Elsewhere in North America: How U.S. Tariffs on China Boosted Mexico's Manufacturing Employment and Output*

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Using longitudinal firm- and plant-level data from Mexico linked to customs records over 2014–2023, I examine whether US tariffs targeting China stimulated manufacturing expansion in Mexico. Leveraging the abrupt shift in US trade policy as a natural experiment, and constructing firm-level trade policy exposure measures based on firms' pre-shock trade portfolios, I show that higher US tariffs on China significantly increased manufacturing output, value added, and employment. Foreign multinationals and their domestic affiliates operating under Mexico's export platform, IMMEX, drive these gains, with U.S.-headquartered firms making a particularly notable contribution. Adjustment occurs along both intensive and extensive margins, through expansion of existing plants and establishment of new ones. Employment gains are concentrated in technology-intensive industries and among production workers and technicians—precisely the middle-skill manufacturing jobs that trade protectionism sought to restore domestically. These findings show that heightened import protection stimulated manufacturing activity elsewhere in North America, driven by multinationals, including U.S.-headquartered firms, highlighting how the realized outcomes of trade policy can diverge from their intended effects in an integrated global economy.

Keywords: Trade War, Global Value Chains, Multinational Firms, Manufacturing, Output, Employment, Nearshoring

JEL classifications: F13; F14; F23; F61; F68

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1 Introduction

The imposition of U.S. tariffs on a broad range of Chinese imports under Section 301 of the Trade Act of 1974 marked a sharp departure from decades of liberal trade policy. By 2019, the tariffs and subsequent retaliation had affected more than $450 billion in bilateral trade flows, creating a large and sudden shock to globally integrated production networks (Fajgelbaum and Khandelwal 2022).[1]

Although the tariffs were promoted by the administration as a tool to bring back manufacturing jobs (The White House 2018, 2019), recent evidence suggests that they failed to deliver on their central promise of reviving domestic manufacturing (Flaaen and Pierce 2024; Autor et al. 2024), while imposing substantial costs on U.S. consumers and firms (Amiti et al. 2019; Grossman et al. 2024). Instead, studies document sharp increases in multinational-driven exports from Mexico and other third countries, pointing to a broader reorganization of global value chains rather than reshoring (Utar et al. 2025; Fajgelbaum et al. 2024; Beason et al. 2025). Because manufacturing in the United States and Mexico is tightly integrated within North American production networks (Flaaen et al. 2025), the surge in exports from Mexico raises a central question about the mechanism through which U.S. trade policy operates: did the U.S. tariffs on China lead multinational firms to expand manufacturing capacity elsewhere within North America, and if so, where within their cross-border production networks did this adjustment occur?

To examine this question, I use firm-level data from Mexico's national statistics agency (INEGI) covering internationally active manufacturing firms from 2014 to 2023. INEGI's Perfil de Empresas Manufactureras de Exportación (PEME) framework links administrative trade records with firm-level information on production and employment, and can be further linked to establishment-level records for firms operating under Mexico's export platform. The resulting database covers the universe of manufacturing firms active in international trade, which together account for more

[1] Studies show that the 2018–2019 tariff changes were uncorrelated with prior price or import trends across products, making the event a suitable natural experiment for analyzing trade policy and global value chains (e.g., Cavallo et al. 2021; Fajgelbaum et al. 2020; Amiti et al. 2020). For details on product and sectoral coverage, see Bown (2021).

than 84% of Mexico's merchandise trade.

Distinguishing firms that operate under Mexico's export platform—the Maquiladora Manufacturing Industry and Export Services (IMMEX) program—reveals that IMMEX firms account for 90% of Mexico's manufacturing exports to the United States. As shown in Utar et al. (2025), these firms, most of which are either subsidiaries of foreign multinationals or domestically owned affiliates closely tied to U.S. manufacturing, are the primary drivers of Mexico's export growth following the increase in U.S. tariffs on Chinese imports. Throughout the paper, I refer to these firms as "GVC firms," reflecting the program's explicit purpose of fostering participation in global production and service networks.

Using corporate linkages from Dun & Bradstreet, I trace the ultimate owners of GVC firms via their tax identifiers and link this information to the PEME database. This allows a direct assessment of the role of foreign ownership in Mexico's manufacturing expansion. Between 2017 and 2023, firms with ultimate owners headquartered outside Mexico created over half a million manufacturing jobs, of which U.S.-owned firms alone expanded employment by 31 percent, adding more than 300,000 jobs (Figure 1). This aggregate pattern is echoed in a number of high-profile multinational expansions—including Bosch, LEGO, Continental, Volkswagen, and Toyota— that committed substantial investments to expand their manufacturing footprint in Mexico during this period (News Desk 2018; Webwire 2022; Reuters 2022a; Cohen et al. 2025). In several cases, these expansions coincided with reductions in US operations, as seen with John Deere, Foxconn, and Stellantis (Reuters 2020; Reuters 2022b; Glickman 2024).

Did a policy aimed at reviving US manufacturing instead fuel job creation in Mexico? In fact, the share of employment accounted for by manufacturing firms in IMMEX relative to US manufacturing employment rose from roughly one-fifth in the pre–trade war period to one-fourth in the post–trade war period (see Figure 2).

I construct firm-level trade policy exposure measures based on pre-shock product-destination portfolios at the six-digit HS level. Exploiting the abrupt and large-scale nature of the US tariff shock,

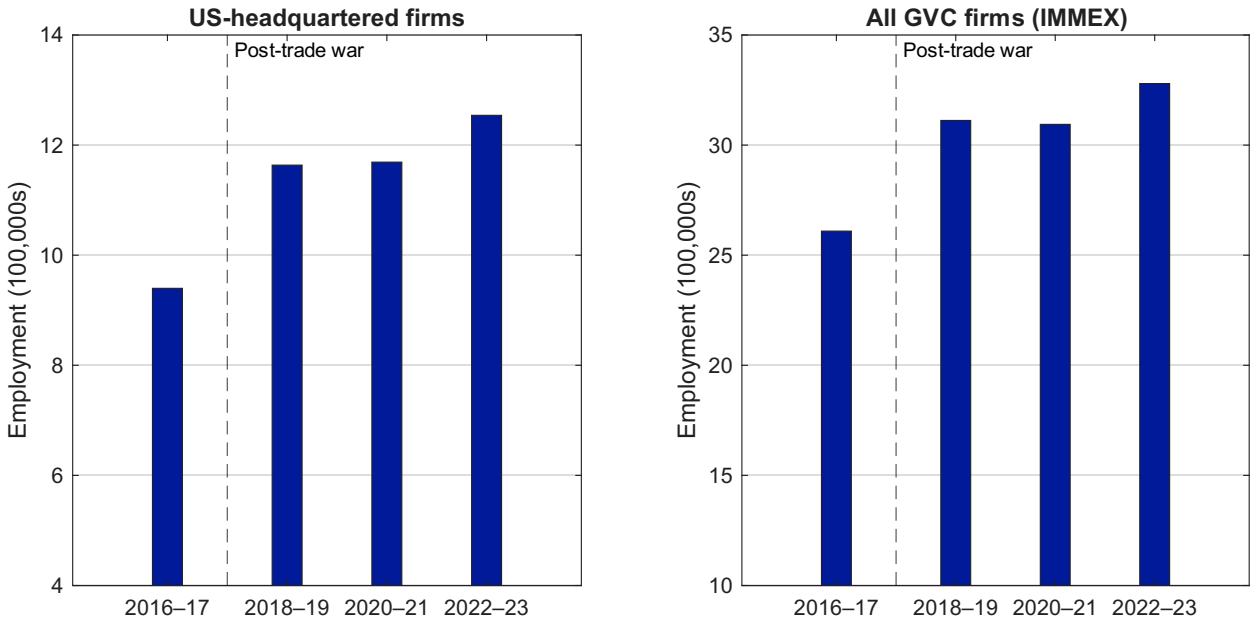


Figure 1: Manufacturing Employment accounted for by U.S. Firms in Mexico

PEME database, INEGI. Within PEME, IMMEX firms and US-owned IMMEX firms are identified via their tax identifiers. The figure plots the total employment accounted for by firms whose ultimate owners are headquartered in the US (left) and the total employment accounted for by all IMMEX firms.

I analyze within-firm outcomes in an event study framework, controlling for aggregate, industry, and firm-specific shocks.

I show that the U.S. trade policy shift against China not only boosted Mexican firms' exports to the United States but also generated significant increases in domestic production and employment, with subsidiaries and affiliates of firms headquartered in the United States and other major economies driving much of this manufacturing expansion.

Distinguishing between contract manufacturing for foreign clients and in-house production, I show that the observed production expansion reflects the relocation of production within firms' cross-border networks, rather than growth in contract manufacturing (*maquila*). This distinction matters because contract manufacturing typically complements U.S. production (Bergin et al. 2009), whereas in-house expansion by multinationals can substitute for it. Consistent with production deepening rather than simple trade pass-through, value added rises alongside output, with domestic contributions arising primarily through labor rather than upstream input production.

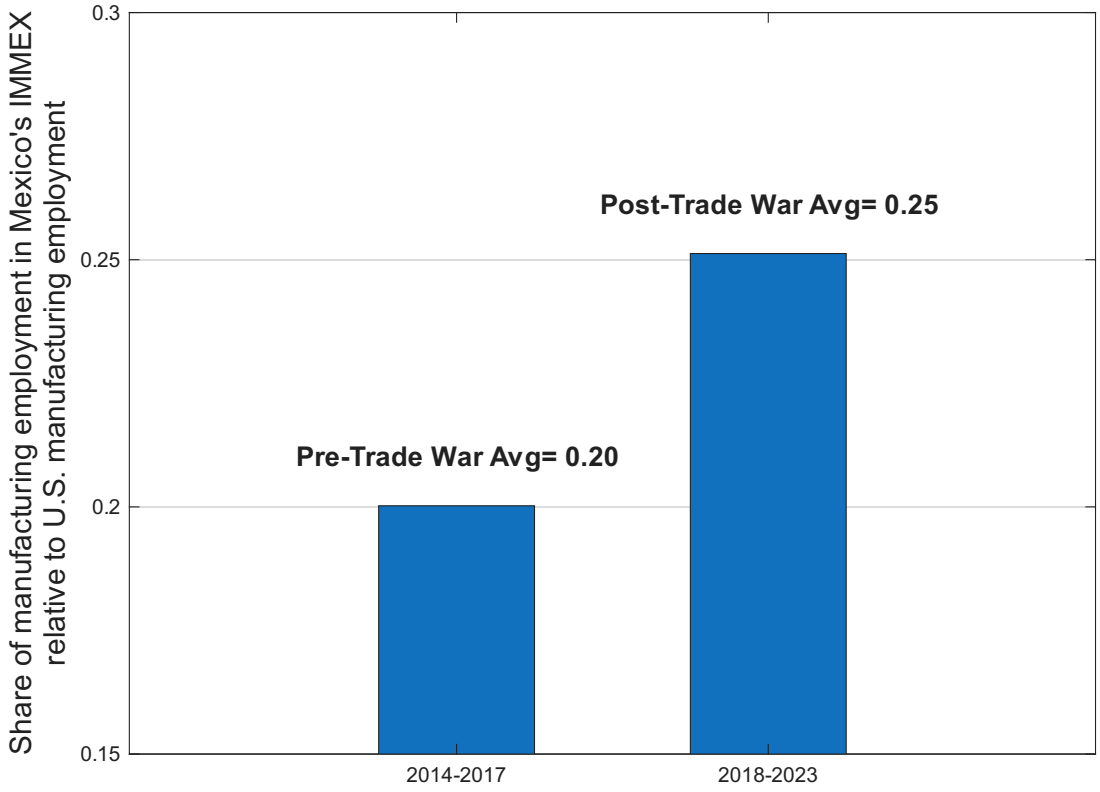


Figure 2: Mexico's Manufacturing GVC Employment Relative to U.S. Manufacturing

PEME database (trade-active manufacturing firms), INEGI. IMMEX firms within PEME are identified via their tax identifiers. Bars show the average share of employment accounted for by IMMEX firms in PEME relative to U.S. manufacturing employment. U.S. manufacturing data are from the Federal Reserve Economic Data (FRED), Federal Reserve Bank of St. Louis. Author's calculations.

The employment gains are concentrated in technology-intensive industries — computers, electronics, machinery, aerospace, and automotive manufacturing — where foreign multinationals in North American supply chains are disproportionately active, while food and textile manufacturing see near-zero effects. Within plants, tariff-induced employment growth is concentrated among production workers and technicians, while non-production employment remains largely unaffected. These are precisely the middle-skill manufacturing jobs that trade protectionism sought to restore domestically.

Adjustment occurs along both intensive and extensive margins. Beyond expansion at existing plants, U.S. and non-U.S. foreign firms embedded in North American value chains established

new manufacturing plants in response to U.S. tariff hikes targeting China. The effect on new plant entry is 2.5 times larger among foreign-owned firms than domestic firms, and is strongest among U.S.-headquartered firms operating in industries that both compete with Chinese goods in the U.S. market and depend on Chinese inputs, suggesting that North American manufacturing, as a whole, responded in ways that may have partially offset the intended reshoring of production to the United States.

Recent studies highlight that U.S. dependence on Chinese supply chains often persisted through third-country trade flows, raising questions about whether tariff-induced trade diversion translated into domestic production gains (Alfaro and Chor 2023; Freund et al. 2024; Garred and Yuan 2025; Gopinath et al. 2025). This paper provides direct causal evidence that the 2018–19 U.S. tariffs on China significantly increased manufacturing output and employment in Mexico and, to my knowledge, is the first to show at the firm level that these tariffs boosted production within the North American manufacturing network.[2] By linking firm-level production data with corporate ownership information and documenting capacity expansion along both intensive and extensive margins, the paper addresses key dimensions—which firms drive relocation and how they adjust capacity—that Fajgelbaum and Khandelwal (2022) identify as largely absent from the trade-war literature.

Although U.S. policymakers aimed to revitalize domestic manufacturing through the trade policy shift against China, recent research finds no measurable impact on U.S. output or employment (Flaaen and Pierce 2024; Autor et al. 2024). The findings of this paper help explain this puzzle: the adjustment occurred primarily outside the United States, as multinational firms reorganized production within their cross-border networks. Strikingly, U.S.-headquartered firms themselves were at the center of this reallocation — the very firms the policy sought to incentivize to expand domestically. This emphasizes how the realized outcomes of trade policy can diverge from their intended effects in an integrated global economy.

[2]Focusing on firms' trade, the positive effect of the US-China trade war on third-country firms is also shown by Rotunno et al. (2023) and Chen et al. (2025), among others. For the reverse effect, how improved Chinese access to the U.S. market negatively affected Mexican firms, see Utar and Ruiz (2013).

A central reason for this divergence is that trade is highly concentrated in the hands of large multinational enterprises. Handley et al. (2025) show that the 2018–19 tariffs disproportionately fell on the largest firms accounting for more than 80% of U.S. exports. Flaaen et al. (2025) emphasize that production in the United States is deeply embedded in global value chains, with extensive cross-border back-and-forth linkages with Mexico and Canada. These interdependencies imply that domestic effects of tariffs can differ substantially from conventional predictions: domestic content of imports and foreign content of exports may limit or even reverse the potential gains for domestic producers. Moreover, such back-and-forth trade often takes place within firms, giving multinational enterprises the flexibility to move production across borders in response to policy changes (Conconi et al. 2025; Graziano et al. 2024; McCaig et al. 2025). Consistent with this, Flaaen et al. (2020) highlight tariff-jumping strategies among multinational firms to circumvent import restrictions, and Utar et al. (2025) show that firms in Mexico embedded in global value chains increased their two-way trade with firms in the United States in response to the U.S.–China trade war. Building on this literature, this paper contributes new evidence by showing that foreign-headquartered firms — especially U.S.-owned firms — were at the center of the U.S. trade-policy-induced manufacturing growth in Mexico, and highlights how multinational firms' cross-country production networks shape the way trade policy shocks are transmitted across borders.

By showing that U.S. tariffs disproportionately increased factory-floor employment in technology-intensive sectors in Mexico — precisely the middle-skill manufacturing jobs that trade protectionism sought to restore domestically — the findings provide firm-level evidence on the production and employment reallocations underlying the documented welfare losses from the 2018–19 U.S. trade policy (Amiti et al. 2019; Fajgelbaum et al. 2020; Grossman et al. 2024). These findings also speak to recent work on optimal trade policy design in the presence of global supply chains and multinational production, where the welfare implications of tariffs depend critically on how firms reorganize across borders (Antràs et al. 2022; Grossman et al. 2024; Gutiérrez et al. 2025; Blanchard et al. 2026).

The next section introduces the institutional context and describes the firm- and plant-level data.

Section 3 presents the tariff exposure measures and empirical strategy. Section 4 presents firm- and plant-level evidence on the effects of U.S. tariffs on Mexican manufacturing exports, output, employment, and capacity expansion, with a particular focus on the role of U.S.-headquartered multinationals. Section 5 concludes. Supplementary results appear in the online appendix.

2 Institutional Background and Data

Deep integration with the United States, first under NAFTA and now under the United States–Mexico–Canada Agreement (USMCA), has made Mexico a central platform for U.S.-centered manufacturing production networks. Competitive labor costs and geographic proximity with a long shared border have supported dense cross-border supply chains in which intermediate inputs cross the border multiple times before final assembly. Recent work using confidential U.S. establishment-level data shows that such global value chain linkages are both large and increasingly important and highlight that U.S. manufacturing performance is closely tied to back-and-forth trade with nearby partners, especially Mexico (Flaaen et al. 2025). Yet much of the empirical literature still identifies GVC firms simply as those that both import and export (Antràs and Chor, 2022), without reference to the institutional arrangements that organize this production sharing. In Mexico, the key institutional framework is the IMMEX program, which allows firms to temporarily import intermediate inputs duty-free for processing and re-export.

In this section, I introduce the institutional context and then describe the PEME firm-level database. I distinguish IMMEX firms and match them with plant-level data to obtain additional detail, creating the data environment that underpins my analysis of firms' responses to U.S. trade policy.

2.1 The Creation of Mexico's Export Platform–IMMEX

In 2007, after the full implementation of the North American Free Trade Agreement which limits duty-free access to non-NAFTA inputs among export-processing establishments, Mexico's Ministry of Economy consolidated all export promotion schemes offering trade-facilitating benefits

under a single framework known as the Maquiladora Manufacturing Industry and Export Services Program (IMMEX).

The program is designed to support firms integrated into regional and global value chains by lowering transaction costs on inputs not destined for domestic consumption. IMMEX establishments are predominantly multinational subsidiaries active in North American supply chains, alongside contract manufacturers serving predominantly U.S. clients. The program has become the principal vehicle through which foreign firms enter and run manufacturing and related operations in Mexico.

Firms register under IMMEX to access a set of trade-facilitating benefits, including a waiver of the 16 percent value-added tax typically levied on all purchases, including imported inputs and capital equipment, reduced custom processing fees, and the option to defer tariff payments on inputs not originating in North America until the time of re-export. To qualify, firms must either maintain an annual export value of at least 500,000 USD or derive at least 10 percent of their revenue from exports. In 2017, firms operating under IMMEX accounted for 84 percent of Mexico's total exports and 64 percent of its imports and provided 2.7 million jobs.

2.2 Data

Manufacturing Firms Matched to Customs Transactions

The PEME database links transaction-level customs records detailing firms' export and import activities with firm-level information on manufacturing production and employment. PEME covers the universe of exporting manufacturers observable in INEGI's manufacturing statistical system, with no size threshold. Firms in the database account for more than 84% of Mexico's total merchandise trade. Although firms in PEME are predominantly large—reflecting the typical size distribution of exporting manufacturers—the database also includes small and micro firms.

Production and employment information at the firm level are aggregated from establishment-level data considering only establishments whose primary activity falls within manufacturing. Each firm-level customs record includes product codes, destination or origin countries, and transaction

values reported in USD. Products are classified under the Mexican Import and Export General Tariff Act (TIGIE), which closely aligns with the Harmonized System (HS) at the six-digit level.

Another key advantage of these data is their comprehensive coverage of workers, including both directly hired employees and workers supplied through third-party staffing firms. This is particularly important in the Mexican manufacturing sector, where staffing arrangements are widespread and lead social security–based employment records to systematically understate employment and labor compensation. Estefan et al. (2024) show that such arrangements account for nearly one-fifth of manufacturing employment and generate substantial gaps in worker coverage and wage reporting in data from the Mexican Social Security Institute (IMSS)[3]. By contrast, INEGI's measures capture both directly hired and third-party-supplied workers.

Firms' customs data are linked with the six-digit products and country pairs subject to newly imposed tariffs as part of the 2018–19 trade war. I employ the datasets of tariff changes on US imports and exports over 2018-2019 as assembled and updated by Fajgelbaum et al. 2020. The tariffs are aggregated at the six-digit HS level, which is the level of detail that can be matched smoothly with TIGIE.[4]

The 2017 PEME dataset includes 6,092 exporting manufacturing firms, which together accounted for approximately 3.5 million jobs. Merging PEME with the Ministry of Economy's IMMEX registry identifies 4,092 firms operating under the IMMEX export program. These GVC firms represent about two-thirds of exporting firms and account for 76% of manufacturing employment in 2017.

[3]IMSS records workers based on formal employment relationships for the purpose of social security contributions. Manufacturers frequently hire workers through third-party or shell staffing firms to reduce payroll taxes, profit-sharing obligations, and exposure to severance and unionization costs. These workers are typically registered with IMSS at the statutory minimum wage on the staffing firm's payroll, with the remainder of compensation paid through non-contributory bonuses. As a result, IMSS data understate both employment and labor remuneration (Estefan et al., 2024).

[4]To calculate the tariff changes in HS 6-digit goods, I use the share of each HS 10-digit good per source country in total US HS 6-digit import in the pre-trade war year, 2017, as a weight to collapse the US import tariffs data into the HS6 level. Similarly, I calculate the share of each HS 8-digit good per country in total US HS 6-digit export as a weight to collapse the retaliatory tariff data into the HS6 level. See Appendix B.

Table 1: Summary Statistics—Estimation Sample

	(1)	(2)	(3)	(4)	(5)
Variable	**Mean**	**SD**	**p25**	**p75**	**Obs**
Panel. A					
All 2017 Exporting Firms (PEME)					
Log Employment	5.44	1.46	4.51	6.39	52,198
Log Value of Production	16.65	1.86	15.49	17.92	51,865
Log Value of Exports	15.09	2.82	13.38	17.08	50,616
Log Value of Imports	15.27	2.59	13.69	17.08	49,806
US Export Share	0.75	0.36	0.60	1.00	50,616
Number of Plants	1.55	3.85	1.00	1.00	51,679
Panel. B					
	IMMEX			**Others**	
	Mean	**Obs**		**Mean**	**Obs**
Log Employment	5.47	37,391		5.38	14,807
Log Value of Production	16.62	37,209		16.73	14,656
Log Value of Exports	15.62	36,872		13.67	13,744
Log Value of Imports	15.53	36,465		14.56	13,341
Number of Plants	1.46	36,874		1.77	14,805

Notes: Manufacturing exporters as of 2017 over 2014-2023. Values are expressed in 2019 constant USD. Employment is measured in number of workers; number of plants is reported in levels.

Table 1 summarizes the estimation sample, which consists of exporting firms in 2017. Panel B reports firm characteristics separately for GVC (IMMEX) firms and other exporting manufacturing firms. The GVC group corresponds to firms that underlie the spillover effects of the U.S.–China trade war, as documented by Utar et al. (2025). The median firm in the PEME data employs 239 workers, while the median GVC and non-GVC firms employ 245 and 228 workers, respectively. Consistent with this pattern, average log employment is very similar across the two groups—5.5 among GVC (IMMEX) firms and 5.4 among non-IMMEX exporters. Although employment is

slightly higher in GVC firms, non-GVC exporters exhibit larger production volumes, whereas GVC firms export more. This pattern is consistent with GVC firms being more labor-intensive and more export-focused than non-GVC exporters.

Figure A.1 shows the distribution of firms across two-digit manufacturing industries, separately for GVC firms and for exporting firms outside IMMEX. GVC firms are concentrated in machinery and equipment industry, reflecting the broader pattern of North American supply chain specialization.

Using firms' unique tax identifiers, I link firms operating under IMMEX in the PEME data to D&B's Hierarchy and Connections database to identify each firm's global ultimate parent and its country of headquarters. Slightly more than half of the GVC firms are foreign-owned, and these foreign firms employed roughly 2 million workers in 2017.[5]

Figure A.2 shows that foreign ownership is strongly concentrated in machinery and equipment, particularly among U.S.-owned firms. Table A.2 presents summary statistics for these firms in 2017 by ownership status (U.S., non-U.S. foreign, and domestic).

To complement the firm-level PEME data, I also draw on INEGI's plant-level IMMEX survey of manufacturing establishments. IMMEX plant level data provides comprehensive measures of revenues, input costs, and labor inputs at the establishment level. Merging the firm- and plant-level data using firm–plant identifiers enables an analysis of how firm-level exposure to trade shocks manifests at the plant level.

The IMMEX data report sales of own manufactured goods and revenues from contract manufacturing separately, disaggregated by destination (domestic versus foreign). I construct total foreign revenue by aggregating contract manufacturing revenues for foreign clients, foreign sales of own manufactured goods, and other foreign revenues, such as carry-over trade. Table A.3 reports summary statistics for IMMEX establishments matched to firms in PEME.

The average labor cost share is 21%, while material costs account for 62% of total expenses. A

[5]Note that firms whose ultimate owner is not identified as foreign also include *shelter firms*—firms operating under contractual arrangements with foreign clients—as well as firms affiliated with foreign companies but without a direct ownership link, or those owned by a foreign company holding less than 50 percent of shares.

majority of material inputs originate outside Mexico, as reflected in a foreign material cost share of 42%. These patterns highlight the international integration of IMMEX plants.

3 Empirical Strategy

To identify the causal impact of the U.S.–China trade war on manufacturing firms in Mexico, I construct firm-level tariff exposure measures from firms' six-digit product level exports and imports in the pre-shock year 2017. I then estimate how firms' outcomes evolved differentially across years according to their susceptibility to the trade shock.

3.1 Firm-Level Exposures to the US-China Trade War

3.1.1 US Import Tariffs on China

The analysis centers on the 2018–19 US import tariffs imposed on China, which covered approximately $350 billion of U.S. imports. Let $USIT^{CN}$ represent the set of HS 6-digit products subject to the 2018–19 US import tariffs on China and let $\Delta\tau_{\ell}^{USIT^{CN}}$ denote the change in the US import tariff rate for HS 6-digit good l from China, measured in percentage points and expressed as a decimal.[6] Additionally, let $X_{i\ell}^{2017}$ be the value of exports of firm i in good ℓ in year 2017. Then, the level of exposure of firm i in Mexico to the increased US import tariffs on Chinese goods can be determined as:

$$T_i^{\text{US}\to\text{CN}} = \frac{\sum_{\ell\in\text{USIT}^{\text{CN}}} X_{i\ell}^{2017} \times \Delta\tau_{\ell}^{\text{USIT}^{\text{CN}}}}{\sum_{\ell} X_{i\ell}^{2017}} \tag{1}$$

Here, $X_{i\ell}^{2017}$ denotes firm i's exports of good ℓ in 2017, and $T_i^{\text{US}\to\text{CN}}$ measures the tariff-weighted share of targeted goods in the firm's overall exports.

While most exports from a typical Mexican firm are destined for the United States (see Table 1),

[6] Since the tariff escalations occurred in multiple phases between 2018 and 2019, I use the increased tariff rates valid as of December 2019.

Equation 1 does not distinguish export destinations. This is because the increased cost of Chinese goods entering the US market is expected to make the US more attractive to Mexican exporters relative to other markets. As a result, manufacturing firms that previously produced and exported affected goods to non-US markets are potentially treated by the increased appeal of the US market.

Consider two manufacturing exporters with identical export product portfolios and the same level of $T^{\text{US}\to\text{CN}}$, say 0.20. Suppose one sells 50 % of its exports to the US while the other sells 100 %. The firm exporting entirely to the US is treated via its full customer base, whereas the other firm is treated via only half of its customer base. At the same time, the firm selling 50% of its export capacity to the US may have greater flexibility to expand its US exports without going through costly adjustment of its production capacity. Thus, when focusing on firms' trade outcomes, it is important to adopt a broader definition of treatment.

However, firms with an established customer base in the US are more likely to respond to the costlier entry of Chinese goods to the US by expanding their production capacity. To account for this in the analysis of firms' output and employment outcomes which is the focus of this paper, exposure to US tariffs targeting China is constructed specific for the US market, as follows:

$$T_{i,\text{US}}^{\text{US}\to\text{CN}} = \frac{\sum_{\ell\in\text{USIT}^{\text{CN}}} X_{i\ell}^{2017,US} \times \Delta\tau_{\ell}^{\text{USIT}^{\text{CN}}}}{\sum_{\ell} X_{i\ell}^{2017}} \tag{2}$$

where $X_{i\ell}^{2017,US}$ denotes firm i's US exports of good ℓ in 2017.[7]

The exposure measure in Equation 2 is considered *narrow* because it classifies firms with no US exports, but with pre-shock exports of targeted goods, into the control group. However, firms that exported little or nothing to the US before the shock, yet maintained an export portfolio concentrated in targeted goods, may have redirected exports to the US market, leading to downward bias in the estimated effect.

Appendix Table B.1 provides evidence of this potential bias by comparing the average treatment

[7]One can also use the measure described in Equation 1 and scale it by the firm's pre-shock U.S. export share, thereby assigning greater weight to U.S.-oriented firms. This alternative approach yields similar results.

effect on firms' US export shares based on the broad exposure measure, while sequentially excluding firms with low baseline US export shares. Firms with initially low exposure to the US market increase their US exports share more than others. To address this concern, when employing the *narrow* (US-specific) exposure measure on the analysis of production and employment outcomes, I restrict the sample to firms that were exporting to the US in 2017, defined as those for which at least 30% of export revenue came from the US market.[8]

To account for confounding effects of firms' exposure to concurrent trade policy changes, namely the US–Mexico tariff escalation under Section 232, and China's retaliatory tariffs, I construct firm-specific measures that reflect firms' susceptibility to these policies. I further consider the potentially confounding influence of tariffs on firms via the input channel and construct exposure measures based on the relative importance of targeted goods in firms' imports from China and the US. These additional measures are described in Appendix Section B.2

3.2 Empirical Model

Using the firm-level trade policy exposure measures constructed in Section 3.1, I estimate the effects of the U.S. import tariff increases targeting China on manufacturing firms in Mexico. The analysis is conducted on the universe of firms with positive exports in 2017 and at least one employee. I examine firms' trade, production, and employment responses using an event study framework covering the ten year period from 2014 to 2023. The analysis begins in 2014 to establish a counterfactual baseline four years prior to the onset of the trade war and extends through 2023 to capture long-run effects.

Identifying the Impact of the U.S. Tariffs Hikes Targeting China on Firms in Mexico

Let Y_{ijt} be firm i's outcome variable in industry j at time t, for example, the log value of employment. To examine the effects of the US tariffs targeting China on manufacturing firms in Mexico, the following generalized difference in differences (DD) equation with two sided fixed effects is

[8]The 30% threshold is informed by the results in Table B.1. The estimated tariff exposure effect on U.S. export share becomes statistically insignificant once the sample is restricted to firms with at least 20% of exports destined for the United States. I adopt a 30% cutoff as a conservative criterion that also preserves a sufficiently large sample.

formed:

$$Y_{ijt} = \beta_0 + \sum_{\substack{h=2014 \\ \neq 2017}}^{2023} \beta_h \mathbb{1}_{h=t} \times T_i^{\text{US}\to\text{CN}} + P_{it} + \eta_{jt} + \phi_i + \varepsilon_{it} \tag{3}$$

In Equation 3, the continuous firm-level treatment variable, $T_i^{\text{US}\to\text{CN}}$, is interacted with year indicators to examine the yearly evolution of the impact. Using 2017 as the baseline year, I track exporting manufacturing firms through 2023 to assess the effects of the US tariff hikes targeting China, while also looking backward until 2014 to identify any pre-existing trends.

The vector P_{it} includes controls for the concurrent trade policy changes and tariff exposures via their inputs. In the baseline specification, it includes interactions of the US-Mexico tariff escalation exposures, namely $T_i^{\text{US}\to\text{MEX}}$, and $T_i^{\text{MEX}\to\text{US}}$ with year fixed effects. This allows for differential time trends for firms susceptible to temporary US tariffs on Mexican goods and firms whose imports are affected by Mexico's retaliatory tariffs on US goods. P_{it} further accounts for differential trends among firms impacted by US tariffs on China through their input use and controls for firms' exposure to China's retaliatory tariffs.

The equation also includes η_{jt} which denotes three-digit industry by time fixed effects to control for potentially confounding time trends that may vary across narrow industries. For example, the key change introduced by the USMCA in 2020 was the tightening of local content requirements in the automotive and textile sectors, and these changes are absorbed by the fixed effects.[9] As a result, the tariff effect is identified from variation across firms within three digit industries as industry-wide variations are contained by η_{jt}.[10]

The time-invariant or relatively persistent firm characteristics such as management skills, production technology, and line of business are controlled with firm fixed effects, ϕ_i. This means that coefficients are estimated from within-firm variation over time as the influence of any observed or

[9] As a robustness check, Appendix Figure D.4 shows that production and employment effects remain strong—and if anything, marginally stronger—when excluding firms prone to USMCA provisions.

[10] In Appendix Section D, Figures D.1–D.3 illustrate how the estimates change as control variables are added sequentially.

unobserved initial firm characteristic that may be correlated with firm i's future exposure to the change in the US trade policy is absorbed by firm fixed effects. The error term ε_{it} is assumed to have a zero mean, and we allow for correlation within firms by clustering standard errors at the level of the firm, which is the level at which our treatment variables vary (Abadie et al., 2023).

Plant-level Analysis

Complementing the firm-level analysis, I estimate the following plant-level event-study specification using data on IMMEX establishments over the period 2015–2023:

$$Y_{pijt} = \alpha_0 + \sum_{\substack{h=2015 \\ \neq 2017}}^{2023} \alpha_h \mathbb{1}_{h=t} \times \mathbf{T}_{\mathbf{i}}^{\text{US}\to\text{CN}} + P_{it} + \eta_{jt} + L_{pt} + \phi_p + \varepsilon_{pt} \tag{4}$$

In Equation 4, ϕ_p denotes plant fixed effects and, as before, η_{jt} represents three-digit industry-by-year fixed effects. Here, the industry classification is based on each plant's reported primary activity, rather than on firm i's primary industry used in the firm-level analysis. The plant-level database also contains information on plant location. Leveraging this additional variation, L_{pt} includes municipality-by-year fixed effects to account for potentially confounding effects of the minimum wage reform enacted in 2019, which raised the minimum wage in border municipalities by 100 percent.[11] Since municipalities in Mexico are typically contained within local labor markets (Utar, 2025), controlling for L_{pt} also absorbs local labor market shocks, including those associated with labor shortages and COVID-related shutdowns.

The treatment variable remains defined at the firm level, and the vector P_{it} continues to include controls for concurrent trade policy changes and tariff exposures through firms' input sourcing, as described in Equation 3. The error term ε_{pt} is assumed to have mean zero, and standard errors are clustered at the firm level, which is the level at which treatment varies.

[11] In 2019, Mexico revised its minimum wage legislation to improve workers' living conditions. The reform was implemented unevenly, dividing the country into two regions: the northern border region—which includes 45 municipalities located within approximately 25 kilometers of the U.S. border—and the rest of the country. In the northern border region, the minimum wage doubled in 2019, while in the rest of the country it rose gradually, with annual increases of 16%, 20%, and 15%, respectively, between 2019 and 2021.

To estimate average treatment effects rather than year-by-year dynamic responses, I replace the event-study interactions in Equations 3 and 4 with interactions between the firm-specific trade exposure measures and a post-shock indicator, PostTW_t, equal to 1 from 2018 onward and 0 otherwise.

4 Production and Employment Consequences of the US Trade Policy Shift Against China

This section uses firm-level production and employment data linked to customs records through 2023 to first confirm the persistent positive effect on exports, then addresses the key question of whether this trade response translated into real effects on firm-level manufacturing output and employment. Finally, I examine the nature of this expansion: which workers benefited, whether firms adjusted along the extensive margin through new plant openings, and the role of U.S.-headquartered multinationals in driving these gains.

4.1 The Effect of U.S. Tariffs on China on Mexican Manufacturing Firms' Exports

I begin by estimating Equation 3, where the dependent variable is the logarithm of firms' exports to the United States. Figure 3 presents the year-by-year DD coefficient estimates for the continuous firm-level treatment variable $\mathbf{T_i^{US \to CN}}$.

The results show that higher U.S. tariffs on Chinese imports significantly increase manufacturing firms' exports to the United States. The DD estimates are statistically indistinguishable from zero prior to the onset of the trade war, indicating no meaningful differential pre-trends across firms with differing exposure levels. The estimates then rise gradually relative to the 2017 baseline through 2023, with a temporary decline during the COVID shock in 2020. By 2023, the DD estimate reaches 1.71 and is highly statistically significant.

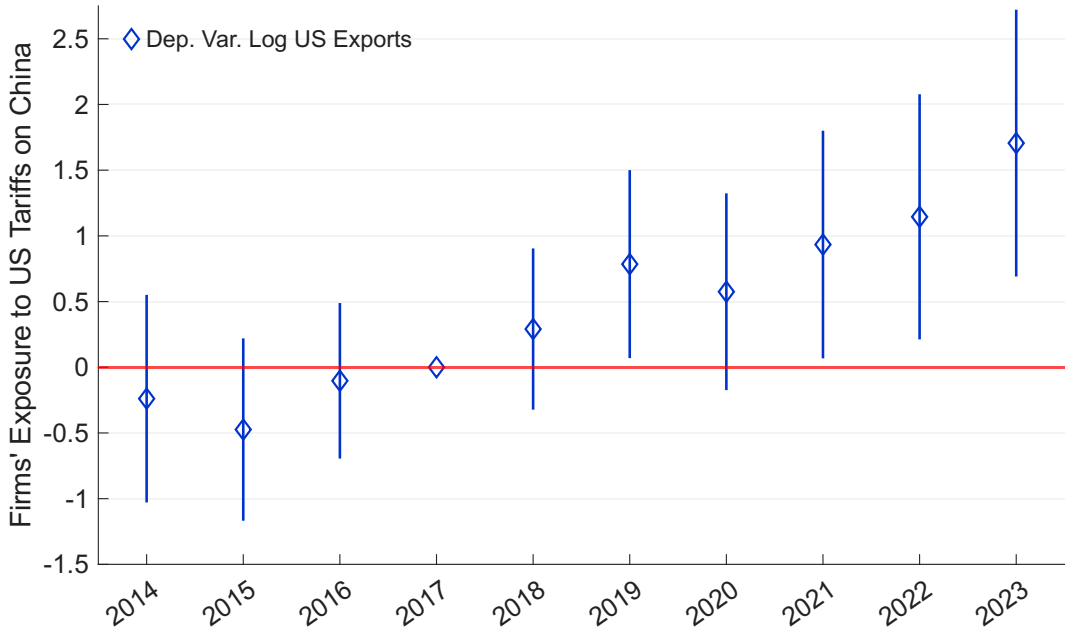


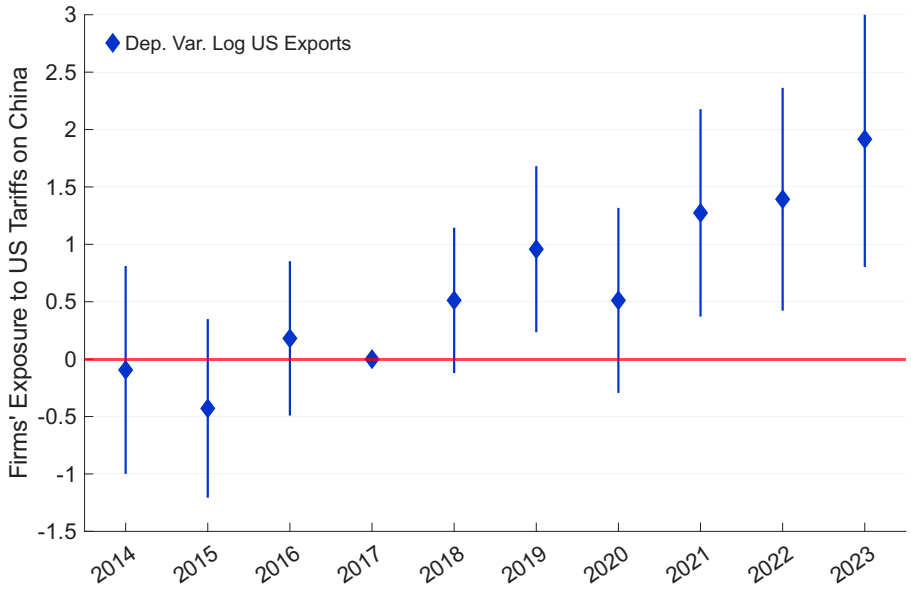
Figure 3: Impact of US Tariffs Targeting China on Manufacturing Firms' Exports

Notes: Estimation of Equation 3. The dependent variable, as indicated in the legend, is the natural logarithm of firms' value of exports. PEME firms exporting as of 2017, covering the period from 2014 to 2023, with N=46,453. The regression controls for firm fixed effects, three-digit-industry-by-year fixed effects and concurrent trade policy changes. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US \to CN}}$, along with 95% confidence intervals.

To gauge the economic magnitude of the effect, note that firms at the 90th percentile of tariff exposure faced a 25% increase in U.S. tariffs on Chinese imports, compared with 7.7% for firms at the 10th percentile (see Table A.1). This difference in exposure implies a 34% increase in exports to the United States ($e^{1.71 \times 0.17}$).[12]

These results show that the significant positive impact of U.S. tariffs on Chinese goods—previously documented by Utar et al. (2025) using customs data through 2021—is also evident in INEGI's firm-level database, and persists through 2023. Utar et al. (2025) show that the positive effect of the U.S. trade policy shift was primarily attributable to GVC firms operating under Mexico's export-platform program (IMMEX). Building on this evidence, I estimate Equation 3 separately for GVC firms and for non-IMMEX manufacturing firms.

[12] Appendix Figure C.1 shows that tariff exposure also increased firms' total exports and total imports, indicating an overall expansion in trade activity.



(a) GVC Firms



(b) Other Manufacturing Firms

Figure 4: Impact of US Tariffs Targeting China on Manufacturing Firms' Exports

Notes: Estimation of Equation 3. PEME database. N=35,787 (IMMEX firms in PEME) N=10,666 (Others). The dependent variable in both figures is the natural logarithm of firms' value of US exports. All regressions control for firm fixed effects, three-digit-industry-by-year fixed effects and concurrent trade policy changes. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US \to CN}}$, along with 95% confidence intervals.

Figure 4 reports the estimated effects on U.S. exports for these two groups. The U.S. trade policy shift has a significant positive effect on GVC firms, with the estimated coefficient reaching 1.92 by 2023. In contrast, the impact on non-IMMEX manufacturing firms remains statistically insignificant throughout 2018–2023. The coefficient estimate of 1.92 corresponds to a 39% increase in U.S. exports for firms at the 90th percentile of exposure relative to those at the 10th percentile.

To address the possibility that the observed export growth reflects transshipment of Chinese goods through Mexico, I construct a measure of firms' U.S. exports net of Chinese imports, defined as

$$NetUSX_{it}^{MCN} = \sum_{j \in \mathtt{J}_{\mathtt{it}}^{\mathtt{USX}}} [X_{ijt}^{US} - M_{ijt}^{CN}],$$

where $\mathtt{J}_{\mathtt{it}}^{\mathtt{USX}}$ denotes the set of six-digit HS products that firm i exports to the United States in period t. This measure captures the value of firm i's U.S. exports net of its imports from China of the same products. Appendix Figure C.2 shows that the estimated effect on U.S. exports net of Chinese imports closely follows the effect on gross U.S. exports, indicating that the export response is not driven by simple transshipment of Chinese goods.

Table C.1 in the Appendix reports the average treatment effects on firms' trade outcomes, separately for GVC firms and other manufacturing exporters (firms outside the IMMEX program). The results show that the broader trade response to U.S. tariffs on China is also concentrated among GVC firms. In addition to increasing their exports to the United States, GVC firms significantly expand their imports and total exports, whereas non-IMMEX manufacturing firms show little response. The estimates also show that, on average across GVC firms, the share of imports sourced from China does not increase in response to the tariff hikes.

These findings indicate that the export response to the U.S. trade policy shift is primarily driven by firms operating under Mexico's IMMEX program, which encompasses firms integrated into North American production networks. Importantly, the effect reflects who operates within IMMEX, rather than the program's specific policy features. Because IMMEX hosts a large share of foreign-owned multinationals serving the North American market, I further distinguish firms by ownership using Dun & Bradstreet's corporate hierarchy data and re-estimate the effects separately among

foreign-owned IMMEX firms. With an estimated coefficient of 2 in 2023, the results in Figure C.3 confirm a strong export response of foreign-owned firms following the U.S. trade policy shift.

Taken together, these results show that firms more exposed to U.S. tariffs on Chinese goods significantly increased their exports to the United States, with the export gains from the U.S.–China trade war largely accounted for by firms embedded in global value chains, many of which are foreign multinationals operating in Mexico. Did this expansion in exports and imports translate into higher manufacturing output in Mexico? I now turn to the effects on production.

4.2 How US Tariffs on Chinese Products Stimulated Manufacturing Output in Mexico

I begin by examining how firms' manufacturing output responds to the U.S. trade policy shift, where output is measured as the value of production at factory prices.

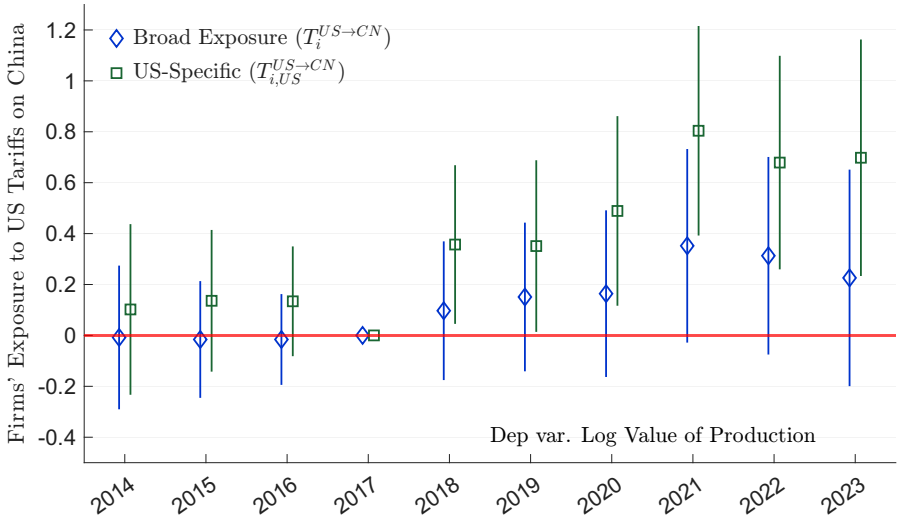
Because expansion may be more pronounced among firms with an established customer base in the United States, I estimate the effects using both the narrow U.S.-specific measure, estimated among firms exporting to the United States in 2017, and the broad measure, estimated among all firms that exported in 2017. Figure 5 presents these results, with Panel (a) showing estimates for all exporters (whether GVC firms or not) and Panel (b) isolating the effects among GVC firms, which Section 4.1 showed were the primary drivers of export growth.

The estimates are statistically indistinguishable from zero prior to the trade war across both panels. Following the increase in U.S. tariffs on Chinese goods, manufacturing output rises, with stronger effects among firms exporting to the United States, particularly after 2020.

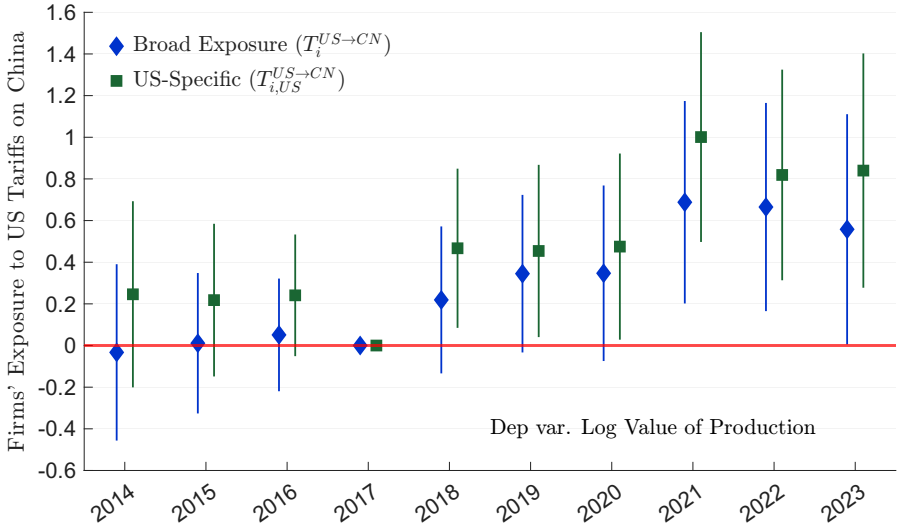
In the full sample (Panel a of Figure 5a), the DD coefficient for U.S. exporters reaches 0.8 in 2021 and remains around 0.7 by 2023, with both estimates precisely estimated.

Among GVC firms (Panel b), the response is stronger, indicating that these firms are key drivers behind the full-sample results. At the 2021 peak, the DD coefficients reach 0.7 for all exporters and 1.0 for U.S. exporters, corresponding to respective increases in manufacturing production of

13% and 19% at the 90–10 exposure difference.



(a) Full sample of Manufacturing Firms



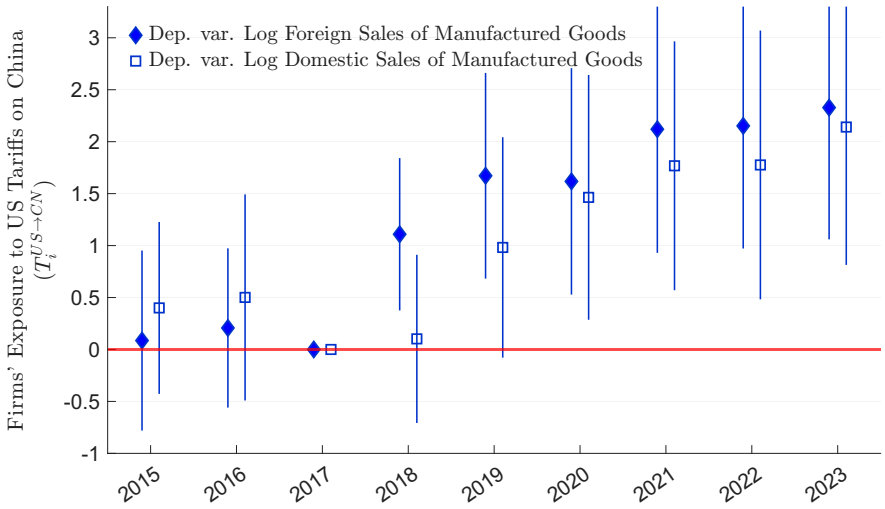
(b) GVC Firms (IMMEX)

Figure 5: Impact of US Tariffs on Chinese Goods on Firms' Production

Notes: The dependent variable is the natural logarithm of firms' value of production. Equation 3 is estimated using the treatment variable $T_i^{\text{US}\to\text{CN}}$ among 2017 exporters (Figure (a): $N = 51{,}838$ Figure (b): $N = 37{,}202$), and using the treatment variable $T_{i,\text{US}}^{\text{US}\to\text{CN}}$ among 2017 U.S. exporters (Figure (a): $N = 41{,}914$ Figure (b): $N = 33{,}418$). All regressions include firm fixed effects, three-digit industry-by-year fixed effects, and controls for concurrent trade policy changes. The y-axis displays yearly difference-in-differences coefficient estimates with 95% confidence intervals based on robust standard errors clustered at the firm level.



(a) Sales of Manufactured Goods at the Plant-level



(b) Foreign versus Domestic Sales of Manufactured Goods at the Plant-level

Figure 6: Impact of US Tariffs targeting China on Sales of Manufactured Goods

Notes: Estimation of Equation 4 using IMMEX plant-level data, N=19,410 (total sales), 15,967 (foreign), 17,804 (domestic). All regressions control for plant fixed effects, three-digit industry-by-year, municipality-by-year fixed effects and firm-level controls for concurrent trade policy changes. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US \to CN}}$, along with 95% confidence intervals. Robust standard errors are clustered at the firm level.

Contract Manufacturing versus In-House Production Establishments operating under IMMEX include both maquiladoras—export-processing plants performing labor-intensive tasks under contract manufacturing arrangements—and full-fledged manufacturing operations that produce goods for the North American market, often within multinational firms. Distinguishing between these margins is important for interpreting the implications for U.S. manufacturing: contract manufacturing typically moves in tandem with U.S. production, whereas in-house production can expand independently within Mexico and therefore need not reflect changes in U.S. manufacturing activity.

To examine this distinction, I match IMMEX firms in PEME to their establishments using the IMMEX plant-level survey (2015–2023), which reports both plant-level sales of own-manufactured goods and total plant revenues. Sales of own production exclude revenues from contract manufacturing services, allowing me to isolate in-house production.

Figure 6 reports estimates of Equation 4 using plant-level data, with sales of own-manufactured goods (total, foreign, and domestic) as the dependent variables. Figure 6a shows a strong positive response in total sales, with no evidence of differential pre-trends. By 2023, the DD coefficient reaches 1.92, corresponding to a 39% increase in own production at the 90–10 exposure difference. Figure 6b shows that the increase is driven primarily by foreign sales, for which the coefficient reaches 2.33 in 2023, corresponding to a 49% increase. Domestic sales also rise substantially, albeit with a one-year lag relative to foreign sales. This pattern is consistent with supply-chain deepening as production stages expand within Mexico.

To assess the role of contract manufacturing, I next examine total plant revenues, which include both sales of own production and revenues from contract work.[13] Figure C.4 shows that while tariff exposure has a positive and statistically significant effect on total revenues, the response is substantially smaller than for own production. In 2023, the DD coefficient for foreign revenues is

[13] Sales of own-manufactured goods exclude revenues from contract manufacturing services. As a result, plants that operate exclusively as contract manufacturers report zero own production and only *maquila* revenues. When total plant revenues are used as the outcome, the sample expands from 19,410 to 36,378 plants, reflecting the inclusion of establishments engaged solely in contract manufacturing.

0.87, compared with 2.33 for foreign sales of own production, and the coefficient for total revenues (0.67) is well below that for total own production (1.92).

Appendix Table C.3 reports estimates separately for own sales and contract manufacturing revenues. The estimates show a strong positive effect on own sales, but little to no effect on contract manufacturing revenues, indicating that the expansion following the tariff increases is driven primarily by in-house manufacturing.

Taken together, these results show that firms more exposed to U.S. tariffs on Chinese goods expand manufacturing output in Mexico, without a corresponding increase in export-processing (contract manufacturing) activity. Because contract manufacturing typically moves in tandem with U.S. production, this pattern suggests that the observed growth is not necessarily tied to U.S. manufacturing growth.

4.3 Effects of U.S. Tariffs Targeting China on Manufacturing Jobs in Mexico

The U.S.–China trade war tariffs were framed as an effort to "bring back jobs to America." This section examines how this shift in U.S. trade policy toward China affected manufacturing employment in neighboring Mexico, a key production location within North American value chains. While the tariffs were promoted as a means of revitalizing domestic manufacturing, this paper shows that instead of bringing production back home, they led to manufacturing expansion in Mexico — the United States' key production partner within North American supply chains.

While higher output suggests increased labor demand, the link between output and employment is not mechanical, as firms may adjust through productivity improvements or the adoption of automation-intensive technologies (Diao et al. 2025; Firooz et al. 2025). To examine the employment response at the firm level, I estimate Equation 3 using the logarithm of the firm's total employment across its manufacturing establishments.

Figure 7 presents results using the broad exposure measure and the U.S.-specific exposure measure,

applied to 2017 exporters and 2017 U.S. exporters, respectively. The estimates show no evidence of differential pre-trends and a significant positive effect of U.S. tariff hikes on manufacturing employment under both exposure measures. Employment effects begin to emerge in 2019 and grow steadily through 2023, lagging output as firms expand production before adjusting their workforce.

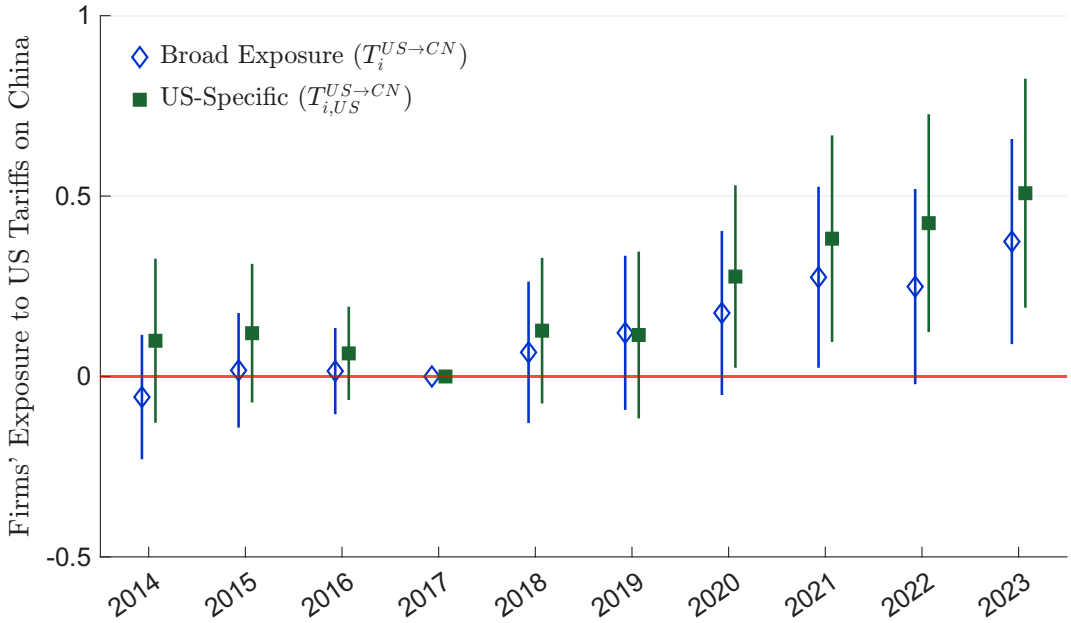


Figure 7: Impact of US Tariffs on Chinese Goods on Manufacturing Employment

Notes: Estimation of Equation 3. The dependent variable is the natural logarithm of firms' employment. 2017 Exporters, with N=52,174 and 2017 US Exporters, with N=42,171. All regressions control for firm fixed effects, three-digit industry-by-year fixed effects and concurrent trade policy changes. Robust standard errors are clustered at the firm level. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US\to CN}}$ and $\mathbf{T_{i,US}^{US\to CN}}$, along with 95% confidence intervals.

Table C.2 reports estimates separately for GVC and non-GVC firms and shows that employment gains are concentrated among GVC firms. By 2023, the DD coefficients for GVC firms reach 0.52 under the broad exposure measure and 0.57 under the U.S.-specific measure, both highly significant. The latter implies a 10% increase in manufacturing employment at the 90–10 exposure difference.

Figure 8 plots the estimates by two-digit industry, revealing that employment gains are concentrated in technology-intensive industries, particularly materials and chemicals (NAICS 32) and machinery and equipment manufacturing (NAICS 33). In contrast, employment effects in food

and textile manufacturing (NAICS 31) remain near zero throughout the period. This pattern reflects the sectoral distribution of foreign multinationals in Mexico, which are disproportionately concentrated in materials and machinery industries and are integrated into North American production networks.

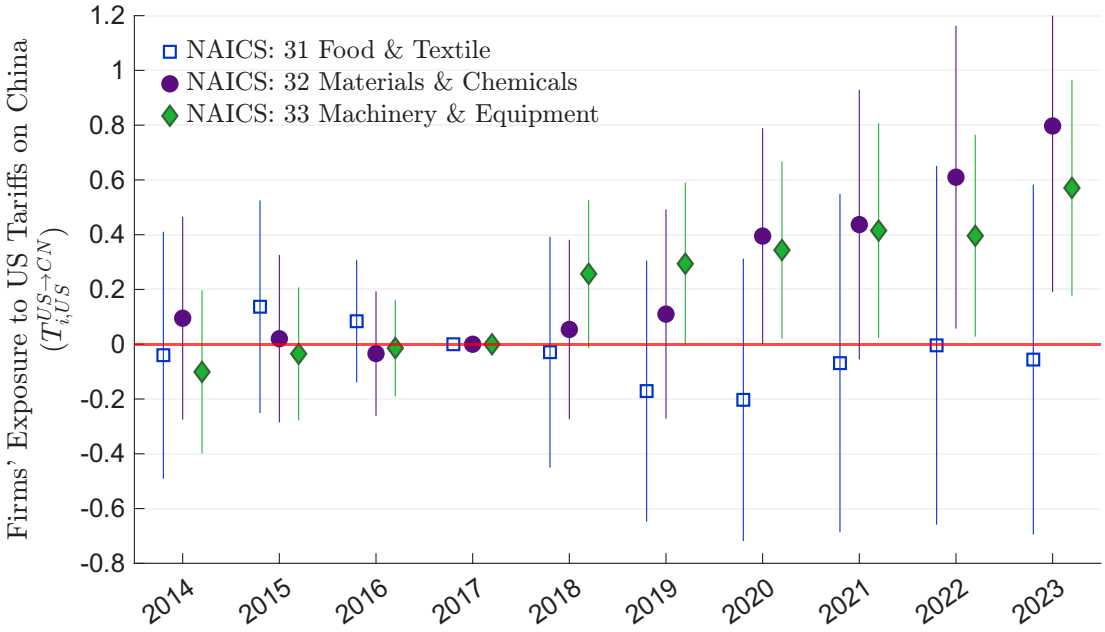


Figure 8: Employment gains are concentrated in tech-intensive industries

Notes: The sample consists of firms exporting to the United States as of 2017 in NAICS 31 (N = 8,197), NAICS 32 (N = 10,243), and NAICS 33 (N = 23,720). The dependent variable is the natural logarithm of firm employment. All regressions include for firm and year fixed effects and controls for concurrent trade policy changes. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T}_{\mathbf{i},\mathrm{US}}^{\mathrm{US}\to\mathrm{CN}}$, along with 95% confidence intervals based on robust standard errors clustered at the firm level.

Because firm-level measures in the PEME data aggregate activity across manufacturing establishments, they may understate firms' responses if production or employment is reallocated across units or expands into establishments not fully captured in the data. Appendix Figure C.5 addresses this concern by focusing on firms operating a single establishment in 2017. The results show similar, and if anything stronger, increases in both production and employment, suggesting that the baseline firm-level estimates may be attenuated, particularly if part of the adjustment occurs through the addition of new establishments.

I next examine how this employment growth is distributed across worker types within plants.

4.4 Within Plant Adjustment: Workforce Composition

To examine within-plant adjustment in greater depth, I turn to the IMMEX plant-level data. I use the occupation breakdown in the data to assess whether employment gains reflect expansion in core manufacturing activity.

Figure 9 presents estimates from Equation 4 for production workers and technicians and for non-production workers. The results show that exposure to U.S. tariff hikes leads to a significant and sustained increase in employment of production workers and technicians, beginning in 2018 and rising through 2023. In contrast, non-production employment exhibits much smaller and less precisely estimated responses, with coefficients close to zero and wider confidence intervals.

The increasing effects on production workers and technicians through 2023 point to a persistent expansion in production capacity rather than a transitory adjustment. Quantitatively, the 2023 coefficient of 0.7, combined with the 17 percentage-point difference in tariff exposure between the 90th and 10th percentiles, implies approximately a 13% increase in blue-collar employment at the plant level.

The employment measures in Figure 9 include both payroll and non-payroll workers. Because the plant-level data separately report payroll employment and workers supplied by third-parties, I test whether tariff-induced expansion initially relied on non-payroll arrangements, which were a low-cost and flexible hiring margin prior to the 2021 reform.

Figure C.7 in the Appendix shows that in the early years of the trade war, tariff-induced employment gains were concentrated among non-payroll workers. This pattern is consistent with firms adjusting along more flexible and lower-cost labor margins in the presence of trade policy uncertainty (Handley and Limão, 2022).

From 2021 onward, the composition shifts markedly: payroll employment effects become large and statistically significant, while non-payroll employment effects diminish. Notably, non-payroll employment begins to decline even before the 2021 prohibition on the use of shell companies for core business activities. This pattern suggests that, as tariffs became more clearly permanent

and non-payroll arrangements less advantageous, firms transitioned from temporary to formal employment relationships, reflecting a shift from cautious, reversible expansion to more committed capacity growth.[14]

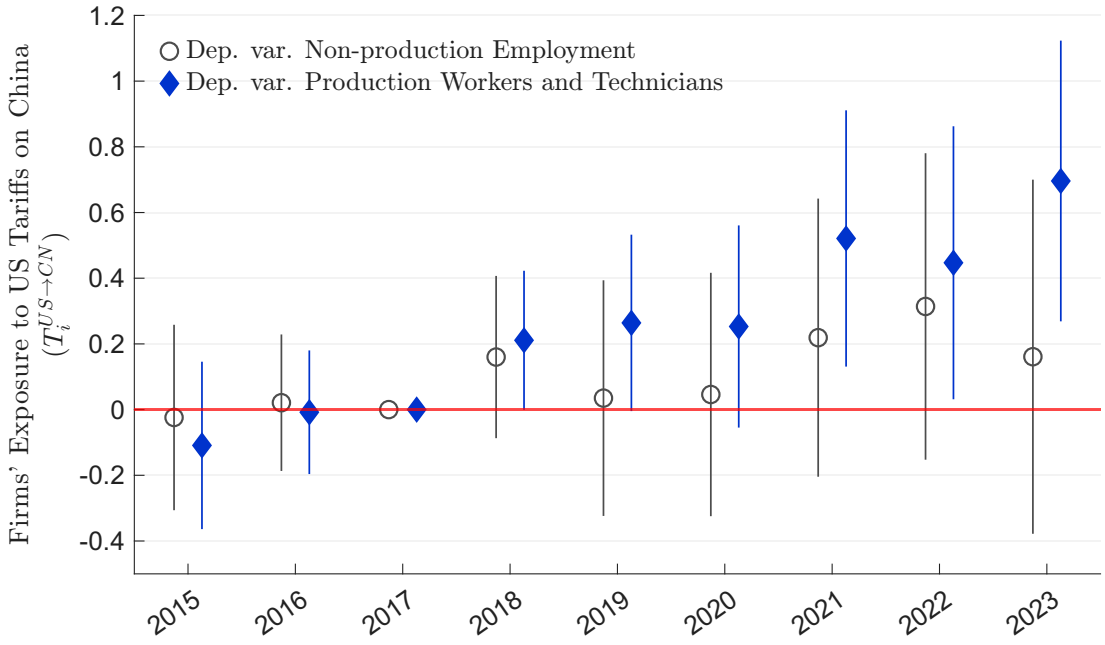


Figure 9: Tariff-Induced Employment Growth Concentrated in Production Occupations

Notes: Estimation of Equation 4 using IMMEX plant-level data, N=35,870 (non-production employment), N=36,336 (production workers and technicians). All regressions control for plant fixed effects, three-digit industry-by-year, municipality-by-year fixed effects and firm-level controls for concurrent trade policy changes. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US \to CN}}$, along with 95% confidence intervals. Robust standard errors are clustered at the firm level.

4.5 Within-Plant Adjustment: Material Inputs and Value Added

I next examine material inputs and value added to further characterize the nature of production expansion within plants.

Table C.4 shows that tariff exposure is associated with a large increase in imported (foreign) ma-

[14]Estimated effects on wages are positive and statistically insignificant (Appendix Table C.5), suggesting that increased labor demand was absorbed through employment expansion without meaningful upward wage pressure relative to other plants in the same local labor market and year. Chen et al. (2025) document a decline in average wages at more exposed firms using IMSS data through 2019. Since early expansion relied disproportionately on non-payroll labor which falls outside IMSS payroll reporting, tariff-induced labor demand was not fully captured in IMSS data. This helps reconcile the apparent wage declines documented with IMSS records.

terial inputs: the coefficient on log foreign materials is 1.48 (s.e. 0.39). Using the 17 percentage-point exposure gap between plants at the 90th and 10th percentiles, this implies roughly a 29% increase in imported material expenditures post–trade war. In contrast, domestic material inputs rise only modestly and imprecisely, while total materials increase by about 11% at the same exposure contrast. Plants scale export-oriented production primarily by expanding imported intermediate use, consistent with standard "importing to export" production in global value chains.

At the same time, value added rises significantly. The estimated effect on total value added (0.42) implies a 7% increase at the 90–10 exposure contrast, and the effect on domestic value added embodied in foreign sales (0.61) implies an 11% increase. Together with the earlier concentration of labor growth among production workers and technicians, these results suggest that U.S. tariff exposure expands real production activity within Mexico, combining imported intermediates with domestic labor and other domestic factors to generate additional value embedded in export sales. However, the composition of this expansion indicates that it is strongly dependent on foreign inputs and firm organization, with domestic contributions arising primarily through labor rather than through upstream input production.

4.6 Firm-Level Evidence on New Plant Openings

Since 2018, major multinational companies—including Bosch, LEGO, Continental, Volkswagen, and Toyota, all operating under Mexico's IMMEX program—have announced plans to expand their production capacity in Mexico through a wave of new investments, as reported in business media (News Desk 2018; Webwire 2022; Reuters 2022a; Cohen et al. 2025). A large share of these projects involves the construction of new manufacturing plants.

Figure 10 reports the estimated effect of the U.S. trade policy shift on the number of manufacturing plants operated by firms. The results show a clear shift after 2018, consistent with a reallocation of production capacity toward Mexico in response to the U.S.–China trade conflict.

The estimates imply that more exposed firms experience a persistent net expansion in the number

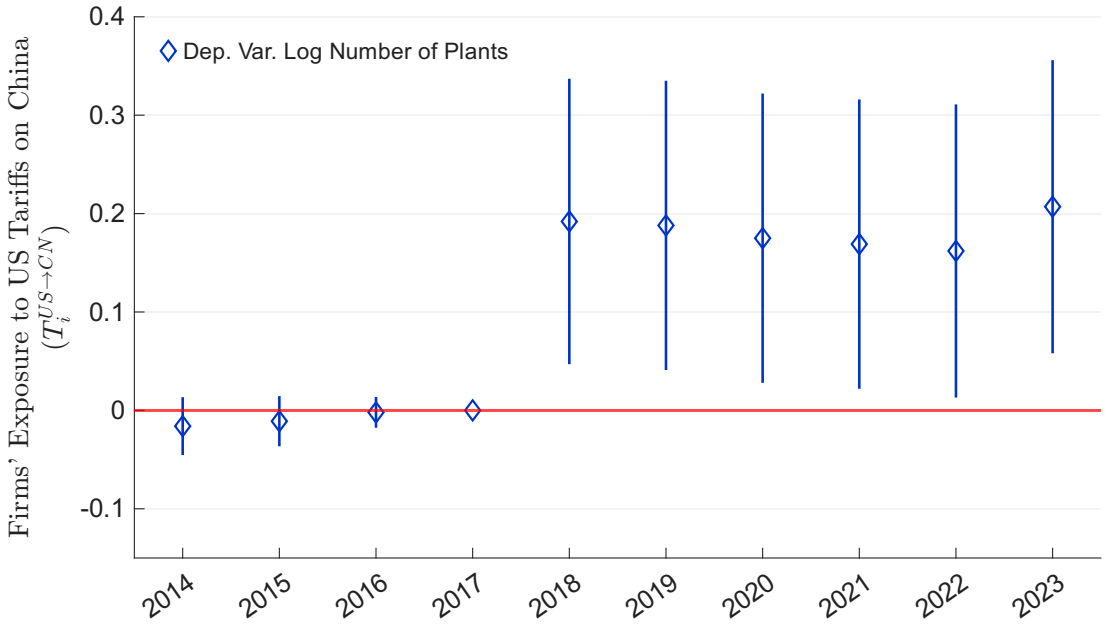


Figure 10: Rising US import tariffs on China spur plant openings in Mexico

Notes: Estimation of Equation 3 with the dependent variable being the natural logarithm of number of plants a firm has. PEME sample firms exporting as of 2017, covering the period from 2014 to 2023, N=51,651. All regressions control for firm fixed effects, industry-by-year fixed effects and concurrent trade policy changes. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US \to CN}}$, along with 95% confidence intervals.

of operating plants after 2018. Using the 90–10 exposure difference of 0.17, the 2023 coefficient of 0.21 implies a 3.6 percent increase, corresponding to an increase of about $0.036 \times 1.55 \approx 0.05$ additional plants per firm. As a back-of-the-envelope measure of aggregate expansion, aggregating this effect across the roughly 6,000 exporting manufacturing firms in the sample implies an increase of approximately 360 additional plants associated with differential exposure to U.S. tariffs on China.

Because the outcome in Figure 10 is the log number of plants, the effect captures the net entry margin, plant openings minus closures, rather than openings alone. To isolate the effect on plant entry, I identify newly established plants using the IMMEX registry over the period 2016–2024. A plant is classified as new if it appears for the first time in the registry under firm i at an address not previously associated with that firm. For each firm i and year t, I construct the total number of newly opened plants, which serves as the outcome variable in the entry regressions.

To maintain comparability with the main analysis, I restrict the IMMEX registry sample to man-

ufacturing firms active as of 2017 and estimate a firm-level specification in which tariff exposure is defined at the three-digit industry level, constructed from the firm-level trade data analogously to the firm-level measures.[15] The specification includes firm and border-by-year fixed effects and controls for concurrent trade policy exposures.

The results presented in Table 2 show that U.S. tariffs on China spurred the establishment of new manufacturing plants in Mexico. The dependent variable is the inverse hyperbolic sine transformation of the number of new plants per firm per year. Column (1) shows that across all firms, greater tariff exposure is associated with significantly more plant openings, with a coefficient of 0.59. Columns (2) and (3) split the sample by firm nationality and reveal that the effect is 2.5 times larger among foreign-owned firms (0.791) than for non-foreign firms (0.317) and both statistically significant. Moving from the 10th to the 90th percentile of tariff exposure (0.10–0.23) is associated with 0.106 additional new plants per firm per year among foreign firms — a 64% increase relative to their mean of 0.166 — and 0.041 additional new plants per firm per year among non-foreign firms, a 53% increase relative to their mean of 0.077.[16]

Columns (4)–(6) augment the specification with an interaction between tariff exposure and Chinese input dependence. Chinese input dependence is measured by $IMCN_j^{\text{US}\to\text{CN}}$, which captures the share of industry j's imports in 2017 that originated from Chinese products subject to US tariffs on China, weighted by the magnitude of those tariff increases (Equation B.4). I construct this measure at the three-digit industry level by aggregating firm-level import data, and define the indicator $\mathbf{1}\left[\text{IMCN}_j^{\text{US}\to\text{CN}} \geq \text{Median}\right]$ accordingly.

The interaction term is large and significant for foreign firms (2.8) but small and insignificant for non-foreign firms (-0.2), suggesting that the plant-opening response among foreign firms is concentrated in those that rely more heavily on Chinese inputs — consistent with a supply chain

[15] The IMMEX registry is maintained by the Ministry of Economy and falls outside INEGI's confidential microdata environment; this analysis is therefore conducted outside INEGI's secure servers, which necessitates industry-level rather than firm-level exposure measures.

[16] These figures are obtained by inverting the inverse hyperbolic sine transformation. Specifically, for a coefficient $\hat{\beta}$ and a change in tariff exposure ΔT (the difference between the 90th and 10th percentiles), the predicted change in the outcome in levels is $\sinh(\text{IHS}(\bar{y}) + \hat{\beta} \times \Delta T) - \bar{y}$, where $\bar{y}$ is the sample mean of new plants per firm per year and $\sinh(x) = (e^x - e^{-x})/2$ is the inverse of the IHS transformation.

reorganization motive. The baseline tariff exposure, $\mathbf{T_j^{US\to CN}}$ already captures the degree to which a Mexican firm's substitute for Chinese goods in the US market, so trade diversion alone should show up in the baseline coefficient. Columns (7) further distinguishes by US-owned from other foreign-owned firms. The interaction with Chinese input dependence is even larger at 4.9, nearly double the pooled foreign estimate, suggesting that the non-linear effect is driven by the US-owned firms. For US-owned firms above the median of Chinese input dependence, moving from the 10th to the 90th percentile of tariff exposure is associated with 0.676 additional new plants per firm per year, nearly four times their mean, implying 338 additional new plants per 1,000 US-owned firms per year. The additional role of the interaction term points to a more specific mechanism: Mexican affiliates of US firms that operate in industries which both compete with Chinese goods in the US market and depend more on Chinese inputs face the strongest incentive to expand and respond by opening new plants.

Column (8) explores heterogeneity by Chinese ownership, combining firms headquartered in China, Hong Kong, and Singapore due to their small individual counts. Despite their limited aggregate presence, the significant interaction (1.963) together with the positive and significant baseline effect suggests that Chinese-owned affiliates respond disproportionately to tariff exposure, providing empirical evidence on the behavior of Chinese-owned firms that has featured prominently in public debate.[17]

4.7 The Role of U.S.-headquartered Firms in Creating Jobs in Mexico

U.S.-headquartered firms in the IMMEX program accounted for 38% of Mexico's exports to the United States and nearly one million manufacturing jobs in 2017.[18] Given the central role of U.S. multinationals in North American production networks (Flaaen et al. 2025), and evidence that Mexico's export surge between 2018 and 2021 was driven by firms embedded in global value

[17] Appendix Table D.1 replicates the analysis using the continuous $IMCN_j^{US\to CN}$ measure instead of the binary indicator and reports wild cluster bootstrap p-values to address possible concerns about standard error reliability with a small number of industry-level clusters. The results are qualitatively unchanged. Appendix Table D.2 presents PPML estimates using the count of new plants directly as the outcome, with broadly consistent results.

[18] Author's calculation based on customs data, the IMMEX registry, and PEME.

Table 2: Rising US import tariffs on China spur plant openings in Mexico

	Linear			Linear × CN Input Dep.				Parent
	(1) All	(2) Foreign	(3) Not Foreign	(4) All	(5) Foreign	(6) Not Foreign	(7) US	(8) Foreign
$\mathbf{T_j^{US\to CN}} \times \text{PostTW}_t$	0.590***	0.791**	0.317***	0.194	0.076	0.293	-0.296	0.723*
	(0.194)	(0.368)	(0.092)	(0.239)	(0.310)	(0.176)	(0.339)	(0.375)
$\mathbf{T_j^{US\to CN}} \times \text{PostTW}_t \times \text{CN Input Dep.}$				1.371*	2.822***	-0.226	4.881***	
				(0.786)	(0.714)	(0.526)	(0.974)	
$\mathbf{T_j^{US\to CN}} \times \text{PostTW}_t \times \text{CN Affiliate}$								1.963***
								(0.628)
Observations	33,627	17,166	16,461	33,619	17,166	16,453	10,739	17,193
R-squared	0.288	0.284	0.283	0.289	0.285	0.283	0.299	0.285
Concurrent Trade Policy Controls	✓	✓	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓	✓	✓	✓
Border × Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Chinese Input Dependence × PostTW_t	–	–	–	✓	✓	✓	✓	–
CN Affiliate × PostTW_t	–	–	–	–	–	–	–	✓
Avg. Number of New Plants	0.122	0.166	0.077	0.122	0.166	0.077	0.178	0.166

Notes: Manufacturing IMMEX firms operating as of 2017, over 2017–2024. Dependent variable is the inverse hyperbolic sine transformation of the number of new plants. Concurrent Trade Policy Controls include exposures to the U.S.–Mexico tariff escalation, China's retaliatory tariffs, and the input channel measures $IMUS_j^{\text{CN}\to\text{US}}$, and $IMUS_j^{\text{US}\to\text{CN}}$, all constructed using firm-level data aggregated to the industry level and interacted with the post–trade war indicator. Columns (4)–(7) further control for Chinese Input Dependence as defined by $\mathbf{1}\left[\text{IMCN}_j^{\text{US}\to\text{CN}} \geq \text{Median}\right]$. CN Affiliate is a dummy variable that takes the value of one if the parent company headquarters are located in China, Hong Kong, or Singapore. All specifications include firm and border × year fixed effects. Robust standard errors are clustered at the three-digit industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

chains, particularly foreign multinationals (Utar et al., 2025), focusing on U.S.-headquartered firms provides a natural lens for assessing how U.S. trade policy propagated through North American production networks. This section examines how these firms adjusted their trade and production.

The increase in newly established manufacturing plants by U.S.-headquartered firms in Mexico—documented in Section 4.6—is particularly notable given the absence of corresponding gains in U.S. manufacturing output or employment (Flaaen and Pierce, 2024; Autor et al., 2024). The new plant entry by U.S. firms occurs in industries that both rely on Chinese inputs and compete with Chinese suppliers. This raises the question of whether higher input costs from U.S. tariffs shifted production toward Mexico rather than expanding manufacturing activity in the United States.

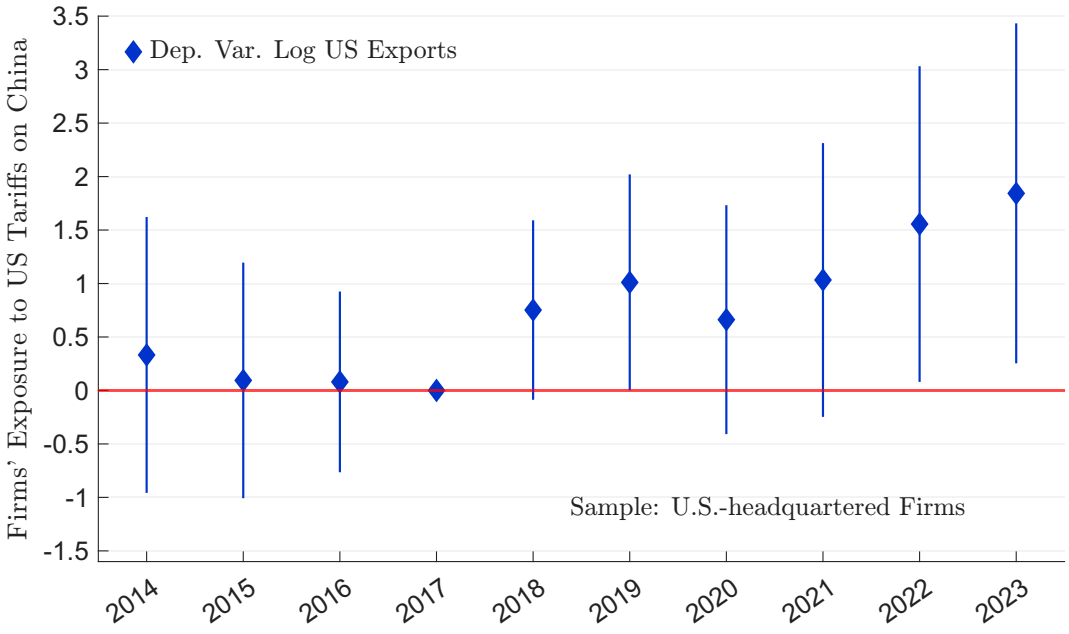
Figure 11a plots the response of exports to the United States by U.S.-headquartered manufacturing firms in Mexico to rising U.S. tariffs on China. The estimates show no evidence of pre-trends and a positive post-2018 response that strengthens over time. By 2023, the coefficient reaches 1.84—similar to the magnitude estimated across all firms—implying that a 90–10 difference in tariff exposure corresponds to a 37% increase in firm-level exports.

Figure 11b traces the year-by-year response of U.S.-headquartered firms' imports from the United States and China. Imports from the United States rise alongside exports, reflecting the structure of multinational production networks in which affiliates source inputs from their headquarters country (Utar et al., 2025). Imports from China also rise, but with a more delayed response, becoming more pronounced from around 2020 onward. This sequencing suggests that the tariff-induced expansion of U.S. firms in Mexico initially relied more heavily on existing North American supply chains, with Chinese sourcing increasing as Mexican operations scaled up.[19]

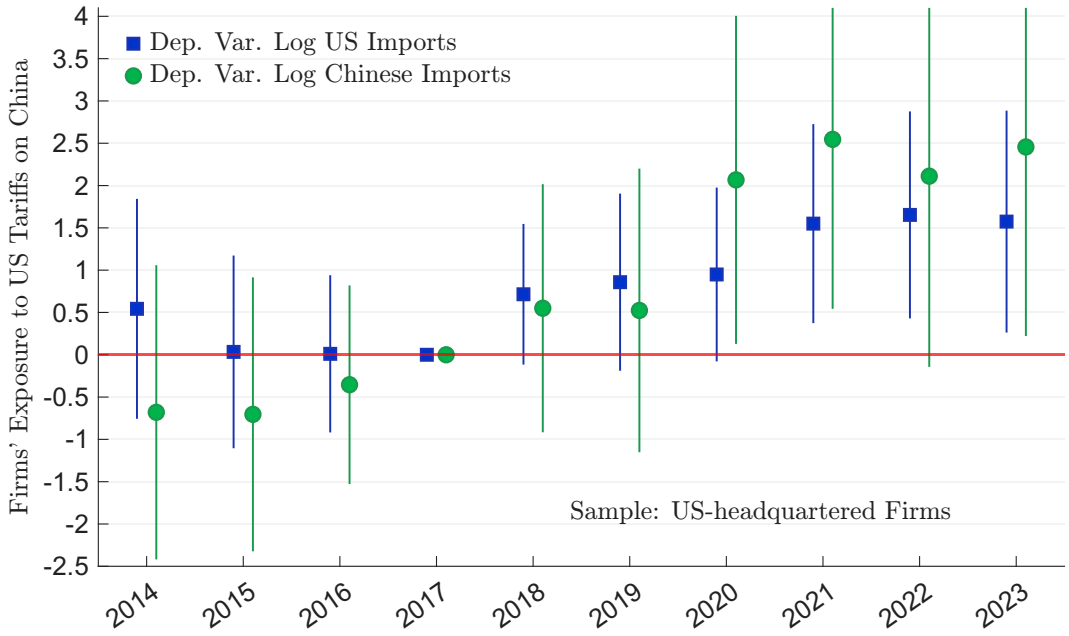
A possible mechanism is that higher tariffs on Chinese inputs increased the cost of final assembly in the United States, leading U.S. firms to shift downstream stages of production to Mexican affiliates. As these operations expanded, Mexican plants increasingly combined inputs sourced from both the

[19]The initial reliance on existing North American supply chains is consistent with high switching costs in buyer-supplier relationships (Monarch 2022), which discourage firms from replacing established partners even when tariffs alter relative costs.

United States and China while exporting to the U.S. market.



(a) Export Responses of U.S.-Headquartered Firms



(b) Import Responses of U.S.-Headquartered Firms

Figure 11: Trade Responses of U.S.-Headquartered Firms to U.S. Tariffs on China

Notes: Top panel shows the response of U.S. exports by U.S.-headquartered firms in Mexico (N=10,940). Bottom panel shows import responses from the United States (N=10,955) and China (N=10,459). Estimation of Equation 3. All regressions include firm fixed effects, three-digit-industry-by-year fixed effects, and controls for concurrent trade policy changes. The y-axis reports yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US \to CN}}$, with 95% confidence intervals.

Table 3: U.S. Tariffs on China and Expansion of U.S.-Headquartered Firms in Mexico

	(1) Log Production	(2) Log Employment	(3) Log Labor Productivity
$T_{i,US}^{US \to CN} \times 2014$	0.049	0.348	0.001
	(0.332)	(0.310)	(0.245)
$T_{i,US}^{US \to CN} \times 2015$	-0.156	0.194	-0.103
	(0.278)	(0.257)	(0.202)
$T_{i,US}^{US \to CN} \times 2016$	-0.078	0.084	-0.080
	(0.182)	(0.134)	(0.151)
$T_{i,US}^{US \to CN} \times 2018$	0.714**	0.296	0.466*
	(0.338)	(0.237)	(0.269)
$T_{i,US}^{US \to CN} \times 2019$	0.419	0.127	0.370
	(0.364)	(0.249)	(0.291)
$T_{i,US}^{US \to CN} \times 2020$	0.517	0.267	0.323
	(0.382)	(0.264)	(0.302)
$T_{i,US}^{US \to CN} \times 2021$	1.302***	0.551*	0.945**
	(0.449)	(0.293)	(0.395)
$T_{i,US}^{US \to CN} \times 2022$	1.134***	0.510*	0.725**
	(0.411)	(0.306)	(0.307)
$T_{i,US}^{US \to CN} \times 2023$	0.772	0.602*	0.293
	(0.473)	(0.349)	(0.414)
N	10,522	10,553	10,521
Firm FE	✓	✓	✓
3-digit Industry × Year FE	✓	✓	✓
Concurrent Trade Policy Controls	✓	✓	✓

Notes: Sample: U.S.-headquartered firms (with global ultimate headquarters in the United States) that exported to the United States as of 2017. Concurrent Trade Policy Controls include firms' exposures to the US-Mexico tariff escalation, retaliatory tariffs of China and the input channels as described in equations B.1-B.6. Robust standard errors are clustered at the firm level. ***, **, and * indicate significance at the 1%, 5% and 10% levels, respectively.

Notably, this sourcing pattern appears specific to U.S.-headquartered firms. Table C.6 in the Appendix shows that while both U.S.- and non-U.S. foreign firms expand exports to the United

States, only U.S.-headquartered firms significantly increase imports from both the United States and China. If anything, the share of imports sourced from China declines among other foreign firms as tariff exposure rises (Figure C.8), suggesting that their Mexican operations substituted more directly for Chinese production.

Overall, these patterns suggest that U.S.-headquartered firms deepened their Mexican production networks within multinational supply chains rather than simply substituting Mexican for Chinese production.

Table 3 reports estimates of Equation 3 for U.S.-headquartered manufacturing firms. Higher U.S. tariffs on China increase firm-level production in Mexico and are followed by later gains in employment, alongside positive effects on labor productivity in several post-2018 years. The joint rise in output, employment, productivity, and plant entry indicates that U.S.-headquartered firms expanded manufacturing capacity in Mexico, rather than deflecting trade through minimally transformed goods.

Taken together, the evidence indicates that the 2018–2019 U.S. trade policy shift caused a significant expansion of manufacturing activity by U.S.-headquartered firms in Mexico, manifested in higher exports to the United States, greater sourcing from both the United States and China, higher output and employment, and the establishment of new plants.

5 Concluding Remarks

The 2018–2019 U.S.–China trade war marked one of the most dramatic shifts in U.S. trade policy in decades. While the tariffs, estimated to impose large costs on U.S. consumers and producers, were promoted as a means of revitalizing domestic manufacturing, this paper shows that they led to a significant manufacturing expansion in Mexico—the United States' key production partner within North American supply chains.

The findings show that the trade war significantly increased manufacturing output, value added, employment, and the number of plants in Mexico. These gains are driven by foreign multination-

als and their domestic affiliates operating under Mexico's export platform, IMMEX. The tariffs induce growth in in-house production rather than contract manufacturing (*maquila*), with value added and employment rising in technology-intensive industries—concentrated among production workers and technicians, the very segment of the workforce that trade protectionism aimed to restore domestically. The expansion ran through pre-existing North American production networks, highlighting the important role of existing MNE networks in mediating trade policy shocks.

U.S.-headquartered firms were at the center of this expansion, with their Mexican subsidiaries significantly increasing production, employment, and establishing new plants in response to the tariffs. This pattern suggests that the adjustment to U.S. protectionism occurred not within U.S. borders, but through the reallocation of activity within multinational networks.

What does this mean for Mexico? While U.S. tariffs delivered a significant boost to manufacturing activity, its character warrants attention. Production gains are concentrated among foreign multinationals responding to a global trade policy shock originating outside Mexico, with limited effects on domestic firms outside the IMMEX program. The expansion relies on imported intermediates with domestic labor rather than reflecting the emergence of a broader domestic industrial base, suggesting that the benefits of deep integration into North American supply chains, while real, remain contingent on external policy decisions and unevenly distributed across firms.

Overall, the findings suggest that tariff policy may be ill-suited to achieving domestic manufacturing objectives in a deeply integrated regional economy, where production is organized through global value chains. Rather than reshoring, protectionist trade policy measures may reinforce cross-border production linkages, shifting manufacturing activity to proximate economies while leaving domestic manufacturing outcomes largely unchanged.

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Appendix to:

“Elsewhere in North America”

Hâle Utar

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A Descriptive Statistics

Table A.1: Firm-Level Measures of Exposures to the Trade War

	(1) Mean	(2) SD	(3) P10	(4) P25	(5) P75	(6) P90	(7) N
All Exporters							
$T_i^{\text{US}\to\text{CN}}$	0.201	0.074	0.077	0.152	0.250	0.250	52,260
$T_{i,\text{US}}^{\text{US}\to\text{CN}}$	0.150	0.095	0.000	0.056	0.242	0.250	52,260
$T_i^{\text{US}\to\text{MEX}}$	0.003	0.022	0.000	0.000	0.000	0.000	52,260
$T_i^{\text{MEX}\to\text{US}}$	0.004	0.019	0.000	0.000	0.000	0.004	52,260
$T_i^{\text{CN}\to\text{US}}$	0.167	0.072	0.058	0.110	0.225	0.250	52,260
$IMUS_i^{\text{US}\to\text{CN}}$	0.103	0.084	0.000	0.019	0.175	0.224	52,260
$IMCN_i^{\text{US}\to\text{CN}}$	0.026	0.046	0.000	0.000	0.030	0.081	52,260
$IMUS_i^{\text{CN}\to\text{US}}$	0.081	0.071	0.000	0.015	0.132	0.183	52,260
GVC Firms							
$T_i^{\text{US}\to\text{CN}}$	0.203	0.072	0.087	0.157	0.250	0.250	37,440
$T_{i,\text{US}}^{\text{US}\to\text{CN}}$	0.169	0.086	0.014	0.117	0.245	0.250	37,440
$T_i^{\text{US}\to\text{MEX}}$	0.003	0.025	0.000	0.000	0.000	0.000	37,440
$T_i^{\text{MEX}\to\text{US}}$	0.005	0.021	0.000	0.000	0.000	0.006	37,440
$T_i^{\text{CN}\to\text{US}}$	0.166	0.072	0.059	0.108	0.225	0.249	37,440
$IMUS_i^{\text{US}\to\text{CN}}$	0.113	0.082	0.002	0.036	0.182	0.226	37,440
$IMCN_i^{\text{US}\to\text{CN}}$	0.026	0.043	0.000	0.000	0.032	0.078	37,440
$IMUS_i^{\text{CN}\to\text{US}}$	0.089	0.070	0.002	0.027	0.140	0.188	37,440

Notes: See Section 3.1 and Appendix Section B.2 for the definitions of these variables.

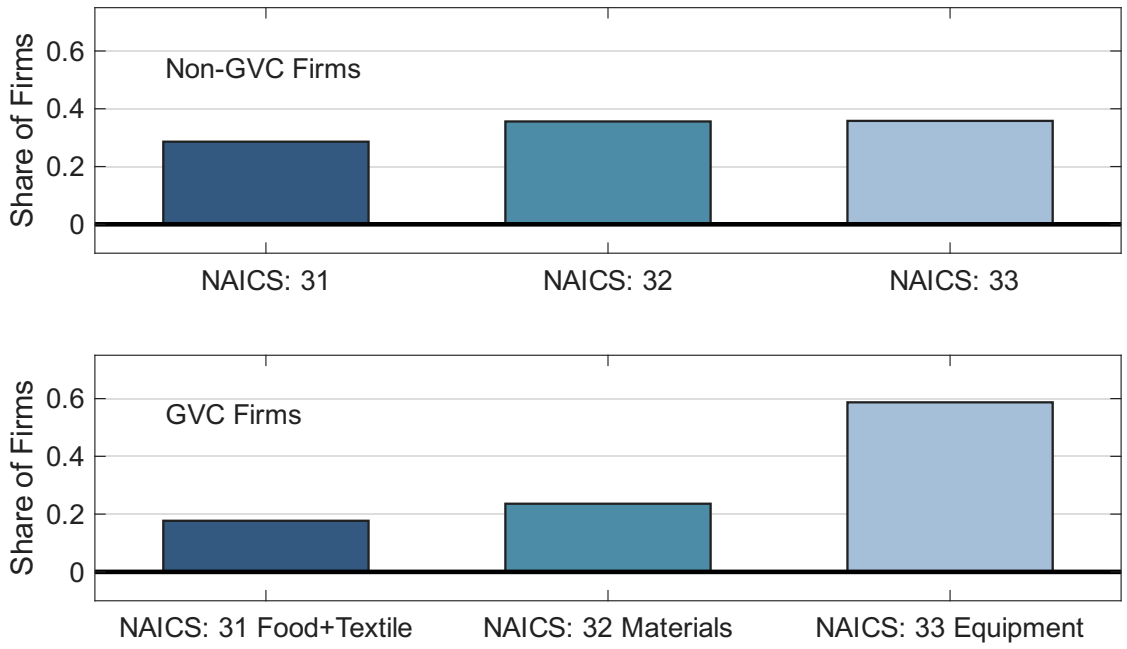


Figure A.1: Distribution of firms across industries

Notes: Top figure: Non GVC firms across two-digit industries (N=14,820). Bottom figure: GVC firms across two-digit industries (N=37,440)

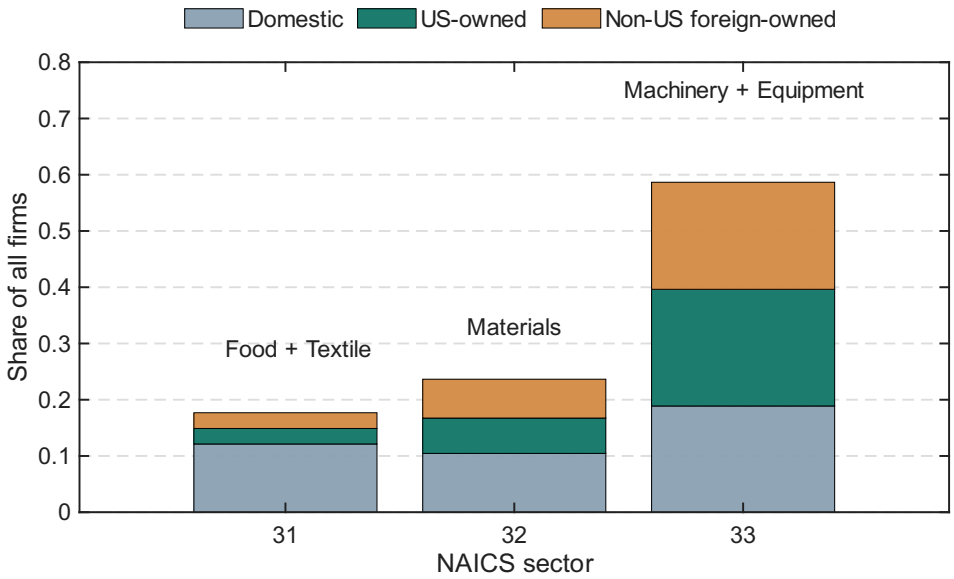


Figure A.2: Distribution of GVC firms across industries by ownership type

Notes: GVC firms by ownership type across two-digit industries (N=37,440)

Table A.2: Summary Statistics—GVC Firms by Country of Ownership

	(1)	(2)	(3)	(4)	(5)
Variable	**Mean**	**SD**	**p25**	**p75**	**Obs**
Panel. A U.S. Firms					
Log Employment	5.74	1.46	4.79	6.71	1183
Log Value of Production	16.91	1.68	15.91	18.02	1177
Log Value of Exports	16.24	2.42	15.03	17.96	1183
Log Value of Import	16.27	2.22	15.05	17.79	1170
US Export Share	0.89	0.23	0.92	1.00	1183
US Import Share	0.64	0.28	0.46	0.88	1170
Chinese Import Share	0.12	0.18	0.01	0.17	1170
Panel. B Non U.S. Foreign Firms					
Log Employment	5.69	1.51	4.69	6.72	1164
Log Value of Production	17.12	1.93	16.02	18.41	1157
Log Value of Exports	15.79	2.97	13.94	17.85	1164
Log Value of Import	16.38	2.27	15.19	17.84	1152
US Export Share	0.76	0.33	0.64	1.00	1164
US Import Share	0.39	0.32	0.10	0.67	1152
Chinese Import Share	0.14	0.20	0.01	0.19	1152
Panel. C Domestic Firms					
Log Employment	4.80	1.48	3.76	5.79	1745
Log Value of Production	15.72	1.92	14.48	16.93	1729
Log Value of Exports	14.34	2.44	12.94	15.95	1745
Log Value of Import	14.05	2.44	12.52	15.74	1647
US Export Share	0.83	0.31	0.82	1.00	1745
US Import Share	0.55	0.36	0.19	0.89	1647
Chinese Import Share	0.14	0.23	0.00	0.17	1647

Notes: GVC (IMMEX) firms in 2017 by country of wonership. Values are expressed in 2019 constant USD. Employment is measured in number of workers. Domestic firms are defined as those whose parent company is identified as domestic in the D&B database, or as firms that do not have a listed parent company.

Table A.3: Summary Statistics—IMMEX establishment-level data (2015-2023)

Variable	(1) Mean	(2) SD	(3) p25	(4) p75	(5) Obs
Log Total Revenue	16.19	1.88	14.98	17.46	37,822
Log Total Foreign Revenue	15.66	1.91	14.47	16.96	35,762
Log Sales of Own Manufactured Goods	16.22	2.73	15.16	17.99	20,766
Log Domestic Sales of Own Manufactured Goods	15.36	2.83	13.96	17.32	19,139
Log Foreign Sales of Own Manufactured Goods	15.73	2.32	14.51	17.26	17,234
Labor Cost Share	0.21	0.16	0.10	0.27	37,904
Material Cost Share	0.62	0.22	0.50	0.79	37,904
Foreign Material Cost Share	0.42	0.31	0.10	0.70	37,904
Log Non Production Employees	3.60	1.50	2.56	4.66	37,330
Log Production Employees	5.39	1.45	4.43	6.40	37,793
Log Employment on Firm's Payroll	5.48	1.55	4.53	6.55	33,342
Log Employment not on Firm's Payroll	4.71	1.82	3.58	6.00	10,465

Notes: IMMEX plants matched with PEME. Values are expressed in 2019 constant USD. Total revenue includes sales of own manufactured goods and revenues from contract manufacturing. The labor cost share is defined as total labor payments—including wages, benefits, and payments to staffing companies—divided by total expenses. The material cost share is total material costs divided by total expenses, and the foreign material cost share is total foreign material costs divided by total expenses. Non-production employees include administrative, managerial, and other non-production workers, whether directly hired or supplied through staffing companies. Production employees include production workers and technicians involved in manufacturing, whether on the firm's payroll or supplied through staffing companies.

B Data and Variable Construction

Firm-level data The Profile of Export-Oriented Manufacturing Firms (PEME) is a statistical product developed by Mexico's National Institute of Statistics and Geography (INEGI) that provides detailed firm-level information on the foreign trade activities of manufacturing firms. PEME is constructed by linking multiple data sources, including administrative foreign trade records, manufacturing surveys, and statistics from the IMMEX program. These datasets are integrated through Mexico's Statistical Business Register (RENEM), which provides a unified framework for identi-

fying and tracking firms across sources. INEGI has undertaken this data-linking effort since 2013, combining foreign trade records with information from the Economic Censuses, the Annual and Monthly Manufacturing Industry Surveys, and IMMEX Program Statistics.

The unit of observation in PEME is the firm, defined as an organization owned by a single legal entity that engages in one or more economic activities. Firms are autonomous in decisions related to marketing, finance, and investment, and allocate resources according to a defined production strategy. A firm may operate in one or multiple establishments under the same legal name.PEME includes manufacturing firms for which at least one establishment reports information in the Manufacturing Surveys or the IMMEX Program Statistics.

Plant-level data The IMMEX plant-level dataset covers all establishments belonging to firms participating in the IMMEX Program, making it a census of activity conducted under the program. Since the analysis focuses on manufacturing, I restrict attention to manufacturing plants. The data, originally reported at the monthly frequency, are aggregated to the annual level.

Registry data In addition to the IMMEX plant-level data, I use the monthly IMMEX firm registry maintained by Mexico's Ministry of Economy (Secretaría de Economía) for the period 2016–2024. The registry includes firm names, descriptions of primary activities (which roughly correspond to three-digit NAICS industries), addresses, and tax identifiers (Registro Federal de Contribuyentes, RFC). The registry is updated monthly to reflect plant openings and closures, which I use to identify new plant establishments. Firm tax identifiers are used to link firms to their global ultimate owners using D&B's Corporate Hierarchies and Linkages database.

B.1 Overview of Categories, Variables, and Classifications

In the PEME, firms' economic activity is classified using the North American Industry Classification System (NAICS, 2018), based on establishments' outputs and production processes. Each firm is assigned a primary activity at the three-digit NAICS level, yielding 21 manufacturing industries. Importantly, the PEME includes microenterprises (1–10 employees), providing more

complete coverage of firms' contributions to employment and Mexico's international trade.

INEGI provides a crosswalk between establishment and firm identifiers for the period 2013–2023. This key makes it possible to track the number of establishments belonging to a firm over time. It also enables the merge of firm-level PEME data with the plant-level IMMEX database.

B.2 Firm-Level Controls for Concurrent Trade Policy Changes

Section 232 and Mexico's retaliation Before the US government targeted China specifically, Section 232 tariffs led to retaliation from Mexico, among other countries. To control for the potentially confounding effects of the brief US-Mexico tariff escalation, we separately construct firm-specific exposures to the US tariffs on Mexican products ($T_i^{\text{US}\to\text{MEX}}$) and Mexico's retaliatory tariffs on US products ($T_i^{\text{MEX}\to\text{US}}$).

To construct firm-level exposure to the increased US tariffs on Mexico, we focus on firms that, before the shock, were exporting goods to the US that will be subject to Section 232 tariffs:

$$T_i^{\text{US}\to\text{MEX}} = \frac{\sum_{\ell\in\text{USIT}^{\text{MEX}}} X_{i\ell}^{2017,US} \times \Delta\tau_\ell^{\text{USIT}^{\text{MEX}}}}{\sum_\ell X_{i\ell}^{2017}} \tag{B.1}$$

Since the Section 232 tariffs included other third countries, $T_i^{\text{US}\to\text{MEX}}$ does not cleanly identify the specific effects of US tariffs on Mexico but essentially functions as a robust control for the possible confounding effects of the Section 232 tariffs.

To measure the effect of the Mexico's retaliatory tariffs, we focus on firms that, before the shock, were importing goods from the US, which will later be subject to Mexico's retaliatory tariffs. Let $USRT^{MEX}$ be the set of HS-6 products subject to the retaliatory tariffs of Mexico, and $\Delta\tau_j^{USRT^{MEX}}$ measures the change in the Mexican import tariff rate for good ℓ from the US in decimal points and let $M_{i\ell}^{2017}$ be the value of firm i's imports of good ℓ in 2017, and let $M_{i\ell}^{2017,US}$ denote firm i's imports of good ℓ from the US. The firm-level exposure to the Mexican government's retaliatory tariffs is then given by the following:

$$T_i^{\text{MEX}\to\text{US}} = \frac{\sum_{\ell\in\text{USRT}^{\text{MEX}}} M_{i\ell}^{2017,US} \times \Delta\tau_\ell^{\text{USRT}^{\text{MEX}}}}{\sum_\ell M_{i\ell}^{2017}} \tag{B.2}$$

As the empirical analysis focuses on exporters as of 2017, not all firms are importing in the sample. For non-importing firms, $T_i^{\text{MEX}\to\text{US}}$ is defined as zero.

Tariff Exposures via Input Channels I additionally construct firm-level exposure measures for firms that import inputs from the US exposed to the US tariffs on China, as well as for firms whose inputs concentrate on Chinese imports that would have been subject to US tariffs if imported into the US as follows:

$$IMUS_i^{\text{US}\to\text{CN}} = \frac{\sum_{\ell\in\text{USIT}^{\text{CN}}} M_{i\ell}^{2017,\text{US}} \times \Delta\tau_\ell^{\text{USIT}^{\text{CN}}}}{\sum_\ell M_{i\ell}^{2017}} \tag{B.3}$$

$$IMCN_i^{\text{US}\to\text{CN}} = \frac{\sum_{\ell\in\text{USIT}^{\text{CN}}} M_{i\ell}^{2017,\text{CN}} \times \Delta\tau_\ell^{\text{USIT}^{\text{CN}}}}{\sum_\ell M_{i\ell}^{2017}} \tag{B.4}$$

China's retaliatory tariffs By offering manufacturing and export services like polishing, packaging, and warehousing to US businesses, some exporting firms likely complement US operations without altering the nature of the goods traded, and hence their exports may be dampened due to costlier entry of US goods to China. However, particularly in the agricultural sector, Mexico's exports may also compete with US products in global markets.

Let $USRT^{CN}$ represent the set of HS 6-digit products targeted by China's retaliatory tariffs, and $\Delta\tau_\ell^{USRT^{CN}}$ denote the increase in the retaliatory tariff rate for good ℓ as of December 2019.

$$T_i^{\text{CN}\to\text{US}} = \frac{\sum_{\ell\in\text{USRT}^{\text{CN}}} X_{i\ell}^{2017} \times \Delta\tau_\ell^{\text{USRT}^{\text{CN}}}}{\sum_i X_{i\ell}^{2017}} \tag{B.5}$$

$T_i^{\text{CN}\to\text{US}}$ measures the weighted value of exports in goods that are targeted by China's retaliatory tariffs relative to the total exports of firm i as of 2017. As before, we weight exported goods based on their respective retaliatory tariff rates, ensuring that Mexican firms with a greater concentration

of exports in goods subject to higher export tariffs are regarded as more exposed, all else being equal.

I additionally account for firms whose imports from the US concentrated in goods that will be subject to retaliatory tariffs from China.

$$IMUS_i^{\text{CN}\to\text{US}} = \frac{\sum_{\ell\in\text{USRT}^{\text{CN}}} M_{i\ell}^{2017,US} \times \Delta\tau_\ell^{\text{USRT}^{\text{CN}}}}{\sum_\ell M_{i\ell}^{2017}} \tag{B.6}$$

Table A.1 presents summary statistics for these measures.

B.3 Sample Restriction for the U.S.-Specific Exposure Measure

The U.S.-specific exposure measure is designed to capture variation among U.S.-exporting firms based on the extent to which their sales are concentrated in goods subject to U.S. tariffs. When firms have low baseline U.S. export shares, this measure becomes less informative about their exposure to U.S. tariffs, as their U.S.-oriented sales constitute only a small portion of overall activity. Table B.1 examines how firms' U.S. export shares relate to tariff exposure across subsamples defined by baseline U.S. export intensity. The estimated relationship is driven by firms with low initial U.S. export shares and declines as the minimum U.S. export-share threshold is raised and becomes statistically insignificant at around the 30 percent cutoff, which motivates the baseline sample restriction.

Table B.1: U.S. Export Share Gains by Baseline U.S. Export Share

Sample based on 2017 share of US exports	(1) All (>= 0)	(2) > 0	(3) >= 0.1	(4) >= 0.2	(5) >= 0.3	(6) >= 0.4
Dep var. for all columns			US Export Share			
Firm Exposure to US Tariffs on China	0.120***	0.085**	0.071*	0.062	0.053	0.027
$(T_i^{\text{US}\to\text{CN}} \times PostTW_t)$	(0.039)	(0.039)	(0.041)	(0.041)	(0.040)	(0.039)
N	50,550	46,596	43,614	42,335	41,265	40,054
Firm FE	✓	✓	✓	✓	✓	✓
3-digit Industry × Year FEs	✓	✓	✓	✓	✓	✓
Additional Trade Policy Controls	✓	✓	✓	✓	✓	✓

Notes: $PostTW_t$ is a dummy variable equal to 1 for years 2018 and later, and 0 otherwise. Additional Trade Policy Controls include firms' exposures to the US-Mexico tariff escalation, retaliatory tariffs of China and the input channels as described in equations B.1-B.6. Robust standard errros are clustered at the firm level.

C Additional Analysis

C.1 Firms' Trade Outcomes

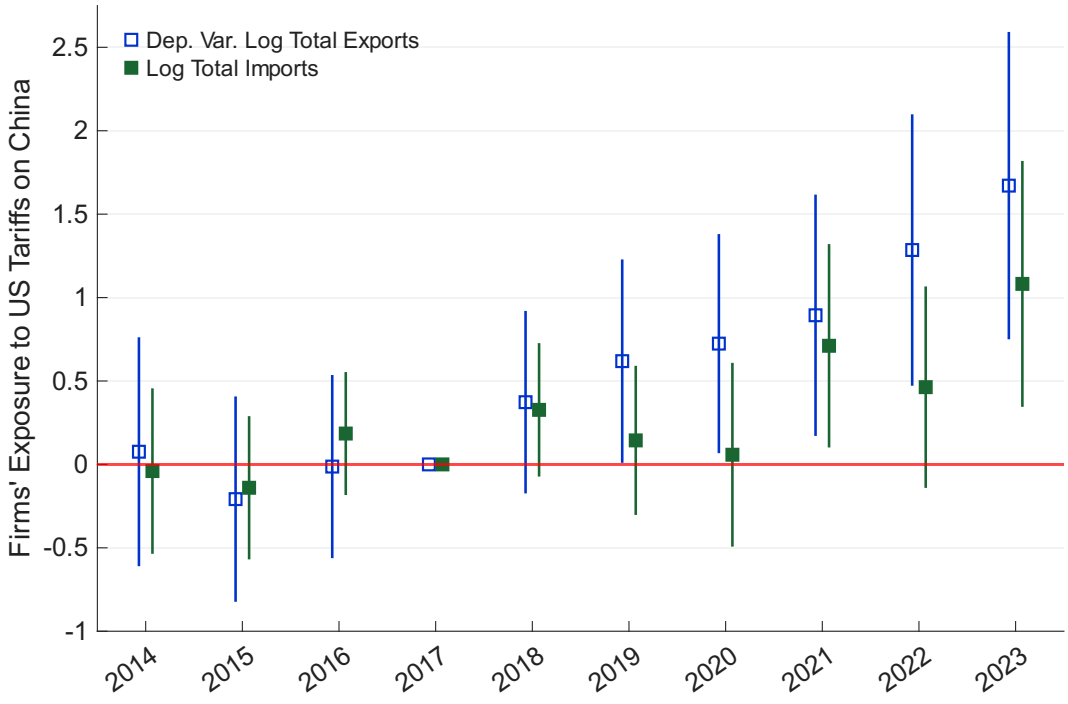


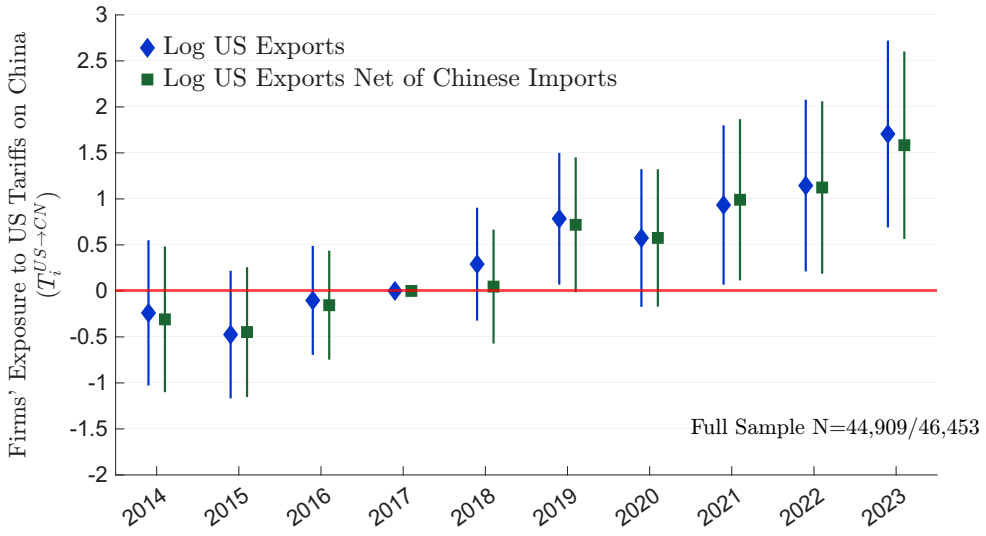
Figure C.1: Impact of US Tariffs Targeting China on Manufacturing Firms' Total Exports and Imports

Notes: Estimation of equation 3. The dependent variables are the natural logarithm of firms' value of exports (N=50,550) and imports (49,706). All regressions control for firm fixed effects, three-digit-industry-by-year fixed effects and concurrent trade policy changes. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US \to CN}}$, along with 95% confidence intervals based on robust standard errors clustered at the firm level.

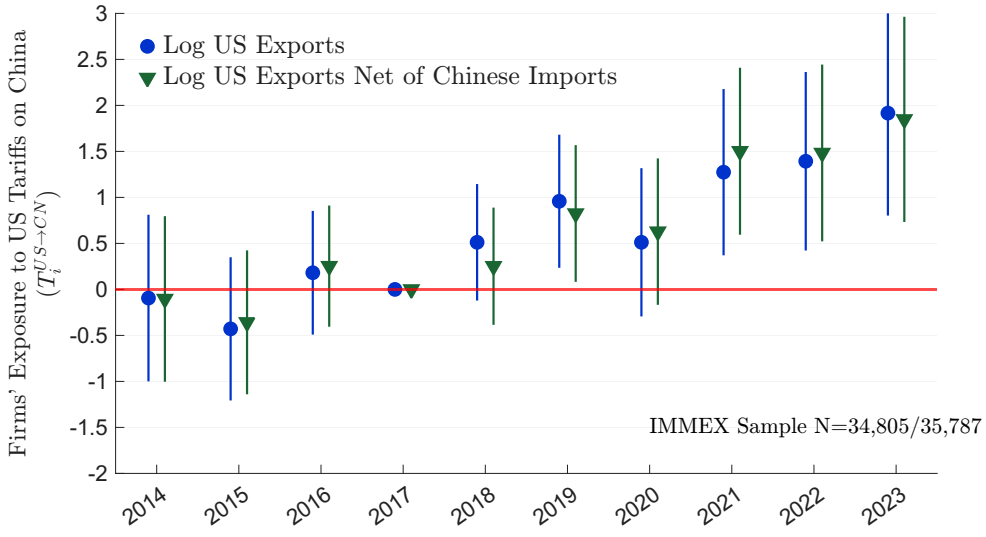
Table C.1: The US-China Trade War and Manufacturing Firms' Trade Outcomes

	(1) Log US Exports	(2) Log Total Exports	(3) Log Non-US Exports	(4) Log Total Imports	(5) Log US Imports	(6) Log Non-US Imports	(7) Share of Imports from China
Panel A. IMMEX-GVC Firms							
US Tariffs on China	1.157***	1.088***	-0.615	0.585**	0.604*	0.736**	0.019
$(\mathbf{T_i^{US \to CN}} \times PostTW_t)$	(0.331)	(0.302)	(0.503)	(0.256)	(0.317)	(0.300)	(0.037)
N	35,787	36,859	22,381	36,430	35,217	35,219	36,430
Panel B. Other firms							
US Tariffs on China	0.730	0.556	1.012	0.407	0.521	0.038	0.052
$(\mathbf{T_i^{US \to CN}} \times PostTW_t)$	(0.757)	(0.547)	(0.633)	(0.411)	(0.526)	(0.493)	(0.050)
N	10,666	13,691	10,779	13,276	11,716	12,729	13,276
For both panels:							
Firm FEs	✓	✓	✓	✓	✓	✓	✓
3-digit Industry × Year FEs	✓	✓	✓	✓	✓	✓	✓
Additional Trade Policy Controls	✓	✓	✓	✓	✓	✓	✓

Notes: $PostTW_t$ is a dummy variable equal to 1 for years 2018 and later, and 0 otherwise. Additional Trade Policy Controls include firms' exposures to the US-Mexico tariff escalation, retaliatory tariffs of China and the input channels as described in equations B.1-B.6. Robust standard errros are clustered at the firm level.



(a) Full Sample



(b) GVC Firms

Figure C.2: Impact of US Tariffs Targeting China on US Exports Net of Chinese Imports

Notes: Estimation of equation 3. The dependent variables are the natural logarithm of US exports and US exports net of Chinese imports, $\sum_{\ell \in \mathcal{L}_{it}^{USX}} [X_{i\ell t}^{US} - M_{i\ell t}^{CN}]$. All regressions control for firm fixed effects, three-digit-industry-by-year fixed effects and concurrent trade policy changes. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US\to CN}}$, along with 95% confidence intervals based on robust standard errors clustered at the firm level.

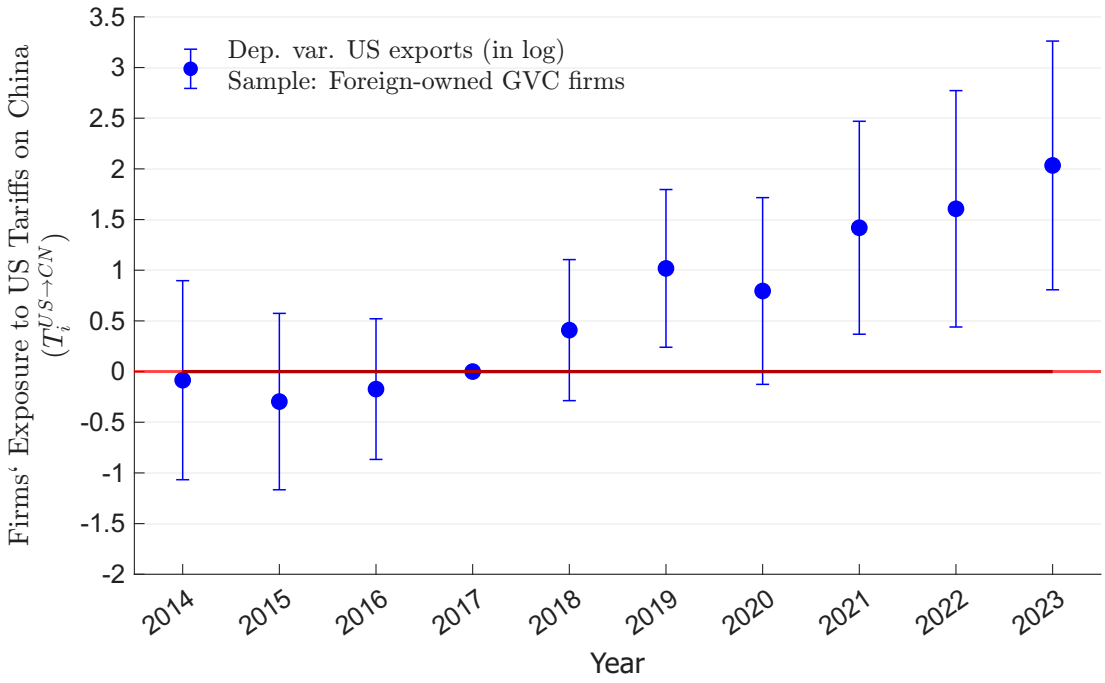


Figure C.3: How US Exports of Foreign GVC Firms Respond to the US Tariffs

Notes: The dependent variables are the natural logarithm of US exports, N=21,177 (among foreign IMMEX). All regressions control for firm fixed effects, industry-by-year fixed effects and concurrent trade policy changes. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US \to CN}}$, along with 95% confidence intervals based on robust standard errors clustered at the firm level.

C.2 Supplemental Analysis–Manufacturing Output

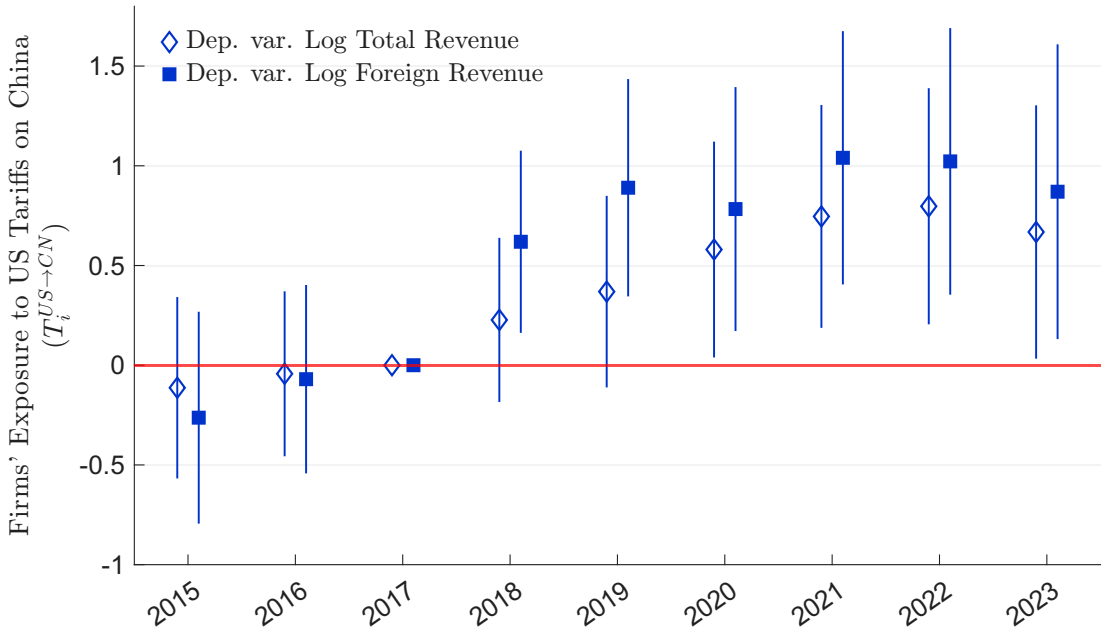


Figure C.4: Impact of the U.S. Tariff Hikes Targeting China on Plants' Revenue

Notes: Estimation of equation 4. The dependent variables are the natural logarithms of total plant revenue (N=36,378) and total foreign revenue (N=34,325). All regressions control for plant fixed effects, three-digit-industry-by-year, municipality-by-year fixed effects and concurrent trade policy changes. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US \to CN}}$, along with 95% confidence intervals based on robust standard errors clustered at the firm level.

C.3 Supplemental Analysis–Manufacturing Employment

Table C.2: The US-China Trade War and Manufacturing Employment

	Broad Exposure			US market specific		
	ALL	GVCs	Others	ALL	GVCs	Others
Dep var. Log Employment						
2014	-0.057	-0.117	-0.007	0.099	0.069	0.195
	(0.088)	(0.134)	(0.099)	(0.116)	(0.156)	(0.145)
2015	0.017	-0.051	0.095	0.120	0.084	0.231*
	(0.081)	(0.110)	(0.122)	(0.098)	(0.131)	(0.120)
2016	0.015	-0.030	0.080	0.064	0.057	0.110
	(0.061)	(0.073)	(0.107)	(0.066)	(0.088)	(0.078)
2018	0.067	0.084	-0.022	0.127	0.163	-0.018
	(0.100)	(0.116)	(0.190)	(0.103)	(0.126)	(0.163)
2019	0.121	0.132	0.060	0.115	0.125	0.039
	(0.109)	(0.129)	(0.205)	(0.118)	(0.141)	(0.202)
2020	0.176	0.167	0.171	0.277**	0.197	0.490*
	(0.116)	(0.132)	(0.231)	(0.129)	(0.147)	(0.261)
2021	0.275**	0.359**	0.157	0.382***	0.452***	0.157
	(0.128)	(0.164)	(0.192)	(0.146)	(0.175)	(0.243)
2022	0.249*	0.351**	0.081	0.425***	0.445**	0.377
	(0.138)	(0.169)	(0.227)	(0.154)	(0.182)	(0.276)
2023	0.374**	0.518***	0.118	0.508***	0.570***	0.269
	(0.145)	(0.183)	(0.224)	(0.162)	(0.194)	(0.276)
N	52,174	37,385	14,789	42,171	33,573	8,598
Firm FEs	✓	✓	✓	✓	✓	✓
Industry × Year FEs	✓	✓	✓	✓	✓	✓
Concurrent Trade Policy Controls	✓	✓	✓	✓	✓	✓

Notes: Concurrent Trade Policy Controls include firms' exposures to the US-Mexico tariff escalation, retaliatory tariffs of China and the input channels as described in equations B.1-B.6. Robust standard errros are clustered at the firm level.

C.4 Aggregation Across Establishments and Single-Plant Firms

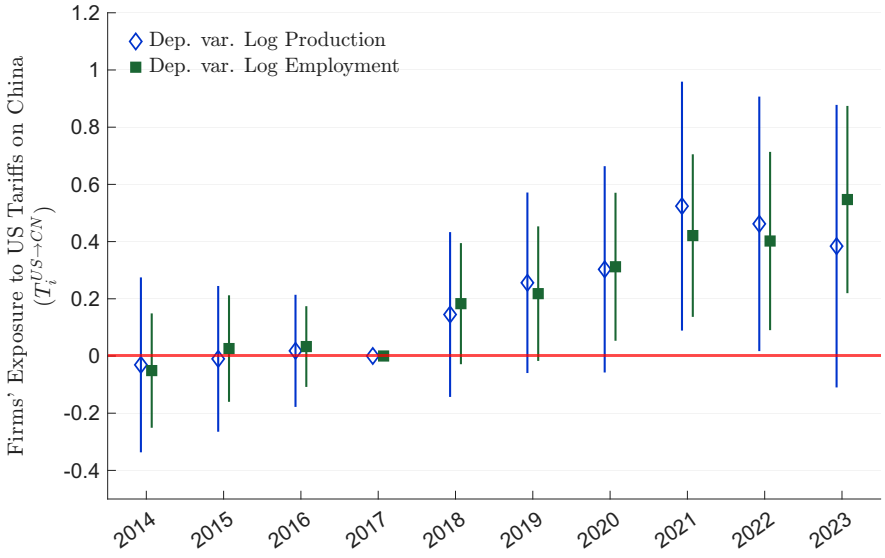
Firm-level measures of production and employment in the PEME database are constructed by aggregating information across establishments whose primary activity is classified as manufacturing. This aggregation can attenuate estimated responses if firms adjust along margins that are not fully captured within the set of establishments included in the data. In particular, firms may reallocate production or employment across establishments or expand activity through the addition of new plants that are not immediately reflected in firm-level measures. In such cases, firm-level estimates may understate the true extent of adjustment.

To assess the importance of this concern, I estimate Equation 3 on a subsample of firms that operated a single manufacturing establishment in 2017. Focusing on this group limits the scope for reallocation across pre-existing plants and provides a cleaner measure of within-establishment adjustment.

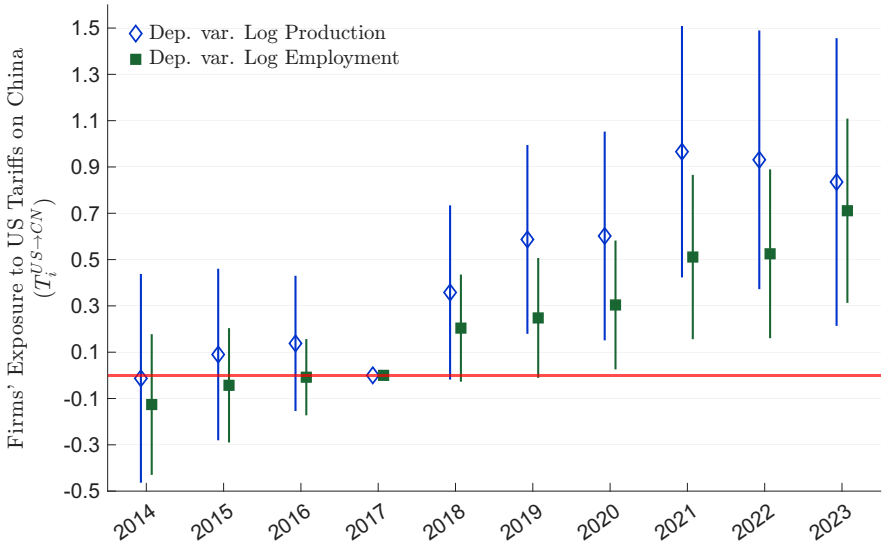
Figure C.5 reports the results. Panel (a) presents estimates for all single-plant exporters, while Panel (b) focuses on single-plant GVC firms. The results show a significant positive effect of U.S. tariffs on both production and employment. By 2023, the employment effect reaches 0.55 for all exporters and 0.71 for GVC firms, while production effects peak earlier, in 2021, with DD estimates of 0.52 and 0.97, respectively.

Comparing production and employment dynamics reveals that output initially expands more rapidly than labor input, particularly among GVC firms. Because the analysis focuses on firms operating a single establishment in 2017, this pattern primarily reflects within-establishment adjustment rather than reallocation across pre-existing plants. After 2021, employment growth accelerates and the gap narrows, suggesting that early output expansion was partly supported by increases in labor productivity (see Figure C.6).

Overall, these results indicate that the baseline firm-level estimates are not driven by aggregation across establishments and, if anything, may understate the magnitude of firms' responses.



(a) Single-plant Exporters



(b) Single-plant GVC firms

Figure C.5: Employment and Production Effect among Single Plant Firms

Notes: Estimation of equation 3 among single plant firms as of 2017. In figure (a) N=42,596/42,297, in figure (b) N=30,853/30,694. All regressions control for firm fixed effects, three-digit industry-by-year fixed effects and concurrent trade policy changes. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US\to CN}}$, along with 95% confidence intervals based on robust standard errors clustered at the firm level.

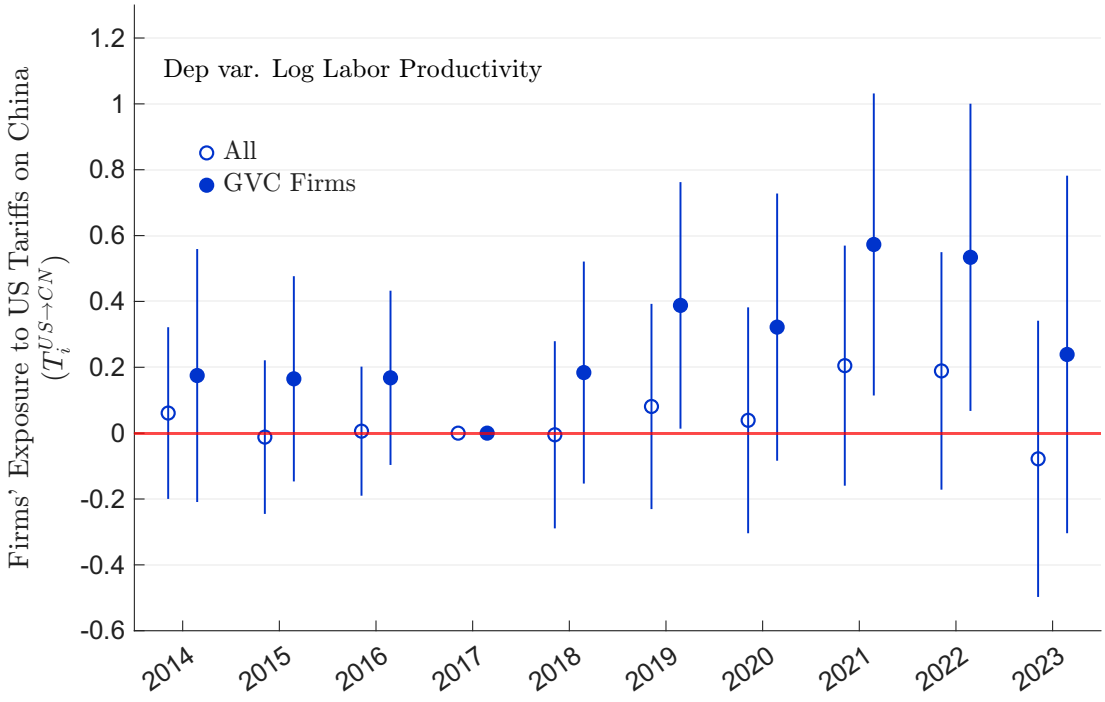


Figure C.6: The Effect of Rising U.S. Import Tariffs on China on Labor Productivity

Notes: Estimation of equation 3 among single-plant firms with the dependent variable being the natural logarithm of the labor productivity. N=42,278/30,681. All regressions control for firm fixed effects, three-digit industry-by-year fixed effects and concurrent trade policy changes. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US \to CN}}$, along with 95% confidence intervals.

C.5 Within-Plant Adjustment: Additional Results

Table C.3: Impact of U.S. Tariffs Targeting China on Plant-Level Revenue and Sales

Panel A: Total Revenue and Sales			
	(1) Log Total Revenue	(2) Log Total Sales	(3) Log Contract Manufacturing Revenue
$\mathbf{T_i^{US\to CN}} \times \text{PostTW}_t$	0.548***	1.209***	0.236
	(0.193)	(0.368)	(0.304)
Observations	36,378	19,410	19,996
R-squared	0.939	0.953	0.925
Panel B: Foreign Revenue and Sales			
	(4) Log Total Foreign Revenue	(5) Log Foreign Sales	(6) Log Foreign Contract Manufacturing Revenue
$\mathbf{T_i^{US\to CN}} \times \text{PostTW}_t$	0.959***	1.729***	0.349
	(0.245)	(0.441)	(0.274)
Observations	34,325	15,967	18,759
R-squared	0.909	0.911	0.923
For both panels:			
Plant Fixed Effects	✓	✓	✓
Industry (3-digit) × Year FE	✓	✓	✓
Municipality × Year FE	✓	✓	✓

Notes: The table reports estimates of Equation 4 using IMMEX plant-level data. The dependent variables are the natural logarithms of revenue and sales measures as indicated in the column headers. Contract manufacturing revenue refers to revenues from production services provided to other firms (maquila). All regressions include plant fixed effects, three-digit industry-by-year fixed effects, municipality-by-year fixed effects and controls for concurrent trade policy changes. Robust standard errors clustered at the firm level are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table C.4: Impact of U.S. Tariffs Targeting China on Material Inputs and Value Added

	(1) Log Foreign Material Expenses	(2) Log Domestic Material Exp.	(3) Log Total Material Exp.	(4) Log Value Added	(5) Log Domestic VA in Exports
$\mathbf{T_i^{US\to CN}} \times \text{PostTW}_t$	1.476***	0.249	0.595*	0.420**	0.610**
	(0.392)	(0.435)	(0.305)	(0.209)	(0.252)
Observations	30,800	19,766	36,269	33,313	31,173
R-squared	0.890	0.898	0.897	0.910	0.900
For all specifications:					
Plant Fixed Effects	✓	✓	✓	✓	✓
Industry (3-digit) × Year FE	✓	✓	✓	✓	✓
Municipality × Year FE	✓	✓	✓	✓	✓

Notes: The table reports estimates of Equation 4 using IMMEX plant-level data. The dependent variables are the natural logarithms of material expenditures and value added measures.
Value added is defined as total sales minus material and packaging input expenditures, plus revenue from contract manufacturing services (maquila), which captures payments for processing activities not included in sales.
Domestic value added in exports is defined as foreign sales minus foreign material and packaging input expenditures, plus revenue from foreign contract manufacturing. This construction assumes that all foreign inputs are used in export-oriented production. If some foreign inputs are instead used for domestic sales, the measure will understate domestic value added embodied in exports.
All regressions include plant fixed effects, three-digit industry-by-year fixed effects, municipality-by-year fixed effects, and controls for concurrent trade policy changes. Robust standard errors clustered at the firm level are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table C.5: Impact of U.S. Tariffs Targeting China on Wages

	(1) Log Average Wage	(2) Log Average White-Collar Wage	(3) Log Average Blue-Collar Wage
$\mathbf{T_i^{US\to CN}} \times \text{PostTW}_t$	0.096	0.294	0.028
	(0.101)	(0.180)	(0.099)
Observations	36,430	30,453	30,650
R-squared	0.805	0.778	0.788
Plant Fixed Effects	✓	✓	✓
Industry (3-digit) × Year FE	✓	✓	✓
Municipality × Year FE	✓	✓	✓

Notes: The table reports estimates of Equation 4 using IMMEX plant-level data. The dependent variables are the natural logarithms of average wages. Average wage is constructed by dividing total labor costs, inclusive of payments to non-payroll workers, by total employment. White-collar and blue-collar wages correspond to average hourly wages of payroll workers, excluding benefits, measured as of November. All regressions include plant fixed effects, three-digit industry-by-year fixed effects, municipality-by-year fixed effects, and controls for concurrent trade policy changes. Robust standard errors clustered at the firm level are reported in parentheses.

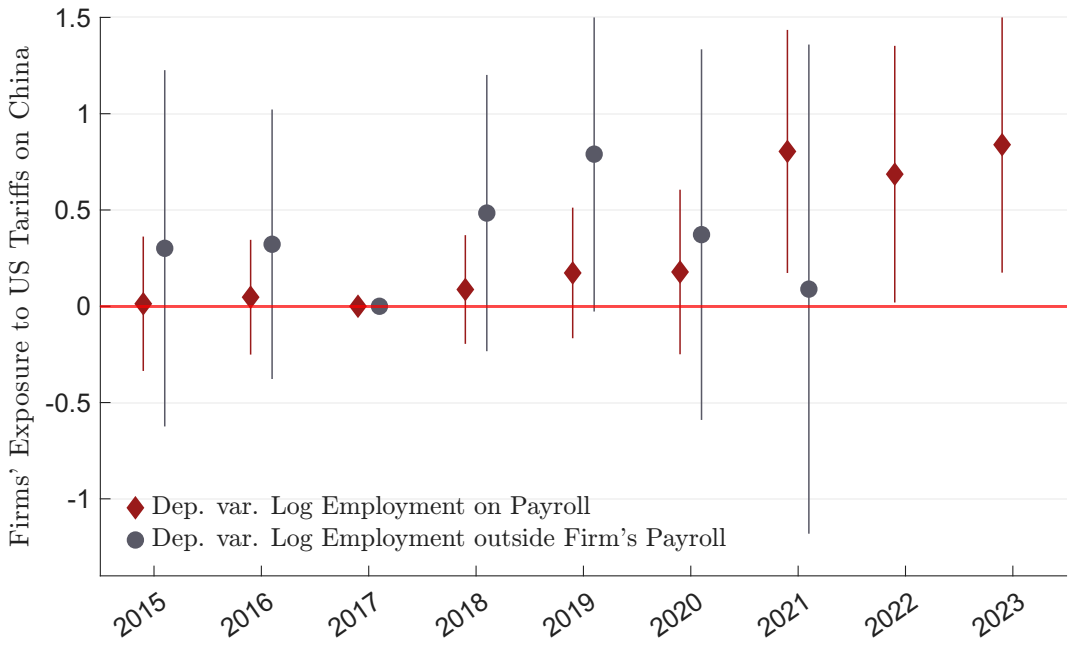


Figure C.7: Rising U.S. Tariffs on China and Labor Adjustment Margins

Notes: Estimation of equation 4 among IMMEX plants. The dependent variables are payroll employment (N = 31,938) and non-payroll employment (N = 9,426). All specifications include plant FE, three-digit-industry-by-year FE, municipality-by-year FE and concurrent trade policy changes. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US \to CN}}$, along with 95% confidence intervals. Robust SEs clustered at the firm level.

Table C.6: Export and Import Responses of US- and Non-US Foreign Firms Operating in Mexico

	(1) Log US Exports	(2) Log US Exports Net of Chinese Imports	(3) Log US Imports	(4) Log Chinese Imports
Panel A. US MNEs in Mexico				
Firm Exposure to US Tariffs on China ($T_i^{US \to CN} \times PostTW_t$)	1.000**	0.902*	1.074***	2.073***
	(0.498)	(0.488)	(0.380)	(0.783)
N	10,940	10,706	10,955	10,459
Panel B. Non-US Foreign MNEs in Mexico				
Firm Exposure to US Tariffs on China ($T_i^{US \to CN} \times PostTW_t$)	1.548*	1.539*	0.715	0.398
	(0.850)	(0.875)	(0.686)	(0.822)
N	10,231	9,809	10,369	9,954
For both panels				
Firm FE	✓	✓	✓	✓
Industry (3-dig) × Year FE	✓	✓	✓	✓
Concurrent Trade Policy Controls	✓	✓	✓	✓

Notes: $PostTW_t$ is a dummy variable equal to 1 for years 2018 and later, and 0 otherwise. Additional Trade Policy Controls include firms' exposures to the US-Mexico tariff escalation, retaliatory tariffs of China and the input channels as described in equations B.1-B.6. Robust standard errros are clustered at the firm level.

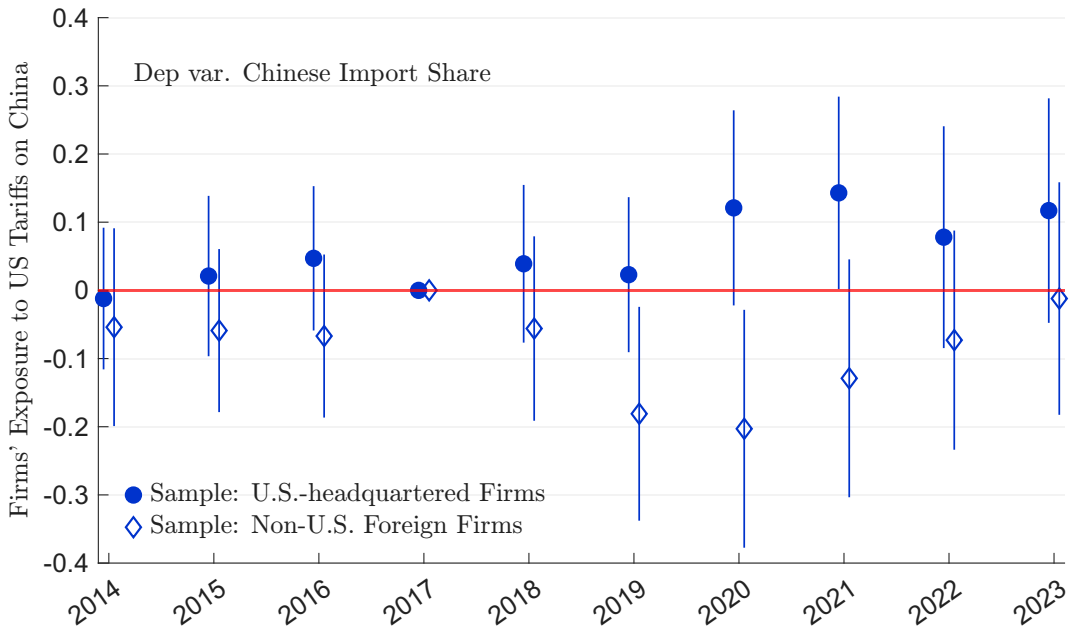


Figure C.8: Import Share from China in Response to Rising US Tariffs: U.S.- vs. Other Foreign-Headquartered Firms

Estimates of equation 3 for U.S.-headquartered (N = 10,459) and non-U.S. foreign-headquartered (N = 9,954) firms. The dependent variable is the share of firm imports sourced from China (imports from China divided by total imports). All regressions include firm fixed effects, three-digit industry-by-year fixed effects, and controls for concurrent trade policy changes. The y-axis reports the yearly DD coefficient estimates corresponding to $\mathbf{T_i}^{US \to CN}$, with 95% confidence intervals.

D Robustness Analysis

This section examines the robustness of the main results to alternative specifications and potential confounding policy changes. In particular, it assesses the stability of the estimates to the sequential inclusion of control variables, alternative specifications for plant openings, and the introduction of USMCA-related policy changes.

D.1 Sequential Inclusion of Controls

This subsection examines the robustness of the main results to the sequential inclusion of control variables. Figures D.1–D.3 report estimates for U.S. exports, production, and employment, respec-

tively, under progressively richer specifications: firm and year fixed effects only; adding controls for concurrent trade policy measures; and further including two-digit and three-digit industry-by-year fixed effects.

Across all outcomes, the estimated effects remain stable in magnitude and statistical significance as controls are added.

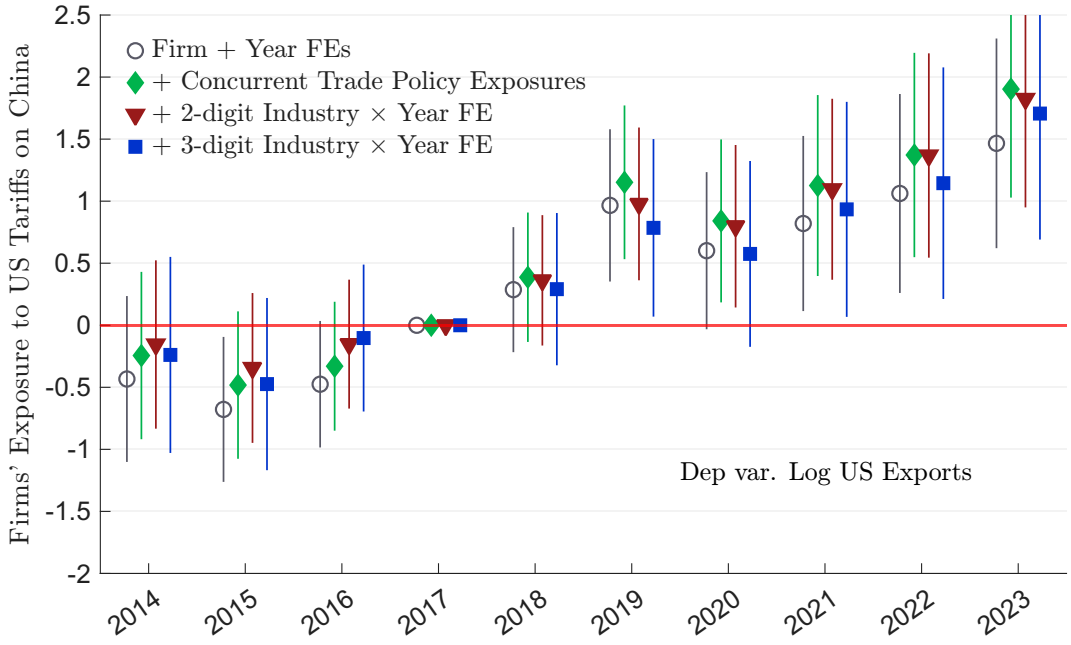


Figure D.1: U.S. tariffs on China and firms' exports to the United States, with sequentially added controls

Notes: Estimation of equation 3 with the dependent variable being the natural logarithm of firm's exports to the U.S.. N=46,453. The y-axis displays the yearly DD coefficient estimates corresponding to $\mathbf{T_i^{US \to CN}}$, along with 95% confidence intervals.

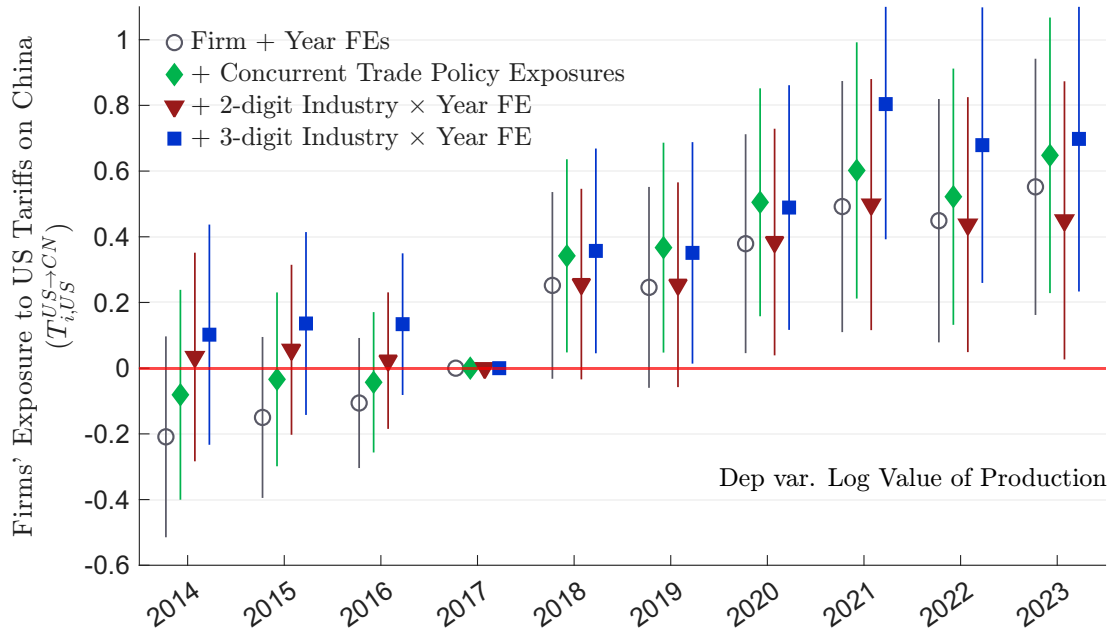


Figure D.2: U.S. tariffs on China and firms' production, with sequentially added controls

Notes: Estimation of equation 3 with the dependent variable being the natural logarithm of firm's value of production at factory prices. Estimation is conducted among U.S. exporters with N=41,914. The y-axis displays the yearly DD coefficient estimates corresponding to $T_{i,\text{US}}^{\text{US}\to\text{CN}}$, along with 95% confidence intervals.

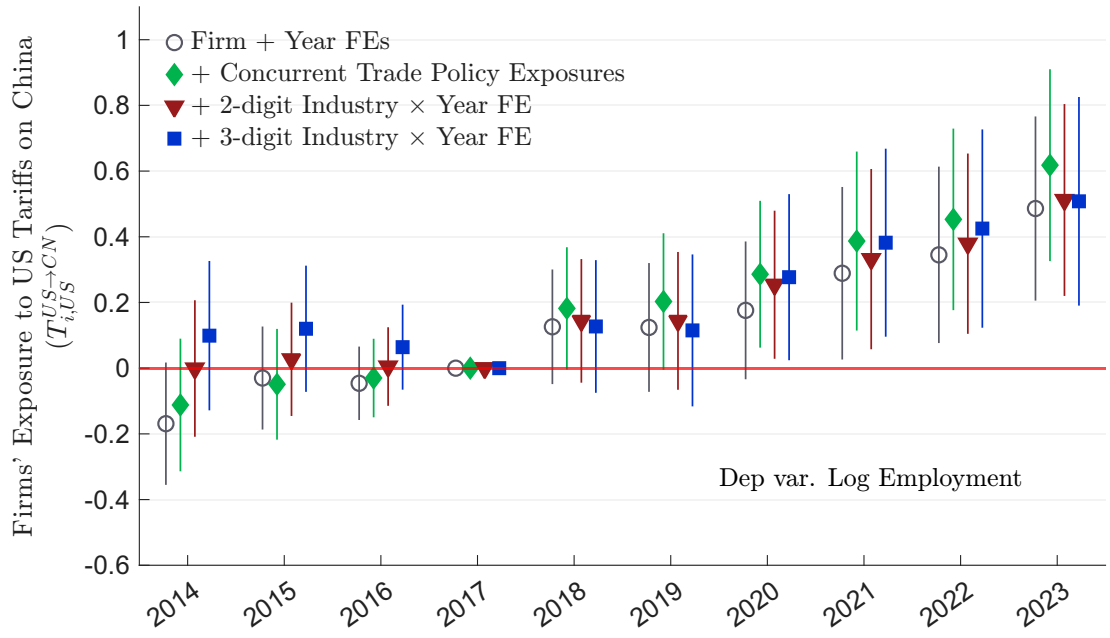


Figure D.3: U.S. tariffs on China and firms' employment, with sequentially added controls

Notes: Estimation of equation 3 with the dependent variable being the natural logarithm of firm's employment. Estimation is conducted among U.S. exporters with N=42,171. The y-axis displays the yearly DD coefficient estimates corresponding to $T_{i,\text{US}}^{\text{US}\to\text{CN}}$, along with 95% confidence intervals.

D.2 Robustness—Plant Openings in Mexico

This subsection examines the robustness of the plant-opening results to alternative specifications and inference procedures. Table D.1 reports estimates using wild cluster bootstrap inference and continuous measures of Chinese input dependence, while Table D.2 presents Poisson pseudo-maximum likelihood (PPML) estimates for the number of new plants. The results are broadly consistent with the baseline findings and confirm the role of Chinese input dependence and firm heterogeneity.

Across specifications, the results are consistent with the baseline findings.

Table D.1: Plant Openings in Mexico: Continuous Chinese Input Dependence and Wild Cluster Bootstrap Inference

	Linear			Linear × CN Input Dep.				
	(1) All	(2) Foreign	(3) Not Foreign	(4) All	(5) Foreign	(6) Not Foreign	(7) US	(8) Foreign
$\mathbf{T_j^{US\to CN}} \times \text{PostTW}_t$	0.590**	0.791*	0.317***	-2.086	-4.960***	0.450	-7.556***	0.723*
	(0.210)	(0.395)	(0.099)	(1.274)	(1.269)	(0.594)	(1.457)	(0.403)
$\mathbf{T_j^{US\to CN}} \times \text{PostTW}_t \times IMCN_j^{\text{US}\to\text{CN}}$				111.974*	228.110***	-4.693	334.898***	
				(54.780)	(55.939)	(28.063)	(62.432)	
$\mathbf{T_j^{US\to CN}} \times \text{PostTW}_t \times \text{CN Affiliate}$								1.963***
								(0.674)
Observations	33,797	17,193	16,604	33,627	17,166	16,461	10,739	17,193
R-squared	0.290	0.284	0.289	0.289	0.285	0.283	0.298	0.285
Bootstrap p: tariff exposure	0.016	0.068	0.159	0.308	0.030	0.571	0.030	0.104
Bootstrap p: interaction				0.166	0.021	0.902	0.021	0.698

Notes: Manufacturing IMMEX firms operating as of 2017, over 2017–2024. Dependent variable is the inverse hyperbolic sine transformation of the number of new plants. All specifications include firm and border × year fixed effects. Concurrent Trade Policy Controls include exposures to the U.S.–Mexico tariff escalation, China's retaliatory tariffs, and the input channel measures $IMUS_j^{\text{CN}\to\text{US}}$, and $IMUS_j^{\text{US}\to\text{CN}}$, all constructed using firm-level data aggregated to the industry level and interacted with the post–trade war indicator. Columns (4)–(7) further control for Chinese Input Dependence, $IMCN_j^{\text{US}\to\text{CN}}$. CN Affiliate is a dummy variable that takes the value of one if the parent company headquarters are located in China, Hong Kong, or Singapore. All specifications include firm and border × year fixed effects. Robust standard errors are clustered at the three-digit industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Bootstrap p-values from wild cluster bootstrap (Roodman et al. 2019) reported at bottom.

Table D.2: Plant openings in Mexico: PPML Estimates

Dependent variable: Number of New Plants.						
	(1)	(2)	(3)	(4)	(5)	(6)
Sample:	All	All	Foreign	Not Foreign	US	Foreign
$\mathbf{T_j^{US\to CN}} \times \text{PostTW}_t$	4.631**	0.010	-1.331	5.919***	-2.577	4.612
	(2.314)	(1.404)	(1.867)	(1.590)	(1.642)	(3.738)
$\mathbf{T_j^{US\to CN}} \times \text{PostTW}_t \times$ CN Input Dep.		15.996***	21.023***	-0.545	31.395***	
		(4.759)	(5.622)	(6.860)	(6.879)	
$\mathbf{T_j^{US\to CN}} \times \text{PostTW}_t \times$ CN Affiliate						4.836***
						(1.864)
Observations	13,498	13,498	8,448	5,050	5,473	8,448
Pseudo R-squared	0.197	0.198	0.207	0.180	0.209	0.206

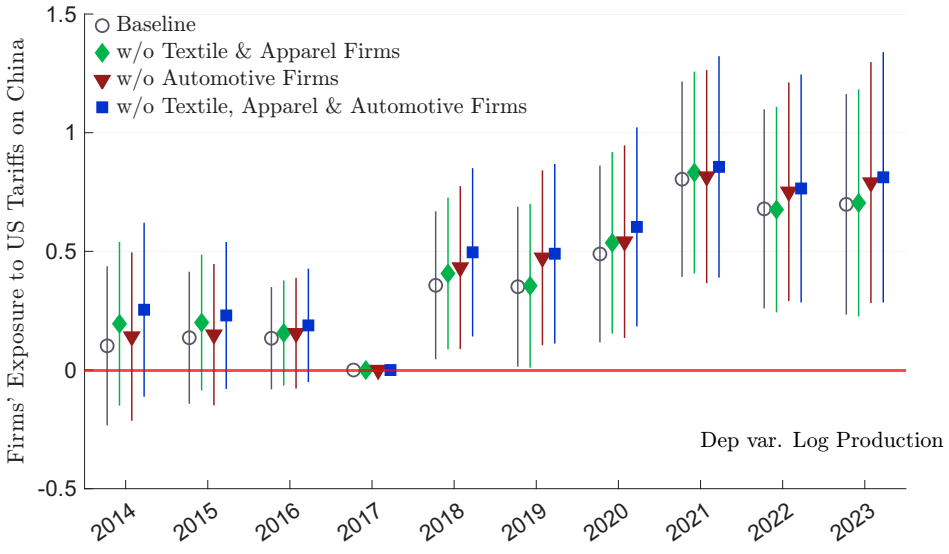
Notes: Manufacturing IMMEX firms operating as of 2017, over 2017–2024. Dependent variable is the number of new plants. Concurrent Trade Policy Controls include exposures to the U.S.–Mexico tariff escalation, China's retaliatory tariffs, and the input channel measures $IMUS_j^{\text{CN}\to\text{US}}$, and $IMUS_j^{\text{US}\to\text{CN}}$, all constructed using firm-level data aggregated to the industry level and interacted with the post–trade war indicator. Columns (4)–(7) further control for Chinese Input Dependence $\mathbf{1}\left[\text{IMCN}_j^{\text{US}\to\text{CN}} \geq \text{Median}\right]$ interacted with he post–trade war indicator. CN Affiliate is a dummy variable that takes the value of one if the parent company headquarters are located in China, Hong Kong, or Singapore. All specifications include firm and border $\times$ year fixed effects. Robust standard errors are clustered at the three-digit industry level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

D.3 Robustness to USMCA-Affected Industries

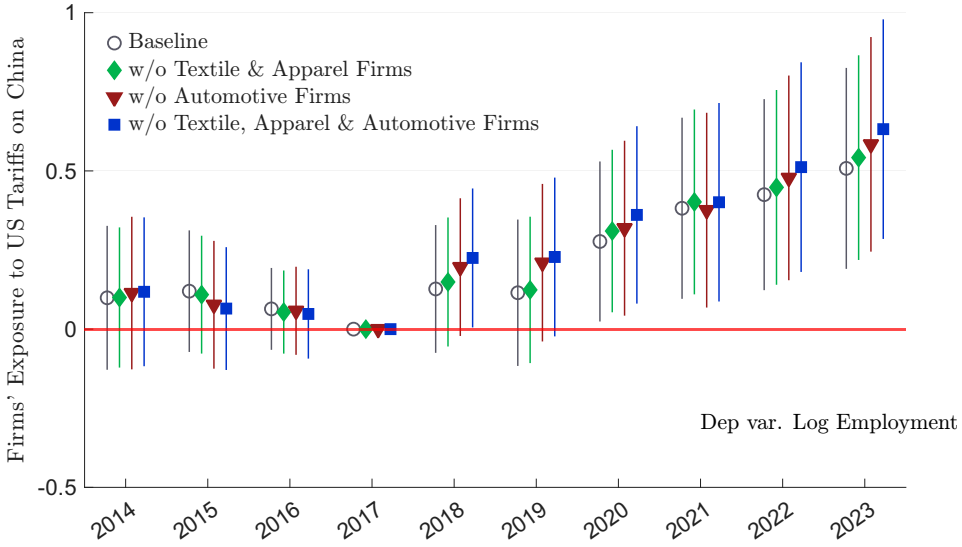
The USMCA entered into force in July 2020 and introduced new rules that disproportionately affected a narrow set of manufacturing industries, most notably automotive and textile and apparel production. These provisions—including higher regional value content requirements and new labor value content thresholds in transportation equipment, as well as revised rules of origin in textiles and apparel—could, in principle, affect employment and production outcomes.

The baseline specification includes three-digit industry by year fixed effects, which absorb industry-wide shocks and time-varying trends common to narrowly defined sectors. As a result, broad adjustments associated with the implementation of the USMCA are already accounted for in the main estimates. Nevertheless, firms within the same three-digit industry may have been differentially affected by USMCA provisions due to heterogeneity in product composition, sourcing patterns, or integration into North American supply chains.

To assess whether such within-industry exposure to USMCA changes influences the results, I conduct a set of robustness exercises that re-estimate the employment and production effects after excluding industries most directly targeted by the agreement. Specifically, I sequentially exclude firms operating in textiles and apparel manufacturing (NAICS 313–315), transportation equipment manufacturing (NAICS 336), and the combined set of these industries. Across all specifications, production (Figure D.4a) and employment (Figure D.4b) effects remain positive and statistically significant, with no important differences, suggesting that the results reflect responses to the tariff shock rather than USMCA-related adjustments.



(a) Production



(b) Employment

Figure D.4: Robustness to Excluding Firms Affected by USMCA Provisions

Notes: Estimation of Equation 3 using the treatment variable $T_{i,\text{US}}^{\text{US}\to\text{CN}}$ among 2017 U.S. exporters, as firms in textiles and apparel manufacturing (NAICS 313–315) and transportation equipment manufacturing (NAICS 336) are sequentially removed. The dependent variables are the natural logarithm of firms' value of production in (a) with N=41,914/31,798 and employment in (b) N=42,171/31,970. All regressions include firm fixed effects, three-digit industry-by-year fixed effects, and controls for concurrent trade policy changes. The y-axis displays yearly difference-in-differences coefficient estimates with 95% confidence intervals based on robust standard errors clustered at the firm level.