How Protectionist Measures Shape the Offshoring Strategies of Chinese Firms: Evidence and Trade Implications

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April 2026

Abstract

We study how export controls targeting China reshape its global investment and host-country production networks. We begin by documenting two stylized facts: since 2018, export controls have become widespread and disproportionately target strategic industries, and Chinese outward FDI has increasingly concentrated in these affected sectors. Exploiting staggered exposure across industries, we find that Chinese outward FDI increases by 60–70 percent in affected industries, with stronger responses in connector economies that provide alternative production platforms. Turning to host economies, we show that industries receiving export control–induced FDI exhibit increases in capital and production-critical input imports. These industries also display deeper integration into global value chains, with strengthened forward and backward linkages to the world. At the same time, linkages with China increase in the short run but weaken over time, indicating a reorientation of production networks away from China-centric linkages, although domestic value added as a share of gross exports declines. Taken together, these patterns suggest that export controls induce production relocation and reconfiguration of supply chains in host economies, with production expanding disproportionately through foreign firms.

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1 Introduction

Since the onset of the US-China trade war, escalating geopolitical tensions and intensifying technological competition have placed increasing pressure on global supply chains. Trade protectionist measures, especially import barriers such as higher tariffs, have weakened the export competitiveness of both multinational corporations and export-oriented Chinese firms operating in China. In response, both foreign and Chinese firms have accelerated their adoption of the "China Plus One" strategy, seeking to diversify operations beyond China and potentially evade the protectionist measures targeting the country. ASEAN countries have emerged as key destinations for companies that pursue this approach. For example, China's leading electric vehicle (EV) manufacturer, BYD, is expected to complete its USD 1 billion production facility in Indonesia by the end of 2025, mainly targeting export markets (The Business Times, 2025). There has also been a growing number of Chinese-owned solar plants in Indonesia and Laos, strategically located beyond the reach of US trade sanctions (Jackson et al., 2024).

Meanwhile, China's outward FDI has increasingly shifted toward securing advanced technology and production capabilities, largely due to restricted access to critical inputs—such as advanced materials and technologies essential for semiconductor production—stemming from export controls imposed by major trading partners, particularly the United States (Sanders and Shepardson, 2024). Additionally, ASEAN's strong connectivity and preferential access to global markets—enabled by agreements such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and various free trade agreements with large markets such as the United States and the European Union—further enhance its appeal as an attractive destination for investment. Moreover, Chinese companies operating in ASEAN enjoy advantages from trade frameworks like the ASEAN-China Free Trade Area (ACFTA), which offers them incentives for regional investments and facilitates the import and export of materials and products between China and ASEAN.

Against the backdrop of evolving trade and investment dynamics, in this paper, we examine the effect of rising protectionist measures on Chinese direct investment abroad. Specifically, we first document the growing number of new trade policies announced since 2008 that affect China, with the sharpest increase occurring after the onset of the US–China trade war in 2018. We show that while the number of import barrier announcements has been large and relatively stable since the post–global financial crisis period, the surge in export barriers is a more recent phenomenon—especially after 2018. Compared with import barriers, which often target a wide range of industries, export barriers affecting China have increasingly concentrated on industries of strategic importance since 2018. In terms of Chinese outward

FDI dynamics, we identify two peak periods of offshoring activity by Chinese firms: the first surrounding the US–China trade war in 2018, and the second beginning in 2022, during the pandemic and associated lockdowns. In particular, during the second wave of Chinese FDI flight, the bulk of investment flows into "connector economies," namely, Poland, Mexico, Morocco, Indonesia, and Vietnam.

We next estimate the impact of different types of trade policies on China's outward FDI globally. Our findings reveal significant heterogeneity across destination economies, industry compositions, and time periods. We find that an increasing number of import barriers imposed on China is associated with rising Chinese outward FDI in Poland, Indonesia, and Vietnam. Meanwhile, a greater number of export barriers is linked to increasing Chinese outward FDI in Morocco and Indonesia. These results remain robust even after controlling for trade policies targeting the FDI-receiving countries and a full set of fixed effects. In particular, we show industry-specific impacts of export barriers hitting China: an increase in export barriers targeting China's strategic industries induces more offshoring activity by Chinese firms, especially when the destination economies are connector economies and during post–trade war periods.

Third, given the prominent increase in export controls targeting China after 2018, and the significant impact these have on China's outward FDI, we provide formal evidence for the causal relationship between the two. To do so, through a staggered difference-in-differences framework, we estimate a canonical two-way fixed effects (TWFE) model and show that compared to industries never hit by any export control measures, Chinese outward FDI increases by between 60 percent and 70 percent in industries affected by export barriers after these policies were rolled out. As the conventional TWFE model has increasingly come under criticism due to its inadequacy in factoring heterogeneous treatment effects for groups treated at different times, and the potential bias that might arise due to the "forbidden comparisons" that contrast the later treated group to the earlier treated group (De Chaisemartin and d'Haultfoeuille, 2020; Sun and Abraham, 2021; Goodman-Bacon, 2021; Callaway and Sant'Anna, 2021), we further complement our TWFE results with dynamic treatment effects estimated according to Callaway and Sant'Anna (2021). Our results again indicate that while there is no statistically significant difference between FDI in industries affected by export barriers and industries that are never affected by such measures before any of these policies are implemented – supporting the parallel pre-trend assumption and the validity of our methodology – the relative value of Chinese outward FDI in industries affected by export controls jumps during post-policy implementation periods. These results strengthen our earlier findings that bypassing export controls has become an important motivation among others for Chinese firms to engage in offshoring activites.

Finally, we test whether export control–induced Chinese FDI inflows are associated with production

relocation to host countries. We estimate differential trends in the shares of capital, intermediate, and consumption imports across industries in FDI-receiving economies exposed to export controls on China. Rising capital and intermediate shares would suggest production relocation. We also examine trends in import volumes weighted by product centrality; increases would indicate greater import sophistication in industries that both received Chinese FDI and were affected by export controls, consistent with strengthening domestic production capabilities in host economies alongside FDI inflows from China driven by export-control circumvention.

Amid escalating geopolitical frictions and the resurgence of trade protectionism, understanding how trade policy shocks reshape firms' international investment strategies is of both theoretical and practical significance. From a theoretical standpoint, existing FDI frameworks—such as Dunning's eclectic paradigm (Dunning, 1977, 2015), and internalization theory(Buckley and Casson, 1976) —largely emphasize firm- and country-level advantages under relatively stable global conditions, offering limited insight into how sudden policy disruptions, especially export controls, alter the geography and motivation of outward investment. Empirically, to the best of our knowledge, we are the first to provide causal evidence on both the first-order effects of protectionist measures—particularly export controls—on Chinese outward FDI, and the second-order effects on how import composition and sophistication in host economies evolve in FDI-receiving industries, potentially driven by Chinese firms' efforts to evade export controls.

2 Related Literature

Our paper contributes to several strands of literature. First, we contribute to the extensive empirical literature on the determinants of foreign direct investment (FDI). Prior studies have examined a wide range of firm-level factors—such as productivity (Tomiura, 2007; Yeaple, 2009) and labor costs—as well as macro-level determinants, including institutional quality (Du et al., 2008), bilateral trade linkages (Erel et al., 2012), exchange-rate movements (Cushman, 1985; Russ, 2007), financial development in home and host countries (Giovanni, 2005; Erel et al., 2012), and cultural or social proximity (Guiso et al., 2009; Burchardi et al., 2019). Within this literature, our study is most closely related to research examining the determinants of Chinese outward FDI, which emphasizes host-country characteristics—such as market size, institutional quality, and geographic proximity (Buckley et al., 2009)—firm-level attributes, including size, productivity, and export intensity (Chen and Tang, 2014), and domestic institutional distortions that disadvantage private firms (Chen et al., 2019).

While this literature largely focuses on structural and firm-level drivers of investment location, a growing body of work suggests that policy shocks can also reshape firms' internationalization strategies. Building on this insight, we posit that protectionist trade measures targeting China constitute an additional, externally imposed determinant of outward FDI.

Hypothesis 1. Protectionist trade measures targeting China are positively associated with Chinese outward FDI.

Moreover, different types of trade barriers may induce distinct strategic responses. Import barriers may incentivize firms to establish foreign affiliates to maintain market access, whereas export barriers—especially those targeting strategic industries—may induce firms to relocate production abroad to circumvent restrictions.

Hypothesis 2a. Import barriers imposed on China are positively associated with Chinese outward FDI.

Hypothesis 2b. Export barriers imposed on China generate larger increases in Chinese outward FDI, particularly in strategically targeted industries.

Second, our paper adds to the growing literature on how firms respond to trade shocks and policy uncertainty. Prior studies find that trade policy uncertainty affects firms' export decisions (Feng et al., 2017; Crowley et al., 2018), investment, R&D, and profitability (Benguria et al., 2022), as well as their innovation performance (Liu and Ma, 2020; Coelli, 2025). More broadly, our paper is also related to policy uncertainty and investment (Gulen and Ion, 2016; Bonaime et al., 2018; Stokey, 2016) and is most closely related to the study evaluating the impact of trade policy uncertainty on China's FDI inflows (Bao et al., 2022).

Extending this literature, we argue that policy shocks may not only affect whether firms invest abroad but also where and when they do so. In particular, firms may respond strategically to heightened policy constraints by reallocating investment toward jurisdictions that facilitate continued participation in global value chains.

Hypothesis 3. The positive relationship between trade barriers targeting China and Chinese outward FDI is stronger for connector economies than for other host countries.

Hypothesis 4. The impact of trade barriers on Chinese outward FDI is stronger in post-shock periods characterized by heightened geopolitical tensions.

Third, our study connects to the burgeoning literature on geoeconomics and geopolitical risk, which investigates how strategic competition and economic statecraft reshape global trade and investment patterns (Clayton et al., 2023, 2025; Thoenig, 2023; Fernández-Villaverde et al., 2024; Mohr and Trebesch,

2025; Kleinman et al., 2024). Relatedly, recent studies document the reallocation of trade and FDI in response to rising geopolitical tensions (Aiyar et al., 2023; Gopinath et al., 2025). Our paper extends this line of research by revisiting the classical notion of tariff-jumping FDI, whereby firms establish production abroad to circumvent trade barriers (Barrell and Pain, 1999; Blonigen, 2002).

In the contemporary geoeconomic environment, export controls—besides the import barriers such as tariffs—represent a particularly salient policy instrument that may affect firms' internationalization decisions, because they directly restrict firms' ability to access key technologies and inputs. Such constraints may incentivize firms to reconfigure their international production networks.

Hypothesis 5. Industries exposed to export controls targeting China experience greater increases in Chinese outward FDI than industries not exposed to such controls.

Hypothesis 6. Increases in Chinese outward FDI in affected industries occur primarily after export control implementation rather than prior to policy adoption.

Finally, our study also extends to new dimensions on top of earlier works that examine the economic consequences of export controls. Prior research documents two main outcomes: the immediate disruption of China's supply chains and collateral losses among U.S. firms caused by U.S.-imposed export restrictions (Crosignani et al., 2024), and the more recent evidence that such controls have spurred innovation among Chinese firms (He and Lyu, 2025; Liu et al., 2025). We extend this literature by examining how Chinese firms adjust their outward investment behavior in response to export controls—highlighting FDI reallocation as a key firm-level adaptation to geoeconomic policy shocks.

If export controls induce firms to relocate production abroad, their investments should be accompanied by observable changes in host-country production structures. In particular, production relocation is likely to increase imports of capital goods and intermediate goods, as well as inputs that are critical to production supply chains, especially if relocated production is technologically sophisticated.

Hypothesis 7. Industries receiving export control–induced Chinese FDI exhibit increases in the shares of capital and intermediate imports relative to consumption imports.

Hypothesis 8. Industries receiving export control–induced Chinese FDI exhibit shifts of import composition towards critical inputs, as reflected in higher centrality-weighted import volumes.

Taken together, these hypotheses link policy shocks to firm strategy, investment relocation, and host-country production upgrading, thereby integrating insights from international business, trade, and geoeconomics into a unified framework.

The remainder of this paper is structured as follows. Section 3 discusses the data used for tracking protectionist policies and Chinese direct investment abroad. Section 4 examines trends in protectionist

measures hitting China and the country's outward FDI, emphasizing their industry, time, and destination country heterogeneity. Section 5 spells out the empirical strategy we adopt for estimating the impact of protectionist measures on Chinese outward FDI and the evolution of import structure by FDI-receiving countries. Section 6 presents our results and analyses. Finally, Section 7 concludes.

3 Data

Foreign Direct Investment (FDI). We obtain the FDI data from the Bureau van Dijk's Orbis Crossborder Investment (OCI) database, which has been widely used in FDI and policy studies (Zabetta et al., 2025; Estrin et al., 2018; Musteen et al., 2025; Schulze and Xin, 2025). The OCI provides transaction-level data on cross-border investments, covering both Greenfield projects and Mergers & Acquisitions (M&As), with detailed information on source and destination countries, industry classification, project announcement date, status, and capital expenditure. While comprehensive, the OCI database is constrained by its reliance on publicly available information such as news reports and corporate announcements. As a result, it may overlook smaller or less publicized investment projects, particularly those occurring in countries with limited media transparency.Another limitation of OCI database is that not all capital expenditure of the transactions are documented. This introduces potential coverage and reporting bias, making the dataset more representative of large, internationally visible FDI projects than of the full universe of cross-border investment activity.

Protectionist Measures. This paper draws on data on trade protectionist measures from the Global Trade Alert (GTA) database, which has become a standard source in the analysis of trade policy (Evenett et al., 2024; Ruta and Sztajerowska, 2025; Jakubik and Ruta, 2023; Jakubik et al., 2023). The GTA classifies measures into three categories: red, which clearly discriminate against foreign commercial interests; amber, which are likely to have discriminatory effects; and green, which liberalize trade or improve transparency. In this paper, we follow Evenett et al. (2024) to further classify the red (restrictive) measures into import barriers, export barriers, and other red measures. For each policy, the database provides detailed information including (i) the implementing (source) country, (ii) the targeted (destination) country, (iii) the specific products affected at the six-digit Harmonized System (HS) level or 3-digit Central Product Classification (CPC) sector level, (iv) the dates of implementation and removal (if applicable), and (v) a detailed description of the measure.

Trade. We use annual bilateral trade data at the six-digit level of the Harmonized System (HS) product classification, obtained from CEPII-BACI (Gaulier and Zignago, 2010). We map the trade data to their associated industries coded by Standard Industrial Classification (SIC) using the correlation table provided by the World Integrated Trade Solution (WITS). Finally, we classify each traded product according to their relative position in the supply chain as either capital goods, intermediate products, or final consumption products based on the Broad Economic Categories (BEC) classification.

The resulting dataset enables us to examine whether trade patterns diverge between industries targeted by export controls and those that are not. For example, a differential increase in the import shares of capital goods or intermediate inputs in targeted industries would suggest that export control–driven Chinese outward FDI is associated with production relocation to host countries. By contrast, an increase in the import share of consumption goods would instead be consistent with host economies serving as export rerouting hubs.

We complement the analysis by constructing a trade volume index weighted by product centrality, a measure capturing the importance of a product as an input in production networks[1]. This allows us to test whether imports in industries receiving export control–driven Chinese FDI shift toward more production-critical goods, which will be consistent with strengthening domestic production capabilities (Fetzer et al., 2024).

4 Patterns of Protectionism and China's Outward FDI

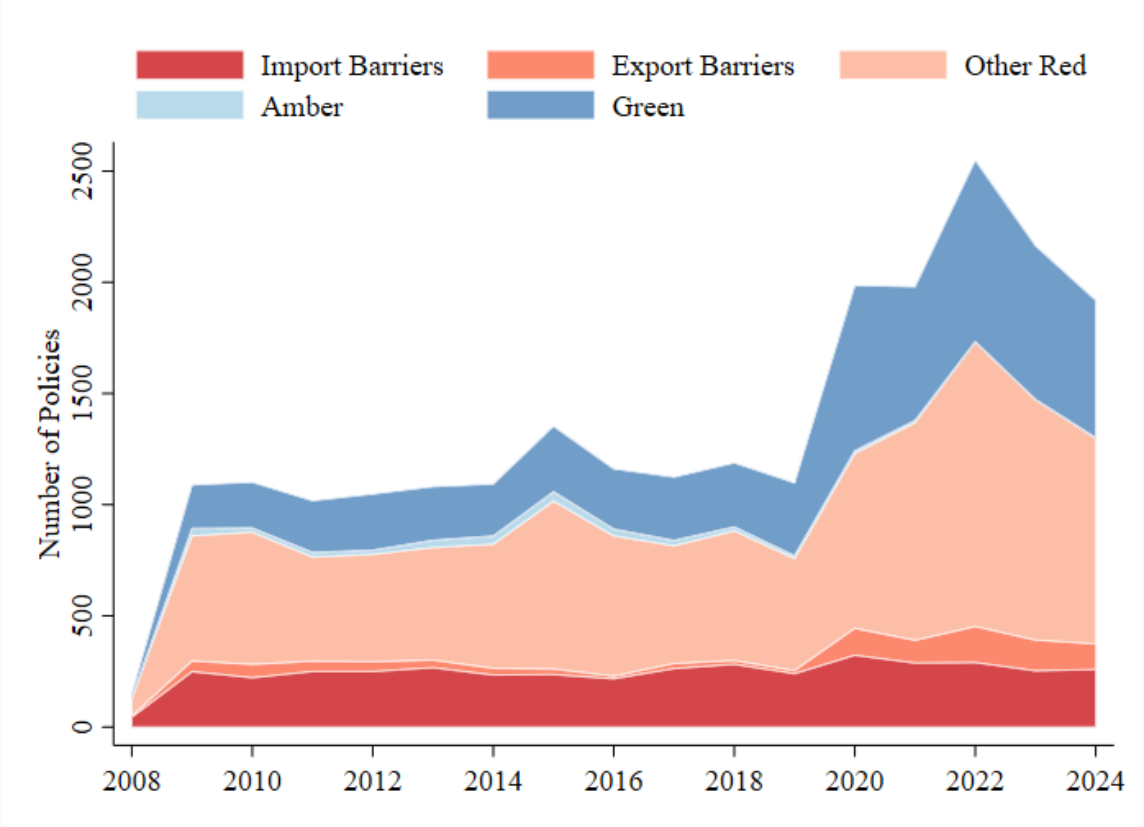
In this section, we begin the empirical analysis by documenting the evolution of protectionist measures targeting China. Figure 1 shows that after nearly a decade of relative stability between 2008 and 2017, the onset of the US–China trade war in 2018 marked a sharp inflection point, with newly documented policy interventions rising from around 1,000 per year to nearly 2,500. This surge persisted through the COVID-19 pandemic, as supply chain disruptions exposed strategic vulnerabilities and accelerated global decoupling efforts. The composition of these measures also shifted markedly: while import barriers remained relatively stable, export barriers became the fastest-growing category, reflecting a strategic move from defensive protectionism to more offensive restrictions on China's market access. At the same time, "Other Red" measures proliferated, encompassing technology-related export controls, investment screening, and critical infrastructure restrictions. This transformation from trade disputes into a broader

[1]The centrality measure we use is the Integrated Global Product Centrality (IGPC) from (Fetzer et al., 2024). The IGPC measure provides a network-based measure of product importance that incorporates both trade intensity and supply-chain position. Conceptually, it parallels PageRank: products connected to highly central products receive higher scores, reflecting their systemic importance.

regime of economic competition has created the institutional environment underpinning the "China Plus One" diversification strategies discussed above, as Chinese firms confront not only rising trade costs but also systematic exclusion from key markets and technologies, prompting strategic relocation of investment toward alternative hubs such as ASEAN economies that retain preferential access to global value chains.

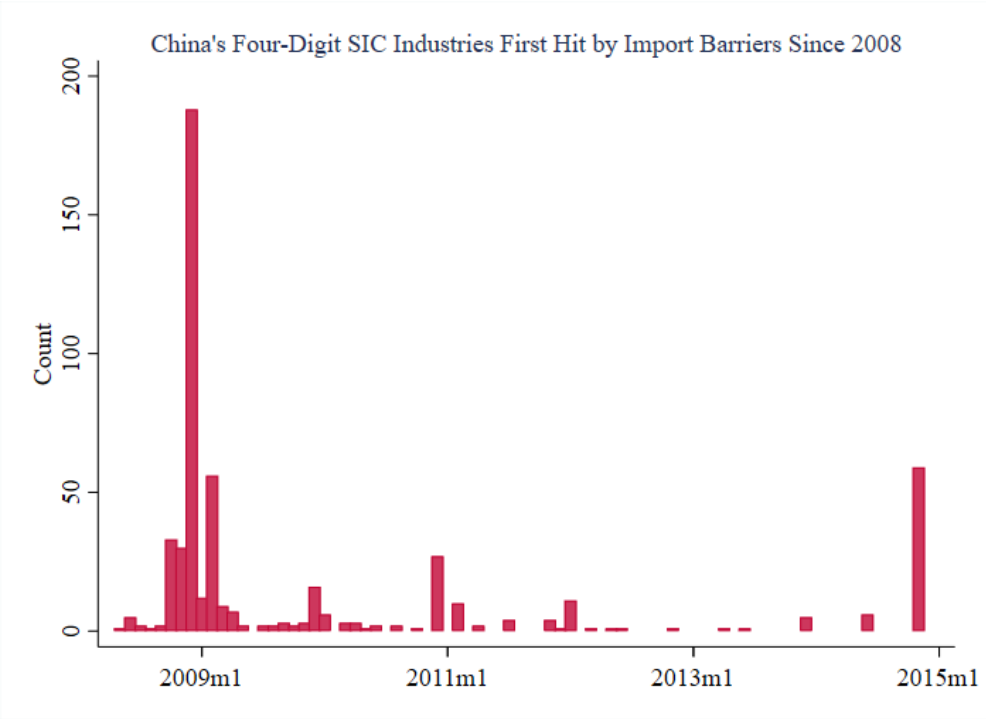
Figure 2 documents the timing of China's four-digit SIC industries first exposed to import and export barriers since 2008. Panel A shows that most industries subject to import barriers were hit early, with a sharp concentration around 2009 and a smaller spike in 2015. This pattern suggests that import barriers were largely deployed in response to the global financial crisis and later revived during episodes of sector-specific trade frictions, but have not been the dominant form of protection in recent years. By contrast, Panel B highlights a very different trajectory for export barriers. Initial exposure was relatively modest in the early 2010s, but the incidence rose sharply in the mid-2010s and peaked in 2019, coinciding with the escalation of the US–China trade war. The clustering of first exposures around 2018–2019 underscores the strategic use of export barriers as a key instrument of economic statecraft in the trade conflict. Moreover, the persistence of new first exposures into the 2020s indicates that export restrictions have become an enduring feature of the global policy environment facing Chinese industries. Taken together, the comparison across panels points to a structural shift in the nature of trade protection: while import barriers were front-loaded in the aftermath of the global financial crisis, export barriers have recently emerged as the primary channel through which China's industries encounter international restrictions, reflecting a broader turn from defensive trade policy to offensive measures aimed at curbing China's integration into advanced value chains.

FIGURE 1: Distribution of New Policies Affecting China (2008-2024)

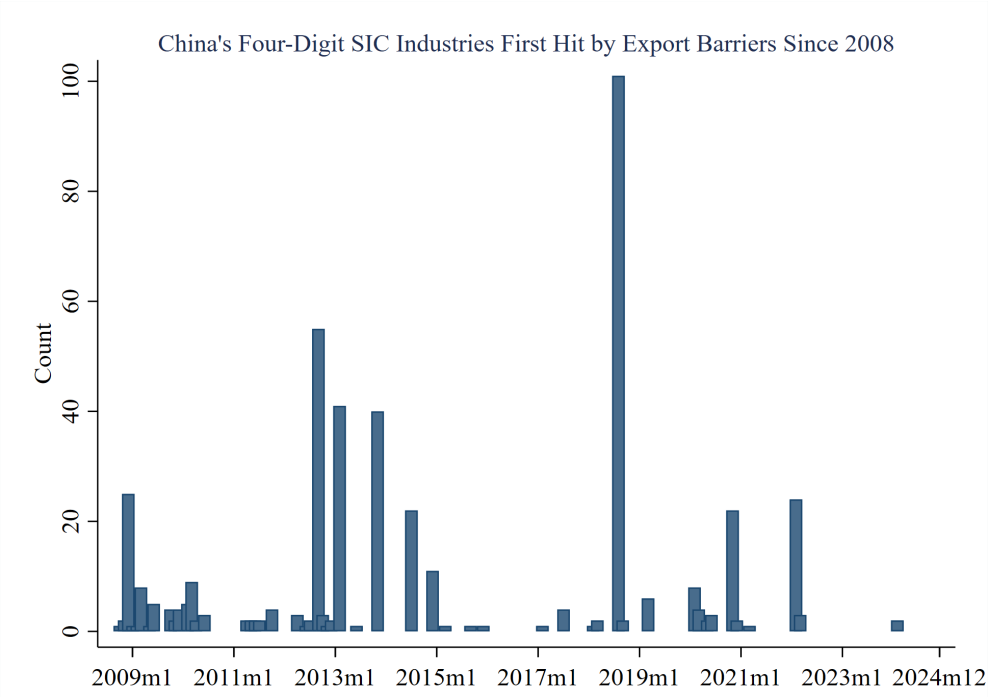


Notes: Here, the number of policies refers to newly documented policies in the GTA database, rather than the total stock of policies in force affecting China in a given year.

FIGURE 2: Distribution of China's Four-Digit SIC Industries First Hit by Import and Export Barriers Since 2008



(A) Industries First Hit by Import Barriers



(B) Industries First Hit by Export Barriers

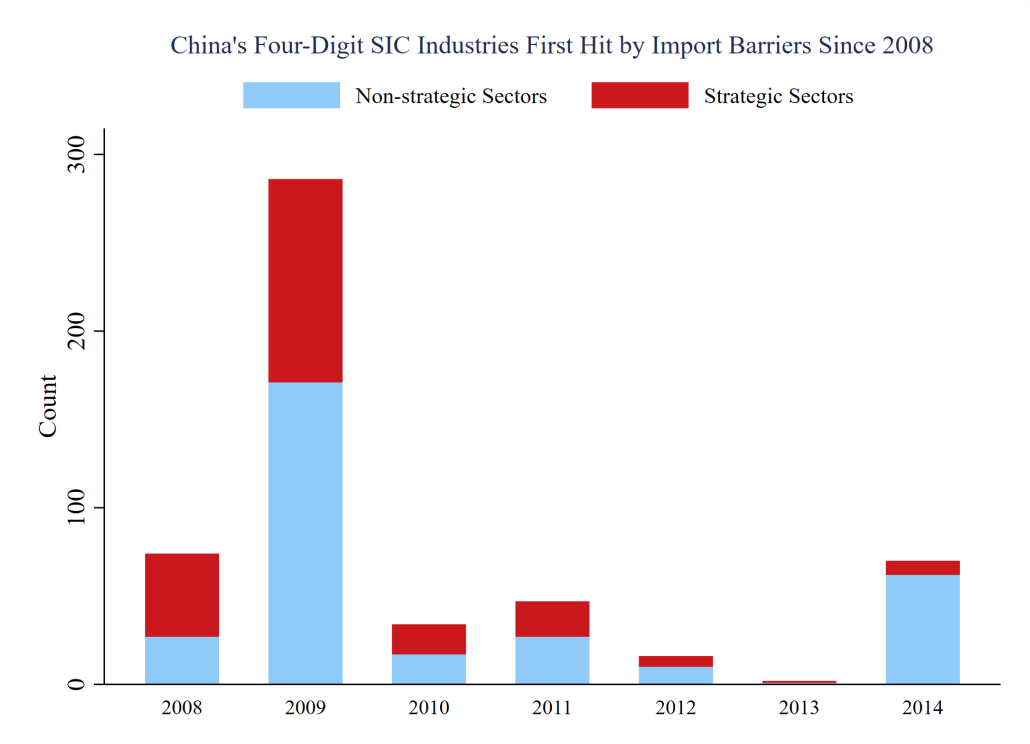
Notes: The date refers to the point in time when the 4-digit SIC industry was first affected by import barriers and export barriers, beginning in 2008, the earliest year covered by the Global Trade Alert (GTA) database.

Figure 3 provides further nuance by distinguishing between strategic and non-strategic sectors in

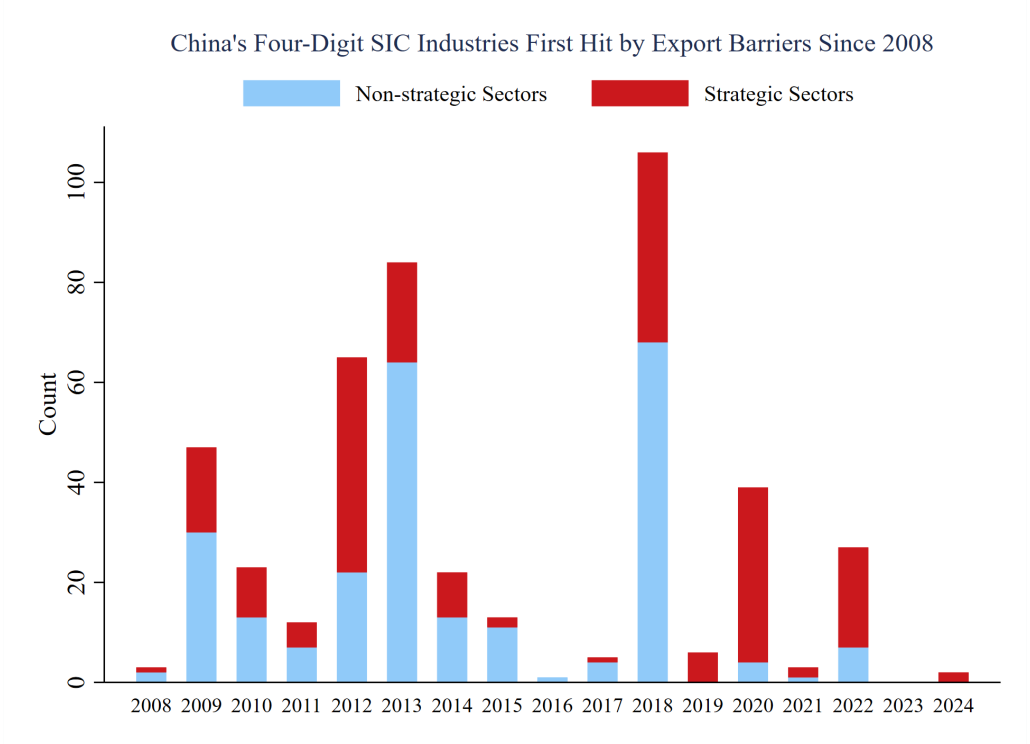
terms of the timing of industries first hit by trade barriers. Panel A shows that the initial surge in import barriers in 2009 heavily impacted non-strategic industries, such as traditional manufacturing, although some strategic sectors were also affected during that episode. After this early wave, the incidence of new import barriers declined sharply and became more sporadic. By contrast, Panel B highlights a very different pattern for export barriers. Beginning in the early 2010s, an increasing number of strategic industries—electronics, machinery, and transport equipment—were brought under restrictions, with the concentration reaching its peak around 2018–2019, coinciding with the escalation of the US–China trade war. Unlike the earlier import measures, these export barriers were overwhelmingly targeted at sectors central to China's technological upgrading and integration into global value chains. This shift from broad, defensive protectionism toward selective, strategic restrictions illustrates how the global policy environment has moved from general trade frictions to deliberate efforts at constraining China's access to advanced industries.

Building on the broad timing patterns in Figure 2 and the sectoral distinctions in Figure 3, Table 1 provides a detailed analysis to identify which strategic industries were first targeted by export barriers after July 2018. Consistent with the surge in restrictions documented in Figure 3, the data reveal a strong concentration in high-technology and capital-intensive sectors. Electronic components (SIC 367) and measuring and controlling devices (SIC 382) were among the earliest and most heavily affected, with eight and seven four-digit industries respectively first hit. Traditional machinery-related sectors—including general industrial machinery (SIC 356), metalworking machinery (SIC 354), and construction and materials-handling equipment (SIC 353)—also featured prominently, highlighting the breadth of restrictions beyond frontier electronics into core industrial capabilities. At the same time, industries tied to dual-use technologies and national security—such as communications equipment (SIC 366), aircraft and parts (SIC 372), and motor vehicles (SIC 371)—were also early targets. Taken together, these patterns reinforce the finding from Figures 2 and 3: while import barriers were front-loaded and diffuse, export barriers after 2018 were systematically directed at sectors central to China's technological upgrading and strategic competition.

FIGURE 3: Distribution of China's Four-Digit SIC Industries First Hit by Import and Export Barriers by Sector Since 2008



(A) Industries First Hit by Import Barriers



(B) Industries First Hit by Export Barriers

Notes: The date refers to the point in time when the 4-digit SIC industry was first affected by import barriers and export barriers, beginning in 2008, the earliest year covered by the Global Trade Alert (GTA) database.

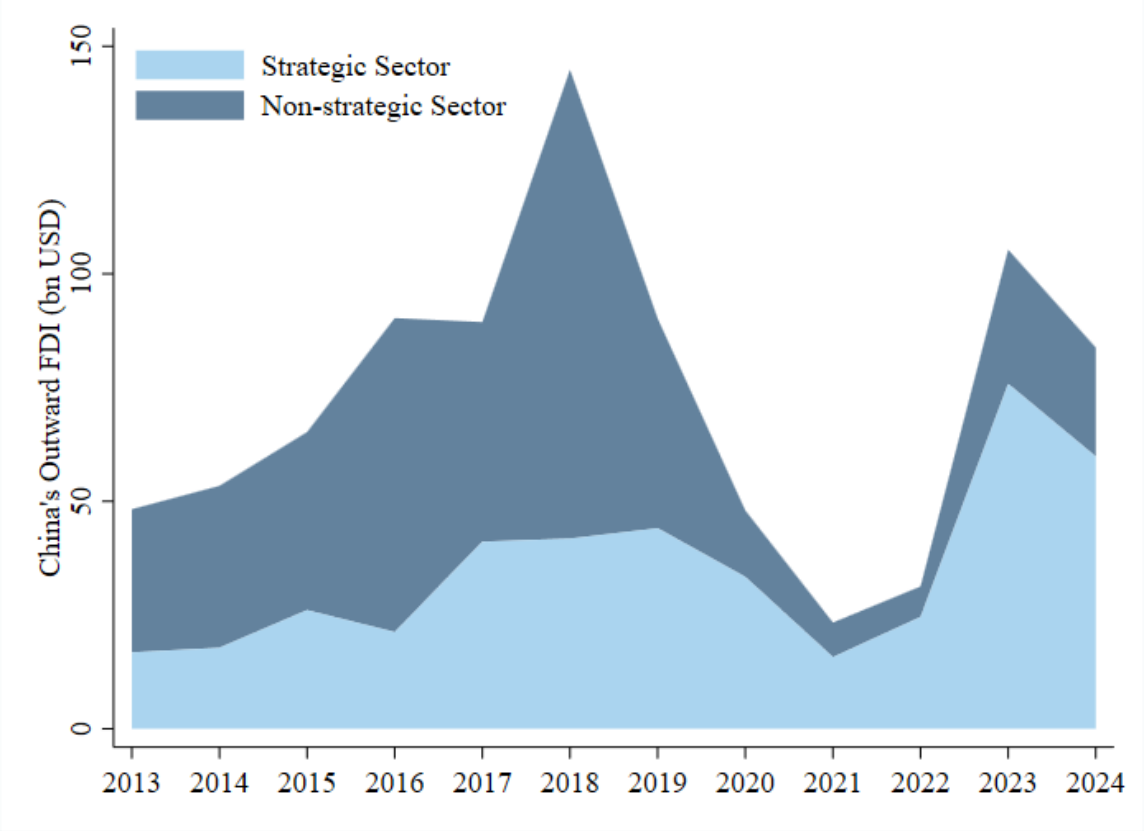
TABLE 1: China's Strategic Industries First Hit by Export Barriers After July 2018

SIC3	First	Total
367 Electronic Components and Accessories	8	8
382 Measuring and Controlling Devices	7	8
363 Household Appliances	5	6
356 General Industrial Machinery and Equipment	4	9
354 Metalworking Machinery and Equipment	4	9
326 Pottery and Related Products	4	5
308 Miscellaneous Plastics Products, NEC	4	9
353 Construction, Mining, and Materials Handling Machinery and Equipment	4	7
369 Miscellaneous Electrical Machinery, Equipment, and Supplies	4	5
349 Miscellaneous Fabricated Metal Products	3	9
364 Electric Lighting and Wiring Equipment	3	3
362 Electrical Industrial Apparatus	3	4
366 Communications Equipment	3	3
371 Motor Vehicles and Motor Vehicle Equipment	2	4
372 Aircraft and Parts	2	3
361 Electric Transmission and Distribution Equipment	2	2
359 Miscellaneous Industrial and Commercial Machinery	2	5
358 Refrigeration and Service Industry Machinery	2	4
391 Jewelry, Silverware, and Plated Ware	2	3
399 Miscellaneous Manufacturing Industries	2	3
342 Cutlery, Handtools, and General Hardware	2	2
341 Metal Cans and Shipping Containers	2	2
329 Miscellaneous Nonmetallic Mineral Products	2	6
346 Metal Forgings and Stampings	2	3
289 Miscellaneous Chemical Products	2	4

Notes: This table includes only those 3-digit SIC industry groups for which at least two 4-digit strategic SIC industries were first targeted. "First" denotes the number of strategic 4-digit SIC industries initially targeted within each group, and "Total" denotes the total number of 4-digit SIC industries classified as strategic within that group.

We then zoom in on the evolution of China's outward FDI flows, distinguishing between strategic and non-strategic sectors from 2013 to 2024. Figure 4 shows that Chinese outward FDI expanded steadily through the mid-2010s, with non-strategic sectors accounting for the bulk of investment. The sharp peak in 2018 coincided with the escalation of the US–China trade war, followed by a steep decline in total FDI. Notably, however, recent years revealed a marked compositional shift. While strategic sectors represented a relatively small share of outward FDI before 2018, they accounted for an increasingly large share of investment during the post-2020 recovery. By 2023–2024, strategic sectors dominated the rebound, aligning with the evidence in Figures 2 and 3 and Table 1 that export barriers disproportionately targeted high-tech and capital-intensive industries. In other words, as China faced systematic restrictions abroad, firms in Chine responded not by withdrawing but by reallocating outward FDI toward strategic sectors and connector economies integrated in global supply chains. This pattern reinforces the view that export barriers have acted as a catalyst for structural reallocation rather than a mere contraction in cross-border investment.

FIGURE 4: Annual China's Outward FDI by Sector (2013-2024)

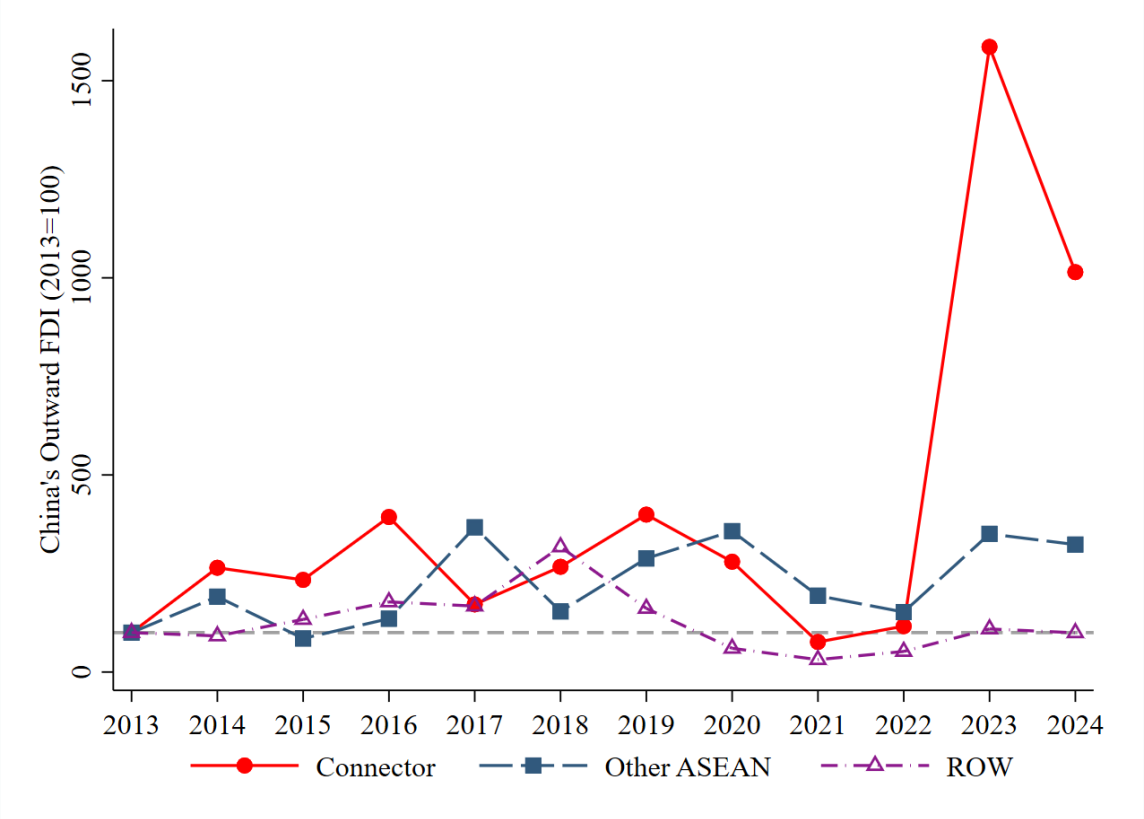


Notes: We follow the International Monetary Fund (2023) to define strategic sectors.

Figure 5 zooms in on the geographic reallocation of China's outward FDI, contrasting flows to connector economies, other ASEAN members, and the rest of the world (ROW) over 2013–2024.

We follow the classification established by Gopinath et al. (2025) and Bloomberg (2023) to identify the connector economies, which includes Vietnam, Indonesia, Mexico, Poland, and Morocco. These economies are singled out as key relocation hubs, and the figure highlights that while FDI to other ASEAN countries and ROW remained relatively stable, investment in connector economies displayed a sharp surge in recent years. In particular, after a period of relative decline during 2020–2022, FDI to connectors spiked dramatically in 2023, rising more than tenfold relative to 2013 levels, before moderating in 2024. This explosive increase underscores the strategic role of connector economies in providing Chinese firms with continued access to global value chains amid intensifying trade restrictions. The contrast with the muted trend in other ASEAN members and ROW suggests that the "China Plus One" strategy is not uniformly applied across destinations but is concentrated in economies that combine geographic proximity, preferential trade agreements, and political neutrality. Taken together, these patterns reinforce the interpretation that export barriers did not simply depress Chinese outward FDI but redirected it toward specific safe harbors within the global economy.

FIGURE 5: Annual China's Outward FDI to Connector Economies vs. Other ASEAN Countries vs. ROW (2013-2024)



Notes: We borrow the list of connector economies from Bloomberg (2023) and Gopinath et al. (2025), which include Vietnam, Indonesia, Mexico, Poland, and Morocco.

5 Empirical Strategy

In this section, we outline the empirical specifications used to quantify the effects of export controls and import barriers on China's outward FDI, examining the heterogeneity of these effects across destinations, industries, and time periods surrounding the US–China trade war, and present the causal identification strategy used to isolate the impact of export controls.

5.1 Baseline Model

We begin with a baseline specification that estimates the average effect of import controls and export barriers on Chinese outward FDI. This specification provides initial evidence on how protectionist and liberalizing measures shape China's direct investment abroad. Formally, we estimate the following equation (1):

$$\log\left(\text{FDI}_{s,d,i,t}\right) = \sum_{l \in L} \beta_l \, NS^{l}_{s,i,t-1} + \delta_{d,i} + \delta_{d,t} + \varepsilon_{s,d,i,t} \,, \tag{1}$$

where $\ln\left(\text{FDI}_{s,d,i,t}\right)$ denotes the natural logarithm of the FDI value from source country s (China, in our context) to destination d in industry i at time t. $NS^{l}_{s,i,t-1}$ denotes the cumulative number of trade policies of type l targeting industry i of source s (China, in our context) that are in place up to period $t-1$ (lagged 1 month to reduce reverse causality concerns). We consider five types of measures: import barriers, export barriers, other restrictive ("red"), "amber," and liberalizing ("green"). Hence,

$$L = \{\text{import barriers, export barriers, other red, amber, green}\}.$$

The specification includes a rich set of fixed effects. Destination–industry fixed effects, $\delta_{d,i}$, absorb all time-invariant heterogeneity between destinations and industries, such as historical ties, geographical proximity, or structural complementarities. Destination–time fixed effects, $\delta_{d,t}$, flexibly capture shocks at the destination–year or month level, including macroeconomic fluctuations, institutional reforms, or contemporaneous shocks such as financial crises and the pandemic.

Furthermore, in robustness tests, we account for the possibility that China may have rerouted its outward FDI to avoid sanction measures, but not toward destinations that were themselves subject to a high number of such sanctions. Thus, we control the cumulative number of all policy measures (restrictive, neutral or liberalizing) that affect destination industry d' i, denoted by $NS^{l}_{d,i,t-1}$. Specifically, we estimate the following equation equation (2):

$$\log\left(\text{FDI}_{s,d,i,t}\right) = \sum_{l \in L} \beta_l \, NS^{l}_{s,i,t-1} + \sum_{l \in L} \theta_l \, NS^{l}_{d,i,t-1} + \delta_{d,i} + \delta_{d,t} + \varepsilon_{s,d,i,t} \,, \tag{2}$$

Based on specifications (1) and (2), positive and statistically significant estimates of β, especially when these are coefficients of export or import barriers, provide empirical support for **Hypothesis 1**.

5.2 Heterogeneity

5.2.1 Destination Heterogeneity

To investigate whether the effects of protectionist and liberalizing trade measures are heterogeneous across different host-country contexts, we extend the baseline model by distinguishing between *connector*

economies (Vietnam, Indonesia, Mexico, Poland, and Morocco) and all other destinations. These economies play a central role in China's "China Plus One" strategy, serving as relocation hubs for production in response to rising trade barriers.

Formally, we augment equation (1) with interaction terms between policy measures and a connector dummy that equals one if the destination d is a connector economy:

$$\begin{aligned}\log(\text{FDI}_{s,d,i,t}) = &\sum_{l\in L}\beta_l\, NS^{l}_{s,i,t-1} + \sum_{l\in\{\text{import, export}\}}\gamma_l\, NS^{l}_{s,i,t-1}\times \text{Connector}_d \\ &+ \delta_{d,i} + \delta_{d,t} + \varepsilon_{s,d,i,t}\,,\end{aligned} \tag{3}$$

where Connector_d is a dummy variable equal to one if d is a connector economy, and zero otherwise. The coefficients γ_l capture the additional impact of export and import barriers in connector economies relative to other non-connector economies.

Country-specific heterogeneity. Next, we allow the impact of trade measures to vary across individual connector economies by interacting policy measures with country dummies for $c \in C = \{\text{Vietnam, Indonesia, Mexico, Poland, Morocco}\}$:

$$\begin{aligned}\log(\text{FDI}_{s,d,i,t}) = &\sum_{c\in C}\Big[\theta_{1c}\, NS^{\text{export}}_{s,i,t-1}\times\mathbf{1}\{d=c\} + \theta_{2c}\, NS^{\text{import}}_{s,i,t-1}\times\mathbf{1}\{d=c\} \\ &+ \theta_{3c}\, NS^{\text{other red}}_{s,i,t-1}\times\mathbf{1}\{d=c\} + \theta_{4c}\, NS^{\text{amber}}_{s,i,t-1}\times\mathbf{1}\{d=c\} \\ &+ \theta_{5c}\, NS^{\text{green}}_{s,i,t-1}\times\mathbf{1}\{d=c\}\Big] \\ &+ \sum_{l\in L}\beta_l\, NS^{l}_{s,i,t-1} + \delta_{d,i} + \delta_{d,t} + \varepsilon_{s,d,i,t}\,,\end{aligned} \tag{4}$$

where $d = c$ is an indicator equal to one if destination d is country c. This specification allows us to test whether specific connector economies disproportionately absorb Chinese FDI when trade barriers rise.

The identifying variation comes from within-destination–industry changes in Chinese FDI following the imposition of trade policy measures, netting out structural differences and aggregate shocks. By interacting policy shocks with connector dummies, equation (3) captures the group-level diversion of Chinese FDI toward connector economies, while equation (4) uncovers which individual connector economies are driving the effect. Positive and statistically significant estimates of coefficients on connector economies mean larger differential impact of protectionist measures on Chinese outward FDI on connector economies, supporting **Hypothesis 3**

5.3 Industry Heterogeneity

We next investigate whether Chinese outbound FDI reacts more strongly to trade policy shocks in *strategic* industries (e.g., electronics, machinery, transport equipment) relative to non-strategic sectors, which relates to **Hypothesis 2**. These industries are central to global value chains and are often the focus of both protectionist measures abroad and industrial upgrading policies in China. $\text{Strategic}_i \in \{0, 1\}$ is an indicator that equals one if industry i belongs to the set of strategic sectors, and zero otherwise. We extend equation (1) by interacting policy shocks with Strategic_i:

$$\begin{aligned} \log\left(\text{FDI}_{s,d,i,t}\right) = & \sum_{l \in L} \beta_l \, NS^{l}_{s,i,t-1} \\ & + \gamma_1 \, NS^{\text{export}}_{s,i,t-1} \times \text{Strategic}_i + \gamma_2 \, NS^{\text{import}}_{s,i,t-1} \times \text{Strategic}_i \\ & + \delta_{d,i} + \delta_{d,t} + \varepsilon_{s,d,i,t} \, , \end{aligned} \tag{5}$$

The coefficients γ_1 and γ_2 capture whether the effects of export and import barriers are systematically stronger in strategic industries than in non-strategic ones.

Strategic industries and destination policies. Again, for robustness check, we additionally control for trade measures affecting the FDI-receiving destination countries:

$$\begin{aligned} \log\left(\text{FDI}_{s,d,i,t}\right) = & \sum_{l \in L} \beta_l \, NS^{l}_{s,i,t-1} \\ & + \gamma_1 \, NS^{\text{export}}_{s,i,t-1} \times \text{Strategic}_i + \gamma_2 \, NS^{\text{import}}_{s,i,t-1} \times \text{Strategic}_i \\ & + \sum_{l \in L} \theta_l \, NS^{l}_{d,i,t-1} + \delta_{d,i} + \delta_{d,t} + \varepsilon_{s,d,i,t} \, . \end{aligned} \tag{6}$$

Strategic industries, destination policies, and connector economies. Finally, we test whether the strategic-sector amplification is especially pronounced in connector economies. Let $\text{Connector}_d \in \{0, 1\}$

indicate whether destination d is a connector. We extend (6) with three-way interactions:

$$
\begin{aligned}
\log\left(\mathrm{FDI}_{s,d,i,t}\right) = & \sum_{l \in L} \beta_l \, NS^{l}_{s,i,t-1} \\
& + \gamma_1 \, NS^{\text{export}}_{s,i,t-1} \times \text{Strategic}_i + \gamma_2 \, NS^{\text{import}}_{s,i,t-1} \times \text{Strategic}_i \\
& + \gamma_3 \, NS^{\text{export}}_{s,i,t-1} \times \text{Strategic}_i \times \text{Connector}_d \\
& + \gamma_4 \, NS^{\text{import}}_{s,i,t-1} \times \text{Strategic}_i \times \text{Connector}_d \\
& + \sum_{l \in L} \theta_l \, \mathrm{NS}_{d,i,t-1} + \delta_{d,i} + \delta_{d,t} + \varepsilon_{s,d,i,t} \, .
\end{aligned}
\tag{7}
$$

Equation (5) tests for strategic-sector amplification; (6) separates industry effects from destination policy environments; and (7) examines whether strategic industries in connector economies disproportionately absorb Chinese FDI as barriers intensify.

5.4 Timing Heterogeneity: Post–US–China Trade War

We next examine whether the impact of trade policy shocks on Chinese outbound FDI changed following the escalation of the US–China trade war in mid-2018. July 2018 marks the introduction of large-scale tariff measures between the two countries, representing a salient shift in the trade policy environment facing Chinese firms. To capture potential differences across periods, we define $\text{War}_t \in \{0, 1\}$, which equals one if period t falls after July 2018, and zero otherwise. We then extend our baseline by interacting policy shocks with War_t:

$$
\begin{aligned}
\log\left(\mathrm{FDI}_{s,d,i,t}\right) = & \sum_{l \in L} \beta_l \, NS^{l}_{s,i,t-1} \\
& + \gamma_1 \, NS^{\text{export}}_{s,i,t-1} \times \text{War}_t + \gamma_2 \, NS^{\text{import}}_{s,i,t-1} \times \text{War}_t \\
& + \delta_{d,i} + \delta_{d,t} + \varepsilon_{s,d,i,t} \, .
\end{aligned}
\tag{8}
$$

The coefficients γ_1 and γ_2 capture whether the marginal effects of export and import barriers became systematically stronger or weaker after the onset of the trade war relative to the pre-2018 period, serving as a test for **Hypothesis 4**.

Timing heterogeneity and destination policies. To ensure that our results are not confounded by contemporaneous shifts in the broader policy environment of destination economies, we additionally control for destination-specific trade measures. Specifically, we include the cumulative number of

policies targeting each destination–industry pair:

$$
\begin{aligned}
\log\left(\mathrm{FDI}_{s,d,i,t}\right) = & \sum_{l \in L} \beta_l \, NS^{l}_{s,i,t-1} \\
& + \gamma_1 \, NS^{\text{export}}_{s,i,t-1} \times \mathrm{War}_t + \gamma_2 \, NS^{\text{import}}_{s,i,t-1} \times \mathrm{War}_t \\
& + \sum_{l \in L} \theta_l \, NS^{l}_{d,i,t-1} + \delta_{d,i} + \delta_{d,t} + \varepsilon_{s,d,i,t} \, .
\end{aligned} \tag{9}
$$

Timing heterogeneity, connector economies, and destination policies. Finally, we test whether the post-2018 amplification is especially pronounced in connector economies, which serve as key relocation hubs for Chinese firms. We exploit the following equation (10) by including three-way interactions:

$$
\begin{aligned}
\log\left(\mathrm{FDI}_{s,d,i,t}\right) = & \sum_{l \in L} \beta_l \, NS^{l}_{s,i,t-1} \\
& + \gamma_1 \, NS^{\text{export}}_{s,i,t-1} \times \mathrm{War}_t + \gamma_2 \, NS^{\text{import}}_{s,i,t-1} \times \mathrm{War}_t \\
& + \gamma_3 \, NS^{\text{export}}_{s,i,t-1} \times \mathrm{War}_t \times \mathrm{Connector}_d \\
& + \gamma_4 \, NS^{\text{import}}_{s,i,t-1} \times \mathrm{War}_t \times \mathrm{Connector}_d \\
& + \sum_{l \in L} \theta_l \, NS^{l}_{d,i,t-1} + \delta_{d,i} + \delta_{d,t} + \varepsilon_{s,d,i,t} \, .
\end{aligned} \tag{10}
$$

The coefficients γ_3 and γ_4 identify whether Chinese firms disproportionately redirected FDI toward connector economies in response to trade barriers after the escalation of the US–China trade war.

5.5 Causal Inference Framework: The Role of Export Barriers on Chinese Outward FDI Flows

Given the increasing prominence of export barriers, particularly following the escalation of US-China trade tensions since 2018, and considering that many industries were first affected by export barriers after 2018 based on available data in the GTA database, we estimate the impact of export barriers on China's outward FDI in this section. We employ the following staggered difference-in-differences (DiD) specification to account for variation in the timing of rest-of-world export barriers affecting China across four-digit industries:

$$
\log\left(FDI_{s,d,i,y}\right) = \beta DS^{ExportBarriers}_{s,i,y} + \delta_{d,i} + \delta_{d,y} + \varepsilon_{s,d,i,y} \tag{11}
$$

Here, $\log(\text{FDI}_{s,d,i,y})$ is the natural logarithm of the FDI value from source country s (China, in our context) to destination d in industry i at year y. Our treatment indicator, $DS_{s,i,y}^{ExportBarriers}$, is defined as an *absorbing* dummy that switches to one when industry i in source country s is first targeted by an export barrier and remains one in all subsequent years in which at least one such measure is in force. Industries that eventually experience export barriers constitute the treatment group (entering treated status at the time of first exposure), whereas industries that are never subject to export barriers throughout the sample period serve as the control group. The terms $\delta_{d,i}$ denote destination–industry fixed effects, and $\delta_{d,y}$ denote destination-year fixed effects that absorb that absorb contemporaneous shocks or policy interventions at the host–country level; in particular, they account for other trade or investment policies affecting destination economies in a given year. The parameter of interest, β, captures the average treatment effect of export barriers on Chinese outward FDI flows. A positive and significant estimate of β would indicate that the imposition of export barriers systematically pushes Chinese investment abroad in the affected industries.

Dynamic Treatment Effects and Parallel Trends. While the baseline specification in Equation (11) adopts a conventional two-way fixed effects (TWFE) framework, recent methodological studies have raised concerns about its validity in staggered treatment settings. Specifically, the standard TWFE estimator may yield biased estimates when treatment effects are heterogeneous across groups or over time, as it implicitly uses already-treated units as controls for not-yet-treated units. This can distort the estimated average treatment effect when treatment timing varies across groups (De Chaisemartin and d'Haultfoeuille, 2020; Sun and Abraham, 2021; Goodman-Bacon, 2021; Callaway and Sant'Anna, 2021). To address these identification concerns, we complement our TWFE estimates with dynamic treatment effects following the approach of Callaway and Sant'Anna (2021). Using this estimator, we compare each treatment cohort only to units that are never treated. Our identification relies on the parallel trends assumption: in the absence of export barriers, treated industries would have followed the same trajectory of outward FDI as never-treated industries. To assess this assumption and capture potential dynamic adjustments, we follow Callaway and Sant'Anna (2021) in estimating an event study specification over the window from five years prior to five years after the first exposure.

Specifically, we estimate whether Chinese outward FDI differs between industries exposed to export controls and those that are not, following Callaway and Sant'Anna (2021) and using log FDI at the recipient country–industry–year level. Consistent with **Hypotheses 5** and **6**, we expect no differential pre-trends but larger post-policy FDI outflows in affected industries. We examine a five-year window

before and after policy implementation.

5.6 Causal Inference Framework: The Role of Export Barriers on Host Economies' Import Structure

To assess the trade implications of export control–induced Chinese outward FDI, we examine whether investment inflows into host economies are associated with systematic changes in the composition and sophistication of their imports at the industry level. We combine bilateral trade data at the six-digit Harmonized System (HS) level with industry concordances to construct measures of import structure for each destination country–industry–year observation. Products are classified into capital, intermediate, and consumption categories using the Broad Economic Categories (BEC) classification, allowing us to track shifts in the supply chain stage composition of imports.

We first analyze whether industries that receive Chinese FDI following export control shocks exhibit differential trends in the shares of capital and intermediate goods imports relative to consumption goods. Increases in capital and intermediate import shares are consistent with production relocation, as they reflect rising demand for production inputs rather than final consumption (**Hypothesis 7**). Conversely, increases in consumption goods shares would be consistent with host economies serving primarily as trade intermediaries or rerouting hubs rather than production sites. We estimate these compositional changes by showing the dynamic causal effects of the export controls on FDI-receiving industries, again following Callaway and Sant'Anna (2021), in five years prior and five years after the imposition of such measures.

To further capture changes in the quality and strategic content of imports, we construct a trade volume index weighted by product centrality. This measure reflects the structural importance of imported goods within global production networks, assigning greater weight to inputs that occupy more central positions in supply chains. We then examine whether industries receiving export control–induced Chinese FDI experience differential increases in this index, also showing the dynamic causal effects since the first time when such a policy hit a given industry (**Hypothesis 8**).

6 Results

6.1 Impact of Export Controls on Chinese OFDI

To begin with, we estimate the baseline (Column 1) and do the robustness check (Column 2). Column 1 of Table 2 shows that import barriers targeting China significantly reduce Chinese outward FDI, with

the coefficient negative and highly significant, while export barriers are negative but not statistically significant. Green (liberalizing) measures, on the contrary, are positive and significant, suggesting that such policies stimulate investment flows. When we include destination–industry policy controls in column 2, the results strengthen: the coefficient of export barriers becomes negative and statistically significant, indicating that once host-country policies are netted out, export restrictions systematically depress Chinese FDI. Import barriers remain negative and highly significant, while green measures continue to show a positive effect. Other categories of policies remain insignificant, and the destination-policy variables themselves are not statistically significant, consistent with destination–year fixed effects absorbing most of the host-country environment. Overall, the results suggest that protectionist measures, particularly import and export barriers, reduce Chinese outward FDI, whereas liberalizing policies facilitate it. Despite seeming to contradict **Hypothesis 1**, the results differ when focusing on connector economies next.

We test whether specific connector economies disproportionately absorb Chinese FDI when trade barriers rise, shown in Table 3. Column 1 of Table 3 shows that import barriers continue to exert a negative and significant effect on Chinese outward FDI on average, while export barriers are negative but insignificant. Liberalizing (green) measures remain positive and significant. The positive and significant coefficient on the interaction between import barriers and the connector-economy dummy indicates that, relative to non-connector economies, Chinese firms are more likely to invest in connector economies when import barriers rise. This relationship remains robust in column 2 of Table 3 after controlling for trade restrictions affecting China's FDI destinations. Moreover, column 2 also shows that the interaction between export barriers and the connector-economy dummy is positive and significant, suggesting that Chinese firms redirect their FDI toward connector economies when facing export restrictions as well. Taken together, these results are consistent with **Hypothesis 3**, and provide evidence that trade barriers, while discouraging Chinese outward FDI on average, simultaneously encourage firms to reallocate investment toward connector economies that offer alternative access to foreign markets. This pattern supports the "tariff-jumping" interpretation and aligns with growing evidence that Chinese companies increasingly invest in intermediary countries to sustain global market access (Lopez and Vázquez, 2023; Gopinath et al., 2025). Building on this literature, our study further clarifies which types of trade restrictions are most likely to prompt such FDI redirection. In column 3, we further disaggregates by individual countries of connector economy. The results show particularly strong positive interaction effects for Indonesia and Vietnam in the case of import barriers, and for Indonesia and Morocco in the case of export barriers, consistent with these economies acting as key relocation hubs under rising trade

tensions. By contrast, the coefficients for Mexico and Poland are small and insignificant, suggesting heterogeneous roles among connector economies. Overall, these results demonstrate that while trade barriers generally depress Chinese outward FDI, their adverse effects are mitigated or even reversed when the host country functions as a connector economy. In other words, connector economies provide Chinese firms with alternative channels to sustain international production and market access under protectionist pressure, with Indonesia and Morocco emerging as particularly important strategic destinations.

TABLE 2: Baseline and Robustness Check Results

	Dependent variable: $\log(\text{FDI}_{s,d,i,t})$	
	(1)	(2)
$\text{ExportBarriers}_{s,i,t-1}$	-0.000987	-0.00198**
	(0.000664)	(0.000969)
$\text{ImportBarriers}_{s,i,t-1}$	-0.000613***	-0.000729***
	(0.000191)	(0.000233)
$\text{OtherRed}_{s,i,t-1}$	0.0000490	-0.0000520
	(0.000314)	(0.000170)
$\text{Amber}_{s,i,t-1}$	-0.0000558	0.0000899
	(0.000170)	(0.000310)
$\text{Green}_{s,i,t-1}$	0.000993***	0.00116**
	(0.000313)	(0.000514)
$\text{ExportBarriers}_{d,i,t-1}$		0.00179
		(0.00209)
$\text{ImportBarriers}_{d,i,t-1}$		0.000305
		(0.000280)
$\text{OtherRed}_{d,i,t-1}$		0.0000910
		(0.000174)
$\text{Amber}_{d,i,t-1}$		-0.000281
		(0.000293)
$\text{Green}_{d,i,t-1}$		-0.000302
		(0.000367)
Constant	2.195***	2.214***
	(0.0584)	(0.0567)
Destination-industry FEs	Yes	Yes
Destination-year-month FEs	Yes	Yes
Destination Policy Control	No	Yes
Observations	4,482	4,482

Notes: *** denotes statistical significance at 1% level, ** 5% level, and * 10% level. Robust standard errors are shown in the parentheses.

TABLE 3: Heterogeneity: Connector and Country-Specific Effects

	Dependent variable: $\log(\text{FDI}_{s,d,i,t})$		
	(1)	(2)	(3)
$\text{ExportBarriers}_{s,i,t-1}$	-0.00117	-0.00388***	-0.00397***
	(0.000786)	(0.00112)	(0.00116)
$\text{ImportBarriers}_{s,i,t-1}$	-0.000921***	-0.000965***	-0.00100***
	(0.000194)	(0.000215)	(0.000225)
$\text{OtherRed}_{s,i,t-1}$	0.0000134	-0.000121	-0.000123
	(0.0000259)	(0.000164)	(0.000169)
$\text{Amber}_{s,i,t-1}$	0.000165	0.000218	0.000194
	(0.000166)	(0.000322)	(0.000444)
$\text{Green}_{s,i,t-1}$	0.00107***	0.00142***	0.00155***
	(0.000324)	(0.000521)	(0.000554)
Export $\text{Barriers}_{s,i,t-1} \times \text{Connector}_d$	0.000764	0.00200***	
	(0.000632)	(0.000765)	
Import $\text{Barriers}_{s,i,t-1} \times \text{Connector}_d$	0.000427***	0.000771***	
	(0.000158)	(0.000206)	
Export $\text{Barriers}_{s,i,t-1} \times \text{POL}_d$			–
Import $\text{Barriers}_{s,i,t-1} \times \text{POL}_d$			0.494***
			(0.151)
Export $\text{Barriers}_{s,i,t-1} \times \text{MEX}_d$			0.00129
			(0.00128)
Import $\text{Barriers}_{s,i,t-1} \times \text{MEX}_d$			0.00108
			(0.00155)
Export $\text{Barriers}_{s,i,t-1} \times \text{MAR}_d$			0.0703***
			(0.0246)
Import $\text{Barriers}_{s,i,t-1} \times \text{MAR}_d$			-0.000941
			(0.000582)
Export $\text{Barriers}_{s,i,t-1} \times \text{IDN}_d$			0.00309***
			(0.000994)
Import $\text{Barriers}_{s,i,t-1} \times \text{IDN}_d$			0.000748***
			(0.000226)
Export $\text{Barriers}_{s,i,t-1} \times \text{VNM}_d$			-0.00119
			(0.00343)
Import $\text{Barriers}_{s,i,t-1} \times \text{VNM}_d$			0.00108***
			(0.000378)
$\text{ExportBarriers}_{d,i,t-1}$		0.00560**	0.00638**
		(0.00235)	(0.00257)
$\text{ImportBarriers}_{d,i,t-1}$		-0.000599*	-0.000716**
		(0.000317)	(0.000351)
$\text{OtherRed}_{d,i,t-1}$		0.0000964	0.0000552
		(0.000170)	(0.000180)
$\text{Amber}_{d,i,t-1}$		-0.000310	-0.000319
		(0.000310)	(0.000447)
$\text{Green}_{d,i,t-1}$		-0.000300	-0.000272
		(0.000368)	(0.000389)
Constant	2.240***	2.278***	2.110***
	(0.0640)	(0.0580)	(0.0823)
Destination–industry FEs	Yes	Yes	Yes
Destination–year–month FEs	Yes	Yes	Yes
Destination Policy Control	No	Yes	Yes
Observations	4,482	4,482	4,482

Notes: *** denotes statistical significance at 1% level, ** 5% level, and * 10% level. Robust standard errors are shown in the parentheses. POL, MEX, MAR, IDN, and VNM represents the connector economy Poland, Mexico, Morocco, Indonesia, and Vietnam, respectively.

We next investigate whether China's outward FDI reacts more strongly to trade policy shocks in strategic industries (e.g., electronics, machinery, transport equipment) relative to non-strategic sectors. Column 1 of Table 4 shows that export barriers significantly reduce China's outward FDI, with attenuated negative effects in strategic industries, meaning that Chinese outward FDI is relatively larger in strategic industries following export control shocks, while the coefficient on import barriers is small and insignificant. Column 2 introduces destination-specific policy controls as a robustness check. The effect of export barriers remains negative and significant, whereas the interaction of export barriers with strategic industries remains positive, confirming robustness. Column 3 adds three-way interactions with connector economies. The results indicate that it is strategic industries within connector destinations attenuate the average adverse effects: the interaction between import barriers, strategic industries, and connector economies is positive and highly significant, while export barriers in strategic industries are less prohibiting when the host is a connector. Overall, the evidence suggests that while trade barriers tend to reduce China's outward FDI on average, the outward FDI in strategic industries is more resilient, especially into connector economies that act as relocation hubs absorbing investment diverted from more restrictive markets.

Table 5 further examines whether China's outward FDI responds differently to trade policy shocks after the escalation of the US–China trade war in mid-2018. Column 1 shows that import barriers consistently reduce China's outward FDI, while export barriers are insignificant; the interaction terms with the post-war dummy are also insignificant, suggesting no differential effect in the baseline. Column 2 introduces destination-specific policies as a robustness check, and the results for import barriers remain negative and highly significant, confirming robustness, while other coefficients remain small and insignificant. Column 3 further includes three-way interactions with connector economies. Here, the interaction between export barriers and the war dummy turns negative and significant, indicating that the trade war magnified the adverse impact of export restrictions on China's outward FDI. Moreover, the three-way interactions are positive and significant, suggesting that connector economies mitigated these negative war-time effects by absorbing redirected Chinese investment. Overall, the results confirm that while trade barriers, particularly import restrictions, reduce China's outward FDI across periods, the escalation of the US–China trade war amplified the effect of export barriers, consistent with **Hypothesis 4**, with connector economies acting as key buffers.

TABLE 4: Heterogeneity: Strategic and Destination-Specific Effects

	Dependent variable: $\log(\text{FDI}_{s,d,i,t})$		
	(1)	(2)	(3)
$\text{ExportBarriers}_{s,i,t-1}$	-0.00793*	-0.0120**	-0.00791
	(0.00422)	(0.00522)	(0.00544)
$\text{ImportBarriers}_{s,i,t-1}$	-0.000258	-0.000195	0.0000619
	(0.000245)	(0.000249)	(0.000261)
$\text{OtherRed}_{s,i,t-1}$	0.0000423	-0.0000662	-0.000128
	(0.0000318)	(0.000171)	(0.000167)
$\text{Amber}_{s,i,t-1}$	-0.0000704	0.0000877	0.000205
	(0.000170)	(0.000311)	(0.000319)
$\text{Green}_{s,i,t-1}$	0.00102***	0.00128**	0.00154***
	(0.000317)	(0.000551)	(0.000557)
Export $\text{Barriers}_{s,i,t-1} \times \text{Strategic}_i$	0.00696*	0.00988*	0.00417
	(0.00414)	(0.00507)	(0.00536)
Import $\text{Barriers}_{s,i,t-1} \times \text{Strategic}_i$	-0.000371	-0.000632*	-0.00110***
	(0.000245)	(0.000353)	(0.000362)
$\text{ExportBarriers}_{d,i,t-1}$		0.00192	0.00532**
		(0.00208)	(0.00236)
$\text{ImportBarriers}_{d,i,t-1}$		0.000489*	-0.000383
		(0.000252)	(0.000345)
$\text{OtherRed}_{d,i,t-1}$		0.0000916	0.000104
		(0.000177)	(0.000175)
$\text{Amber}_{d,i,t-1}$		-0.000305	-0.000350
		(0.000290)	(0.000303)
$\text{Green}_{d,i,t-1}$		-0.000439	-0.000465
		(0.000405)	(0.000408)
Export $\text{Barriers}_{s,i,t-1} \times \text{Strategic}_i \times \text{Connector}_d$			0.00172**
			(0.000772)
Import $\text{Barriers}_{s,i,t-1} \times \text{Strategic}_i \times \text{Connector}_d$			0.000713***
			(0.000214)
Constant	2.183***	2.199***	2.239***
	(0.0619)	(0.0614)	(0.0623)
Destination–industry FEs	Yes	Yes	Yes
Destination–year–month FEs	Yes	Yes	Yes
Destination Policy Control	No	Yes	Yes
Observations	4,482	4,482	4,482

Notes: *** denotes statistical significance at 1% level, ** 5% level, and * 10% level. Robust standard errors are shown in parentheses. Column (1) corresponds to equation (6): $\log(\text{FDI}_{s,d,i,t}) = \sum_{l \in L} \beta_l \text{NS}^l_{s,i,t-1} + \gamma_1 \text{ExportBarriers}_{s,i,t-1} \times \text{Strategic}_i + \gamma_2 \text{ImportBarriers}_{s,i,t-1} \times \text{Strategic}_i + \sum_{l \in L} \theta_l \text{NS}^l_{d,i,t-1} + \delta_{d,i} + \delta_{d,t} + \varepsilon_{s,d,i,t}$. Column (2) extends this with destination-specific effects. Column (3) corresponds to equation (7) with three-way interactions including Connector_d.

TABLE 5: Timing Heterogeneity and War Effects

	Dependent variable: $\log(\text{FDI}_{s,d,i,t})$		
	(1)	(2)	(3)
$\text{ExportBarriers}_{s,i,t-1}$	0.00680	0.00514	0.0120*
	(0.00585)	(0.00572)	(0.00638)
$\text{ImportBarriers}_{s,i,t-1}$	-0.000643***	-0.000755***	-0.000836***
	(0.000201)	(0.000228)	(0.000232)
$\text{OtherRed}_{s,i,t-1}$	0.0000572*	-0.0000632	-0.000118
	(0.0000321)	(0.000170)	(0.000168)
$\text{Amber}_{s,i,t-1}$	0.0000291	0.000183	0.000316
	(0.000169)	(0.000338)	(0.000349)
$\text{Green}_{s,i,t-1}$	0.000987***	0.00111**	0.00131**
	(0.000312)	(0.000516)	(0.000517)
Export $\text{Barriers}_{s,i,t-1} \times \text{War}_t$	-0.00784	-0.00719	-0.0161**
	(0.00589)	(0.00574)	(0.00644)
Import $\text{Barriers}_{s,i,t-1} \times \text{War}_t$	0.0000321	-0.00000128	-0.0000901
	(0.0000696)	(0.0000727)	(0.0000920)
$\text{ExportBarriers}_{d,i,t-1}$		0.00178	0.00517**
		(0.00214)	(0.00234)
$\text{ImportBarriers}_{d,i,t-1}$		0.000355	-0.0000213
		(0.000298)	(0.000321)
$\text{OtherRed}_{d,i,t-1}$		0.000111	0.0000975
		(0.000174)	(0.000175)
$\text{Amber}_{d,i,t-1}$		-0.000259	-0.000300
		(0.000292)	(0.000297)
$\text{Green}_{d,i,t-1}$		-0.000265	-0.000148
		(0.000374)	(0.000375)
Export $\text{Barriers}_{s,i,t-1} \times \text{War}_t \times \text{Connector}_d$			0.00211***
			(0.000743)
Import $\text{Barriers}_{s,i,t-1} \times \text{War}_t \times \text{Connector}_d$			0.000317***
			(0.000122)
Constant	2.183***	2.203***	2.201***
	(0.0597)	(0.0579)	(0.0569)
Destination–industry FEs	Yes	Yes	Yes
Destination–year–month FEs	Yes	Yes	Yes
Destination Policy Control	No	Yes	Yes
Observations	4,482	4,482	4,482

Notes: *** denotes statistical significance at 1% level, ** 5% level, and * 10% level. Robust standard errors are shown in parentheses. Column (1) corresponds to equation (9): $\log(\text{FDI}_{s,d,i,t}) = \sum_{l \in L} \beta_l \text{NS}^l_{s,i,t-1} + \gamma_1 \text{ExportBarriers}_{s,i,t-1} \times \text{War}_t + \gamma_2 \text{ImportBarriers}_{s,i,t-1} \times \text{War}_t + \sum_{l \in L} \theta_l \text{NS}^l_{d,i,t-1} + \delta_{d,i} + \delta_{d,t} + \varepsilon_{s,d,i,t}$. Column (2) extends this with destination-specific effects. Column (3) corresponds to equation (10) with three-way interactions including $\text{War}_t \times \text{Connector}_d$.

Motivated by the rising salience of export barriers in the aftermath of the US–China trade war, and the fact that many Chinese industries first became subject to such measures after 2018 according to GTA data, we then assess how these barriers have shaped China's outward FDI in a causal inference framework. Columns (1) and (2) of Table 6 report the baseline staggered DiD estimates of the effect of export barriers on Chinese outward FDI. The treatment coefficient is positive and highly statistically significant across both specifications. In column (1), which includes destination–industry fixed effects, the estimated coefficient of 0.694 implies that, once an industry is first exposed to export barriers, Chinese FDI stock in that destination–industry pair increases by roughly 69 percent relative to the pre-treatment baseline. The magnitude remains large and significant in column (2), at 0.603, when we additionally control for destination–year fixed effects to account for host-country shocks and policies. These results provide strong evidence that the imposition of export barriers systematically pushes Chinese firms to expand investment abroad, consistent with the interpretation of export restrictions as a "push factor" accelerating offshoring.

TABLE 6: Export Barriers and Chinese Outward FDI: Staggered DiD Results

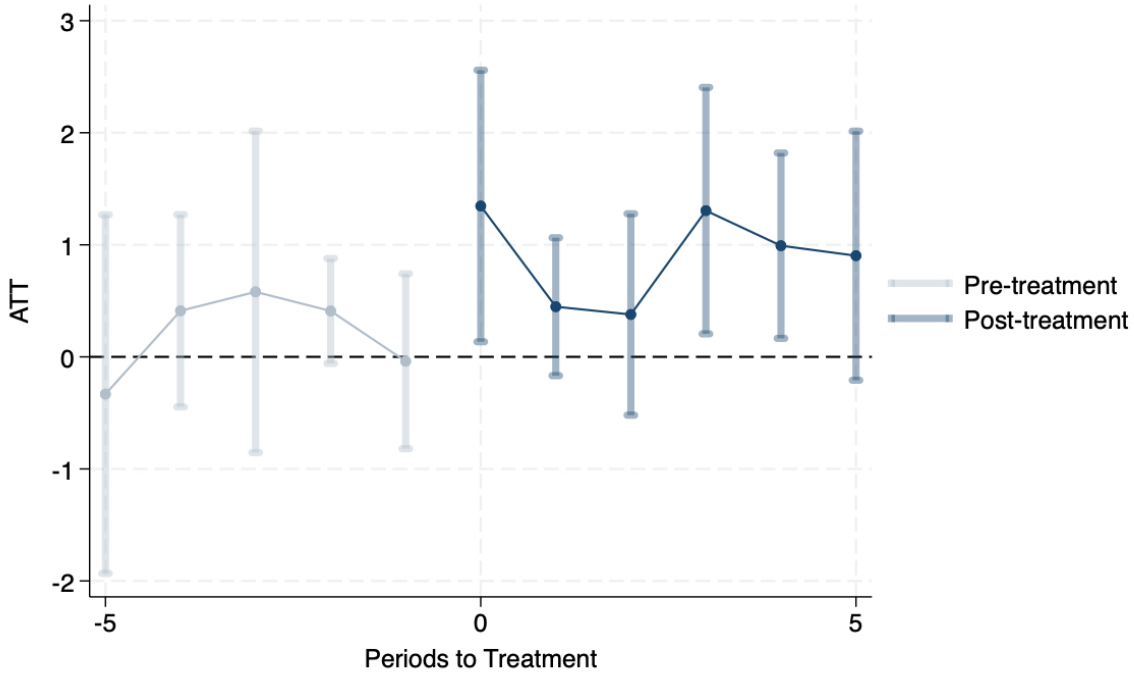
	Dependent variable: $\log(\text{FDI}_{s,d,i,t})$	
	(1)	(2)
$DS_{s,i,t}^{\text{Export Barriers}}$	0.6947***	0.6031***
	(0.2243)	(0.1831)
Constant	2.6034***	2.6599***
	(0.0186)	(0.0148)
Destination–industry FEs	Yes	Yes
Destination–year FEs	No	Yes
Year FEs	Yes	No
Clusters	1,025	941
Observations	3,655	3,359

Notes: *** denotes statistical significance at 1% level. Robust standard errors clustered at the destination-industry level are shown in parentheses. The dependent variable is the logarithm of Chinese outward FDI stock. $DS_{s,i,t}^{\text{Export Barriers}}$ is an absorbing treatment indicator that equals one from the period when industry i in source country s first faces an export barrier and remains unity while at least one such measure persists. Column (1) includes destination-industry fixed effects, while column (2) adds destination-year fixed effects. The specification corresponds to equation (11): $\log(FDI_{s,d,i,t}) = \beta DS_{s,i,t}^{\text{Export Barriers}} + \delta_{d,i} + \delta_{d,t} + \varepsilon_{s,d,i,t}$.

The dynamic event-study estimates further corroborate this interpretation. Figure 6 plots the dynamic treatment effects of export barriers on Chinese outward FDI. Pre-treatment coefficients for the five years prior to treatment are statistically indistinguishable from zero, supporting the parallel trends assumption and suggesting that treated and control industries followed comparable trajectories before the

imposition of export barriers. At the time of treatment (T), the estimated effect turns positive, indicating an immediate increase in Chinese FDI once an industry is first hit by export barriers. The effect remains elevated in subsequent years, with notable persistence at $T + 4$ and $T + 5$, where the estimates are again positive and statistically different from zero. Although confidence intervals widen in the later years, the overall pattern suggests that the imposition of export barriers induces not only an immediate but also a sustained increase in Chinese outward FDI, consistent with a durable relocation of investment rather than a short-lived adjustment. These results are consistent with **Hypothesis 5** and **Hypothesis 6**.

FIGURE 6: Dynamic Treatment Effects and Parallel Trends



Notes: Our estimation is based on Section 5.5 and we plot the 95% confidence interval of the estimate. Robust standard errors are clustered at the destination–industry level.

We further examine how the effect of export barriers on China's outward FDI varies across connector economies. Table 7 shows that export barriers generally stimulate Chinese outward FDI, consistent with a reallocation motive when high-tech materials become less accessible domestically. In particular, Chinese FDI increases more sharply in Mexico—given its proximity to the U.S. market—and in Morocco, which provides access to the EU market. Furthermore, Table 8 shows that when strategic sectors face export controls imposed by other countries, Chinese firms are more likely to redirect their investment abroad.

TABLE 7: Export Barriers and Chinese Outward FDI: Heterogeneity by Connector Economy

	Dependent variable: $\log(\text{FDI}_{s,d,i,t})$
	(1)
$DS^{\text{Export Barriers}}_{s,i,t}$	0.5446***
	(0.2048)
$DS^{\text{Export Barriers}}_{s,i,t} \times \text{Vietnam}_d$	0.3605
	(0.6355)
$DS^{\text{Export Barriers}}_{s,i,t} \times \text{Poland}_d$	-3.3987***
	(0.2172)
$DS^{\text{Export Barriers}}_{s,i,t} \times \text{Mexico}_d$	0.7386**
	(0.3727)
$DS^{\text{Export Barriers}}_{s,i,t} \times \text{Morocco}_d$	5.0702***
	(0.2099)
$DS^{\text{Export Barriers}}_{s,i,t} \times \text{Indonesia}_d$	-2.8213***
	(0.5544)
Constant	2.6579***
	(0.0142)
Destination–industry FEs	Yes
Year FEs	Yes
Clusters	1,025
Observations	3,655

Notes: *** denotes statistical significance at 1% level, ** at 5% level. Robust standard errors clustered at the destination-industry level are shown in parentheses. The dependent variable is the logarithm of Chinese outward FDI stock. $DS^{\text{Export Barriers}}_{s,i,t}$ is an absorbing treatment indicator that equals one from the period when industry i in source country s first faces an export barrier and remains unity while at least one such measure persists. The interaction terms capture differential effects for each connector economy relative to the baseline effect. Vietnam, Indonesia, Mexico, Poland, and Morocco are identified as connector economies following Gopinath et al. (2025) and Bloomberg (2023).

TABLE 8: Export Barriers and Chinese Outward FDI: Strategic Industry Heterogeneity

	Dependent variable: $\log(\text{FDI}_{s,d,i,t})$
	(1)
$DS_{s,i,t}^{\text{Export Barriers}}$	0.5810***
	(0.1840)
$DS_{s,i,t}^{\text{Export Barriers}} \times \text{Strategic}_i$	2.4467***
	(0.5527)
Constant	2.6598***
	(0.0148)
Destination–industry FEs	Yes
Year FEs	Yes
Clusters	1,025
Observations	3,655

Notes: *** denotes statistical significance at 1% level. Robust standard errors clustered at the destination-industry level are shown in parentheses. The dependent variable is the logarithm of Chinese outward FDI stock. $DS_{s,i,t}^{\text{Export Barriers}}$ is an absorbing treatment indicator that equals one from the period when industry i in source country s first faces an export barrier. Strategic_i is a dummy variable indicating whether industry i belongs to strategic sectors as defined by the International Monetary Fund (2023). The interaction term captures the differential effect of export barriers on strategic versus non-strategic industries. Standard errors are clustered at the destination-industry level.

6.2 Trade Implications

Finally, we examine whether FDI-receiving industries also experienced statistically significant differences in their import patterns. To do so, we first show that Chinese outward FDI in industries affected by export controls is concentrated almost entirely in manufacturing, whereas FDI in industries not affected by export controls is predominantly in retail (14%) and services (28%) (see Table 9). Further, products associated with industries targeted by export controls on China are already predominantly capital and intermediate goods (see Table 10).

We present the dynamic treatment effects for industries exposed to export controls relative to unaffected industries on host economies' import structure in Figure 7, estimated using an event-study specification with a five-year window before and after policy implementation. The top panels show effects on capital and intermediate import shares, the bottom left panel shows consumption import shares, and the bottom right panel shows the centrality-weighted import volume index. Pre-treatment coefficients are close to zero and statistically insignificant across outcomes, supporting the parallel trends assumption and the validity of our empirical design. Following policy implementation, capital import shares exhibit a positive shift, although not statistically significant at the 95% level, whereas intermediate and

TABLE 9: Sector Distribution by Export Control Status

Sector	Not subject to export control (%)	Subject to export control (%)
Agriculture	4	0
Construction	3	0
Finance	14	0
Manufacturing	16	100
Mining	1	0
Public Admin	0	0
Retail	14	0
Services	28	0
Transport & Utilities	10	0
Wholesale	10	0

TABLE 10: Product Composition Linked to Export-Controlled Industries

BEC Type	Capital	Consumption	Intermediate	Others
Share of products linked to industries subject to export control (%)	67	8	23	2

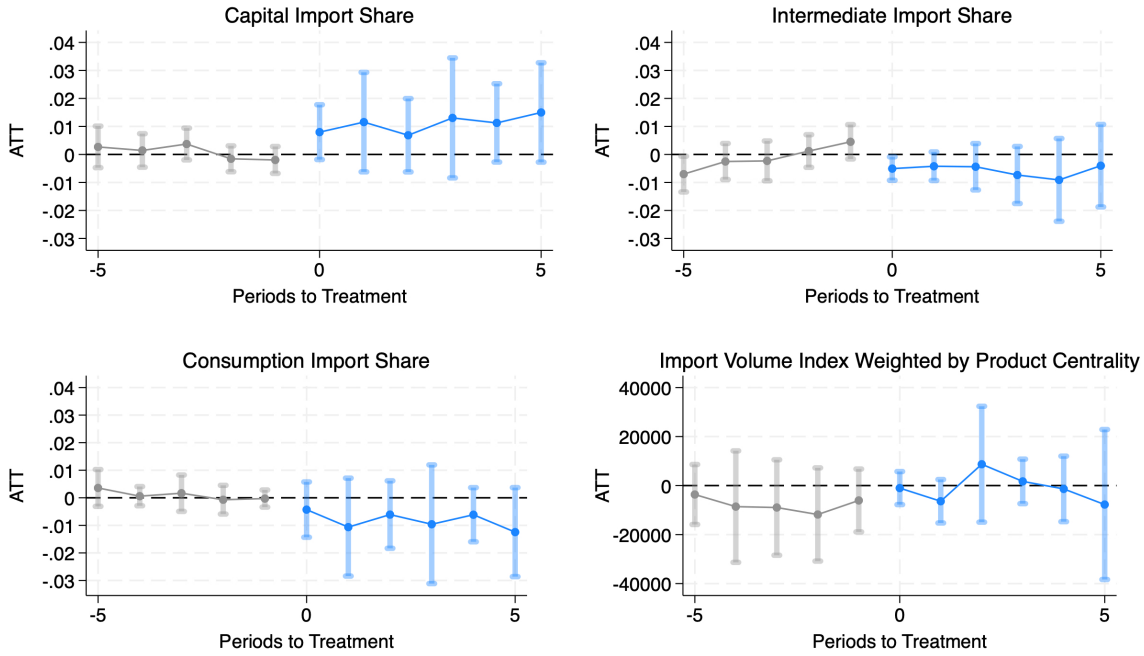
consumption import shares remain relatively stable and, if anything, show slight declines. Meanwhile, the centrality-weighted import index does not display a clear increase. Overall, the post-policy rise in capital import shares in Chinese FDI-receiving industries affected by export controls is consistent with production-oriented adjustments rather than pure trade rerouting.

We then re-estimate changes in host economies' import structures, focusing only on imports from China, as shown in Figure 8. The main difference from the baseline results (Figure 7) is that, when restricting the sample to imports from China, we find a statistically significant increase in the centrality-weighted import index. This again supports the interpretation that export control–induced FDI is associated with changes in host-country import composition consistent with production reallocation. Interestingly, Figure 8 also shows a modest increase in the consumption share. The results we have obtained thus far are consistent with **Hypothesis 7** and **Hypothesis 8**.

Finally, if the shifts towards import of inputs central to production networks truly signal production relocation, we should expect such a shift to be more prominent for imports from China than from the world on average, and such a shift should be more evident for imports of emerging market economies (EMEs) that are Chinese FDI recipients than advanced economies, due to their cost-competitiveness. We confirm these conjectures in Figure 10: the dynamic effects of export controls are more pronounced for associated imports from China (right panel) than world (left panel), and larger for EME FDI recipients,

including ASEAN economies [2], Mexico, and India (top right panel) than top advanced economy FDI recipients[3] (bottom right panel).

FIGURE 7: Dynamic Treatment Effects on Imports from the World

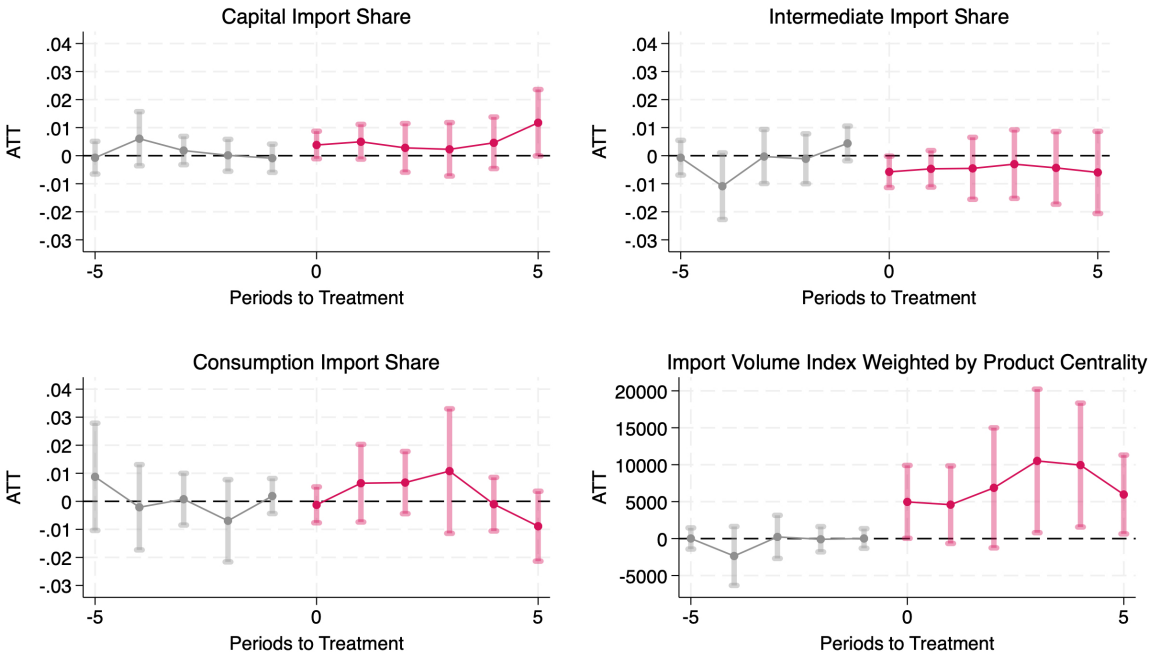


Notes: Dynamic effects of export controls on the composition of imports from world in affected industries across Chinese outward FDI destination countries. Our estimation is based on Section 5.6 and we plot the 95% confidence interval of the estimate. Robust standard errors are clustered at the destination–industry level.

[2]We include the ASEAN-6 economies—Indonesia, Malaysia, Vietnam, Singapore, Thailand, and the Philippines—as they are often cited as key beneficiaries of "China Plus One" supply chain reconfigurations. We additionally include Mexico and India, as they are the top non-ASEAN emerging market economies most targeted by Chinese FDI, measured by their respective number of Chinese FDI-receiving industries where China is hit by export controls.

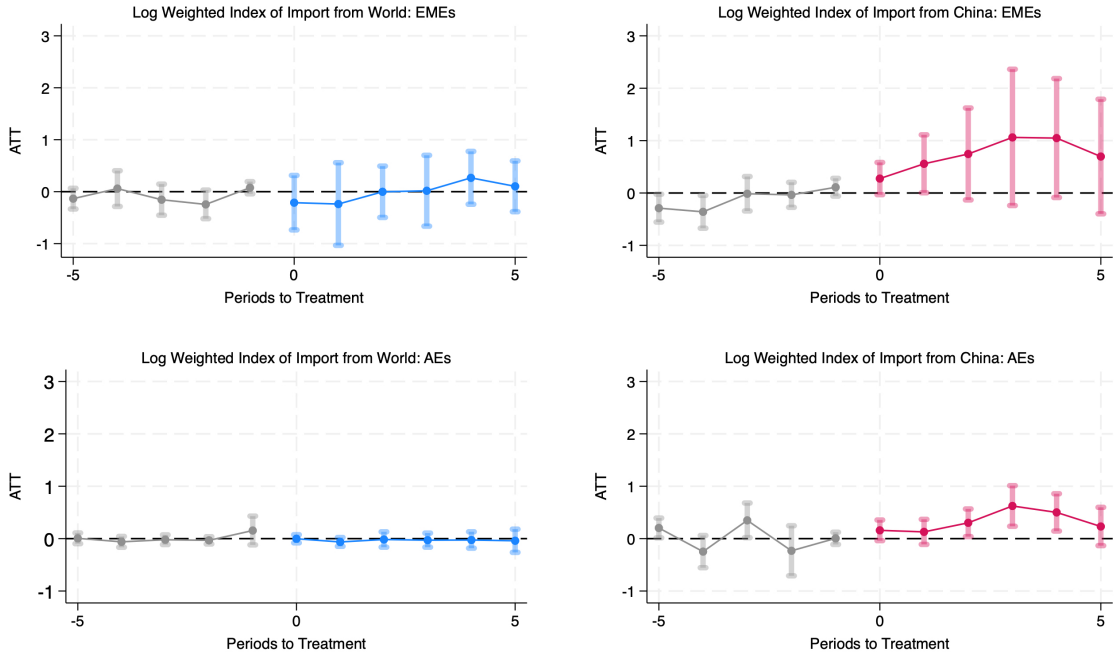
[3]These are top advanced economies most targeted by Chinese FDI, measured by their respective number of Chinese FDI-receiving industries where China is hit by export controls. They include United States, Germany, UK, France, Spain, Italy, Cezch Republic, and Japan.

FIGURE 8: Dynamic Treatment Effects on Imports from China



Notes: Dynamic effects of export controls on the composition of imports from China in affected industries across Chinese outward FDI destination countries. Our estimation is based on Section 5.6 and we plot the 95% confidence interval of the estimate. Robust standard errors are clustered at the destination–industry level.

FIGURE 9: Dynamic Treatment Effects on Log Product Centrality Weighted Import Volume Index by Chinese Outward FDI Destination



Notes: Dynamic effects of export controls on import composition from the world (left) and China (right) in affected industries across emerging markets (top) and advanced economies (bottom) with the highest number of industries receiving Chinese FDI and subject to export controls. Our estimation is based on Section 5.6 and we plot the 95% confidence interval of the estimate. Robust standard errors are clustered at the destination–industry level.

6.3 Mechanism

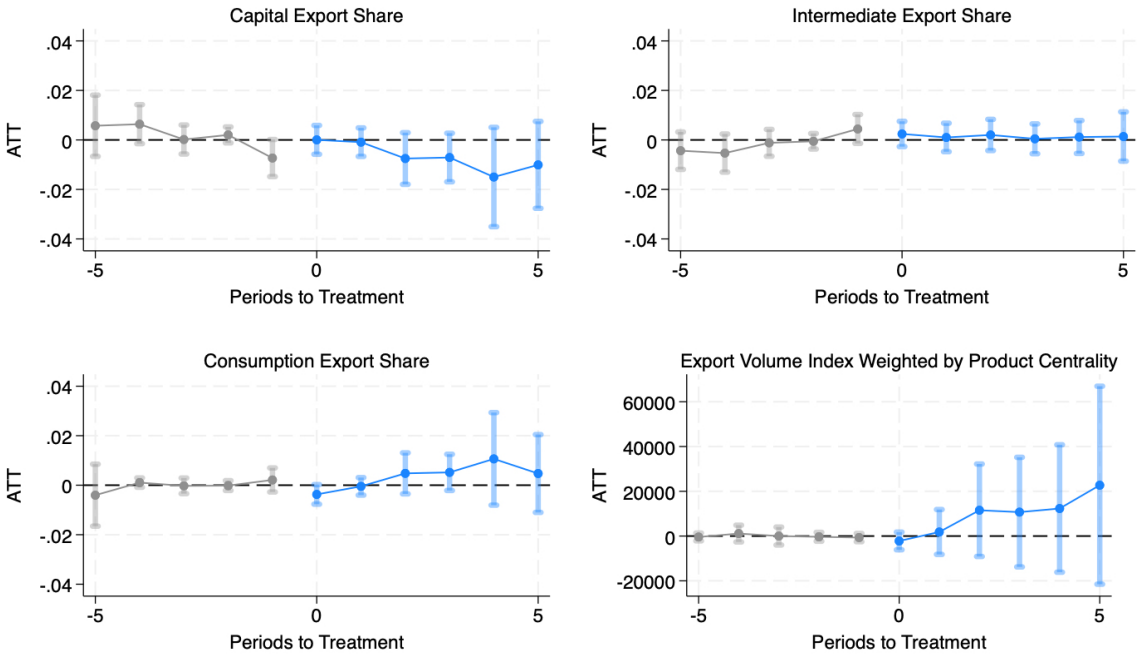
To shed light on the underlying mechanism, we examine how export patterns of host economies evolve following export control–induced Chinese outward FDI. If the observed responses primarily reflect trade rerouting, we would expect to see clear shifts in export composition toward capital goods and reorientation toward specific destination markets such as the United States.

Figure 11 presents dynamic treatment effects on exports to the world. Pre-treatment coefficients are close to zero, supporting the validity of the empirical design. Following treatment, we find no statistically significant increase in the share of capital goods exports, suggesting limited evidence of trade rerouting through host economies in response to export controls. Instead, export shares across capital, intermediate, and consumption goods remain broadly stable.

Figure 12 examines exports to the United States. The estimated effects are generally small and statistically insignificant across all export categories, providing little support for the hypothesis that affected industries reorient exports toward the U.S. market following export controls. This further weakens the interpretation of simple trade diversion as the dominant adjustment channel.

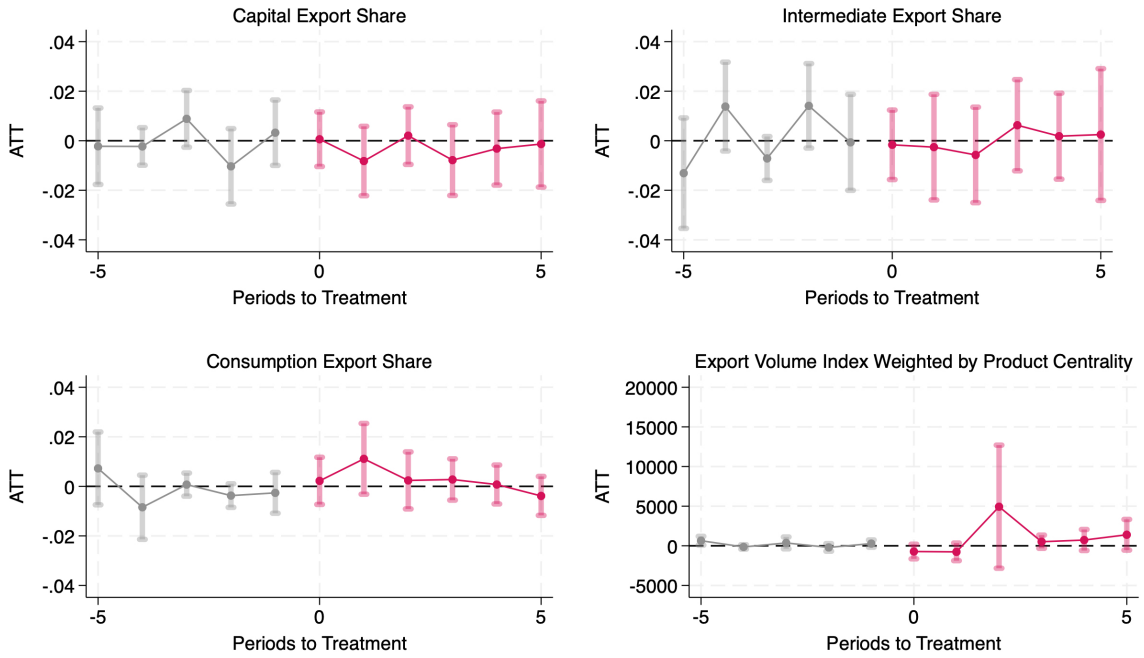
At the same time, the centrality-weighted export volume index for exports to the world increases persistently following treatment, indicating a shift toward products that are more central in global production networks. This pattern is more consistent with deeper integration into global value chains than with simple trade rerouting. We examine changes in host economies' GVC participation more directly in the next section.

FIGURE 10: Dynamic Treatment Effects on Exports to the World



Notes: Dynamic effects of export controls on the composition of exports to the world in affected industries from Chinese outward FDI destination countries. Our estimation is based on Section 5.6 and we plot the 95% confidence interval of the estimate. Robust standard errors are clustered at the destination–industry level.

FIGURE 11: Dynamic Treatment Effects on Exports to the US



Notes: Dynamic effects of export controls on the composition of exports to the US in affected industries from Chinese outward FDI destination countries. Our estimation is based on Section 5.6 and we plot the 95% confidence interval of the estimate. Robust standard errors are clustered at the destination–industry level.

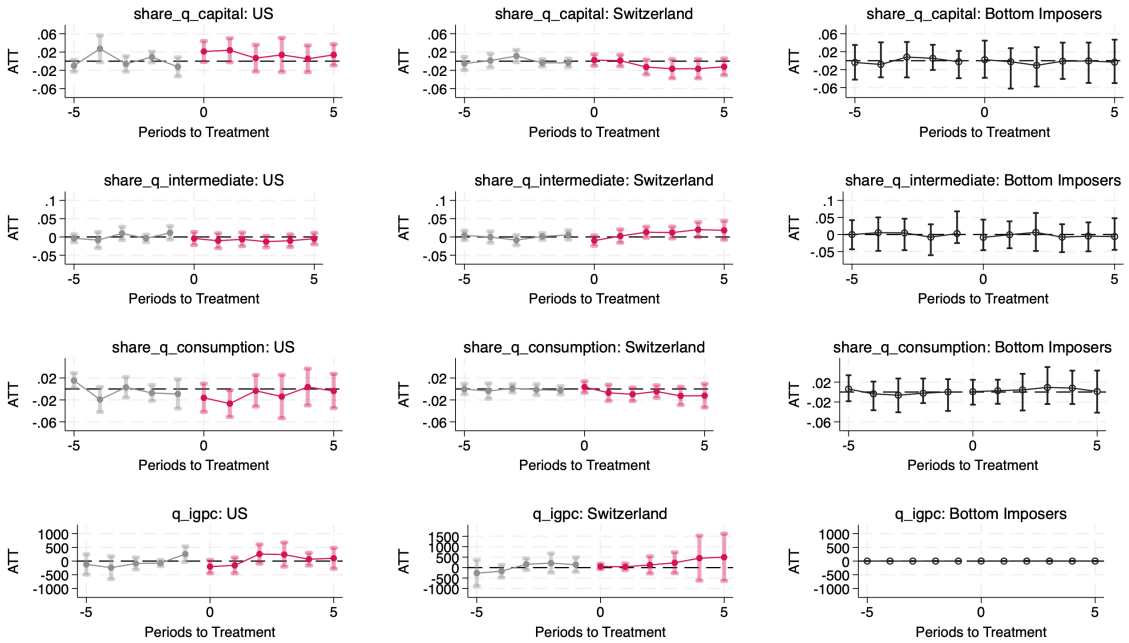
We further examine whether export control–induced adjustments are driven by substitution toward inputs from export control–imposing countries. If export controls restrict access to specific technologies or inputs, we would expect host economies receiving Chinese FDI to increase imports from major imposing countries, particularly the United States.

Figure 13 presents dynamic treatment effects on import composition from three groups of countries: the United States (the top export control imposer), Switzerland (the median imposer), and a group of bottom imposers. It provides suggestive evidence that post-treatment import adjustments are more pronounced for major export-control imposers than for low-imposition countries. In particular, capital import shares from the United States increase modestly following treatment, while the centrality-weighted import volume index rises for imports from both the United States and Switzerland. By contrast, corresponding effects for the bottom-imposer group are largely muted[4]. Although these patterns are estimated imprecisely, they are consistent with the view that export control-induced FDI is associated with greater reliance on inputs sourced from countries that occupy more central positions in affected

[4]As shown in Figure 15 in Appendix B, we plot dynamic treatment effects of imports from the United States and the bottom export control imposer group. The figure shows a clear relative increase in the centrality-weighted import index (q_igpc) for the United States: while US imports are less central than those from bottom imposers prior to treatment, they become more central following treatment, exceeding most bottom imposers and in some cases their upper confidence bounds.

supply chains, rather than from low-imposition economies.

FIGURE 12: Dynamic Treatment Effects of Imports from the US, Switzerland (the Median Export Control Imposer), and the Bottom Export Control Imposer Group



Notes: Dynamic effects of export controls on the composition of imports in affected industries for Chinese outward FDI destination countries. The left column reports results for imports from the United States, the top export control imposer accounting for 18% of total policy–industry counts. The middle column shows imports from Switzerland, the median imposer. The right column presents imports from bottom-imposer group, defined as countries whose combined policy–industry counts equal the bottom 18% of the distribution. For this group, we plot the median point estimates and median 95% confidence intervals across countries, excluding Thailand and Vietnam due to strong intra-regional trade linkages with ASEAN. All estimates are based on the specification in Section 5.6, with standard errors clustered at the destination–industry level.

6.4 Additional Analysis: Effects on GVC Linkages

In this section, we examine how host economies' integration into global value chains evolves over time following export controls affecting Chinese FDI–receiving industries. We consider four measures: forward linkage to the world, forward linkage to China, backward linkage from the world, and backward linkage from China.

We begin by mapping US SIC industry codes to OECD economic activities used in the TiVA dataset. The treatment year is defined as the first year in which the corresponding OECD activity in China is exposed to export controls. Forward and backward linkages with the world are drawn from standard TiVA indicators. We additionally construct China-specific measures. Specifically, we construct forward linkage with China as value added of a country c embodied in the total gross export of industry i of

China, as a share of country c's gross exports [5]. Likewise, backward linkage from China is constructed as value added from China as a share of country c's gross exports in industry i [6].

Figure 14 presents the dynamic effects of export controls targeting China on the global value chain (GVC) linkages of industries in host economies receiving Chinese outward FDI. We distinguish between forward and backward linkages, and between linkages with the world and with China.

Several patterns emerge. First, forward linkages to the world increase steadily following treatment, with positive and persistent effects emerging after two to three periods. In contrast, forward linkages to China exhibit a short-lived increase in the immediate post-treatment periods before dissipating and returning to baseline levels. A similar pattern is observed for backward linkages from China, which rise modestly on impact but decline sharply after several periods.

The short-run increase in both forward and backward linkages with China is consistent with an initial adjustment phase in which production continues to rely on China-centric networks. In particular, it may reflect processing-type activities, whereby host economies import inputs linked to Chinese firms, undertake relatively simple stages of production, and re-export processed goods back to China. Such arrangements are consistent with existing firm-level production structures and the inertia of supply chains immediately following policy shocks.

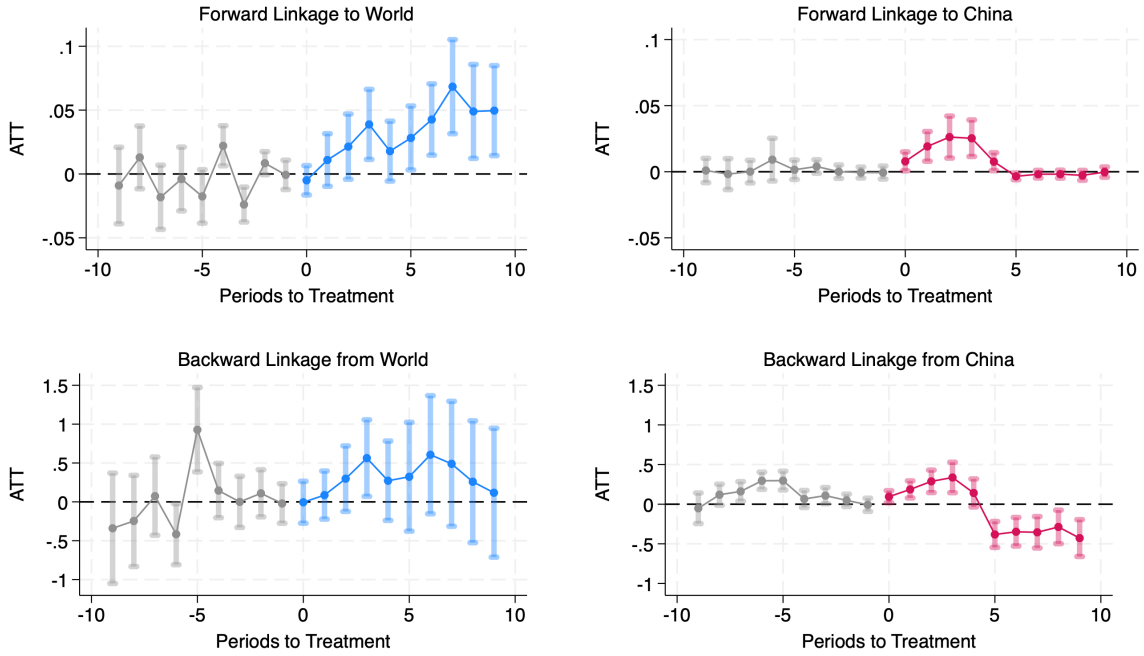
Over time, however, both forward and backward linkages with China decline, while linkages with the rest of the world strengthen. Backward linkages from the world increase in the medium run, indicating substitution toward alternative foreign suppliers, while the sustained rise in forward linkages to the world suggests a reorientation of export markets away from China.

Taken together, these results point to a reconfiguration of GVC participation away from China-centric networks toward more diversified global linkages. The evidence is consistent with a transition from short-run reliance on existing China-linked processing arrangements to longer-run diversification in both sourcing and market orientation. However, Figure 16 shows that the domestic value-added share of exports declines following treatment, suggesting that the observed expansion in production in host economies is disproportionately driven by foreign value added, rather than reflecting broad-based domestic upgrading.

[5] We construct a bilateral variant using EXGRVA data, where the numerator is the value added originating from country c embodied in China's exports, and the denominator is total exports of c: $\text{FL-CHN}_{c,i} = \frac{\text{EXGRVA}_{c,_T,\text{CHN},i}}{\text{EXGR}_{c,_T,W}} \times 100$.

[6] This is again constructed using EXGRVA data, where the numerator is the value added originating from China embodied in country c's exports, and the denominator is total exports: $\text{BL-CHN}_{c,i} = \frac{\text{EXGRVA}_{\text{CHN},_T,c,i}}{\text{EXGR}_{c,i,W}} \times 100$.

FIGURE 13: Dynamic Effects of Export Controls Targeting China on GVC Linkages of Chinese OFDI-Receiving Countries



Notes: Dynamic effects of export controls on global value chain (GVC) linkage measures for affected industries, estimated using the Callaway and Sant'Anna (2021) difference-in-differences estimator with the doubly robust inverse probability weighting (DRIPW) method. Standard errors are clustered at the destination–industry level. The horizontal axis denotes periods relative to the first year of treatment (export control imposition), and the vertical axis reports the average treatment effect on the treated (ATT). Blue (top-left, bottom-left) and pink (top-right, bottom-right) markers indicate post-treatment periods; grey markers indicate pre-treatment periods. The dashed horizontal line denotes zero.

7 Conclusion

Amid rising geopolitical tensions and the increasing use of export controls, this paper examines how trade barriers targeting China reshape firms' outward investment and host-country production structures. We document a surge in Chinese outward FDI alongside a sharp increase in trade restrictions, particularly after 2018, when export controls became more prevalent and concentrated in strategic industries.

Our results show that while trade barriers can depress aggregate Chinese outward FDI, they also redirect investment toward connector economies that provide alternative production platforms and access to global markets. This reallocation is economically meaningful: exploiting staggered exposure across industries, we find that export controls causally increase Chinese outward FDI in affected sectors, with persistent effects over time. These patterns point to production relocation rather than a contraction in cross-border investment.

Turning to host economies, we show that industries receiving export control–induced Chinese FDI

undergo systematic changes in production structure. These industries exhibit increases in capital and production-critical input imports and rising centrality in global production networks. At the same time, they become more integrated into global value chains, with strengthened forward and backward linkages to the world. Notably, linkages with China increase in the short run but decline over time, indicating an initial reliance on China-linked production arrangements followed by a reorientation toward more diversified production networks. Consistent with this, domestic value added shares decline, suggesting that production expansion is disproportionately driven by foreign firms.

Taken together, these findings point to a reconfiguration of global production networks rather than simple trade rerouting. Export controls act not only as trade restrictions but also as shocks to production feasibility, inducing firms to reallocate investment and reorganize supply chains across countries. The resulting adjustments generate cross-border spillovers by reshaping host-country input structures and their integration into global value chains.

Our paper contributes to several strands of literature. First, we extend research on multinational enterprise spillovers by showing how outward FDI from an emerging economy responds to policy shocks and reshapes host-country production. Second, we contribute to the literature on trade and global value chains by documenting that export controls induce production relocation and reconfiguration of value chains, rather than simple trade diversion. Third, we contribute to the growing literature on geoeconomics by providing causal evidence on how export controls—an increasingly prominent policy instrument—affect firm behavior and global production networks.

These findings carry important policy implications. For policymakers imposing export controls, our results suggest that such measures may have unintended consequences by inducing production relocation rather than constraining economic activity in targeted sectors. For host economies, attracting FDI in the context of geopolitical fragmentation may support deeper integration into global value chains, but may also increase reliance on foreign firms and external production networks.

More broadly, our results highlight that trade restrictions in an era of fragmented globalization operate not only through trade flows but also through the reorganization of production. Understanding these adjustment margins is essential for evaluating the effectiveness and global consequences of modern trade policy.

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A Additional Tables

TABLE 11: Top Export Control–Imposing Countries by Policy-Affected Industry Count, 2018-2024

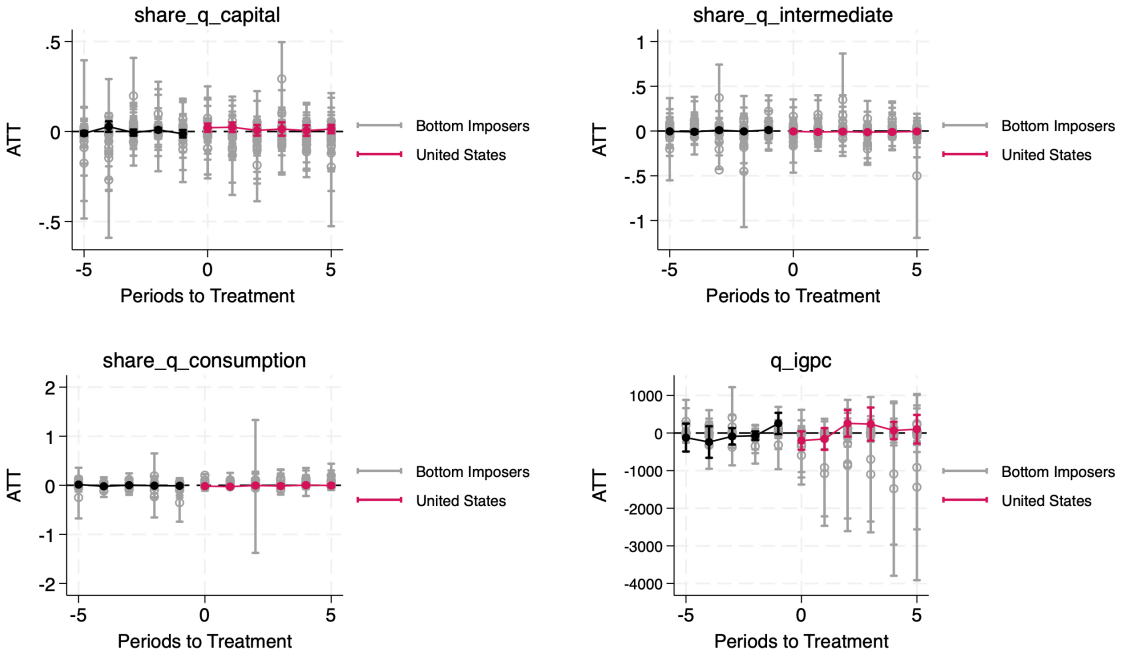
Rank	Country	Most Targeted Industries by Share (%)
1	United States (2,384)	Special-purpose machinery (9.48%), Radio, television and communication equipment (9.40%), Basic chemicals (7.68%), Electrical machinery and apparatus (6.88%), General-purpose machinery (6.71%), Other (59.86%)
2	Russia (742)	Products of agriculture, horticulture and market gardening (22.37%), Coke oven products; refined petroleum; nuclear fuel (9.57%), Meat, fish, fruits, vegetables, oils and fats (8.09%), Basic chemicals (7.95%), Glass and glass products and other non-metallic products n.e.c. (3.64%), Other (48.38%)
3	Argentina (406)	Meat, fish, fruits, vegetables, oils and fats (15.27%), Grain mill products; starches and starch products (7.14%), Products of agriculture, horticulture and market gardening (7.14%), Basic chemicals (6.65%), Other chemical products; man-made fibres (4.19%), Other (59.61%)
4	Germany (320)	Radio, television and communication equipment (8.75%), Special-purpose machinery (8.13%), Basic chemicals (8.13%), Other chemical products; man-made fibres (6.88%), Electrical machinery and apparatus (6.56%), Other (61.56%)
5	Netherlands (319)	Special-purpose machinery (9.72%), Radio, television and communication equipment (9.40%), Basic chemicals (8.15%), Other chemical products; man-made fibres (6.90%), General-purpose machinery (6.58%), Other (59.25%)

TABLE 12: Top Export Control–Imposing Countries by Policy-Affected Industry Count, 2013-2017

Rank	Country	Most Targeted Industries by Share (%)
1	Indonesia (110)	Products of wood, cork, straw and plaiting materials (14.55%), Metal ores (11.82%), Basic chemicals (10.91%), Basic metals (8.18%), Coke oven products; refined petroleum; nuclear fuel (6.36%), Other (48.18%)
2	Malaysia (75)	Meat, fish, fruits, vegetables, oils and fats (18.67%), Products of agriculture, horticulture and market gardening (12.00%), Products of wood, cork, straw and plaiting materials (10.67%), Forestry and logging products (8.00%), Furniture; other transportable goods n.e.c. (6.67%), Other (44.00%)
3	India (40)	Metal ores (15.00%), Grain mill products; starches and starch products (10.00%), Meat, fish, fruits, vegetables, oils and fats (10.00%), Products of agriculture, horticulture and market gardening (10.00%), Yarn and thread; woven and tufted textile fabrics (7.50%), Other (47.50%)
4	Venezuela (40)	Grain mill products; starches and starch products (15.00%), Products of agriculture, horticulture and market gardening (12.50%), Meat, fish, fruits, vegetables, oils and fats (10.00%), Dairy products and egg products (7.50%), Other chemical products; man-made fibres (7.50%), Other (47.50%)
5	Argentina (22)	Meat, fish, fruits, vegetables, oils and fats (31.82%), Live animals and animal products (excluding meat) (13.64%), Other chemical products; man-made fibres (13.64%), Grain mill products; starches and starch products (9.09%), Leather and leather products; footwear (9.09%), Other (22.73%)

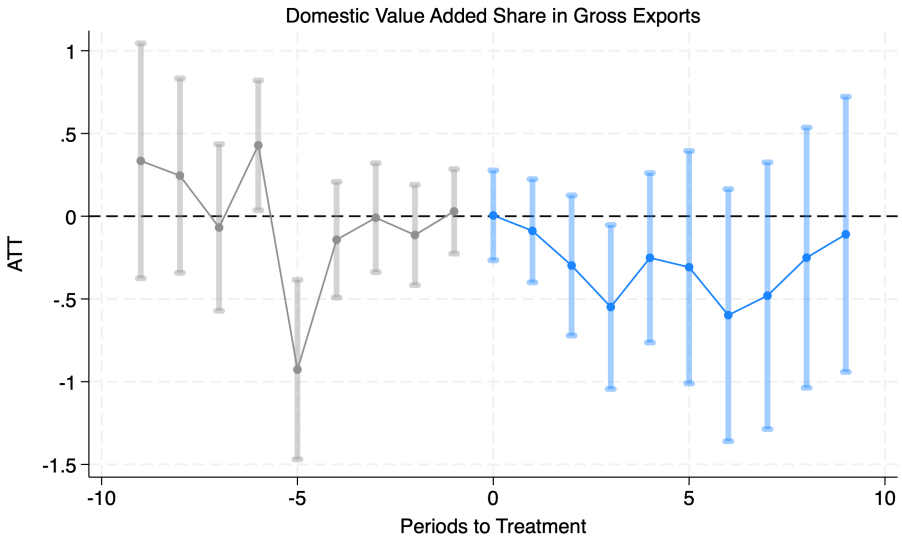
B Additional Figures

FIGURE 14: Dynamic Treatment Effects of Imports from the US and the Bottom Export Control Imposers



Notes: Dynamic effects of export controls on the composition of imports in affected industries for Chinese outward FDI destination countries. Dynamic effects of imports from the United States, the top export control imposer accounting for 18% of total policy–industry counts, are shown in red. The dynamic effects of imports from bottom-imposer group, defined as countries whose combined policy–industry counts equal the bottom 18% of the distribution, are shown in grey. For this group, we plot the point estimates and 95% confidence intervals for each country, excluding Thailand and Vietnam due to strong intra-regional trade linkages with ASEAN. All estimates are based on the specification in Section 5.6, with standard errors clustered at the destination–industry level.

FIGURE 15: Dynamic Effects of Export Controls Targeting China on Domestic Value-Added Share of Exports in Chinese OFDI-Receiving Countries



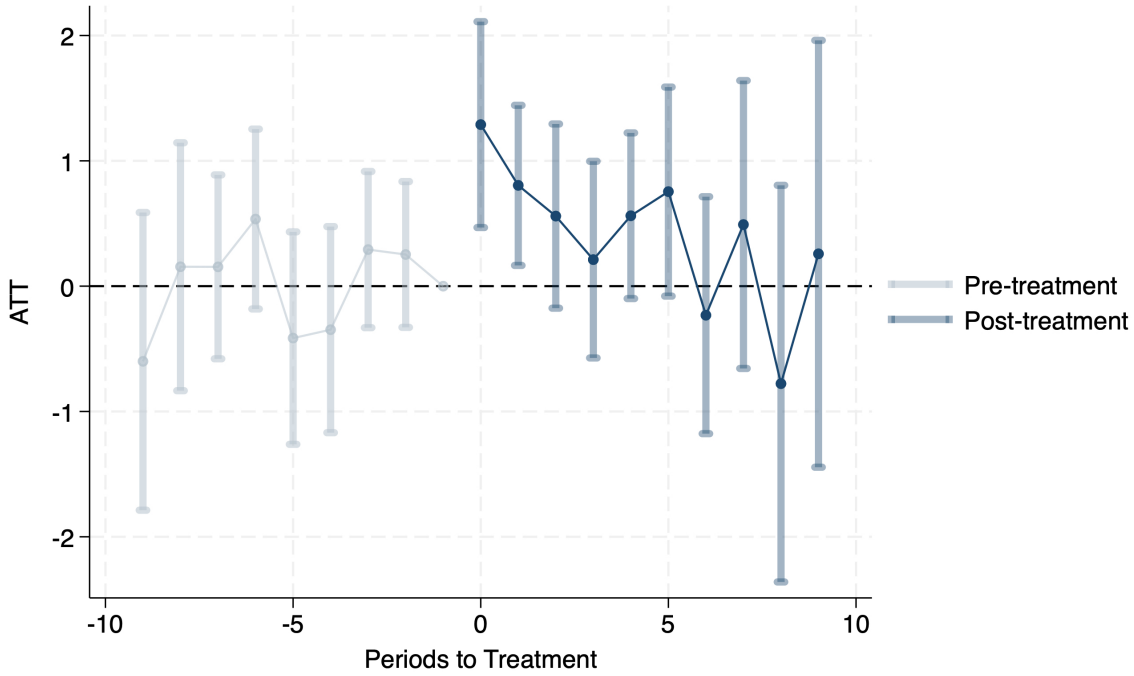
Notes: This figure reports dynamic treatment effects of export controls on the domestic value-added share of gross exports (EXGR_DVASH) for affected industries. Estimates are obtained using the Callaway and Sant'Anna (2021) difference-in-differences estimator with the doubly robust inverse probability weighting (DRIPW) method. Standard errors are clustered at the destination–industry level. The horizontal axis denotes periods relative to the first year of treatment (export control imposition), and the vertical axis reports the average treatment effect on the treated (ATT). Blue markers indicate post-treatment periods, while grey markers indicate pre-treatment periods. The dashed horizontal line denotes zero.

C Robustness Checks: Alternative Estimators

In this section, we assess the robustness of our main results using alternative estimators.

C.1 Effects on Chinese OFDI

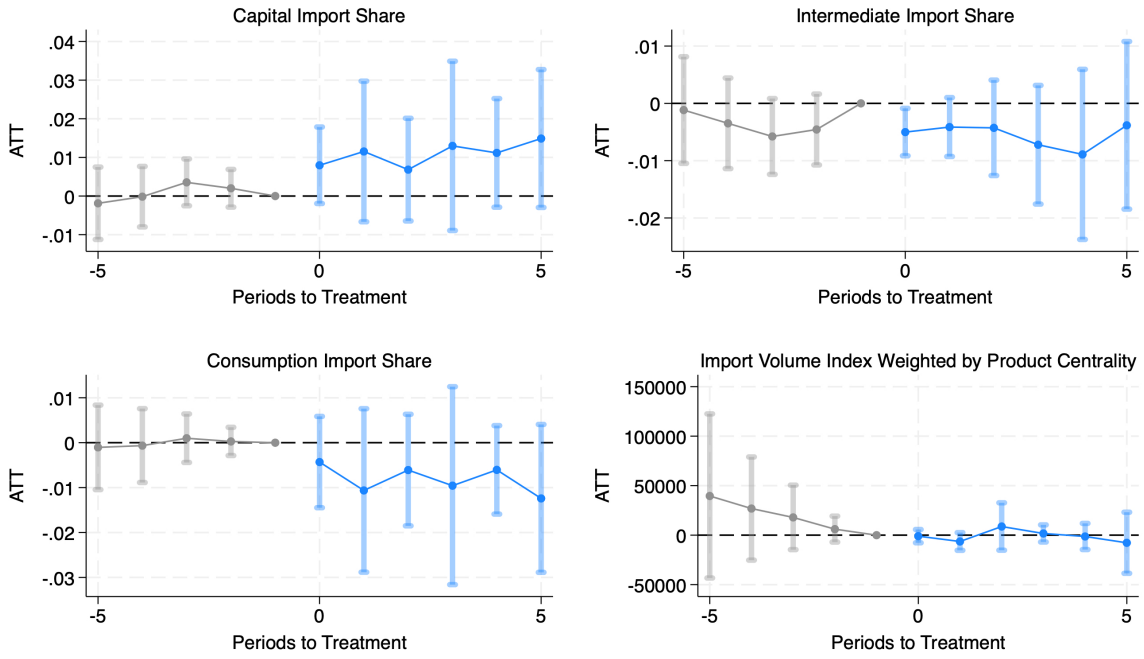
FIGURE 16: Dynamic Treatment Effects of Export Controls on Chinese OFDI



Notes: Dynamic effects of export controls on Chinese outward FDI for affected industries, estimated using the Wooldridge (2025) difference-in-differences estimator. The estimator is based on a pooled regression with cohort-time interaction terms, using never-treated units as the comparison group. Standard errors are clustered at the destination–industry level. The horizontal axis denotes periods relative to the first year of treatment (export control imposition), and the vertical axis reports the average treatment effect on the treated (ATT). Post-treatment markers are shown in navy and pre-treatment markers in light navy. The dashed horizontal line denotes zero.

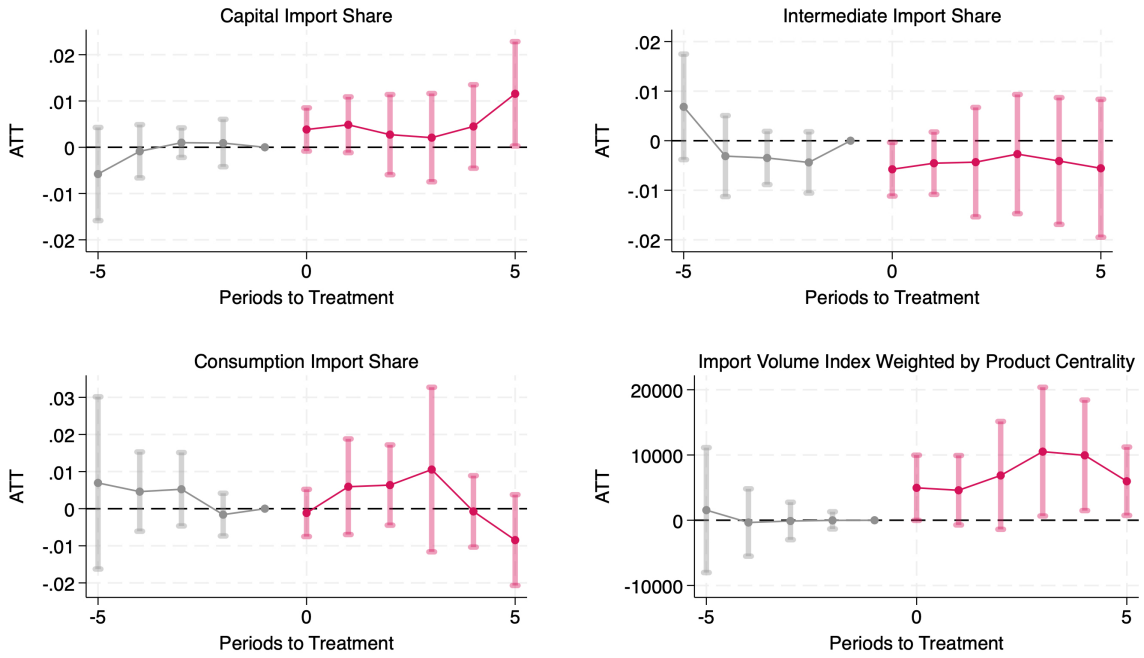
C.2 Effects on Host Economies' Import Structure

FIGURE 17: Dynamic Treatment Effects on Imports from World



Notes: Dynamic effects of export controls on import from the world by host economies for affected industries, estimated using the Wooldridge (2025) difference-in-differences estimator. The estimator is based on a pooled regression with cohort-time interaction terms, using never-treated units as the comparison group. Standard errors are clustered at the destination–industry level. The horizontal axis denotes periods relative to the first year of treatment (export control imposition), and the vertical axis reports the average treatment effect on the treated (ATT). Post-treatment markers are shown in blue and pre-treatment markers in light gray. The dashed horizontal line denotes zero.

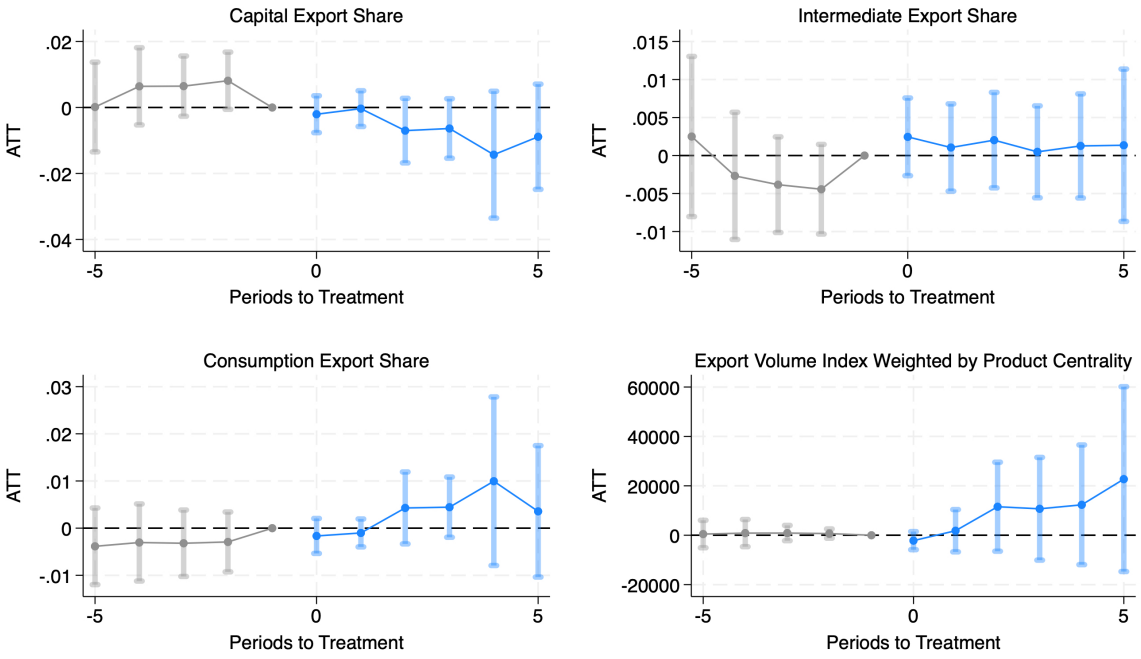
FIGURE 18: Dynamic Treatment Effects on Imports from China



Notes: Dynamic effects of export controls on import from China by host economies for affected industries, estimated using the Wooldridge (2025) difference-in-differences estimator. The estimator is based on a pooled regression with cohort-time interaction terms, using never-treated units as the comparison group. Standard errors are clustered at the destination–industry level. The horizontal axis denotes periods relative to the first year of treatment (export control imposition), and the vertical axis reports the average treatment effect on the treated (ATT). Post-treatment markers are shown in red and pre-treatment markers in light gray. The dashed horizontal line denotes zero.

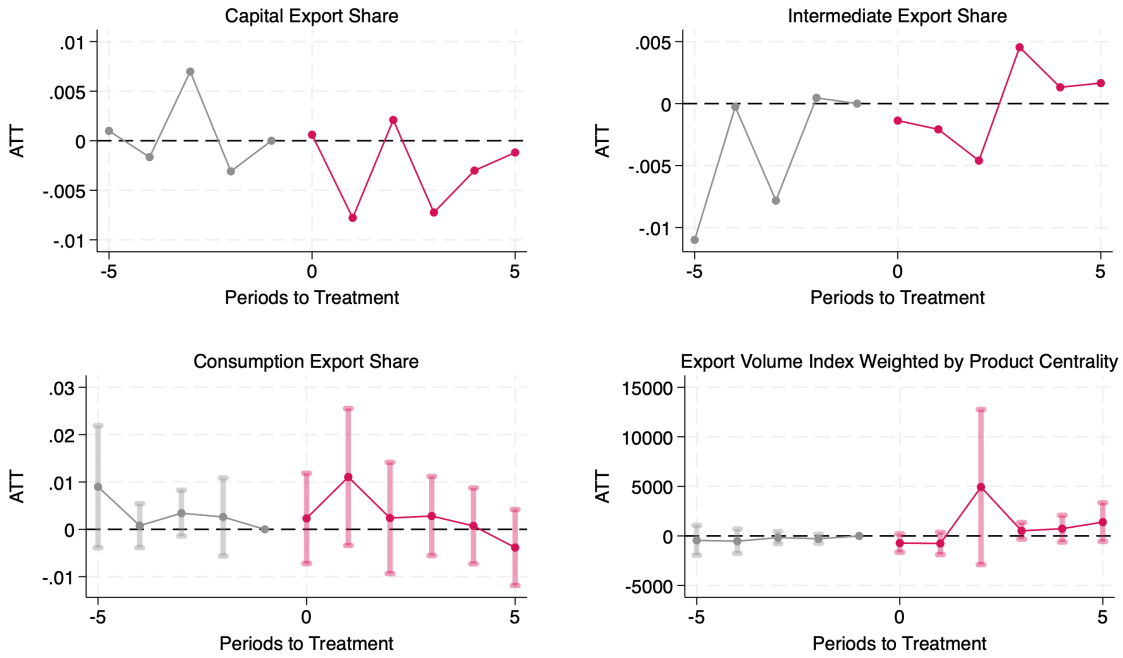
C.3 Effects on Host Economies' Export Structure

FIGURE 19: Dynamic Treatment Effects on Exports to the World



Notes: Dynamic effects of export controls on exports to the world by host economies for affected industries, estimated using the Wooldridge (2025) difference-in-differences estimator. The estimator is based on a pooled regression with cohort-time interaction terms, using never-treated units as the comparison group. Standard errors are clustered at the destination–industry level. The horizontal axis denotes periods relative to the first year of treatment (export control imposition), and the vertical axis reports the average treatment effect on the treated (ATT). Post-treatment markers are shown in blue and pre-treatment markers in light gray. The dashed horizontal line denotes zero.

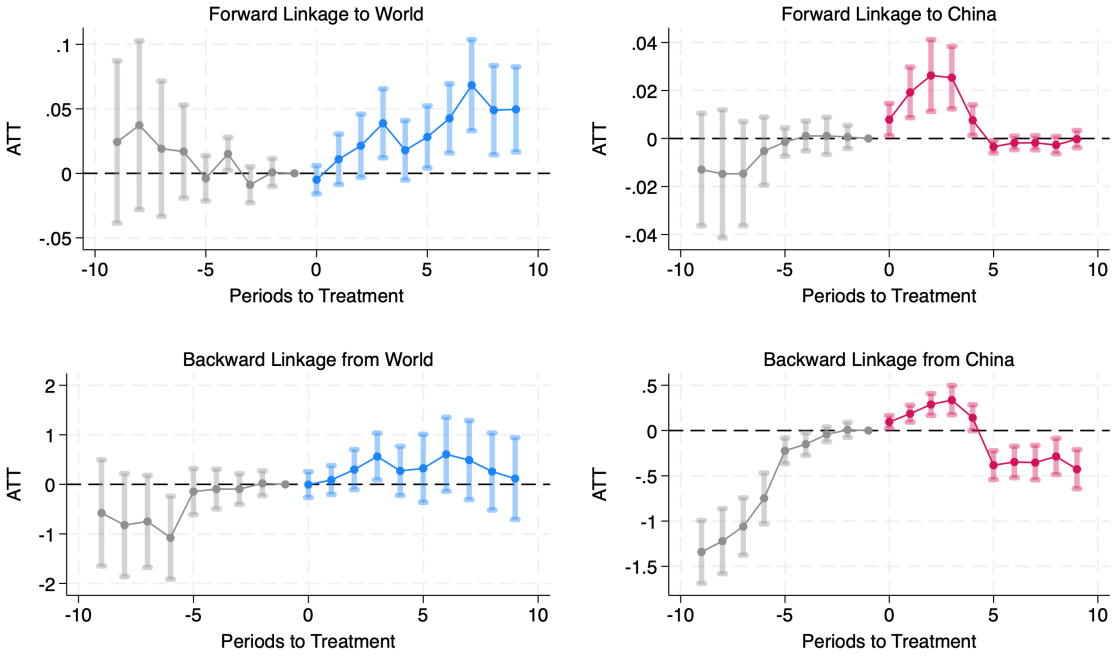
FIGURE 20: Dynamic Treatment Effects on Exports to the US



Notes: Dynamic effects of export controls on exports to the US by host economies for affected industries, estimated using the Wooldridge (2025) difference-in-differences estimator. The estimator is based on a pooled regression with cohort-time interaction terms, using never-treated units as the comparison group. Standard errors are clustered at the destination–industry level. The horizontal axis denotes periods relative to the first year of treatment (export control imposition), and the vertical axis reports the average treatment effect on the treated (ATT). Post-treatment markers are shown in red and pre-treatment markers in light gray. The dashed horizontal line denotes zero.

C.4 Effects on GVC Linkages

FIGURE 21: Dynamic Effects of Export Controls Targeting China on GVC Linkages of Chinese OFDI-Receiving Countries



Notes: Dynamic effects of export controls on global value chain (GVC) linkage measures for affected industries, estimated using the Wooldridge (2025) difference-in-differences estimator. The estimator is based on a pooled regression with cohort-time interaction terms, using never-treated units as the comparison group. Standard errors are clustered at the destination–industry level. The horizontal axis denotes periods relative to the first year of treatment (export control imposition), and the vertical axis reports the average treatment effect on the treated (ATT). Post-treatment markers are shown in colour and pre-treatment markers in grey. The dashed horizontal line denotes zero. Top-left: forward linkage to world. Top-right: forward linkage to China. Bottom-left: backward linkage from world. Bottom-right: backward linkage from China.