Importers Big and Small: The Heterogeneous Impacts of U.S.-China Tariffs on Sourcing and Prices *

Beata Javorcik†

Justin Pierce‡

Emily Wisniewski§

February 7, 2025 - Preliminary

Abstract

This paper employs the universe of transaction-level U.S. import data to examine how firms have adjusted their foreign sourcing patterns in response to the 2018-19 U.S. tariffs on China. Consistent with studies based on aggregate data, we find a reallocation of imports away from China and toward other countries. Exploiting the granularity of our data, we show that U.S. firms have diversified imports across source countries in response to tariffs, while increasing the share of imports purchased from foreign affiliates and decreasing their overall value of imports. These aggregate patterns conceal substantial heterogeneity across firms. Large importers were already importing from multiple countries and have been able to reallocate trade with minimal effect on average import prices both in arm's-length and related-party transactions. They seem to have leveraged market power, benefiting from lower prices on goods sourced from China. Smaller firms faced a more disruptive adjustment, with an increase in average import prices in arm's-length transactions due to the reallocation of imports to fewer, more expensive source countries.

JEL classifications: F13, F14, F15

Keywords: Tariffs; Trade Fragmentation; Trade War; Firms; Importers

*This paper benefited from helpful comments at presentations at the 2023 FSRDC Conference, the 2023 Devils and Wolves (Duke-NC State) seminar, the 2025 ASSA meetings, and the IMF. We thank William Yang for outstanding research assistance. Any views expressed are those of the authors and not those of the U.S. Census Bureau, the European Bank for Reconstruction and Development, the Board of Governors of the Federal Reserve System, or its research staff. The Census Bureau has reviewed this data product to ensure appropriate access, use, and disclosure avoidance protection of the confidential source data used to produce this product. This research was performed at a Federal Statistical Research Data Center under FSRDC Project Number 2718 (CBDRB-FY25-0083, CBDRB-FY25-0010, CBDRB-FY24-0015, CBDRB-FY23-223, CBDRB-FY23-P2718-R10460, CBDRB-FY23-P2718-R10217, CBDRB-FY22-P2718-R9867).

†University of Oxford, European Bank for Reconstruction and Development, and CEPR; beata.javorcik@economics.ox.ac.uk

‡Federal Reserve Board; justin.r.pierce@frb.gov

§U.S. Census Bureau; emily.m.wisniewski@census.gov

1 Introduction

An extensive literature has explored the wide-ranging distributional effects of trade policy changes on industries, producers, workers, and consumers. However, much less attention has been paid to the distributional impacts of trade policy shocks on different types of importing firms. While only a minority of firms engage in direct importing, these firms form a highly heterogeneous group. For example, in 2017, the average firm importing into the U.S. sourced a particular product from a single country.[1] In contrast, the average dollar of trade came from an individual firm sourcing the same product from more than six different countries (see Figure 1). This highlights the significant diversity within the importing sector, where many small firms operate alongside large firms that dominate U.S. imports by volume.

Understanding the potentially different implications of trade policy changes on importing firms of different sizes has gained importance since 2018, as the U.S. began imposing substantial tariffs on hundreds of billions of dollars of imports from China. Importing firms have faced important decisions on how to respond. Some have continued to import from China and paid the tariffs, while others have shifted imports from China to other countries. Very little is known about the implications of these decisions for firms, especially the impact of reallocating imports across countries.

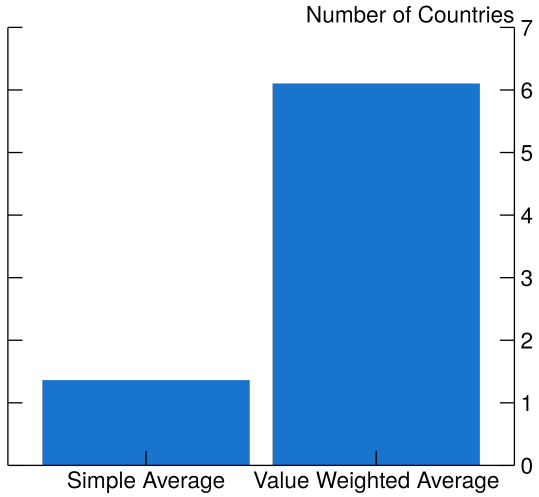
Large firms with diversified source countries and an extensive network of arm's-length suppliers and foreign affiliates may have been significantly better positioned to respond to trade policy changes than smaller importers that depend on a single country. Additionally, the greater bargaining power enjoyed by large importers in negotiations with foreign suppliers may have enabled them to secure price concessions when trade policies shifted. Consequently, trade policy shocks may have had different impacts on large and small importers, with smaller firms becoming less competitive when faced with increased tariffs.

This paper examines the implications of the 2018-19 US import tariff hikes on China for the global sourcing decisions of US firms. We use confidential data on US imports, which allow us to study differential responses of large and small importers, calculate measures of source-country diversification, distinguish between related-party and arm's-length transactions, and observe changes in unit values taking place over time for a given firm importing a given product from a given country. Thus, we are able to shed light on adjustments at a highly disaggregated level that is not visible in aggregate trade statistics.

The 2018-19 tariffs provide a very useful setting for the purposes of our study. It was a concrete and substantial shock, with meaningful variation in tariff hikes across firms

[1] This was also true in 2007, as documented by Antràs et al. (2017).

Figure 1: Avg. Number of Source Countries for Firm-Product Pairs



Note: Figure displays the average (simple or import value weighted) number of countries from which firms import ten-digit HS products.
Source: LFTTD and authors' calculations.

importing a given product, which we refer to as as firm-product "pairs." It can also be considered plausibly exogenous from the perspective of individual firms and pairs.[2] Moreover, while initially the US tariff increases may have been seen as temporary, by the end of 2019 it became clear that there was no speedy resolution to the conflict in sight.

We consider changes to sourcing patterns between 2017 (i.e., the year preceding the imposition of tariffs) and 2021. Our choice of timing is also motivated by the fact that it takes time to reorganize the supply chain and find alternative suppliers. Our long-differenced specification relates an array of variables measuring firms' sourcing behavior to the change in US tariffs on imports from China. Because a pair's exposure to tariffs is weighted by the value of the pair's 2017 imports, our continuous treatment variable increases in the tariff applicable to a given product and in the firm's reliance on importing this product from China in the pre-tariff period. Moreover, because our sample period contains the onset of the Covid-19 pandemic, our baseline specification includes product

[2]For instance, Amiti et al. (2019) and Fajgelbaum et al. (2020) have treated the tariffs as plausibly exogenous due to the uncertain timing of the tariff waves and exact composition of products and countries targeted. Although it was possible to apply for exclusions, of 52,746 requests made, only 13% (6,804) were granted. Moreover, exclusions applied to a product code rather than to an individual importer (Congressional Research Service (2024)), and factors other than exclusions accounted for a larger portion of the deviation between announced and actual duties collected (Flaaen et al. 2021). Finally, our findings that both small and large firms reacted strongly to tariffs, albeit in somewhat different ways, suggesting that exclusions most likely played only a minor role.

fixed effects that control for factors common to all firms importing a product, including changes in relative demand that might occur, for example, as consumers demand less formal clothing and more home office equipment.

Our findings document substantial changes taking place in firms' sourcing patterns in response to the US import tariff hikes. We find that US importers have lowered the share of imports sourced from China and increased sourcing from other Asian and Latin American countries, consistent with existing work.[3] Using firm-product-level data for the universe of U.S. trade, we find that this shift in trade flows has led to an overall diversification of the supply sources—as measured by a Herfindahl index of source countries—for products hit by import tariffs. We document a decline in the overall value of imports and an increased reliance on intra-firm trade. We find no response of the average unit value of imports sourced by a given firm from all countries to the tariff. In sum, while the increased diversification that has occurred in response to tariffs may have reduced the risk of future supply chain disruptions, our results indicate that it has come at the cost of reduced trade flows.

The aggregate results, described so far, mask significant differences in how firms of varying sizes have adjusted to tariffs. To examine this heterogeneity, we compare findings from import-weighted and unweighted regressions and then divide the sample into large and small importers.[4] The two approaches yield consistent insights, highlighting the divergent responses across firm sizes.

Both large and small importers have reduced their reliance on China while increasing their dependence on other Asian countries and Mexico. However, the nature of these adjustments has differed significantly between the two groups. Small importers have made larger shifts away from China and reduced the number of countries they source from. This reduction in sourcing diversity has led to higher average unit values of imports, driven by an increased reliance on more expensive manufacturing locations.

In contrast, large importers have been able to source from China at lower unit values and to expand the number of countries they source from, without experiencing a rise in overall unit values. These findings are in line with the idea that larger importers benefit from greater market power in negotiations with Chinese suppliers and can effectively leverage their established trade networks to diversify their sources further.

Delving deeper into the changes in unit values, we find that they have been primarily driven by arm's-length transactions, which alleviates concerns that the changes we ob-

[3]See Nicita (2019), Bown (2022), Freund et al. (2023), and Alfaro and Chor (2023), among others. As shown by Fajgelbaum et al. (2024), the US-China trade war created net export opportunities rather than simply shifting trade across destinations.

[4]As discussed below, a firm is defined as being a large importer for a given product if the value of its imports of that product in 2017 was above the 90th percentile across firms importing that product.

serve stem from transfer pricing practices. Furthermore, there is no evidence that the unit values of products sourced from countries other than China have responded to the tariffs imposed on China. Therefore, for small importers, the increase in average unit values is entirely attributable to the reallocation of sourcing shares across countries.

Overall, our findings are in line with the US import tariffs having substantial implications for the pattern of US imports, with distributional consequences for small and large importing firms.

Our paper contributes to the growing literature on the implications of the 2018-19 U.S.-China trade tensions.[5] The strand closest to our work documents substantial reallocation of U.S. imports across source countries and supplier firms (see Nicita (2019), Bown (2022), Freund et al. (2023), Alfaro and Chor (2023) and Handley et al. (2024)), while Alfaro et al. (2025) examines the role of specialized banks in aiding reallocation and expansion across countries and suppliers. A complementary strand investigates the impacts of the tariffs with on firms' financial performance, finding negative effects for stock returns and investment (see Huang et al. (2021) and Amiti et al. (2020)).[6] Our contribution to this body of work lies in examining diversification in supply patterns at the firm-product level, using the universe of US trade transactions. The greater detail available in our data allows us to document differential adjustments made by small and large importers, thus pointing out distributional consequences of tariffs across firms of different sizes. The sourcing patterns we consider have not been examined to date.

Our paper also speaks to the broader literature on the implications of the 2018-19 tariffs for the US economy. Flaaen and Pierce (2024) investigated the impact of the tariffs on manufacturing employment at the industry level and found that the US tariffs on China were associated with relative declines in US manufacturing employment due to the rising imported input costs and export retaliation, which more than offset the gains from import protection. Javorcik et al. (2024) found evidence that both tariffs on imported inputs and retaliatory tariffs led to a relative decline in online job postings in affected commuting zones. The effects of imported input tariffs were stronger for lower skilled postings than for higher skill postings and for part-time than full-time jobs. By contrast, they did not find any evidence of positive impacts of import protection on job openings. Their estimates suggest that the tariffs led to a combined effect of 137,000 fewer job postings in 2018, or 0.5 percent of the US total. These patterns are echoed in the work of Goswami (2020) who showed that commuting zones subject to higher retaliatory tariffs experienced lower employment growth, with no effects found from import protection and in the work of Waugh (2019) who concentrated specifically on the retaliatory Chinese tariffs and showed

[5]For a recent survey on this literature, see Fajgelbaum and Khandelwal (2022).

[6]On the China side, Chor and Li (2021) also show how the US tariffs lowered industrial activity of Chinese firms.

that retaliatory tariffs lowered retail employment growth.

This paper is structured as follows. The next section outlines the timeline of the US-China trade tensions and is followed by a section describing the data and defining the variables we use to observe sourcing patterns. Section 4 presents the empirical strategy and main results. Section 5 explicitly distinguishes between small and large importing firms and Section 6 explores changes in sourcing patterns across sectors. Section 7 reports results of additional robustness checks, and the final section concludes.

2 US-China Trade Tensions and Tariffs

In August of 2017, the US Trade Representative (USTR) initiated an investigation into whether any of China's laws, policies, practices, or actions "may be unreasonable or discriminatory and may be harming American intellectual property rights, innovation, or technology development" (Section 301 of the Trade Act of 1974). In March of 2018, the conclusions of the investigation were published, with a finding of unfair trade practices in all three of these areas. In response to these conclusions, the Trump Administration announced that it would respond with new tariffs, new rules on investment, and a WTO dispute.

A list of products, on which a tariff of up to 25 percent was to be imposed, was published on the 3rd April covering about $46.2 billion of imports from China and including products such as machinery, mechanical appliances, and electrical equipment. In response, one day later, China published its own list of products for retaliatory tariffs covering $50 billion of US exports in products including vehicles, aircraft, vessels and soybeans. Again escalating the confrontation, the US started to consider tariffs on an additional $100 billion of imports from China on the 5th April.

On the 15th June, the USTR released a revised list of products, splitting the implementation into two phases, the first starting on the 6th July and covering $34 billion in imports from China and the second phase planned to cover $16 billion in imports. On the same day, China also released its revised retaliatory list, also including a two-phase approach, and covering vehicles as well as agricultural and food products. In response to China's retaliation, President Trump directed the USTR to identify an additional $200 billion of imports from China to potentially face a rate of 10 percent, along with threatening yet another $200 billion if China was to retaliate again.

The first phase of the tariffs (defined on the 15th June) came into effect on the 6th of July. Four days later the USTR released the list of $200 billion of imports from China to be subject to a 10 percent tariff after public hearings in August.

On the 20th July, President Trump indicated intentions of introducing tariffs on the

remaining $262 billion of imports from China, therefore including all $504 billion of 2017 imports. Moreover, he instructed the USTR to consider 25 percent tariffs on the July 10th list of $200 billion, rather than the initial proposal of 10 percent. In response, China warned that another $60 billion of US exports that could be covered by new tariffs, ranging from 5-25 percent.

On the 7th August, an updated list for the second phase of the $50 billion tariffs announced on the 15th June was released. Only 5 out of the 284 products initially identified were removed, and the tariff rate was increased from 10 percent to 25 percent on the remaining $16 billion. China also revised its second phase list the following day, covering a similar value of US exports, and removing crude oil and introducing a few other products. Both lists were then implemented on the 23rd of August as planned.

On the 17th of September, the $200 billion list of imports from China that would face a 10 percent tariff from the 24th September onwards was finalized. President Trump also announced that this rate would increase to 25 percent on the 1st of January 2019. China responded with its own finalized list of $60 billion of US exports, with tariffs ranging from 5-10 percent. Both sets of tariffs then went into action on the 24th September.

In February of 2019, President Trump announced that he would delay the scheduled March 1 tariff increase on $200 billion of imports from China. The increase would have raised the 10 percent tariffs to 25 percent.

On the 5th of May, after several weeks of US-China trade negotiations, President Trump announced that the 10 percent tariff will increase to 25 percent on May 10th, covering $200 billion of imports from China. Additionally, a 25 percent tariff is announced on the rest of US imports from China that were not targeted by the Section 301 tariffs.

Following retaliatory tarifs by China, in August 2019, President Trump announced a 10 percent tariff on an additional $300 billion of imports from China. These were scheduled to take effect on September 1, 2019 (on $112 billion of imports) and December 15 (on $160 billion of imports). The finalized list includes final consumer goods not targeted by the previous tariffs.

After threats of additional tariffs by both the U.S. and China in August, in September, tensions begin to cool. On December 13, just prior to the scheduled December 15 tariff increase, President Trump announces his administration and China have reached an agreement to be signed in January 2020. Under the agreement, China agrees to purchase an additional $200 billion worth of US exports, and most tariffs remain in effect, but future tariffs are temporarily halted.

Table 1: Tariffs on U.S. imports enacted by the United States in 2018

Tariff wave	Date enacted	Products	2017 imports		Tariff (%)	
		(# HS-10)	(mil US$)	(%)	2017	2018
China 1	6th July, 2018	1,672	33,510	1.4	1.3	26.2
China 2	23rd Aug, 2018	433	14,101	0.6	2.7	27
China 3	24th Sep, 2018	9,102	199,264	8.3	3.3	12.9

Source: Fajgelbaum et al. (2020). Unweighted monthly 10-digit HS country average tariff rates. 2017 tariff rates computed as annual average; 2018 rates computed in December 2018.

3 Data

3.1 Primary Sources

Our primary dataset is the U.S. Census Bureau's (Census) Longitudinal Foreign Trade Transaction Database (LFTTD), which captures the universe of U.S. international trade transactions. Our focus is on the U.S. import data, which record the value, quantity, ten-digit Harmonized Tariff Schedule (HTS) product code, country of origin, related party status, and, importantly, a longitudinal identifier for the importing firm. The data begin in 1992, and the most recent year available, as of this is draft, is 2021.

We link the LFTTD trade data with Census's Longitudinal Business Database (LBD), which records the six-digit NAICS industry code, employment, and payroll for the establishments of essentially all U.S. private employers.[7] We use data from the LBD to classify firms by their primary sector of operation.

Our unit of analysis is a firm-product pair, which is the level of aggregation best suited to examining the implications for firms' sourcing activities as they reallocate imports across countries in response to tariffs. Because HTS codes change over time, we use an updated version of the concordances from Pierce and Schott (2012) to create time-consistent product codes.[8]

[7]The LBD excludes employment in agriculture and forestry. For industry classification, we use the time-consistent NAICS codes from (Fort and Klimek 2016).

[8]Without incorporating these time-consistent product codes, there can be discrete jumps in measures of firms sourcing behavior at the time of revisions to the U.S. Harmonized Tariff Schedule or to the World Customs Organization's six-digit Harmonized System Product classifications.

3.2 Measures of Pair-Level Sourcing Behavior

In the empirical analysis that follows, we examine the relationship between tariffs and a range of measures of firm-product-pair level sourcing behavior. Here, we define these measures of sourcing behavior, which we categorize into three groups. Summary statistics for all variables are provided in Section A of the appendix.

Reallocation: The first group of measures examines the extent of reallocation of U.S. imports across source countries in response to tariffs. These measures are simply the share of a pair's imports coming from particular countries or sets of countries (e.g. the share of imports from China, Asia excluding China, etc.):

$$Country\ Share^{c}_{fht} = \frac{imp_{fhct}}{\sum_{c \in C} imp_{fhct}}. \tag{1}$$

Risk Reduction: The second group of measures of sourcing behavior pertains to activities that might be associated with reducing risk in firms' supply chains or increasing supply chain resilience.

The first of these measures is a Herfindahl index of pairs' imports across source countries:

$$Herf_{fht} = \sum_{c \in C} (\frac{imp_{fhct}}{imp_{fht}})^2. \tag{2}$$

This traditional measure is useful for measuring the extent of a pair's concentration or diversification across source countries, and therefore the extent to which a pair's sourcing may be subject to risk of tariffs on a particular country.[9]

The next risk reduction measure is the share of imports coming from "related parties," i.e. from overseas affiliates. Census considers firms to be related if either party owns, controls, or holds voting power equivalent to 6 percent of the outstanding voting stocks or shares of the other firm (Heise et al. 2021). Importing from affiliates may become more desirable given the possibility of tariffs if imports from affiliates are easier or faster to ad-

[9]Note that this measure of source country concentration differs from that used by Handley et al. (2024), which is based on the number supplier firms, irrespective of country, and is defined at the product level. While that measure captures risks associated with failure of a particular supplier firm due to idiosyncratic factors, the measure we employ is useful for capturing risks of trade policy that pertain to all suppliers within a country. In addition, the Herfindahl measure in equation 2 is defined at the firm-product-year level, and it is treated as a decision variable for the firm importing a given product, which could be influenced by tariffs.

just or less subject to disruption than imports from unaffiliated "arm's length" suppliers. In addition, importing more from affiliates may allow for greater leeway to use transfer pricing to reduce tariff burden. We measure a pair's involvement in related party as the share of its imports sourced from related parties:

$$Related\ Party\ Share_{fht} = \frac{imp^{rp}_{fht}}{imp_{fht}}. \tag{3}$$

The final measure of "risk reduction" activities is simply the count of the number of countries from which a pair sources an input. Increasing the number of countries increases that possibility of avoiding country-specific tariffs. It provides a measure of extensive margin diversification that complements the Herfindahl measure of equation 2, which captures both extensive and intensive margin diversification.

Broader effects: The third group of measures, which we term "broader effects," includes variables that capture potential costs associated with any reallocation and risk reduction activities a pair may undertake to increase supply chain resilience.

The first of these broader effect measures is the total value of imports for the pair. Examining effects on the total value of imports shows whether any reallocation away from China simply leads to a deflection of trade or instead leads to trade destruction (Bown and Crowley (2007)). The second broader effect measure is the Average Unit Value a pair pays for its imports:

$$AUV_{fht} = \frac{imp_{fht}}{qty_{fht}} \tag{4}$$

where imp_{fht} is the value of imports for firm f importing product h at time t and qty_{fht} is the quantity imported. This proxy for price is useful for determining whether a pair must pay higher unit values as it reallocates trade away from China in response to tariffs. We note that AUV_{fht} is defined exclusive of tariffs.

4 Empirical Strategy and Results

To examine how U.S. importers' sourcing behavior responds to the imposition of tariffs, we estimate a simple long-differenced specification,

$$\Delta y_{fh,2017:2021} = \alpha + \beta \Delta Tariff_{fh,2017:2021} + \gamma_h + \epsilon_{fh}. \tag{5}$$

where the dependent variable is the change, from 2017 to 2021, in one of the pair-level (specific to firm f and product h) measures of sourcing behavior described above. The independent variable of interest is the change, over the same period, in the import-value-weighted average tariff across all countries from which firm f imports product p in year t. While the tariffs themselves are time varying, the weights are based based on product and mix of source countries in 2017:

$$Tariff_{fht} = \sum_{c \in C} \frac{imp_{c,2017}}{imp_{2017}} * Tariff_{cht}. \tag{6}$$

This continuous treatment variable increases in the tariff applicable to a given product and the firm's reliance on importing this product from China in the pre-tariffs period. Thus, to experience an increase in tariffs, a firm must have imported a given product from China in 2017 (the year before the tariffs were put in place) and the product must be covered by U.S. Section 301 tariffs.

The product-level fixed effects, γ_h, control for shocks that have common effects on the sourcing characteristics of all firms importing a given product from 2017 to 2021. Key among these are demand shocks associated with the Covid-19 pandemic, which occurs during our sample period. It's well known that the pandemic led to substantial changes in the composition of goods demanded, and that high demand combined with constrained supply for certain products led firms to scramble to change their sourcing patterns (Arriola et al. 2021). Product fixed effects control for these changes in demand across products. Changes in sourcing patterns that are common to all products, such as changes in technology that allow for easier coordination of imports across countries, are captured in the constant of our long-differences specification.

4.1 Reallocation

We begin by examining the relationship between tariffs and any subsequent reallocation of imports across countries. As a starting point, we present results for import-value-weighted regressions. As a result, the reported estimates should be interpreted as representing the effect of tariffs on the average dollar of U.S. imports, and they will be heavily influenced by the large importers that dominate U.S. trade.

Results are presented in table 2. As visible in the first column, larger increases in

tariffs are associated with reductions in the share of imports coming from China, with a one standard deviation increase in tariff rates associated with a 14.3 percentage point reduction in the share of imports coming from China. By contrast, higher tariffs are associated with higher shares of imports from Vietnam, Asia excluding China, and Mexico. In all columns, the estimates are significant at the one percent level. This pattern of reallocation across countries has been documented in other papers using more aggregate data, including Nicita (2019), Bown (2022), Freund et al. (2023) and Alfaro and Chor (2023). Therefore, we consider our finding of similar patterns using more disaggregated data at the firm-product level and a different empirical strategy to be a proof of concept of our approach.

Table 2: Reallocation - Import Value Weighted

	(1)	(2)	(3)	(4)
	Δ CHN SHARE	Δ VNM SHARE	Δ Asia Ex. CHN SHARE	Δ MEX SHARE
Δ Tariff$_{fh}$	-1.927***	0.225***	0.913***	0.223***
	(0.0844)	(0.0269)	(0.122)	(0.0218)
R^2	0.39	0.183	0.197	0.19
Clustering	HS	HS	HS	HS
FE	HS	HS	HS	HS
Weight	Imp. Val.	Imp. Val.	Imp. Val.	Imp. Val.
Observations	2,541,000	2,541,000	2,541,000	2,541,000
Effect of 1 SD ↑ in Tariff	-14.3%	1.7%	6.8%	1.7%

Note: Table displays results of OLS regressions of the change in noted dependent variable from 2017-2021 on the change in exposure to tariffs. Estimates are weighted by import value and standard errors are clustered at the product level.
Source: LFTTD and authors' calculations.

4.2 Risk Reduction in Supply Chains

Next we focus on outcomes that might reduce risk in firms' supply chains, with import-value-weighted results reported in Table 3. As seen in column (1), there is a clear negative relationship between tariffs and a Herfindahl index of pairs' suppliers, where suppliers are defined at the country-level. That is, as tariffs increase, pairs diversify their supplier base by making it less concentrated across countries. Interestingly, as shown in column

(3), this diversification does not occur—on average—via the addition of new source countries, but rather by a shift in imports across existing source countries.

Column (2) focuses on the share of imports sourced from related parties. Here, we find a positive and statistically significant relationship between exposure to tariffs and the share of imports coming from foreign affiliates.[10] As mentioned above, this shift toward intra-firm trade may reflect firms' beliefs that imports from affiliates may be less likely to be disrupted in the event of trade tensions. An influential literature has considered factors beside tariffs that might influence the extent of intra-firm trade (e.g. Antràs (2003), Nunn (2007), Bernard et al. (2010), etc.), a possibility we plan to explore in future work.

Table 3: Risk Reduction - Import Value Weighted

	(1)	(2)	(3)
	Δ Herf. Of Suppliers	Δ Related Share	Δ # Source Countries
Δ Tariff$_{fh}$	-0.460***	0.163***	10.54
	(0.0919)	(0.0474)	(7.430)
R^2	0.183	0.157	0.096
Clustering	HS	HS	HS
FE	HS	HS	HS
Weight	Imp. Val.	Imp. Val.	Imp. Val.
Observations	933,000	2,541,000	2,541,000
Effect of 1 SD $\uparrow$ in Tariff	-3.4%	1.2%	0.8

Note: Table displays results of OLS regressions of the change in noted dependent variable from 2017-2021 on the change in exposure to tariffs. Estimates are weighted by import value and standard errors are clustered at the product level.
Source: LFTTD and authors' calculations.

4.3 Broader Effects

The previous two sub-sections report that U.S. importers undertook substantial reallocation and supply chain risk-reduction activities in response to the 2018-19 tariffs. Now, we examine whether there are costs associated with these activities. For example, while firms shifted trade away from China and toward other countries, they may shrink the overall amount of imports as they find some trade no longer profitable. Moreover, firms had

[10] Our analysis pertains to U.S. importers and their foreign affiliates, regardless of ultimate corporate parent. Graziano et al. (2024) examine how Chinese multinational firms are relocating production across countries in response to tariffs.

presumably optimized their import values among the set of potential source countries prior to tariffs. Given that new tariffs would induce a move away from this preferred allocation, firms may have to pay higher unit values for their imports as they shift trade toward less desirable source countries.

We examine these possibilities in Table 4, which again reports import-value-weighted estimates. The first column shows that tariffs are associated with *overall* trade decreases, or trade destruction, rather than simply trade diversion. The estimates are statistically significant at the one percent level.

The second column shows that the average unit value paid for overall imports goes up in response to tariffs, but this effect is not statistically significant. This lack of a response in prices is somewhat surprising given the major shift in trade in response to tariffs, especially when China is anecdotally considered a lowest-cost supplier for many goods. In the coming sections, we investigate this results and find important differences in the effects of tariffs based on a firm's size in the import market for a given product.

Table 4: Broader Effects - Import Value Weighted

	(1)	(2)
	Δ ln(Imp. Value)	Δ ln(AUV)
Δ Tariff$_{fh}$	-1.053***	0.7
	(0.291)	(0.452)
R^2	0.186	0.275
Clustering	HS	HS
FE	HS	HS
Weight	Imp. Val.	Imp. Val.
Observations	933,000	687,000
Effect of 1 SD $\uparrow$ in Tariff	-7.8%	5.2%

Note: Table displays results of OLS regressions of the change in noted dependent variable from 2017-2021 on the change in exposure to tariffs. Estimates are weighted by import value and standard errors are clustered at the product level.
Source: LFTTD and authors' calculations.

4.4 Unweighted Results - The First Signs of Heterogeneous Effects

The prior results focused on import-value-weighted estimates that convey the relationships between tariffs and sourcing patterns for the average dollar of trade. Here, we present estimates from unweighted estimates that reflect these relationships for the aver-

age firm. As a result, these unweighted estimates will be much more influenced by small importers that make up the bulk of U.S. importing firms, even as they account for a much smaller share of value. We report results for the reallocation, risk-reduction, and broader effects variables together in the three panels of Table 5.

In some ways, results for the unweighted regressions are similar to their value-weighted counterparts. Both sets of results show firms reallocating trade away from China toward other countries, while diversifying across source countries and increasing their use of related-party trade.

But in other ways, the unweighted results differ substantially from the weighted in ways that are indicative of differences between large and small importers. First, we see that in the unweighted results, higher tariffs are associated with a *reduction* in the number of source countries. This result could reflect importers dropping China as a source country or—because the dependent variable is permitted to go to zero—halting importing altogether.

Second, and importantly, the unweighted results indicate a statistically significant increase in unit values as tariffs increase. This difference—with the weighted results showing now effect of tariffs on AUVs—points to adjustments to tariffs being more disruptive to small importers than large importers, a possibility we examine in the next section.

Table 5: Unweighted Results

(a) Reallocation Unweighted

	(1)	(2)	(3)	(4)
	Δ CHN SHARE	Δ VNM SHARE	Δ Asia Ex. CHN SHARE	Δ MEX SHARE
Δ Tariff$_{fh}$	-2.855***	0.0620***	0.774***	0.113***
	(0.0253)	(0.00385)	(0.0130)	(0.00329)
R^2	0.503	0.021	0.08	0.057
Clustering	HS	HS	HS	HS
FE	HS	HS	HS	HS
Weight	No	No	No	No
Observations	2,541,000	2,541,000	2,541,000	2,541,000
Effect of 1 SD ↑ in Tariff	-31.1%	0.7%	8.4%	1.2%

(b) Risk Unweighted

	(1)	(2)	(3)
	Δ Herf. Of Countries	Δ Related Share	Δ # Source Countries
Δ Tariff$_{fh}$	-0.0601***	0.222***	-0.0758***
	(0.00409)	(0.00574)	(0.0250)
R^2	0.016	0.028	0.013
Clustering	HS	HS	HS
FE	HS	HS	HS
Weight	No	No	No
Observations	933,000	2,541,000	2,541,000
Effect of 1 SD ↑ in Tariff	-0.7%	2.4%	-0.8%

(c) Broad Unweighted

	(1)	(2)
	Δ ln(Imp. Value)	Δ ln(AUV)
Δ Tariff$_{fh}$	-0.687***	0.250***
	(0.0313)	(0.0796)
R^2	0.027	0.052
Clustering	HS	HS
FE	HS	HS
Weight	No	No
Observations	933,000	687,000
Effect of 1 SD ↑ in Tariff	-7.5%	2.7%

Note: Table displays results of OLS regressions of the change in noted dependent variable from 2017-2021 on the change in exposure to tariffs. Estimates are unweighted and standard errors are clustered at the product level.
Source: LFTTD and authors' calculations.

5 Importers Big and Small

The previous section provided suggestive evidence of a differential adjustment process among large and small importers. In this section, we address this question explicitly by comparing the tariff responses in the subsamples of large and small importers.

We define a firm importing a given product as a large importer if its import value in 2017 is at or above the 90th percentile of firms importing the product. Small firms are those whose 2017 import values are below the 90th percentile. We note two features of this definition. First, this measure is an indicator for a firm's importance in the import market for a given product, which is the relevant measure of interest for our research questions, particularly when we examine the possibility of importers exercising market power with their foreign suppliers. While this measure may be correlated with firm size, it is not necessarily the case that large importers are large firms in terms of their U.S. employment, revenue, profit, etc. Second, and relatedly, because the measure is defined based on a firm's importance in *product-level* imports—rather than overall firm-level imports—a firm may be large importer of one product, but a small importer of another.

In the analysis that follows, we report results for unweighted regressions, which represent effects for the average firm in each sub-sample, i.e. the average small importer and the average large importer. We choose to do so, as weighted results would mask distinctions between the two sets of importers as results in the small importer sample would become dominated by the largest of the "small" importers.

5.1 Reallocation: Importers Big and Small

In Table 6, we focus on reallocation patterns across countries. The top and bottom panels present the results for the subsamples of large and small importing firms, respectively. The patterns observed provide more concrete evidence on some of the suggestive results from weighted and unweighted regressions.

The results suggest that both large and small importers reallocate trade away from China and toward other countries in response to tariffs. There are some differences in the extent of reallocation across these different types of firms, with one standard deviation increase in tariff exposure associated with a 32.2 percentage point decline in the China import share for small importers, versus a 20.8 percentage point decline for large importers.

However, notable and striking differences become readily apparent. First, while large importers expand the number of countries they source from, small importers reduce the number of source countries. Because small importers disproportionately import from a

single country (Figure 1), this likely represents small importers simply ceasing import operations.[11]

Table 6: Reallocation Across Countries: Big vs Small Importers

(a) Big Importers

	(1)	(2)	(3)	(4)	(5)
	Δ CHN SHARE	Δ VNM SHARE	Δ Asia Ex. CHN SHARE	Δ MEX SHARE	Δ CTY COUNT
Δ Tariff$_{fh}$	-1.912***	0.133***	0.654***	0.131***	0.311***
	(0.0227)	(0.00977)	(0.0141)	(0.00504)	(0.0754)
R^2	0.331	0.058	0.109	0.085	0.033
Clustering	HS	HS	HS	HS	HS
FE	HS	HS	HS	HS	HS
Weight	No	No	No	No	NO
Observations	248,000	248,000	248,000	248,000	248,000
Effect of 1 SD ↑ in Tariff	-20.8%	1.4%	7.1%	1.4%	3.3%

(b) Small Importers

	(1)	(2)	(3)	(4)	(5)
	Δ CHN SHARE	Δ VNM SHARE	Δ Asia Ex. CHN SHARE	Δ MEX SHARE	Δ CTY COUNT
Δ Tariff$_{fh}$	-2.960***	0.0537***	0.781***	0.112***	-0.129***
	(0.0264)	(0.00326)	(0.0135)	(0.00333)	(0.0245)
R^2	0.53	0.023	0.083	0.061	0.019
Clustering	HS	HS	HS	HS	HS
FE	HS	HS	HS	HS	HS
Weight	No	No	No	No	No
Observations	2,293,000	2,293,000	2,293,000	2,293,000	2,293,000
Effect of 1 SD ↑ in Tariff	-32.2%	0.6%	8.5%	1.2%	-1.4%

Note: Table displays results of OLS regressions of the change in noted dependent variable from 2017-2021 on the change in exposure to tariffs. Estimates are unweighted and standard errors are clustered at the product level..
Source: LFTTD and authors' calculations.

[11]See Chung (2017) for additional information on firms' sourcing from multiple countries.

5.2 Unit values: Importers Big and Small

Next we focus on changes in unit values, another area where the earlier results were suggestive of differential adjustment of importers of different sizes (see Table 7).

Table 7: AUVs for Big vs. Small Firms

(a) Big Firms

	(1)	(2)	(3)
	Δ ln(AUV)	Δ ln(RP AUV)	Δ ln(AL AUV)
Δ Tariff$_{fh}$	0.12	0.323	0.0573
	(0.216)	(0.295)	(0.202)
R^2	0.165	0.154	0.146
Clustering	HS	HS	HS
FE	HS	HS	HS
Weight	No	No	No
Observations	135,000	48,500	120,000
Effect of 1 SD $\uparrow$ in Tariff	1.3%	3.5%	0.6%

(b) Small Firms

	(1)	(2)	(3)
	Δ ln(AUV)	Δ ln(RP AUV)	Δ ln(AL AUV)
Δ Tariff$_{fh}$	0.275***	0.0824	0.231***
	(0.0554)	(0.0813)	(0.0555)
R^2	0.041	0.08	0.043
Clustering	HS	HS	HS
FE	HS	HS	HS
Weight	No	No	No
Observations	552,000	90,500	468,000
Effect of 1 SD $\uparrow$ in Tariff	2.9%	0.9%	2.5%

Note: Table displays results of OLS regressions of the change in noted dependent variable from 2017-2021 on the change in exposure to tariffs. Estimates are unweighted and standard errors are clustered at the product level.
Source: LFTTD and authors' calculations.

In response to the tariff shock, average unit values increase for small importers but

remain unchanged (i.e., the relationship is not statistically significant) for large importers. This rise in unit values in the small importer subsample is primarily driven by arm's-length transactions. Specifically, a one-standard-deviation increase in the tariff leads to a 2.9% increase in the average unit value for small importers. The fact that arm's length transactions drive the relationship attenuates concerns about the impact of transfer pricing.

Table 8 zooms in on unit values of imports from China and documents quite different responses in the two subsamples. For large importers, there is a decrease in the unit values of imports from China, driven by arm's-length transactions rather than transfer pricing. Specifically, a one standard deviation increase in tariffs results in a 2.7% reduction in unit values. In contrast, no statistically significant effects are observed for small importers. This is consistent with the idea that large importers possess significant market power.

We note that there are important differences between our approach and those used in papers more broadly examining the effects of tariffs on import prices (Amiti et al. (2019), Fajgelbaum et al. (2020)). First, we focus on a different level of aggregation—the firm-product-level—rather than the country-product-level. Second, because our measure of tariff-exposure is based on a firm-product-pair's distribution of imports across countries in 2017, it accounts only for effects on unit values of continuing pairs; it does not account for entry and exit. Furthermore, we note that the import value-weighted regressions in Section 4 do not find a response of AUVs to tariffs. Nonetheless, our unweighted regressions here offer useful insights into heterogeneous effects of tariffs on unit values for continuing pairs of different sizes.

Table 8: China AUVs for Big vs. Small Firms

(a) Big Firms

	(1)	(2)	(3)
	Δ ln(AUV)	Δ ln(RP AUV)	Δ ln(AL AUV)
Δ Tariff$_{fh}$	-0.231**	-0.235	-0.250**
	(0.0919)	(0.237)	(0.101)
R^2	0.108	0.154	0.11
Clustering	HS	HS	HS
FE	HS	HS	HS
Weight	No	No	No
Observations	62,500	12,500	57,000
Effect of 1 SD ↑ in Tariff	-2.5%	-2.5%	-2.7%

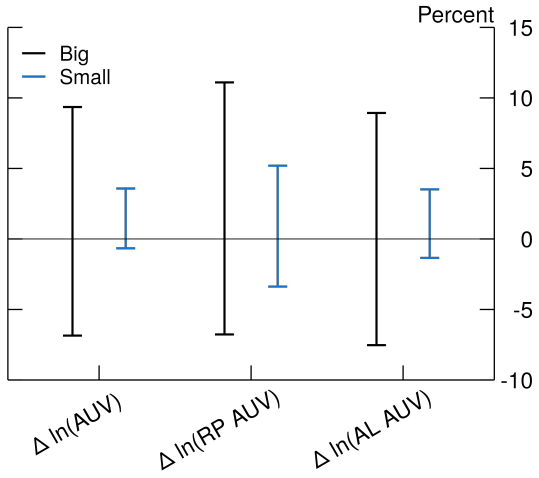
(b) Small Firms

	(1)	(2)	(3)
	Δ ln(AUV)	Δ ln(RP AUV)	Δ ln(AL AUV)
Δ Tariff$_{fh}$	-0.113	-0.354	-0.137
	(0.0821)	(0.240)	(0.0899)
R^2	0.055	0.203	0.058
Clustering	HS	HS	HS
FE	HS	HS	HS
Weight	No	No	No
Observations	158,000	11,500	145,000
Effect of 1 SD ↑ in Tariff	-1.2%	-3.9%	-1.5%

Note: Table displays results of OLS regressions of the change in noted dependent variable from 2017-2021 on the change in exposure to tariffs. Estimates are unweighted and standard errors are clustered at the product level.
Source: LFTTD and authors' calculations.

Finally, as visible in Figure 2, neither large nor small importers experience a change in the unit values of imports from the rest of the world in response to the tariff shock. Therefore, the overall increase in the average unit value appears to be driven by a reallocation of sourcing from China to more expensive locations (rather than a demand shock driving up prices in locations that present an alternative to China).

Figure 2: Rest of World AUV by Related Party and Arm's Length



Note: Estimates are for a 1 SD change in tariff rates.
Source: US Census Bureau; authors' calculations.

6 Examining Sourcing Patterns by Sector

In this section, we examine how firms in different sectors alter their sourcing patterns in response to tariffs on imports from China. We find that despite substantial pre-tariff differences in sourcing behavior across sectors, firms in different sectors exhibit the same qualitative responses to tariffs, though responses are strongest for retailers.

6.1 Sourcing Patterns Over Time, by Sector: Descriptive Evidence

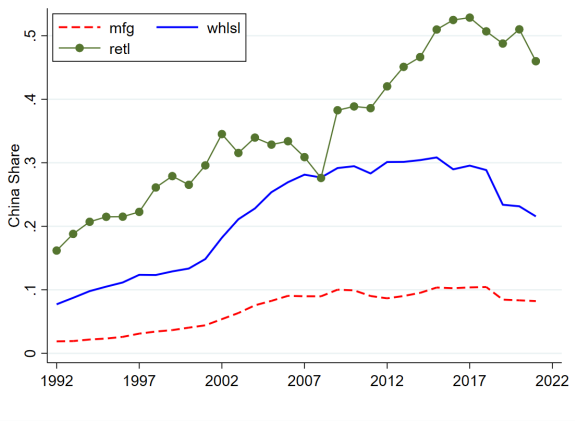
Figure 3 displays sourcing patterns over time for three major U.S. trading sectors, manufacturing, wholesale, and retail. The left panel displays the share of firm-level imports from China. As shown in that left panel, prior to the onset of tariffs, there is notable variation in the extent of reliance on imports from China by sector, with retailers import much more intensively from China than wholesalers or retailers. In terms of trends, while firms in all three sectors increased the share of imports from China in the 1990s and especially the early 2000s, the share peaks for manufacturers and retailers around the time of the Global Financial Crisis (GFC), while it continues to increase for retailers until the time of the tariffs. After the tariffs, firms from all sectors decrease the share of their imports coming from China.

As shown in the right panel of Figure 3, firms in different sectors also exhibit substantial differences in their extent of diversification across countries prior to the imposition of tariffs. Manufacturers had been increasing their diversification across source coun-

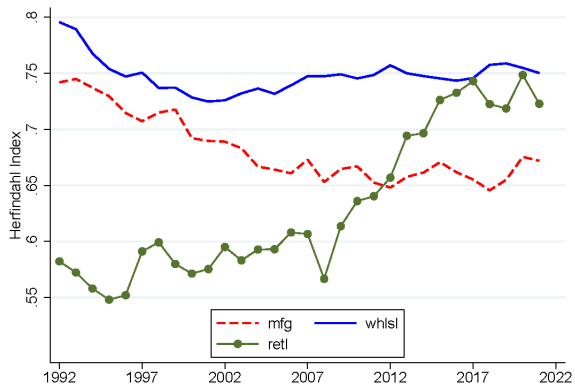
tries (decreasing Herfindahl) for decades prior to the tariffs, while retailers—with their increasing reliance on China shown in the left panel—had been becoming increasingly concentrated. Notably, the overall level of Herfindahl index for source countries only declines, on net, for retailers once tariffs are imposed, with a temporary jump during the Covid-19-affected year of 2020.

Figure 3: Sourcing Patterns by Major Sector of Firm

(a) Share of Imports from China



(b) Herfindahl Index of Source Countries



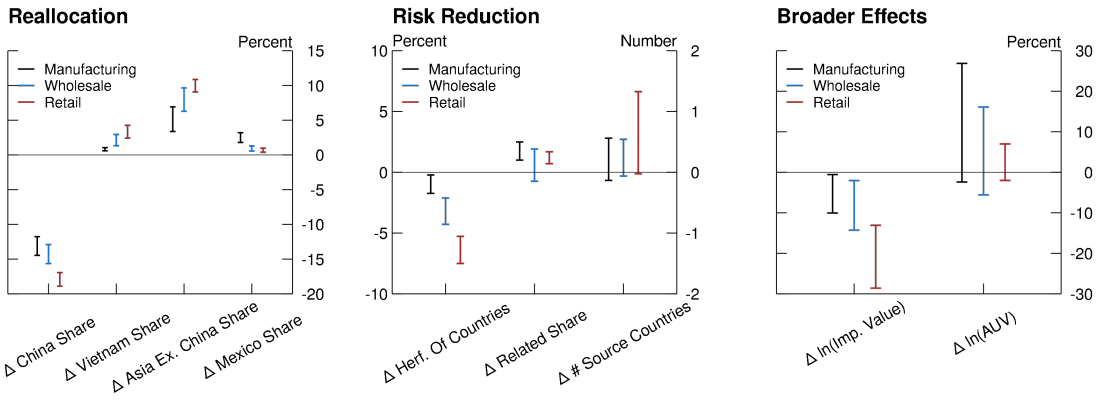
Source: LFTTD and authors' calculations.
Notes: Left panel displays the share of imports from China and right panel displays Herfindahl index of supplier countries. In both panels, a firm's sector is defined as the sector with the largest share of firm-level employment and the displayed data are import value-weighted.

6.2 Tariffs and Sourcing Patterns: Evidence Across Sectors

Next, we re-estimate equation 5 for each of the three sectors, with coefficient estimates and standard errors—scaled to show the effect of a one standard deviation change in tariffs—displayed in Figure 4. The figure highlights two messages about sector-level responses to tariffs. First, firms in all sectors display the reallocation and risk reduction behavior described above and decrease the overall value of their imports as they undertake these activities. This consistency indicates that the results in Section 4 are not driven by a particular sector.

However, the second takeaway of Figure 4 is that there is some variation in the magnitude of these responses across sectors. Retailers show the most drastic reallocation of imports away from China toward other sources. They also show the largest decline in source country concentration (Herfindahl) and the largest overall decline in imports. These larger responses are intuitive given the much higher reliance on imports from China displayed by retailers in Figure 3.

Figure 4: Tariffs and Sourcing Patterns: Evidence by Sector



Note: Estimates are for a 1 SD change in tariff rates.
Source: LFTTD and authors' calculations.

7 Additional Robustness

In this section, we provide additional checks of the robustness of the results presented in Section 4. We find that the baseline results are robust to excluding products subject to tariffs on imports from all countries and to excluding product fixed effects.

7.1 Excluding Products Subject to Tariffs for All Countries

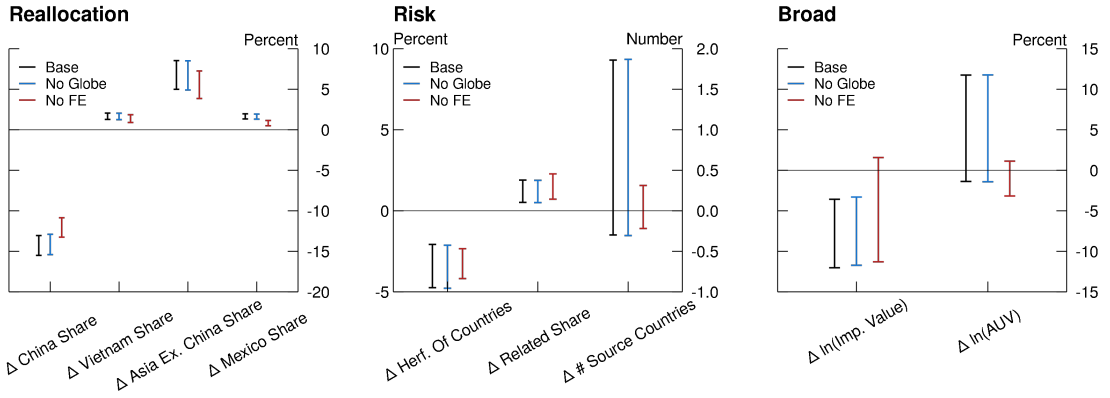
The focus of this paper is on the Section 301 U.S. tariffs on imports from China, given that these country-specific tariffs are the ones that create incentives for reallocating trade across countries and adopting risk-reducing practices. At this time, the U.S. also imposed tariffs on imports of certain products from all countries (e.g. steel, aluminum, washing machines). Tariffs common to all countries for a given product are absorbed in the product fixed effects in our baseline regression. Here, we re-estimate equation 5 excluding any products subject to global U.S. tariffs. The blue bars in Figure 5 display coefficient estimates and standard errors for a one standard deviation increase in tariffs when excluding these products. As indicated in the figure, results are nearly identical to the baseline with all products included in the sample (black bars).

7.2 Excluding Fixed Effects

Our baseline specification in equation 5 includes product fixed effects to capture shocks that are common to all firms importing a product, such as demand shocks associated with changes in taste during the Covid-19 pandemic. Here, we re-estimate equation 5, but

exclude fixed effects. Results are displayed in the red bars in Figure 5, and as indicated, they are highly similar with to the baseline results, with the primary difference being a decrease in precision for the negative relationship between tariffs and overall import values.

Figure 5: Robustness Checks



Note: Estimates are for a 1 SD change in tariff rates.
Source: LFTTD and authors' calculations.

8 Conclusion

This paper analyzes firm-product-level panel data on importing behavior of US firms for the period 2017-2021 to shed light on their response to import tariffs introduced by the U.S. beginning in 2018. The analysis shows that higher tariffs were associated with a decline in the share of imports sourced from China and increased sourcing from other Asian countries and from Latin America, leading to an overall geographic diversification of the supplier base. Additionally, the results show a decline in the overall value of imports and an increased reliance on related-party trade.

The paper documents notable differences in how firms of varying sizes have adjusted to the tariffs. To explore this variation, we analyze import-weighted versus unweighted regressions and separately assess large and small importers. Both approaches yield consistent results, underscoring the distinct responses of firms based on their size.

Both large and small importers have decreased their dependence on China while increasing their sourcing from other Asian countries and Mexico. However, the adjustments have been markedly different between the two groups. Small importers have made more substantial shifts away from China and have relied more on other Asian countries, ultimately reducing the number of countries they source from. This narrowing of sourcing

options has contributed to higher average unit values for their imports, as they increasingly depend on more expensive manufacturing locations.

In contrast, large importers have been able to maintain lower unit values for imports from China and expand the number of countries they source from. This diversification has been achieved without any significant increase in their overall unit values. These results are consistent with the idea that large importers enjoy greater bargaining power with Chinese suppliers and can strategically use their existing trade networks to further diversify their sourcing.

A closer look at the changes in unit values reveals that these shifts are primarily driven by arm's-length transactions, mitigating concerns about transfer pricing as the underlying cause. Additionally, we find no evidence of changes in the unit values of goods imported from countries outside of China. For small importers, this suggests that the rise in average unit values is purely a consequence of reallocating their sourcing shares.

Taken together, our findings highlight that the recent tariffs have reshaped the patterns of US imports, with significant distributional effects between small and large importing firms.

References

Alfaro, Laura and Davin Chor, "Global Supply Chains: The Looming "Great Reallocation"," Working Paper 31661, National Bureau of Economic Research September 2023.

____, Mariya Brussevich, Camelia Minoiu, and Andera Presbitero, "Bank Financing of Global Supply Chains," 2025. Mimeo.

Amiti, Mary, Sang Hoon Kong, and David Weinstein, "The Effect of the U.S.-China Trade War on U.S. Investment," *NBER Working Paper*, May 2020, (27114), 46.

____, Stephen J. Redding, and David E. Weinstein, "The Impact of the 2018 Tariffs on Prices and Welfare," *Journal of Economic Perspectives*, November 2019, *33* (4), 187–210.

Antràs, Pol, "Firms, Contracts, and Trade Structure," *Quarterly Journal of Economics*, 2003, *118* (4), 1375–1418.

Antràs, Pol, Teresa C. Fort, and Felix Tintelnot, "The Margins of Global Sourcing: Theory and Evidence from US Firms," *American Economic Review*, September 2017, *107* (9), 2514–64.

Arriola, Christine, Przemyslaw Kowalski, and Frank van Tongeren, "The Impact of COVID-19 on Directions and Structure of International Trade," Technical Report 252, Organization for Economic Co-operation and Development 2021.

Bernard, Andrew B., J. Bradford Jensen, Stephen J. Redding, and Peter K. Schott, "Intrafirm Trade and Product Contractibility," *American Economic Review*, May 2010, *100* (2), 444–48.

Bown, Chad, "Four Years Into the Trade War, are the US and China Decoupling?," Working Paper, Peterson Institute for International Economics 2022.

Bown, Chad P. and Meredith A. Crowley, "Trade deflection and trade depression," *Journal of International Economics*, 2007, *72* (1), 176–201.

Chor, Davin and Bingjing Li, "Illuminating the Effects of the US-China Tariff War on China's Economy," Technical Report w29349, National Bureau of Economic Research, Cambridge, MA October 2021.

Chung, Elaine, "Global Multisourcing and Supply Risk Diversification," Technical Report, SSRN 2017.

Congressional Research Service, "Section 301 Tariff Exclusions on U.S. Imports from China," Technical Report, In Focus 11582, version 21 2024.

Fajgelbaum, Pablo D. and Amit K. Khandelwal, "The Economic Impacts of the US–China Trade War," *Annual Review of Economics*, August 2022, *14* (1), annurev–economics–051420–110410.

Fajgelbaum, Pablo D, Pinelopi K Goldberg, Patrick J Kennedy, and Amit K Khandelwal, "The Return to Protectionism," *The Quarterly Journal of Economics*, February 2020, *135* (1), 1–55.

Fajgelbaum, Pablo, Pinelopi Goldberg, Patrick Kennedy, Amit Khandelwal, and Daria Taglioni, "The US-China Trade War and Global Reallocations," *American Economic Review: Insights*, June 2024, *6* (2), 295–312.

Flaaen, Aaron and Justin Pierce, "Disentangling the Effects of the 2018-2019 Tariffs on a Globally Connected U.S. Manufacturing Sector," *Review of Economics and Statistics*, 2024, *Forthcoming*.

____, Kathryn Langemeier, and Justin Pierce, "Factors Affecting Recent U.S. Tariffs on Imports from China," FEDS Notes 29401, Federal Reserve Board February 2021.

Fort, Teresa C. and Shawn Klimek, "The Effect of Industry Classification Changes on US Employment Composition," Technical Report, Tuck School at Dartmouth 2016.

Freund, Caroline, Aaditya Mattoo, Alen Mulabdic, and Michele Ruta, "Is US Trade Policy Reshaping Global Supply Chains?," Working Paper 2023.

Goswami, Sanjana, "Employment Consequences of U.S. Trade Wars," 2020.

Graziano, Alejandro, Monika Sztajerowska, and Christian Volpe Martincus, "Trading Places: How Trade Policy is Reshaping Multinational Firms' Location," Working Paper 11514, CESifo 2024.

Handley, Kyle, Fariha Kamal, and Ryan Monarch, "Supply chain adjustments to tariff shocks: Evidence from firm trade linkages in the 2018-2019 U.S. trade war," *Economics Letters*, 2024, *244*, 112009.

Heise, Sebastian, Justin R. Pierce, Georg Schaur, and Peter K. Schott, "Tariff Rate Uncertainty and the Structure of Supply Chains," 2021. mimeo.

Huang, Yi, Chen Lin, Sibo Liu, and Heiwai Tang, "Trade Networks and Firm Value: Evidence from the U.S.-China Trade War," 2021, p. 61.

Javorcik, Beata, Ben Kett, and Katherine Stapleton, "Did the 2018 TradeWar Improve Job Opportunities for US Workers?," *Journal of International Economics*, 2024, *Forthcoming.*

Nicita, Alessandro, "Trade and Trade Diversion Effects of United States Tariffs on China," Working Paper, UNCTAD Research Paper No. 37 2019.

Nunn, Nathan, "Relationship-Specificity, Incomplete Contracts, and the Pattern of Trade," *Quarterly Journal of Economics*, 2007, *122* (2), 569–600.

Pierce, Justin R. and Peter K. Schott, "Concording U.S. Harmonized System Categories Over Time," *Journal of Official Statistics*, 2012, *28* (1), 53–68.

Waugh, Michael, "The Consumption Response to Trade Shocks: Evidence from the US-China Trade War," Technical Report w26353, National Bureau of Economic Research, Cambridge, MA October 2019.

A Summary Statistics

This section presents summary statistics for all variables considered in our empirical analysis. We present means and standard deviations, both import-value-weighted and unweighted.

Table A1: Summary Statistics

	(1)	(2)	(3)	(4)	(5)
	Δ Tariff$_{fh}$	Δ CHN Share$_{fh}$	Δ VNM Share$_{fh}$	Δ Asia Ex. CHN Share$_{fh}$	Δ MEX Share$_{fh}$
Mean (weighted)	3.3%	-7.5%	1.3%	1.6%	-0.5%
SD (weighted)	7.4%	23.9%	10.3%	23.0%	16.1%
Mean (unweighted)	5.9%	-21.0%	-0.4%	-9.5%	-1.8%
SD (unweighted)	10.9%	42.8%	9.7%	33.8%	15.2%

	(6)	(7)	(8)
	Δ Herf$_{fh}$	Δ RP Share$_{fh}$	Δ Country Count$_{fh}$
Mean (weighted)	-0.3%	-6.4%	-1.75
SD (weighted)	19.0%	29.3%	11.57
Mean (unweighted)	-0.5%	-7.1%	-0.73
SD (unweighted)	20.1%	29.8%	1.49

	(9)	(10)	(11)	(12)	(13)
	Δ ln(Val$_{fh}$)	Δ ln(AUV$_{fh}$)	Δ ln(RP AUV$_{fh}$)	Δ ln(AL AUV$_{fh}$)	Δ ln(CHN AUV$_{fh}$)
Mean (weighted)	-41.8%	2.1%	4.3%	8.3%	-6.5%
SD (weighted)	160.5%	96.4%	101.6%	118.8%	130.8%
Mean (unweighted)	9.3%	0.1%	0.5%	0.0%	-3.6%
SD (unweighted)	164.7%	131.8%	140.6%	131.8%	116.5%

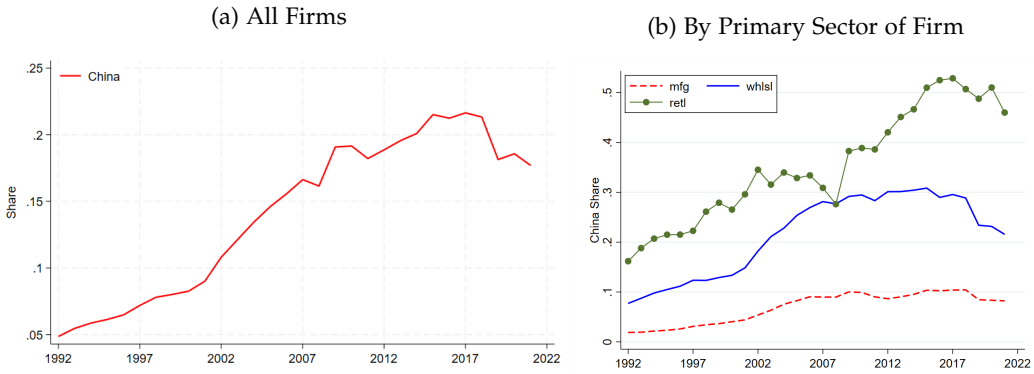
Note: Table displays means and standard deviations for all variables employed in the paper. The first two rows of each panel present import-value-weighted statistics, while those in the third and fourth rows are unweighted.
Source: LFTTD and authors' calculations.

B The Evolution of Sourcing from China

In this section, we graphically present a series of summary statistics to set the stage for the analysis. As shown in Figure B1a, the aggregate share of imports from China rises in the 1990s, increases at a faster pace after China joins the WTO in 2001, and then

moves sideways in the years until tariffs are imposed. Once the U.S. begins imposing tariffs in 2018, the share of US imports sourced from China drops considerably. Figure B1b indicates that firms of multiple sectors—retailers, wholesalers, and manufacturers—decrease the share of imports they source from China. Figure B1b also shows that while retailers continued to increase their Chinese import share right until the onset of tariffs, wholesalers and manufacturers had held their China shares constant since around the time of the Global Financial Crisis (GFC).

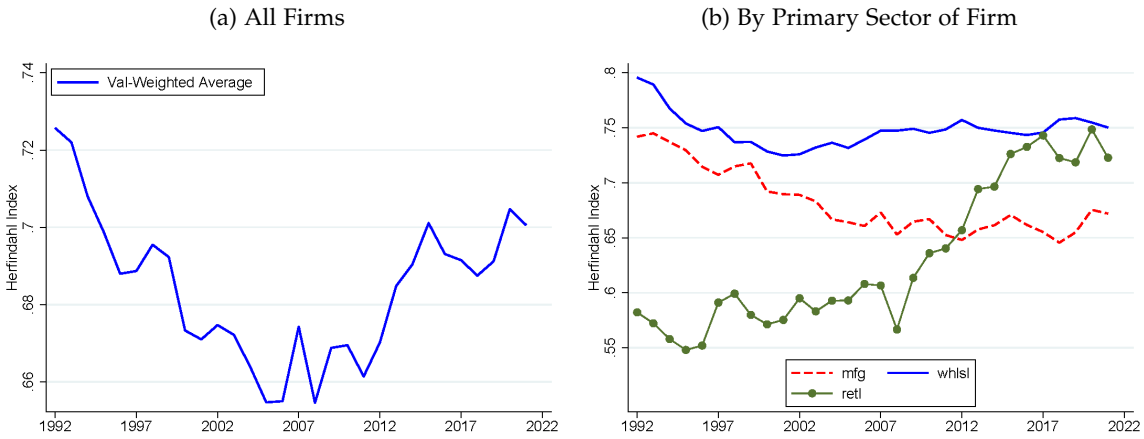
Figure B1: Share of U.S. Imports Sourced from China



Source: United States International Trade Commission and Longitudinal Foreign Trade Transaction Database, U.S. Census Bureau.
Notes: This figure displays the value-weighted average share of U.S. imports from China from 1992-2021, in aggregate (left panel) and by major sector of firms (right panel), where the top 3 sectors in terms of U.S. import value are displayed. The unit of observation is the firm-product pair. The major sector of the firm is the sector that accounts for the plurality of the firm's employment over the entire sample period.

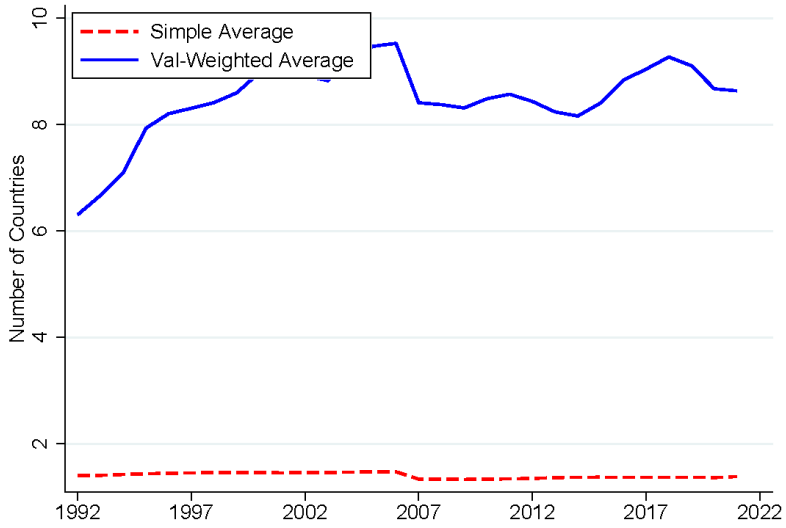
Figure B3 shows the average number of RoW countries (i.e., countries other than China) for firm-product pairs that import from China. The simple average indicates that the typical pair that imports from China imports from between 1 and 2 other countries. The value-weighted average shows that the average dollar of trade is occurring at a pair that imports from 7-8 additional countries. After the implementation of tariffs in 2018, there is a step up in the weighted average number of rest of world countries.

Figure B2: Concentration



Source: Longitudinal Foreign Trade Transaction Database, U.S. Census Bureau.
Notes: This figure displays the value-weighted Herfindahl index of supplier countries from 1992-2021, in aggregate (left panel) and by major sector of firms (right panel), where the top 3 sectors in terms of U.S. import value are displayed. The unit of observation is the firm-product pair. The major sector of the firm is the sector that accounts for the plurality of the firm's employment over the entire sample period.

Figure B3: Number of "Rest of World" Countries for Firm-Product Pairs Importing from China



Source: Longitudinal Foreign Trade Transaction Database, U.S. Census Bureau.
Notes: This figure displays the simple and value-weighted average of "rest of world" countries for firm-product pairs that import from China from 1992-2021. The unit of observation is the firm-product pair. The "rest of world" countries are defined as any country other than China.

C Delving deeper into unit values

This subsection presents results examining how the relationship between tariffs and pairs' average unit values differ across transactions based on whether they occur between related or arm's length parties. This question is interesting in its own right, as it sheds light on the role existing or newly established foreign affiliates play in redirecting trade. The additional advantage of this analysis is the ability to distinguish between the type of transactions that may be affected by transfer pricing undertaken to alleviate the tariff burden (related party) versus transactions that are unlikely to be affected by transfer pricing (arm's length).

The overall message emerging from Table C2 is that while the unweighted regressions point to the tariff shock leading to an increase in the average unit values overall as well as for related party and arm's length transactions, this relationship is not statistically significant in the weighted regressions (except for the related party unit values). This is again suggestive of large and small importers responding differentially to the tariff shock.

Table C2: AUV by Related Party vs. Arm's Length

	Weighted			Unweighted		
	(1)	(2)	(3)	(4)	(5)	(6)
	Δ ln(AUV)	Δ ln(RP AUV)	Δ ln(AL AUV)	Δ ln(AUV)	Δ ln(RP AUV)	Δ ln(AL AUV)
Δ Tariff$_{fh}$	0.7	1.175**	0.0925	0.250***	0.187*	0.201**
	(0.452)	(0.558)	(0.385)	(0.0796)	(0.111)	(0.0782)
R-squared	0.275	0.254	0.249	0.052	0.083	0.052
Clustering	HS	HS	HS	HS	HS	HS
FE	HS	HS	HS	HS	HS	HS
Weight	Imp. Val	Imp. Val	Imp. Val	No	No	No
Observations	687,000	139,000	588,000	687,000	139,000	588,000
Effect of 1 SD ↑ in Tariff	7.6%	12.8%	1.0%	2.7%	2.0%	2.2%

Note: Table displays results of OLS regressions of the change in noted dependent variable from 2017-2021 on the change in exposure to tariffs. Estimates for columns 1-3 are import value-weighted and those for columns 4-6 are unweighted. Standard errors are clustered at the product level.
Source: LFTTD and authors' calculations.