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Import diversification and trade diversion:

Insights from United States of America - China trade patterns

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Abstract

This study examines United States import diversification patterns between 2017 and 2022. It finds that import diversification from China was of a larger magnitude and scope compared to other countries. The study shows that the magnitude of the decline in China's market share across various sectors was mainly influenced by trade policy changes and industry characteristics. The analysis also examines trade diversion effects, which have benefited some countries' exports, finding that these effects were largely driven by the United States' trade policy stance and the economic competitiveness of those countries.

Key words

International trade, diversification, trade diversion, trade policy.

United Nations

Contents

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1. Introduction

In recent years, geopolitical tensions, trade disputes, logistics challenges, and global pandemics have fuelled discussions on supply chain resilience. A common narrative arising from these events has been the need to mitigate risks stemming from potential trade policy changes and supply chain disruptions. A substantial part of this narrative has focused on the United States of America and China because of their strong trade relationship, shifts in their trade policy stance[1], and supply diversification strategies.[2]

The shifts in trade policy between the United States and China began in 2018, with both countries imposing additional tariffs on each other (Bown and Kolb, 2022). These tariffs have been complemented by other trade restrictions aimed at addressing national security concerns and protecting sensitive technology (Bown, 2020). These trade policy measures have significantly affected trade patterns between the two major economies. In spite of an increase in the value of trade between the two countries, a key trend has been the overall decline of China's market share as a supplier to the United States. In 2017, the United States' total merchandise imports, excluding fuels, amounted to approximately US$ 2 trillion, with nearly one-fourth originating from China. By 2022, United States merchandise imports had reached almost US$ 3 trillion, of which China contributed less than 20 per cent, a decline in market share of about five percentage points. Beyond these averages, the data shows that the change in China's share of the United States' market has varied across sectors and products.

The substantial change in United States import patterns from China provides a valuable opportunity to examine the outcomes and drivers of supply diversification strategies. This analysis is important for both policymakers and businesses, offering empirical insights into how global trade relationships are evolving. In exploring the patterns and effects of United States supply diversification, this paper investigates three related issues. First, it examines whether recent changes in United States import patterns have been driven by the general objective to reduce risks from limited supply diversification or whether these changes primarily stem from reducing imports from China. Second, by analyzing industry-specific changes, the paper identifies possible determinants of China's loss in market share. Lastly, it expands

[1] For instance, the statement in the United States Trade Policy Agenda 2022 and 2021 Annual Report specifically state that trade policy needs to realign "to defend the interests of America's workers and businesses, to strengthen our middle-class, create shared sustainable growth, and spur resilient climate action" (https://ustr.gov/sites/default/files/2022%20Trade%20Policy%20Agenda%20and%202021%20Annual%20Report%20(1).pdf).

[2] https://www.whitehouse.gov/cea/written-materials/2023/11/30/issue-brief-supply-chain-resilience.

on the literature regarding trade diversion effects, providing additional insights into the factors that may have allowed third countries to benefit from China's reduced presence in the United States market.

The analysis in this paper is based on disaggregated data at the HS 6-digit level, covering United States imports between 2017 and 2022 from 192 countries. The paper uses market share as a key measure of supply concentration. This approach is rooted in the concept of import diversification, which suggests that when a country heavily relies on a few large suppliers, it becomes more vulnerable to supply chain disruptions and unexpected supply shocks (Baldwin and Freeman, 2022). The paper uses descriptive statistics to illustrate general and sectoral trends, followed by econometric estimates to capture the economic and policy determinants of import diversification patterns. The econometric analysis relies on a simple identification strategy in which supply diversification is measured by changes in suppliers' market share, with its determinants identified both at the product and country levels.

This paper is part of the literature examining the trade effects originating from the additional tariffs the United States and China imposed on each other during 2018 and 2019.[3] Some early studies include Bekkers and Schroeter (2020), Bown (2021), Fajgelbaum et al. (2021), Itakura (2020), Li et al. (2020), Nicita (2019), and Shen et al. (2021). These studies find significant trade reallocation effects following the introduction of tariffs. The empirical literature focusing on the United States-China trade relationship has expanded considerably in recent years, largely confirming trade diversion effects while expanding on determinants and patterns (Chor and Bingjing, 2024; Cigna et al. 2022; Dang et al., 2023; Freund et al. 2023; Fajgelbaum et al. 2023; Utar et al., 2023). This paper contributes to the literature by comparing whether United States' import diversification patterns are primarily related to the reduction of imports from China or result from broader risk-mitigation strategies aimed at reducing dependence on large suppliers. Another contribution of the paper is that it examines whether pre-existing trade policy also contributed to supply diversification patterns.

The paper finds that, at similar levels of supply concentration, China's share of the United States import market has declined more significantly and broadly than that of other countries. Importantly, the findings indicate that these patterns have been influenced not only by changes in trade policy but also by differences in existing trade policy stances. Moreover, once trade policy is taken into account, the results of this paper do not find geographic proximity or geopolitical alignment to be important factors for supply diversification. Concerning China's declining share in the United States market, our study highlights heterogeneous diversification across sectors driven by trade policy changes and industry characteristics. In addition, our study finds that import diversification strategies become significantly more challenging when supply is already highly concentrated. Regarding trade diversion effects, the analysis shows that these effects are primarily related to existing trade policies and economic competitiveness. Specifically, lower tariffs attract more trade, and trade patterns have been relatively more beneficial for countries within the United States-

[3] Moreover, a significant amount of literature has focused on the impact of tariffs on the domestic economies of the United States and China (Amiti et al., 2019; Cavallo et al., 2021; Chor and Li, 2024; Fajgelbaum et al. 2020; Flaaen et al., 2020).

Mexico-Canada Agreement (USMCA), suggesting the broader impact of regional trade agreements beyond tariff reductions. Additionally, countries that were already competitive exporters were more likely to benefit from the United States' import diversification. Overall, these results suggest that broader geopolitical tensions have limited trade effects when not supported by changes in tariffs or trade-related policy measures.

This paper relates to several recent studies, and its results are generally consistent with their findings. In particular, Freund et al. (2023) follow a similar approach, finding that the growth of United States imports from China was slower than from other suppliers, an effect directly linked to United States tariffs. They also find that countries replacing China as United States suppliers are primarily large developing countries with revealed comparative advantages in specific products and connections to China's supply chain. Another paper pursuing a similar analysis is Dang et al. (2023), which finds evidence of trade diversion in various industries and products, including those not targeted by United States tariffs on China. They link trade diversion effects to comparative advantage while also identifying co-location effects among related products. A paper substantially broader in scope is Alfaro and Chor (2023), which provides a more comprehensive analysis of the evolution of global value chains, particularly focusing on the relationship between China and the United States. They find trade diversion effects benefiting low-wage locations and regional trade partners, particularly Mexico. These results align with expected dynamics in the functioning of global value chains (Antràs and Chor, 2022) and are supported by the argument that one way for firms to mediate rising costs from trade policy changes is by altering supply and demand locations and switching supply-chain partners (Gereffi et al., 2021).

The remainder of this paper is as follows: Section 2 describes the data and provides some definitions. Section 3 presents descriptive statistics on United States import diversification patterns between 2017 and 2022. Section 4 uses econometric methods to provide estimates on the patterns and determinants of United States import diversification. Section 5 identifies countries that have benefited from trade diversion effects and explores some of the determinants of such gains. Section 6 concludes.

2. Data and definitions

The data used in the analysis of this paper comes from various sources. Macroeconomic variables are obtained from the UNCTADStat database. Trade statistics are sourced from the COMTRADE database maintained by the United Nations Statistical Division. Tariff data is from the UNCTAD TRAINS database. Data on trade agreements originates from the Regional Trade Agreements Database (Egger and Larch, 2008). The data used to identify the products affected by additional tariffs under the various lists of Section 301 is taken from Bown (2022).[4]

The analysis covers the period from 2017 to 2022, with data at the 6-digit level of the HS (Harmonized System) nomenclature (2017 edition). To avoid potential biases introduced by trivial trade flows, products whose total United States imports were below US$ 10 million were excluded.[5] The dataset used in this paper consists of approximately 4,700 HS 6-digit products imported by the United States from 192 countries. For the analysis, the data is aggregated into fourteen sectors. HS 6-digit products are grouped into four critical sectors and ten non-critical sectors. Critical sectors (critical minerals, ICT, energy, and public health) contain only products defined as critical in the United States Government Executive Order 14017 of February 24, 2021, "Executive Order on America's Supply Chains.[6]" The non-critical sectors (referred to as "other sectors") consist of products that are not on the United States list of critical products and are grouped into ten broad sectors based on the SITC classification.

The analysis employs the concepts of nearshoring, which refers to greater reliance on geographically closer suppliers, and geopolitical alignment, indicating increased sourcing of imports from countries with a similar geopolitical stance. Nearshoring is quantified by changes in the average geographical distance

[4] We aggregated this data at the HS 6-digit level. While additional tariffs on China's imports were introduced at HS 8-digit level, it was often the case that all or the majority of HS 8-digit products under an HS 6-digit heading were subject to additional tariffs. In a few cases, a HS 6-digit line contains products that have been subject to diverse additional tariffs and/or products that do not face any additional tariffs. In such cases, we calculated the average across tariff lines and assigned it to the closer category.

[5] We further exclude from our analysis fossil fuels (identified by HS 2-digit sector 27) because the particularity of their trade and the little trade between China and the United States.

[6] The executive order can be found at: https://www.whitehouse.gov/briefing-room/presidential-actions/2021/02/24/executive-order-on-americas-supply-chains/. The executive order defines critical sectors at HS 10- or 8-digit level. For our analysis, these data are transformed to HS 6-digit level, where a product at 6-digit level is included in a critical sector if at least one sub-product at 10 or 8-digit level is included in a critical sector. The list of critical products can be found at: https://www.trade.gov/data-visualization/draft-list-critical-supply-chains#:~:text=Executive%20Order%2014017%20of%20February%2024.

of United States suppliers, measured using the CEPII geo distance variable (Mayer and Zignago, 2011). A decrease in the average distance would indicate a nearshoring trend. Geopolitical alignment is based on foreign policy similarity between an importer and its supplier. Data on foreign policy similarity is obtained from the Foreign Policy Similarity (FPSIM) dataset (Häge, 2017)[7]. An increase in the average geopolitical alignment of suppliers signals a shift in the importer's import structure toward countries that share similar global views. The analysis also uses the concepts of revealed comparative advantage (Balassa, 1965) and relative preferential margins (Fugazza and Nicita, 2013). Additionally, product sophistication and unit value data are included. Sophistication is measured by the Product Complexity Index (PRODY) (Hidalgo and Hausmann, 2009), and unit value is defined as the price per unit or kilogram of a product.

Trade dependence between two countries is typically assessed by examining the level of bilateral trade relative to their GDP. However, this measure is not suitable for analyses investigating patterns where trade relationships are defined at the product level. In such cases, trade dependence can be represented by supply concentration. The change in supply concentration can be measured either in absolute terms—the change in the amount of bilateral trade—or in relative terms—the change in bilateral trade as a percentage of total trade, i.e., market share. Throughout this paper, changes in market share are used as a key measure to assess changes in supply concentration. The main benefit of employing changes in market share is that they better align with the paper's objective, particularly when investigating supply diversification trends. Intuitively, the change in reliance on a specific supplier is better conceptualized through changes in market share rather than in the value of the goods supplied. On a practical level, using changes in market share allows for effectively factoring out the scale of trade across various products, which could otherwise complicate the analysis.

When a country heavily relies on a specific supplier, it becomes more vulnerable to supply chain disruptions and unexpected supply shocks. For instance, a product is more subject to supply risks if a single supplier controls 80 per cent of the market, compared to a situation where a number of suppliers account for 80 per cent of the importing country's market. More formally, we define the measure of supply concentration as the market share of country j in the United States' total imports of product p:

$$MS_{j,p} = \frac{imp_{j,p}}{\sum_j imp_{j,p}}$$

A high market share indicates that the United States is overly reliant on country *j* for the supply of product *p*. The change in market share between 2022 and 2017 is calculated as follows:

$$\Delta MS_{j,p} = \frac{imp_{j,p}^{2022}}{\sum_j imp_{j,p}^{2022}} - \frac{imp_{j,p}^{2017}}{\sum_j imp_{j,p}^{2017}},$$

[7] The FPSIM is based on alliance ties and United Nations General Assembly voting patterns.

A negative change suggests that the importance of country *j* as a supplier of product *p* to the United States has decreased, while a positive change indicates increased reliance on a specific supplier, hence an increase in supply concentration.

Additionally, the analysis considers import concentration among suppliers, measured by the Herfindahl-Hirschman index: $\sum_j \left(\frac{imp_{j,p}}{\sum_j imp_{j,p}}\right)^2$.

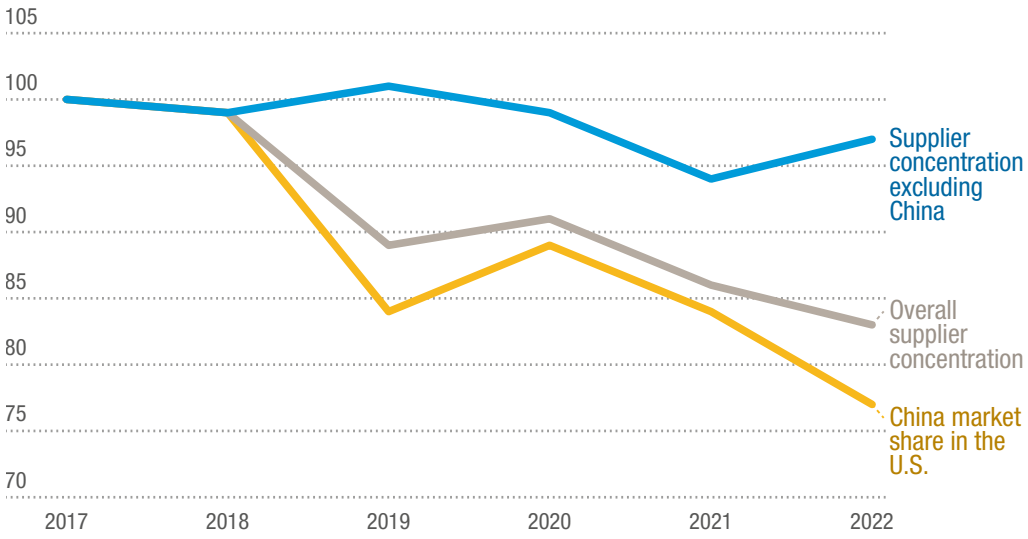
3. Descriptive statistics

This section first provides descriptive statistics illustrating the import diversification trends for the United States between 2017 and 2022. It then presents sectoral trends and explores possible determinants for import diversification patterns. Special attention is given to supply diversification trends from China, which experienced the largest trade policy changes during this period.

3.1 United States import diversification

Between 2017 and 2022, United States imports became more diversified across suppliers. This is evidenced by the overall decline in the United States' import concentration index, which fell by more than 15 per cent during this period (Figure 1). Most of this change was driven by a reduction in China's share of the United States import market. China's overall market share in the United States declined by more than 20 per cent relative to its 2017 level. In contrast, the concentration of United States suppliers, excluding China, declined significantly less. Overall, while the reduction in China's market share was the primary driver of the United States' supplier diversification, some diversification patterns also emerged concerning non-China suppliers.

Figure 1.
United States supplier concentration



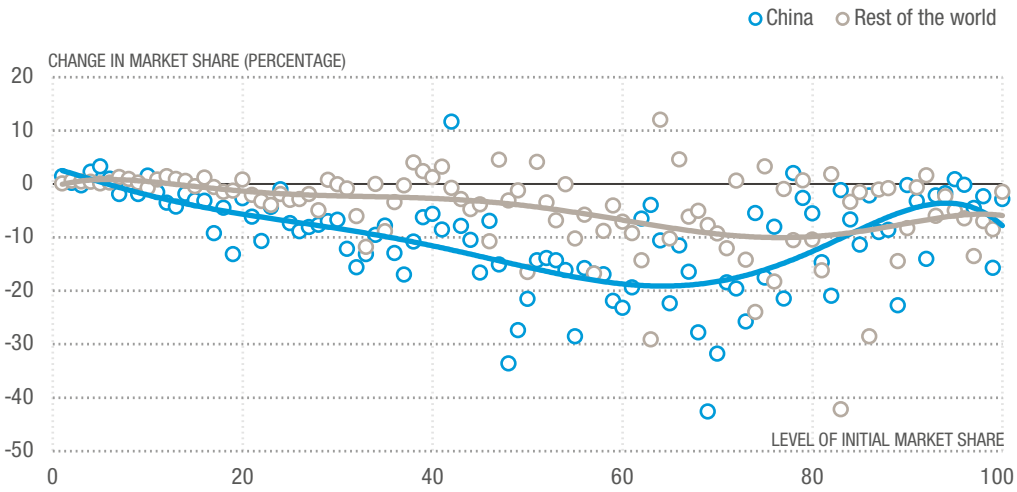
Source: Authors' calculations.

Note: Import concentration is calculated using the Herfindahl-Hirschman index. All variables are standardized relative to their 2017 level (2017=100).

Figure 2 shows the product-level change in market shares between 2017 and 2022 for China and other countries worldwide. These series are plotted against the initial level of country market share in 2017.[8] The figure reveals that the United States' import market shares generally declined for both China and other countries. However, the change in China's market share relative to that of other countries varied depending on the initial market share. Importantly, the decline in China's market share was more widespread, including products where China initially held a relatively low market share. For instance, the United States' exposure to Chinese supply in products where China initially held a market share of about 40 per cent saw a reduction of roughly 10 percentage points, whereas the reduction in supply from the rest of the world at this level of market share was significantly smaller.

More broadly, while China's market share declined even when its initial share was relatively low, meaningful reductions in market shares from other countries only occurred when initial shares exceeded 50 per cent. Moreover, the peak reduction in market share for China occurred when its initial market share was between 50 and 70 per cent, whereas for other countries, it peaked at a much higher level—closer to 80 per cent. Finally, reductions in market share, both for China and other countries, were substantially smaller when initial market shares were at their highest, suggesting a lack of suitable alternative suppliers.

Figure 2.
Changes in market shares of China and other countries, by initial level of market share, 2017-2022



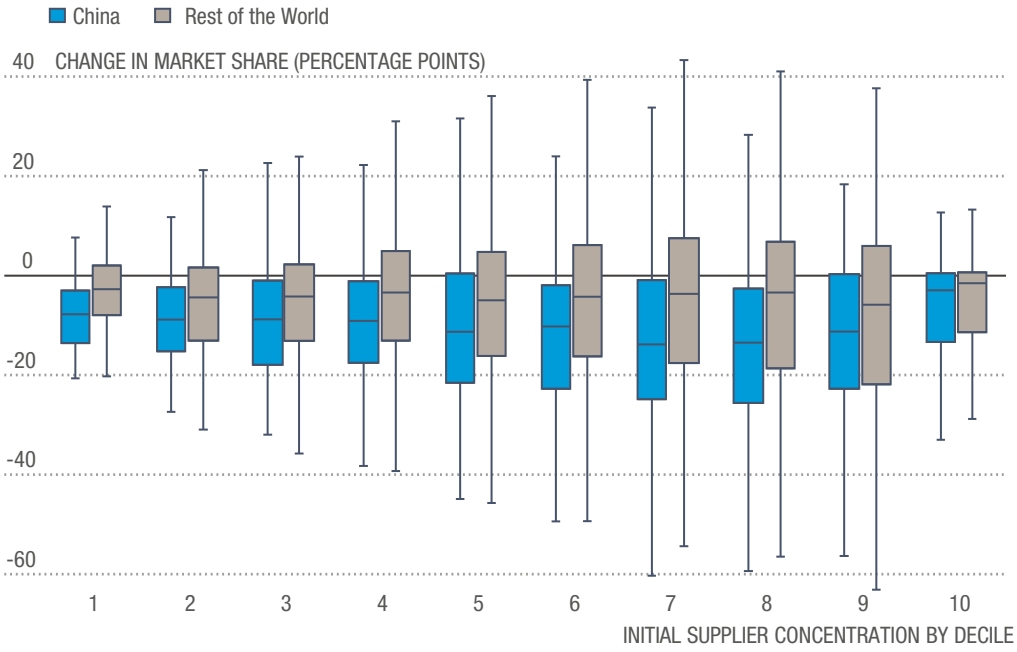
Source: Authors' calculations.

Note: The average is taken across 6-digit products, weighted by the 2017 levels of United States imports. Smoothing is done using a bandwidth filter.

[8] Each dot represents weighted average change in market share for the initial level of the market share. For China, the average is taken across 6-digit products, weighted by the 2017 levels of the United States import. For Rest of the World, it is taken across products and countries in a similar manner. Changes for China and the rest of the world do not sum up to zero because this is an average across hs6 codes and not the total changes in market shares. The lines represent smoothed trends using a bandwidth filter.

To further explore whether supply diversification from China was disproportionate compared to other countries, we focus specifically on products with market shares larger than 25 per cent.[9] Figures 3 and 4 present the results. Figure 3 illustrates the relationship between changes in market share and supplier concentration. Unsurprisingly, the figure reveals that supply diversification has been less prevalent at lower and middle levels of supplier concentration than at higher levels. This finding holds true for changes in market share from both China and other countries, on average and at the median. Moreover, the interquartile range of the distribution of market share changes is strictly negative for China across most concentration levels, whereas for the rest of the world, it consistently includes zero. In summary, Figure 3 indicates that the United States' supply diversification from China was relatively more pronounced than from other countries, even when considering supplier concentration levels.

Figure 3.
Changes in market shares of China and other countries, by initial level of supplier concentration, 2017-2022



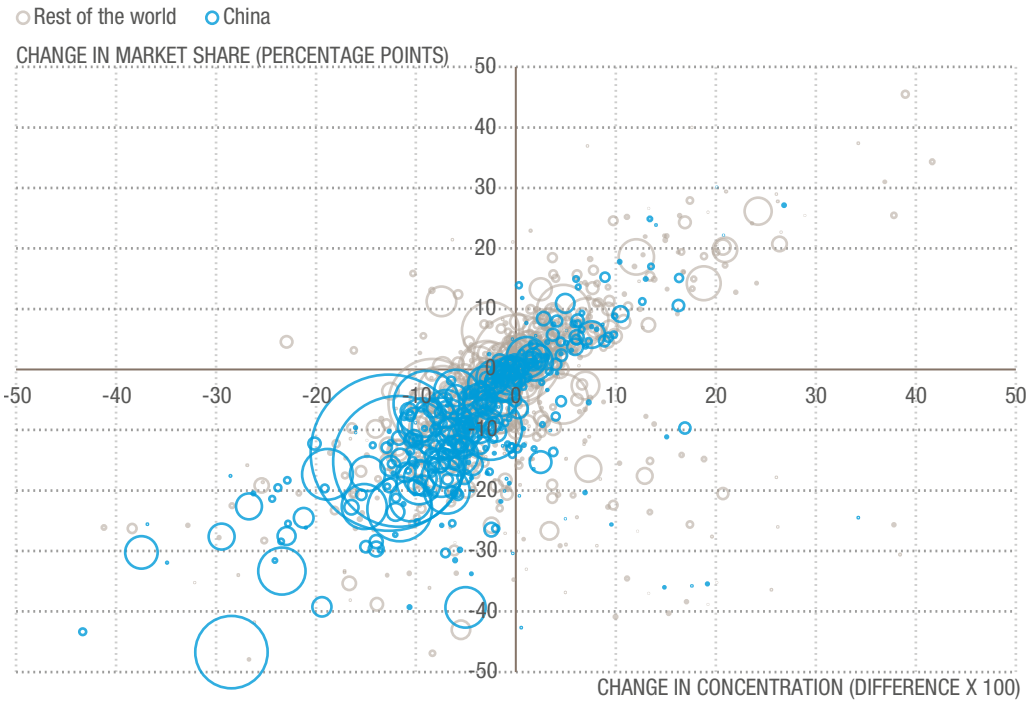
Source: Authors' calculations.

Figure 4 further refines the analysis by examining product-level diversification patterns. Specifically, it plots changes in the share of China (orange) and other countries (blue) in the United States' market across products against changes in the United States' import concentration in those products, as measured by the Herfindahl-Hirschman index. Approximately 80 per cent of the products that

[9] This corresponds to China's average of non-zero market shares in 2017. There is at least some degree of import diversification for both China and rest of the world countries for initial market shares in this range.

China exported to the United States experienced a decline in their market share, compared to 60 per cent for other countries (products in the lower quadrants). More importantly, Figure 4 shows that the products the United States imported from China were mostly located in the bottom-left quadrant, indicating that the increase in the United States' overall import diversification (as measured by a decline in the Herfindahl-Hirschman index) was generally associated with a reduction in China's market share. Additionally, Figure 4 demonstrates that increases in the Herfindahl-Hirschman index observed in some products primarily resulted from gains in market share by countries other than China (upper-right quadrant). Overall, Figure 4 suggests that the United States' import diversification was largely driven by lower sourcing of imports from China.

Figure 4.
Change in market share and change in import concentration across products, 2017-2022



Source: Authors' calculations.

Note: Products are aggregated at the HS 4-digit level for improved readability. Circle sizes are proportional to import values.

The descriptive statistics presented above indicate that from 2017 to 2022, the United States experienced stronger import diversification in relation to China compared to other countries. These patterns do not appear to be necessarily driven by the initial market share or the concentration level of suppliers in specific products. Even for products where China had relatively high initial market shares, supply diversification from non-China suppliers was less common and less often associated with a decline in supply concentration. We will further investigate these preliminary results in the econometric section, as it is possible that these diversification trends are influenced by other factors, such as import composition and sectoral characteristics.

3.2 Determinants of the decline in China's share of the United States market

This section presents statistics on the patterns of the decline in China's share of the United States market, first at the sectoral level and then according to potential determinants.

In 2017, the United States total merchandise imports, excluding fuels, were valued at approximately US$ 2.1 trillion, with nearly one-fourth originating from China. By 2022, United States merchandise imports stood at about US$ 2.9 trillion, with China contributing less than 20 per cent. While the value of United States imports from China continued to rise between 2017 and 2022, China's exports lost more than 5 percentage points in terms of market share in the United States. Beyond these averages, the decline in China's share varied across sectors. To illustrate these patterns, we divided United States imports into 14 sectors. Four sectors consist of products identified by United States Government Executive Order 14017 as critical to the policy objective of strengthening the resilience of United States supply chains, while the remaining products are categorized into ten sectors as described in Section 2.

Table 1.
Changes in China's market share in the United States by sector

	Level in 2017		Change between 2022 and 2017			
	Total US import US$ billion	China market share per cent	China market share percetage points	Total US import per cent	Import from China per cent	HH index Δx100
Total	**2100**	**25**	**-5.4**	**39**	**9**	**-2.3**
Critical sectors	669	29	-8.5	49	4	-3.6
Critical Minerals	28	7	-0.9	48	29	1.8
Energy	133	20	-2,4	62	43	-1.7
ICT	312	44	-16.5	32	-17	-9.6
Public Health	196	13	1.1	65	79	0.3
Other sectors	1430	23	-4.0	35	12	-1.8
Agri-food	160	5	-2.0	58	-7	1.0
Chemicals and Pharmaceuticals	66	10	-0.1	67	65	-0.6
Machinery	246	22	-5.0	36	5	-1.8
Metals	99	23	-3.4	51	29	-1.0
Non-Critical ICT	75	69	-4.9	21	12	-4.9
Other Manufacturing	233	44	-9.9	51	17	-7.2
Precision Instruments	33	21	-3.2	29	9	-0.9
Textile and Apparel	135	39	-11.6	31	-9	-5.7
Transportation	324	5	1.0	9	30	0.6
Other, including Energy	60	12	-2.4	20	-5	0.1

Note: Data excludes fossil fuels (HS 27).

Table 1 shows that changes in China's market share in the United States have been broad-based across economic sectors—it declined in all sectors except for critical public health and transportation. In most sectors, the decline in China's market share was associated with a decrease in the Herfindahl-Hirschman concentration index. Overall, products identified as critical by the United States experienced a relatively higher decline in China's market share, but this result is predominantly

driven by critical products in Information and Communication technology (ICT). Notably, China's decline in market share has been most pronounced in the critical ICT and textiles and apparel sectors, where the dollar value of United States imports from China also decreased between 2017 and 2022. Conversely, the decline in China's market share has been substantially below average in agri-food and chemicals, as well as in critical sectors apart from critical ICT. However, China's loss in the agri-food sector, while below average, was still substantial in relative terms, as China's market share in this sector dropped from 5 to 3 per cent. Considering China's initial level of market share, it managed to maintain a dominant presence in the United States market only in the non-critical ICT sector.

We now illustrate whether China's market shares declined based on three product-specific factors: additional tariffs imposed by the United States on Chinese imports in 2018 and 2019, the product's degree of sophistication, measured by the PRODY index, and the value of a product relative to its weight.[10] The latter two variables examine whether the process of supply diversification was more challenging for products that are more difficult to replace due to having greater variety (i.e., highly sophisticated, more heterogeneous products) or for goods that require significant trade infrastructure that may not be readily available elsewhere (i.e., low-cost, high-weight goods).

Table 2.
Change in China's market share in the United States import across broad product groups

	Level in 2017		Change between 2022 and 2017		
	Total US import US$ billion	China market share per cent	China market share percetage points	Total US import per cent	Import from China per cent
No change in tariff	206	25	-0.2	63	61
Tariff 7.5 per cent	1030	26	-3.8	35	15
Tariff 25 per cent	1070	18	-7.3	43	-14
Low sophistication	494	50	-8.3	35	12
Mid sophistication	1260	19	-5.8	42	-1
High sophistication	548	6	0.4	45	56
Low unit value	436	9	-2.6	52	9
Mid unit value	688	32	-5.2	45	21
High unit value	1020	25	-6.2	31	-2

Source: Authors' calculations.

Note: The level of sophistication is measured by the Product Complexity Index (PRODY). Unit value is a price per unit or kg of a product. Variables are split between low, middle, and high categories according to the percentile of their respective distributions. Below 25th percentile is low, between 25th and 75th is middle, and above 75th percentile is high.

[10] Another relevant variable could be the degree of substitutability across countries for the same product, estimated by Broda and Weinstein (2006), because the market share decline could be larger for products which are easier to substitute from other suppliers. However, in our sample change in China's market share does not show a clear pattern with respect to this variable, and in regression analysis—while having the expected positive sign—it is at best borderline significant. The results are available from the authors upon request.

The results are presented in Table 2. In general, China's market share decreased significantly more in products that were targeted with additional tariffs by the United States. Specifically, China's market share dropped by approximately 4 percentage points for products facing a tariff increase of 7.5 per cent and by 7 percentage points for products subject to an additional tariff of 25 per cent. In the latter group, the value of imports from China also declined. Conversely, for products not subjected to additional tariffs, there was virtually no change in China's market share.

Turning to product sophistication, Table 2 reveals that China managed to maintain its market share as a supplier of sophisticated products to the United States. However, it lost market share for less sophisticated products. This outcome is likely driven by two factors. First, high-sophistication products, such as microelectronics, pharmaceuticals, medical equipment, and advanced telecommunications equipment, tend to exhibit greater heterogeneity and require high levels of embedded knowledge, making them potentially more challenging to substitute with alternative suppliers.[11] Second, low-sophistication products, such as textiles and apparel, basic household goods, and low-end electronics, in addition to being generally more homogeneous, typically represent areas where China's comparative advantage has eroded compared to suppliers from other developing economies.

The final variable presented in Table 2 captures whether changes in China's share of the United States market could depend on logistical infrastructure. This variable aims to capture different supply diversification trends for industries where shipping costs or space constraints are more relevant factors. The rationale is that it might be easier for the United States to find alternative suppliers for products that do not require or rely on the existing logistics that China has already established (e.g., shipping and port infrastructure). The general argument is that it may be easier in logistical terms to move production for high-price, low-volume goods (e.g., semiconductors) than for low-price, high-volume goods (e.g., furniture). The statistics in Table 2 seem to confirm this hypothesis, as China's market share declined more in high-value, low-volume products, suggesting the relevance of logistics costs for supply diversification strategies.

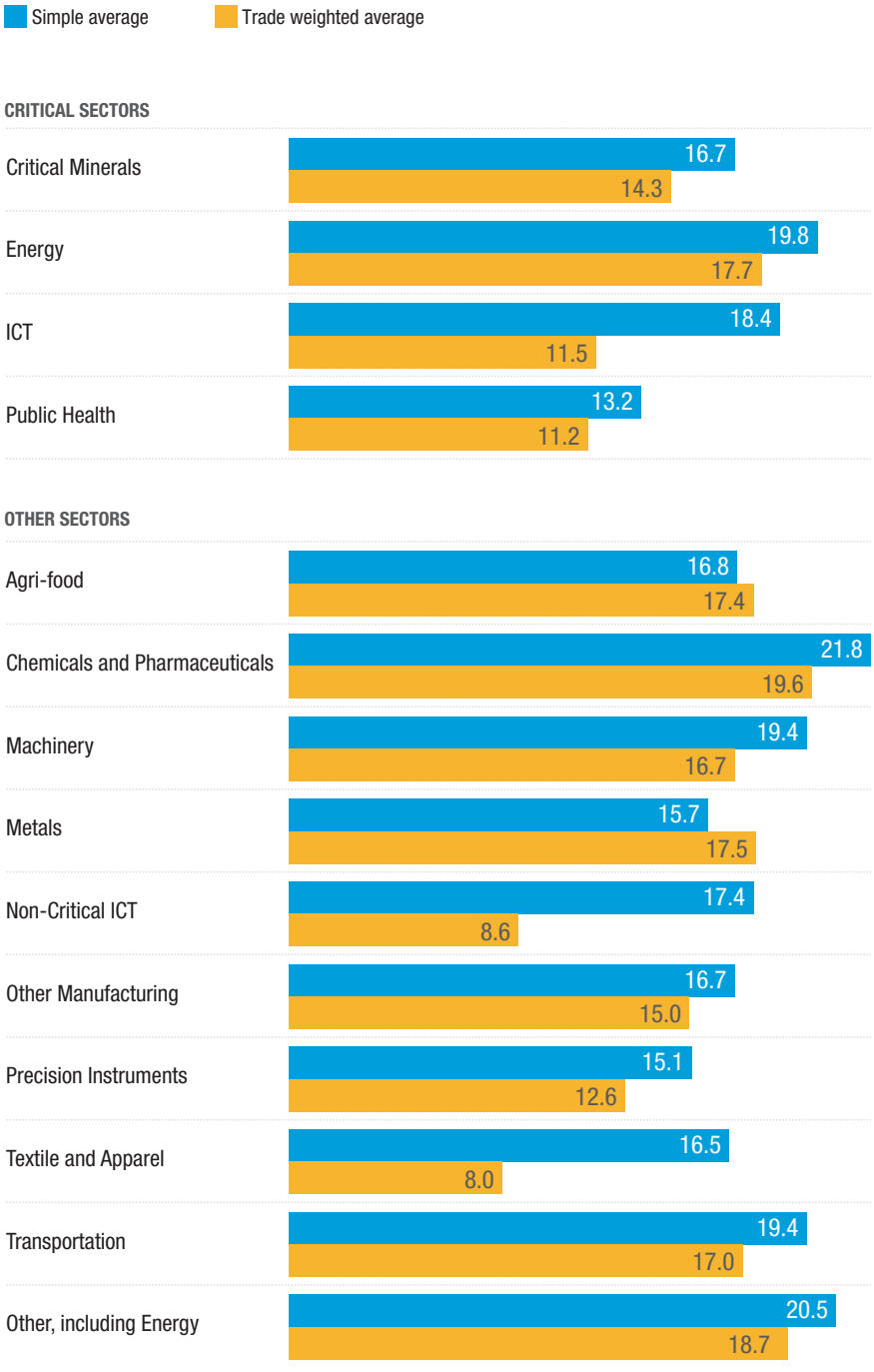
Overall, the statistics in Table 2 suggest that the decline in China's share of the United States market was largely driven by the introduction of tariffs, and that it was more prominent for low-sophistication goods as well as for high-value, low-volume products. While these results are captivating, the econometric analysis will assess the relative importance of these factors while also controlling for sector-specific characteristics and the initial market share.

As United States supply diversification from China was largely associated with increases in tariffs, a relevant question is whether tariff increases were relatively higher for products defined as critical in the United States Government Executive Order 14017. This would suggest the use of tariffs as an instrument for incentivizing

[11] Atkin et al. (2021) present evidence that exports in more complex sectors have been facing more foreign competition, not less. In our analysis we use sophistication not as a measure of product competitiveness, but as a measure of product heterogeneity, assuming more sophisticated products have more varieties and therefore are less substitutable.

supply diversification. Figure 5 shows that additional tariffs were not very different between critical and non-critical sectors, averaging between about 10 and 20 per cent depending on the aggregation scheme. Differences between critical and non-critical sectors are more formally explored in the econometric section, controlling for additional tariff changes in different sectors.

Figure 5.
Average additional tariff by sector, per cent



Source: Authors' calculations.

4. Econometric analysis

The econometric analysis in this section includes two components. First, following the arguments of Section 3.1, Section 4.1 provides an econometric analysis of whether the United States' import diversification patterns between 2017 and 2022 are similar across countries. The analysis examines country characteristics that could explain the varying declines in market shares. However, this set of regressions does not explore product-level characteristics, as the sample is restricted to products where initial market shares were relatively high. Section 4.2 focuses specifically on trade with China and analyzes product-level characteristics to explain the observed patterns.

4.1. United States' import diversification across countries

The following regression model is used to study United States import diversification patterns across countries, with a focus on whether supply diversification from China has been different from other countries:

$$\Delta MS_{j,p} = \alpha_s + \beta_1 CHN + \beta_2 geopol_j + \beta_3 \ln(dist_j) + \beta_4 USMCA + \beta_5 RTA_j + \beta_6 tar_{j,p} + \beta_7 imp\_share_{j,p} + \varepsilon_{jp}, \quad (1)$$

where $\Delta MS_{j,p}$ is the change in market share of country *j* in product *p* between 2022 and 2017.[12] Geopolitical alignment is measured by ($geopol_j$) and nearshoring is measured by ($dist_j$) as defined in Section 2. Trade policy is captured by a dummy variable for the existence of a regional trade agreement between the United States and country (RTA_j),[13] a dummy variable for USMCA, and a variable capturing the level of tariffs applied by the United States on the import of product *p* from country *j*

[12] Throughout the analysis we use the change in market share between 2022 and 2017 in percentage points as our dependent variable. This definition makes changes larger for high market shares, as those potentially can decrease more. Defining the dependent variable in terms of proportional change in per cent could strengthen the results by magnifying changes for low initial market shares. Generally, the results are qualitatively similar if the dependent variable is defined as the proportional change in the market share in per cent, instead of change in market share in percentage points, and therefore are not presented.

[13] RTAs follows WTO definition and includes any reciprocal trade agreement between two or more partners, not necessarily belonging to the same geographic region.

in 2017 ($tar_{j,p}$). Equation (1) also controls for the initial level of market share in 2017 ($imp\_share_{CHN,p}$). Finally, a dummy indicates whether the imports originate from China (CHN). The estimation employs fixed effects to control for sector-specific characteristics (α_s). The error term is denoted by ε_{jp}.

To limit the presence of outliers and to make the interpretation of the estimates more meaningful, we restrict the observations to relatively high levels of suppliers' market share and concentration. Specifically, observations where the market share is below 25 per cent and where the concentration of suppliers is less than 0.2 are omitted.[14] This restriction help avoid explaining supply diversification patterns in cases where market share is not a concern or where supply concentration is low or non-existent. Overall, the dataset used for this estimation contains 3,425 bilateral trade relationships of the United States, of which 1,109 involve China.

Table 3 presents the results of the estimation of Equation (1). Specification 1 shows that trade flows where supply concentration was high in 2017 experienced a larger decline in market share in 2022. This is reflected in an average decline in market share of about 12 per cent for China and about 5.7 per cent for suppliers from the rest of the world. This is a simple average decrease across all exporter-product trade flows in the sample. Specification 2 introduces distance and geopolitical alignment, showing that, apart from China, United States supply diversification patterns were smaller for geographically closer countries and for countries less geopolitically aligned with the United States. Specification 3 adds the initial level of tariffs in 2017, showing that supply diversification from countries facing higher tariffs was significantly more pronounced. Specification 4 introduces a dummy variable for the USMCA and another for general regional trade agreements (RTAs). The results indicate no significant effects for general RTAs in explaining supply diversification patterns beyond those already captured by the tariff level, but there was a significantly lower supply diversification from USMCA countries. Notably, the distance variable turns positive in Specification 4, indicating that the nearshoring effects found in Specification 2 primarily benefited Mexico and Canada. Moreover, the geopolitical alignment variable becomes insignificant, suggesting that once accounting for RTAs, supply diversification strategies have not been significantly influenced by geopolitical alignments. Finally, Specification 5 includes the initial market share as an additional control, with no significant changes in the coefficients of the variables of interest.

The last two specifications of Table 3 build on Specification 5 to explore supply diversification patterns across different levels of initial market share. 6 retains only the observations with market shares between 25 and 75 per cent, while specification 7 retains those above 75 per cent. Overall, specification 6 confirms the results of specification 5. Specification 7 shows that there was little supply diversification in products where a single country supplied more than 75 per cent of United States imports, which supports the trend shown in Figure 2.

[14] The cut off for the market share of 25 per cent corresponds to China's average of non-zero market shares in 2017. We also drop the bottom quartile of the concentration distribution in 2017, corresponding to concentration indices of less and 0.2.

Table 3.
Import diversification for high concentration products and high market shares

Dependent variable: change in market share between 2017 and 2022 for products, where market share in 2017 exceeded 25 per cent and concetration of suppliers exceeded 0.2

	(1)	(2)	(3)	(4)	(5)	(6) MS<75 per cent	(7) MS>75 per cent
CHN	-0.063***	-0.073***	-0.063***	-0.051***	-0.034***	-0.048***	0.056
	(0.007)	(0.009)	(0.010)	(0.010)	(0.011)	(0.011)	(0.038)
geopol		-0.061***	-0.060***	-0.005	-0.007	-0.022	0.062
		(0.018)	(0.018)	(0.023)	(0.023)	(0.023)	(0.090)
ln(dist)		-0.017***	-0.017***	0.020*	0.013	0.011	0.026
		(0.005)	(0.005)	(0.010)	(0.010)	(0.010)	(0.038)
tar			-0.002***	-0.002***	-0.003***	-0.002**	-0.005
			(0.001)	(0.001)	(0.001)	(0.001)	(0.004)
USMCA				0.066***	0.063***	0.061***	0.064
				(0.024)	(0.023)	(0.023)	(0.091)
RTA				0.009	0.009	0.010	0.022
				(0.016)	(0.015)	(0.015)	(0.062)
imp_share					-0.135***	-0.191***	0.157
					(0.017)	(0.024)	(0.120)
Constant	-0.057***	0.103**	0.101**	-0.251**	-0.125	-0.078	-0.520
	(0.004)	(0.042)	(0.042)	(0.100)	(0.097)	(0.098)	(0.374)
Observations	3,425	3,425	3,425	3,425	3,425	2,903	522
R-squared	0.035	0.039	0.041	0.046	0.066	0.078	0.081

Note: MS stands for market share. All specifications include sectoral fixed effects based on the sectors presented in Table 1. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Overall, the results of this section highlight several key findings: 1) The United States' import diversification away from China has been more significant in both magnitude and scope compared to that from other countries. 2) Geopolitical alignment with the United States does not appear to have significantly influenced import diversification from other countries. 3) Import diversification patterns generally did not favour geographically closer countries. 4) Trade policy is associated with the United States' supply diversification patterns, with the initial level of tariffs being positively correlated with a reduction in market share. In a similar vein, USMCA countries' loss in market share has been relatively lower.

4.2 Factors contributing to China's declining share in the United States' market

This section investigates the factors explaining changes in market shares across products exported by China to the United States. The identification strategy relies on the heterogeneity of changes in market shares across 3,420 HS 6-digit product categories in which the United States imports from China are non-zero. The regression equation is as follows:

$$\Delta MS_{CHN,p} = \alpha_s + \beta_1 tar_{CHN,p} + \beta_2 T1_{CHN,p} + \beta_3 T2_{CHN,p} + \beta_4 \ln(uv_{CHN,p}) + \beta_5 \ln(prody_{CHN,p}) + \beta_6 imp\_share_{CHN,p} + \beta_7 imp\_share^2_{CHN,p} + \varepsilon_p, \quad (2)$$

where $tar_{CHN,p}$ is the level of tariffs on China's products in 2017. Two dummy variables denote the products subject to additional tariffs under the United States Section 301. In particular, $T1_{CHN,p}$ identifies the products subject to an additional 7.5 per cent tariffs and $T2_{CHN,p}$ denotes the products subject to an additional 25 per cent tariff. The level of sophistication of the product is captured by $prody_{CHN,p}$ as defined in Section 2. Variable $uv_{CHN,p}$ is unit value per unit or kg, capturing high-cost, low volume products. This specification controls for sectoral fixed effects and the initial market share of China in the United States, $imp\_share_{CHN,p}$, which captures China's pre-existing competitiveness in the United States' market.[15]

Table 4 presents the results of the estimation of Equation (2). Specification 1 shows that the initial level of tariffs and the additional tariffs imposed by the United States on Chinese goods in 2018 and 2019 were significant factors affecting the differences in the decline in China's share of the United States market across products. Specifically, China's loss in market share was approximately 3 percentage points higher for products subjected to an additional 7.5 per cent tariff and around 7 percentage points higher for products that faced an additional 25 per cent tariff.

Specification 2 introduces the level of sophistication of the products and the unit value, capturing high-value, low-volume products. The findings suggest that more sophisticated products experience lower declines in market share. On the other hand, there appears to be no significant difference in changes in market share for high-value, low-volume goods. These two latter effects are reversed in Specification 3, which controls for China's initial market share. Lastly, Specification 4 adds the initial market share in squared terms to reiterate the finding that the decline in China's share of the United States market was less pronounced for products where China was the largest supplier.

To test whether declines in market shares were larger for products defined as critical by the United States, we estimate Specification 4 of Table 4 by adding dummy variables identifying critical products. The results are presented in Table 5. In this set of regressions, we do not include SITC sector-specific fixed effects because they are largely collinear with the critical sector groupings; instead, we use HS 2-digit fixed effects.[16] We omit the coefficients of the variables from Table 4 in the presentation, as they remain generally unchanged.

[15] The empirical analysis uses market shares based on import values rather than quantities. However, the changes in the two variables should be similar because we use the value of imports before tariffs (CIF), which can be interpreted as the quantity imported multiplied by the border price. Previous literature (Amiti et al., 2019; Cavallo et al., 2021) found that tariffs have been internalized by importers, and therefore the United States' border prices did not change. Under the assumption that tariffs have been passed on to domestic prices, the change in import values is equal to the change in quantities. By contrast, if tariffs were to be borne by exporters, observed import values would decrease (i.e. China would respond to the tariff by reducing its price to maintain market share), and therefore the decline in quantities would have been larger than that in values.

[16] Results are similar when controlling for HS 1-digit fixed effects.

Table 4.
Factors contributing to China's declining share in the United States' market, all market shares

Dependent variable: change in market share of China between 2017 and 2022 for all products

	(1)	(2)	(3)	(4)
tar	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
T1	-0.031**	-0.029**	-0.026**	-0.030**
	(0.012)	(0.012)	(0.012)	(0.012)
T2	-0.043***	-0.047***	-0.058***	-0.053***
	(0.005)	(0.005)	(0.005)	(0.005)
ln(uv)		-0.001	-0.003***	-0.004***
		(0.001)	(0.001)	(0.001)
ln(prody)		0.046***	0.002	0.003
		(0.006)	(0.006)	(0.006)
imp_share			-0.217***	-0.438***
			(0.012)	(0.028)
imp_share^2				0.289***
				(0.037)
Constant	0.010	-0.456***	0.059	0.070
	(0.011)	(0.066)	(0.063)	(0.062)
Observations	3,420	3,420	3,420	3,420
R-squared	0.091	0.107	0.257	0.277

Note: All specifications include sectoral fixed effects based on the sectors presented in Table 1. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5.
Factors contributing to China's declining share in the United States' market, critical sectors

Dependent variable: change in market share of China between 2017 and 2022 for all products

	(1)	(2)	(3)	(4)
critical sector	0.018***	0.009*		
	(0.005)	(0.006)		
minerals			0.008	0.004
			(0.013)	(0.015)
ict			-0.020*	-0.035***
			(0.011)	(0.012)
energy			0.017**	0.009
			(0.007)	(0.007)
public health			0.045***	0.041***
			(0.010)	(0.010)
Constant	-0.060	0.099	-0.057	0.102
	(0.055)	(0.067)	(0.054)	(0.067)
Observations	3,420	3,420	3,420	3,420
R-squared	0.255	0.317	0.261	0.323
Fixed Effect	.	HS2	.	HS2

Note: Coefficients on policy variables are not reported as their significance is qualitatively similar to Table 4. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

The first result from Table 5 indicates that the reduction in China's market share was relatively less pronounced in the products identified as critical by the United States Government Executive Order 14017 (Specification 1). However, this finding is close to losing statistical significance when considering HS 2-digit fixed effects, meaning that there has been no pronounced difference in changes in market shares between critical and non-critical products within an industry, at least on average (Specification 2).[17]

A more detailed examination of critical products across the four critical sectors reveals that supply diversification was primarily associated with the information and communication technology (ICT) sector (Specification 3). In contrast, China's market share in the United States increased for critical products in the energy and public health sectors. Critical minerals, however, did not exhibit significant deviations from average levels. Specification 4 introduces industry controls and corroborates the results of Specification 3, except for critical energy products, where the effect loses significance. This suggests that, within the energy industry, the change in market share for critical products did not significantly differ from that for non-critical products.

While all specifications in Table 5 control for trade policy changes, thus capturing the fact that the level of tariff increases can differ across various critical sectors, supply diversification for the ICT sector might be explained by other factors at play. In particular, trade in the ICT sector between the United States and China has been subject to trade policies not captured by tariffs (Bown, 2020), which could also partially drive the result.[18] Another reason for higher supply diversification in ICT could be the anticipation of potential future policy changes, as suggested by Pierce and Yu (2023).[19]

In summary, the decline in China's share of the United States market across products has been primarily driven by trade policy, with higher additional tariffs being associated with larger losses in market share. These results confirm the findings of previous literature, such as Dang, Krishna, and Zhao (2023), Alfaro and Chen (2023), Freund et al. (2023), and Bown (2023). Additionally, this section finds that the initial level of the tariff contributed to explaining part of the decline in Chinese market shares across products. Finally, we find that the decline in market shares in critical sectors largely mirrored those in non-critical sectors, except for critical ICT products, where declines in market shares were significantly higher.

[17] Freund et al. (2023) also study whether import growth was slower in critical products, however, their analysis in this aspect focuses solely on products on the tariff list. Here we look at whether changes in China's market share were different for critical products irrespective of whether they were subject to additional tariffs, thus testing whether criticality plays a role by itself.

[18] Garcia-Macia and Goyal (2020) show that such protective policies for the ICT sector can be rationalized by the presence of monopoly rents inherent to technological goods.

[19] Pierce and Yu (2023) suggest that critical sectors may be at higher risk of disruptive policy changes due to their strategic nature. They descriptively show that United States' imports from China is advanced technology products has declined more than in other products, irrespective of whether they were subject to additional tariffs or not. Our paper corroborates this result using a more formal econometric analysis.

5. Trade diversion effects

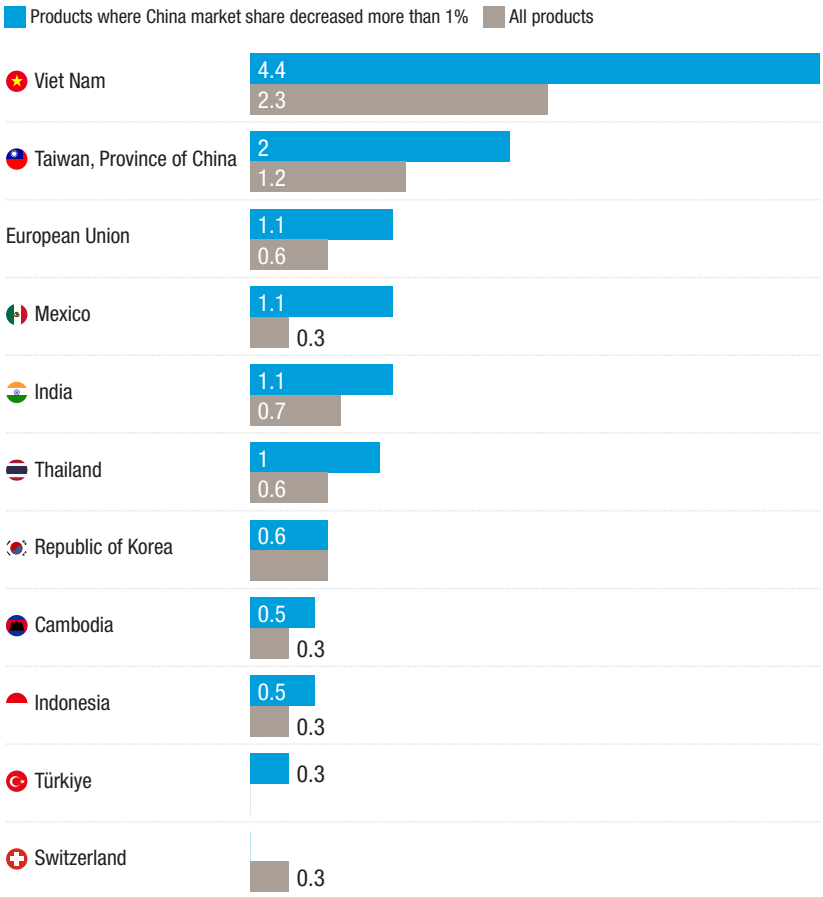
The decline in China's share of the United States market during the 2017-2022 period created notable shifts in the global trade landscape. China's market share declines allowed firms from other countries to seize opportunities and establish a stronger presence in the United States market. This section first presents descriptive statistics on which countries gained market share and in which sectors, then employs econometric methods to identify the determinants of these gains.

5.1 Economies gaining market share in the United States

As we assess trade relationships in relative terms using market share, the decline in China's share of the United States market between 2017 and 2022 must, by definition, be compensated by an increase in other countries' market shares in the United States.

Overall, the 5.4 per cent decline in China's market share in the United States during this period was offset by a relatively small number of countries. For completeness, Figure 6 presents descriptive statistics on the main beneficiary countries. These results confirm the trade diversion effects that have been largely recognized in the previous literature (Dang, Krishna, and Zhao, 2023; Fajgelbaum et al., 2023; Freund et al., 2023; and Alfaro and Chor, 2023). Figure 6 shows the overall changes in market share by country, as well as for products where China's market share has declined by more than one per cent. On aggregate, the economies that gained the most were in Southeast Asia, particularly Viet Nam, but also the European Union, Mexico, and India. Switzerland gained market share in sectors where China's market share did not decline or where the decline was minimal.

Figure 6.
Top 10 beneficiaries of China's declining share in the United States' market, 2017-2022



Source: Authors' calculations.

In most manufacturing sectors, the primary beneficiaries of China's declining market share were economies in Southeast Asia and Mexico. Notably, Viet Nam appears to have been particularly successful in capturing China's market share across multiple sectors. Taiwan, Province of China, Viet Nam and Mexico[20] have been most successful in replacing China's market share in critical ICT products. In the textile and apparel sector, Viet Nam, Bangladesh, and Cambodia saw substantial growth in their market shares in the United States. In the machinery sector, the Republic of Korea, Viet Nam, and Thailand experienced the most significant increases. Switzerland gained market share in precision instruments and other manufacturing sectors. Canada also experienced gains in market share in certain sectors, although generally not in those where China's decline was more pronounced. A similar trend was observed among some European Union

[20] Building a unique industry-level dataset for Mexico, Wang and Hannan (2023) find trade diversion effect on Mexico's exports to the United States related to the latter trade tensions with China in 2018. This effect varies according to tariff increases on Chinese products, the decrease in the United States imports from China, and the degree of substitutability of Mexico's products vis-à-vis China.

economies. This suggests that suppliers from these countries may not have been direct beneficiaries of the decline in China's share of the United States market, and that their gains largely originated from other factors.

Looking beyond averages, countries have gained market shares of varying magnitudes across different sectors. Table 6 identifies the economies that have experienced the largest market share gains in the United States across the 14 sectors utilized in this analysis.

Table 6.
Beneficiaries of China's market share reduction by sector

Change in market share between 2017 ans 2022, percentage points

	China	Largest beneficiary	Top 3 beneficiaries	Economies
Critical sectors	-8.5	2.7	6.3	Viet Nam; Taiwan, Province of China; Republic of Korea
Critical Minerals	-0.9	3.9	6.2	Canada; Bahrain; Mexico
Energy	-2.4	1.8	4.4	Republic of Korea; Viet Nam; Thailand
ICT	-16.5	6.0	13.3	Taiwan, Province of China; Viet Nam; Mexico
Public Health	1.1	1.7	3.5	Ireland; Belgium; The Netherlands
Other sectors	-4.0	2.2	3.6	Viet Nam; India; Switzerland
Agri-food	-2.0	3.4	5.6	Canada; Singapore; Brazil
Chemicals and Pharmaceuticals	-0.1	3.5	5.3	Belgium; Republic of Korea; Russian Federation
Machinery	-5.0	2.5	5.4	Republic of Korea; Viet Nam; Thailand
Metals	-3.4	2.1	4.7	Mexico; Viet Nam; Taiwan, Province of China
Non-Critical ICT	-4.9	10.0	11.9	Viet Nam; India; Israel
Other Manufacturing	-9.9	4.3	7.9	Viet Nam; Switzerland; Cambodia
Precision Instruments	-3.2	3.4	4.8	Switzerland; Viet Nam; Taiwan, Province of China
Textile and Apparel	-11.6	4.5	7.9	Viet Nam; Bangladesh; Cambodia
Transportation	1.0	5.7	8.3	Mexico; Republic of Korea; Slovak Republic
Other, including Energy	-2.4	4.7	7.8	India; Australia; Spain

Source: Authors' calculations.

5.2 Factors determining third countries' gains in the United States market

This section identifies the economic and policy factors that enabled certain countries to capitalize on opportunities created by China's reduced presence in the United States market between 2017 and 2022. Since the focus is on establishing a connection between the decrease in China's market share in the United States and the corresponding gains in market share by other countries, only products where China's market share declined by more than one percentage point are considered. No constraints are placed on the initial market share of countries other than China. This narrows the analysis to 1,924 products, with a total of approximately 178,000 observations.[21]

In formal terms, the regression equation is as follows:

$$\Delta MS_{j,p} = \alpha_s + \beta_1 RCA_{j,p} + \beta_2 I\_similarity_p^{j,CHN} + \beta_3 \ln(GDP_j) + \beta_4 \ln(GDPPC_j) + \\ + \beta_5 \ln(dist_j) + \beta_6 geopol_j + \beta_7 RTA_j + \beta_8 USMCA + \beta_9 RPM_{j,p} + \beta_{10} imp\_share_{j,p} + \varepsilon_{jp}, \\ j \neq CHN \quad (3)$$

[21] The data used in these regressions excludes observations where total exports of a country in a particular product are zero, this controls for the absence of any export capacity at the exporter product level.

Equation (3) seeks to identify some of the economic, policy, and strategic factors that may have enabled certain countries to capitalize on United States reduced imports from China. The first variable that could explain the heterogeneity in the gains is the revealed comparative advantage of country *j* in product *p* ($RCA_{j,p}$). RCA[22] measures a country's international competitiveness in exporting a specific product; therefore, we expect it to be positively correlated with changes in market share, as more competitive countries are likely to be among the most viable alternative suppliers.

The variable $I\_similarity_p^{j,CHN}$ addresses potential product heterogeneity within HS 6-digit lines. It identifies alternative suppliers whose products are more similar to those exported by China, and therefore, have greater substitutability for Chinese products. We expect a positive coefficient for this variable because suppliers with products closely resembling those from China should be better positioned to capture the United States market. Equation (3) also controls for the economic size of the country j potentially replacing China in the United States market, as measured by its GDP (GDP_j), and the level of income, measured by its GDP per capita ($GDPPC_j$). While we expect larger countries to achieve more substantial gains, there is no well-defined a priori expectation regarding the income level of the beneficiaries.

The analysis also seeks to identify whether the countries that gained market share in the United States tend to be geographically closer to the United States or more geopolitically aligned with it. In this regard, the variables in Equation (3) are those discussed in Section 3.1, measuring geopolitical alignment ($geopol_j$) and geographic distance ($dist_j$). Finally, the analysis considers the role of United States trade policy in explaining these patterns. In Equation (3), the United States tariff structure is measured by the Relative Preferential Margin ($RPM_{j,p}$) as referenced in Section 2. The RPM quantifies each country's relative tariff advantage in terms of the United States tariff structure, considering alternative suppliers. A positive RPM indicates a tariff advantage (in percentage points) compared to competitors. We anticipate a positive coefficient for the RPM, as lower relative tariffs should provide an advantage to alternative exporters. Equation (3) also incorporates the United States trade policy stance by adding two categorical variables: one representing the presence of a preferential trade agreement (RTA_j), and another capturing the additional effect resulting from the USMCA. We anticipate a positive coefficient for these terms because RTAs with the United States should confer competitive advantages to countries, particularly concerning costs associated with non-tariff measures.[23]

Table 7 presents the results of Equation (3). We first examine a set of economic explanatory variables in Specification 1. Countries with a revealed comparative advantage in a specific product experienced an increase in market share for that product, as did countries whose export variety was closer to that of China. Notably, larger economies saw higher gains in market share overall, which may be attributed to economies of scale in production. In contrast, gains were relatively lower for countries with high GDP per capita. The larger gains for relatively poorer countries can

[22] RCA is constructed following Balassa (1965).

[23] Notably, by including the RPM, we separate the tariff effects from the trade agreement variable, enabling the RTA and the USMCA variables to specifically capture non-tariff trade-related costs.

be attributed to their tendency to be more price-competitive than relatively wealthier countries, as the former often have lower production costs, particularly labor costs.

Specification 2 explores the importance of geographic proximity and geopolitical alignment and finds that countries that are geographically and geopolitically closer to the United States benefited relatively less. Specification 3 investigates the role of trade policy in explaining the gains and reveals that lower tariffs resulted in larger gains, while the presence of Regional Trade Agreements (RTAs) had a surprisingly negative impact. Finally, USMCA countries benefited more, likely because the USMCA is a comprehensive agreement with additional advantages beyond those provided by tariff preferences.

Specification 4 combines Specifications 1 to 3, showing that most of the variables retain the same significance and magnitude. The only difference is the variable capturing the presence of a general RTA, which becomes insignificant. Specification 5 adds the initial market share as a control, resulting in virtually no changes in the results. Overall, these findings confirm those of Freund et al. (2023) in identifying the factors contributing to trade diversion. However, we find that geopolitical alignment is not a determinant of increases in market shares for third countries, while export similarity to China is.

Table 7.
Factors explaining the trade diversion effects

Dependent variable: change in market share of countries other than China between 2017 and 2022 for products, where China's market share declined by at least 1 percentage point

	(1)	(2)	(3)	(4)	(5)
RCA	0.0009***			0.0009***	0.0013***
	(0.0001)			(0.0001)	(0.0001)
ln(GDP)	0.0009***			0.0006***	0.0009***
	(0.0000)			(0.0000)	(0.0001)
ln(GDPPC)	-0.0008***			-0.0004***	-0.0004***
	(0.0000)			(0.0000)	(0.0000)
l_similarity	0.0015***			0.0011***	0.0014***
	(0.0002)			(0.0002)	(0.0002)
ln(dist)		0.0010***		0.0018***	0.0019***
		(0.0002)		(0.0002)	(0.0002)
geopol		-0.0010***		-0.0021***	-0.0021***
		(0.0002)		(0.0003)	(0.0003)
RTA			-0.0008***	-0.0001	-0.0001
			(0.0002)	(0.0002)	(0.0002)
USMCA			0.0044***	0.0066***	0.0106***
			(0.0010)	(0.0011)	(0.0012)
RPM			0.0003***	0.0002***	0.0002***
			(0.0000)	(0.0000)	(0.0000)
imp_share					-0.0609***
					(0.0098)
Constant	0.0034***	-0.0075***	0.0007***	-0.0161***	-0.0177***
	(0.0003)	(0.0017)	(0.0000)	(0.0015)	(0.0016)
Observations	177,756	177,756	177,756	177,756	177,756
R-squared	0,01	0,001	0,003	0,013	0,022

Note: All specifications include sectoral fixed effects based on the sectors presented in Table 1. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

6. Conclusions

This study examines changes in the United States' import patterns between 2017 and 2022 by looking at three key issues. First, it studies United States import diversification in the context of mitigating broader supply chain risks. Second, it identifies the underlying factors contributing to China's declining share in the United States market. Finally, it builds on existing literature regarding trade diversion effects, providing further insights into the underlying factors.

The results of this paper indicate that United States supply diversification was largely a result of lower reliance on imports from China. While the decline in China's share of the United States market was broad-based, diversification from other countries primarily occurred when their initial market shares were sizeable. An important caveat is that import diversification has been less pronounced when the exporting country held a very high market share, a result likely driven by the challenges of supply diversification in cases where alternative suppliers are lacking. The results do not provide compelling evidence that geopolitical alignment with the United States or geographic proximity have been significant factors in supply diversification strategies, beyond those overlapping with trade policy stances and economic competitiveness.

The paper finds that, in addition to the imposition of additional tariffs on imports from China under Section 301, the United States' pre-existing trade policy stance was also a significant determinant of changes in market shares across countries. In examining changes in China's share of the United States market, the paper finds that these changes are heterogeneous across sectors and not generally driven by a strategy to diversify imports in sensitive sectors. The notable exception is critical ICT products, where China's share of the United States market decreased sharply. This result is likely driven by non-tariff restrictions that the United States has been imposing on trade in semiconductors (Bown, 2020). For non-strategic sectors, above-average supply diversification is observed in both the textile and apparel industries and in the general machinery sector. These results are related to ongoing changes in competitiveness and labor productivity across countries, which have likely contributed to the shift of supply chains from China to other Asian economies (McCaig and Pavcnik, 2018).

This paper also finds that the reduction in China's share of the United States market created export opportunities for third countries, which were largely captured by Mexico and some Southeast Asian economies. Notably, Vietnamese suppliers gained significant market share across various sectors where China's market share declined. Finally, the analysis finds that the factors driving the distribution of these gains are largely related to economic competitiveness and existing trade policies rather than geopolitical alignment or geographic proximity.

Regarding factors behind diversification and trade diversion effects, the paper supports the findings of much of the literature indicating that the decline in China's share of the United States market was primarily a result of the tariffs imposed on China under Section 301, and that the countries benefiting from trade diversion effects are those with higher comparative advantages.

Overall, the results suggest that the success of broad supply diversification strategies across countries depends on the extent to which these strategies are based on economic competitiveness and supported by changes in trade policies. Given the increased use of trade and industrial policies globally, it is important to regularly examine their effects on international trade, including by expanding this paper's analysis to other economies. We suggest this as an area for future research.

References

Alfaro L and Chor D (2023). Global Supply Chains: The Looming 'Great Reallocation'. NBER Working Paper No. 31661.

Amiti M, Redding SJ, and Weinstein DE (2019). The impact of the 2018 tariffs on prices and welfare. *Journal of Economic Perspectives* 33.4: 187-210.

Antràs P and Chor D (2022). *Global Value Chains*. In Handbook of International Economics, edited by Gita Gopinath, Elhanan Helpman, and Kenneth Rogoff, vol. 5, 297-376.

Atkin D, Costinot A, and Fukui M (2021). Globalization and the ladder of development: Pushed to the top or held at the bottom? National Bureau of Economic Research Working Paper 29500.

Baldwin R and Freeman R (2022). Risks and Global Supply Chains: What We Know and What We Need to Know. *Annual Review of Economics* 14, 153-180.

Balassa B (1965). Trade liberalization and 'revealed' comparative advantage. The Manchester School of Economic and Social Studies 32: 99–123.

Bekkers E and Schroeter S (2020). An economic analysis of the US-China trade conflict. No. ERSD-2020-04. WTO Staff Working Paper.

Bown CP (2020). How the United States marched the semiconductor industry into its trade war with China. *East Asian Economic Review* 24(4): 349-388.

Bown CP and Kolb M (2022). Trump's trade war timeline: An up-to-date guide. Peterson Institute for International Economics.

Bown CP (2023). US-China Trade War Tariffs: An Up-to-Date Chart, Peterson Institute for International Economics.

Broda C and Weinstein DE (2006). Globalization and the gains from variety. *The Quarterly journal of economics*, 121(2):541–585.

Cavallo A, Gopinath G, Neiman B, & Tang J (2021). Tariff pass-through at the border and at the store: Evidence from US trade policy. *American Economic Review: Insights*, 3(1), 19-34

Chor D and Bingjing L (2024). Illuminating the effects of the US-China tariff war on China's economy, *Journal of International Economics*, 150

Cigna S, Meinen P, Schulte P, and Steinhoff N (2022). The impact of US tariffs against China on US imports: Evidence for trade diversion? Economic Inquiry 60(1): 162-173.

Dang AH, Krishna K, and Zhao Y (2023). Winners and losers from the US-China trade war. NBER Working Paper No. 31922.

Egger PH and Larch M (2008). Interdependent Preferential Trade Agreement Memberships: An Empirical Analysis. *Journal of International Economics* 76(2): 384-399.

Fajgelbaum P, Goldberg PK, Kennedy PJ, Khandelwal A, and Taglioni D (2021). The US-China trade war and global reallocations. National Bureau of Economic Research (NBER) Working Paper No. 29562.

Fajgelbaum P, Goldberg PK, Kennedy PJ, Khandelwal A (2020). The Return to Protectionism, *The Quarterly Journal of Economics* 135(1): 1-55.

Flaaen A, Hortaçsu A, and Tintelnot F (2020). The production relocation and price effects of US trade policy: the case of washing machines. *American Economic Review* 110(7): 2103-2127.

Freund C, Mattoo A, Mulabdic A, and Ruta M (2023). Is US Trade Policy Reshaping Global Supply Chains? Paper presented at the IMF Conference on Geoeconomic Fragmentation, May 2023.

Fugazza M and Nicita A (2013). The direct and relative effects of preferential market access. *Journal of International Economics*, 89(2), 357-368.

Häge FM (2017). Chance-Corrected Measures of Foreign Policy Similarity (FPSIM Version 2). Harvard Dataverse, V2.

Hidalgo CA and Hausmann R (2009). The building blocks of economic complexity. *Proceedings of the National Academy of Sciences* 106(26): 10570-10575.

Garcia-Macia D and Goyal R (2020). Technological and economic decoupling in the cyber era. IMF Working Paper WP/20/257.

Gereffi G., Lim HC and Lee J (2021). Trade policies, firm strategies, and adaptive reconfigurations of global value chains. *Journal of International Business Policy*, 4, 506–522.

Itakura K (2020). Evaluating the impact of the US–China trade war. *Asian Economic Policy Review*, 15(1), 77-93.

Li M, Balistreri EJ, and Zhang W. (2020). The US–China trade war: Tariff data and general equilibrium analysis. *Journal of Asian Economics*, 69 (2020): 101216.

Mayer T and Zignago S (2011). Notes on CEPII's distances measures: the GeoDist Database. CEPII Working Paper 2011-25.

McCaig B and Pavcnik N (2018). Export Markets and Labor Allocation in a Low-Income Country. *American Economic Review* 108(7): 1899-1941.

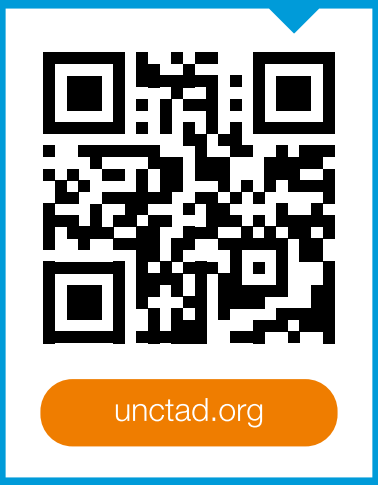
Nicita A (2019). Trade and Trade Diversion Effects of United States Tariffs on China. UNCTAD Research Paper 37.

Pierce JR and Yu D (2023). Assessing the Extent of Trade Fragmentation, FEDS Notes. Washington: Board of Governors of the Federal Reserve System, November 03, 2023.

Shen G, Wang P, and Xu Y (2021). Trade destruction and deflection effects of US-China trade frictions on China's tariff-targeted products. *The World Economy*, 44.7, 2076-2106.

Utar H, Zurita AC and Torres Ruiz LB (2023). The US-China Trade War and the Relocation of Global Value Chains to Mexico. CESifo Working Paper Series 10638.

Wang M and Hannan SA (2023). Trade diversion effects from global tensions—higher than we think. IMF Working Paper WP/23/234.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