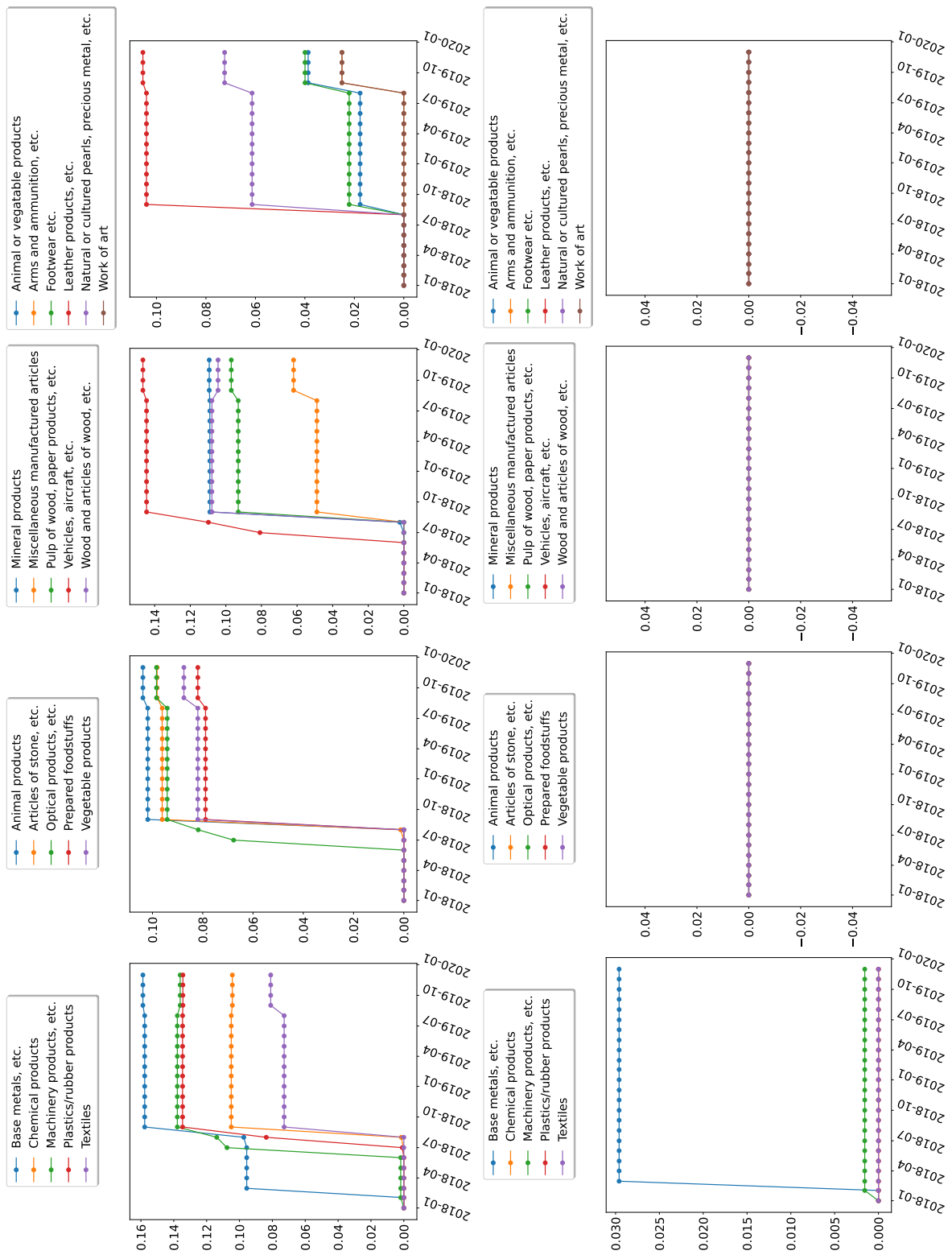
To measure each district’s market access, we calculate the employment-weighted average of inverse distances, using each district’s total employment as recorded in the 2016 Vietnam Enterprise Survey data. Figure 10 in Appendix shows the spatial distribution of market and port access across Vietnamese districts. Alongside these access measures, we also gather data on the location and establishment years of industrial zones in Vietnam from the Japan External Trade Organization. Figure 11 in Appendix illustrates the spatial distribution of industrial zones as of 2022.

The firm-level variables used in this study are derived from the Vietnam Enterprise Survey, covering the period from 2010 to 2021. Specifically, we utilize data on foreign capital by source country, available from 2017 to 2020, to examine the role of foreign affiliates in shaping Vietnam’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. The Vietnamese customs data has the firm’s tax IDs that connect uniquely to the firm-level survey data.

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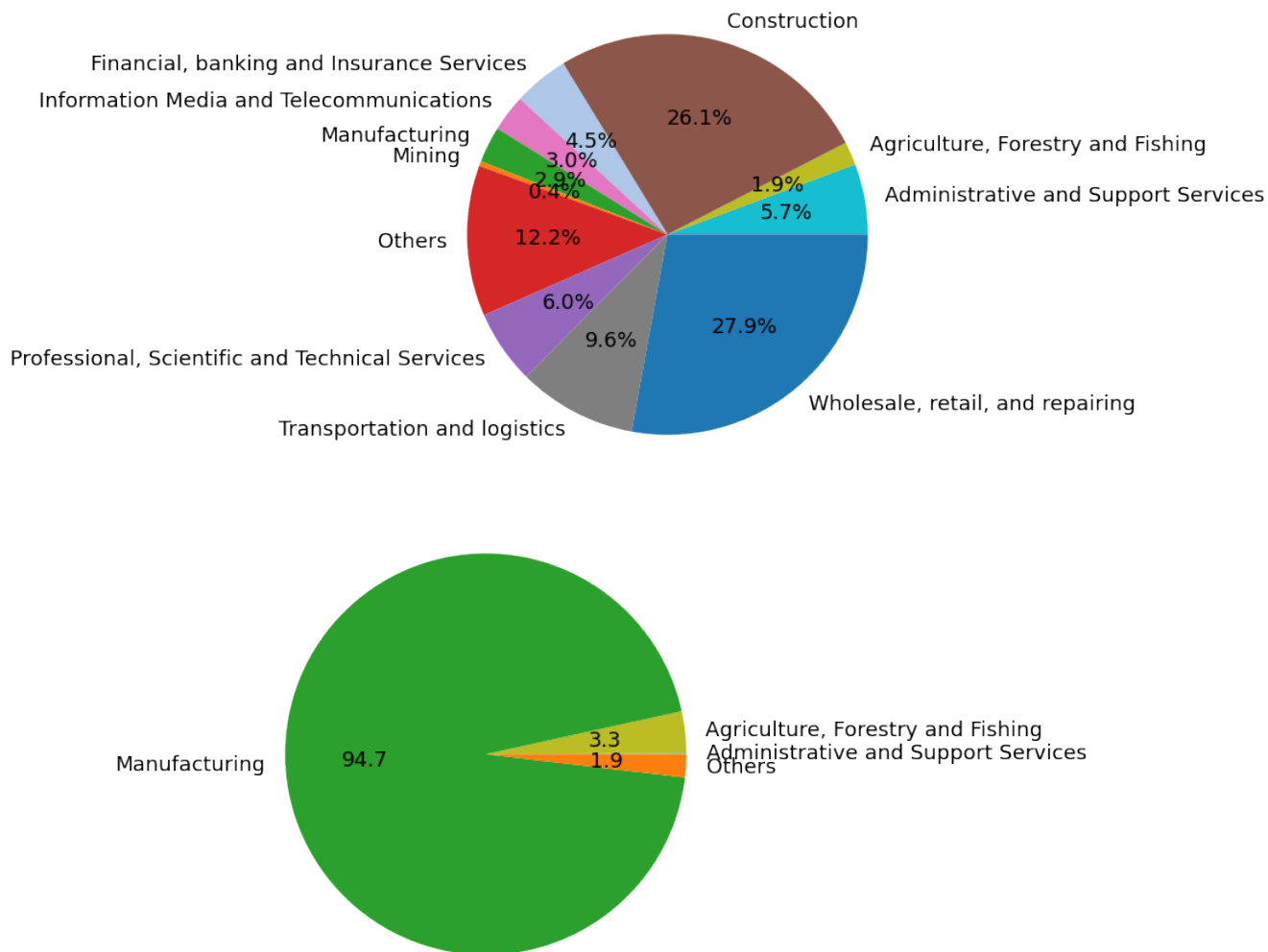
<sup>1</sup>The Vietnam Standard Industrial Classification is very similar to the ISIC, and we treat them as equivalent.

Figure 1: Time Profiles of Tariffs Implemented by the United States (Top: China; Bottom: Vietnam)



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: Industry Composition of Control Group (Top) and Treatment Group (Bottom)



The upper panel plots the industry composition for the control group in terms of total employment in 2016; the lower panel plots the same composition for the treated group. A firm is in the treatment group if its industry is assigned a positive tariff by the US on China. Source: Vietnam Enterprise Survey data and Authors' calculation.

## 5 The Stylized Facts

In this section, we show several stylized facts that support the predictions of our model. The subsection 5.1 shows that the US tariffs on China increases Vietnam's exports to US and imports from China. Appendix 8.3 presents evidence that the trade dispute leads to more multinational production activities in Vietnam. As background, Appendix 8.2 describes the overall patterns of Vietnam's trade before and after the trade dispute between the US and

PRC.

## 5.1 Estimate the Impacts of Trade Dispute on Trade Flows

Using UN Comtrade data at HS6 code and trade partner level, we estimate the effects of trade disputes on Vietnam’s trade flows. Many papers estimating the trade disputes’ effects have adopted the strategy of difference-in-differences (DID), which compares the time difference between the products that are affected and not affected by the US tariffs. In our context, we find the parallel pre-trend assumption difficult to be satisfied, therefore, the estimates from a DID regression are less convincing. The reason is shown in Figure 3, which plots the time trends for the affected and not affected products of Vietnam’s exports and imports. Firstly, the figures show that the affected products account for a much larger share of trade values. Secondly, the two groups of products have different time trends since 2011. Figure 12 in Appendix illustrates the composition of Vietnamese exports for HS codes *affected* and *unaffected* by US tariffs, which we define in this paper as the *treatment* and *control* groups, respectively. Export values across HS6 codes are aggregated within each sector, with the share of export values plotted for the control group on the top and the treated group on the bottom. The first figure shows that the control group consists of a diverse range of sectors, while the second 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. It therefore raises the concern that the treated products have a different sector composition from the untreated products.

Figure 4 suggests an alternative estimation strategy that allows us to avoid the potential bias arising from the violation of the parallel trend assumption. It plots the time trends of Vietnam’s export and import values for the affected products, by the location of the trade partners. These two figures show a significant change in time trend for the exports to the US and the imports from the PRC, compared to the other East Asian countries (EA). Therefore, a triple difference-in-differences strategy, which uses trade partners whose trade flows are less likely to be affected by the US-China disputes, is more likely to provide a valid causal estimate of the trade dispute effects on Vietnam’s trade flows. We implement the triple difference estimation strategy by running the following regression:

$$\ln Y_{igt} = \beta_1 \ln \left( Tari_{gt}^{US,CN} + 1 \right) + \sum_k \beta_{2,k} \ln \left( Tari_{gt}^{US,CN} + 1 \right) \times \mathbf{1} \{ Region_i = k \} + \phi_{ig} + \phi_t + \varepsilon_{igt}, \quad (36)$$

where  $Y_{igt} \in \{ Export_{igt}, Import_{igt} \}$  represent the exports or imports value between Vietnam and trade partner  $i$  on HS6 product  $g$  in year  $t$ ,  $Tari_{gt}^{US,CN}$  is the average tariffs that the US

imposed on PRC for HS6 product  $g$  in year  $t$ ,  $\mathbf{1}\{Region_i = k\}$  is a dummy equal to one if trade partner  $i$  belongs to region  $k$ , where  $k$  iterates over the US (PRC) and the reference region in the export (import) regression. We also control for trade partner-product effects,  $\phi_{ig}$ , and year effects,  $\phi_t$ .

The estimation results of the above regression are reported in Table 1. Our main focus is the coefficients,  $\beta_{2,USA}$  and  $\beta_{2,PRC}$ , of  $\ln\left(Tar_{gt}^{US,CN} + 1\right) \times \mathbf{1}\{Region_i = USA\}$  for exports and  $\ln\left(Tar_{gt}^{US,CN} + 1\right) \times \mathbf{1}\{Region_i = PRC\}$  for imports, respectively. They are both significantly positive, showing that the US tariffs increase Vietnam’s exports to the US and imports from PRC. The elasticity of Vietnam’s exports to the US with respect to the US tariffs is 5.6, while the elasticity of Vietnam’s imports from PRC is 2.4.

To test the validity of using other East Asian countries (EA) as the reference to estimate the trade dispute effects, we run event study regressions by interacting the treated product dummy  $\mathbf{1}\left\{\max_t Tar_{gt}^{US,CN} > 0\right\} \times \mathbf{1}\{Region_i = k\}$  with year dummies, and plot the resulted coefficients in Figure 5. The figures show that the exports to other East Asian region (EA) are not significantly different until 2018, but exports to the US started to be higher in 2019. On the other hand, the imports from PRC is not significantly different from imports from other East Asian region (EA) until 2017, but became higher after 2018.<sup>2</sup>

Using detailed customs data, we are able to observe trade flows for all firms with different origins (i.e., foreign firms with different sources of ownership) that produce in Vietnam. In the notation of our model, for exports, we observe all combinations of  $i$  and  $n$ , holding  $l$  being Vietnam. While for imports, we observe all combinations of  $i$  and  $l$ , holding  $n$  being Vietnam. Figure 6 plots the annual total value of imports from PRC and exports to the US in our sample of Vietnam’s customs data by the firm’s source of FDI. Since we do not have FDI source information in 2021, we infer each firm’s source of foreign capital using its value in 2020. That is, we regard a firm in the 2021 sample as a Chinese foreign affiliate if it was so in 2020. Note that this way of extrapolation does not account for the new entrants and may underestimate the trade contribution of foreign affiliates. The foreign firms increased, while the domestic firms decreased, imports value from PRC during 2018 to 2020. The rate of increase is particularly high for PRC-related and East Asian region (EA) related firms. For the exports value to the US, while all types of firms increased their exports value from 2018 to 2020, the rate of increase is significantly higher for PRC-related firms. Table 3 further decompose the changes in trade values into the intensive and the extensive margin. We calculate the change in trade values as log difference between the current and the previous

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<sup>2</sup>Our main conclusion that the exports to the US are positively affected by the US tariffs is qualitatively unchanged if we change the reference group to the EU countries or restrict to the final consumption goods. The result of a positive impact on the imports from the PRC is robust if we restrict the sample to the imports of intermediate consumption. These results are reported in the appendix.

year for years 2019 and 2020, then the average change between these two years is reported in the table. We do not perform this exercise for year 2021 as our data does not have FDI source at the firm level in that year. As shown in the first and third columns of the table, the PRC-related firms have the largest increase in imports from PRC and exports to the US. Their imports from PRC increased by 0.451 log points, and exports to the US increased by 0.705 log points. Moreover, the second, fourth, and fifth columns show that this increase is significantly driven by the new entrants, which is 0.292 log points.

To estimate the effects of trade disputes on a firm’s trade decisions, we exploit the variation of tariffs imposed by the US on PRC, and run the following regression:

$$\ln(Y_{ft} + 1) = \beta_1 \text{Tariff}_{gt}^{US,CN} + \sum_k \beta_{2,k} \mathbf{1}\{FDIS_{ft} = k\} \quad (37)$$

$$+ \sum_k \beta_{3,k} \text{Tariff}_{gt}^{US,CN} \times \mathbf{1}\{FDIS_{ft} = k\} + \phi_f + \phi_g + \phi_t + \epsilon_{ft},$$

where  $Y_{ft} \in \{ExportUS_{ft}, ImportCN_{fj}\}$  is either exports to the US or imports from PRC for firm  $f$  in year  $t$ ,  $\text{Tariff}_{gt}^{US,CN}$  is the level of tariff imposed by the US on PRC in industry  $g$ , year  $t$ ,  $\mathbf{1}\{FDIS_{ft} = k\}$  is a dummy variable equal to 1 if the source of capital is  $k \in \{PRC, EA, SEA, US, EU, Domestic, Others\}$ . We control for firm, industry, year fixed effects. Table 4 presents the summary statistics at the firm-year level. The average firm in the full 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 33.2% of observations are in districts with industrial zones.<sup>3</sup>

Table 5 reports the estimates of the trade dispute effects on firm-level trade. The interpretation of the coefficients of  $\beta_{2,k}$  and  $\beta_{3,k}$  are relative to the domestic firms, which are chosen as the reference group. From the estimation results shown in the first column of the table, we see that almost all types of firms increased exports to the US. The magnitude of responsiveness is particularly high for PRC, other East Asian region (EA), Europe, and US related firms. From the second column of the table, we see that for the domestic firms, the imports from PRC declined for the affected industries after the trade dispute, but for foreign affiliates, the imports from PRC increased, and the estimates are statistically significant, so for PRC, other East Asian region (EA), and Europe related firms.

We can also run the regression with a similar idea as Equation (36) but with finer data. Table 2 reports the results from such regressions. Importantly, such a regression is consistent with Equation (11) in our model. The results are very close to the bilateral regression, where the tariff elasticity of exports to US is equal to 5.089, while the elasticity of imports from

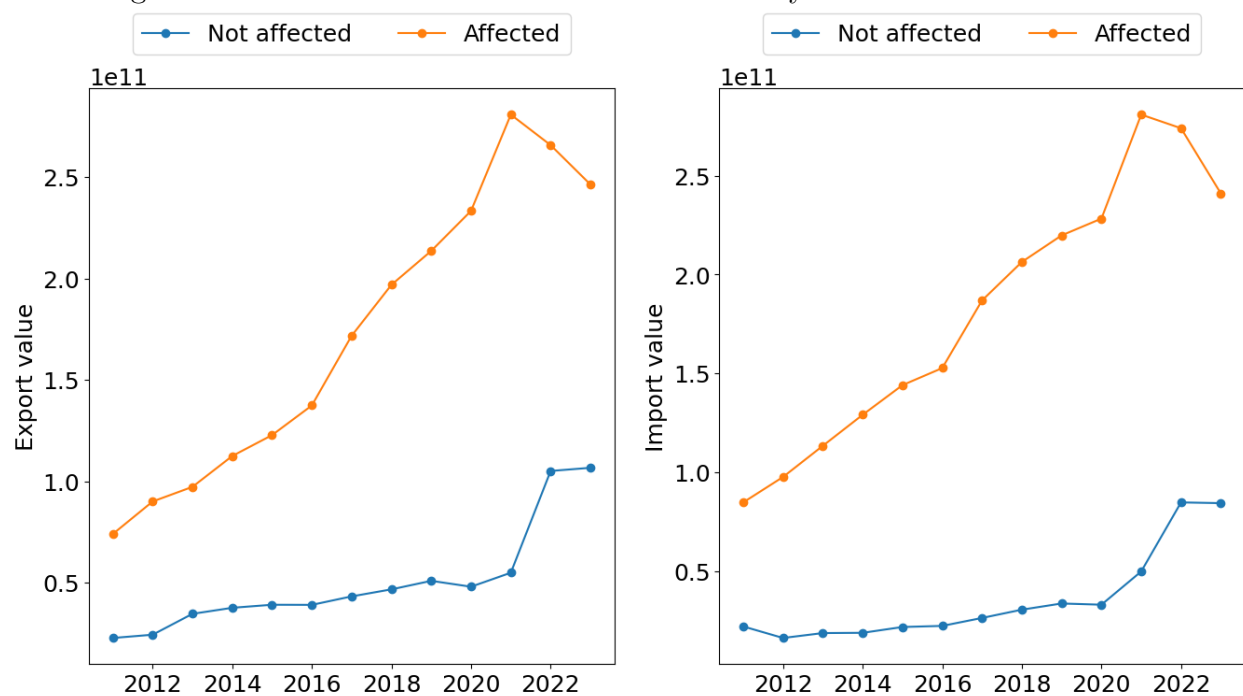
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<sup>3</sup>The regression sample differs from the full sample due to the availability of variables in different years.

PRC is slightly higher and equal to 3.126.

In Appendix 8.3, we provide more evidence related to the nature behind the changes in trade flows. Overall, the evidence in that section suggests that the changes in trade flows in Vietnam is unlikely to be a result of simple re-routing from PRC, since the goods that Vietnam imports from PRC are different from the goods exported to the US, and there are significantly more international capital flows happening together with the changes in trade flows. However, the declining domestic value-added suggests the resulted multinational production activities involve a lower share of domestic contents.

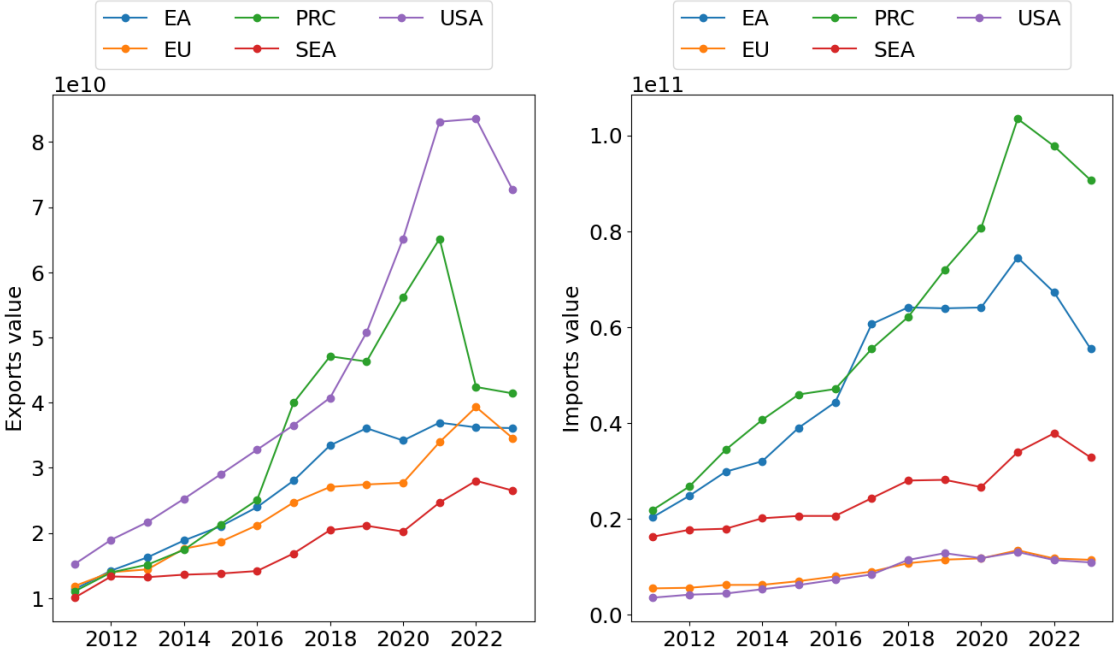
Figure 3: Time Trend of Vietnam's Trade Flows by Whether Affected or Not



Notes: The left panel plots the total export value, and the right panel plots the total import value of Vietnam by whether the products are affected by the trade dispute. An HS6 code is affected if it has a positive tariff in any year during the sample period.

Source: Authors' calculations based on UN Comtrade data.

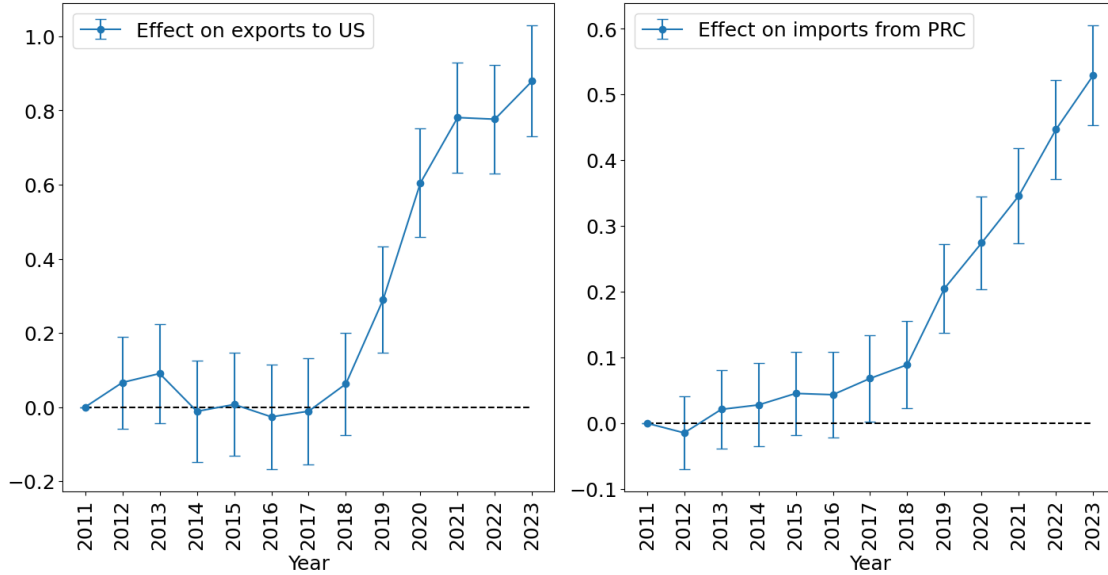
Figure 4: Time Trend of Vietnam’s Trade Flows by Trade Partners for Affected Products



Notes: The left panel plots the total export value, and the right panel plots the total import value of Vietnam by the location of trade partners. The sample is restricted to the HS6 codes that are affected by the US tariffs.

Source: Authors’ calculations based on UN Comtrade data.

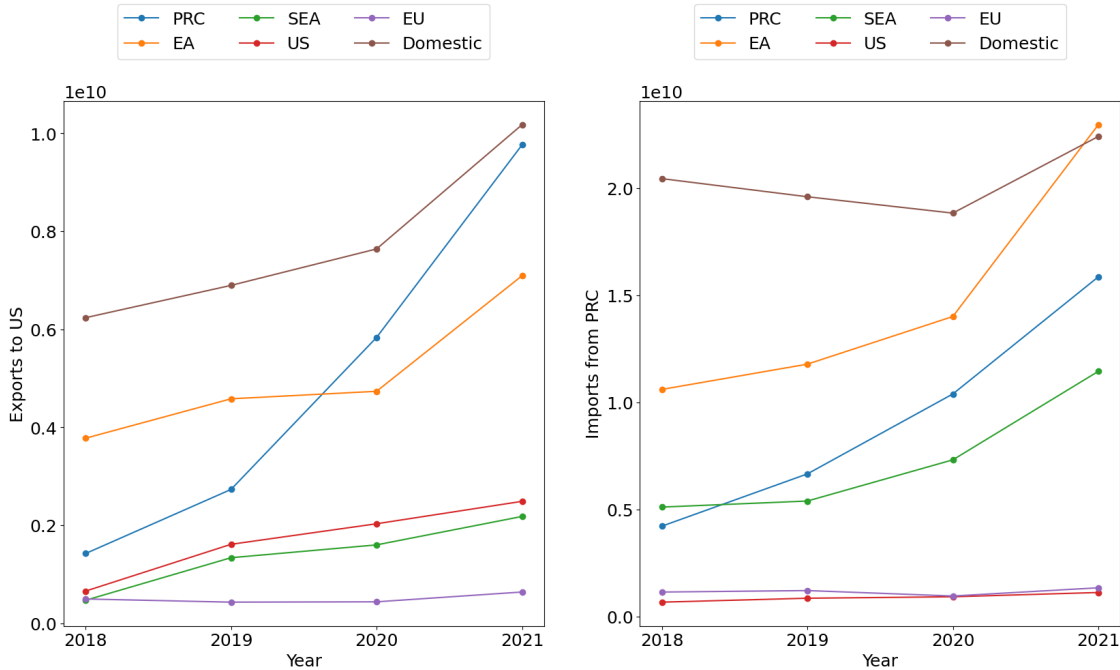
Figure 5: Event Study Plots of Trade Dispute Effect on Vietnam's Trade Flows



Note: The left panel plots the estimates of event study coefficients of exports to the US, and the right panel plots the estimates of the event study the coefficients of imports from PRC for Vietnam from the triple difference regression. Both regressions use the other East Asian countries (EA) as the reference group.

Source: Authors' calculations based on UN Comtrade data.

Figure 6: Exports to US and Imports from PRC by FDI Source



Note: The figure shows the total exports to US and imports from PRC by sources of capital. Source: Authors' calculations based on the Vietnam Enterprise Survey and customs data.

Table 1: Estimates of Trade Dispute Effect on Vietnam's Trade Flows

	$\ln Export_{igt}$	std	$\ln Import_{igt}$	std
$\ln(Tari_{gt}^{US,CN} + 1)$	-0.114	0.403	-2.414	0.251
$\ln(Tari_{gt}^{US,CN} + 1) \times \mathbf{1}\{Region_i = PRC\}$			2.385	0.189
$\ln(Tari_{gt}^{US,CN} + 1) \times \mathbf{1}\{Region_i = USA\}$	5.604	0.441		
Partner-product	x		x	
Year	x		x	
Observations	86671		162864	
S.E. type	by HS6		by HS6	
R2	0.805		0.853	

Note: For both regressions, the reference group is other East Asian countries (EA).

Source: Authors' calculations based on UN Comtrade data.

Table 2: Gravity Regression at Origin-Production-Destination Level

	$\ln Export$	$\ln Import$
$\ln(Tari_{gt}^{US,CN} + 1)$	0.061 (0.693)	-1.077** (0.483)
$\ln(Tari_{gt}^{US,CN} + 1) \times US$	5.089*** (0.692)	
$\ln(Tari_{gt}^{US,CN} + 1) \times PRC$		3.126*** (0.239)
N	1,695,043	3,785,765
R <sup>2</sup>	0.613	0.594
R <sup>2</sup> (within)	0.000	0.000
Fixed effects	i-p, l-p, Year	l-p, n-p, Year

Source: Authors' calculations based on Vietnam's customs data and VES data. The variables US and PRC indicate the trade-partner (origin or destination) countries of Vietnam.

Table 3: Decompose Annual Imports from PRC and Exports to US by FDI Source

FDI Source	Export to US	Export to US per firm	Import from PRC	Import from PRC per firm	Number of firm
PRC	0.705	0.413	0.451	0.159	0.292
EA	0.113	0.074	0.139	0.100	0.039
SEA	0.612	0.566	0.180	0.133	0.046
US	0.564	0.461	0.160	0.057	0.102
EU	-0.062	-0.101	-0.089	-0.128	0.039
Others	0.853	0.690	0.271	0.108	0.163
Domestic	0.101	0.040	-0.041	-0.103	0.062

Note: Each column shows the average annual log difference of the corresponding variable between the current and the previous year, for the groups of firms by source of FDI. The time period includes 2019 and 2020.

Source: Authors' calculations based on the Vietnam Enterprise Survey and customs data.

Table 4: 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
$Tari_{ft}^{US,CN}$	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, the 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 Vietnam Enterprise Survey.

Table 5: Effects of Trade Conflicts on Firm-level Trade

	$\ln(Export_{US,ft} + 1)$	std	$\ln(Import_{CN,ft} + 1)$	std
$Tari_{gt}^{US,CN}$	5.395	0.601	-1.791	0.649
$\mathbf{1}\{FDIS_{ft} = PRC\}$	-0.241	0.130	0.072	0.110
$\mathbf{1}\{FDIS_{ft} = EA\}$	-0.061	0.107	0.122	0.096
$\mathbf{1}\{FDIS_{ft} = EU\}$	-0.340	0.211	-0.034	0.172
$\mathbf{1}\{FDIS_{ft} = Others\}$	0.493	0.195	0.099	0.173
$\mathbf{1}\{FDIS_{ft} = SEA\}$	0.167	0.144	-0.115	0.161
$\mathbf{1}\{FDIS_{ft} = US\}$	-0.396	0.316	0.266	0.237
$Tari_{gt}^{US,CN} \times \mathbf{1}\{FDIS_{ft} = PRC\}$	11.388	1.830	4.288	1.180
$Tari_{gt}^{US,CN} \times \mathbf{1}\{FDIS_{ft} = EA\}$	3.452	1.027	4.237	0.800
$Tari_{gt}^{US,CN} \times \mathbf{1}\{FDIS_{ft} = EU\}$	13.598	3.530	5.555	1.860
$Tari_{gt}^{US,CN} \times \mathbf{1}\{FDIS_{ft} = Others\}$	-0.059	2.552	3.266	1.833
$Tari_{gt}^{US,CN} \times \mathbf{1}\{FDIS_{ft} = SEA\}$	3.393	1.998	3.549	1.658
$Tari_{gt}^{US,CN} \times \mathbf{1}\{FDIS_{ft} = US\}$	14.610	4.483	2.491	2.839
Firm	x		x	
Industry	x		x	
Year	x		x	
Observations	143011		143011	
S.E. type	by firms		by firms	
R2	0.891		0.904	

Source: Authors' calculations based on the Vietnam Enterprise Survey and customs data.

## 5.2 The Entry Pattern

In this and the next subsection, we test the other two predictions from our model. Firstly, our model predicts that the changes in trade flows are driven by the extensive margin. Figure 7 plots the time trends of the number of PRC firms (excluding Hong Kong SAR) in the Vietnam Enterprise Survey. As shown in the upper left panel, the number of Chinese firms has kept increasing from 2017 to 2020. Moreover, the lower left panel shows that the share of PRC firms increases as well, therefore the entry of PRC firms is higher relative to other foreign firms.

Using Vietnam's firm survey data, we can formally examine the changes in the extensive

margin by running the following regression model:

$$\begin{aligned} \ln NumFirm_{it} = & \beta_0 \ln \left( Tari_{g(i)t}^{US,CN} + 1 \right) + \beta_1 PRCFirm_i + \beta_2 DomFirm_i \quad (38) \\ & + \beta_3 \ln \left( Tari_{g(i)t}^{US,CN} + 1 \right) \times PRCFirm_i + \beta_4 \ln \left( Tari_{g(i)t}^{US,CN} + 1 \right) \times DomFirm_i + \epsilon_{it}, \end{aligned}$$

where  $i$  is the cell defined by four dimensions: Vietnamese district, industry, owner category (i.e., PRC, Domestic, Other Foreign Regions), and year. Therefore  $NumFirm_{it}$  represent the number of firms in each cell,  $Tari_{g(i)t}^{US,CN}$  is the US tariffs on PRC in the corresponding industry  $g(i)$  in year  $t$ ,  $PRCFirm_i$  is the dummy equal to 1 if the cell corresponds to PRC firm,  $DomFirm_i$  is the dummy equal to 1 if the cell corresponds to a domestic firm. Firms whose source of ownership is other foreign regions are used as the comparison group.

Table 6 reports the estimation results. In the second column, we include the logarithmic value of the number of employment in addition to the number of firms as the outcome variable. The positive coefficients of  $\ln \left( Tari_{g(i)t}^{US,CN} + 1 \right)$  show that size expands for other foreign firms in the affected industries after the trade conflicts. Moreover, the interaction term of  $\ln \left( Tari_{g(i)t}^{US,CN} + 1 \right)$  and  $PRCFirm_i$  shows that the expansion of PRC firms is even higher. On the other hand, the size of domestic firms tends to shrink, reflecting a higher level of competition in the labor market.

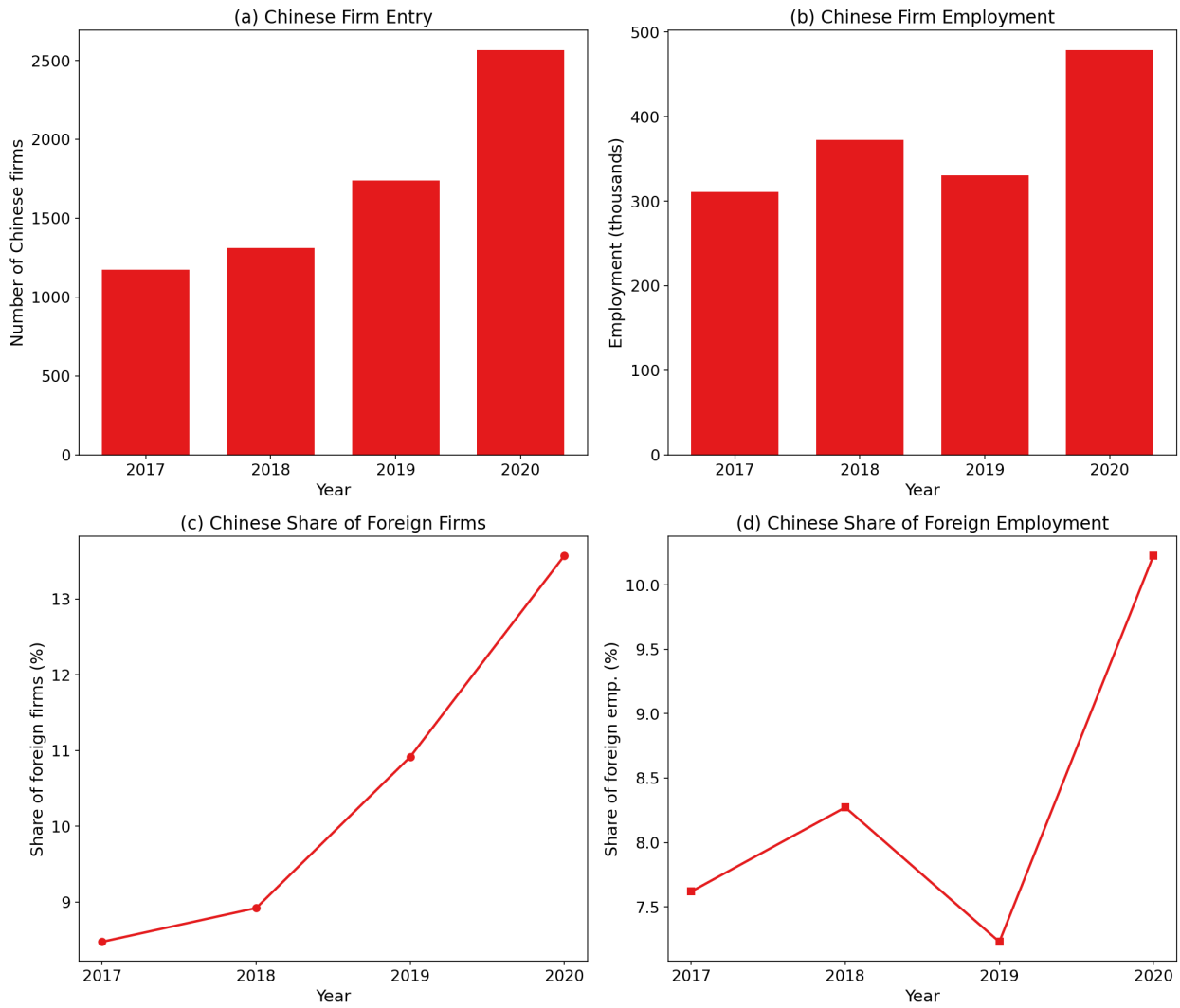
To further explore the determinants of the location of foreign firms, we employ the following regression framework:

$$ShareEmpFor_{it} = \beta_0 + \beta_1 \ln Access_i + \beta_2 NoIndZone_{it} + \beta_3 \ln ProxPort_i + \phi_i^{prov} + \phi_t + \epsilon_{it}, \quad (39)$$

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 the transport network in Vietnam 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 of the trade dispute, we restrict the sample period to 2015–2017 in this regression.

Table 7 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 a zero mean and one unit standard deviation. Industrial zone policy is found to have the largest impact and the 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

Figure 7: Time Trend of Number of PRC Firms



increase in market access were found to have a 7.4% increase in the employment share of foreign affiliates, and a one standard deviation an increase in port proximity was found to increase foreign firms' employment share by 1.6%.

Table 6: Entry Patterns of PRC Firms

	$\ln NumFirm$	$\ln Emp$
$\ln(Tar_{g(i)t}^{US,CN} + 1)$	5.922*** (0.475)	12.514*** (0.809)
$PRCFirm$	-0.322*** (0.030)	-1.105*** (0.063)
$DomFirm$	1.048*** (0.029)	-0.041 (0.049)
$\ln(Tar_{g(i)t}^{US,CN} + 1) \times PRCFirm$	1.949*** (0.438)	2.428** (1.000)
$\ln(Tar_{g(i)t}^{US,CN} + 1) \times DomFirm$	-7.081*** (0.347)	-15.451*** (0.626)
N	254,213	254,213
R <sup>2</sup>	0.485	0.360
R <sup>2</sup> (within)	0.108	0.024
Fixed effects	Ind, Dist-Year	Ind, Dist-Year

Source: Authors' calculations based on the Vietnam Enterprise Survey

Table 7: Spatial Distribution of Foreign Affiliates in Vietnam

	$ShareEmpFor_{it}$	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 <sup>2</sup>	0.433	

Notes: The table reports the regression of the 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: Authors' calculations based on the Vietnam Enterprise Survey.

### 5.3 The Return to Scale

Our model allows the possibility of returns to scale in each location and industry. The presence and the magnitude of such return to scale would have meaningful policy implications and could change the overall welfare impacts of the trade dispute shock. Therefore, in this subsection, we attempt to estimate the magnitude of return to scale in our data. For each

firm, we calculate productivity by dividing sales (deflated and converted to US dollars) by total employment. Following Jones (2016), this variable can be interpreted as the Revenue Productivity (TFPR) defined by Foster et al. (2008). Then, to control for unobserved firm-level factors, we take the log difference across years within each firm to get  $\Delta \ln Prod_{it}$ , then run the following regression:

$$\Delta \ln Prod_{it} = \beta_0 + \beta_1 \Delta \ln DistIndEmp_{it} + \beta_2 \Delta \ln Emp_{it} + \beta_3 \ln Emp_{it-1} + \epsilon_{it}, \quad (40)$$

where  $\Delta \ln DistIndEmp_{it}$  is the change in total employment in the district and industry that the firm belongs,  $\Delta \ln Emp_{it}$  is the change in firm level employment,  $\ln Emp_{it-1}$  is the level of lagged firm-level employment. The last two variables serve to control for the firm's specific conditions that may also affect productivity change. To use the source of variation in total employment that comes from the trade dispute, we also use the sample of years from 2017 to 2020 to run the same regression.

Table 8 reports the estimation results. The first column uses the total employment in the district instead of industry-specific employment to measure the size of the external return to scale, but we do not see any effect at this level. The second column uses the industry-specific total employment in each district, and the estimate is significantly positive, showing that if the industry increases total employment by 10%, then the firm's productivity would increase by around 0.3%. The magnitude does not change when we restrict to the sample period to between 2017 and 2020.

Table 8: Estimate Return to Scale

	$\Delta \ln Prod$	$\Delta \ln Prod$	$\Delta \ln Prod$
$\Delta \ln(DistEmp)$	-0.018 (0.014)		
$\Delta \ln(Emp)$	-0.674*** (0.008)	-0.678*** (0.008)	-0.753*** (0.005)
Lagged $\ln(Emp)$	-0.037*** (0.002)	-0.037*** (0.002)	-0.039*** (0.003)
$\Delta \ln(DistIndEmp)$		0.029*** (0.001)	0.029*** (0.002)
N	4,229,467	4,229,467	2,551,602
R <sup>2</sup>	0.911	0.911	0.943
R <sup>2</sup> (within)	0.111	0.111	0.142
Fixed effects	year	year	year

Source: Authors' calculations based on the Vietnam Enterprise Survey

## 6 Assessing the Overall Trade Dispute Impacts

### 6.1 Reduced-Form Shift-Share Estimates

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 a measure of trade dispute shocks for each district, namely we define variable  $TWShock_{it} = \sum_n EmpShare_{ni,2016} Tari_{nt}$ , where  $EmpShare_{ni,2016}$  is the employment share for industry  $n$  in district  $i$  in 2016. The use of the employment share 2 years before the trade dispute started avoids the possibility that the exposure was affected by the trade dispute, but it 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 Vietnam, 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:

$$\ln y_{it} = \beta_0 + \beta_1 TWShock_{it} + \beta_2' x_{it} + \phi_i + \phi_t + \varepsilon_{it}, \quad (41)$$

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,  $\phi_i$ , and the year fixed effect,  $\phi_t$ . The regressions are weighted by the district’s employment share in Vietnam 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 (41) using the sample of data from 2016 to 2020 are reported in Table 10. 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  $TWShock_{it}$  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

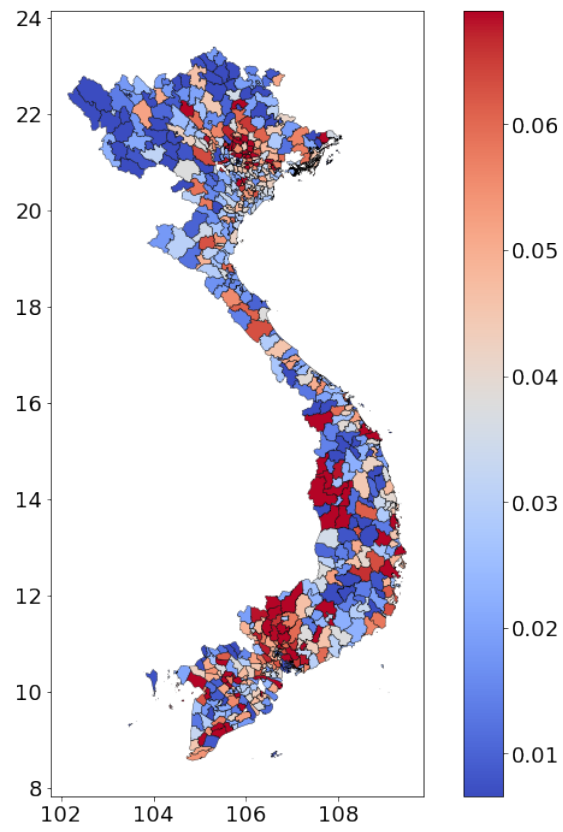
sales, a 4.2% increase in district employment, and a 5.6% increase in the number of firms. The employment share in the last period is a strong explanatory variable for district sales and employment, but has no significant correlation with the number of firms. The number of industrial zones is positively 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 11, 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 12, 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 Vietnam’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 13 employs the same shift-share regression as in equation (41), 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 non-manufacturing employment surpassing that of the manufacturing sector, suggesting a significant indirect effect through inter-industry linkages.

Figure 8: Spatial Distribution of Trade Dispute Shocks



Note: The figures show the spatial distribution of  $TWShock_{it}$  across districts in the year 2019.

Table 9: Summary Statistics at District-year Level

	count	mean	std	min	25%	50%	75%	max
$Tari_{it}$	3388	0.013	0.013	0.000	0.000	0.010	0.025	0.059
$EmpShare_{it}$	3388	0.001	0.003	0.000	0.000	0.000	0.001	0.037
$TWShock_{it}$	3388	0.017	0.022	0.000	0.000	0.008	0.027	0.100
$Emp_{it}$	3388	19692.108	43281.507	91.000	1369.000	4379.000	15700.750	513233.000
$Sales_{it}$	3388	893.909	2665.848	0.600	32.999	113.074	478.340	40386.647
$NumFirm_{it}$	3388	700.494	1633.364	6.000	94.000	187.000	436.000	20358.000
$NumForeFirm_{it}$	3120	23.978	84.547	0.000	0.000	2.000	8.000	1526.000
$ManEmp_{it}$	3388	10026.608	25768.539	2.000	240.000	1600.000	8430.500	301516.000
$NonManEmp_{it}$	3388	9665.500	27952.565	44.000	829.000	1886.000	5349.250	475398.000
$ManShare_{it-1}$	3388	0.404	0.279	0.001	0.142	0.380	0.641	0.987
$IndZone_{it}$	3388	0.394	1.104	0.000	0.000	0.000	0.000	11.000
$Export_{it}$	2861	139817747.577	375611722.546	10.000	3131410.589	22183826.212	110445558.147	4583071298.971
$Import_{it}$	2927	129047467.048	342142016.808	15.000	1103746.485	10891277.271	75231326.826	3513738089.563

Note: The table shows summary statistics for key variables at district-year level.  $Tari_{it}$  is the simple average of  $Tari_{nt}$  across industries for each district in each year,  $EmpShare_{it}$  is the share of employment for district  $i$  among all districts in year  $t$ . Refer to the text for the details of how the other variables are calculated. The sample is from 2016 to 2020.

Source: Authors' calculations based on the Vietnam Enterprise Survey.

Table 10: Shift-Share Estimates of Trade dispute Effects on Regional Development

	$\ln(Sales_{it})$	std	$\ln(Emp_{it})$	std	$\ln NumFirm_{it}$	std
$TWShock_{it}$	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, and 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,  $TWShock_{it}$ , lagged manufacturing employment share,  $ManShare_{it-1}$ , and number of industrial zones,  $IndZone_{it}$ .

Source: Authors' calculations based on the Vietnam Enterprise Survey.

Table 11: Shift-Share Estimates of Trade Dispute Effects on Regional Development and Foreign Direct Investment

	$\ln(FDI_{it} + 1)$	std	$\ln(ManFDI_{it} + 1)$	std
$TWShock_{it}$	-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,  $TWShock_{it}$ , lagged manufacturing employment share,  $ManShare_{it-1}$ , and number of industrial zones,  $IndZone_{it}$ .

Source: Authors' calculations based on the Vietnam Enterprise Survey.

Table 12: Shift-Share Estimates of Trade Dispute Effects on Regional Development and Trade

	$\ln(Export_{it})$	std	$\ln(Import_{it})$	std
$TWShock_{it}$	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,  $TWShock_{it}$ , lagged manufacturing employment share,  $ManShare_{it-1}$ , and number of industrial zones,  $IndZone_{it}$ .

Source: Authors' calculations based on the Vietnam Enterprise Survey and customs data.

Table 13: Heterogeneous Trade dispute Effects on Regional Development

	$\ln(ManEmp_{it})$	std	$\ln(NonManEmp_{it})$	std
$TWShock_{it}$	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 non-manufacturing industries,  $NonManEmp_{it}$ . The independent variables include trade dispute shocks,  $TWShock_{it}$ , lagged manufacturing employment share,  $ManShare_{it-1}$ , and number of industrial zones,  $IndZone_{it}$ .

Source: Authors’ calculations based on the Vietnam Enterprise Survey.

## 6.2 Numerical Analysis of Quantitative General Equilibrium Model

To quantify the general equilibrium effects of the US–PRC trade dispute and to validate the mechanisms identified in the reduced-form analysis, we calibrate and simulate a two-sector version of the model described in Section 3. The simulation abstracts from internal regions and port choice to focus on the three-country connector-channel mechanism (Vietnam, China, US), two sectors (Agriculture and Manufacturing), and two functions (production and innovation).

### 6.2.1 Calibration Strategy

The model is calibrated to match five observable moments for China and the US circa 2020–2025, focusing on manufacturing given its centrality to the trade dispute: (i) China/US manufacturing wage ratio  $\approx 0.20$ ; (ii) China/US manufacturing expenditure ratio  $\approx 1.61$ ; (iii) US manufacturing domestic share  $\approx 60\%$ ; (iv) US trade deficit relative to manufacturing expenditure  $\approx 10\%$ ; and (v) China/US manufacturing employment ratio  $\approx 4$ –8 (based on ILO, CEIC, World Bank, and BLS data).

Calibration proceeds in four stages. First, labor endowments are set to approximate real employment: 55 million for Vietnam, 250 million for China, and 50 million for the US. Second, exogenous transfers  $\Delta_l$  simulate the US trade deficit, with  $\Delta_{China} = -20$  and  $\Delta_{US} = +20$ , allocated to sectors by Cobb–Douglas consumption shares ( $\alpha_A = 0.30$ ,  $\alpha_M = 0.70$ ). Third, productivity parameters  $T_{i,l,k}$  are adjusted to match wage ratios and domestic shares.

In manufacturing,  $T_{US,US,M} = 8.00$  reflects high US productivity, while  $T_{China,China,M} = 0.30$  (China) and  $T_{China,Vietnam,M} = 0.18$  (connector channel) are moderate, consistent with China's lower wages. Fourth, returns to scale are set low ( $\gamma_A = 0.03$ ,  $\gamma_M = 0.05$ ) to ensure fixed-point convergence in the hat-algebra solver. The full set of parameter values is reported in the appendix.

Table 14 summarizes the calibration fit. The China/US manufacturing wage ratio reaches 0.382, which is the best achievable value in a two-sector model without a services sector to absorb surplus Chinese labor. The expenditure ratio (1.57) and US manufacturing domestic share (60.1%) closely match their targets. The exogenous transfer as a share of US manufacturing expenditure (11.2%) approximates the real US trade deficit in goods.

Table 14: Calibration Fit and Equilibrium Trade Shares

Calibration Target	Model	Source/Target
China/US Mfg wage ratio	0.382	$\approx 0.20$
China/US Mfg expenditure ratio	1.57	$\approx 1.61$
China/US Mfg employment ratio	4.47	4–8
US Mfg domestic share	60.1%	$\approx 60\%$
$\Delta$ / US Mfg expenditure	11.2%	$\approx 10\%$
<i>Manufacturing Trade Shares (to US)</i>		
C→C→US (direct)	23.6%	
C→V→US (connector)	2.6%	
V→V→US (direct)	7.9%	
U→U→US (domestic)	60.1%	

Note: Manufacturing wage ratio uses US Mfg production wage as numeraire ( $w_{US,M} = 1$ ). Exchange rates and local price levels are not modeled separately. Source: Authors' simulation based on the model in Section 3.

### 6.2.2 The Connector Channel under a 25 Percent Tariff Shock

We simulate a 25% increase in the US tariff on Chinese-manufactured goods (from 5% to 31.2%) and compute the hat-algebra equilibrium. Table 15 reports the percentage changes in welfare, wages, prices, and key trade flows. The results reveal three main patterns.

Table 15: 25% US Tariff Increase on Chinese Manufacturing: General Equilibrium Effects

Variable	Vietnam	China	US
Aggregate welfare	+6.22%	-5.17%	+0.00%
<i>Manufacturing sector:</i>			
Production wage	+3.71%	-8.61%	+0.00%
Innovation wage	+1.35%	-8.52%	+0.08%
Production labor	+2.73%	-0.72%	-0.06%
Price index	-2.50%	-4.15%	+6.75%
Expenditure	+5.07%	-9.20%	+1.66%
<i>Agriculture sector:</i>			
Production wage	-1.23%	-0.69%	-4.66%
Price index	-3.49%	-3.69%	-3.53%
<i>Key Mfg Trade Flow Changes (to US)</i>			
C→C→US (direct)		-58.21%	
C→V→US (connector)		+108.61%	
V→V→US (direct)		+43.35%	
U→U→US (domestic)		+15.46%	

Note: US manufacturing production wage is the numeraire. US welfare change is +0.0049%, rounded to +0.00%. The connector channel change reflects goods produced in Vietnam by Chinese multinationals and exported to the US. Source: Authors' simulation.

First, the connector channel—Chinese multinationals producing in Vietnam for the US market—more than doubles (+108.6%), directly reflecting the mechanism formalized in Equation (11): the relative tariff advantage of the Vietnam route increases. The model's prediction aligns closely with the empirical findings in Table 1 that a one percentage point increase in US tariffs on the PRC raises Vietnamese exports to the US by 5.6%. Here, a 25 percentage point increase yields approximately the same implied elasticity ( $108.6/25 \approx 4.3$ ).

Second, Vietnam's aggregate welfare rises by 6.2%, driven by higher wages (+3.7% in manufacturing production) and labor reallocation toward the expanding connector sector. China's welfare declines by 5.2%, driven by an 8.6% decline in manufacturing wages and a 9.2% decline in manufacturing expenditure. These welfare estimates are consistent with the regional development effects documented in Table 10, where trade dispute shocks are found to increase district-level sales, employment, and firm entry in Vietnam.

Third, US aggregate welfare is essentially unchanged (+0.0049%), as the gain from higher tariff revenue (which more than doubles,  $\hat{R}_{US} = 2.18$ ) is almost exactly offset by an increase in the manufacturing price index (+6.75%). This is a standard terms-of-trade result: the tariff revenue collected at the border is paid by US consumers through higher prices.

### 6.2.3 Cross-Sector Spillovers

An important general equilibrium result emerges in the agricultural sector. The US agricultural price index *falls* by 3.5% despite the absence of any direct tariff on agricultural goods. This occurs through a cross-sector labor reallocation channel: Chinese manufacturing contracts under the tariff (−8.6% wages), displacing labor that reallocates to Chinese agriculture (+3.5% in agricultural employment). Expanded Chinese agricultural production increases exports to the US (+9.7%), intensifying competition in the US agricultural market and lowering the agricultural price index. This result highlights how sectoral tariffs generate unintended spillovers through global factor reallocation, and is consistent with the empirical evidence in Table 13 that the trade dispute positively affects both manufacturing and non-manufacturing employment in Vietnam through inter-industry linkages.

Taken together, the simulation results corroborate three central empirical findings of this paper: (i) US tariffs on the PRC divert trade through Vietnam, with the connector channel expanding substantially; (ii) the expansion is driven by multinational production decisions, particularly by Chinese firms relocating production; and (iii) trade shocks propagate through input–output and factor market linkages, generating spillovers to non-manufacturing sectors. The model further illuminates welfare consequences that are not directly observable in the data: Vietnam is a net beneficiary of the trade dispute, while China bears the largest welfare cost. The calibrated model also suggests that the two-sector structure compresses the China/US wage ratio relative to the data, implying that extending the model to include a services sector would be a valuable direction for future quantitative work.

## 7 Conclusion

In this paper, we study how the US-China trade dispute affected Vietnam through trade, investment, and regional development, combining a quantitative trade model with reduced-form empirical analysis. Our first contribution verifies the trade reallocation effect of US tariffs using both bilateral and origin-production-destination-level data, finding that a one percentage point increase in US tariffs on the PRC raises Vietnamese exports to the US by around 5% and imports from China by around 3%. Our second contribution shows that these changes are driven by the location choices of multinational enterprises, particularly PRC firms, together with evidence of increasing returns to scale: PRC firm entry accounts for a substantial share of trade growth, and a 10% increase in industry employment raises firm productivity by 0.3%. Our third contribution uses a shift-share design to estimate regional impacts, finding that tariff-exposed districts experience significant increases in sales,

employment, firm entry, exports, and imports.

Preliminary simulations of the calibrated quantitative general equilibrium model validate the mechanisms identified in the data and quantify the welfare consequences. Under a 25 percent tariff increase on Chinese manufacturing, Vietnam's welfare rises by 6.2 percent, China's falls by 5.2 percent, and the connector channel, namely Chinese firms producing in Vietnam for the US market, more than doubles. The two-sector structure, while tractable, compresses the China/US wage ratio relative to the data, suggesting that extending the model to include a services sector would be a valuable direction for future quantitative work.

This study examines the general interplay between transport infrastructure, foreign direct investment (FDI), and international trade in shaping the spillover effects of trade disputes. It highlights how these channels jointly influence the economic resilience and competitiveness of third-party countries. The analysis further shows how the resulting impacts are distributed globally, creating both winners and losers in the world economy.

There are several potential directions to enrich our exploration. For one thing, the structure of internal trade costs could be further explored. For example, there could be a threshold of costs beyond which the trade-hurting effect could jump discontinuously. The existence of such a threshold could help explain the concentration of response to the trade dispute we find. Secondly, while we only use the number of industrial zones, the qualitative differences across industrial zones could be further explored to shed light on the optimal design of place-based industrial policies. Finally, while we include seaports in some of the analyses, it will also be worthwhile to examine the additional effects of other infrastructure investments, such as airports. These elements offer valuable avenues for future research.

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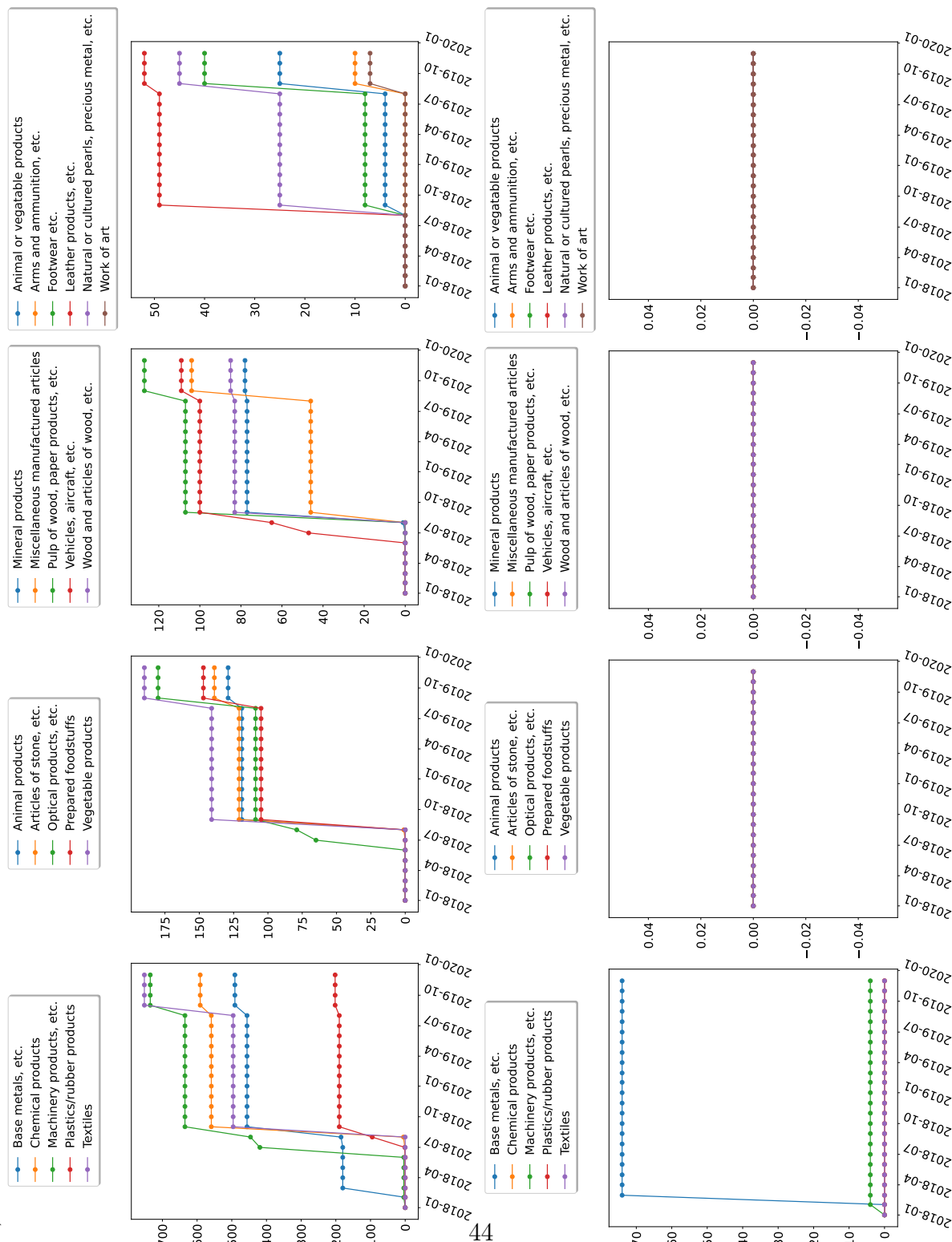
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# 8 More Empirical Results

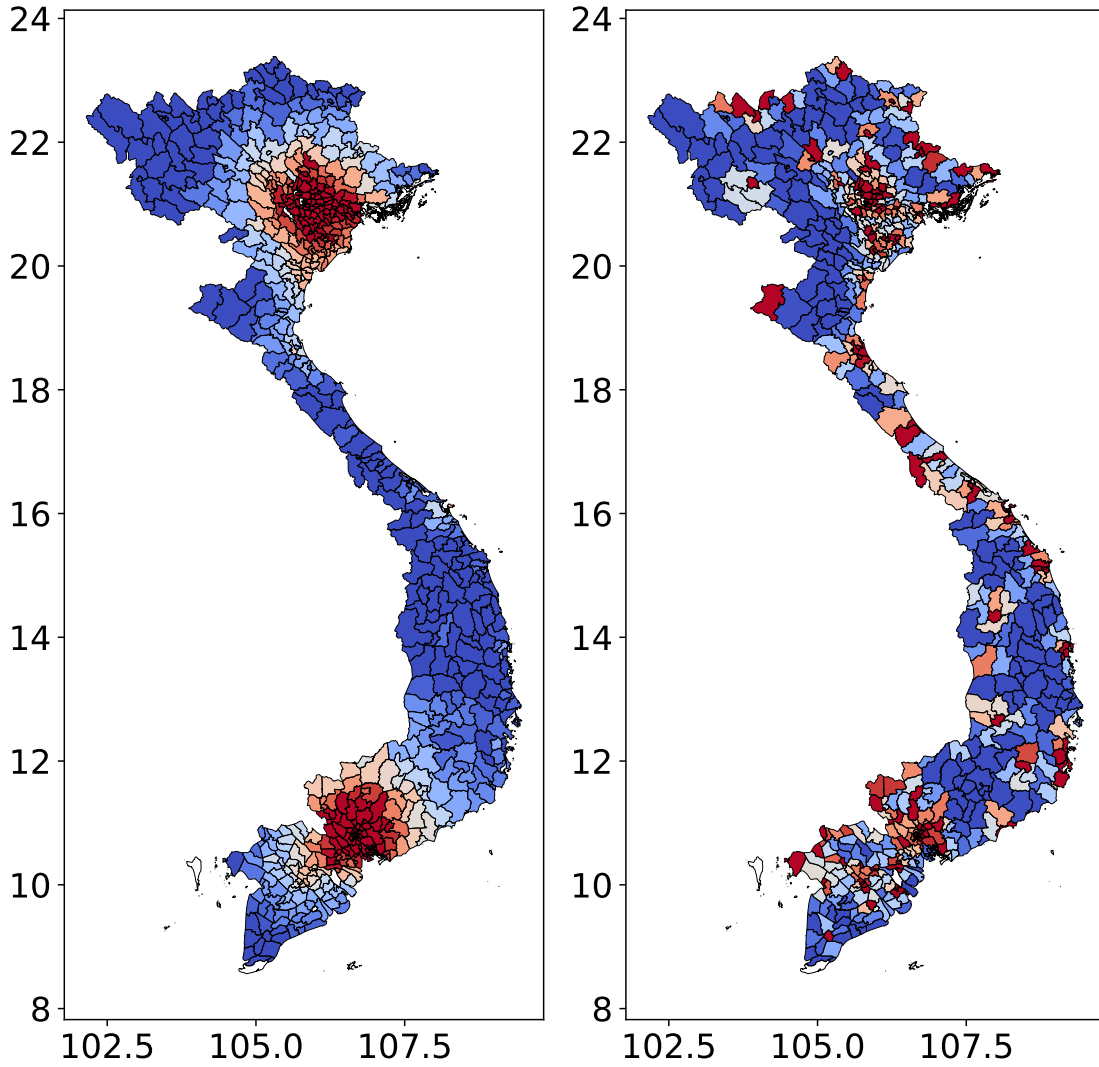
## 8.1 Descriptive Figures

Figure 9: Time Trends of the Number of Products Affected by Tariffs Implemented by the United States (Top: China; Bottom: Vietnam)



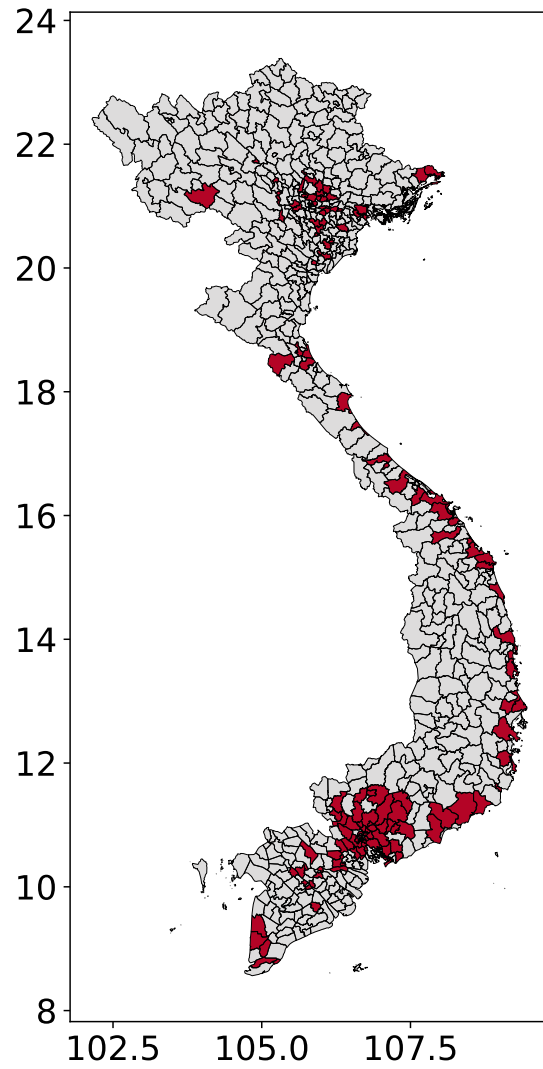
HS = Harmonized System, PRC = People's Republic of China. Note: The numbers represent unique HS codes. Source: Fajgelbaum et al. (2020) and Authors' calculation.

Figure 10: Market Access and Port Proximity



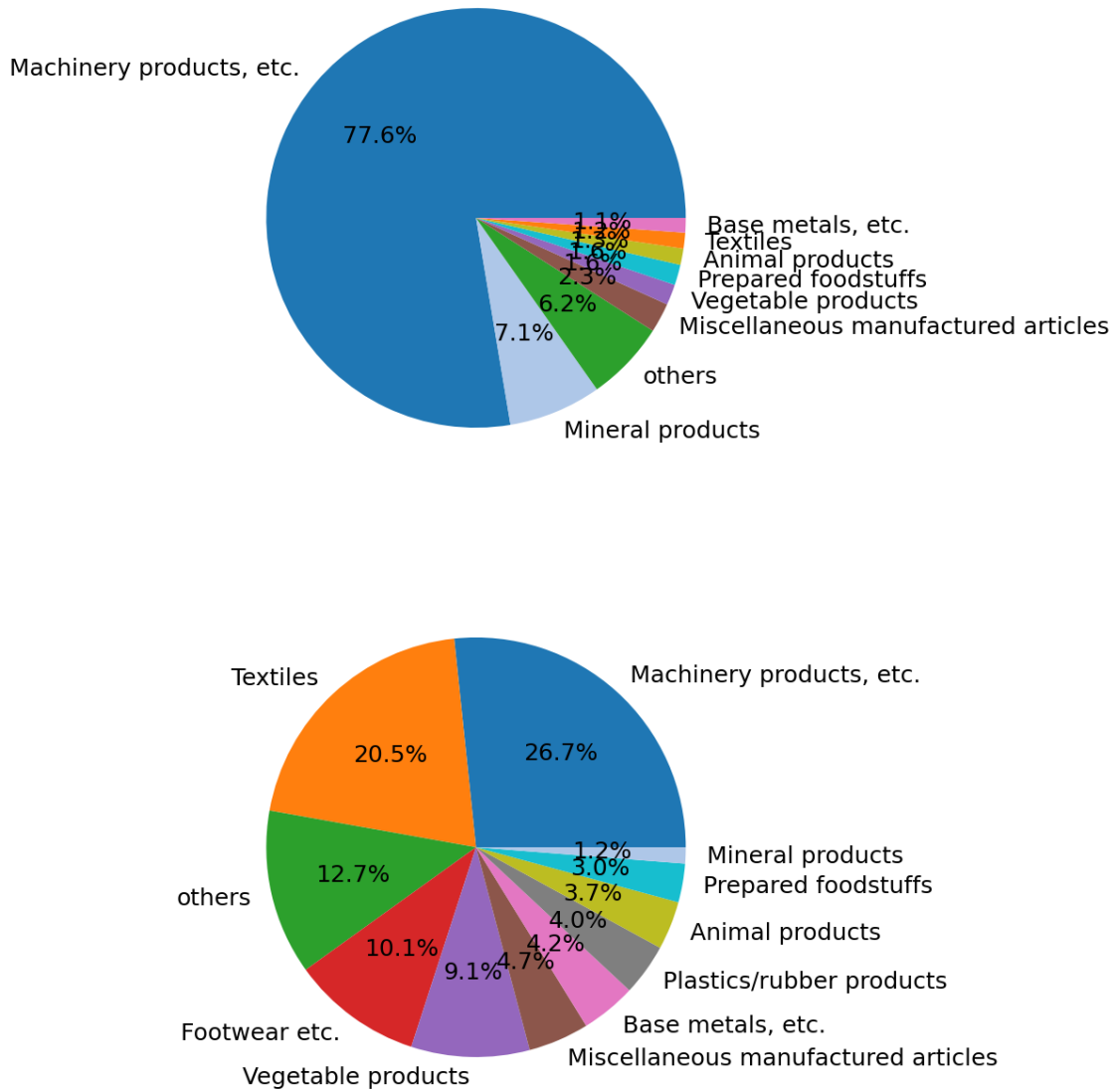
Note: Left panel plots market access, right panel plots port proximity in 2016.  
Source: the National Geospatial Information Authorities and Authors' calculation.

Figure 11: Location of Industrial Zones



Source: the Japan External Trade Organization and Authors' calculation.

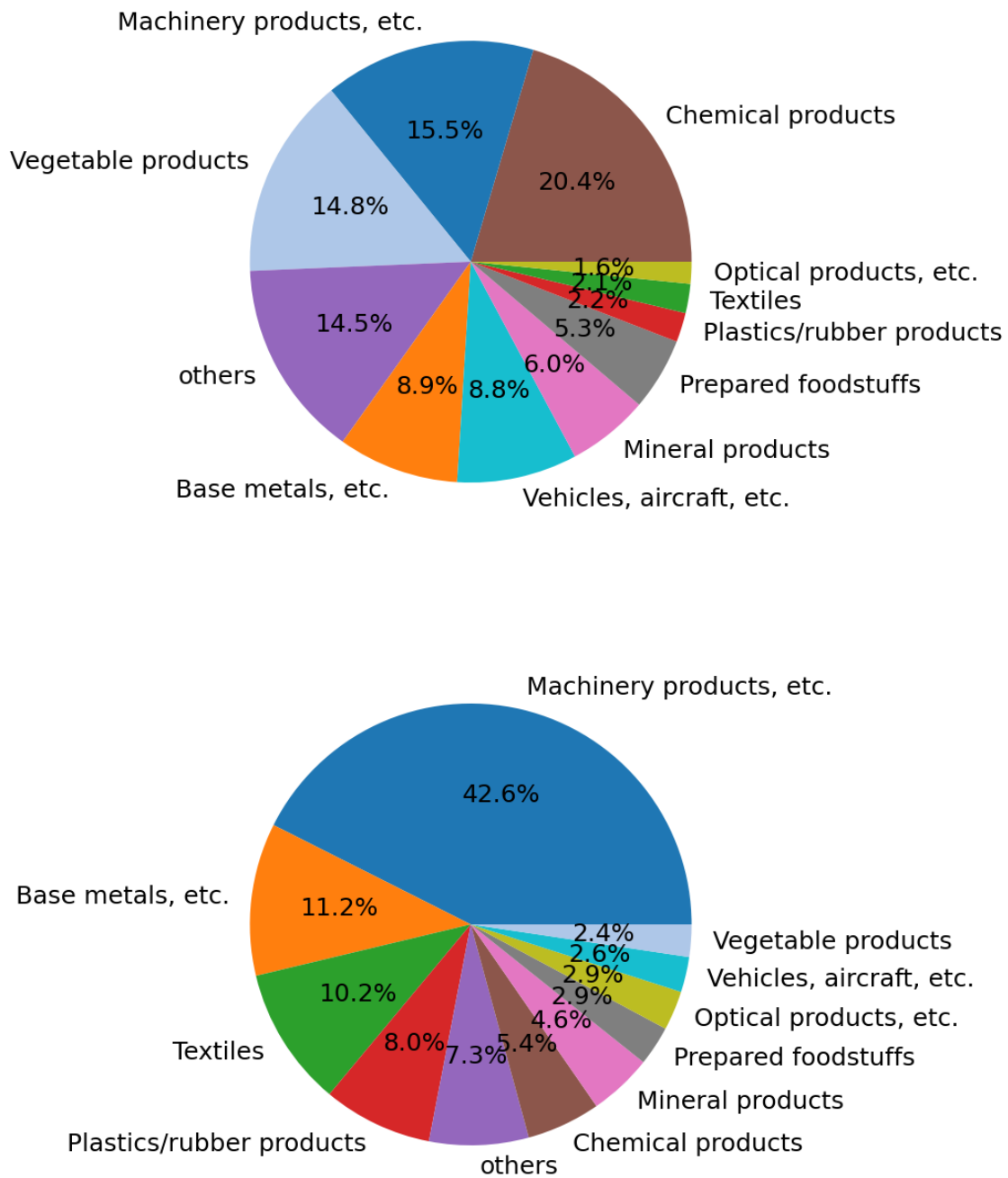
Figure 12: Harmonized System Sector Composition of Treated and Control Groups in Exports of Vietnam (Top: Unaffected Control Group; Bottom: Affected Treatment Group)



HS = Harmonized System. The upper panel plots the HS sector composition for the control group in terms of total export value in 2016; the lower panel plots the same composition for the treated group. An HS code is in the treated group if it is assigned positive tariff by the US on China.

Source: UN Comtrade data and Authors' calculation.

Figure 13: Harmonized System Sector Composition of Control Group (Top) and Treatment Group (Bottom) in Imports of Vietnam



HS = Harmonized System. The upper panel plots the HS sector composition for the control group in terms of total import value in 2016; the lower panel plots the same composition for the treated group. An HS code is in the treated group if it is assigned positive tariff by the US on China.

Source: UN Comtrade data and Authors' calculation.

## 8.2 Vietnam’s Trade Before and After the Trade Dispute

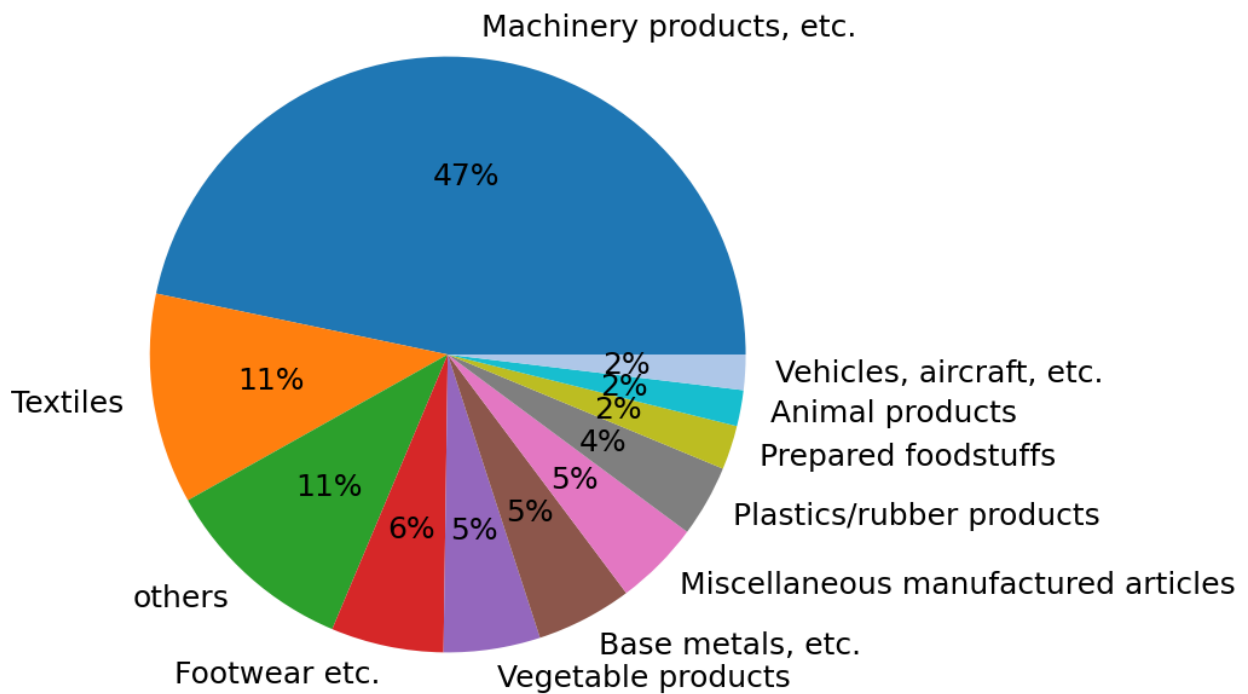
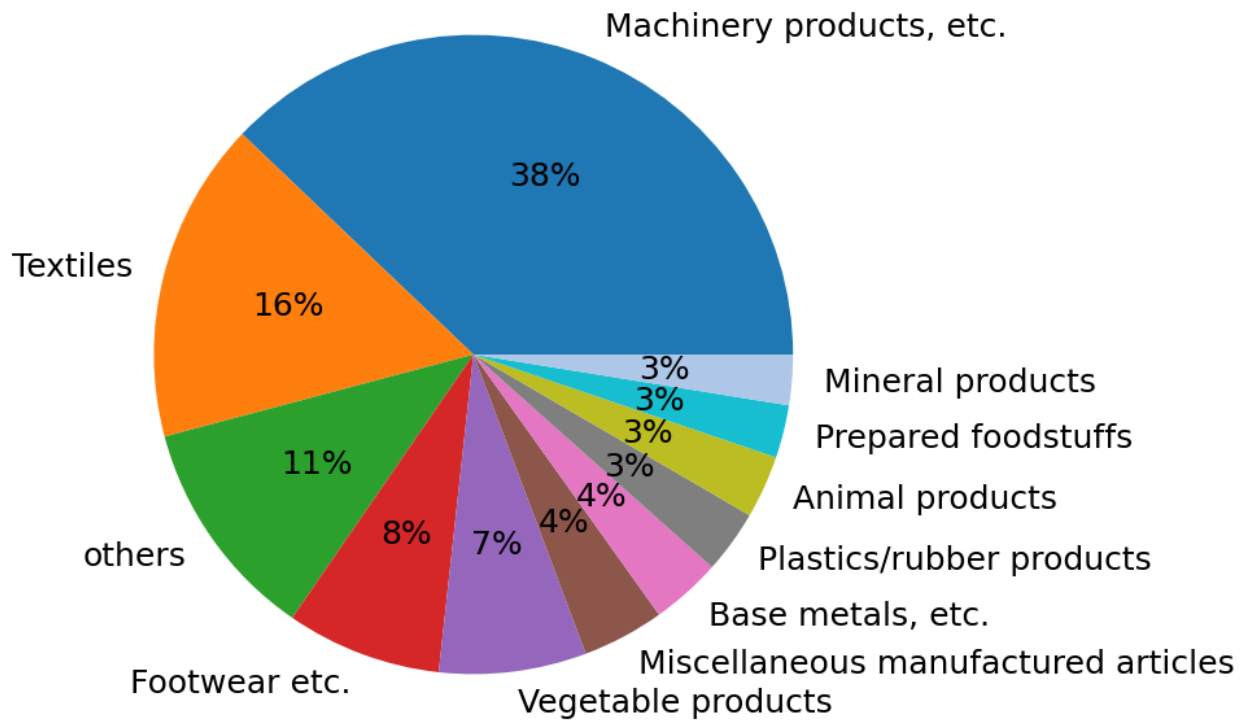
This section presents descriptive evidence to show the overall changes in Vietnam’s trade flows. Figure 14 shows the composition of Vietnam’s exports in terms of HS sector before and after the trade dispute. It shows that Vietnam mainly exports manufacturing products, in particular machinery products, whose share of exports increased from 38% in 2016 to 47% to 2023. In terms of export destinations, Figure 15 shows that the US has replaced EU after the trade dispute, becoming the most important export destination.<sup>4</sup> Moreover, the exports to PRC also overweight EU in 2023, accounting for 20% of the overall export value in Vietnam. Overall, the five groups of regions, including US, PRC, EU, EA, and SEA account for 84% of Vietnam’s total exports in 2023.

Figure 16 and Figure 17 present the changes in composition of Vietnam’s imports by HS sectors and by regions. Machinery products are the biggest sector of Vietnam’s imports both before and after the trade dispute. Before the trade dispute, the PRC and the other East Asian countries (EA) roughly accounted for the same share of import value. After the trade dispute, however, the imports from PRC start to account for a higher share of imports. In addition, note that much of the Vietnam’s imports are primary goods or intermediate goods that are likely to be used in production. This nature of trade contents has important implications to how we should understand the consequences of changes in trade flows after the trade dispute.

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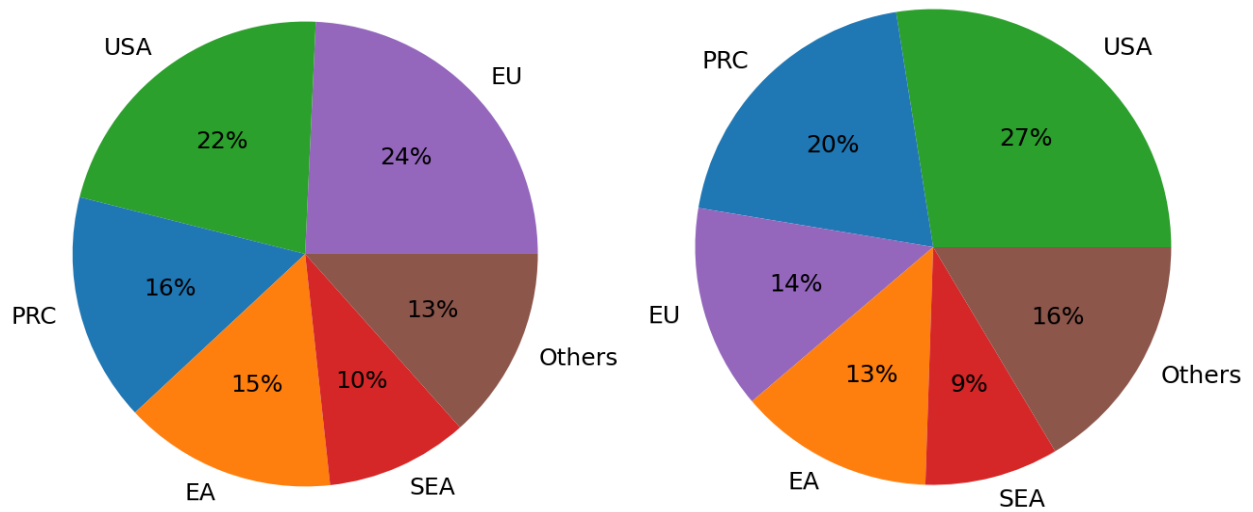
<sup>4</sup>Trade partners are grouped into regions as follows. PRC includes China and Hong Kong, China. EA includes Japan and Korea. SEA includes Indonesia, Malaysia, Myanmar, Philippine, Thailand, Singapore, Brunei Darussalam, Cambodia, and Laos. EU includes Austria, Belgium, Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and United Kingdom.

Figure 14: Harmonized System Sector Composition of Vietnam's Exports



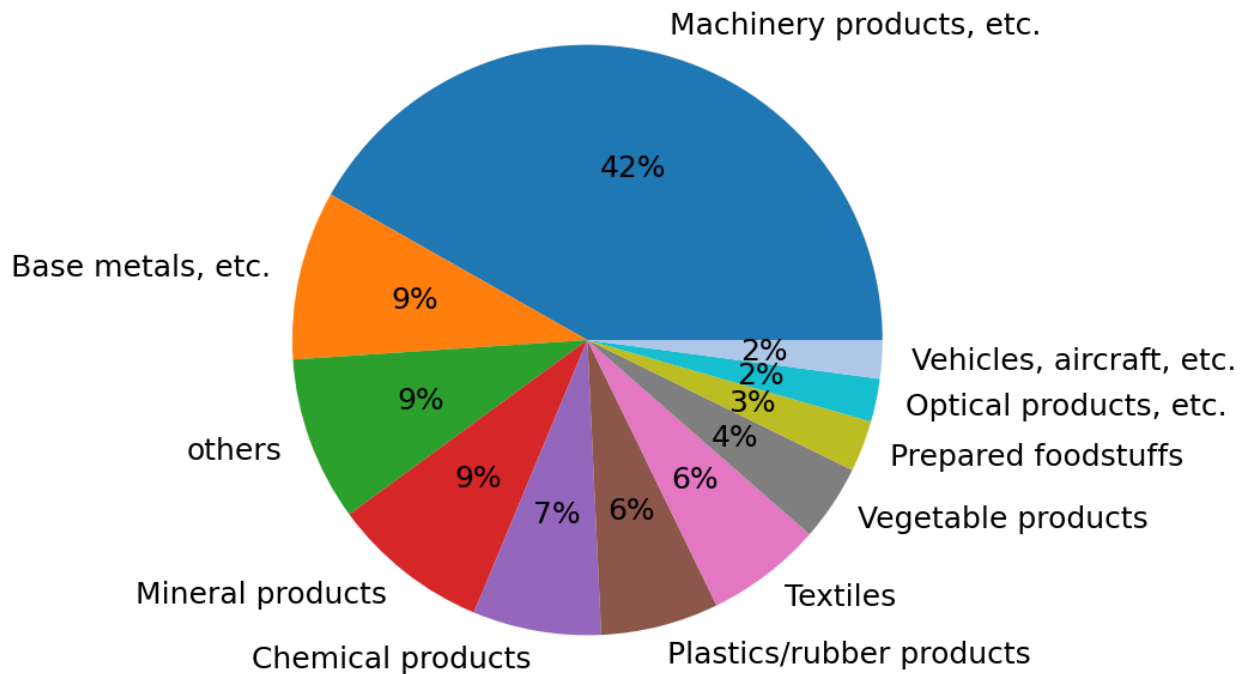
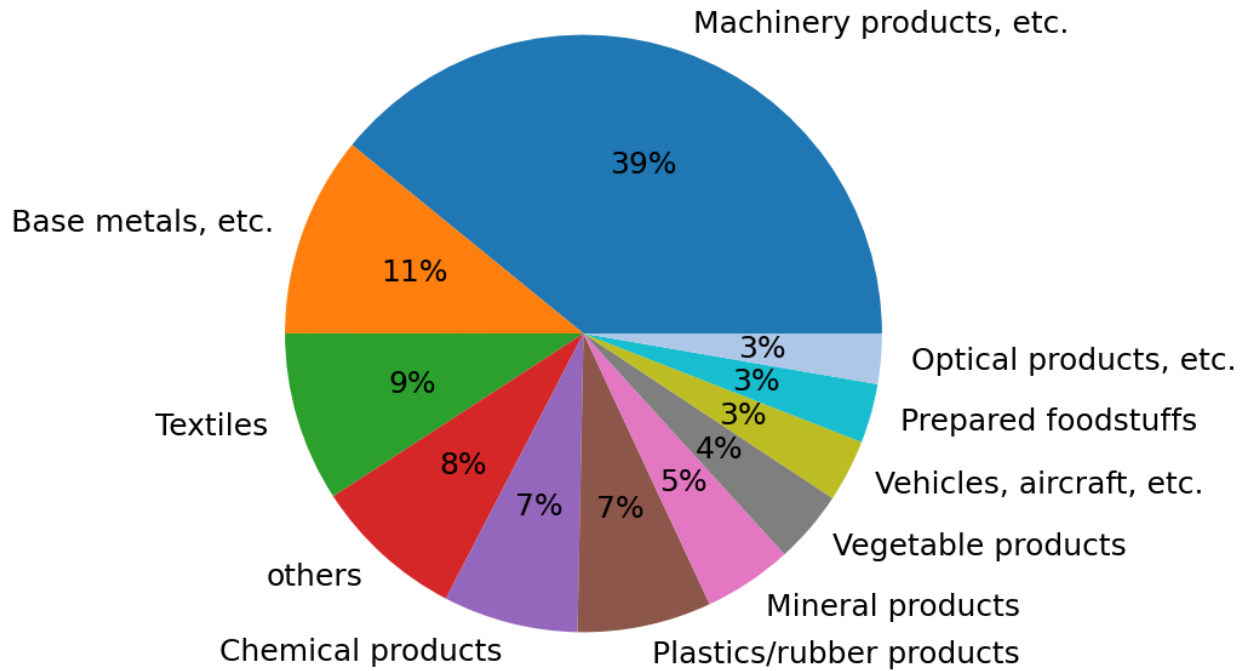
The first figure plots the HS sector composition for Vietnam's total export value in 2016. The second figure plots the same composition in 2023. Source: UN Comtrade data and Authors' calculation.

Figure 15: Destination Composition of Vietnam's Exports



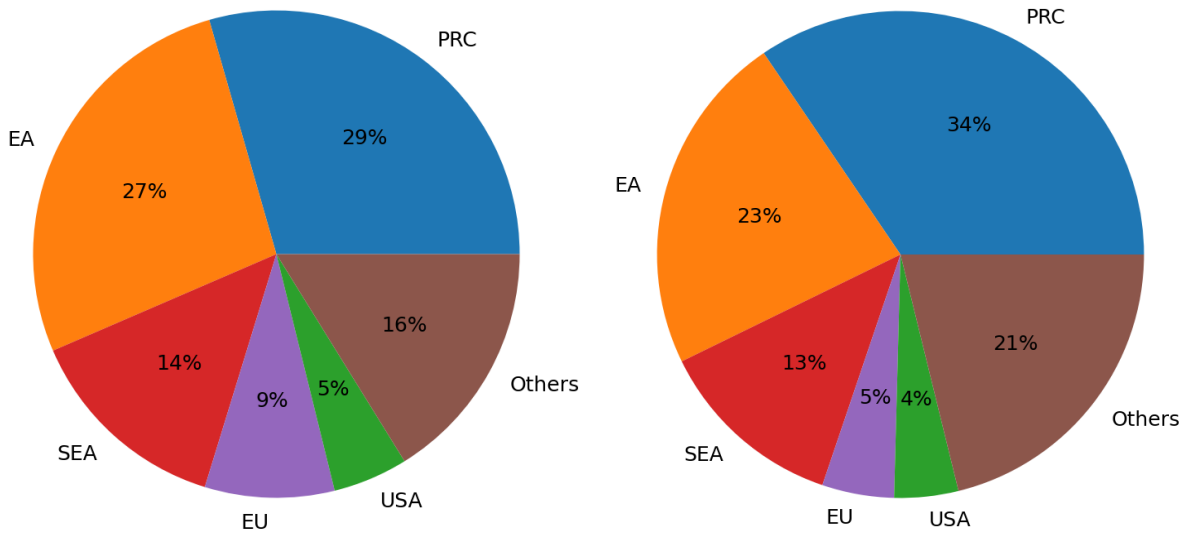
The first figure plots the destination composition for Vietnam's total export value in 2016. The second figure plots the same composition in 2022. Source: UN Comtrade data and Authors' calculation.

Figure 16: Harmonized System Sector Composition of Vietnam's Imports



The first figure plots the HS sector composition for Vietnam's total import value in 2016. The second figure plots the same composition in 2023. Source: UN Comtrade data and Authors' calculation.

Figure 17: Destination Composition of Vietnam's Imports



The first figure plots the destination composition for Vietnam's total import value in 2016. The second figure plots the same composition in 2022. Source: UN Comtrade data and Authors' calculation.

### 8.3 Interpretation of the Trade Dispute Effects

The nature of the changes in trade flows can have profound implications to the economic development of Vietnam. If the changes are simple rerouting of goods, then we expect that (a) Vietnam would import the same product from PRC and export to the US; (b) the flow of capital associated with the trade flows would be minimal; (c) the trade dispute would not bring much economic growth. The reason for hypothesis (b) and (c) is that re-routing will not lead to much more production activity. On the other hand, if the changes are associated with relocation of production for multinational enterprises, then we expect the opposite patterns in Vietnam. This section provides evidence that aims at testing the above hypothesis.

Firstly, Figure 18 and Figure 19 further split the trade volumes between Vietnam and other regions into intermediate consumption and final consumption using the United Nation's Broad Economic Categories. These two figures show a clearer nature of trade contents between Vietnam and its major trade partners. Both the exports and imports with PRC are mainly intermediate consumption. This suggests that the trade between the two countries is largely related to the production network. On the other hand, the exports to the US and the EU mainly consist of final consumption. Trade between Vietnam and the other

East Asian countries (EA) is somewhat in between, consisting of both intermediate and final consumption. Although the right panel of Figure 19 shows that Vietnam also imports final consumption goods from the SEA countries and the PRC, the magnitude is smaller than the intermediate goods. Therefore, we find evidence that, at least for a significant part of trade, the goods that Vietnam imports from PRC and exports to the US are different.

Secondly, we use OECD's TiVA data to explore the changes in the composition of value added in Vietnam's gross exports and imports. Specifically, we calculate the value added coming from each region in the manufacturing industries, and divide them by the total value added. We then plot the time trend of shares of value added for Vietnam's gross exports in Figure 20. The share of value added coming from PRC increased from 2012 to 2015, declined in 2016, then started to increase again after 2017. PRC's importance exceeds other East Asian region (EA) exactly after 2018. Meanwhile, Vietnam's share of domestic value added in the manufacturing industries has been decreasing. A similar trend is found using ADB's Multi-region input-output tables and is shown in Figure 21. In this figure, we plot the share of intermediate goods in the manufacturing sector in Vietnam that comes from different sources. In the left figure, we find that the share of intermediate goods sourced domestically has declined. While on the right figure, we find that the share of intermediate goods that come from PRC (the green line) increases significantly after 2018. These patterns suggest a higher degree of integration in the supply chain between Vietnam and PRC.

Next, we present two pieces of evidence related to multinational enterprise activities in Vietnam. Figure 22 plots the time trend of FDI flows released by the Ministry of Planning & Investment of Vietnam. It reveals that the amount of foreign investment from East Asia and PRC increased after 2017. The importance of foreign firms is further confirmed by Figure 23, which shows the share of foreign affiliates in the exports to the US (left panel) and imports from PRC (right panel) in the manufacturing industries. The figure is calculated using the OECD Analytical Activity of Multinational Enterprises (AAMNE) database. Foreign affiliates account for more than 23% of exports to the US and 36% of imports from PRC, and both shares increased after 2018. Together with the changes in input-output relations, these patterns are consistent with the hypothesis that MNEs in the East Asia region increasingly bring production activities into Vietnam.

Finally, we examine whether tariff effects propagate along value chains. In particular, we examine the hypothesis that if the downstream products are targeted by tariffs, then the inputs of those products will be imported from PRC to Vietnam. To achieve this, we run the regression

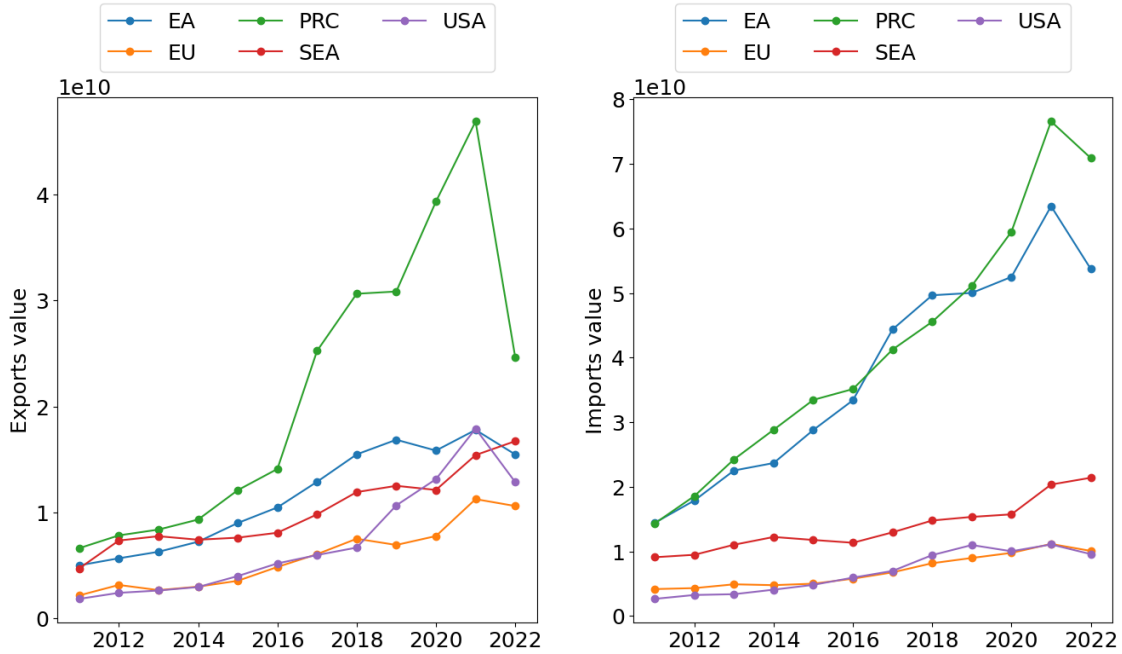
$$\ln Import_{igt} = \beta_1 \ln \left( Tari_{gt}^{US,CN} + 1 \right) + \sum_k \beta_{2,k} \ln \left( Tari_{gt}^{US,CN} + 1 \right) \times \mathbf{1} \{ Region_i = k \} \quad (42)$$

$$+ \beta_3 \ln \left( TariDown_{gt}^{US,CN} + 1 \right) + \sum_k \beta_{4,k} \ln \left( TariDown_{gt}^{US,CN} + 1 \right) \times \mathbf{1} \{ Region_i = k \} + \phi_{ig} + \phi_t + \varepsilon_{igt},$$

where  $TariDown_{gt}^{US,CN}$  the US tariffs imposed on the downstream product of product  $g$  in year  $t$ , and other variables are defined in the same was as in Equation (42). To identify the input-output linkage at the product level, we use AIPNET constructed by [Fetzer et al. \(2024\)](#). This paper uses the large language model to identify the production linkages between pairs of HS-6 codes. We take the average for the level of tariffs across all the downstream products identified by their data.

The estimate results are reported in Table 16. The coefficients of the interactions terms,  $\beta_{2,PRC}$  and  $\beta_{4,PRC}$ , in the first column, show that the relative increases in the imports from PRC are driven by the increase in the tariffs imposed on the downstream products instead of tariffs imposed on the focal products: the estimate of  $\beta_{2,PRC}$  is positive but insignificant, while the estimate of  $\beta_{4,PRC}$  is higher and more significant. In the second column, we restrict to the products to those whose number of downstream product is less or equal to three, in order to improve the relevance of the identified downstream products. In those cases, the increase of downstream tariffs is more likely to be important because the focal products are used more specifically to produce those downstream products. Results in the second column confirm that the downstream tariffs have an even higher effect in those cases.

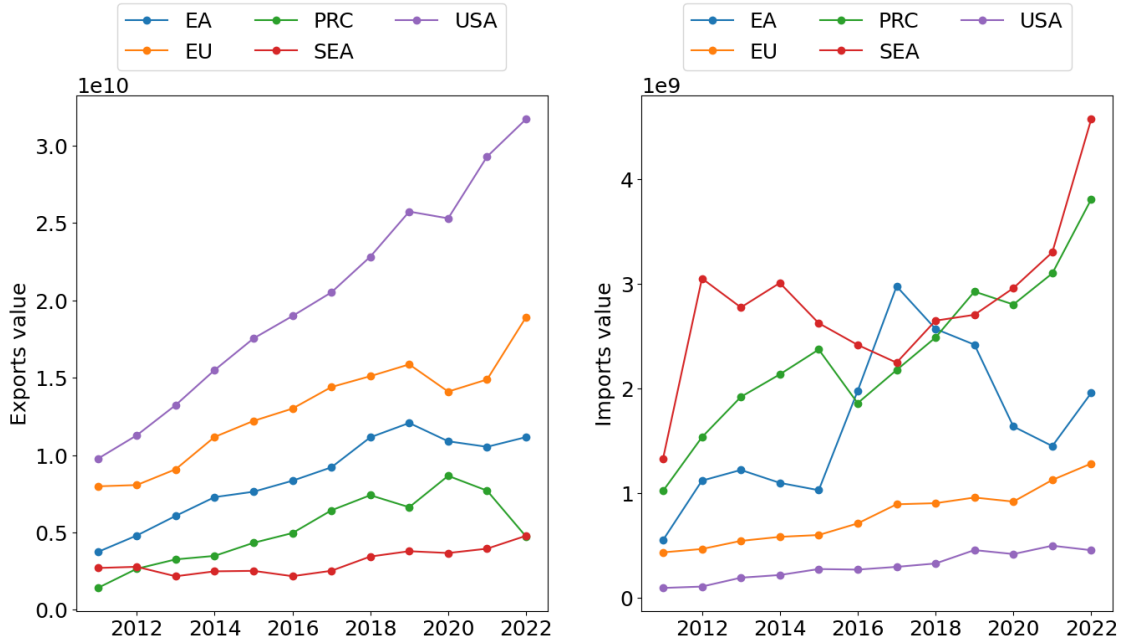
Figure 18: Time Trend of Vietnam’s Trade Flows by Trade Partners for Affected Products, Intermediate Consumption



Notes: The left panel plots the total export value, and the right panel plots the total import value of Vietnam by the location of trade partners. The sample is restricted to the HS6 codes that are affected by the US tariffs and intermediate consumption as classified by United Nation’s Broad Economic Categories.

Source: Authors’ calculations based on UN Comtrade data.

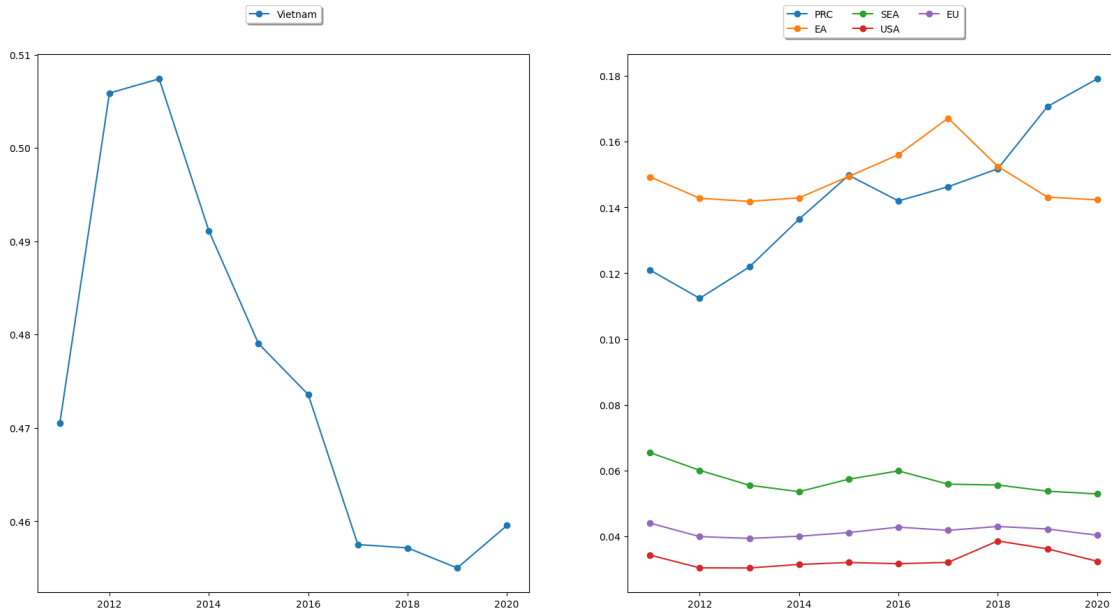
Figure 19: Time Trend of Vietnam's Trade Flows by Trade Partners for Affected Products, Final Consumption



Notes: The left panel plots the total export value, and the right panel plots the total import value of Vietnam by the location of trade partners. The sample is restricted to the HS6 codes that are affected by the US tariffs and final consumption as classified by United Nation's Broad Economic Categories.

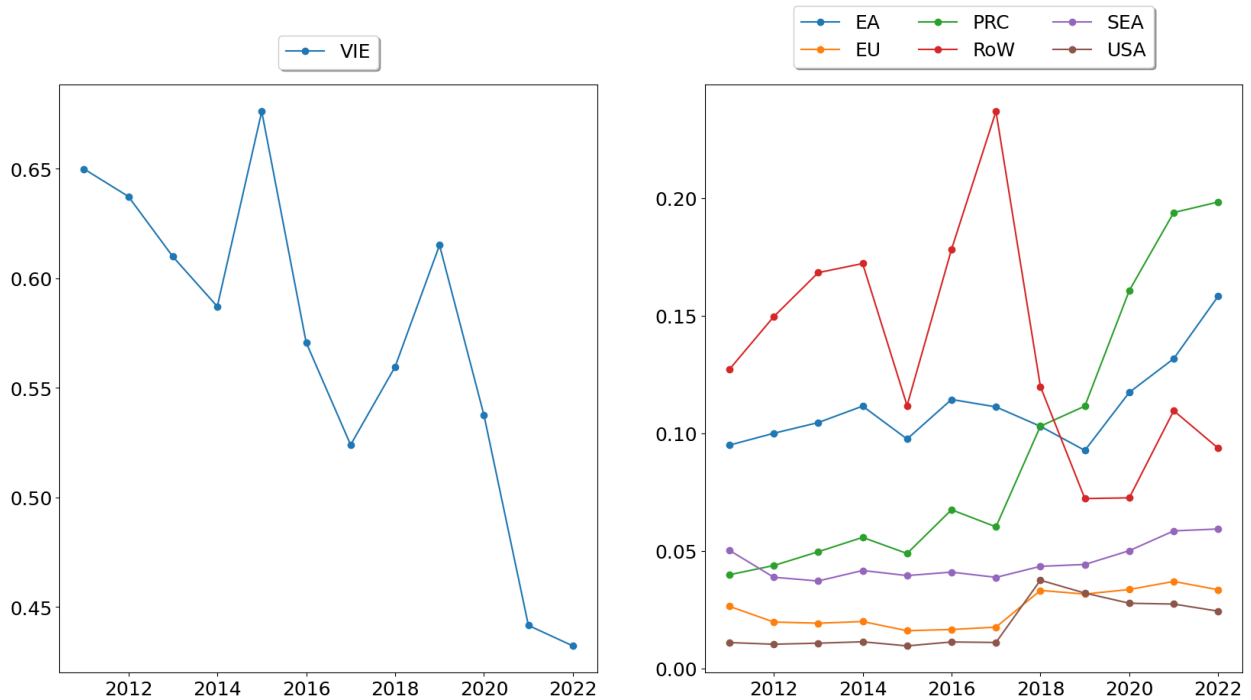
Source: Authors' calculations based on UN Comtrade data.

Figure 20: Value Added Shares of Gross Exports of Vietnam



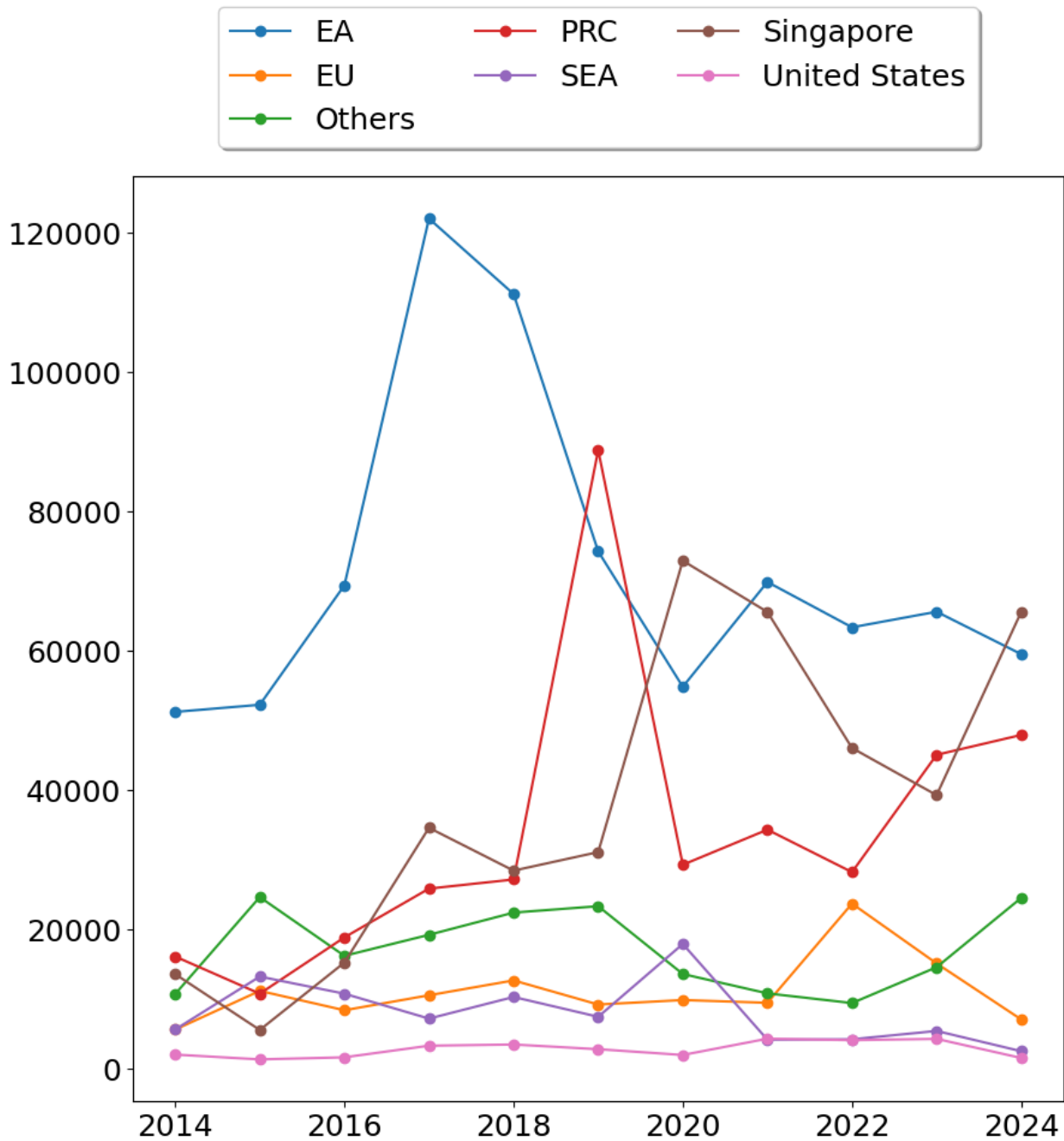
Note: The left panel plots the time trend of the domestic share of value-added of manufacturing industries in Vietnam's gross exports. The right panel plots the time trend of the shares of value-added of manufacturing industries coming from other regions in Vietnam's gross exports.

Figure 21: Time Trend of Shares of Intermediate Goods in Manufacturing Sector in Vietnam



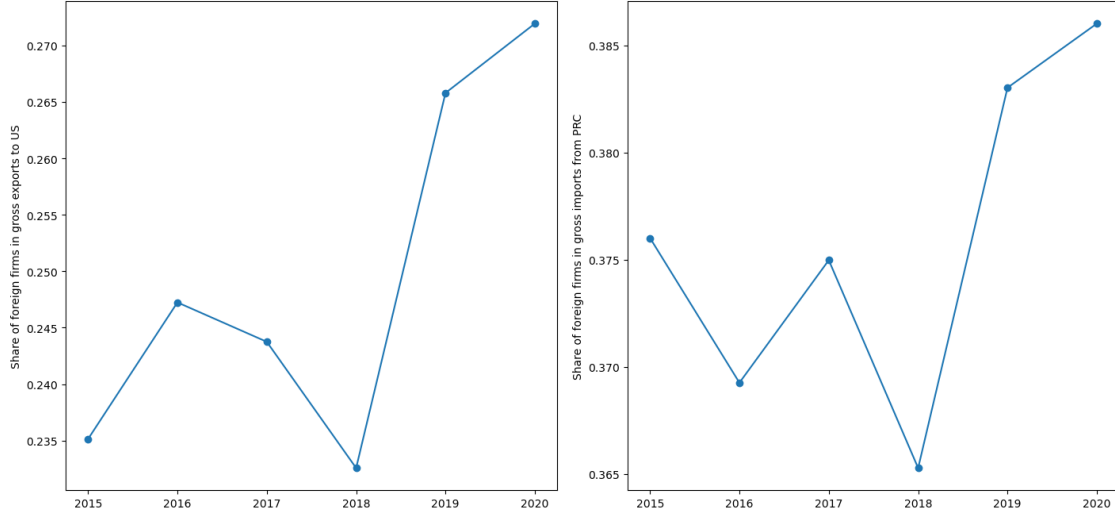
Source: ADB MRIO and Authors' calculation.

Figure 22: Time Trend of FDI Flows by Region



Due to data availability, the definition is slightly different from that in the UN Comtrade data. Europe includes France, Germany, Belgium, Poland, United Kingdom, Netherlands, Denmark, Luxembourg, Russia, Cyprus, Italy, Spain, Switzerland, Romania, Sweden, Czech Republic, Estonia, Ireland, Finland, Hungary, Norway, Ukraine, Austria, Slovenia, Latvia, Bulgaria, Andorra, Moldova, Liechtenstein, Belarus, Portugal, Armenia, Lithuania, Greece, Slovakia, Serbia, Iceland, Albania, Malta, Monaco, Croatia, Georgia, Guernsey, Isle of Man, Channel Islands. South East Asia includes Malaysia, Brunei, Thailand, Indonesia, Philippines, Laos, Cambodia, Myanmar. Singapore is shown separately. East Asia includes Japan, South Korea, and Taiwan Province of China. PRC includes China and Hong Kong. Source: Authors' calculations based on the data released by the Ministry of Planning & Investment of Vietnam.

Figure 23: International Trade Presence of Foreign Affiliates in Vietnam



Notes: The left panel plots the aggregate share of gross export values for foreign affiliates in the manufacturing industries in Vietnam to the US. The right panel plots the aggregate share of gross import values for foreign affiliates in the manufacturing industries of Vietnam from PRC.

Source: Authors' calculations based on the OECD AAMNE database.

Table 16: Estimates of Trade Dispute Effect on Vietnam's Trade Flows

	$\ln Import_{igt}$	std	$\ln Import_{igt}$	std
$Tari_{gt}^{US,CN}$	-1.225	0.295	-0.458	1.035
$TariDown_{gt}^{US,CN}$	-1.538	0.436	-7.113	1.139
$Tari_{gt}^{US,CN} \times \mathbf{1}\{Region_i = PRC\}$	0.682	0.362	1.392	1.290
$TariDown_{gt}^{US,CN} \times \mathbf{1}\{Region_i = PRC\}$	2.100	0.465	3.524	1.344
Partner-product	x		x	
Year	x		x	
Observations	151044		11520	
S.E. type	by HS6		by HS6	
R2	0.850		0.831	

For the imports regression, the reference group is EA.  $TariDown_{gt}^{US,CN}$  is the average tariff imposed on downstream products identified using AIPNET. The second column restricts to the sample of products that are upstream products for less or equal to 3 downstream products.

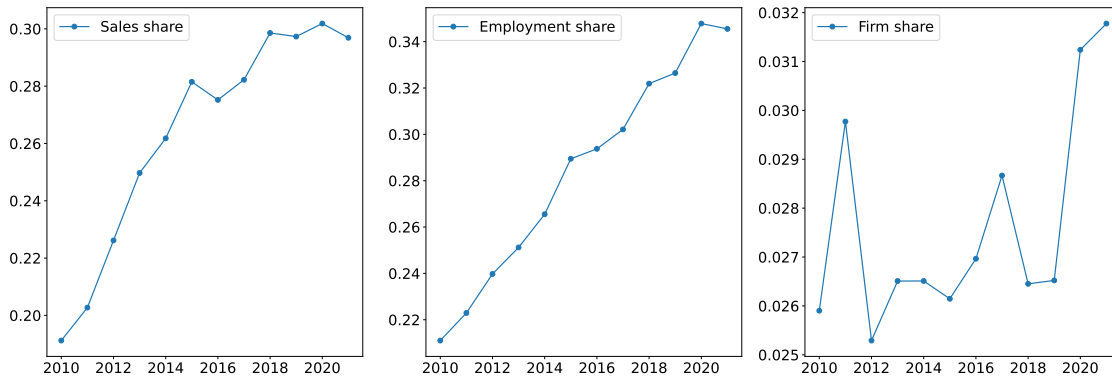
## 8.4 The Presence of Multinationals in Vietnam

In this section, we document descriptive facts regarding the multinationals in Vietnam. Figure 24 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. We also find that the distribution of foreign firms is far from even across different regions in Vietnam. Across district-years, the average share of employment for foreign affiliates is 13.1%, while the median is only 0.7%.

To explore the role of foreign firms, we use the FDI source information in VES to classify firms by the location of their largest source of foreign capital. Firms receiving most foreign capital from PRC (including Hong Kong, China) are regarded as PRC related firms. Firms receiving most foreign capital from Japan, Korea, and Chinese Taipei are classified as other East Asian region (EA) related firms (denoted as EA). Firms receiving most foreign capital from Singapore, Malaysia, Thailand, Philippine, or Indonesia are classified as South East Asian related firms (denoted as SEA). Firms receiving most foreign capital from France, Britain, Germany, Netherlands, or Italy are classified as Europe related firms (denoted as EU). Firms receiving most foreign capital from the US are regarded as US related firms. Firms receiving most foreign capital from other regions are classified into another category denoted as others. Domestic firms are defined as those firms receiving no foreign capital according to our data.

Figure 25 plots the time trend of total employment of different groups of firms by the source of FDI. While the other East Asian region (EA) accounts for the largest share of employment, its share increases from 2017 to 2018 then declines since 2019. On the other hand, the employment by the PRC firms keeps increasing over the four year period. The number of employment for firms from the SEA, the US, and the EU are smaller, and their levels increase slightly or decrease by year 2020.

Figure 24: Presence of Foreign Affiliates in Vietnam



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

Source: Authors' calculations based on the Vietnam Enterprise Survey.

Figure 25: Employment by FDI Source



Note: The figure plots the total number of employment for groups of firms by source of FDI.

Source: Authors' calculations based on the Vietnam Enterprise Survey.

## 8.5 Robustness Checks

This section reports robustness checks that examine the sensitivity of our findings to alternative specifications.

Table 17: Estimates of Trade Dispute Effect on Vietnam's Trade Flows, Robustness

	(1)		(2)		(3)		
	$\ln Export_{igt}$	std	$\ln Export_{igt}$	std	$\ln Import_{igt}$	std	
$Tari_{gt}^{US,CN}$	0.619	0.333	$Tari_{gt}^{US,CN}$	2.204	0.960	-0.954	0.251
$Tari_{gt}^{US,CN} \times \mathbf{1}\{Region_i = EA\}$	1.475	0.330	$Tari_{gt}^{US,CN} \times \mathbf{1}\{Region_i = EU\}$	-2.689	0.947	-0.107	0.199
$Tari_{gt}^{US,CN} \times \mathbf{1}\{Region_i = PRC\}$	1.630	0.356	$Tari_{gt}^{US,CN} \times \mathbf{1}\{Region_i = PRC\}$	0.482	1.048	1.173	0.211
$Tari_{gt}^{US,CN} \times \mathbf{1}\{Region_i = SEA\}$	-0.711	0.281	$Tari_{gt}^{US,CN} \times \mathbf{1}\{Region_i = SEA\}$	-0.290	0.913	-1.012	0.229
$Tari_{gt}^{US,CN} \times \mathbf{1}\{Region_i = USA\}$	6.406	0.450	$Tari_{gt}^{US,CN} \times \mathbf{1}\{Region_i = USA\}$	5.707	1.383	-0.297	0.277
Partner-product	x		x		x		
Year	x		x		x		
Observations	447852		123784		342057		
S.E. type	by HS6		by HS6		by HS6		
R2	0.793		0.820		0.824		

Note: This table reports additional checks related to equation (36). Column (1) reports the export regression using the EU countries as the reference group. Column (2) reports the export regression restricted to final consumption goods. Column (3) reports the import regression restricted to intermediate consumption goods.