Working Paper 24-012

Global Supply Chains: The Looming "Great Reallocation"

Laura Alfaro
Davin Chor

Global Supply Chains: The Looming "Great Reallocation"

Laura Alfaro
Harvard Business School
Davin Chor
Tuck School of Business, Dartmouth

Working Paper 24-012

Paper prepared for the Jackson Hole Symposium, 24-26 Aug 2023, organized by the Federal Reserve Bank of Kansas City. We are grateful to Kadee Russ for her discussion of our paper. We also thank Chad Bown, Anusha Chari, Penny Goldberg, Rob Johnson, Nina Pavcnik, and Kei-Mu Yi for helpful conversations, and Tarek Hassan, fDi Intelligence, and Kenneth Peterson (Harvard Business School Library) for support in acquiring data. We thank Pablo A. Picardo, Bashudha Dhamala, Raúl Gerardo Reyes, Gede Virananda, and Kuitai Wang for excellent research assistance.

Funding for this research was provided in part by Harvard Business School.

Global Supply Chains: The Looming "Great Reallocation" *

Laura Alfaro
Harvard Business School,
CEPR and NBER

Davin Chor
Tuck School of Business at Dartmouth
and NBER

Paper prepared for the Jackson Hole Symposium, 24-26 Aug 2023,
organized by the Federal Reserve Bank of Kansas City

Draft: 30 August 2023

Abstract:

Global supply chains have come under unprecedented stress as a result of US-China trade tensions, the Covid-19 pandemic, and geopolitical shocks. We document shifts in the pattern of US participation in global value chains over the last four decades, in terms of partner countries, products, and modes, with a focus on the last five years (2017-2022). The available data point to a looming "great reallocation" in supply chain activity: Direct US sourcing from China has decreased, with low-wage locations (principally: Vietnam) and nearshoring/friendshoring alternatives (notably: Mexico) gaining in import share. The production line positioning of the US' imports has also become more upstream, which is indicative of some reshoring of production stages. We sound several cautionary notes over the policies that have set this reallocation in motion: It is unclear if these measures will reduce US dependence on supply chains linked to China, and there are moreover already signs that prices of imports from Vietnam and Mexico are on the rise.

JEL codes: E3, F1, F2, F52, F6.

Keywords: Global value chains; offshoring; foreign direct investment; unit values; upstreamness; deglobalization.

* We are grateful to Kadee Russ for her discussion of our paper. We also thank Chad Bown, Anusha Chari, Penny Goldberg, Rob Johnson, Nina Pavcnik, and Kei-Mu Yi for helpful conversations, and Tarek Hassan, fDi Intelligence, and Kenneth Peterson (Harvard Business School Library) for support in acquiring data. We thank Pablo A. Picardo, Bashudha Dhamala, Raúl Gerardo Reyes, Gede Virananda, and Kuitai Wang for excellent research assistance. All errors are on our own. Author emails: lalfaro@hbs.edu; davin.chor@dartmouth.edu

1 Introduction

Global supply chains have been in the spotlight over the past several decades among international business and policy circles. In the late 1990s and early 2000s, much attention was drawn to how cross-border production and supply chain arrangements – often referred to as global value chains (GVCs) – could improve the efficiency of even the most complex manufacturing processes. Spurred by advances in communication technologies and a liberalizing trade policy environment, firms started to reap the benefits of specialization more extensively by performing production stages or procuring inputs across a host of locations, each particularly adept at delivering on their slice of the value chain. This in turn opened up opportunities for growth for those emerging economies who successfully gained roles in GVC-related production (World Bank 2020).

Lately, however, this optimistic view of GVCs has soured considerably. In its place, concerns are being voiced over the wisdom of sprawling supply chains that can expose firms and countries to the risk of disruptions. A confluence of recent events has shown that this risk now presents itself in myriad forms. Extreme weather events (associated with climate change) and natural disasters (such as the Tohoku earthquake) have sent shockwaves through global supply chains by disrupting the flow of critical inputs (Barrot and Sauvagnat 2016; Boehm et al. 2019). Public health shocks have emerged as a novel source of risk, epitomized by the shortages of medical equipment and other critical necessities at the height of the Covid-19 pandemic. There is a renewed awareness too of geopolitical risk. Russia's invasion of Ukraine exposed the vulnerability of European countries' natural gas supplies. Meanwhile, the brewing US-China big-power rivalry has prompted a major policy rethink in the US of its reliance on supply chains linked to China, particularly for goods deemed to be of strategic or national security importance.

This reconsideration of GVCs is fused at a deeper level with the broader backlash against globalization currently seen in many developed countries (Colantone et al. 2022; Goldberg and Reed 2023). The underlying causes of this backlash are complex and vary somewhat from country to country. But an influential line of research has found one common thread, linking this disaffection to the longstanding decline in manufacturing sector jobs in advanced economies that can be attributed (at least in part) to import competition from China (Autor et al. 2013, 2016; Dauth et al. 2014; Colantone and Stanig 2018).[1] In countries such as the US, this has contributed to a strong under-current of reservation among segments of the general public about engaging with China as a trade and supply chain partner (Alfaro et al. 2023).

But sentiment aside, what do the data actually tell us about the state-of-play in global supply chains? In this paper, we take a broad-ranging look at the evolution of patterns of global supply chain activity, with a focus on the particularly eventful last five years (2017-2022). We do so by assembling information from a range of datasets that speak to sourcing within cross-border value

[1] These studies focus on the direct impact of the "China shock" in displacing local manufacturing jobs. On the other hand, other studies have shown that low-priced inputs from China have made US manufacturing firms more competitive (Amiti et al. 2020) and allowed for non-manufacturing employment growth that has more than outstripped job losses in manufacturing (Caliendo et al. 2019). These potential gains however do not appear to have as much traction in shaping the general public's views on trade liberalization with China; see Alfaro et al. (2023) for survey-based experimental evidence on this front.

chains. We document changes over time in terms of partner countries, products, and modes; more specifically, we keep an eye out for discernible signs of friendshoring, nearshoring, or reshoring in recent years.

Accordingly, the principal source of data we use will be product-level trade statistics (from UN Comtrade), which speak to direct import sourcing patterns over time. We combine this with measures of upstreamness, based on Fally (2011) and Antràs et al. (2012), to characterize the positioning of industries and countries within GVCs. We further supplement our analysis with information from various sources on multinational activity and FDI, on companies' earnings calls, as well as on the state of the US manufacturing sector.

Our goal in working with these data sources is to provide an early assessment of recent shifts in global supply chains. More detailed assessments that use firm-level administrative data or updated World Input-Output Tables to construct more refined measures of GVC trade will surely be conducted as such resources become available. That said, we view it as important to highlight such trends as may already be evident from these more readily accessible sources of data. In what follows, we will largely focus on shifts from the perspective of the US, given the US' role as a key nexus from which many GVCs are organized and in which much of the output from GVCs is ultimately absorbed; we will nevertheless draw some brief comparisons to changes seen in other major developed economies (namely, Europe and the UK).

We start by documenting trends in US imports over the past four decades to ground our discussion of supply chain patterns in a longer-run perspective. In terms of locations, the bulk of the US' direct import sourcing has historically been (and continues to be) from other high-income economies. A wave of shifts toward low-wage countries did get underway during the 1990s, with Japan and Canada losing import share in the US to China and Mexico. It is important to note, though, that Japan and Canada have remained closely engaged with the US economy, as FDI – especially from Japan – replaced trade as a mode for accessing the US market.

In terms of product composition, the 1990s were also a period during which the US established itself as an exporter of relatively upstream products (e.g., electronic integrated circuits, machinery and parts, and other material inputs for processing and assembly overseas), while being an importer of final goods (e.g., electronics, textiles). The late 2000s, in turn, saw a significant (albeit often overlooked) shift in the US' trade profile, as its growing energy independence led to a decrease in imports of petroleum and related products.[2]

We then zoom in on developments in the past five years. While this recent period has been marked by intensifying anti-globalization sentiment, we confirm the broad assessment in other studies (e.g., Antràs 2021; Baldwin 2022; Aiyar et al. 2023; Goldberg and Reed 2023) that this has not led yet to an outright retrenchment in global trade as a share of world GDP. In fact, the aggregate value of key trade flows, such as US goods imports, rebounded strongly after the Covid-19 pandemic to all-time highs in 2022.

However, the aggregate level of trade masks substantial shifts that are afoot in the source-country composition of US imports. China's share of US goods imports peaked at 21.6% in 2017

[2] This stands in contrast to the situation in Europe, which remains reliant on imports of energy-related resources.

and has since fallen to 16.5% in 2022. Put otherwise, what we are seeing in the data are the early phases of a "great reallocation" in US sourcing away from China. The locations that have (thus far) been the main beneficiaries of this shift comprise other low-wage manufacturing countries, with Vietnam most notably seeing a two-percentage point increase in its share of US imports, as well as friendshoring or nearshoring alternatives, such as Mexico.[3]

We moreover find that this reallocation has been occurring at the product level: Across HS4 products, decreases between 2017-2022 in China's share of US imports are systematically correlated with gains in the import shares held by Vietnam and Mexico (even after accounting for pre-trends in these countries' shares of the US market). Both Vietnam and Mexico picked up import market share in various categories of electrical and electronic equipment. But there have been subtle differences too in the product mix of observed shifts, with Vietnam gaining ground in telephone sets, apparel and textiles, and Mexico increasing its US import share in automobile parts, as well as glass, iron, and steel products.

This reallocation in the trade statistics lines up with evidence from other complementary data sources. Indeed, we find that references to friendshoring, nearshoring, or reshoring have been on the rise in companies' earnings calls since 2018 and that a good share of these discussions pertains to potential moves away from China toward Vietnam or Mexico. At the same time, China has dropped off in prominence as a preferred destination for greenfield FDI originating from the US (as well as from other FDI source countries).

Last but not least, we present preliminary evidence that this reallocation away from China is being accompanied by some reshoring. We find that the upstreamness of US imports rose slightly over the past five years, which suggests that more finishing stages of production in GVCs are now being performed within the US. The data up to 2022 also indicate that, for some subsectors, the long-run decline in US manufacturing activity has bottomed out. While this is partly attributable to developments that occurred prior to 2017 (such as the Obama administration's policies to revive the US automobile industry), there are signs too of an uptick in the last two years in establishment and employment counts in specific industries (e.g., semiconductors) that likely reflect recent efforts to promote domestic manufacturing capability in these areas.

What are the causes of this "great reallocation" away from China? And what are its likely consequences? The first question has a relatively straightforward answer: The ongoing shift in production and sourcing patterns is largely the result of intentional government policies, as noted also by other observers.[4] Starting in 2018, the Trump administration reversed the US' decades-long approach in favor of trade liberalization, by introducing a series of tariffs that eventually covered virtually all of the US' imports from China.[5] While US-based corporations may initially

---

[3] Several other articles have noted this trend, including: Nicita (2019), Bown (2022), Grossman et al. (2023), Freund et al. (2023), and Fajgelbaum et al. (2023). Relative to these studies, we further show that products in which China lost ground in the US market also tend to be products in which Vietnam and Mexico gained in import share, and document movements in the unit values of these imports from Vietnam and Mexico.

[4] For example, Aiyar et al. (2023) attributes much of ongoing geoeconomic fragmentation to countries' pursuit of protectionist policies.

[5] For a detailed timeline on the US-China tariff actions, see Bown (2023). See Flaaen and Pierce (2019), Fajgelbaum et al. (2020), Flaaen et al. (2020), and Handley et al. (2020) for studies of the impact of the tariffs on economic

have been hesitant to incur the fixed and sunk costs of reconfiguring their global supply chains, the continued use of these tariffs under the Biden administration has since started to tip many companies out of a "wait-and-see" approach.[6] At the same time, US government officials have been encouraging friendshoring and nearshoring in order to mitigate supply chain risk, particularly risk of a geopolitical nature.[7] The Biden administration's turn toward large-scale industrial policies, as announced in the Inflation Reduction Act (IRA) and the CHIPS and Science Act, has further laid bare its intent to bolster domestic manufacturing with the help of generous subsidies. These policy directions are unlikely to change in the foreseeable future even past the next presidential election in 2024, given what appears to be bipartisan support for policies that support US manufacturing jobs.

With their broad scope and ambition, these policy measures are poised to profoundly reshape production and sourcing decisions in cross-border supply chains that emanate from the US. However, we seek to register two cautionary notes. First, the policies which have set this reallocation in motion may ultimately not even achieve their stated goal of reducing the US' dependence on supply chains linked to China. Already, we can see in the trade data that while China's share in US imports has fallen, its share in Europe's imports has risen. China has moreover stepped up its trade and FDI in both Vietnam and Mexico in recent years. This means that the US could well remain indirectly connected to China through its trade and GVC links with these third-party countries.

Second, this ongoing reallocation of global supply chain activity comes attached with costs that need to be monitored and assessed more rigorously. There is now a body of empirical work showing that the US tariffs on Chinese goods have been borne almost entirely by US buyers through higher prices (Amiti et al. 2019; Fajgelbaum et al. 2020; Cavallo et al. 2021). We will further show in this paper that decreases in product-level import shares from China are associated with rising unit values for imports from Vietnam and Mexico, which likely reflects rising costs of production in these locations. More work is needed to investigate how much this reallocation away from direct imports from China might be contributing to higher US prices and inflation. Likewise, there is a need for more frameworks to be developed to formally assess whether the dynamic gains from reshoring – arising say from agglomeration effects or increased innovation in the US manufacturing sector – can in fact offset the static welfare losses incurred from pursuing this goal.

The rest of the paper is organized as follows. After making several data-related remarks in Section 2, we turn in Section 3 to describe longer-term patterns in US import sourcing. Section 4 then focuses on the last five years (2017-2022), particularly the shifts toward friendshoring and

outcomes in the US, including on employment and the performance of firms in the US manufacturing sector. See Chor and Li (2021) for evidence of the effects of the tariffs on economic activity in China.

[6] Companies have likely taken their cue from statements by Biden administration officials signaling that a unilateral easing of US tariffs on China remains unlikely. For example, in testimony to the US Senate Appropriations Committee in June 2022, US Trade Representative Katherine Tai noted that: "The China tariffs are, in my view, a significant piece of leverage, and a trade negotiator never walks away from leverage" (Reuters 2022).

[7] For example, at an address to the Atlantic Council in April 2022, US Treasury Secretary Janet Yellen stated that: "Favoring the friendshoring of supply chains to a large number of trusted countries, so we can continue to securely extend market access, will lower the risks to our economy as well as to our trusted trade partners" (Yellen 2022).

nearshoring to Vietnam and Mexico. Section 5 describes the preliminary signs of reshoring. We conclude with a discussion of implications in Section 6.

2 Data Approach

Before presenting our findings, it is useful to briefly discuss the broader data approach we are taking in this paper to shed light on cross-border supply chain activity. In terms of data sources, our study uses most extensively the rich trade statistics from UN Comtrade. These have the advantage of being up-to-date (with the most recent available year being 2022), while providing a reasonable level of detail on products (which we will exploit at the HS4 digit level).

Readers who are familiar with the recent literature on GVCs will however recognize that these gross trade flows only pick up on patterns of direct sourcing. In an age of cross-border supply chains, goods that are received at US ports in principle embody value added that has been contributed by multiple countries and industries further upstream. Focusing on the gross value of direct imports alone, one is likely to understate the extent of some countries' involvement in GVCs – and hence, the US' dependence on these countries as supply chain partners – particularly for those source countries that are engaged in upstream stages.

To address this concern, researchers have over the past two decades developed accounting methodologies to trace and measure the value that is added at different stages along GVCs (Johnson and Noguera 2012; Koopman et al. 2014; Borin and Mancini 2023).[8] These draw on information contained in World Input-Output Tables – on transactions between country-by-industry pairs (e.g., purchases by the automobile industry in the US from the auto parts industry in Mexico) – in order to infer the country and industry sources from which value added originates. However, the work that goes into assembling such World Input-Output Tables is extensive, and so these tables are only available with a time lag: For example, the latest release of the World Input-Output Database extends up to 2014, while the OECD Inter-Country Input-Output Tables are only available up to 2018. These are ill-suited unfortunately to the more pressing task of studying shifts in global supply chains over the past five years.

Absent the data to implement a full accounting of GVC trade, our approach will thus be to focus on the evolution of direct sourcing patterns as observed from product-level trade flows. To nevertheless shed light on countries' positioning within GVCs, we will combine the trade data with industry measures of upstreamness (Fally 2011; Antràs et al. 2012), in order to illustrate how the global production line positioning of the US – as reflected in the profile of its imports and exports – has been shifting over time. [9] We will supplement the above with additional sources of information: (i) on multinational affiliate sales (from the US Bureau of Economic Analysis) and on greenfield FDI (from fDi Markets), that shed light on GVCs that operate through multinational corporations; (ii) from company earnings conference calls (from NL Analytics), that facilitate a topical analysis of firms' priorities; and (iii) on the recent state of the US manufacturing sector (from the Bureau of Labor Statistics), to speak to the issue of reshoring.

[8] See Johnson (2018), as well as Section 2 in Antràs and Chor (2022), for an overview of GVC measurement issues and methodologies.

[9] This follows the approach in Chor et al. (2021). We use the UN correspondences across different Harmonized System vintages to concord the data over time consistently to HS 2017 codes.

3 The US in Global Value Chains: Background

In this section, we provide an overview of the rise of trade in GVCs over the last four decades. As the US' participation in global supply chains expanded, this period was one marked by shifts in sourcing locations, products, and modes. This discussion will form the backdrop against which to compare the more recent changes of the past five years.

3.1 Trade Flows: Trends

World trade grew steadily and in a virtually uninterrupted manner in the four decades leading up to the Global Financial Crisis. In the early nineties, the ratio of trade in goods and services to GDP stood at 38% for the World, 20% in the US, and 22% in China. By 2006, China's trade-to-GDP ratio had exploded to close to 65%, while that for the World and the US had grown to 60% and 27% respectively.[10]

The reasons for this boom in international trade are well-documented. Favorable political developments – including the end of the Cold War, political and economic reforms in Latin America and Asia, and China's opening up to the world – brought more countries into the fold of the world trade system. This was further facilitated by policy moves that progressively lowered tariff and non-tariff barriers to trade, such as the establishment of regional trade agreements (e.g., the EU, NAFTA) and the expansion of the World Trade Organization (culminating in China's accession in 2001). Notably too, the fragmentation of production processes and supply chains across country borders generated an increase in trade in intermediate inputs, which by some estimates now constitutes as much as two-thirds of gross world trade flows (Johnson and Noguera 2012).

This growth in international trade, however, slowed down in the aftermath of the Global Financial Crisis of 2008-2009. By 2020, China's trade-to-GDP ratio had decreased to 35%, while that for the US had slipped to 23%, prompting the observation that the world had perhaps reached "peak globalization" (Baldwin 2022).[11] With the benefit of hindsight, there appears to be a consensus now that the prior rate of increase in the trade-to-GDP ratio was unsustainable, and so some slowdown was inevitable (Antràs 2021; Baldwin 2022; Goldberg and Reed 2023). It would nevertheless be premature to interpret this slowdown as an outright "deglobalization" or the "end of an age". While the past five years have been marked by various shocks – such as the

[10] Sum of exports and imports of goods and services as a share of GDP (from the World Bank's World Development Indicators, WDI).

[11] Baldwin (2022) cautions against over-interpreting these trends, noting that the so-called peak in trade as a share of GDP has not been synchronized across countries: While the ratio has tapered off in China, it has not peaked in some large trading economies. He further notes that some of the apparent slowdown in the value of world trade has been an artefact of the decline in commodities prices in the mid-2010s. On a separate note, there have been changes over time in the system of national income accounts, for example relating to the treatment of software in 1999 and intellectual property in 2013. The Balance of Payments methodology was moreover substantially updated from BPM5 to BPM6 in 2009; countries adopted the new methodology and harmonized older series at different times, with the US incorporating these changes in 2014. To our knowledge, there is no systematic analysis of how these accounting changes might have affected observed trends in trade in goods and services over GDP. Note that there is evidence that these account for some of the perceived reduction in labor shares (Koh et al. 2020).

US-China tariff war and the Covid-19 pandemic – which dealt momentary setbacks to trade flows, global trade has held steady at just under 60% of world GDP rather than gone into freefall (see **Appendix Figure 1**).[12]

Turning to the US, its engagement in international trade over time mirrors this broad pattern of growth up till the mid-2000s, followed by a slowdown. Between 1994-2005, the US saw the growth rates in the value of its goods exports and imports reach 5.3% and 8.8% per annum respectively.[13] This was followed by a distinct dropoff in the pace of growth between 2006-2022, to 4.5% for exports and 3.6% for imports (**Table 1, Panel A**). This slowdown was even more pronounced after accounting for price effects: In chained real dollar terms, US exports and imports grew respectively at 2.6% and 2.2% per annum in this latter period (**Table 1, Panel B**).

Table 1: US Trade, Growth Rates (1994-2022)

	1994-2022	1994-2005	2006-2022	2017-2022
	Panel A: Nominal USD Growth Rates			
Goods				
Exports	5.1%	5.3%	4.5%	5.9%
Imports	5.8%	8.8%	3.6%	6.7%
Services				
Exports	5.6%	6.0%	5.0%	2.1%
Imports	6.1%	8.1%	4.4%	4.7%
	Panel B: Chained 2017 Dollars Growth Rates			
Good Exports	3.8%	5.1%	2.6%	1.5%
Non-petroleum	3.5%	5.2%	1.9%	0.9%
Petroleum	7.1%	0.7%	11.5%	5.2%
Good Imports	4.7%	8.5%	2.2%	3.6%
Non-petroleum	5.4%	8.9%	3.0%	4.2%
Petroleum	-0.4%	3.5%	-3.0%	-3.6%
Services				
Exports	3.4%	4.3%	2.5%	-1.6%
Imports	3.8%	5.9%	2.1%	0.9%

Source: Trade data (Census Basis) from the US Census Bureau; downloaded in June 2023. Real services data from the Federal Reserve Bank of St. Louis, FRED.

Two further points are worth highlighting about these US trade patterns. First, the overall growth rates mask a substantial shift in composition in US trade, as the US evolved from being a net importer of oil and gas products to being a net exporter. In 1994, petroleum products represented close to 4% of US exports and 23% of imports; by 2022, the export share stood at 10%, while the

[12] Goldberg and Reed (2023) have made the cogent observation that "global trade was remarkably resilient during the pandemic, and supply shortages would likely have been more severe in the absence of trade".

[13] Table 1 starts in 1994 due to the availability of the real goods trade data from the US Census Bureau. The date marks the enactment of NAFTA, the conclusion of the Uruguay Round of GATT-WTO negotiations, and the early years of China's trade liberalization. Casting an eye further back, the US trade balance turned negative in 1971 for the first time since 1893; see Bordo (1992), Eichengreen (1996, 2000), and Irwin (2017) for historical perspectives on US policy on trade and capital flows.

import share had fallen to a mere 6%. In line with this shift, the annual growth rate in the US' real petroleum imports turned negative (-3.0%) in 2006-2022, compared to a growth rate of 3.5% in 1994-2005. On the other hand, the US' real imports of non-petroleum products recorded steady growth of 3.0% between 2006-2022 (**Table 1, Panel B**).

Second, it is useful (for the sake of completeness) to point out that there has been a similar slowdown in the US' trade in services: between 2006-2022, the growth rate in the real value of US service exports and imports moderated to 2.5% and 2.1% per annum respectively (**Table 1, Panel B**). That said, note that the US maintained a surplus in services trade throughout this period. The rest of our analysis below will focus on goods trade, which has dominated the debate on the future of global supply chains.

3.2 Trade Partners

Underlying these aggregate trends, **Table 2** displays the evolution of the trade shares of the US' main trade partners from 1994-2022. Several points, generally recognized, deserve emphasis.

The US has over the years conducted most of its trade with high-income countries. In 1994, its primary trade partners were Canada, the European Union (cum UK), and Japan. Around 22% of US exports in that year went to Canada, from which the US received 19% of its imports. The EU cum UK accounted for a similar share of US exports (22%) and imports (18%). Japan's share was slightly smaller, receiving about 10% of US exports while being the source of about 18% of the US' imports. Among the US' other significant trading partners, the East Asian economies of South Korea, Taiwan and Singapore comprised around 10% of both US exports and imports.

By the dawn of the millennium, however, China and Mexico had emerged as major US trade partners. China's rapid and dramatic rise as an export powerhouse has been studied extensively.[14] China's share in US imports leaped from nearly 6% in 1994 to a peak of around 22% in 2017, making China the single largest source country partner of the US. On the other hand, exports to China which were just 2% of total US exports in 1994, peaked at 9% in 2020, and stood at approximately 7% in 2022. Turning to Mexico, the enactment of NAFTA in 1994 (known as the USMCA post-2020) was a pivotal moment for its bilateral trade with the US.[15] The US' imports from Mexico rose consistently from nearly 7% in 1994 to 14% in 2022, while Mexico's share of US exports expanded from around 10% in 1994 to nearly 16% in 2022.

[14] See, for example, Hanson (2012) and Frankel (2016) for an overview of trends in China's external trade. After the US ended a longstanding trade embargo, President Nixon landed in the People's Republic of China in 1972 and established formal diplomatic relations in 1978. The 1980 bilateral trade agreement conditionally granted China the "Most Favored Nation" treatment reducing tariffs on Chinese imports to the US. The US became a net importer of Chinese goods in 1985. See Greenland et al. (2020) for an evaluation of the US' granting of Permanent Normal Trade Relations (PNTR) to China.

[15] In 1965, the US and Canada entered the Auto Pact, agreeing to the duty-free, two-way movement of new vehicles and parts. That same year, the Mexican government introduced the Border Industrialization program, lifting foreign ownership restrictions along its border and allowing US manufacturers to build factories, import materials duty-free, hire local labor for assembly, and reexport the finished products; this eventually served as a basis for the NAFTA agreement (Hansen 2003). Given that the NAFTA agreement dominates the analysis period, we will refer to the trade agreement between Mexico, Canada, and the US by that name in most of this paper.

Table 2: US Trade, Partner Country Shares (1994-2022)

	1994	2000	2005	2010	2015	2017	2018	2019	2020	2021	2022
Exports of Goods, bn USD	**513**	**782**	**901**	**1,278**	**1,503**	**1,547**	**1,666**	**1,646**	**1,430**	**1,758**	**2,065**
as % exports											
European Union & UK	**22%**	**22%**	**21%**	**19%**	**18%**	**18%**	**19%**	**20%**	**20%**	**19%**	**21%**
France	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Germany	4%	4%	4%	4%	3%	3%	3%	4%	4%	4%	4%
UK	5%	5%	4%	4%	4%	4%	4%	4%	4%	4%	4%
NAFTA	**32%**	**37%**	**37%**	**32%**	**34%**	**34%**	**34%**	**33%**	**33%**	**33%**	**33%**
Canada	**22%**	**23%**	**24%**	**19%**	**19%**	**18%**	**18%**	**18%**	**18%**	**18%**	**17%**
Mexico	**10%**	**14%**	**13%**	**13%**	**16%**	**16%**	**16%**	**16%**	**15%**	**16%**	**16%**
Rest of Western Hem.	7%	6%	6%	9%	8%	8%	8%	8%	8%	8%	9%
Brazil	2%	2%	2%	3%	2%	2%	2%	3%	2%	3%	3%
Asia and Pacific	**30%**	**27%**	**26%**	**28%**	**27%**	**29%**	**28%**	**27%**	**30%**	**30%**	**28%**
China	**2%**	**2%**	**5%**	**7%**	**8%**	**8%**	**7%**	**6%**	**9%**	**9%**	**7%**
Japan	**10%**	**8%**	**6%**	**5%**	**4%**	**4%**	**5%**	**5%**	**4%**	**4%**	**4%**
South Korea	4%	4%	3%	3%	3%	3%	3%	3%	4%	4%	3%
Taiwan	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Hong Kong	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	1%
Singapore	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Vietnam	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%
India	0%	0%	1%	2%	1%	2%	2%	2%	2%	2%	2%
Reminder	9%	8%	10%	12%	12%	11%	11%	11%	10%	9%	10%
Imports of Goods, bn USD	**663**	**1,218**	**1,673**	**1,914**	**2,249**	**2,340**	**2,536**	**2,492**	**2,331**	**2,829**	**3,243**
as % imports											
European Union & UK	**18%**	**19%**	**19%**	**17%**	**19%**	**19%**	**19%**	**21%**	**20%**	**19%**	**19%**
France	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Germany	5%	5%	5%	4%	6%	5%	5%	5%	5%	5%	5%
UK	4%	4%	3%	3%	3%	2%	2%	3%	2%	2%	2%
NAFTA	**27%**	**30%**	**28%**	**27%**	**26%**	**26%**	**26%**	**27%**	**25%**	**26%**	**27%**
Canada	**19%**	**19%**	**17%**	**15%**	**13%**	**13%**	**13%**	**13%**	**12%**	**13%**	**13%**
Mexico	**7%**	**11%**	**10%**	**12%**	**13%**	**13%**	**14%**	**14%**	**14%**	**14%**	**14%**
Rest of Western Hem.	5%	5%	6%	6%	4%	4%	4%	4%	3%	4%	4%
Brazil	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Asia and Pacific	**42%**	**37%**	**36%**	**38%**	**42%**	**42%**	**42%**	**40%**	**42%**	**42%**	**41%**
China	**6%**	**8%**	**15%**	**19%**	**21%**	**22%**	**21%**	**18%**	**19%**	**18%**	**17%**
Japan	**18%**	**12%**	**8%**	**6%**	**6%**	**6%**	**6%**	**6%**	**5%**	**5%**	**5%**
South Korea	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
Taiwan	4%	3%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Hong Kong	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Singapore	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Vietnam	**0%**	**0%**	**0%**	**1%**	**2%**	**2%**	**2%**	**3%**	**3%**	**4%**	**4%**
India	1%	1%	1%	2%	2%	2%	2%	2%	2%	3%	3%
Reminder	8%	9%	12%	13%	8%	9%	9%	8%	9%	9%	9%
Serivces (BOP Basis), bn USD											
Exports of Services	200	298	378	582	769	837	866	891	726	801	929
Imports of Services	133	221	312	436	498	555	565	593	466	559	697

Source: Goods trade data (Census Basis) and services trade data (BOP basis) are from the US Census Bureau; downloaded in June 2023. Differences between Census basis and BOP basis series are small; see: https://www.census.gov/foreign-trade/statistics/historical/goods.pdf. Regions are as follows: European Union & UK: All current 27 EU members, plus the UK. NAFTA: Canada and Mexico. Rest of Western Hemisphere: Argentina, Brazil, Chile, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Peru, Venezuela, Bermuda, Dominican Republic & UK Caribbean Virgin Islands. Middle East: Bahrain, Israel, Jordan, Oman & Saudi Arabia. Africa: All the countries within the continent.

As China and Mexico rose in prominence as US trading partners, it has primarily been Canada and Japan who lost market share, particularly in their share of US imports. In 2022, Canada accounted for 13% of US imports (down from 19% in 1994), while Japan's share had fallen to only 5% (from 18% in 1994). One other country worth highlighting here is Vietnam, in anticipation of our later discussion on more recent supply chain shifts. Vietnam's exports to the US have increased steadily since the 2000s, following its normalization of relations with the US in 1995 and the entry into force of its bilateral trade agreement in 2001 (McCaig and Pavcnik 2018); this intensified after 2017, with Vietnam's share of US imports doubling from 2% to about 4% by 2022.

In sum, the last four decades have seen a discernible shift in the origin countries of the US' direct imports as the US moved toward sourcing more from low-income, low-wage locations, specifically China, Mexico, and (to a lesser extent) Vietnam. There is nevertheless a sense in which the pattern of US imports has remained stable since 1994, in that its import shares from broad geographical regions have held relatively steady: The EU (cum UK) continues to be the source of around 20% of the US' imports, while the corresponding shares accounted for by NAFTA and the Asia-Pacific region remains around 30% and 40% respectively. This suggests that US trading relationships continue to be characterized by regional value chains (Baldwin and Gonzalez-Lopez 2015).[16]

3.3 Products

We turn next to examine the product composition of US trade flows, to shed light on the US' positioning within GVCs and how this has evolved over time.

For this purpose, we adopt the approach in Chor et al. (2021) to compute measures that summarize the upstreamness of the US' export and import profiles respectively, to characterize the positioning of these trade flows with respect to final demand. This is based in turn on the concept of industry upstreamness developed in Fally (2011) and Antràs et al. (2012): Making use of the information on production linkages across industries reported in Input-Output Tables, these papers define and construct a measure of the number of stages that an industry's output will on average traverse before it is absorbed in final uses (i.e., in consumption or investment).[17] The procedure for constructing this upstreamness measure at the industry level is detailed in the Appendix; we apply this on the US Input-Output Tables, using 2012 as a convenient benchmark year that precedes the US-China tariff actions, and further map these industry upstreamness values to HS4 product codes with the concordance in Pierce and Schott (2012).

The upstreamness measure we compute takes on a minimum value of 1 and ranges up to a maximum value of 4.58. An upstreamness value of 1 indicates that the entirety of the output of that product is directly absorbed in final uses (i.e., the product is exactly one stage removed from final demand). Products that have low upstreamness values include: automobiles, toys, furniture, and apparel. On the other hand, products that have high upstreamness values tend to go through

[16] Note that the stable import share held overall by the EU (cum UK) masks some subtle shifts, as high-income trade partners (Germany, France, the UK) have each lost market share to lower-wage source countries in Eastern Europe.
[17] See also Antràs and Chor (2018) for a further discussion of the theoretical foundations and properties of the upstreamness measure. Antràs and Chor (2013) and Alfaro et al. (2019) show that industry upstreamness is relevant for understanding whether firms tend to source inputs from that industry by integrating their supplier within firm boundaries or via an arm's-length outsourcing relationship instead.

multiple stages of production before they become final goods; examples of these include: raw materials and agricultural commodities, as well as petroleum-related and chemical products. (See **Appendix Table 1** for the upstreamness values of the US' largest traded products.)

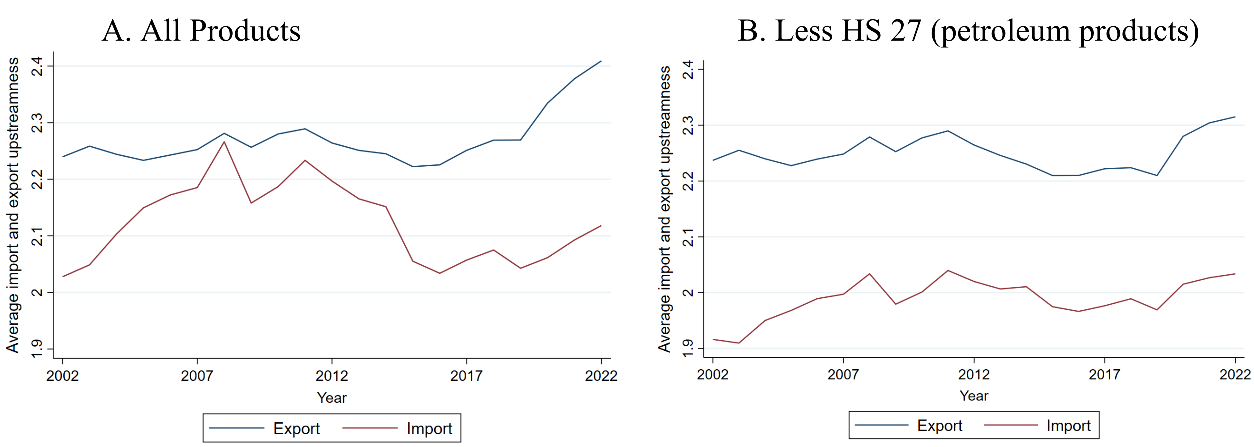
To translate these into a country measure of import (respectively, export) upstreamness, we take a weighted average of the product-level upstreamness values as follows:

$$U_{US,t}^{M} = \sum_{p=1}^{N} \frac{M_{pt}}{M_t} U_p, \quad U_{US,t}^{X} = \sum_{p=1}^{N} \frac{X_{pt}}{X_t} U_p. \qquad (1)$$

where M_{pt}/M_t is the value of imports of product p expressed as a share of the US' total imports in year t, and X_{pt}/X_t is the corresponding share of product p in total US exports. A country's import (respectively, export) upstreamness naturally takes on higher values if a larger share of its imports (respectively, exports) is composed of relatively upstream products that tend to be separated by multiple stages from final demand.

We illustrate the export and import upstreamness of the US over the two decades leading up to 2022. As seen in **Figure 1, Panel A**, the US' exports are persistently more upstream than its imports (in relation to final demand). This reflects the fact that the US' main exports include such goods as electronic integrated circuits, machinery, and other goods-in-process that are sent overseas for further assembly and processing. The US' export upstreamness has moreover risen over this period, given the increases in the US' agricultural exports and its transition to being a net exporter of petroleum products.[18] In exchange, the US tends to import goods that are relatively finished, which are then used in final consumption or investment in the US economy.[19]

Figure 1: US Export and Import Upstreamness (2002-2022)



Notes: Authors' calculations based on the methodology in Chor et al. (2021), using UN Comtrade data and the 2012 US Input-Output Tables.

[18] From **Appendix Table 1**, the US' main exported products by 2017-2022 average value include petroleum oils (HS2709), petroleum gases (HS2711), soybeans (HS1201), electronic integrated circuits (HS8542), machines for semiconductor manufacture (HS8486), motor vehicle parts (HS8708), and civilian aircraft (HS8800).

[19] From **Appendix Table 1**, the US' main imported products by 2017-2022 average value include motor cars (HS8703), telephone sets (HS8517), medicaments (HS3004), and furniture (HS9403). Note that there is a fair amount of two-way trade in some product categories, such as motor vehicles and various forms of machinery.

Note that while there was a rise in the upstreamness of US imports leading up to 2007, this was largely the result of the surge in oil prices following the 2001 dot-com recession until just prior to the Global Financial Crisis; in particular, **Panel B** confirms that the time series for the upstreamness of US imports is much smoother when petroleum products (HS code 27) are excluded from the sample.[20] It is moreover useful to point out that the US' exports continue to be more upstream on average than its imports even when we restrict the construction of the country-level measures in (1) to products classified as manufacturing goods (**Appendix Figure 2**), so the high upstreamness of US exports is not driven by agricultural products *per se*.

3.4 Modes of Globalization: Trade and FDI

Multinational corporations (MNCs) have been instrumental in the growth of GVCs, given that a good share of cross-border production and trade occurs between MNCs and their foreign affiliates. For example, up to 40% of the value of US trade takes place within the ownership boundaries of MNCs.[21] As we will see below, it is important to take multinational activity into account, without which we would end up with an incomplete picture of the extent of the US' supply chain links to key countries.

While the US has in recent years been sourcing more via trade from lower-income locations, the bulk of its foreign direct investment (FDI) remains of a North-North nature, taking place with countries with relative factor endowments and factor prices similar to the US (Antràs and Yeaple 2013; Alfaro and Charlton 2009).[22] Japan has been the leading source of FDI for the US, accounting for close to 15% of the stock of all US inward direct investment; this is followed by Germany, Canada, and the UK (10-13% each), and Ireland and France (around 7% each). These nations, along with the Netherlands and Switzerland, contribute roughly 70-80% of FDI in the US.[23] More than 40% of this inward investment is in the manufacturing sector; most of this investment is in industries where GVCs feature prominently in firms' integration strategies, namely: chemicals, computers and electronic products, and transportation equipment.

It is instructive to examine the trajectory of Japanese firms in US manufacturing over the last four decades, as this illustrates various mechanisms through which trade and institutional barriers have shaped firms' production and sourcing strategies. In the post-war era, Japanese FDI in the US consisted mainly of trading companies and financial institutions whose goal was to facilitate Japan's trade with the US (Wilkins 1990).[24] But in the 1970s, amid escalating US trade deficits and rising concerns over US protectionism, Japanese firms started to establish production

---

[20] The price of a barrel of West Texas intermediate crude rose from $26 to $99 during this time; prices from the US Energy Information Administration, retrieved from the Federal Reserve Bank of St. Louis, FRED.

[21] From the US Census Bureau Related Party trade database, for the year 2021.

[22] Beyond the US, the picture is more nuanced. From the IMF CDIS database (stock, BOP FDI positions), around half of all FDI assets globally are North-North in nature, and this share has been stable over our period of study. From fDi Markets data (flows, greenfield projects), North-South FDI in the manufacturing sector has instead grown in importance in terms of both counts and capital expenditures. See Horn et al. (2021, 2022) and Alfaro and Kanczuk (2022) for the role of China as an international lender.

[23] Data from the US Bureau of Economic Analysis, for 2022; by country of the ultimate beneficial owner. The total inward position in the US of FDI from abroad was close to $5.25 trillion at the end of 2022, while that of US FDI abroad was close to $6.58 trillion.

[24] Mitsui & Co's New York office in 1870 was the earliest recorded Japanese FDI. See Wilkins (1990) and Yoshino (1974) for a historical overview, and for later trends, see Oldenski and Moran (2015).

facilities in the US to get around potential import barriers against goods made in Japan. An antitrust lawsuit prompted Sony to break ground in 1971 on the first Japanese manufacturing factory. Similarly, an antitrust case against NEC in 1975 (though later dismissed) jolted the semiconductor sector, resulting in NEC purchasing its first American company in 1978.[25] In anticipation of protectionist measures, major Japanese electronics firms set up US production facilities via acquisitions and greenfield investments.[26] This pattern was repeated in the automobile sector: In the 1980s, Japanese car manufacturers responded to the threat of US protectionism by "voluntarily" limiting their exports to the US, moving their production for the American market to US factories, and upgrading their products.[27]

This discussion brings forth two main implications. First, as a "mode" of globalization, FDI can either function as a complement or substitute to trade. Firms can replicate a subset of activities overseas by setting up plants and directly selling to the foreign market instead of exporting (horizontal FDI). But firms can also exploit GVCs via vertically-integrated plants (vertical FDI); if different stages of production are fragmented across country borders, trade in intermediate inputs is a complementary part of the rise of such multinational activity. Bearing this in mind, decreases in trade or in a country's share of US imports need not signify deglobalization, since firms may be catering to the US market through an alternative "mode" (e.g., horizontal FDI).

Underscoring this point, **Figure 2** combines data on multinational affiliate sales in the US (from the Bureau of Economic Analysis) together with the data on imports (used in the preceding sections).[28] The affiliate sales of foreign-owned multinationals were three times the value of US direct imports in 1995. While this ratio of affiliate sales to imports slipped to around two in 2020, affiliate sales for MNCs from advanced economies like Japan, Germany, the UK, and France still vastly exceed imports from those countries (see also **Appendix Table 2**).

Looking more specifically at the case of Japan, after accounting for affiliate sales in addition to import penetration, the share of sales of Japanese origin in the US market is around 14%. Put otherwise, the 5% share that Japan holds in US imports (reported earlier in **Table 2**) likely understates the continued role that Japanese goods and supply chains play in the US economy. Moreover, after accounting for affiliate sales, advanced economies clearly hold a much larger share than China in the US market, reflecting the relatively low level of affiliate sales by China-owned multinationals in the US.

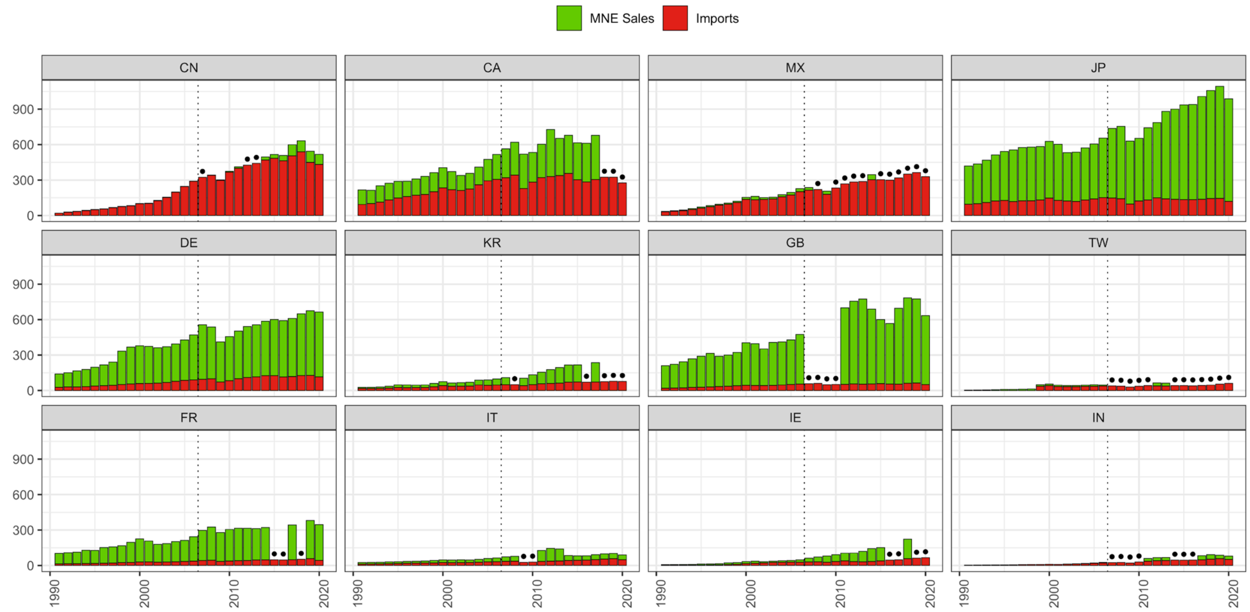
[25] Hitachi, Fujitsu, Toshiba, and Mitsubishi opened plants between 1979 and 1983. As a result of US Defense Department concerns, several Japanese corporations – including Toyo Bearing in 1971 and Fujitsu in 1988 – opted instead to start their own factories on US soil.

[26] Matsushita set up domestic facilities in 1974, Sanyo in 1977, Toshiba in 1978, and Sharp and Hitachi in 1979.

[27] Honda transitioned its motorcycle plant to cars in 1982; Nissan, Isuzu-Subaru and Toyota followed in 1983-1988. See jama.org. Interestingly, Japanese industrial policy did not explicitly target passenger vehicles as a high-priority sector nor did it directly support Honda: the 1961 Specified Industry Promotion Bill aimed for only Toyota and Nissan to export large cars and sought to merge smaller manufacturers (see Spar 1988).

[28] The US Bureau of Economic Analysis does not disclose information from select data cells for confidentiality reasons; such instances of redactions are denoted by a black dot in **Figure 2**. The MNC sales used are for nonbank affiliates from 1990-2006. From 2007 onward, the data are for nonbank affiliates for Canada, Japan, Germany, the UK, and France, but includes bank affiliates for all other economies. The figure is qualitatively similar if data on all affiliates (bank and nonbank) is used consistently throughout the period (available on request).

Figure 2: US Imports and MNC Affiliate Sales, by Source Country, USD bn (1991-2020)



Source: BEA; data downloaded in July 2023. Black dots indicate multinational affiliate sales data that are affected by disclosure redactions. The source country for MNC affiliate sales refers to the country of the ultimate beneficial owner. MNC sales are for nonbank affiliates from 1990-2006. From 2007 onward, the MNC sales data are for nonbank affiliates for CA, JP, DE, GB, and FR, but include bank affiliates for all other economies.

Second, the experience of Japan's MNCs shows that firms turned to FDI as a strategy both to navigate host-country restrictions on trade, as well as to mitigate the effects of rising production costs at home. In particular, the threat of US tariffs on Japan prompted Japanese firms to expand their manufacturing capabilities in the US, and ever-rising costs at home eventually led many Japanese firms to relocate production also to lower-cost countries in Asia.[29]

There are some lessons to be drawn here for the current situation with China. Given the prevailing geopolitical climate, it seems improbable that China will be able to emulate the US-based production approach that Japanese MNCs successfully implemented in terms of speed, scale, or scope. We will nevertheless see in Section 4.4 that there are already signs that Chinese firms have been expanding their FDI footprint in lower-cost locations, through which they potentially remain connected with US supply chains.

4 The "Great Reallocation" in Global Supply Chains

In this section, we focus on key developments in the pattern of global supply chain activity over the last five years (2017-2022). Even as overall trade volumes have been resilient following the recent wave of policy and economic shocks, a significant reallocation in global supply chains has been set in motion, most notably along the dimension of sourcing partner countries. We document the key shifts both at the country level, as well as in the cross-product variation.

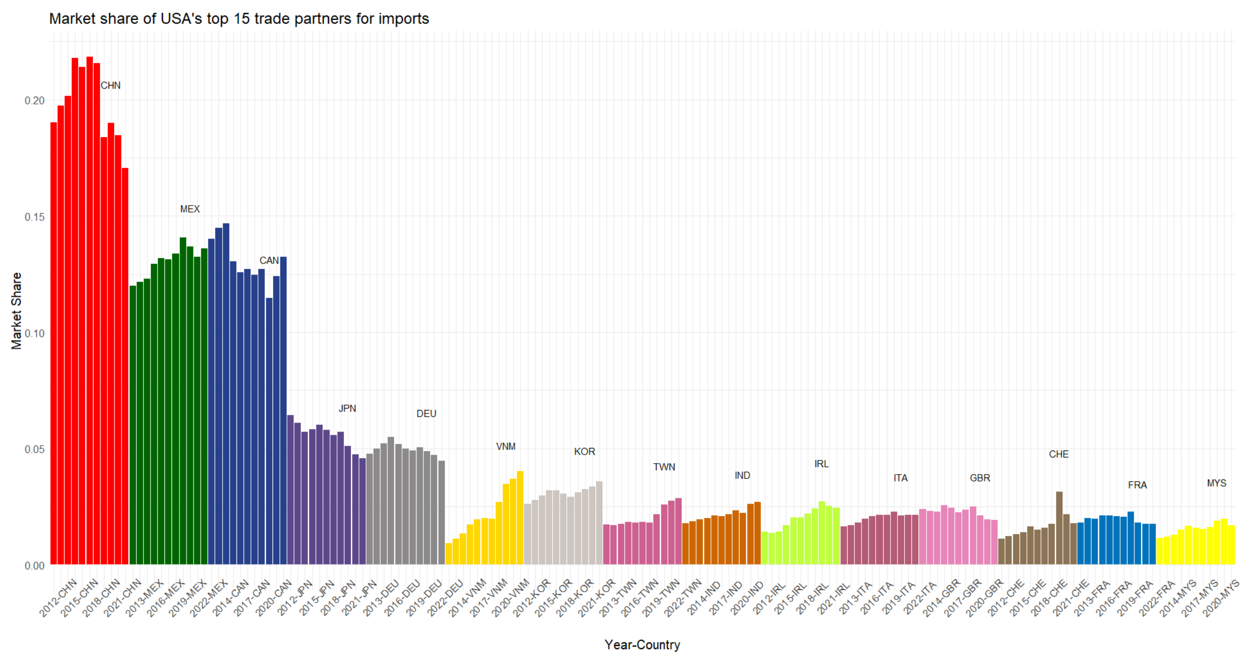
[29] The first round of *Endaka* or high yen following the Plaza Accord of 1985, led Japanese firms to produce in the US, while the second round in the mid-1990s, led them to Asia.

4.1 Trade Patterns: Reallocation across Partner Countries

Figure 3 presents the year-to-year evolution of the share in US imports held by the US' top trade partners (based on the value of total US imports by source country in 2017). This is illustrated for the years following the Global Financial Crisis, i.e., 2012-2022; this can be further divided into two subperiods of interest, respectively prior to and following the introduction of the US-China tariffs in 2017. At a broad level, the figure confirms the gradual shift in US imports away from richer and toward lower-income source countries: In the run-up to 2017, US import shares were rising for China, Mexico, and Vietnam. However, China's import share peaked in 2017 at 21.6%, while that for Mexico and Vietnam continued to register steady growth.

The years following 2017 were marked by a series of shocks to the global economy, including the US-China tariffs and the Covid-19 pandemic. By 2022 though, world trade flows were rebounding strongly.[30] In level terms, the US' imports from China in fact expanded from approximately \$505.1 billion in 2017 to \$531.3 billion in 2022; this represents an annual nominal growth rate of 1.2%. This growth came despite the sharp ups-and-downs in trade volumes in the intervening pandemic years, and despite the fact that Chinese goods were losing ground relative to imports from other source countries in the US market during these five years.[31]

Figure 3: Evolution of US Trade Partners' Import Market Shares

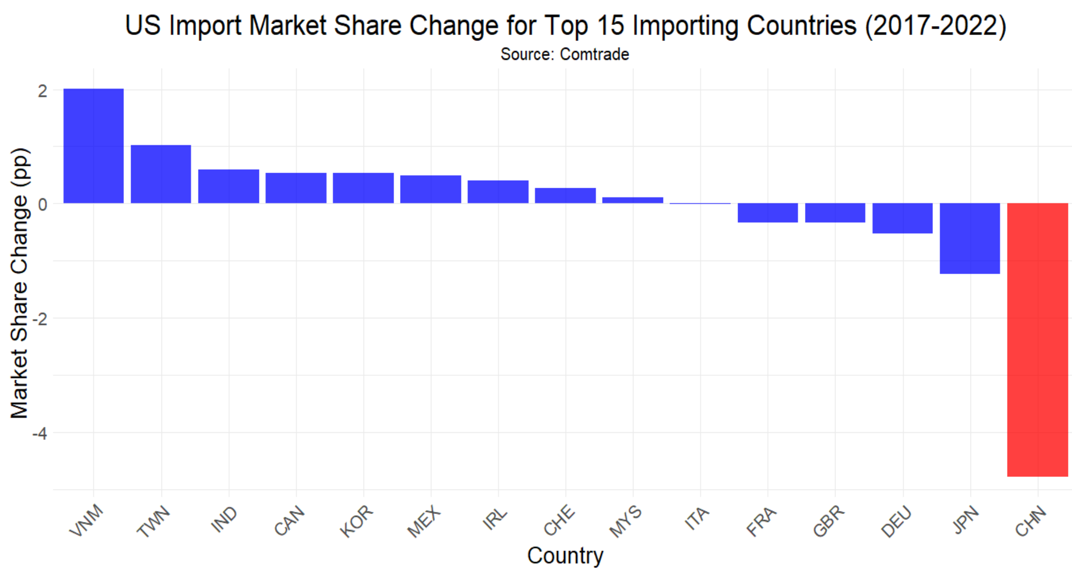


Source: UNComtrade. Top trade partners in 2017. Data Downloaded in April 2023.

[30] With the large year-to-year swings observed in trade flows at the height of the Covid-19 pandemic, one needs to exercise caution about start and end dates when computing changes over time, to avoid comparisons that might be skewed by the peak-pandemic years.
[31] At the same time, US exports to China expanded at an annual rate of 3.4% from \$129.9 billion in 2017 to \$154.0 billion in 2022. The US' trade with most of its significant trade partners grew in level terms between 2017-2022. In 2022, US imports were lower than in 2017 for only Venezuela, Hong Kong, Russia, Nigeria, Kuwait, and Iraq; for US exports, these were lower than in 2017 for Hong Kong, Russia, Saudi Arabia, Venezuela, Kuwait, Afghanistan, and Norway.

Figure 4 underscores the reallocation in sourcing patterns that has occurred, by zooming in on the change in import share in 2017 versus 2022 for the same set of top US trade partner countries (as in **Figure 3**). Despite the growth in absolute levels, China's imports witnessed a significant loss in market share of around 5 percentage points. As seen from the figure and documented by others (Bown 2022; Grossman et al. 2023; Freund et al. 2023; Fajgelbaum et al. 2023), countries in Asia have emerged as big winners. Vietnam emerged as the most significant gainer, with a close to 2 percentage point increase in its share of US imports. Higher-income East Asian economies such as Taiwan and Korea, and South Asian countries such as India, registered more modest but still noticeable gains. Despite their already high import share, NAFTA nations, particularly Mexico, also emerged as beneficiaries; Canada even experienced a reversal in its declining share of the US market. Elsewhere though, Japan and other high-income European countries, such as Germany, the UK, France, and Italy, saw their share of US imports continue to fall.[32]

Figure 4: Changes in US Import Market Share



Source: UN Comtrade. Data Downloaded in April 2023.

4.2 Reallocation across Products and Partners

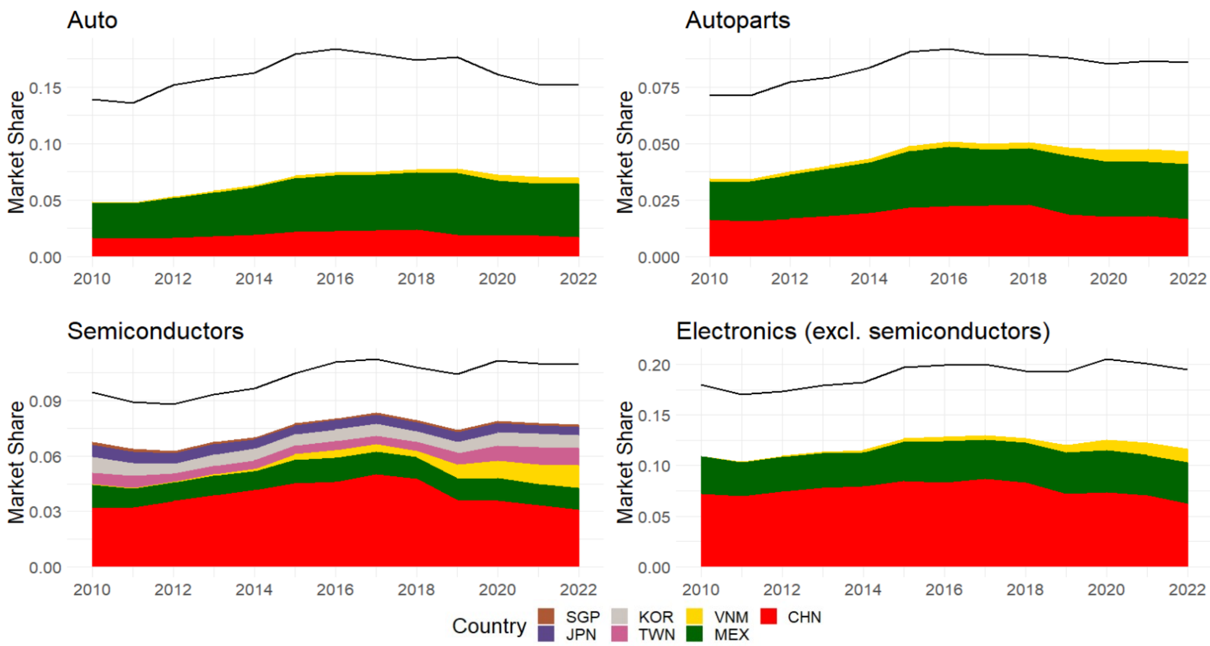
Thus far, we have shown that the US has been moving away from China as a source of its imports. We now show that this reallocation toward other source countries, including Vietnam and Mexico, is evident across a wide range of traded products.

As a first take, **Figure 5** visually represents the shifts in import market share within four sectors often central to US trade and policy discussions: automobiles, auto parts, electronics, and semiconductors. In these sectors, direct imports from China are significant, except in finished

[32] Due to the health emergency during the pandemic, trade in vaccines and other pharmaceutical products intensified; the increase in trade in such products (HS codes 3002 and 3004) accounts for the rise in Ireland's and Switzerland's share of US imports.

automobiles. The decline in China's import share after 2017 is clear in auto parts, electronics, and semiconductors. The figure further highlights the gains by Mexico and Vietnam across these key product categories (except in autos, where imports by the US from Vietnam are negligible). In semiconductors, high-income economies in Asia, such as Taiwan, have seen a notable increase in their market share.

Figure 5: Change in US Import Market Share (2017-2022)
Autos, Auto Parts, Semiconductors, and Electronics



Source: UN Comtrade. Sectors correspond to the following NAICS codes, which are matched to HS using the Pierce and Schott (2012) concordance. Autos (less parts): Motor Vehicle Manufacturing (3361), Motor Vehicle Body and Trailer Manufacturing (3362); Auto parts: Motor Vehicle Parts Manufacturing (3363); Semiconductors: Semiconductor and other Electronic Component Manufacturing (3344), Semiconductor Machinery Manufacturing (332442); Electronics and Electrical: Computer and Electronic Product Manufacturing (334) less 3344, Electrical Equipment, Appliance, and Component Manufacturing (335).

Looking at more specific products, China lost import market share between 2017-2022 in such key items as telephone sets (HS 8517, close to 16.4 percentage points) and machinery (HS 8473, around 46.6 percentage points). Products such as tapes (HS 8523), printing machines (HS 8443), monitors (HS 8528), electrical equipment (HS 8504 and 8543), apparel (HS 6110) and footwear (HS 6403) also saw decreases in the China share of US imports (of between 9.7 to 39.3 percentage points each).[33]

We now present more systematic regression-based evidence of these trends. We approach this by exploring whether product-level changes in the US' share of imports from China are correlated with changes in the import shares and other observable dimensions of the US' imports from third-countries, particularly from Vietnam and Mexico.

[33] On the other hand, products where China gained share in US imports during this period include: electric storage batteries (HS 8507), medicaments (HS 3002 and 3004), and diagnostic reagents (HS 3822).

For this purpose, we use the following specification:

$$\Delta y_{p,22\text{-}17} = \beta_1 \Delta CHNsh_{p,22\text{-}17} + \beta_2 \Delta y_{p,17\text{-}12} + D_{p0} + \varepsilon_p \,, \tag{2}$$

where $\Delta CHNsh_{p,22\text{-}17}$ is the change between 2017-2022 in the share of the US' imports of HS4 product p that are from China.

The variable y denotes product-level outcomes drawn from the UN Comtrade data. For a start, we will explore as the dependent variable $\Delta y_{p,22\text{-}17}$ the corresponding five-year change in the US' import share of product p from other source locations. As we have seen in **Figure 3**, the import shares from specific partner countries might exhibit pre-trends in the US' propensity to source from that location, and so we also control in (2) for the lagged five-year change (between 2012-2017) in this outcome variable. The regression further includes HS2 fixed effects (denoted by D_{p0}) to account for differences in product characteristics at this broader level.

Note that we focus on a five-year difference rather than on year-to-year changes in trade patterns which have been very volatile over this period of study. In other words, we should interpret the regression as an assessment of the cumulative impact of the various major shocks – the US-China tariffs, and the Covid-19 pandemic – that have occurred during the five-year period. The estimated coefficient β_1 is thus intended to capture at a descriptive level how shifts in the propensity to import from China are correlated with shifts in the propensity to import from alternative source locations.

Table 3: Change in US Import Share (2017-2022)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:	Δ US product-level import share from c (2017-2022)						
Import sources, c:	VNM	MEX	CAN	IND, THA, MYS, IDN	KOR, TWN, SGP	IRL, CHE	ROW
ΔCHN import share (2017-2022)	-0.198***	-0.079***	-0.012**	-0.136***	-0.440***	-0.011*	-0.101
	[0.025]	[0.020]	[0.005]	[0.044]	[0.134]	[0.006]	[0.062]
Lag Δ in c's import share (2012-2017)	0.768	-0.118	0.001	0.106	0.188	0.073	-0.453***
	[0.529]	[0.220]	[0.069]	[0.161]	[0.126]	[0.053]	[0.087]
Observations	1,149	1,149	1,149	1,149	1,149	1,149	1,149
R-squared	0.529	0.296	0.220	0.301	0.561	0.136	0.458
HS2 fixed effects?	Y	Y	Y	Y	Y	Y	Y

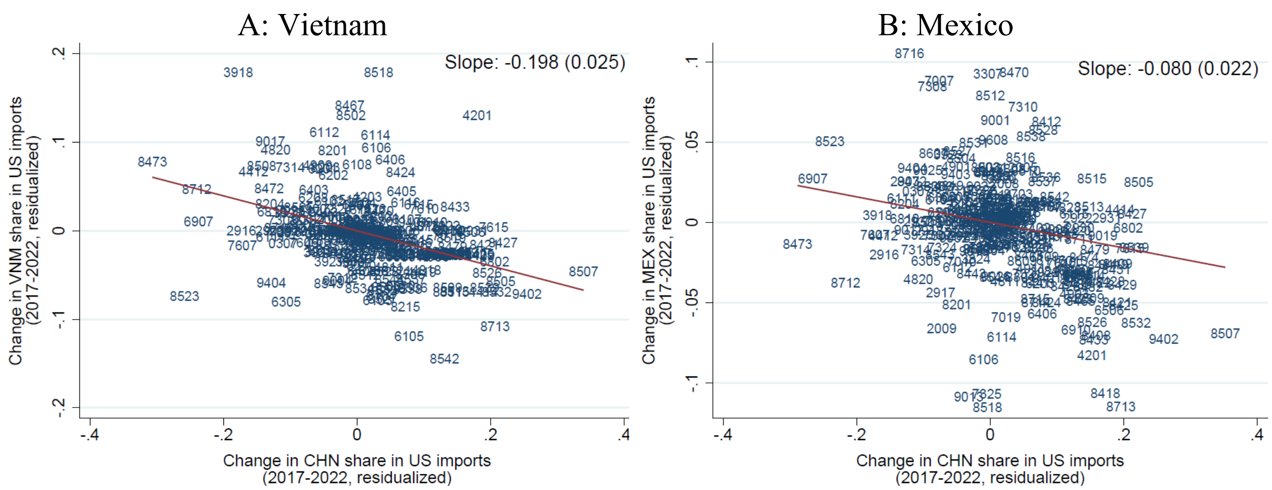
Notes: Based on HS4 product-level trade data from UN Comtrade. Estimation is by weighted least squares with HS2 fixed effects, with the 2017 value of US imports from China for the respective HS4 products as weights. Standard errors are clustered by HS2 codes; ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

Table 3 reports these regression results. We have grouped the alternative import locations as follows in successive columns: (i) Vietnam; (ii) Mexico; (iii) Canada; (iv) a set of four low-wage Asian economies (India, Indonesia, Malaysia, Thailand); (v) a set of high-wage Asian locations (Korea, Singapore, Taiwan); (vi) Ireland and Switzerland (from which there was an increase in imports of pharmaceuticals and medical goods); and (vii) the rest of the world. We use regression weights equal to the initial 2017 value of HS4-digit imports from China, and we report standard errors clustered by HS2-digit codes.

The negative and significant β_1 coefficient in Columns 1 and 2 implies that the share of US imports from Vietnam and Mexico (respectively) indeed rose on average for products that saw a decline in the share imported from China. This confirms that the reallocation of import shares away from China is not just anecdotal but rather a systematic feature in the pattern of US product-level imports. We see this pattern of substitution away from China play out too in favor of the other key import partners (Columns 3-6); note that after accounting for these alternative source locations, the share of US imports for the residual rest-of-the-world category does not respond significantly to changes in the import share from China. When considering instead the log value (rather than the share) of imports for the outcome variable y, **Appendix Table 3** verifies that product-level decreases in the import share from China were accompanied by a broad increase in the value of imports from across many other source countries, including Vietnam and Mexico (Columns 1-2).

In what follows, we will take a closer look at these two alternative source countries, Vietnam and Mexico, which are emblematic of "friendshoring" and "nearshoring." As mentioned earlier, Vietnam saw the most significant market share gain from the US' shift away from China, while Mexico has seen its share of US imports steadily rise since the 1990s and particularly in the past 5 to 10 years (**Figures 3 and 4**).

Figure 6: Correlations between Import Share from China versus Vietnam and Mexico (2017-2022)



Notes: Residualized scatterplots based on the specification in (2), with the 2017-2022 change in the Vietnam (respectively, Mexico) share in US imports on the vertical axes. For the top 300 HS4-digit products by 2017 import value from China.

Figure 6 illustrates the negative relationship between shifts in import shares from China, on the one hand, and shifts in import shares from Vietnam and Mexico, respectively, focusing on the top 300 products by the 2017 value of US imports from China.[34] The figures moreover provide a sense of the products in which Vietnam and Mexico picked up significant import share. Both countries gained ground in various types of electrical and electronic equipment, such as microphones (HS 8518), electric generating sets (HS 8502), and telephone sets (HS 8517) in the case of Vietnam, and discs, tapes and storage devices (HS 8523) and calculating machines (HS 8470) in the case of Mexico. But there have also been differences in the product mix of the observed shifts. Vietnam's import share in plastic floor coverings (HS 3918) and various forms of apparel (HS 6112, 6114) rose more than for the average product. Likewise, Mexico's imports in automobiles and automobile parts (HS 87), as well as glass, iron, and steel products (HS 7007, 7308, 7310), performed particularly well.

On a related note, we show in **Appendix Table 4** that this negative relationship with changes in the import shares of Vietnam and Mexico is robust if we remove petroleum-related products (HS codes starting with "27"); if we were to run a purely cross-sectional regression without HS2 fixed effects; or if we were to focus on just the top 300 products by value that were imported by the US from China in 2017.

Heterogeneity in responses: Table 4 further explores the heterogeneity in product-level responses across Vietnam and Mexico, vis-à-vis which products gained more import share in the US market following decreases in the import share held by China. We do so by augmenting the regression specification in (2) with interaction terms with several product-level characteristics of interest, specifically: the upstreamness of the product *p*, the labor share (computed from 2012 US Input-Output Tables), and the tariff on Chinese imports of product *p* imposed by the Trump administration.[35]

The results reveal interesting differences when comparing which products in Vietnam and Mexico experienced greater shifts in their market shares in tandem with corresponding decreases in China's import share. For Vietnam, a greater increase in its import share is seen for products that are more upstream, that have a lower labor share, or that saw their imports from China hit with higher US tariffs (Columns 1-4). This is broadly consistent with the observation that Vietnam was, during these years, shifting more into the production of electrical and electronic parts and components that are relatively more upstream and less labor-intensive compared to goods (such as textiles) that it had previously been exporting. (**Appendix Figure 3** provides corroboration for this finding that Vietnam has been inserting itself into progressively more upstream stages in US supply chains. There, we show using a trade-weighted measure analogous to (1) that the upstreamness of Vietnam's bilateral exports to the US has been rising, particularly over 2017-2022.)

---

[34] To generate these scatterplots, we follow the specification in (2) to residualize each horizontal and vertical axis variable by the variation explained by HS2-digit fixed effects and the respective lagged dependent variable in each panel, while weighting by the initial value of product-level imports from China.

[35] The upstreamness measure is as described in Section 3.3; the labor share measure is computed as the ratio of employee compensation to total output, as computed from the 2012 US Input-Output Tables, and mapped to HS4 product codes using the Peirce and Schott (2012) concordance (in an analogous manner as for the upstreamness measure); the tariff measure is based on Bown (2021), as processed by Chor and Li (2021).

Table 4: Change in US Import Share for Vietnam and Mexico (2017-2022)
Interaction Terms with Upstreamness, Labor Share, US Tariffs on China

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Δ US product-level import share from c (2017-2022)							
Import sources, c:	VNM	VNM	VNM	VNM	MEX	MEX	MEX	MEX
ΔCHN import share (2017-2022)	0.097	-0.435***	-0.096	-0.180	-0.311***	0.170**	0.081	0.187
	[0.169]	[0.128]	[0.139]	[0.256]	[0.102]	[0.066]	[0.114]	[0.129]
Lag Δ in c's import share (2012-2017)	0.934*	0.941**	0.899*	0.938*	-0.144	-0.295***	-0.170	-0.318***
	[0.516]	[0.459]	[0.519]	[0.471]	[0.220]	[0.104]	[0.250]	[0.104]
Upstreamness	-0.016			-0.013	-0.001			-0.000
	[0.014]			[0.010]	[0.009]			[0.005]
… × ΔCHN import share	-0.143*			-0.018	0.113**			0.035
	[0.084]			[0.085]	[0.050]			[0.042]
Labor Share		-0.060		-0.126*		0.088		0.073
		[0.054]		[0.066]		[0.058]		[0.055]
… × ΔCHN import share		0.977**		0.768**		-0.991***		-0.919***
		[0.480]		[0.339]		[0.301]		[0.279]
US Tariff			-0.002	-0.001			0.000	0.000
			[0.001]	[0.001]			[0.001]	[0.000]
… × ΔCHN import share			-0.006	-0.010*			-0.010	-0.007**
			[0.008]	[0.005]			[0.006]	[0.003]
Observations	280	280	280	280	280	280	280	280
R-squared	0.551	0.593	0.550	0.609	0.344	0.469	0.342	0.491

Notes: Based on HS4 product-level trade data from UN Comtrade. Estimation is by weighted least squares with HS2 fixed effects (unless otherwise stated), with the 2017 value of US imports from China for the respective HS4 products as weights. The sample excludes petroleum products (HS2 code 27), and is further restricted to the top 300 HS4 products by value in 2017 US imports from China. Standard errors are clustered by HS2 codes; ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

For Mexico, on the other hand, the increase in import share has been more pronounced in products that are less upstream, that feature a higher labor share, and whose imports from China were subject to higher US tariffs (Columns 5-8). That Mexico's imports increased in relatively less upstream products could be a by-product of its proximity to the US, and hence its being a natural location for the final stages of assembly of goods, such as motor vehicles, destined for the US market.

Interestingly, the one common thread uncovered for both Vietnam and Mexico in **Table 4** is the negative and significant interaction effect involving the US product-level tariff on China, a finding which underscores the policy-driven nature of this reallocation in the US' sourcing patterns away from China.

Implications for unit prices: Table 5 provides hints that the reallocation in the pattern of imports is likely already having an impact on the prices of goods that arrive in the US from these alternative source countries. We run here the specification in (2), but use instead log product-level unit values – calculated as the value of import flows divided by recorded quantity – as the outcome variable *y*.

Of note, we find that decreases in the share of imports obtained from China are associated with increases in the unit values of goods purchased by the US from Vietnam and Mexico (Columns 1-2).[36] This suggests that either cost-push or demand-pull factors associated with the rise in US import purchases from Vietnam and Mexico have contributed to increases in goods prices from these locations. It is useful to recall here that the trade-weighted average decrease across products in the share of US imports from China is around 5 percentage points. Taking our point estimates in **Table 5** at face value, our analysis indicates that such a 5 percentage-point decrease in the China import share would be associated with non-trivial increases in the unit prices of imports; the size of the implied increases is respectively 9.8% for Vietnam (Column 1) and 3.2% for Mexico (Column 2). (Note that there is also a significant effect in Column 5 on the unit values of imports from Korea, Taiwan and Singapore; the size of this effect is smaller though, with a 5 percentage-point decrease in sourcing from China being associated with a 2.3% increase in goods prices from these locations.)

Table 5: Change in Import Unit Values (2017-2022)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:	Δ Log US product-level import unit value from c (2017-2022)						
Import sources, c:	VNM	MEX	CAN	IND, THA, MYS, IDN	KOR, TWN, SGP	IRL, CHE	ROW
ΔCHN import share (2017-2022)	-1.960* [1.001]	-0.630** [0.282]	0.062 [0.367]	-0.905 [0.905]	-0.460* [0.245]	-0.331 [0.622]	-0.700 [1.110]
Lag Δ log import unit value from c (2012-2017)	-0.334*** [0.086]	-0.198*** [0.027]	0.045 [0.086]	-0.416*** [0.090]	-0.234*** [0.056]	-0.297*** [0.077]	-0.788*** [0.151]
Observations	634	926	982	1,025	954	847	286
R-squared	0.342	0.355	0.424	0.350	0.404	0.325	0.306
HS2 fixed effects?	Y	Y	Y	Y	Y	Y	Y

Notes: Based on HS4 product-level trade data from UN Comtrade. Variables in log changes are computed using the Davis-Haltiwanger-Schuh approximation. Estimation is by weighted least squares with HS2 fixed effects, with the 2017 value of US imports from China for the respective HS4 products as weights. Standard errors are clustered by HS2 codes; ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

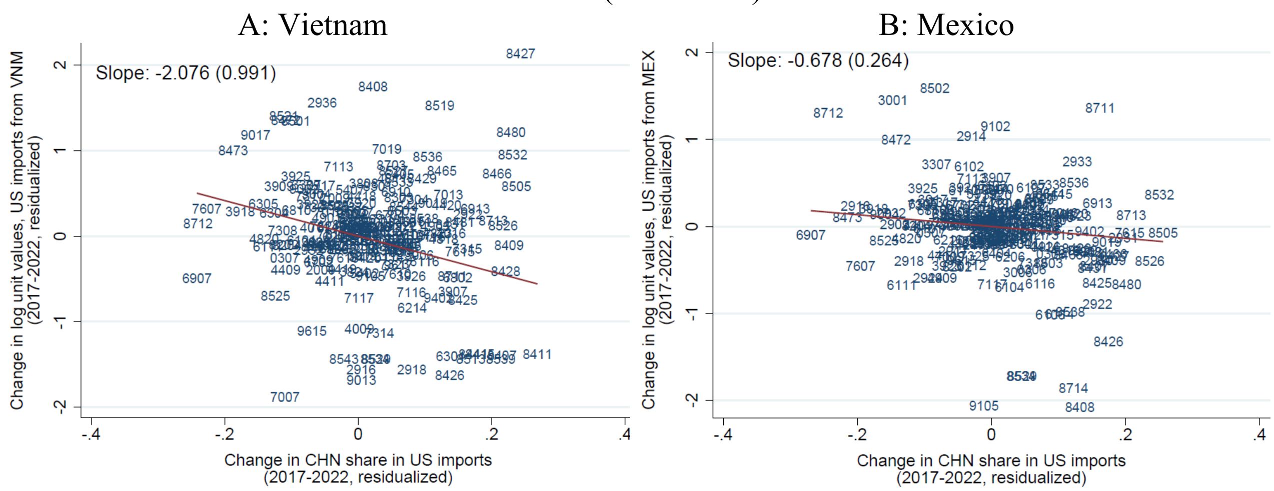
Figure 7 displays this relationship with import unit values. Similar to **Figure 6**, we focus on the top 300 products by initial import value from China, and use the residualized log change in unit values from Vietnam and Mexico as the respective vertical axis variables. The two panels clearly highlight the strong correlation across HS4-digit products between decreased importing from China and higher unit prices of goods from Vietnam and Mexico.

These findings add a new dimension to a body of existing evidence on the price effects of the US tariffs on China. While it is now well-understood that the US tariffs have raised the unit prices of goods imported from China with a near-complete tariff pass-through (Amiti et al. 2019; Fajgelbaum et al. 2020; Cavallo et al. 2021), the above findings suggest that trade diversion to countries such as Vietnam and Mexico has also been associated with quantitatively significant

[36] We compute the change in unit values over time using the Davis-Haltiwanger-Schuh approximation to a log change, in order to accommodate products which were not imported from Vietnam or Mexico in 2017, but for which importing commenced in 2022.

increases in import prices from these alternative source locations. Although Amiti et al. (2019) highlight the complexity of aligning trade data with Consumer Price Index data in a comprehensive manner, it is likely that some portion of these rising prices from third-countries is being passed on to the US firms or consumers purchasing these goods. This reinforces a concern that the policy-driven reallocation is likely to generate increased price and wage pressures in the US.

Figure 7: Correlations between Import Share from China versus Unit Values in Vietnam and Mexico (2017-2022)



Notes: Residualized scatterplots based on the specification in (2), with the 2017-2022 change in the log unit value of US imports from Vietnam (respectively, Mexico) on the vertical axes. For the top 300 HS4-digit products by 2017 import value from China.

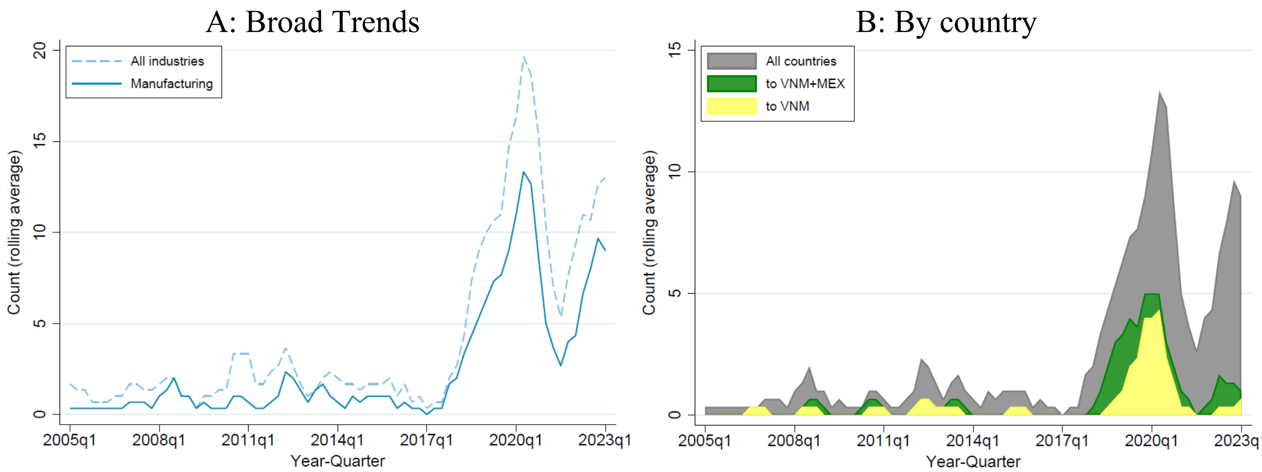
It has been argued that for several decades leading up to 2017, the correlation between prices and wage pressures in the US has been attenuated due to increased importing and outsourcing (Forbes 2019; Obstfeld 2019). Consequently, the recent policy restrictions to shift sourcing patterns or even to encourage substitution toward domestic inputs are poised to add to wage and cost pressures in the US (Amiti et al. 2023; Comin et al. 2023).

4.3 Corroborating Evidence on Friendshoring and Nearshoring

We provide two pieces of corroborating evidence that indicate that the changes in US import patterns we have documented with trade data are indeed a reflection of purposeful decisions being made at the level of individual firms to shift activity away from China.

First, we examine the frequency with which the terms “friendshoring”, “nearshoring”, or “reshoring” appear in earnings conference calls conducted by listed firms, particularly when these terms are raised in the context of sourcing from China. This follows the novel work of Hassan et al. (2019) and Hassan et al. (2021), who demonstrate the feasibility of extracting this textual data to identify business-relevant issues commanding the attention of corporations and their investors. **Figure 8** below illustrates the trends over time (by quarter) in the occurrence of such terms that speak to potential shifts in offshoring arrangements away from China; this draws on the call transcripts in Refinitiv Eikon that have been processed by NL Analytics.[37] While these data are subject to the caveat that earnings calls are typically conducted only by listed firms who need to engage publicly with their investors and stakeholders, these are nevertheless useful as a timely gauge of key issues of concern among major companies.

Figure 8: Friendshoring/Nearshoring/Reshoring in Earnings Calls (2005Q1-2023Q3)



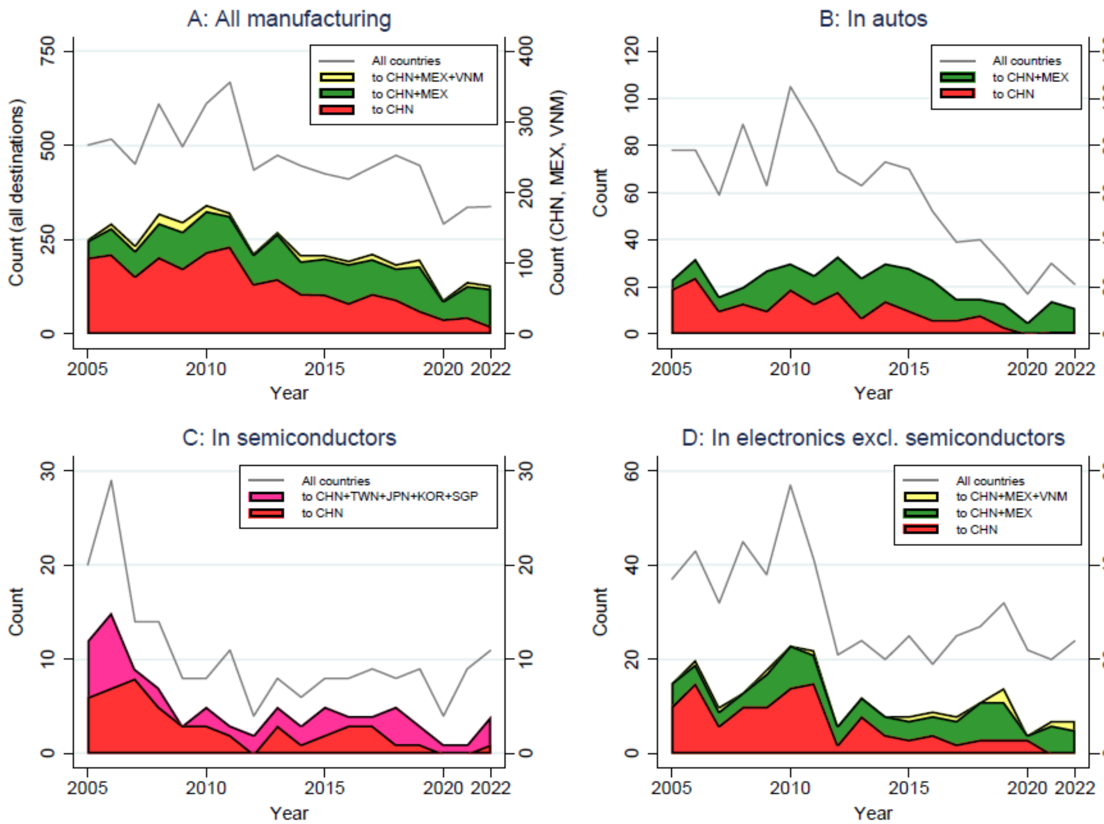
Notes: Friendshoring/Nearshoring/Reshoring in call transcripts in Refinitiv Eikon processed by NL Analytics; counts are three-quarter rolling averages.

Figure 8 confirms a sharp rise in the use of phrases pertaining to friendshoring, nearshoring, or reshoring away from China. Two spikes are evident. The first coincides with the rise in US-China trade tensions in mid-2017 under the Trump administration through to the early phases of the Covid-19 pandemic in mid-2020. After a short lull, there has been a resurgence in this topic in earnings calls starting in 2022, suggesting that a significant number of firms are engaging in discussions about their China sourcing strategies in light of the Biden administration's continued use of discretionary tariffs and its public turn toward industrial policy. This increased attention on whether to source from China was driven by manufacturing companies (**Panel A)**. Vietnam features prominently – and Mexico to a lesser extent – among the countries that are mentioned alongside these discussions about shifting sourcing away from China (**Panel B**).[38]

A second piece of corroborating evidence comes from the pattern of foreign direct investment (FDI) flows, which as we have seen is an alternative mode through which firms can structure and organize their participation in GVCs. Below, we use data from the Financial Times' fDi Markets, which tracks news and announcements on new greenfield FDI projects around the world. What fDi Markets observes is a limited slice of global FDI activity, given that it excludes mergers and acquisitions. That said, with the high sunk and fixed costs that are incurred when firms undertake FDI, decisions over whether to commence greenfield FDI should, in principle, be particularly sensitive to country policies that actively seek to reorient patterns of global production and sourcing.

[37] Specifically, to capture text that speaks to a potential shift in sourcing from China to another country (say Vietnam), our measure counts the number of occurrences of: (i) the root form of "reshor*", "nearshor*", or "friendshor*" that appear in tandem with "China" and "Vietnam", and: (ii) the phrase "China to Vietnam".
[38] The earnings call data unfortunately do not permit a breakdown by detailed manufacturing industries.

Figure 9: US Outward Greenfield FDI (2005-2022)



Source: Financial Times' fDi Markets.

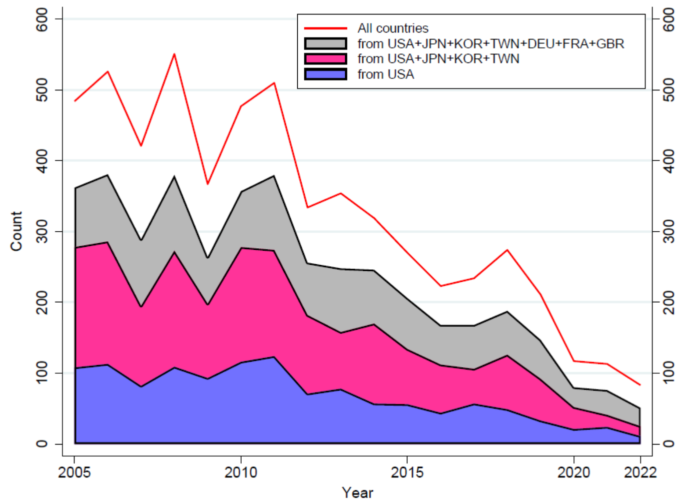
In **Figure 9,** we illustrate trends over time in the counts of outward greenfield FDI projects from the US.[39] Based on this measure, the US' outbound manufacturing FDI was already on a downward trend since the early 2010s, with (not surprisingly) a steady but marked decrease in greenfield projects in China (**Panel A**).[40] This drop in FDI is visible across key sectors, including automobiles, semiconductors, and electronics (**Panels B-D**, respectively). In the case of automobiles and electronics (excluding semiconductors), FDI to Mexico has noticeably taken up some of the slack. By contrast, there has not been a perceptible increase in greenfield FDI by US firms in Vietnam, perhaps reflecting the higher costs of FDI associated with this more distant location.

What about FDI from the perspective of China? **Figure 10** shows that the greenfield FDI China has received in the manufacturing sector has, in fact, been on the decline since the end of the Global Financial Crisis. This is not driven by the fall in FDI from the US *per se*, but is instead a broad-based decline from virtually all major FDI source countries into China, including the key

[39] Using FDI values yields qualitatively similar patterns (available on request), although those illustrations are noisier due to the presence of imputed observations on project capital expenditures.
[40] This is consistent with Ahn et al. (2023), who document a similar broad decline in global greenfield FDI, as well as a shift in outward US FDI away from China toward countries which can be viewed as the US' geopolitical "friends".

Asian actors (Japan, Korea, Taiwan), and Europe (Germany, France, and Great Britain).[41] This strongly suggests that the underlying causes are factors domestic to China which were in place even prior to the US-China trade tensions; this likely includes rising Chinese wages, restrictions on foreign ownership (such as joint venture requirements), or concerns over intellectual property protection.

Figure 10: Evolution of China's Inward FDI Position, Manufacturing (2005-2022)



Source: Financial Times' fDi Markets.

The apparent decline in US greenfield FDI in China is yet another symptom of the reallocation of US economic activity away from Chinese shores. As of now however, we do not yet have a full accounting of the extent to which US multinationals are relocating their operations to other host countries, nor of the extent to which they are onshoring production in domestic locations.

4.4 The Back Door: Does Friendshoring and Nearshoring Reduce Dependence?

Although the US' direct economic engagement with China through trade and FDI has been falling, especially since 2017, it is important to pose a "reality check" question: Has this necessarily reduced the US' dependence on supply chain links to China? As discussed in Section 2, we do not yet have the data resources – such as updated World Input-Output Tables – to fully identify and decompose the country sources of value added that are ultimately embodied in US gross imports. That said, we report on several trends below, which indicate that the US' indirect supply chain links to China remain intact; along some dimensions – through China's economic ties with Vietnam and Mexico – these indirect links have even been intensifying.

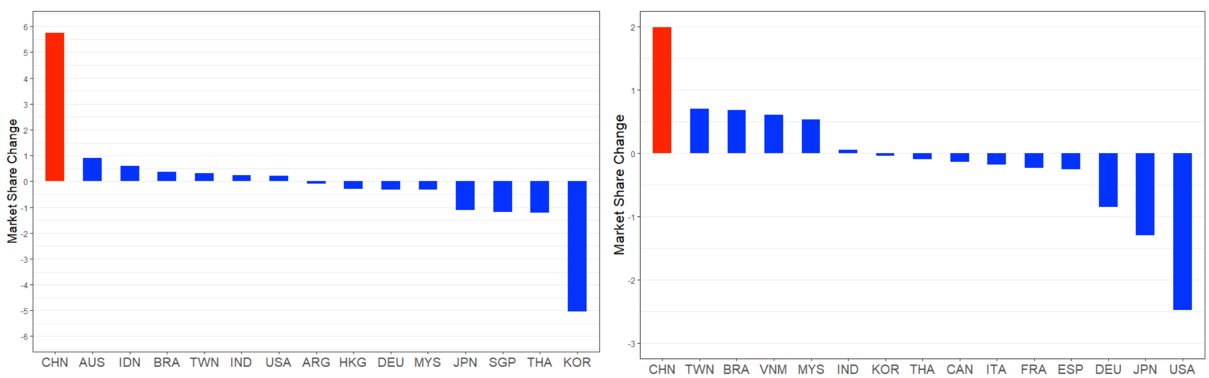
On the trade front, both Vietnam and Mexico have strong trade ties with the US. Nearly a quarter of Vietnam's exports are shipped to the US. In the case of Mexico, the US is in fact its largest foreign market, absorbing nearly 80% of all Mexico's exported goods.

[41] This decrease in greenfield FDI in China can also be seen within key sectors, including autos, semiconductors, and electronics (see **Appendix Figure 4**).

At the same time too, both Vietnam and Mexico have seen their import links with China step up progressively over time. For Vietnam, goods from China were 9% of its total imports in 1994, and this has surged to 26% in 2010 and approximately 40% by 2022; the main items that China ships to Vietnam include integrated circuits, telephone sets, and textiles. Between 2017-2022, the US did see its share of Vietnam's imports grow, but China made even more substantial gains, increasing its share by around 5.5 percentage points during this period (**Figure 11, Panel A**). For Mexico, the share of its imports that originate directly from China has grown considerably from 1% in 1994 to 15% in 2010 and 20% in 2022. Conversely, the proportion of Mexico's imports that are from the US has declined from 69% in 1994 to 44% in 2022. Over the last five years in particular, China was the source country that gained the most import share in Mexico, with much of this coming at the expense of the US (**Figure 11, Panel B**).

Figure 11: Change in Import Market Share, Vietnam and Mexico (2017-2022)

A. Vietnam B. Mexico

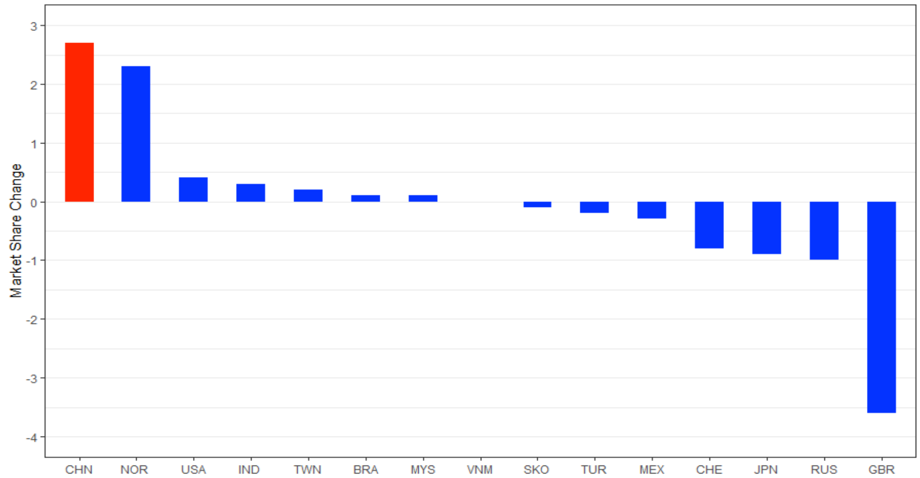


Source: UN Comtrade. For 2022, data on Vietnam's bilateral imports were available for a subset of countries; data for 2021 are used instead.

This trend is not confined to middle and lower-income countries. **Figure 12** depicts the shift in import market share from 2017-2022 for the European Union's primary trade partners. China's share of EU imports rose by nearly 2.7 percentage points during this time frame, accounting for approximately 20.9% of imports by 2022; the peak of Chinese import penetration in the EU was in fact 22.4% in 2020. By contrast, the US represents approximately 11.9% and only saw a modest increase of 0.4 percentage points over the same period.[42] **Appendix Table 5** shows that this pattern of rising Chinese import shares has been the pattern for the leading US trade partners, with the exception of Japan. To the extent then that Chinese firms' exports to these other locations comprise parts and components that are then assembled into final goods and sent thereon to the US market, China would ultimately continue to be a relevant player in the upstream stages of US supply chains.[43]

[42] In the United Kingdom, China also gained import market share (4 percentage points) compared to the 2.7 percentage points of the US (data from UN Comtrade).
[43] Any such shifts that lengthen US supply chains by involving third-country locations are likely to require firms to incur increased working capital costs (Kim and Shin 2023), adding to the cost pressures that might ultimately be felt by final-good consumers.

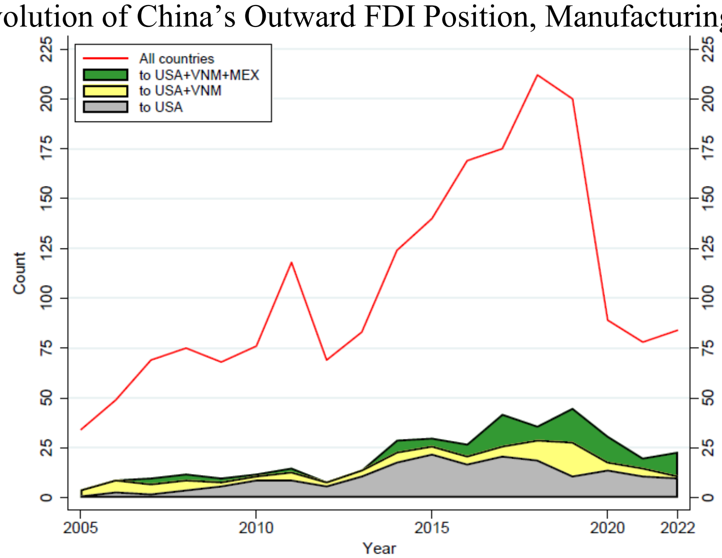
Figure 12: Change in Import Market Share, European Union (2017-2022)



Source: Eurostat (EXT_LT_MAINEU), Updated 15/06/2023.

Turning to FDI, there is also evidence of a growing Chinese presence in the manufacturing sectors of Vietnam and Mexico. China's outward manufacturing FDI rose sharply in the mid- to late 2010s, although this came to a pause during the Covid-19 pandemic. Looking more closely, there is a modest but noticeable increase in Chinese FDI to Vietnam around 2018 (see the small bulge in **Figure 13**); this timing is suggestive, as it is in line with narratives that some Chinese firms set up operations in Vietnam in part to circumvent the US tariffs on direct exports from China. Of note too, there has been an uptick in China's outward FDI to Mexico over the last five to eight years.

Figure 13: Evolution of China's Outward FDI Position, Manufacturing (2005-2022)



Source: Financial Times' fDi Markets.

This pattern of rising FDI by Chinese firms in Vietnam and Mexico is borne out too in the data that is available from these respective countries. Let us start first with Mexico, for which the available national statistics on inward FDI is more detailed and up-to-date.[44] The US has an entrenched position as the largest source country for FDI into Mexico, with US firms accounting for slightly more than 50% of the value of all inbound manufacturing FDI in Mexico in 2022. As for China, in line with the trends from the fDi Markets database, the value of Chinese FDI in Mexico has indeed picked up: Chinese firms' direct investment in the Mexican manufacturing sector grew fivefold from US$31.6 million in 2017 to US$151.5 million in 2022. The vast majority (close to three-quarters) of this Chinese inward FDI between 2017-2022 has been in two industries that are particularly relevant for GVCs, namely: computer and peripheral equipment (NAICS 3341) and motor vehicle parts (NAICS 3363).[45] Admittedly though, Chinese FDI in Mexico is taking off from a low base – in 2022, China's share in all manufacturing FDI flows into Mexico was slightly over 1% – so it will be interesting to monitor how large a player China eventually becomes in Mexican FDI.

The FDI data for Vietnam are less widely available, but if anything, the role of China as a source of inward FDI into the country is even more pronounced. Using proprietary Vietnam Annual Enterprise Data, McCaig et al. (2022) report that China's share of inward FDI by value rose from 0.004% in 1999 to 7% in 2017 (see their Figure 4). Public data from Vietnam's General Statistics Office confirm that this trend has been sustained even through the Covid-19 pandemic: China's share by value of all FDI projects granted licenses by Vietnam in 2021 was 7.7%. By comparison, US multinationals have a smaller presence in Vietnam, with a 2% share of all new FDI projects in 2021.[46]

Chinese firms have thus been increasingly active as a source of FDI into both Vietnam and Mexico, with the timing of this rise coinciding with the US' imposition of discretionary tariffs on direct imports from China. Although we have argued that China may find it challenging to replicate the US local production strategy adopted by Japanese firms in the 1970s and 1980s as outlined in Section 3.4, it is nevertheless catering to the US main trade partners via exports and FDI. The upshot of this is that even though the US may be reallocating its sourcing and imports toward Vietnam and Mexico, it may de facto remain connected with and dependent on China through third-countries, including through Vietnam and Mexico. These indirect supply chain links that the US may be retaining with China deserve closer investigation as more detailed data comes to light.

Before proceeding to the next section, it is useful to highlight that this "great reallocation" away from China is likely to be highly consequential for domestic economic outcomes within Vietnam and Mexico. Already, there is anecdotal evidence that the expansion of manufacturing activity has pushed up workers' wages and industrial real estate rents in both Vietnam (New York Times, 1 September 2022) and Mexico (Kearney 2022). Several more formal empirical studies have also emerged that exploit the variation across industries or districts in Vietnam in their exposure as a

[44] The data are obtained from the Government of Mexico, Secretary of the Economy, Economic Global Intelligence Unit, July 2023 version, available at: https://www.gob.mx/se/acciones-y-programas/competitividad-y-normatividad-inversion-extranjera-directa?state=published.
[45] This upward trend in Chinese FDI in Mexico is corroborated by media reporting; see for example "Why Chinese Companies Are Investing Billions in Mexico" in The New York Times (3 Feb 2023) and "Chinese Firms Skip Over US Tariffs by Setting Up Shop in Mexico" in Bloomberg (14 Sep 2022). Both news articles draw a direct connection from the Trump administration's tariffs on China to this rise in Chinese firm FDI in Mexico.
[46] See: https://www.gso.gov.vn/en/px-web/?pxid=E0416&theme=Investment

third-country standing to benefit from the US' imposition of tariffs on China. These have found positive responses in employment, hours worked, and wages, particularly for women (Mayr-Dorn et al. 2023, Rotunno et al. 2023), as well as in transitions from informal agriculture to formal manufacturing work (Nguyen and Lim 2023). Note though that these should be viewed strictly as short-run responses, given that the Vietnam Labor Force Survey data these studies use is available only up till 2020; future work to determine how long-lasting these consequences are would clearly be useful.[47]

5 Reallocation of Domestic Production: Evidence from Business Patterns

Is the "great reallocation" away from China prompting a reshoring of US economic activity? We take a brief look in this section at emerging trends in the US manufacturing sector to address this question. We draw on data from the Bureau of Labor Statistics, on establishment and employee counts by industry; this data is updated regularly and provide us with snapshots of the state of manufacturing in the US up till the end of 2022. Overall, there are tentative signs of an uptick in manufacturing activity in several subsectors, particularly in semiconductors, although we should stress that this prognosis should be seen as a preliminary one: The developments and shifts in the US manufacturing sector are clearly ongoing, and what we are seeing are likely just the early-stage responses to the industrial policies introduced in the past two years.

The US manufacturing sector employed close to 12.9 million workers at the end of 2022, representing 3.4% of all establishments and 9.9% of total employment in all private industries.[48] From 2017-2022, manufacturing employment increased by 2.8% in the whole period for an average growth rate of 0.6% (**Table 6**). However, manufacturing's share of total private sector employment decreased marginally by 0.2 percentage points, from 10.1% in 2017 to 9.9% in 2022; this is slightly less than the 0.5 percentage point decrease observed in the preceding five years (2012-2017).

We focus on several sectors that have drawn attention of late in the calls to bolster domestic manufacturing capabilities, namely: automobiles, automobile parts, electronics, and semiconductors. In December 2022, these four sectors comprised 19.8% of manufacturing employment, a slight increase from 19.5% in 2017; these sectors also accounted for 11.4% of all establishments in 2022, up from 10.6% in 2017 (**Table 6**). Given the spotlight placed on the importance of domestic manufacturing jobs in recent debates about reshoring, it is useful to point out that these sectors differ substantially in their labor intensity: The ratio of employee compensation to intermediate input use is around 2 in electronic computer manufacturing (NAICS 33411), but this ranges downward to 1.3 in semiconductor manufacturing (NIACS 334412), 0.45 in machinery manufacturing for semiconductors (NAICS 33422), 0.2 in auto and auto parts (NAICS 3361, 3362, 3363) and just 0.04-0.08 in truck manufacturing (NAICS 336112, 336120).

[47] On a related note, Utar et al. (2023) is one of the first studies to use Mexican firm-level customs data to document an apparent increase in exports to the US by firms that are participants in Mexico's export platform program, in response to the US tariffs on China. This would be consistent with "nearshoring", and there is scope for work to be done to link this finding to firm-level employment and wage outcomes within Mexico.

[48] Total employment across all industries was close to 112.3 million in 2012, 124.0 million in 2017, and 130.5 million at the end of 2022. The total number of establishments in these same years went from 8.87 million, to 9.64 million, to 11.48 million, respectively.

Table 6: Establishment and Employment Counts (2012, 2017, 2022)
Autos, Auto Parts, Electronics, and Semiconductors

	2012	2017	2022	Annual Growth		2012	2017	2022	Share Change	
	Thousands			2012-17	2017-22	(%) Share of Manufacturing			2012-17	2017-22
Private Manufacturing[a]										
Establishments	335.3	348.9	385.5	0.8%	2.0%	3.8	3.6	3.4	-0.16	-0.26
Employment	11950	12509	12862	0.9%	0.6%	10.6	10.1	9.9	-0.56	-0.23
Auto										
Establishments	2.5	2.7	3.3	2.0%	3.9%	0.7	0.8	0.9	0.05	0.07
Employment	307	390	455	4.9%	3.1%	2.6	3.1	3.5	0.55	0.42
Auto parts										
Establishments	5.6	5.7	6.2	0.4%	1.7%	1.7	1.6	1.6	-0.04	-0.03
Employment	498	594	562	3.6%	-1.1%	4.2	4.7	4.4	0.58	-0.38
Electrical										
Establishments	20.5	22.5	27.6	1.9%	4.1%	6.1	6.5	7.2	0.34	0.70
Employment	1077	1072	1116	-0.1%	0.8%	9.0	8.6	8.7	-0.44	0.11
Semiconductor										
Establishments	6.0	6.1	7.0	0.5%	2.9%	1.8	1.7	1.8	-0.03	0.08
Employment	394	387	425	-0.4%	1.9%	3.3	3.1	3.3	-0.21	0.21

Notes: BLS. Quarterly Census of Employment and Wages. Data from December of each year. Sectors correspond to the following NAICS codes matched to HS using the Pierce and Schott (2012) concordance. Autos (less parts): Motor Vehicle Manufacturing (3361), Motor Vehicle Body and Trailer Manufacturing (3362); Auto parts: Motor Vehicle Parts Manufacturing (3363); Semiconductors: Semiconductor and other Electronic Component Manufacturing (3344), Semiconductor Machinery Manufacturing (332442); Electronics and Electrical: Computer and Electronic Product Manufacturing (334) less 3344, Electrical Equipment, Appliance, and Component Manufacturing (335). Average growth rates are reported. Sector shares are of manufacturing employment. [a]Private manufacturing shares are to total employment.

At first glance, it would appear that each of the four sectors has experienced some upturn (to varying degrees) in terms of both establishment and employment counts between 2017-2022. The one exception to this would be employment in the auto parts sector (which fell 1.1%), though it should be noted that this was a sector particularly hard-hit by disruptions during the Covid-19 pandemic. (**Appendix Figure 5** plots in more detail the evolution over time in these establishment and employment variables – in both level terms and when expressed as a share of total manufacturing activity – for each of the four sectors.)

Note, however, that one cannot entirely attribute these changes to policy developments – such as the US-China tariffs, the Inflation Reduction Act, or the CHIPS Act – that have occurred only in the past five years. There is in particular a stronger positive pre-trend in the automobile and auto parts industries: Both of these sectors experienced employment growth (4.9% and 3.6%, respectively) in the preceding five years (2012-2017), which likely reflects the rebound from policies enacted during the Global Financial Crisis to revive and support the auto industry and its supplier network.

On the other hand, the trends in electrical and semiconductor manufacturing point to hints of a bottoming out in these sectors. These two sectors witnessed a decline in employment between 2012-2017, but worker headcounts have since picked up in 2017-2022, expanding by 0.8% in electrical manufacturing and by 1.9% in semiconductors. This five-year change, though, masks a good amount of volatility: **Appendix Figure 5** shows that employment in electrical manufacturing actually suffered during the onset of the Covid-19 pandemic in 2020 before bouncing back by 2022; on the other hand, much of the increase in semiconductor employment has come in the past two years (since 2021), in line with the Biden administration's push to bolster domestic manufacturing capacity in this strategic industry.[49]

On balance, there are some tentative signs in the data of reshoring in that establishment, and employment counts have picked up in recent years in manufacturing sectors that have been the focus of US industrial policies. That said, there is some unevenness across sectors in the precise causes and timing of this apparent turnaround, and much remains to be seen as to how strong and sustainable these recent trends are moving forward.

6 Concluding Discussion

In this paper, we provide a comprehensive analysis of the evolution of global value chains with a particular focus on the post-2017 period, a time of unparalleled upheaval struck by both the US-China tariffs and the Covid-19 pandemic. We rely on readily available data such as product-level trade statistics, measures of upstreamness, greenfield FDI announcements, earnings call transcripts, along with recent information on employment and establishments in US manufacturing. We paint a wide-ranging picture of the evolving pattern of US participation in GVCs across different partner countries, products, and modes, and describe how this reflects recent shifts toward friendshoring, nearshoring, and reshoring.

Rather than signaling a trend towards deglobalization, the available data hints at a looming "great reallocation" of US supply chain activity. This shift is marked by a decline in direct US sourcing from China, with a corresponding rise in import share from low-wage locations, chiefly Vietnam, and regional trade areas, particularly Mexico. While US imports have become more upstream in their production line positioning, suggestive of the reshoring of production stages, the economic activity data presents a more nuanced picture. The semiconductor sector, for example, has shown a resurgence post-2021, while other sectors display changes that either precede 2017 or have yet to regain a loss in overall market share. These trends are subject to lags and delays in policy effects, and as fresh data unfolds, a reevaluation of these patterns will eventually be needed.

We also illustrate through our analysis that recent policy efforts may ultimately not succeed in their objective to reduce US dependence on supply chains tied to China. Despite a decrease in the US' direct reliance on China, there has been an increase in China's import share in "friendly" nations, including the EU, Mexico, and Vietnam. And, although geopolitical forces may prevent China from circumventing policy restrictions via domestic production in the US through FDI (as Japan did in the 1970s and 1980s), Chinese firms are stepping up FDI and production facilities in

[49] New semiconductors factories feature prominently among the sectors highlighted on the White House's "Investing in America" website: https://www.whitehouse.gov/invest/

Vietnam and Mexico in critical sectors, albeit from a low base. This suggests that plants in which China is the ultimate owner may continue to play a significant role in US value chains.

A second concern we register is that this push toward reallocation will incur costs. Conceptually, policies that reallocate economic activity away from their market-determined equilibrium will incur static welfare losses.[50] Already, there is evidence from the literature that the US tariffs have been costly from a consumer surplus perspective, as these have raised unit prices of imports from China. We have supplemented this with further evidence that the US tariffs have also raised unit import prices from alternative source locations, principally Vietnam and Mexico. For a more comprehensive understanding, future research should examine the effects on firms' profitability and productivity as additional data becomes available.

Policies in favor of friendshoring, nearshoring or reshoring may nevertheless be justifiable if these generate dynamic gains that offset or exceed the static losses. As surveyed by Harrison and Rodriguez-Clare (2010), such theoretical justifications for industrial policy involve spillovers or external economies of scale, wherein the social marginal benefit from expanding production exceeds the private benefit that firm-level decision-makers internalize (see also Barteleme et al. 2019). The arguments here often hinge on the presence of Marshallian externalities or agglomeration economies, which stress the benefits of geographic proximity between individuals or firms in realizing product- and factor-market externalities and innovation.[51] In principle, the policy interventions ought also to satisfy the Mill test, whereby the assisted sector should ultimately be able to withstand competition once the policy support is removed, as well as the Bastable test, which requires that the discounted future benefits ought to outweigh the policy's cumulative implementation costs.

However, what is arguably missing amid current debates is an articulation of the need to evaluate these welfare tradeoffs, as challenging as it is to develop general equilibrium frameworks to perform such formal assessments. Recent policies instead appear to have eliminated "exhibitions of indecision"[52] within the US, garnering widespread political backing and are thus poised to persist, even though periodic re-appraisals might be useful.

Along these lines, there is the concern that the costs of following through with current US industrial policies may be broader and more extensive than publicly realized. The effective revival of manufacturing hubs requires integrating dependable, efficient supply chain networks

[50] See for example Eppinger et al. (2021) and Javorcik et al. (2022) who provide assessments of the static welfare losses associated respectively with pursuing policies that decouple economies from each other or that encourage friendshoring; these are based on extensions of the multi-country, multi-sector quantitative trade model of Caliendo and Parro (2015). As Goldberg and Reed (2023) note however, there is no framework and quantitative benchmark for assessing "resilience". For a fiscal impact analysis of recent US industrial policies, see Bistline et al. (2023).
[51] Researchers have highlighted gains derived from reduced costs of moving goods across space and proximity to suppliers and customers (Krugman 1991); labor market pooling (Marshall 1890; Rotemberg and Saloner 2000); and the flow of ideas facilitating human capital development, innovation, and technology diffusion (Jacobs 1969). Head et al. (1995) is an early piece of empirical research pointing to the presence of agglomeration effects in Japanese MNCs' decisions over their US manufacturing locations. Alfaro and Chen (2014) find multinational foreign subsidiaries to be more agglomerative than domestic plants in capital-, skilled labor-, and R&D-intensive industries while evidence in Alfaro, Chen and Fadinger (2019) suggests heterogeneity in the ability of regional policies to build superstar-centered industry clusters.
[52] Kennan (1947).

and transportation systems with an adaptable, skilled labor force. Moreover, attaining optimal efficiency levels for certain sectors requires sufficient demand or scale to build specialized production facilities. The announced delays to the construction of TSMC's semiconductor plants in Arizona, arising from a shortage of skilled labor, is a case in point (Financial Times, 20 July 2023).[53]

References

Ahn, JaeBin, Benjamin Carton, Ashique Habib, Davide Malacrino, Dirk Muir, and Andrea Presbitero, (2023), "Geoeconomic Fragmentation and Foreign Direct Investment," in *IMF World Economic Outlook: A Rocky Recovery*, April, Chapter 4.

Aiyar, Shekhar, Jiaqian Chen, Christian H. Ebeke, Roberto Garcia-Saltos, Tryggvi Gudmundsson, Anna Ilyina, Alvar Kangur, Tansaya Kunaratskul, Sergio L. Rodriguez, Michele Ruta, Tatjana Schulze, Gabriel Soderberg, and Juan P. Trevino, (2023), "Geoeconomic Fragmentation and the Future of Multilateralism," IMF Staff Discussion Notes No. 2023/001.

Alfaro, Laura, Pol Antràs, Davin Chor, and Paola Conconi, (2019), "Internalizing Global Value Chains: A Firm-Level Analysis," *Journal of Political Economy* 127(2): 508–559.

Alfaro, Laura, and Andrew Charlton, (2009), "Intra-Industry Foreign Direct Investment," *American Economic Review* 99(5): 2096–2119.

Alfaro, Laura, and Maggie X. Chen, (2014), "The Global Agglomeration of Firms," *Journal of International Economics* 94(2): 263-276.

Alfaro, Laura, Maggie X. Chen, and Davin Chor, (2023), "Can Evidence-Based Information Shift Preferences Towards Trade Policy?" NBER Working Paper No. 31240.

Alfaro, Laura, Maggie X. Chen, and Harald Fadinger, (2019), "Spatial Agglomeration and Superstar Firms: Firm-level Patterns from Europe and U.S," in *ECB Forum on Central Banking: 20 years of European Economic and Monetary Union: Conference Proceedings*, European Central Bank.

Alfaro, Laura, and Fabio Kanczuk, (2022), "Undisclosed Debt Sustainability," *American Economic Review Papers and Proceedings* 112: 521–525.

Amiti, Mary, Mi Dai, Robert C. Feenstra, and John Romalis, (2020), "How did China's WTO Entry Affect US Prices?" *Journal of International Economics* 126, 103339.

Amiti, Mary, Sebastian Heise, Fatih Karahan, and Ayşegül Şahin, (2023), "Inflation Strikes Back: The Role of Import Competition and the Labor Market," in *NBER Macroeconomics Annual*, volume 38, edited by Martin Eichenbaum, Erik Hurst, and Valerie Ramey, University of Chicago Press.

Amiti, Mary, Stephen J. Redding, and David Weinstein, (2019), "The Impact of the 2018 Trade War on US Prices and Welfare," *Journal of Economic Perspectives* 33(4): 187–210.

Antràs, Pol, (2021), "De-Globalisation? Global Value Chains in the Post-COVID-19 Age," *ECB Forum: Central Banks in a Shifting World Conference Proceedings*.

Antràs, Pol, Davin Chor, Thibault Fally, and Russell Hillberry, (2012), "Measuring the Upstreamness of Production and Trade Flows," *American Economic Review Papers and Proceedings* 102(3): 412–416.

Antràs, Pol, and Davin Chor, (2013), "Organizing the Global Value Chain," *Econometrica* 81(6): 2127–2204.

[53]See also Shih (2018).

Antràs, Pol and Davin Chor, (2018), "On the Measurement of Upstreamness and Downstreamness in Global Value Chains," in *World Trade Evolution: Growth, Productivity and Employment*, edited by Lili Yan Ing and Maiojie Yu, Routledge.
Antràs, Pol, and Davin Chor, (2022), "Global Value Chains," in *Handbook of International Economics*, edited by Gita Gopinath, Elhanan Helpman, and Kenneth Rogoff, vol 5: 297-376.
Antràs, Pol, and Stephen R. Yeaple, (2014), "Multinational Firms and the Structure of International Trade," in *Handbook of International Economics*, edited by Gita Gopinath, Elhanan Helpman, and Kenneth Rogoff, vol 4: 55-130.
Autor, David, David Dorn, and Gordon Hanson, (2013), "The China Syndrome: Local Labor Market Effects of Import Competition in the United States," *American Economic Review* 103(6): 2121-2168.
Autor, David, David Dorn, and Gordon Hanson, (2016), "The China Shock: Learning from Labor-Market Adjustment to Large Changes in Trade," *Annual Review of Economics* 8: 205-240.
Baldwin, Richard, (2022), "The Peak Globalisation Myth," VoxEU.
Baldwin, Richard, and Javier Lopez-Gonzalez, (2015), "Supply-Chain Trade: A Portrait of Global Patterns and Several Testable Hypotheses," *The World Economy* 38(11): 1682-1721.
Barrot, Jean-Noel, and Julien Sauvagnat, (2016), "Input Specificity and the Propagation of Idiosyncratic Shocks in Production Networks," *Quarterly Journal of Economics* 131(3): 1543-1592.
Bartelme, Dominick, Arnaud Costinot, Dave Donaldson, and Andrés Rodríguez-Clare, (2019), "The Textbook Case for Industrial Policy: Theory Meets Data," NBER Working Paper No. 26193.
Bistline, John, Neil R. Mehrotra, and Catherine Wolfram, (2023), "Economic Implications of the Climate Provisions of the Inflation Reduction Act," *Brookings Papers on Economic Activity*, Spring, forthcoming.
Bloomberg, (2022), "Chinese Firms Skip Over US Tariffs by Setting Up Shop in Mexico," 14 September.
Boehm, Christoph E., Aaron Flaaen, and Nitya Pandalai-Nayar, (2019), "Input Linkages and the Transmission of Shocks: Firm-Level Evidence from the 2011 Tohoku Earthquake," *Review of Economics and Statistics* 101(1): 60-75.
Bordo, Michael D., (1992), "The Bretton Woods International Monetary System: An Historical Overview," NBER Working Paper No. 4033.
Borin, Alessandro, and Michele Mancini, (2023), "Measuring What Matters in Value-Added Trade," *Economic Systems Research*, forthcoming.
Bown, Chad, (2021), "The US-China Trade War and Phase One Agreement," Peterson Institute for International Economics, Working Paper 21-2.
Bown, Chad, (2022), "Four Years into the Trade War, Are the US and China Decoupling?" PIIE, 20 October.
Bown, Chad, (2023), "US-China Trade War Tariffs: An Up-to-Date Chart," Peterson Institute for International Economics, 6 April.
Cavallo, Alberto, Gita Gopinath, Brent Neiman, and Jenny Tang, (2021), "Tariff Pass-Through at the Border and at the Store: Evidence from US Trade Policy," *American Economic Review: Insights* 3(1): 19-34.

Caliendo, Lorenzo, and Fernando Parro, (2015), "Estimates of the Trade and Welfare Effects of NAFTA," *Review of Economic Studies* 82(1): 1–44.
Caliendo, Lorenzo, Maximiliano Dvorkin, and Fernando Parro, (2019), "Trade and Labor Market Dynamics: General Equilibrium Analysis of the China Trade Shock," *Econometrica* 87(3): 741-835.
Chor, Davin, and Bingjing Li, (2021), "Illuminating the Effects of the US-China Tariff War on China's Economy," NBER Working Paper No. 29349.
Chor, Davin, Kalina Manova, and Zhihong Yu, (2021), "Growing like China: Firm Performance and Global Production Line Position," *Journal of International Economics* 130, 103445.
Colantone, Italo, and Piero Stanig, (2018), "Global Competition and Brexit," *American Political Science Review* 112(2): 201-218.
Colantone, Italo, Piero Stanig, and Gianmarco Ottaviano, (2022), "The Backlash of Globalization," in *Handbook of International Economics*, edited by Gita Gopinath, Elhanan Helpman, and Kenneth Rogoff, vol 5: 405-477.
Comin, Diego, Robert Johnson, and Callum Jones, (2023), "Supply Chain Constraints and Inflation," NBER Working Paper No. 31179.
Dauth, Wolfgang, Sebastian Findeisen, and Jens Seudekum, (2014), "The Rise of the East and the Far East: German Labor Markets and Trade Integration," *Journal of the European Economic Association* 12(6): 1643-1675.
Eichengreen, Barry, (2000), "From Benign Neglect to Malignant Preoccupation: US Balance-Of-Payments Policy in the 1960s," NBER Working Paper No. 7630.
Eichengreen, Barry, (1996), *Globalizing Capital: A History of the International Monetary System*, Princeton University Press.
Eppinger, Peter, Gabriel Felbermayr, Oliver Krebs, and Bohdan Kukharskyy, (2021), "Decoupling Global Value Chains," CESifo Working Paper No. 9079.
Fajgelbaum, Pablo D., Pinelopi K. Goldberg, Patrick J. Kennedy, and Amit K. Khandelwal, (2020), "The Return to Protectionism," *Quarterly Journal of Economics* 135(1): 1–55.
Fajgelbaum, Pablo, Pinelopi K. Goldberg, Patrick J. Kennedy, Amit Khandelwal, and Daria Taglioni, (2023), "The US-China Trade War and Global Reallocations," NBER Working Paper No. 29562.
Fally, Thibault, (2012), "On the Fragmentation of Production in the US," mimeo.
Flaaen, Aaron, Ali Hortaçsu, and Felix Tintelnot, (2020), "The Production Relocation and Price Effects of US Trade Policy: The Case of Washing Machines," *American Economic Review*, 110(7): 2103-2127.
Flaaen, Aaron, and Justin Pierce, (2019), "Disentangling the Effects of the 2018-2019 Tariffs on a Globally Connected US Manufacturing Sector," Finance and Economics Discussion Series No. 86, Federal Reserve Board, Washington, DC.
Freund, Caroline, Aaditya Mattoo, Alen Mulabdic, and Michele Ruta, (2023), "Is US Trade Policy Reshaping Global Supply Chains?" mimeo.
Financial Times, (2023), "World's largest contract semiconductor manufacturer expects 2023 revenue to drop by 10%", 20 July.
Forbes, Kristin J., (2019), "Inflation Dynamics: Dead, Dormant, or Determined Abroad?" *Brookings Papers on Economic Activity*, vol 2019(2): 257-338.
Frankel, Jeffrey A., (2016), "Globalization and Chinese Growth: Ends of Trends?" *Il Grande Sconvolgimento*, ed.: Paolo Onofri, il Mulino.

Greenland, Andrew, Mihai Ion, John W. Lopresti, and Peter K. Schott, (2020), "Using Equity Market Reactions to Infer Exposure to Trade Liberalization," NBER Working Paper No. 27510.
Goldberg, Pinelopi K., and Tristan Reed, (2023), "Is the Global Economy Deglobalizing? And If So, Why? And What is Next?" Brookings Papers on Economic Activity, Spring, forthcoming.
Grossman, Gene, Elhanan Helpman, and Stephen Redding, (2023), "When Tariffs Disrupt Global Supply Chains," NBER Working Paper No. 27722.
Handley, Kyle, Fariha Kamal, and Ryan Monarch, (2020) "Rising Import Tariffs, Falling Export Growth: When Modern Supply Chains Meet Old-Style Protectionism," NBER Working Paper Series No. 26611.
Hansen, Lawrence, (2003), "The Origins of the Maquila Industry in Mexico," *Comercio Exterior*, Vol. 53, November.
Hanson, Gordon, (2012), "The Rise of the Middle Kingdoms: Emerging Economies in Global Trade," *Journal of Economic Perspectives* 26(2): 41-64.
Harrison, Ann, and Andrés Rodríguez-Clare, (2010), "Trade, Foreign Investment, and Industrial Policy for Developing Countries," in *Handbook of Development Economics*, edited by Dani Rodrik and Mark Rosenzweig, vol 5: 4039-4214.
Hassan, Tarek A., Stephan Hollander, Laurence van Lent, and Ahmed Tahoun, (2019), "Firm-Level Political Risk: Measurement and Effects," *Quarterly Journal of Economics* 134(4): 2135-2202.
Hassan, Tarek A., Jesse Schreger, Markus Schwedeler, and Ahmed Tahoun, (2021), "Source and Transmission of Country Risk," NBER Working Paper No. 29526.
Head, Keith, John Ries, and Deborah Swenson, (1995), "Agglomeration Benefits and Location Choice: Evidence from Japanese Manufacturing Investments in the United States," *Journal of International Economics* 38(3-4): 223-247.
Horn, Sebastian, Carmen M. Reinhart, and Christopher Trebesch, (2021), "China's Overseas Lending," *Journal of International Economics* 133, 103539.
Horn, Sebastian, Carmen M. Reinhart, and Christopher Trebesch, (2022), "Hidden Defaults," *American Economic Review Papers and Proceedings* 112: 531-535.
Irwin, Douglas, (2017), *Clashing over Commerce: A History of US Trade Policy*, University of Chicago Press.
Kennan, George F., (1947), "The Sources of Soviet Conduct," *Foreign Affairs*, July.
Kim, Se-Jik, and Hyun Song Shin, (2023), "Theory of Supply Chains: A Working Capital Approach," BIS Working Paper No. 1070.
Jacobs, Jane, (1969), *The Economy of Cities*, Random House.
Javorcik, Beata, Lucas Kitzmueller, Helena Schweiger, and Muhammed Yildirim, (2022), "Economic Costs of Friend-Shoring," EBRD Working Paper No. 274.
Johnson, Robert C., (2018), "Measuring Global Value Chains," *Annual Review of Economics* 10(1): 207-236.
Johnson, Robert C., and Guillermo Noguera, (2012), "Accounting for Intermediates: Production Sharing and Trade in Value Added," *Journal of International Economics* 86(2): 224-236.
Kearney, (2022), "America is Ready for Reshoring. Are You?" Available at: https://www.kearney.com/service/operations-performance/us-reshoring-index
Koh, Dongya, Raul Santaeulàlia-Llopis, and Yu Zheng, (2020), "Labor Share Decline and Intellectual Property Products Capital," *Econometrica* 88(6): 2609-2628.

Koopman, Robert, Zhi Wang, and Shang-Jin Wei, (2014), "Tracing Value-Added and Double Counting in Gross Exports," *American Economic Review* 104(2): 459-494.
Krugman, Paul, (1991), "Increasing Returns and Economic Geography," *Journal of Political Economy* 99(3): 483-499.
Marshall, Alfred, (1890), *Principles of Economics,* Macmillan and Co.
Mayr-Dorn, Karin, Gaia Narciso, Duc Anh Dang, and Hien Phan, (2023), "Trade Diversion and Labor Market Adjustment: Vietnam and the US-China Trade War," mimeo.
McCaig, Brian, and Nina Pavcnik, (2018), "Export Markets and Labor Allocation in a Low-Income Country," *American Economic Review* 108(7): 1899-1941.
McCaig, Brian, Nina Pavcnik, and Woan Foong Wong, (2022), "FDI Inflows and Domestic Firms: Adjustments to New Export Opportunities," NBER Working Paper No. 30729.
New York Times, (2022), "Tech Companies Slowly Shift Production Away from China," 1 September.
New York Times, (2023), "Why Chinese Companies Are Investing Billions in Mexico," 3 February.
Nicita, Alessandro, (2019), "Trade and Trade Diversion Effects of United States Tariffs on China," UNCTAD Research Paper No. 37.
Obstfeld, Maurice, (2020), "Global Dimensions of US Monetary Policy," *International Journal of Central Banking* 16(1): 73-132.
Oldenski, Linday, and Theodore Moran, (2015), "Japanese Investment in the United States: Superior Performance, Increasing Integration," Peterson Institute for International Economics Policy Brief Number 15-3.
Pierce, R. Justin and Peter K. Schott, (2012), "Concording US Harmonized System Categories Over Time," *Journal of Official Statistics* 28(1): 53-68.
Reuters, (2022), "USTR Tai Calls US Tariffs on Chinese Goods 'Significant' Leverage," 22 June.
Rotemberg, Julio J., and Garth Saloner, (2000), "Competition and Human Capital Accumulation: A Theory of Interregional Specialization and Trade," *Regional Science and Urban Economics* 30(4): 373–404.
Rotunno, Lorenzo, Sanchari Roy, Anri Sakakibara, and Pierre-Louis Vézina, (2023), "Trade Policy and Jobs in Vietnam: The Unintended Consequences of Trump's Trade War," mimeo.
San Diego Union Tribute, (1971), "Sony Broke Ground on Plant in Rancho Bernardo in 1971," 14 December.
Shih, Willy, (2018), "Making iPhones in the US would be Challenging, but not Impossible," *Forbes*, 19 October.
Spar, Debora, (1988), "Japan's Automakers Face Endaka," HBS Case 9-798-030.
Utar, Hale, Alfonso Cebreros Zurita, and Luis Torress Ruiz, (2023), "The US-China Trade War and Relocation of Global Value Chains to Mexico," mimeo.
Wilkins, Mira, (1990), "Japanese Multinationals in the United States: Continuity and Change, 1879-1990," *The Business History Review* 64(4): 585-629.
Yellen, Janet, (2022), "US Treasury Secretary Janet Yellen on the Next Steps for Russia Sanctions and 'Friend-Shoring' Supply Chains," address delivered to the Atlantic Council, 13 April.
Yoshino, M. Y., (1974), "The Multinational Spread of Japanese Manufacturing Investment since World War II," *The Business History Review* 48(3): 357–381.

Data Appendix: Upstreamness Measure

In this data appendix, we provide more background on the construction of the industry upstreamness measure, that is used in Section 3.3 to compute the export and import upstreamness of the US' external trade profile. This relies on the information on production linkages that is contained in Input-Output Tables.

The upstreamness of industry i, U_i, is a weighted average of the number of stages that output from industry i will traverse before it is absorbed in final demand (i.e., consumption or investment). Following the methodology in Fally (2012), Antràs et al. (2012), and Antràs and Chor (2018), we calculate U_i as follows:

$$U_i = 1 \cdot \frac{F_i}{Y_i} + 2 \cdot \frac{\sum_{j=1}^{N} d_{ij} F_j}{Y_i} + 3 \cdot \frac{\sum_{j=1}^{N} \sum_{j=1}^{N} d_{ik} d_{kj} F_j}{Y_i} + \cdots, \qquad (3)$$

where $N \geq 1$ is the number of industries in the economy; Y_i is gross output in industry i; and F_i is the value of that output that goes directly to final uses (i.e., consumption or investment). D_{ij} is the direct requirements coefficient; this is equal to the value of i that is used directly as an input to produce one dollar's worth of industry j output.[54]

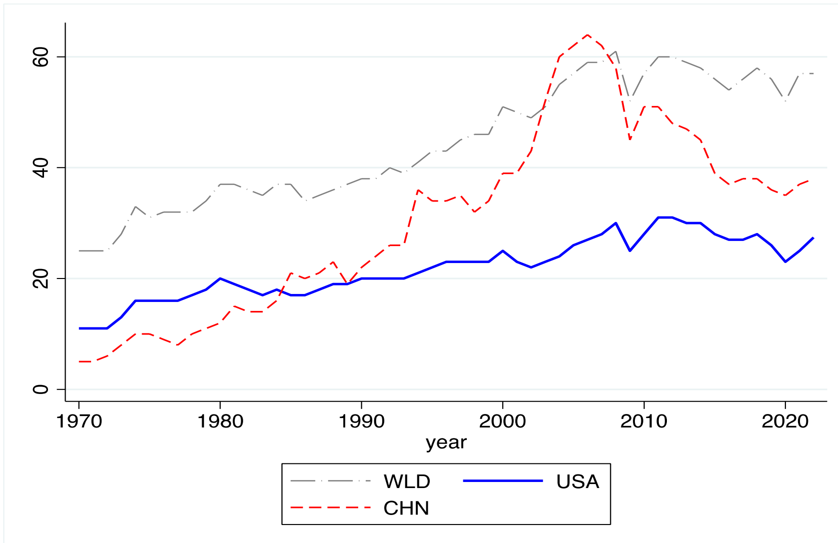
The formula in (3) assigns a weight of 1 to the share of industry-i output that goes directly to final use, 2 to the share that arrives at final use through exactly one other industry, and so on. By construction, $U_i \geq 1$, with equality if and only if the entirety of industry i's output goes directly to final use. If, instead, the industry i tends to enter production chains as an intermediate input multiple stages prior to final demand, this would be reflected in a larger value of U_i. Not surprisingly, the largest U_i values tend to be seen in the extraction and processing of raw materials, agricultural products, petrochemical manufacturing, and chemicals.

We construct U_i using the 2012 US Input-Output Tables as a benchmark. This yields industry upstreamness values for a detailed set of 405 BEA IO industries. We map these to NAICS industries (2012 vintage) using a cross-walk provided by the BEA, and in turn map the NAICS industries to HS 4-digit codes (2017 vintage) using the Pierce and Schott (2012) concordance (specifically its 2018 update). When a HS4 code could not be directly associated with an IO industry, we assigned that HS4 code the upstreamness value of its HS2 digit counterpart; the latter is computed as an output-weighted average of the upstreamness of the IO industries that map to the HS 2-digit code in question.

[54] Following Antràs et al. (2012), we scale d_{ij} by the factor $Y_i/(Y_i - X_i + M_i - NI_i)$, where $X_i - M_i$ is equal to the net exports of i, and NI_i is the net change in inventories of i reported in the Input-Output Tables. This correction accounts for industry-i flows across country borders, as well as into and out of inventories; as Antràs et al. (2012) show, this is the correction term implied by a proportionality assumption, that these industry-i flows are used as inputs across industries j in the same proportion as what is observed in domestic cross-industry flows.

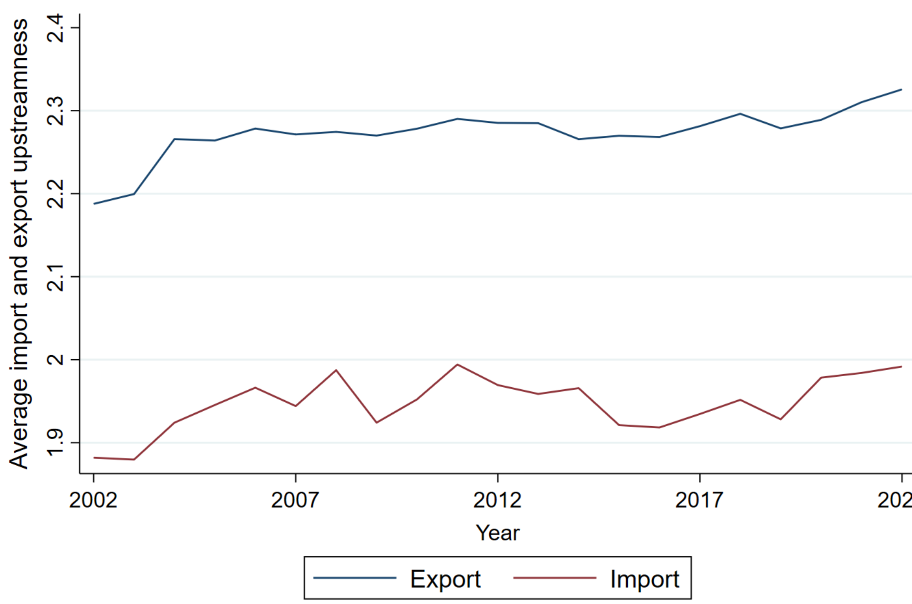
Appendix Figures and Tables

Appendix Figure 1: Trade to World GDP (1970-2022)



Notes: Calculated as the sum of exports and imports of goods and services divided by gross domestic product from the World Bank's World Development Indicators.

Appendix Figure 2: US Export and Import Upstreamness, Manufacturing Goods Only (2002-2022)

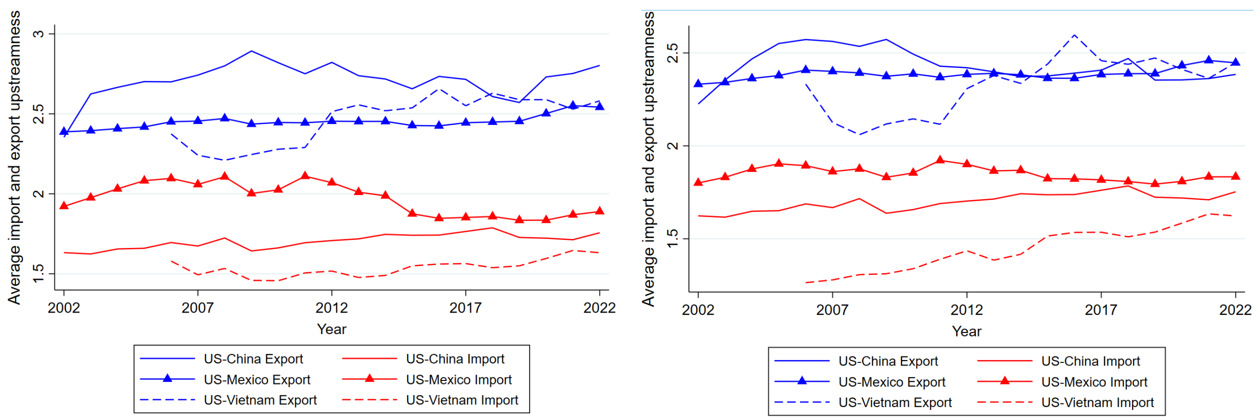


Notes: Authors' calculations based on the methodology in Chor et al. (2021), using UN Comtrade data and the 2012 US Input-Output Tables.

Appendix Figure 3: US Bilateral Export and Import Upstreamness
China, Mexico, Vietnam (2002-2022)

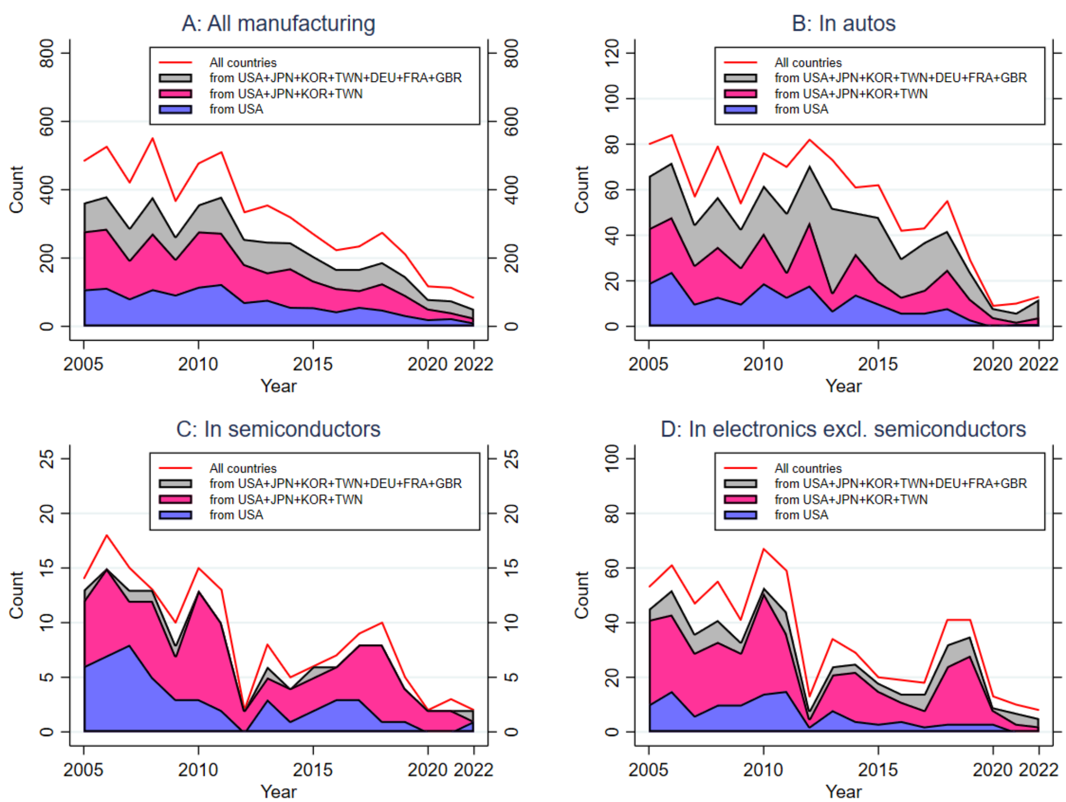
A. All Products

B. Manufacturing Products



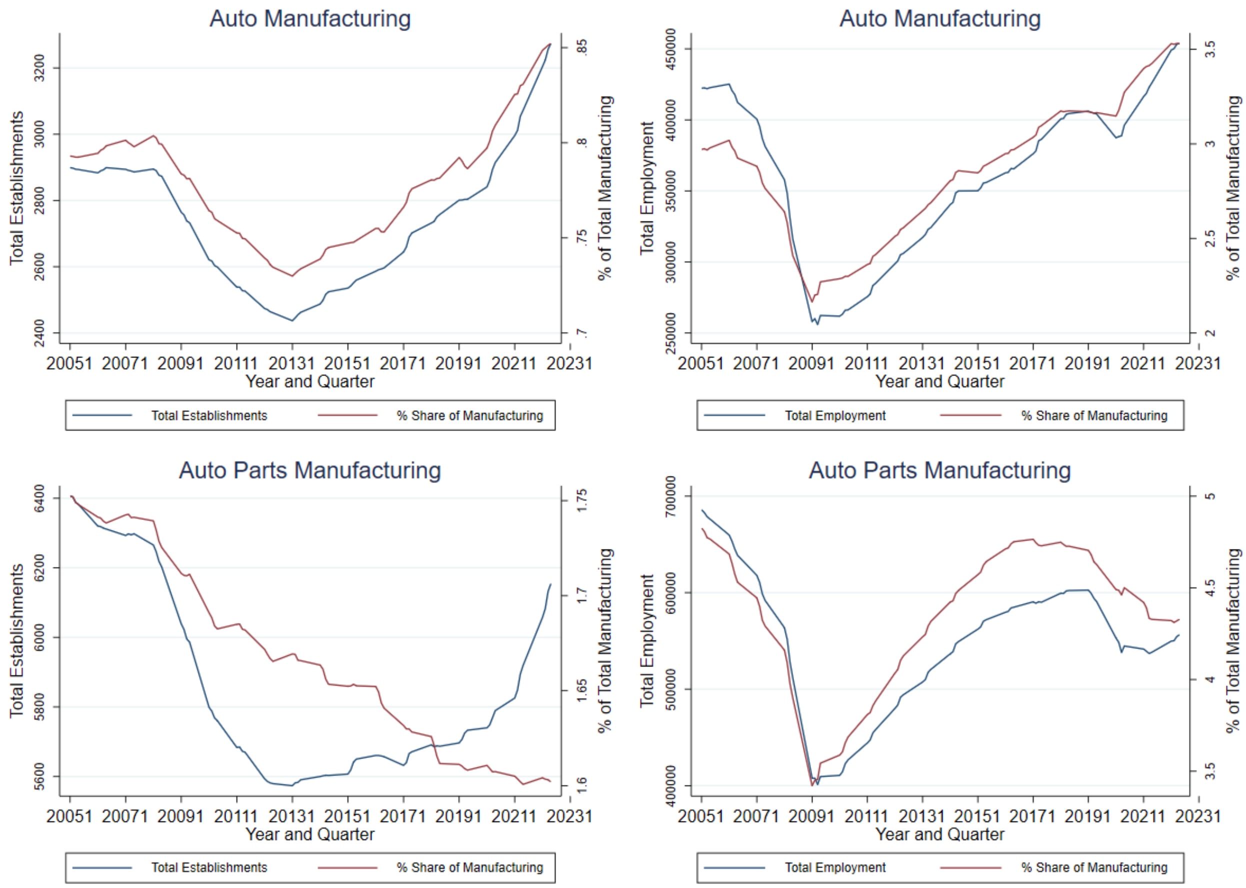
Notes: Authors' calculations based on the methodology in Chor et al. (2021), using UN Comtrade data and the 2012 US Input-Output Tables. The Vietnam trade-weighted upstreamness measures start in 2006 due to limited prior trade data.

Appendix Figure 4: China Inward Greenfield FDI (2005-2022)

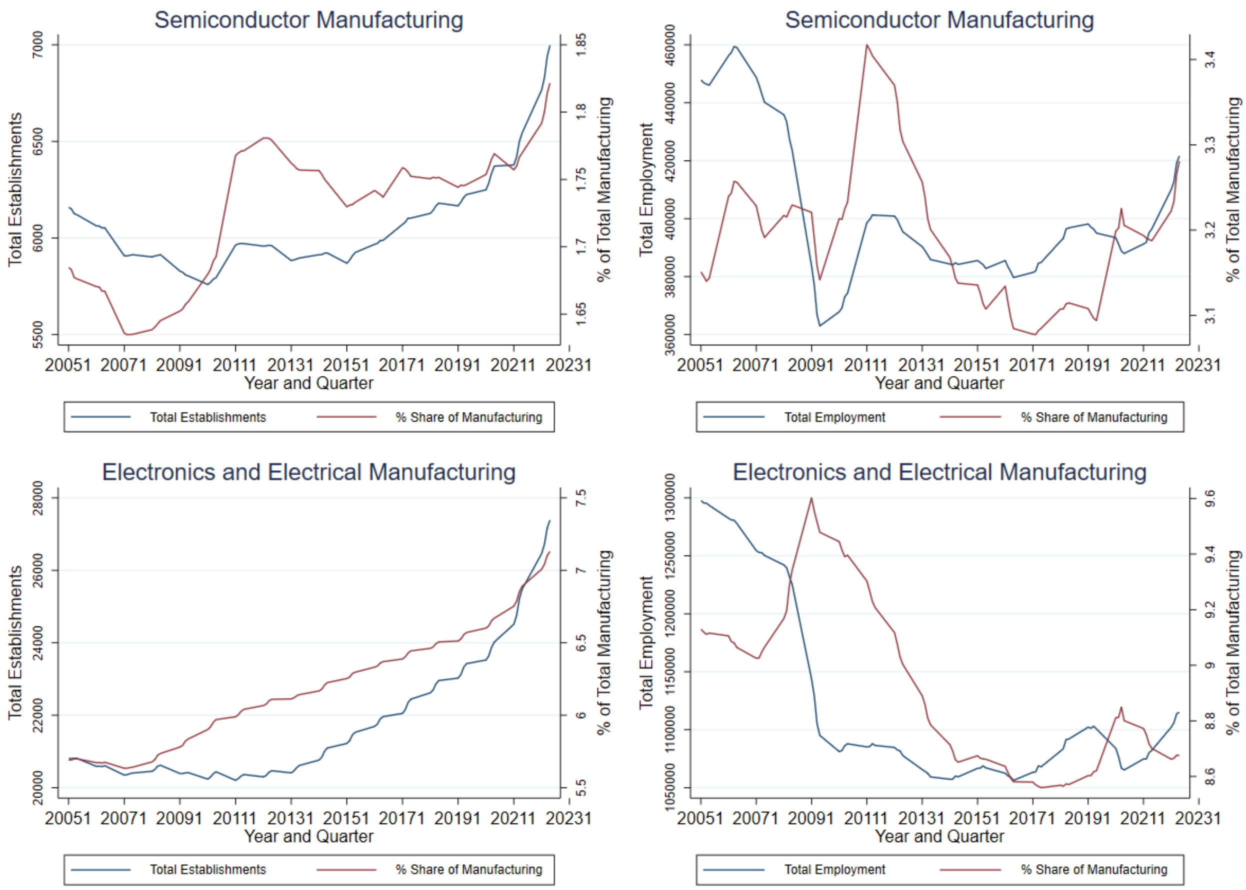


Source: Financial Times' fDi Markets.

Appendix Figure 5: Establishments and Employment (Quarterly Data, 2005-2023)
Autos, Auto Parts, Electronics, and Semiconductors



Continued…



Source: BLS. Each series is illustrated taking rolling averages over three quarters. Sectors correspond to the following NAICS codes matched to HS using the Pierce and Schott (2012) concordance. Autos (less parts): Motor Vehicle Manufacturing (3361), Motor Vehicle Body and Trailer Manufacturing (3362); Auto parts: Motor Vehicle Parts Manufacturing (3363); Semiconductors: Semiconductor and other Electronic Component Manufacturing (3344), Semiconductor Machinery Manufacturing (332442); Electronics and Electrical: Computer and Electronic Product Manufacturing (334) less 3344, Electrical Equipment, Appliance, and Component Manufacturing (335).

Appendix Table 1: Average Value, Share, and Upstreamness of US Exports and Imports (2017-2022)

HS Code	Sector Name	A. Exports Value (USD bn)	Share	Upstr.	HS Code	Sector Name	B. Imports Value (USD bn)	Share	Upstr.
8800	Civilian Aircraft, Engines, And Parts	104.0	6.7	1.6	8703	Motor cars and other motor vehicles; principally designed for the transport of persons (other than those of heading no. 8702), including station wagons and racing cars	163.8	6.2	1.0
2710	Petroleum oils and oils from bituminous minerals, not crude; preparations n.e.c, containing by weight 70% or more of petroleum oils or oils from bituminous minerals; these being the basic constituents of the preparations; waste oils	89.7	5.8	2.1	2709	Petroleum oils and oils obtained from bituminous minerals; crude	137.5	5.2	3.2
2709	Petroleum oils and oils obtained from bituminous minerals; crude	62.4	4.0	3.2	8517	Telephone sets, including telephones for cellular networks or for other wireless networks; other apparatus for the transmission or reception of voice, images or other data (including wired/wireless networks), excluding items of 8443, 8525, 8527, or 8528	108.0	4.1	2.1
8703	Motor cars and other motor vehicles; principally designed for the transport of persons (other than those of heading no. 8702), including station wagons and racing cars	53.7	3.5	1.0	8471	Automatic data processing machines and units thereof, magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, not elsewhere specified or included	101.3	3.9	1.4
2711	Petroleum gases and other gaseous hydrocarbons	46.6	3.0	3.5	9801	Expts Of Repaired Impts; Impts Of Returned Expts	81.0	3.1	1.9
8542	Electronic integrated circuits	45.0	2.9	3.1	3004	Medicaments; (not goods of heading no. 3002, 3005 or 3006) consisting of mixed or unmixed products for therapeutic or prophylactic use, put up in measured doses (incl. those in the form of transdermal admin. systems) or packed for retail sale	78.2	3.0	1.2
8708	Motor vehicles; parts and accessories, of heading no. 8701 to 8705	40.8	2.6	2.2	8708	Motor vehicles; parts and accessories, of heading no. 8701 to 8705	68.8	2.6	2.2
8517	Telephone sets, including telephones for cellular networks or for other wireless networks; other apparatus for the transmission or reception of voice, images or other data (including wired/wireless networks), excluding items of 8443, 8525, 8527, or 8528	31.7	2.1	2.1	2710	Petroleum oils and oils from bituminous minerals, not crude; preparations n.e.c, containing by weight 70% or more of petroleum oils or oils from bituminous minerals; these being the basic constituents of the preparations; waste oils	57.1	2.2	2.1
3002	Human blood; animal blood for therapeutic, prophylactic or diagnostic uses; antisera, other blood fractions, immunological products, modified or obtained by biotechnological processes; vaccines, toxins, cultures of micro-organisms (excluding yeasts) etc	30.3	2.0	2.3	3002	Human blood; animal blood for therapeutic, prophylactic or diagnostic uses; antisera, other blood fractions, immunological products, modified or obtained by biotechnological processes; vaccines, toxins, cultures of micro-organisms (excluding yeasts) etc	46.8	1.8	2.3
9018	Instruments and appliances used in medical, surgical, dental or veterinary sciences, including scintigraphic apparatus, other electro-medical apparatus and sight testing instruments	29.5	1.9	1.6	8542	Electronic integrated circuits	36.1	1.4	3.1

Source: UN Comtrade, US Bureau of Economic Analysis, US Census Bureau. Upstreamness measures are calculated based on Antràs et al. (2012).

Appendix Table 2: Foreign Country Share of Imports + Multinational Affiliate Sales in the US, percentages (1995-2020)

Country	1995	2000	2005	2010	2015	2020
Canada	14.0	11.7	12.0	10.2	9.6	8.4
Mexico*	3.5	4.4	4.9	4.5	4.7	4.6
France	6.2	6.5	5.4	5.8	0.6	4.8
Germany	9.6	10.9	10.8	8.7	9.3	9.3
Great Britain	14.1	11.6	10.8	0.8	9.3	8.8
Netherlands*	4.8	7.7	7.0	6.2	4.9	4.8
Ireland*	0.6	1.0	1.1	1.8	2.3	0.9
Switzerland*	4.4	4.0	4.1	5.0	4.0	4.8
Japan	26.4	18.1	15.3	12.5	14.5	13.8
South Korea*	2.3	2.2	2.3	2.5	3.4	1.1
China*	2.5	2.9	6.2	7.2	8.0	7.2
Taiwan*	0.4	1.6	1.2	0.7	0.6	0.8
Singapore*	0.1	0.7	0.6	0.4	0.7	0.8
Hong Kong*	0.3	0.6	0.4	0.1	0.1	0.6
India*	0.3	0.3	0.5	0.6	0.7	1.1
Cayman Islands*	0.1	0.3	0.4	0.2	0.0	0.0
All (USD tn)**	2.1	3.5	4.0	5.2	6.4	7.2
Imports	0.5	1.2	1.6	1.8	2.1	2.2
MNE Sales	1.5	2.3	2.4	3.4	4.3	5.0

Source: UN Comtrade, US Bureau of Economic Analysis. The BEA data on multinational affiliate sales are for nonbank affiliates except where denoted by a *; the latter indicates that the data for 2010, 2015, and 2020 for the country is for all affiliates (including bank affiliates), due to data disclosure redactions. ** indicates the variables reported in the lower panel are in trillions of USD. BEA data downloaded in July 2023.

Appendix Table 3: Change in US Import Values (2017-2022)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:	∆ Log US product-level import value from c (2017-2022)						
Import sources, c:	VNM	MEX	CAN	IND, THA, MYS, IDN	KOR, TWN, SGP	IRL, CHE	ROW
∆CHN import share (2017-2022)	-0.583*	-1.769***	0.102	-0.819***	-1.191**	-0.615	-0.637
	[0.311]	[0.228]	[0.229]	[0.227]	[0.463]	[0.819]	[0.457]
Lag ∆ log import value from c (2012-2017)	-0.157***	-0.312**	-0.121*	0.026	0.005	-0.157***	-0.482***
	[0.038]	[0.123]	[0.066]	[0.051]	[0.076]	[0.049]	[0.077]
Observations	726	1,056	1,120	1,102	1,058	956	347
R-squared	0.340	0.439	0.238	0.246	0.400	0.254	0.418
HS2 fixed effects?	Y	Y	Y	Y	Y	Y	Y

Notes: Based on HS4 product-level trade data from UN Comtrade. Variables in log changes are computed using the Davis-Haltiwanger-Schuh approximation. Estimation is by weighted least squares with HS2 fixed effects, with the 2017 value of US imports from China for the respective HS4 products as weights. Standard errors are clustered by HS2 codes; ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

Appendix Table 4: Change in US Import Share, Robustness (2017-2022)

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	For US product-level imports from:					
Import sources, c:	VNM	MEX	VNM	MEX	VNM	MEX
Robustness check:	Sans Petroleum products		Sans HS2 fixed effects		Top 300 products	
	Panel A: Δ US product-level import share from c (2017-2022)					
ΔCHN import share (2017-2022)	-0.198***	-0.079***	-0.195***	-0.077***	-0.198***	-0.080***
	[0.025]	[0.020]	[0.028]	[0.017]	[0.025]	[0.022]
Lag Δ in c's import share (2012-2017)	0.768	-0.118	0.693*	0.096	0.936*	-0.134
	[0.529]	[0.220]	[0.383]	[0.220]	[0.542]	[0.256]
Observations	1,136	1,136	1,151	1,151	280	280
R-squared	0.529	0.296	0.296	0.064	0.540	0.308
	Panel B: Δ Log US product-level import value from c (2017-2022)					
ΔCHN import share (2017-2022)	-0.584*	-1.771***	-0.426	-1.325***	-0.487	-1.825***
	[0.311]	[0.228]	[0.472]	[0.416]	[0.334]	[0.236]
Lag Δ log import value from c (2012-2017)	-0.157***	-0.306**	-0.077	-0.247**	-0.164***	-0.322**
	[0.038]	[0.123]	[0.048]	[0.122]	[0.045]	[0.153]
Observations	722	1,045	737	1,057	266	280
R-squared	0.341	0.439	0.018	0.141	0.352	0.462
	Panel C: Δ Log US product-level import unit value from c (2017-2022)					
ΔCHN import share (2017-2022)	-1.968*	-0.630**	-0.936*	-0.897**	-2.076**	-0.678**
	[1.002]	[0.281]	[0.494]	[0.342]	[0.992]	[0.264]
Lag Δ log import unit value from c (2012-2017)	-0.337***	-0.198***	-0.228**	-0.144***	-0.347***	-0.195***
	[0.086]	[0.027]	[0.095]	[0.027]	[0.103]	[0.029]
Observations	630	915	644	927	198	203
R-squared	0.339	0.352	0.091	0.084	0.335	0.395
HS2 fixed effects?	Y	Y	N	N	Y	Y

Notes: Based on HS4 product-level trade data from UN Comtrade. Estimation is by weighted least squares with HS2 fixed effects (unless otherwise stated), with the 2017 value of US imports from China for the respective HS4 products as weights. Variables in log changes are computed using the Davis-Haltiwanger-Schuh approximation. Columns 1-2 exclude products with HS codes starting in "27" (petroleum products); Columns 3-4 exclude HS2 fixed effects; while Columns 5-6 restrict the sample to the top 300 HS4 products by value in 2017 US imports from China. Standard errors are clustered by HS2 codes; ***, ** and * denote significance at the 1%, 5% and 10% levels respectively.

Appendix Table 5: Selected Countries' Import Market Shares (2012, 2017, 2022)

	2012		2017		2022	
Ranking			**MEX**			
1	USA	50.1%	USA	46.4%	USA	43.9%
2	**CHN**	**15.4%**	**CHN**	**17.6%**	**CHN**	**19.6%**
3	JPN	4.8%	JPN	4.3%	KOR	3.7%
4	DEU	3.6%	DEU	3.9%	DEU	3.1%
5	KOR	3.6%	KOR	3.7%	JPN	3.0%
6	CAN	2.7%	CAN	2.3%	TWN	2.5%
			CAN			
1	USA	50.6%	USA	51.4%	USA	48.6%
2	**CHN**	**11.0%**	**CHN**	**12.6%**	**CHN**	**14.0%**
3	MEX	5.5%	MEX	6.3%	MEX	5.5%
4	JPN	3.3%	DEU	3.2%	DEU	3.1%
5	DEU	3.1%	JPN	3.1%	JPN	2.5%
6	GBR	1.8%	GBR	1.6%	ITA	1.7%
			JPN			
1	**CHN**	**21.3%**	**CHN**	**24.5%**	**CHN**	**21.0%**
2	USA	8.8%	USA	11.0%	USA	10.1%
3	AUS	6.4%	AUS	5.8%	AUS	9.8%
4	SAU	6.2%	KOR	4.2%	ARE	5.1%
5	ARE	5.0%	SAU	4.1%	SAU	4.7%
6	KOR	4.6%	TWN	3.8%	TWN	4.3%
			DEU			
1	**CHN**	**8.8%**	**CHN**	**10.2%**	**CHN**	**12.0%**
2	NLD	8.6%	NLD	7.8%	NLD	7.5%
3	FRA	7.0%	USA	6.3%	USA	6.1%
4	USA	5.8%	FRA	6.2%	POL	5.7%
5	ITA	5.3%	ITA	5.1%	ITA	5.4%
6	GBR	4.6%	POL	4.8%	FRA	5.1%
			VNM			
1	**CHN**	**25.5%**	**CHN**	**27.5%**	**CHN**	**33.2%**
2	KOR	13.7%	KOR	22.0%	KOR	17.0%
3	JPN	10.2%	JPN	7.9%	JPN	6.8%
4	TWN	7.5%	TWN	6.0%	TWN	6.3%
5	SGP	5.9%	THA	5.0%	USA	4.6%
6	THA	5.1%	USA	4.4%	THA	3.8%
			EU			
1	**CHN**	**14.7**	**CHN**	**18.2**	**CHN**	**20.9**
2	RUS	12.2	USA	11.5	USA	11.9
3	GBR	11.3	GBR	10.8	GBR	7.2
4	USA	10.1	RUS	7.8	RUS	6.8
5	CHE	5.3	CHE	5.6	NOR	5.3

Source: UN Comtrade and Eurostat for European Union (EU). For 2022, data on Vietnam's bilateral imports were available for only a subset of countries; data for 2021 are used instead. For EU, data for 2012 is not available in Eurostat; data for 2013 are used instead.