Trade Policy Uncertainty and Supply Chain Disruptions: Firm-Level Evidence from "Liberation Day"*

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Abstract

On April 2, 2025, U.S. President Donald Trump announced the "Liberation Day" tariffs, triggering a sharp country-specific surge in trade policy uncertainty. The proposal threatened U.S. trade partners with additional tariffs ranging from 10% to 50%, with implementation conditional on bilateral negotiation outcomes. Using transaction-level U.S. import data, we find that during the April—July 2025 negotiation window, firms rapidly shifted sourcing from high- to low-tariff-risk countries with near one-for-one replacement. As a result, firms' total imports remained largely unchanged, but import prices increased. U.S. importers therefore primarily responded by reallocating import sources rather than by reshoring or stockpiling. This preemptive reallocation was disproportionately driven by firms with inventory-, contract-, and trade-finance-intensive supply chains, consistent with their high vulnerability had tariffs taken effect before they could adjust. Our findings demonstrate that even brief periods of trade policy uncertainty can significantly disrupt supply chains.

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Strategic uncertainty is a negotiating tactic. If we gave other countries too much certainty, they would exploit it in the negotiations. The medium-term goal is to bring back these strategic industries as quickly as possible.[1]

— *Scott Bessent, United States Secretary of the Treasury (May 18, 2025)*

1 Introduction

The announcement of the "Liberation Day" tariffs by U.S. President Donald Trump on April 2, 2025, which covered virtually all countries, marked arguably the most significant protectionist trade policy in modern economic history. 85 countries with large trade surpluses against the U.S. faced announced "reciprocal" tariff rates ranging from 11% to 50%, while all other countries ("10% countries") were assigned a uniform 10% rate, both applied on top of preexisting tariffs.[2]

Although a baseline 10% tariff on all countries took effect on April 5, the implementation of rates above 10% was postponed on April 9 for 90 days and later extended through the end of July. The notable exception was China, where additional tariff rates escalated to 125% until May 12. For other countries with announced rates above 10%, this policy created significant uncertainty about whether they would ultimately face higher tariffs and at what level, as outcomes depended on their negotiations with the U.S. The gap between the announced rates and the 10% baseline provides a novel measure of country-level trade policy uncertainty (TPU) regarding U.S. tariffs from April to July 2025. In contrast, "10% countries" experienced minimal TPU from the threat, since their announced tariffs had already been implemented.

In this paper, we take advantage of the April 2 "Liberation Day" tariff threats—a unique policy that triggered a sudden and country-specific surge in TPU—to examine how TPU affected U.S. firms' global sourcing decisions. A priori, it is unclear whether U.S. importers would respond by reshoring to the U.S., reallocating import sources toward low-TPU countries, or stockpiling from their existing suppliers. We focus on disentangling these distinct adjustment margins, which are central to firms' supply chain strategies in an era of rising global risks yet remain largely unexplored. Prior studies, instead, mainly focused on how uncertainties in bilateral trade policy—such as the U.S. annual review of China's Normal Trade Relations (NTR) status before its WTO accession or Brexit—affected bilateral trade outcomes, and reported mixed results.[3] For instance, Pierce and

[1] https://www.businessinsider.com/scott-bessent-trump-strategic-uncertainty-negotiating-tactic-2025-5.

[2] Table A.1 lists the April 2 announced rates for key countries highlighted at U.S. President Trump's press conference. See https://www.whitehouse.gov/presidential-actions/2025/04/regulating-imports-with-a-reciprocal-tariff-to-rectify-trade-practices-that-contribute-to-large-and-persistent-annual-united-states-goods-trade-deficits/ for details. These rates were imposed on top of the existing tariffs in place before the "Liberation Day." See https://www.csis.org/analysis/liberation-day-tariffs-explained.

[3] Before the U.S. granted China Permanent Normal Trade Relations and China joined the WTO, the U.S. reviewed China's Normal Trade Relations status annually, creating TPU about whether low tariffs would continue or revert to the punitive "Column 2" rates. Brexit generated TPU because, during the prolonged negotiations between the

Schott (2016), Handley and Limão (2017), Graziano et al. (2021), and Graziano et al. (2024) find that TPU reduced bilateral trade by discouraging firm participation, whereas Alessandria et al. (2024) find that continuing traders increased stockpiling under TPU, a mechanism that mitigated the decline in trade as predicted by Steinberg (2019).

Using a difference-in-differences approach, we find that under the "Liberation Day" tariff threats, U.S. firms significantly shifted their input sourcing from high-TPU countries to low-TPU ("10%") countries even during this brief period of TPU. They showed a strong reduction in participation and limited stockpiling from high-TPU countries, as they began importing from "10% countries" instead. While total imports did not significantly change for an average firm-product, import prices rose—driven by firms that reallocated their sourcing origins. This reallocation was concentrated among firms with inventory-, contract-, and trade-finance-intensive supply chains. Because reallocation requires time and trade finance, these firms preemptively adjusted their supply chains, as they would have been even less able to respond quickly if the tariffs were actually implemented after the end of the 90-day negotiation period.

Our analysis uses the S&P Panjiva database. It provides up-to-date, transaction-level information on U.S. firm imports, including firm identifiers, product codes, origin countries, shipment values, and quantities. Moreover, while the data has certain limitations noted in Flaaen et al. (2023), we either demonstrate that these issues are not consequential for our setting or address them through our sample construction and robustness checks, as detailed in Section 2.2.

Our key treatment is firm-product level exposure to the TPU introduced by the "Liberation Day" tariff threats, measured as the weighted average gap between each sourcing origin country's announced tariff rate and 10%, where the weight corresponds to the firm-product pre-period import share from the country. Because China's tariffs fluctuated widely and cannot be reflected by the announced gap, we include the firm-product pre-period import share from China as a separate control. Since the "Liberation Day" tariffs were determined by each country's past trade deficit with the U.S. according to the official formula, we also control for firm-product exposure to countries' average 2023-2024 trade deficits with the U.S., as they may correlate with both TPU and firm outcomes.

Using a difference-in-differences approach, we find that firm-products more exposed to TPU increased their sourcing from "10% countries"—those having limited TPU from "Liberation Day" tariff threats—during the April to July 2025 uncertainty window. This reallocation became significant two months after the "Liberation Day." The adjustment was primarily driven by increased firm entry into importing from low-TPU countries. In anticipation of possible tariff hikes, firms began diverting their imports within a relatively short period.

In contrast, firm-products more exposed to TPU substantially reduced sourcing from high-TPU

U.K. and EU over post-Brexit arrangements, the extent of a potential increase in non-tariff trade barriers remained uncertain (see also Dhingra et al. 2016, 2017).

countries.[4] This reduction was also mainly driven by extensive-margin adjustments, as firms exited sourcing from high-TPU countries. We do not find evidence of stockpiling as in Alessandria et al. (2024). Firms that continued sourcing from high-TPU countries did not significantly increase their imports. Taken together, these results suggest that firms were more likely to shift to low-TPU countries rather than continue and build inventories from high-TPU countries.

The implied elasticity of trade to TPU is comparable to the elasticity with respect to actual tariffs documented in the literature. A 10-percentage-point rise in potential tariffs from the "Liberation Day" announcement led to a 17% increase in firm imports from "10% countries" and a 17% decrease from high-TPU countries by July 2025. The implied elasticity of trade with respect to TPU is therefore close to the short-run tariff elasticity, which is estimated to be between 1 and 2 in the literature. Previous works have shown that tariff elasticity is a critical parameter for trade diversion (Fajgelbaum et al., 2024), the gains from trade (Arkolakis et al., 2012), and welfare losses from sanctions (De Souza et al., 2024). We demonstrate that the "Liberation Day" TPU generated nearly as much reallocation as tariffs themselves, suggesting that TPU elasticity is also a relevant policy consideration.

TPU did not significantly affect firm-product level total imports. Quantitatively, increased imports from low-TPU countries fully offset reduced imports from high-TPU countries, so firm-product level total imports remained largely unchanged. This indicates that, despite higher TPU, firms did not substitute away from international sourcing toward domestic production.

However, firm-product level prices increased two months after the announcement: a 10-percentage-point rise in potential tariffs led to a 0.6% increase in firm-product level prices. Since we find no significant country-specific price change for firm-products that continued to import from either "10% countries" or high-TPU countries, these patterns suggest that firms making major sourcing changes—those newly importing from "10% countries" or ceasing imports from high-TPU countries—were the ones that experienced higher import prices.

Despite the cost of switching suppliers, firms importing inventory-, contract-, and trade-finance-intensive products adjusted more preemptively to TPU. Firms with high inventory intensity had strong incentives to reallocate early to avoid restocking under higher tariffs. Firms with contract-intensive supply chains would have to pay higher tariffs for longer before they could find alternative suppliers. Both types of firms therefore faced higher expected tariff burdens if they waited. Firms dependent on trade finance also moved early, as establishing new supply chains in a high-tariff environment would increase their trade finance and reallocation costs.[5] In contrast, firms with flexible

[4] High-TPU countries refer to those that received a "Liberation Day" tariff above 36%, corresponding to the top 15 countries with the highest announced rates.

[5] For example, in the context of the 2018 U.S.-China trade war, Benguria and Saffie (2024) find that firms importing trade-finance-dependent products were more severely affected by tariffs. Correa et al. (2023) and Alfaro et al. (2025) find that firms have to pay higher interest rates to finance their supply chain adjustments in a high-tariff, trade war environment.

supply chains and lower trade finance needs could wait, as they could adjust swiftly as soon as tariffs were implemented. In short, firms that would be hardest hit by potential future tariffs had the greatest incentive to reallocate preemptively to the threat of tariffs. The strong reallocation toward "10%-countries" by inventory-intensive firms also explains the lack of inventory stockpiling from high-TPU countries in the aggregate.

The reallocation patterns hold across several robustness tests. These include regressions of firm-product level sourcing from different countries on firm-product level exposure to TPU interacted with either country-level "Liberation Day" tariffs or a dummy indicating whether the country is a "10-percent country." Additional robustness checks include product-level regressions that mitigate potential bias from a small share of missing firm names in the Panjiva U.S. import data, as well as tests addressing products primarily imported from Canada or Mexico, those exempt from the "Liberation Day" tariffs, and those subject to Section 232 measures, among others.[6]

Although some expected additional U.S. trade protection after Trump's reelection—and Trump had signaled possible deficit-based tariffs in February and March (Benguria and Saffie, 2025)—the official formula determining the country-specific magnitudes of the "Liberation Day" tariffs was unexpected. The absence of pre-trends in our event-study figures supports this argument. As an additional robustness test, we measure firm-product exposure to TPU using import shares from "above-10%" countries (as suggested by Benguria and Saffie 2025) and find similar results.

We contribute to the literature on the economic effects of TPU by exploiting a unique policy that generated different levels of uncertainty across most countries on the same day. Pierce and Schott (2016), Handley and Limão (2017), Graziano et al. (2021), Graziano et al. (2024), and Fan and Luo (2025) show that—in contexts such as the U.S. annual review of China's NTR status and Brexit—TPU reduced trade, whereas its removal increased import competition.[7] In contrast, Steinberg (2019) finds a minimal impact of TPU on the UK's trade with EU after Brexit, and Alessandria et al. (2024) find that continuing traders increased stockpiling under TPU. Most studies focus on medium- to long-run outcomes years after uncertainty arises or ends, yet much less is known about the speed of firm adjustment to TPU. Furthermore, the literature examines TPU at the product level, focusing on potential tariff increases on specific products, with the exception of

[6]Since Panjiva U.S. import data covers only maritime trade, our calculation of a firm-product's TPU exposure–based on pre-period import shares from different countries–may be inaccurate for products primarily sourced from Canada and Mexico, as a large share of imports from these countries is transported by land. To address this, we use UN Comtrade data, which include all modes of transport, to identify products for which imports from Canada and Mexico account for more than 90% of total imports, and exclude these products in the robustness test. While "Liberation Day" tariffs in principle apply to all products from a given country, two categories of products are exempt: (1) critical upstream inputs such as copper and minerals, and (2) products subject to Section 232 (National Security) investigations and tariffs. In the baseline analysis, we assign a zero "Liberation Day" tariff to the first group and exclude the second group. In robustness tests, we either drop the first group or retain the second group, assigning tariffs to the second group based on information from https://www.piie.com/blogs/realtime-economics/2025/trumps-trade-war-timeline-20-date-guide.

[7]Related to this literature, Heise et al. (2024) show that a reduction in TPU increased imported product quality through long-term, just-in-time relationships.

Benguria et al. (2022), who construct a firm-level TPU measure using public firm annual reports building on Baker et al. (2016) and Caldara et al. (2020).

We exploit the delayed implementation of "Liberation Day" tariffs as a uniquely clean quasi-experiment to study the effects of TPU. Leveraging its variation across almost all countries, we analyze how it shaped the reallocation of trade across sourcing origins—a question not feasible to study in prior settings. We also provide new evidence on the relative importance of firm exit versus stockpiling under TPU and show that firms' increased sourcing from low-TPU countries reduces their incentives to stockpile from high-TPU countries. We find that firms adjusted swiftly to the uncertainty: imports from low-TPU countries rose significantly just two months after the policy announcement. Moreover, this setting allows us to construct a TPU measure for *all* importer-products and study how the TPU effect depends on firm heterogeneity.

This paper contributes to the timely literature on the effects of "Liberation Day" tariffs (e.g., Ignatenko et al., 2025; Rodriguez-Clare et al., 2025) and the now broader body of work studying the 2018 U.S.-China trade war tariffs.[8] We provide the first empirical evidence on how "Liberation Day" tariffs generated TPU and how such uncertainties affected firms, whereas most prior studies on the "Liberation Day" tariffs conduct model-based quantitative exercises.[9] Amiti et al. (2019), Flaaen and Pierce (2019), Alfaro and Chor (2023), and Handley et al. (2025), among others, have studied how the 2018 U.S-China trade war tariffs affected U.S. firm supply chain decisions and performance. Cavallo et al. (2021), Fajgelbaum and Khandelwal (2022), and Iyoha et al. (2024) generally find evidence of trade diversion toward other countries due to tariffs on China, whereas Fajgelbaum et al. (2020) document a weaker such effect.

We show that the postponement of the reciprocal tariffs created country-specific TPU. Using detailed firm-level data, we document substantial TPU-induced trade diversion by U.S. importers, with an elasticity comparable in magnitude to that of actual tariffs. The firms that diverted most preemptively were those with greater inventory and contract intensity, as well as higher trade-finance needs. These are the precise firms that would have been least able to adjust quickly and would have been hit hardest if the tariffs were implemented as initially scheduled.

Overall, this evidence suggests limits to the policy goal of using tariff threats to induce reshoring. Even if negotiations eventually led to lower tariffs, firms had already reallocated their supply chains and incurred higher costs during the uncertain episode. TPU has not led U.S. firms to replace imports with domestic production; as we document, imports were diverted from high-TPU to low-TPU countries, with no significant change in overall imports.

The rest of the paper is organized as follows. Section 2 introduces the institutional background

[8] Fajgelbaum and Khandelwal (2022) provide a comprehensive review of the literature on the 2018 U.S.-China trade war.

[9] Benguria and Saffie (2025) is an exception, as it empirically studies the stock market responses to the "Liberation Day" announcement.

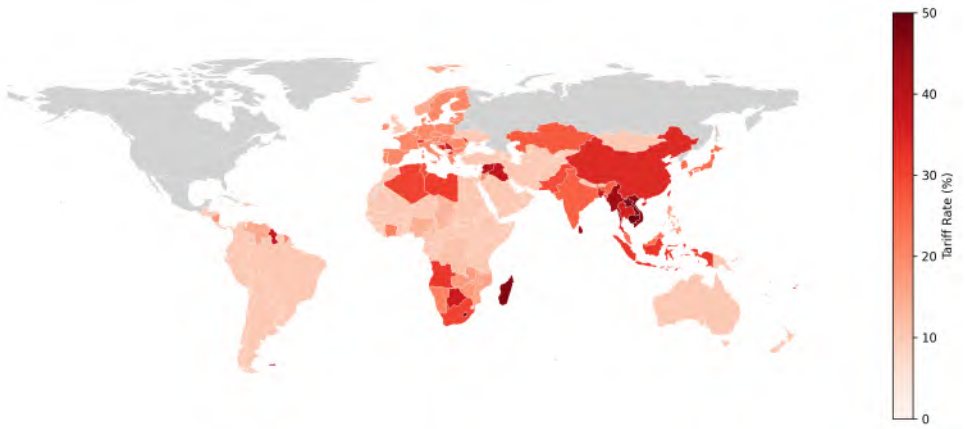
and data. Section 3 outlines our main empirical specifications. Section 4 reports the results. Section 5 concludes.

2 Institutional Background and Data

2.1 "Liberation Day" Tariffs Generated Country-Specific Uncertainty

On April 2, 2025, President Donald Trump imposed new, "Liberation Day" tariffs on nearly all countries.[10] The tariffs ranged from a minimum rate of 10% to as high as 50% for countries running large trade surpluses with the United States (Figure 1).[11] While observers expected President Trump to pursue more protectionist trade policies in his second term, the scope of countries targeted by the "Liberation Day" tariffs, the inclusion of nearly all products, and tariff magnitudes were highly unexpected. This was supported by the fact that the announcement triggered a sharp global financial market reaction in early April.[12]

Figure 1: Liberation Day Tariff Rate (April 2)



Notes: This figure shows the "Liberation Day" tariff rate by country announced on April 2, 2025, which is reproduced in Table A.1. Source: https://www.whitehouse.gov/wp-content/uploads/2025/04/Annex-I.pdf.

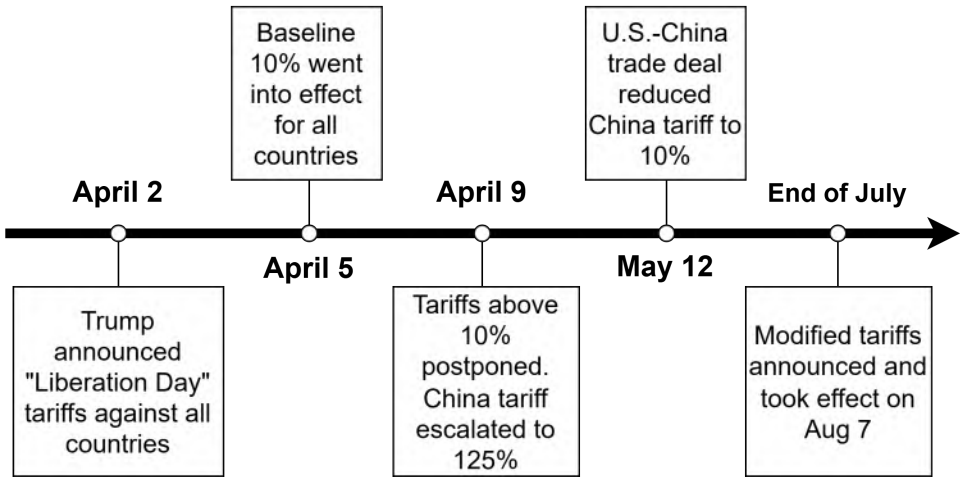
Importantly for our study of TPU, the implementation of the country-specific portions of the "Liberation Day" tariffs above 10% was delayed for four months following the initial announcement. Figure 2 presents the timeline. The baseline 10% tariff on all countries and the portions above 10%

[10] Several countries were not targeted by the "Liberation Day" tariffs and are shown in gray in Figure 1. A few countries already under U.S. sanctions–such as Belarus, Russia, North Korea, and Cuba–were exempt from these new tariffs. Canada and Mexico were also exempt for USMCA-compliant products as they had already been targeted by earlier Executive Orders prior to 'Liberation Day." We exclude these countries from our analysis. The exclusion of Canada and Mexico is both necessary and unavoidable, as the bill of lading data for U.S. imports covers only maritime trade.

[11] Section A.1 presents the formula that the Trump administration used to compute the "Liberation Day" tariffs. See also https://ustr.gov/sites/default/files/files/Issue_Areas/Presidential%20Tariff%20Action/Reciprocal%20Tariff%20Calculations.pdf.

[12] See media coverage such as https://www.reuters.com/markets/us/global-markets-view-usa-2025-04-03/.

Figure 2: Timeline of "Liberation Day" Tariffs



Notes: This figure displays the timeline of "Liberation Day" tariffs.

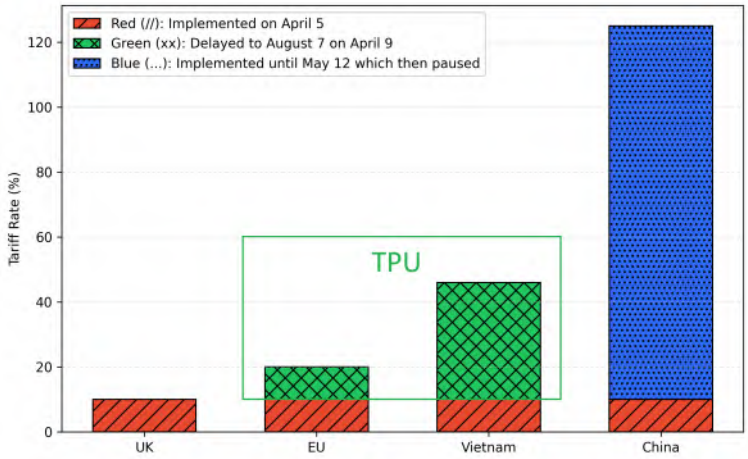
(varied across countries) were initially scheduled to take effect on April 5 and April 9, respectively. The baseline 10% was implemented as planned on April 5. However, on April 9—the day the above 10% tariffs were set to begin—President Trump announced a 90-day postponement, later extended to the end of July, stating that whether the higher tariffs would ultimately be imposed would depend on the outcome of U.S. negotiations with each country. The implementation delay can be considered exogenous to an individual U.S. firm-product since it was largely unexpected and not driven by a specific firm or product.

China as a special case. For most countries, the portions of the announced tariffs above 10% were threatened but not implemented until August. China was a notable exception, as its tariffs fluctuated sharply during this period due to escalating retaliatory measures. On April 2, the U.S. announced a 34% tariff on China and ended duty-free treatment for "de minimis" shipments (those with a transaction value below $800). Following several rounds of tit-for-tat actions, U.S. tariffs on Chinese goods surged to 125% by April 9, accompanied by additional measures such as firm-level sanctions and export controls. On May 12, a U.S.-China trade deal reduced the bilateral tariffs to 10% for three months, later extended to November 10, 2025.[13] Due to this unique trajectory, China is excluded from the cross-country variation used for identification in our empirical specification.

Measuring TPU with the gap between announced and implemented tariffs. We measure country-specific TPU during April–July 2025 using the gap between each country's announced tariff

[13]Imports from Hong Kong and Macau were treated identically to those from mainland China. This treatment was explicitly stated at each stage of the Liberation Day tariff process, including the initial April 2 announcement, the April 9 escalation, and the subsequent May 13 revision that reduced tariffs on China to 10%.

Figure 3: Trade Policy Uncertainty from "Liberation Day" Tariffs



Notes: This figure illustrates the implemented and postponed portions of the tariffs announced on "Liberation Day." The 10% baseline tariff (red) was implemented on all countries on April 5, while the country-specific portions above 10% (green) were postponed until end of July, creating TPU about whether these higher rates would be implemented and at what levels. China's tariff fluctuated sharply during this period, peaking at 125%, before the portion above 10% was paused on May 12 following a U.S.-China trade deal.

and the implemented 10% baseline. This is akin to the way TPU is measured in the literature, such as Pierce and Schott (2016), where TPU is defined as the gap between the lower Normal Trade Relations (NTR) tariff and the higher non-NTR tariff on each product (the NTR gap). However, we use country variations instead of product variations.

Figure 3 illustrates this idea. The announced "Liberation Day" tariff on the U.K. was 10%, which was fully implemented; thus, the U.K. faced no additional TPU from the tariff threat during this episode. In contrast, the EU and Vietnam were threatened with tariffs of 20% and 46%, respectively, meaning that additional tariffs of 10% and 36% depended on the outcomes of their negotiations with the U.S. If negotiations failed, Vietnam would face a greater tariff increase than the EU but also had more room to negotiate down its rate. Consequently, Vietnam faced higher TPU from the "Liberation Day" tariff announcement than the EU, as captured by the larger gap between its announced rate and the 10% baseline. By contrast, China experienced a distinct and volatile tariff trajectory—reaching 125% by April 9—accompanied by unique retaliatory measures and heightened geopolitical tensions.

2.2 Data

2.2.1 S&P Panjiva Bill of Lading Data

We use S&P Panjiva bill-of-lading data for U.S. imports in our analysis. The dataset includes detailed information on importer and exporter firms, product (Harmonized System, or HS, 6-digit code), and

dollar values and weights of transactions.[14] The U.S. bill of lading data has several benefits and limitations documented by Flaaen et al. (2023). We carefully tackle all mentioned issues, with details below.

Panjiva U.S. import data only covers maritime trade. We show that the share of maritime imports by the U.S. did not significantly change around the "Liberation Day." To show this, we use the bill of lading data from S&P Panjiva for countries that provide both maritime and non-maritime exports to the U.S.: Vietnam, Colombia, Mexico, Sri Lanka, India, and Chile. As Figure A.1 shows, the share of maritime imports from any of these countries to the U.S. remained stable around the "Liberation Day." This suggests that the omission of non-maritime trade in the U.S. Panjiva data is unlikely to drive our results.

Moreover, since the "Liberation Day" tariffs did not apply to Mexico and Canada for USMCA-compliant products—and because both countries primarily export to the U.S. through non-maritime modes—we exclude imports from Mexico and Canada from our baseline analysis. To further address this concern, Section 4.4 presents a robustness check in which we exclude products for which more than 90% of the import value originates from Mexico and Canada.

Flaaen et al. (2023) document a high missing rate for firm names/identifiers in U.S. bill-of-lading data. We show that this issue is concentrated in "de minimis" trade—transactions valued below US$800.[15] While the missing rate for these transactions is as high as 90%, it is around 20% for higher-value transactions (Figure A.2). Figure A.2 also shows that the share of transactions with missing firm names and identifiers remained stable for non-"de minimis" trade around the "Liberation Day." As shown in Figure A.3, the shares of *trade values* with missing exporter and importer firm identifiers also remained stable around "Liberation Day," as "de minimis" trade accounts for only a small portion of total trade value.[16]

To address this issue, we exclude "de minimis" transactions from our baseline analysis. To further alleviate concerns about missing firm names/identifiers in higher-value trade, we conduct

[14] Section A.2 details the data cleaning procedures and reports the share of transaction records excluded at each stage. Each transaction in the database corresponds to a single bill of lading.

[15] While Flaaen et al. (2023) note that U.S. firms can request the government to redact their names from the bill-of-lading data shared with private firms such as S&P, leading to missing firm identifiers, we find that this issue is mostly concentrated in "de minimis" trade. According to S&P's customer service, S&P uses an algorithm to detect whether the importer is an individual and whether the importer's address is residential. If either is true, the importer's name and identifier are removed to protect personal privacy. Since most "de minimis" shipments are small parcels imported by individuals, the majority of importer names in this category are redacted. However, for transactions valued above US$800, missing firm identifiers primarily result from firms' own redaction requests. To address this issue, we conduct robustness tests by aggregating imports to the product level, which mitigates the impact of missing firm identifiers by combining all importers with and without available firm names.

[16] Figure A.4 shows that although "de minimis" trade climbed to 60% of all U.S. import transactions before the "Liberation Day," its share of total import value was below 0.03%. Both shares dropped sharply after the April 2 termination of duty-free treatment for "de minimis" imports from China.

robustness tests using regressions aggregated to the product level, which are unaffected by missing firm names/identifiers.

Flaaen et al. (2023) document that a large share of transaction values was missing in Panjiva U.S. import data. While this was the case up to 2021, S&P has since made significant methodological improvements. The fill rate for transaction values has increased from about 50% (as reported by Flaaen et al. 2023) to 99%. These updates substantially mitigate the data quality issues related to missing value and price information identified by Flaaen et al. (2023).

2.2.2 "Liberation Day" Tariffs

We obtain the announced "Liberation Day" tariff rates for each country from Annex I of Executive Order 14257. Countries already subject to U.S. sanctions—Cuba, North Korea, Russia, and Belarus—were exempt. Canada and Mexico were also exempt for USMCA-compliant products. These exempt countries are excluded from our analysis.

Exclude products subject to Section 232 measures and assign zero TPU to strategically exempt products. In addition to USMCA-compliant products, two other major categories of products were excluded from the "Liberation Day" tariffs: (1) Critical upstream inputs such as energy and minerals, which were *strategically exempt*, and (2) Products subject to *Section 232* (National Security) investigations and tariffs, including aluminum, automobiles, steel, and other products expected to undergo investigation. Annex II of Executive Order 14257 lists the HS codes for all exempt products but does not specify the category. We acquire information about products subject to Section 232 from PIIE Trump's trade war timeline 2.0.[17] In our baseline analysis, we exclude the products subject to Section 232, classify all other exempt products as strategically exempt, and set them zero TPU.[18]

Uncertainty window from "Liberation Day" tariffs. We focus on the "Liberation Day" TPU from beginning of April until the end of July. This end date is crucial: in the last week of July, the White House announced new trade deals with Indonesia, Japan, the Philippines, and the EU, as well as additional tariffs on Brazil. These modifications and new tariffs went into effect alongside the country-specific portions of the "Liberation Day" tariffs on August 7. By ending our TPU window at the end of July, we cleanly identify the effect of the initial "Liberation Day" tariff threat, separating it from these subsequent announcements and tariffs.

[17] See https://www.piie.com/blogs/realtime-economics/2025/trumps-trade-war-timeline-20-date-guide.

[18] In robustness tests, we (1) assign tariffs to Section 232 products using the PIIE data, and (2) alternatively drop the strategically exempt products.

Summary: sample construction. Our baseline sample excludes imports from Canada, Mexico, and other countries exempt from the "Liberation Day" tariffs. We also drop "de minimis" imports, as most of these transactions lack importer names and faced a separate, major policy change (the end of China's "de minimis" tariff exemption) on "Liberation Day." We remove products subject to Section 232 investigations and tariffs. For strategically exempt products, we set their TPU to zero. In the robustness section, we report results based on alternative samples.

3 Empirical Specification

In this section, we describe the construction of key regressors and outline the empirical specification.

3.1 TPU Measurement

Our baseline analysis focuses on firm-product level adjustments to TPU.[19] Our main regressor, TPU exposure, is therefore constructed at the firm-product level as a weighted average of the TPU across non-U.S. countries, using pre-period import shares as weights.

Exposure to TPU. A firm f-product p's TPU equals the import-weighted potential increase in tariffs due to the "Liberation Day" announcement relative to the implemented 10% baseline. Specifically, for firm f and product p, we define:

$$\text{TPU}_{f,p} = \frac{\sum_{c \neq CN} \text{IMP}_{f,p,c,pre} \Delta\text{Tariff}_{p,c}}{\sum_{c} \text{IMP}_{f,p,c,pre}}, \tag{3.1}$$

where $\text{IMP}_{f,p,c,pre}$ denotes firm f's total imports of product p from country c (excluding China) in 2023 and 2024, and $\Delta\text{Tariff}_{p,c} = \text{Tariff}_{p,c} - 10\%$ represents the difference between the announced rate and the baseline 10% for country c.[20] For example, for EU member countries, $\Delta\text{Tariff}_{p,c}$ equals 10%, as they faced a "Liberation Day" tariff of 20%, among which 10% was implemented. For "10% Countries," who faced 10% "Liberation Day" tariffs, $\Delta\text{Tariff}_{p,c} = 0$, since they were not subject to the negotiation window that created uncertainty. A product p dimension was introduced because strategically exempt products are assigned $\Delta\text{Tariff}_{p,c} = 0$.[21] Overall, a higher $\text{TPU}_{f,p}$ indicates that firm f previously imported a larger share of product p from countries facing greater uncertainty about the eventual tariff rate after the 4-month negotiation window.[22]

[19] Section 4.4 on robustness considers a firm-product-country level analysis.

[20] In the robustness Section 4.4, we also consider an alternative definition of $\text{TPU}_{f,p}$ as the share of imports from all above-10% countries, where $\Delta\text{Tariff}_{p,c}$ is replaced by $\text{I}(\Delta\text{Tariff}_{p,c} > 0)$, which does not rely on the assumption that countries that faced higher reciprocal tariffs underwent a larger degree of TPU.

[21] Section 4.4 on robustness considers a sample that does not include such exempt products.

[22] An alternative way to conceptualize our measurement is to view it as trade policy ambiguity (Steinberg, 2025) where the announced "Liberation Day" tariff rates could be thought of as the "bad state." Under Knightian uncertainty, agents act as if the bad state is the true future state because they do not know the probability distribution over good

We exclude China from the numerator and consider it separately, as the escalating U.S.-China tariffs cannot be captured by the April 2 announcement alone. We also exclude Hong Kong and Macau, since the United States explicitly stated it would treat these regions equivalently to China at every policy stage.[23]

Table B.1 reports the summary statistics for the exposure to TPU. An average firm-product faced a potential tariff increase of 7% due to the "Liberation Day" tariff threat (excluding potential disputes with China).

The variation in TPU is plausibly exogenous to the underlying firm trend, which allows us to identify its effect via difference-in-differences. The "Liberation Day" tariff rates were set by pre-existing country-level trade balances—not firm-level behavior—and were announced simultaneously for all countries. Moreover, as we will detail further below in section 3.3, we control for the weighted sum of the trade deficit with each country.

3.2 Baseline Specification

We use a difference-in-differences framework to study how the "Liberation Day" TPU affected U.S. firm outcomes, in particular, reallocation of imports to "10% countries." We test whether growth differs for firms more exposed to TPU (the first difference) after the tariff announcement and subsequent postponement (the second difference).

We first present an event study specification, followed by a long-difference specification that studies the overall adjustment. The estimation uses firm-product data aggregated to biweekly intervals over 2025. We choose this time interval to balance the number of observations against the statistical noise associated with shorter import periods.

We estimate the following event-study specification:

$$y_{f,p,t} = \sum_{u} \beta_u \mathbb{I}\{u = t\} \times \text{TPU}_{f,p} + \sum_{u} \theta_u \mathbb{I}\{u = t\} \times \text{X}_{f,p} + \delta_{f,p} + \delta_{p,t} + \delta_{f,t} + \epsilon_{f,p,t}, \tag{3.2}$$

where $y_{f,p,t}$ denotes the outcome for firm f and product p at time t, such as imports from all countries or from a subset, like "10% countries" or high-TPU countries.[24] The first term on the right-hand side represents the TPU effect—an interaction between $\text{TPU}_{f,p}$ and biweekly indicators that capture differential import adjustments among firms more exposed following the April 2 announcement. $\text{X}_{f,p}$ includes control variables, in particular the firm-product's exposure to China and to countries' trade

and bad states. In this interpretation, our measurement does not require that firms assess the probability that the negotiation with each country will be successful.

[23] See the announcement by the White House and CBP at https://www.whitehouse.gov/presidential-actions/2025/04/regulating-imports-with-a-reciprocal-tariff-to-rectify-trade-practices-that-contribute-to-large-and-persistent-annual-united-states-goods-trade-deficits/ and https://content.govdelivery.com/accounts/USDHSCBP/bulletins/3db42c8.

[24] We also estimate the average treatment effect of Equation (3.2) over time. We leave the regression specification to Section C.1.

surpluses with the U.S. We discuss these control variables in the next section.

The rich set of fixed effects ($\delta_{f,p}$, $\delta_{p,t}$, and $\delta_{f,t}$) accounts for unobserved heterogeneity across firm-product pairs, product-time shocks, and firm-time shocks. Under these fixed effects, we compare the growth rates of firms that import the same product but face heterogeneous TPUs because they imported it from different countries. Standard errors are clustered at the firm-product level.

We also apply the following long-difference specification to estimate the overall effect of TPU on firm outcomes over this period. This specification was used by Handley et al. (2024) and Javorcik et al. (2025) to study the effects of the 2018 U.S.-China trade war tariffs. As supply chain adjustments take time and their effects may only turn significant in later periods, the long-difference specification might better capture this delayed effect, whereas the average treatment effect specification dilutes the effect over time. The specification is as follows:

$$\Delta y_{f,p} = \beta \text{TPU}_{f,p} + \theta \text{X}_{f,p} + \delta_p + \delta_f + \epsilon_{f,p}, \tag{3.3}$$

where $\Delta y_{f,p}$ denotes outcome growth from before "Liberation Day" to the end of the negotiation window.[25] Since we have taken the difference over time, the firm-product fixed effects are differenced out. The specification retains the product fixed effect, δ_p, and the firm fixed effect, δ_f. All other variables are defined as in Equation (3.2).

3.3 Exposure to China and Other Country Characteristics as Controls

This section describes the control variables, focusing on firm-product level exposure to China and trade surpluses with the U.S. We leave the discussion of additional controls to Section C.2.

Exposure to China. We measure it using the import share of each firm-product pair from China in 2023 and 2024:

$$\text{CN}_{f,p} = \frac{\text{IMP}_{f,p,CN,pre}}{\sum_c \text{IMP}_{f,p,c,pre}}. \tag{3.4}$$

$\text{CN}_{f,p}$ measures firm f, product p's dependence on Chinese suppliers prior to the "Liberation Day." We include the China measure as a separate control because the timing and scale of tariffs on Chinese goods followed a distinct path and cannot be directly represented by the TPU measure above. Table B.1 reports that the average firm-product import share from China was 46%, which is relatively high because our sample focuses on maritime imports.

Exposure to Countries' Trade Surpluses with the U.S. A country's "Liberation Day" tariff is largely determined by its trade surplus with the U.S. To account for this, we also control for

[25] Specifically, we compute the time-average of the outcome variable beginning two months after "Liberation Day," covering June and July 2025, and compute the average for the period from late January 2025 (when Trump was inaugurated as president) through "Liberation Day." We then take the difference between these two averages.

firm-product level exposure to trade surplus from different countries, as these factors correlate with the "Liberation Day" tariffs and may directly affect U.S. firm imports.

The "Liberation Day" tariff is set according to the following formula:

$$\text{LiberationDayTariff}_c = \max\left\{\frac{1}{2}\cdot\frac{\text{Surplus}_c}{\text{Imp}_c}, 10\%\right\},$$

where Surplus_c denotes the net trade surplus (which may be negative) of country c with the U.S. and Imp_c denotes U.S. imports from country c.[26] As this formula indicates, countries with larger surpluses were assigned higher potential tariff rates, while those with small or negative surpluses faced the baseline 10% tariff.

To account for a firm-product's exposure to trade surpluses across countries, we construct the following import-weighted measure:[27]

$$\text{TradeDeficit}_{f,p} = \frac{\sum_c \text{IMP}_{f,p,c,pre}\dfrac{\text{Surplus}_c}{\text{Imp}_c}}{\sum_c \text{IMP}_{f,p,c,pre}},$$

As with the TPU measure, we set Surplus_c and Imp_c to their 2024 values.

4 Results

A priori, it is unclear whether U.S. importers would respond by reshoring to the U.S., reallocating import sources toward low-TPU countries, or stockpiling from their existing suppliers. Empirically, we find that firms facing higher TPU reallocated their imports toward low-TPU countries, resulting in trade diversion that became significant two months after the "Liberation Day." This reallocation was driven primarily by the extensive margin: firms stopped importing from high-TPU countries and started sourcing from "10% countries," which faced limited TPU from "Liberation Day" tariffs. We do not find significant evidence of stockpiling. Due to this reallocation, overall firm-product level imports did not change significantly. This, however, came at the cost of higher import prices, as switching from familiar to new sourcing origins is costly. Examining cross-firm heterogeneity, we find that adjustments to TPU were more pronounced among firms importing more inventory-, contract-, and trade-finance-intensive products. These firms adjusted preemptively because they would be hit hardest by the actual tariffs.

[26] See Section A.1 for details.

[27] Note that the correlation between $\text{TPU}_{f,p}$ and $\text{TradeDeficitControl}_{f,p}$ is lower than one might expect for four reasons. First, if a country's trade surplus is negative, the "Liberation Day" tariff is set uniformly at 10%. Second, all EU member countries share the same 20% "Liberation Day" tariff rate, regardless of their individual trade balances with the U.S. Due to these two reasons, the correlation between $\text{LiberationDayTariff}_c$ and $\frac{\text{Surplus}_c}{\text{Imp}_c}$ is merely 0.23. Third, the TPU measure excludes China, while the trade deficit control includes it. Fourth, our firm-product level exposure measures and deficit controls are weighted sums of $\text{LiberationDayTariff}_c$ and $\frac{\text{Surplus}_c}{\text{Imp}_c}$ across countries. Empirically, we find that $\text{TPU}_{f,p}$ and $\text{TradeDeficitControl}_{f,p}$ have a correlation of 0.07.

4.1 Reallocation from High-TPU Countries to "10% Countries"

We first show that U.S. firms increased their imports from "10% countries" and decreased them from high-TPU countries in response to "Liberation Day" TPU. We refer to high-TPU countries as those facing "Liberation Day" tariffs higher than 36%, corresponding to the top 15 countries with the highest "Liberation Day" tariffs.[28]

Firms exposed to higher TPU increased imports from "10% countries," driven by extensive margin. Figure 4a shows that firm-products facing greater TPU began significantly increasing their import values from "10% countries" about two months after the "Liberation Day" announcement.[29] Notably, this adjustment occurred even though no "Liberation Day" tariffs beyond 10% were implemented during this period. This finding suggests that firms were preemptively shifting sourcing to low-TPU countries to mitigate the effects of potential future tariffs. The lack of pre-trends in all figures supports the identifying assumption that the TPU variation, caused by country-specific announced rates, is uncorrelated with the underlying firm trend.

Figures 4b and 4c decompose this adjustment by contrasting the extensive and intensive margins. The regression using the indicator of importing any amount from 10% countries (log imports from 10% countries) as the dependent variable analyzes the extensive (intensive) margins.[30] The reallocation was driven almost entirely by the extensive margin: firms began sourcing products from "10% countries" that had not previously been their trade partners. We observe no significant import growth among firms that were already sourcing from "10% countries."

Columns 1 and 2 of Table 1 further show that TPU led firms to increase the number of "10% countries" they source from and to increase sourcing from an average "10% country" due to firm entry into importing from them.[31] Quantitatively, a 10-percentage-point increase in U.S. TPU raised the expected number of "10%" source countries by 0.03 and increased imports from an average "10% country" by 13.7%.[32]

Firms exposed to higher TPU decreased imports from high-TPU countries with limited stockpiling. Figure 5 shows that firms strongly reduced import values from high-TPU countries, which was also predominately driven by the extensive margin (Figure 5b).[33] The absence of pre-trends

[28] In Section 4.4, we perform a robustness test that pools all firm-product-sourcing origins, regressing imports on firm-product TPU interacted with each country's "Liberation Day" tariff. We show that firm-product imports declined more from high-TPU countries relative to low-TPU countries, mitigating concerns that our results could be driven by the specific selection of high- and low-TPU countries.

[29] Figure C.1 shows the corresponding event study results for import weights from "10% countries."

[30] Using log imports as the dependent variable isolates the intensive margin, since observations with zero import values are dropped.

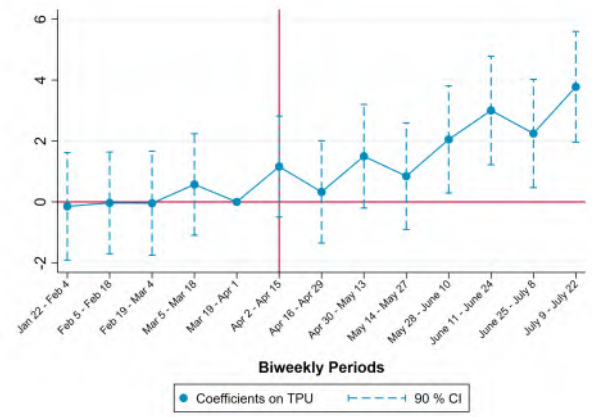
[31] Table C.1 shows the corresponding average treatment effect over time.

[32] To derive these figures, multiply 10% by the non-China import share (54%; see Table B.1) and the corresponding coefficient in the table.

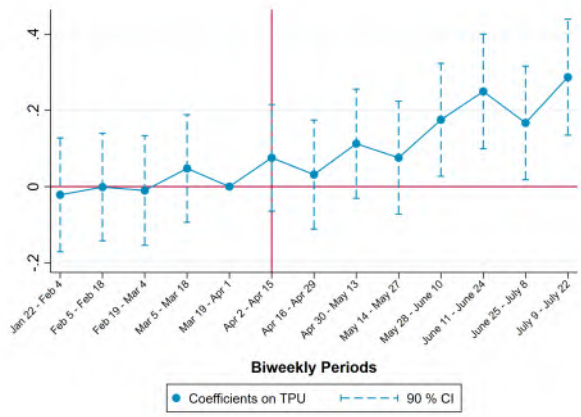
[33] Figure C.2 shows the corresponding event study results for import weights from high-TPU countries.

Figure 4: Firms Increased Import Values from "10% Countries"

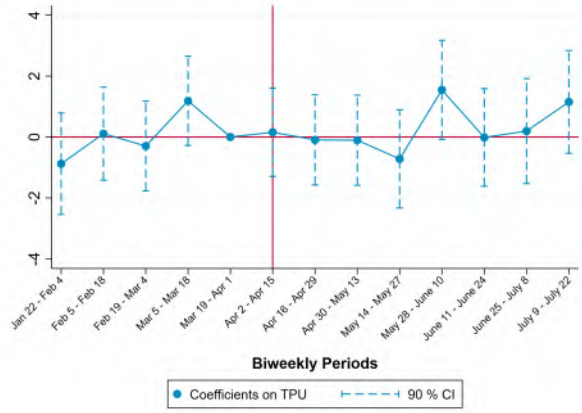
(a) IHS(Value from 10% Countries)



(b) $\mathbb{I}$(Value from 10% Countries > 0)



(c) Log(Value from 10% Countries)



Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the import values of product p by firm f in time t from "10% Countries." "10% countries" refer to those facing 10% announced "Liberation Day" tariff. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Table 1: Number of Countries, Imports per Country, and HHI: Long Difference

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	10% Countries		High-TPU Countries		All Countries		
	Δ*Number of Countries*	ΔIHS(*Avg Imports per Country*)	Δ*Number of Countries*	ΔIHS(*Avg Imports per Country*)	Δ*Number of Countries*	ΔIHS(*Avg Import per Country*)	ΔHHI
TPU_{ip}	0.6340***	2.5399***	-0.4742***	-2.8175***	0.1008	-0.0341	-0.0030
	(0.1801)	(0.6642)	(0.1757)	(0.7684)	(0.0651)	(0.1796)	(0.0270)
R^2	0.408	0.416	0.393	0.401	0.293	0.315	0.262
Firm FE	✓	✓	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓
Observations	22638	22638	17762	17762	227730	227730	69307

Notes: This table displays estimates from Equation (3.3) where the dependent variable is the number of sourcing countries and average imports per country of product p by firm f in time t from "10% Countries," high-TPU countries, and all countries. It also reports the TPU effect on firm-product level Herfindahl Index of imports from different countries. "10% countries" refer to those facing 10% announced "Liberation Day" tariff. "High-TPU countries" refer to those facing more than 36% announced "Liberation Day" tariffs, corresponding to the top 15 countries with the highest "Liberation Day" tariffs. The long difference is computed by subtracting the average value of the dependent variable before April 2 from its average value after May 28. Standard errors clustered at the firm-product ($f - p$) level are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

supports the identifying assumption that variation in TPU due to country-specific announced rates is uncorrelated with underlying firm trends. This finding is consistent with previous works such as Pierce and Schott (2016), Handley and Limão (2017), Graziano et al. (2021), Graziano et al. (2024), and Fan and Luo (2025), who show empirically and theoretically that TPU led to less entry.

In contrast to Alessandria et al. (2024) in the context of annual review of China's NTR status before its accession to the WTO, we do not find significant stockpiling. That is, firms that continued to import from high-TPU countries did not significantly increase their imports during the TPU episode to avoid a potential increase in tariffs. This is evident from the regression using log imports from high-TPU countries as the dependent variable (Figure 5c), which is identified only from firm-products that imported from a high-TPU country both before and after the "Liberation Day" announcement.

The likely reason is exactly the documented diversion of trade to TPU. Since firms strongly increased sourcing from low-TPU countries, the new imports from low-TPU countries substitute continuing imports from high-TPU countries, leading to less stockpiling incentive.

Columns 3 and 4 of Table 1 show that TPU led firms to reduce both the number of high-TPU countries they sourced from and their imports from the average high-TPU country, driven by firm exit. A 10-percentage-point increase in U.S. TPU reduced the expected number of high-TPU countries sourced from by 0.03 and lowered imports from the average high-TPU country by 15.2%. Taking these results together, we find a clear pattern consistent with the idea that firms responded to TPU swiftly and reallocated their import sources from high-TPU to low-TPU countries.

The elasticity of trade to TPU is comparable to the trade elasticity. To study the total effect of TPU on firm imports over time, we use the long-difference specification from Equation (3.3). The change is measured as the difference between the variable's average value before the "Liberation Day" and its average value from June through August 2025.

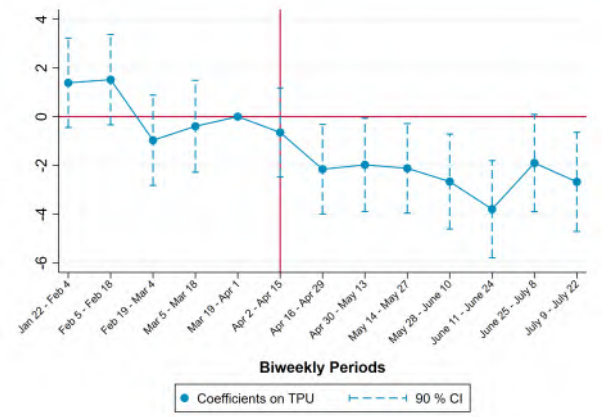
Table 2 estimates the elasticity of trade with respect to tariff threats.[34] These estimates are large and comparable to previous trade elasticities with respect to tariffs. Between the second and fourth months after "Liberation Day," a 10-percentage-point increase in U.S. TPU reduced firm imports from high-TPU countries by 17% ($= 10\% \times$ non-China import share $\times$ 3.2175) and increased imports from countries without "Liberation Day" TPU by 17%. The non-China import share for an average firm-product equals 54% according to Table B.1.

Table 2 also highlights a strong trade adjustment to TPU on the extensive margin. A 10-percentage-point increase in U.S. TPU reduced the probability of U.S. firms importing from high-TPU countries by 1.4 percentage points and increased this probability from countries without "Liberation Day" TPU by 1.3 percentage points between the second and fourth month after the "Liberation Day."

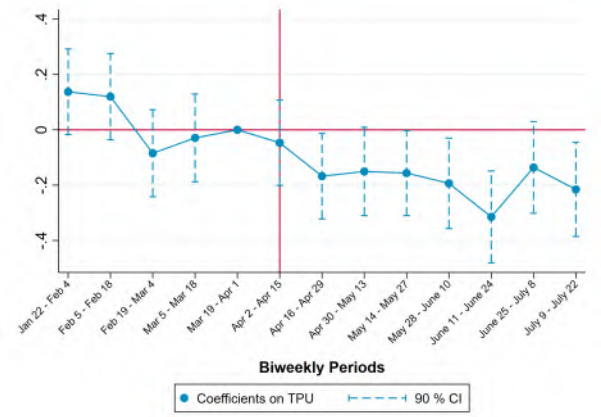
[34] Table C.2 shows the corresponding results for import weights estimated with the long-difference specification, Equation (3.3). Tables C.3 and C.4 show the average treatment effects over time for import values and weights, per Equation (C.1).

Figure 5: Firms Decreased Import Values from "High-TPU Countries"

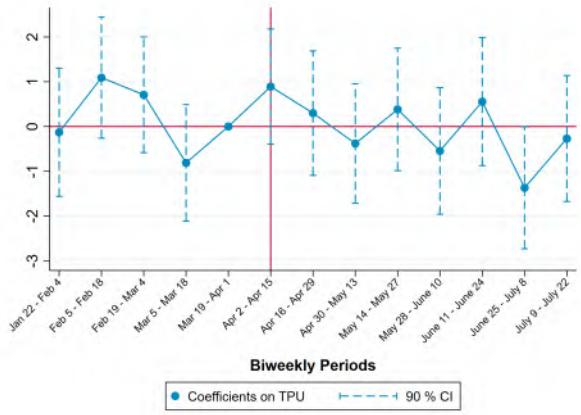
(a) IHS(Value from High-TPU Countries)



(b) $\mathbb{I}$(Value from High-TPU Countries > 0)



(c) Log(Value from High-TPU Countries)



Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the import values of product p by firm f in time t from high-TPU countries. "High-TPU countries" refer to those facing more than 36% announced "Liberation Day" tariffs, corresponding to the top 15 countries with the highest "Liberation Day" tariffs. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Meanwhile, the intensive margin showed no significant change.

These findings indicate that firms adjusted their supply chains rapidly and substantially to import from low-risk countries as a result of TPU, rather than engaging in reshoring to the U.S. or stockpiling from their existing suppliers. The magnitude of reallocation is comparable to the effects of actual tariffs. For example, Fajgelbaum et al. (2020) estimate an elasticity of about -2 for U.S. imports from China with respect to the U.S. tariff against China. Javorcik et al. (2025) find a similar elasticity at the firm-product level. The speed and magnitude of firm responses to TPU, therefore, suggest that elasticity with respect to tariff threats is also an important policy parameter.

Advanced Asia and neutral countries benefited the most from the "Liberation Day" TPU. Figure 6 illustrates the regional shifts in U.S. imports among highly exposed firms. It plots

Table 2: TPU Effects on Firm Imports: Value, Long Difference

	(1)	(2)	(3)
	ΔIHS(*Value of Import from 10% Countries*)	ΔIHS(*Value of Import from High-TPU Countries*)	ΔIHS(*Value of Import from All Countries*)
TPU_{fp}	3.0768***	-3.2176***	0.0534
	(0.7703)	(0.8722)	(0.2123)
R^2	0.424	0.411	0.324
Observations	22638	17762	227730
	$\Delta\mathbb{I}$(*Value of Import from 10% Countries* >0)	$\Delta\mathbb{I}$(*Value of Import from High-TPU Countries* >0)	$\Delta\mathbb{I}$(*Value of Import from All Countries* >0)
TPU_{fp}	0.2495***	-0.2669***	0.0023
	(0.0640)	(0.0717)	(0.0182)
R^2	0.416	0.409	0.322
Observations	22638	17762	227730
	$\Delta\log$(*Value of Import from 10% Countries*)	$\Delta\log$(*Value of Import from High-TPU Countries*)	$\Delta\log$(*Value of Import from All Countries*)
TPU_{fp}	0.0010	-0.7127	0.1796
	(0.5726)	(0.5625)	(0.1397)
R^2	0.446	0.342	0.296
Observations	5238	5462	69307
Firm FE	✓	✓	✓
Product FE	✓	✓	✓
Controls	✓	✓	✓

Notes: This table displays estimates from Equation (3.3) where the dependent variable is the import value of product p by firm f in time t from "10% Countries," high-TPU countries, and all countries. "10% countries" refer to those facing 10% announced "Liberation Day" tariff. "High-TPU countries" refer to those facing more than 36% announced "Liberation Day" tariffs, corresponding to the top 15 countries with the highest "Liberation Day" tariffs. The long difference is computed by subtracting the average value of the dependent variable before April 2 from its average value after May 28. Standard errors (in parentheses) are clustered at the firm-product level $(f-p)$. *** p<0.01, ** p<0.05, * p<0.1.

the coefficients and 90% confidence interval from the long-difference specification, Equation (3.3), where the dependent variable is total import values from the region indicated on the horizontal axis.[35]

Figure 6a shows that firms facing large TPU decreased their imports significantly from China and developing Asian countries such as Vietnam. On the other hand, they increased their imports significantly from Latin America and Africa, which is consistent with our previous findings since a vast majority of Latin American and African countries are 10% countries, as can be seen in Figure 1. Moreover, highly exposed U.S. firms increased their imports from advanced Asian nations. Although they are not low-TPU countries, they likely offer closer substitutes for imports from China. The imports from the European Union, which were subject to a 20% "Liberation Day" tariff, have not significantly changed.

Of particular interest in the literature is trading with different geopolitical blocs (Bonadio et al., 2025). Figure 6b shows that highly exposed U.S. firms reallocated their imports generally from the China-aligned bloc to unaligned nations. This suggests that TPU from "Liberation Day" would have intensified the disintegration between the geopolitical blocs.

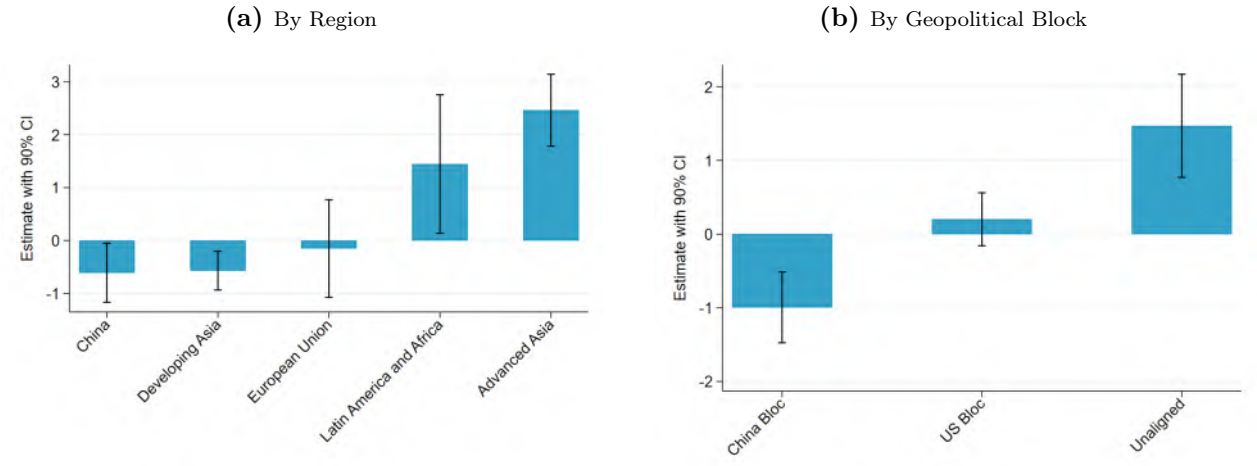
4.2 Total Imports Did Not Fall but Import Price Increased

Figure 7 shows that firm-product level total imports did not significantly change, either in overall value or at the intensive and extensive margins.[36] For this finding, we use firm-product level total

[35] Figure C.3 shows the time-averaged effect of TPU on firm-product imports from different country groups estimated with Equation (C.1).

[36] Figure C.4 shows the corresponding event study results for firm-product level total import weights.

Figure 6: TPU Effects on Firm Imports from Different Country Groups: Long Difference



Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.3) where the dependent variable is total imports from the region indicated in the horizontal axis. In Figure 6b, geopolitical block assignment is based on Bonadio et al. (2025). The long difference is computed by subtracting the average value of the dependent variable before April 2 from its average value after May 28.

imports (inverse hyperbolic sine, indicator, and log) as the dependent variable in Equation (3.2). Columns 5 and 6 of Table 1 further confirm these patterns, showing that TPU did not significantly affect the number of countries from which a firm sourced or its average imports per country. Column 7 of Table 1 also shows that the dispersion of imports across sourcing countries, measured by the Herfindahl Index, did not significantly change.

Taken together, these results show that the increase in sourcing from low-TPU countries almost completely offset the decrease from high-TPU countries, resulting in no significant change in overall imports. These findings suggest that the "strategic uncertainty" has not led firms to substitute away from international sourcing in favor of greater domestic production. Instead, TPU only redirected imports from high-TPU countries to low-TPU countries.

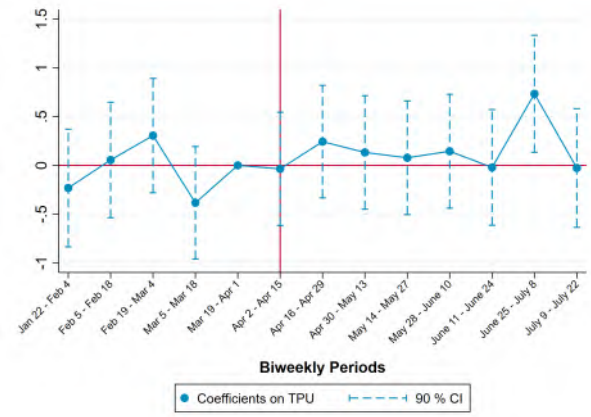
TPU raised average firm-product level overall price in later periods. Table 3 shows that TPU increased the average firm-product level price, while country-specific prices did not change significantly. We calculate these prices by dividing the total import value from all or specific countries by their respective weights.

As shown in Column 3 of Table 3, a 10-percentage-point increase in U.S. TPU against all countries raised the average U.S. firm's import price by 0.6% between the second and fourth months after TPU was introduced.[37] The event study in Figure 8 confirms this finding. The time at which the firm-product level price displayed a significant increase occurred almost simultaneously with their

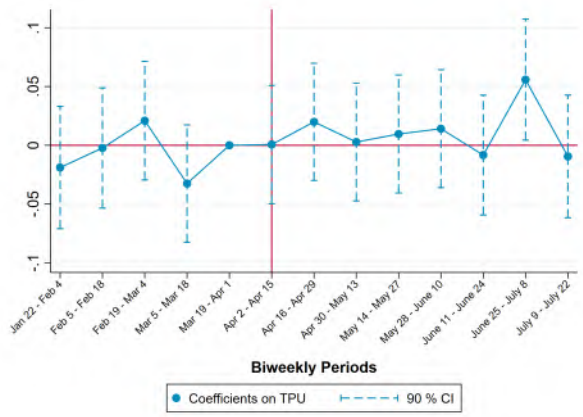
[37]This number is acquired by multiplying the coefficient 0.1087 with the non-China import share for an average firm-product (54%, Table B.1).

Figure 7: TPU Did Not Significantly Affect Firm-Product Imports from all Countries

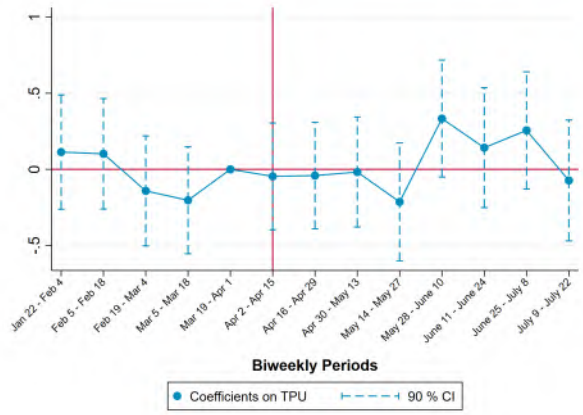
(a) IHS(Value from All Countries)



(b) $\mathbb{I}$(Value from All Countries > 0)



(c) Log(Value from All Countries)



Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the total import values of product p by firm f in time t. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

significant increase in imports from 10% countries (Figure 4).

Columns 1 and 2 of Table 3 show that prices for continuing imports from "10% countries" or high-TPU countries did not significantly change. Identifying the price coefficient requires firm-product pairs to import from a specific country group both before and after "Liberation Day," meaning these estimates capture price changes for continuing imports from the same country group. This lack of a price change for continuing importers is expected, as no country-specific tariffs were implemented during this period.

Taken together, these results indicate that the "*switchers*"—firms that exited high-TPU countries and entered "10% countries"—incurred higher import costs. This finding is consistent with the theory in Heise (2024), which shows that trade partners accumulate relationship-specific capital (which new switchers lack) to lower bilateral prices. It is also consistent with patterns from the 2018 U.S.-China

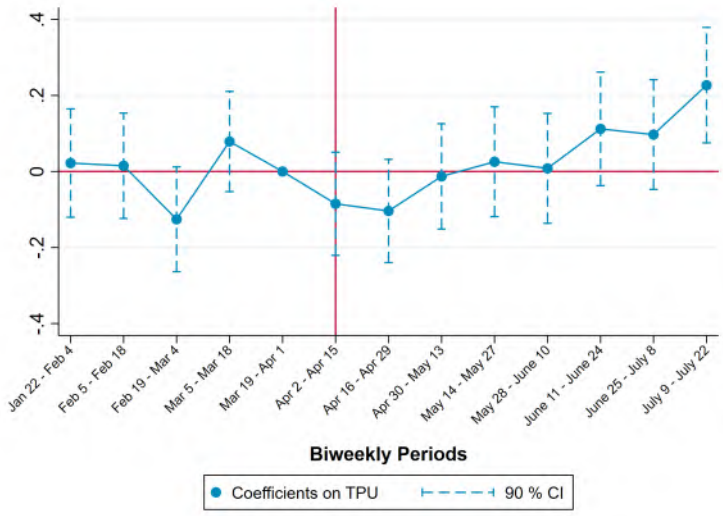
Table 3: TPU Raised Firm-Product Level Prices but Not Country-Specific Prices: Long Difference

	(1)	(2)	(3)
	$\Delta \log(\textit{Price of Import from 10\% Countries})$	$\Delta \log(\textit{Price of Import from High-TPU Countries})$	$\Delta \log(\textit{Price of Import from All Countries})$
TPU_{ip}	0.0528	-0.0037	0.1087*
	(0.2277)	(0.1549)	(0.0611)
R^2	0.514	0.497	0.351
Firm FE	✓	✓	✓
Product FE	✓	✓	✓
Controls	✓	✓	✓
Observations	5238	5462	69307

Notes: This table displays estimates from Equation (3.3) where the dependent variable is the log import price of product p by firm f in time t from "10% Countries," high-TPU countries, and all countries. "10% countries" refer to those facing 10% announced "Liberation Day" tariff. "High-TPU countries" refer to those facing more than 36% announced "Liberation Day" tariffs, corresponding to the top 15 countries with the highest "Liberation Day" tariffs. The long difference is computed by subtracting the average value of the dependent variable before April 2 from its average value after May 28. Standard errors clustered at the firm-product ($f-p$) level are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

trade war with evidence that importers who switch suppliers face higher prices (Monarch, 2022; Monarch and Schmidt-Eisenlohr, 2023).

Figure 8: Firm-Product Level Overall Price Increased Two Months After the "Liberation Day"



Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the overall price of product p by firm f in time t. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

4.3 Mechanism: Resource and Liquidity Needs to Find New Suppliers

Measures of resource and liquidity needs. Although the additional reciprocal tariffs above the 10% baseline were not implemented during the four-month uncertainty window, U.S. importers nevertheless preemptively shifted their import sources, despite facing higher import prices. This

behavior implies that adopting a *wait-and-see* strategy—reallocating import sources only if the tariffs are ultimately imposed at the end of the uncertainty window—entailed nontrivial risks. We hypothesize that firms for which establishing new suppliers is more resource- and liquidity-intensive face greater such risks, and therefore have stronger incentives to adjust preemptively rather than wait-and-see, because delayed adjustment may be infeasible once tariffs are imposed. To concretely test this hypothesis, we consider several industry-level measures as follows.

First, firms that import products requiring higher inventories relative to sales would face higher liquidity pressure (see Alessandria et al. 2010, among others). Such firms would preemptively switch to importing from low-TPU countries, rather than risk being unable to switch once tariffs are imposed. To capture this idea, we use the cash conversion cycle from Tong and Wei (2020), which is referred to as the inventories ratio in Manova et al. (2015) and measures the intrinsic liquidity needed for working capital. At the firm-level, it is defined by the following formula using Compustat USA Industrial Annual:

$$\text{Inventory intensity} = 365 \times \left(\frac{\text{inventories} - \text{accounts payable}}{\text{cost of goods sold}} + \frac{\text{accounts receivable}}{\text{total sales}} \right).$$

An industry-level proxy is then constructed as the median within each U.S. SIC three-digit industry.

Second, contract-intensive firms require more time to establish new supplier relationships and would have to pay high tariffs for a longer duration if the tariffs are actually imposed after the end of the uncertainty window. Therefore, such firms would be more likely to preemptively switch their import sources. To test this hypothesis, we consider the industry-level measure of contract intensity following Nunn (2007).

Third, trade-finance-intensive firms would face higher reallocation and financing costs in a high-tariff environment, leading them to preemptively reallocate import sources. For instance, Paravisini et al. (2023) show that banks providing trade finance specialize by partner country. Thus, when firms switch international suppliers, they often must establish new banking relationships, making reallocation more difficult for trade-finance-intensive firms, especially in a high-tariff environment. In particular, tariffs raise importers' trade finance costs for supply chain reallocation by reducing profits and thereby increasing default risks. In response, banks charge higher interest rates for trade finance, consistent with models in which lending rates compensate for default probability (Holmstrom and Tirole, 1997) and recent empirical evidence (Correa et al., 2023; Alfaro et al., 2025). To avoid these risks, firms that import trade-finance-intensive products would switch to low-TPU countries preemptively. To evaluate this hypothesis, we use a product's trade credit intensity from Manova et al. (2015).

Fourth, firms that import products that require larger external finances for production would face a higher risk of being unable to finance supplier search and re-contracting if tariffs are imposed

in August. Therefore, such firms would preemptively find import sources rather than wait-and-see.

To capture this idea, we use the measure from Tong and Wei (2020), which was first proposed by Rajan and Zingales (1998), defined by the following formula for individual firms in Compustat

$$\text{External financial dependence} = \frac{\text{Capital expenditures} - \text{Cash flow}}{\text{Capital expenditures}},$$

and the industry level proxy is again obtained as the median within each industry.

In sum, we hypothesize that firms have stronger incentives to preemptively adjust to TPU if their imports are more inventory-intensive, contract-intensive, trade-finance-intensive, or more dependent on external finances.

Firm-level resource and liquidity needs to find new suppliers. To construct firm-level characteristics, we take the weighted average of product-level measures for all products a firm imports, using pre-period import shares as weights, similar to the TPU definition in Equation (3.1). Like before, we exclude China (along with Hong Kong and Macau) from the numerator. Since our TPU measure focuses on non-China countries, the import intensity of inventory-, contract-, or trade-finance-intensive products from China is less relevant for this TPU effect.

$$\text{Firm Char}_f = \frac{\sum_{c \neq CN} \sum_p \text{IMP}_{f,p,c,pre} \times \text{Product Char}_p}{\sum_c \sum_p \text{IMP}_{f,p,c,pre}}.$$

To study how firm characteristics drive this reallocation, we consider the following regression specification:

$$\Delta y_{f,p} = \beta^0 \text{TPU}_{f,p} + \beta^1 \text{TPU}_{f,p} \times \text{Firm Char}_f + \theta^0 \text{X}_{f,p} + \theta^1 \text{X}_{f,p} \times \text{Firm Char}_f + \delta_p + \delta_f + \epsilon_{f,p}, \tag{4.1}$$

where, compared to Equation (3.3), this specification adds an interaction between $\text{TPU}_{f,p}$ and firm characteristics to test whether firms with specific characteristics have reallocated more. We also include the interactions between these firm characteristics and the previous control variables as additional controls.

Table 4 indicates that, given the import shares and the announced tariffs, the firms that would find it more difficult to adjust to actual tariffs (those importing products with high inventory requirements or relationship-specific contracts, Columns 1 and 2) and those relying more on trade finance (Columns 3 and 4) increased their imports more toward "10% countries" during the TPU episode.[38] The greater robust reallocation toward "10% countries" among inventory-intensive firms explains the absence of stockpiling from high-TPU origins: inventory-intensive firms substituted

[38]Table C.5, which presents the average treatment effect counterpart for Table 4, shows consistent findings. The coefficient for inventory intensive firms is less significant but points in the same direction.

Table 4: Firms with Inventory-, Contract-, or Trade-Finance-Intensive Supply Chains Reallocated Preemptively

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ΔIHS(Value of Imports from 10% Countries)							
$\text{TPU}_{fp}\times$*Inventory* Import Intensity$_f$	8.5246**				8.2553**			
	(3.9841)				(3.9741)			
$\text{TPU}_{fp}\times$*Contract* Import Intensity$_f$		4.1637*				4.4037*		
		(2.4437)				(2.4439)		
$\text{TPU}_{fp}\times$*TCI* Import Intensity$_f$			12.9647***				12.5671**	
			(4.8576)				(4.9294)	
$\text{TPU}_{fp}\times$*EFD* Import Intensity$_f$				7.7089**				7.4352**
				(3.5571)				(3.5496)
$\text{TPU}_{fp}\times\text{Total Import}_{fp}$					0.1870	0.1790	0.1856	0.1911
					(0.1541)	(0.1544)	(0.1542)	(0.1541)
TPU_{fp}	-1.0484	0.1395	-0.7883	-1.3354	-3.1796	-2.0761	-2.9026	-3.4883
	(1.5644)	(1.1959)	(1.1531)	(1.6590)	(2.5278)	(2.3042)	(2.3010)	(2.5834)
R^2	0.367	0.367	0.367	0.367	0.368	0.368	0.368	0.368
Firm FE	✓	✓	✓	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Observations	36576	36576	36576	36576	36576	36576	36576	36576

Notes: This table displays estimates from Equation (4.1) where the dependent variable is the import values of product p by firm f in time t from "10% Countries." "10% countries" refer to those facing 10% announced "Liberation Day" tariff. The long difference is computed by subtracting the average value of the dependent variable before April 2 from its average value after May 28. Control variables include those in the baseline specification (3.3) and their interactions with the respective firm characteristics. Standard errors clustered at the firm-product ($f-p$) level are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

across sources (reallocation) rather than across time (stockpiling) to minimize exposure to future tariff risks.

Once we include the interaction between TPU and these firm characteristics, the coefficient on TPU alone becomes insignificant. This suggests that, given the cost of reallocation, firms with the least dependence on inventory, contract, and trade finance had no incentive to adjust before tariffs were actually imposed.

Columns 5–8 of Table 4 further control for the interaction between TPU and firm-product level total imports to measure the firm size effect. The preemptive reallocation among contract-intensive and trade-finance-dependent firms remains robust.

Summary. Despite the cost of reallocation, inventory-, contract-, and trade-finance-dependent firms adjusted preemptively to TPU. For these firms, waiting until tariffs were implemented would have been even more costly. Inventory-intensive firms would face large tariff liabilities when restocking. Contract-intensive firms require more time to form new supplier relationships and would therefore pay high tariffs for longer before switching. Firms that rely more on trade finance would face higher borrowing costs to establish new supply chains in a high-tariff environment. As a result, all three types of firms would incur larger profit losses if they waited and tariffs were imposed, making adjustment even more difficult after implementation. In contrast, firms with more flexible supply chains and lower trade-finance needs would wait, as they could swiftly adjust if tariffs were actually implemented. In short, firms that would be hardest hit by tariffs had the greatest incentive to

reallocate their imports when facing TPU.[39]

The strong reallocation toward "10%-countries" by inventory-intensive firms explains the lack of inventory stockpiling documented earlier. Because firms with high inventory requirements began sourcing from low-TPU countries, their incentive to stockpile from high-TPU origins was reduced.

4.4 Extensions and Robustness Tests

As robustness tests, we conduct a regression at the firm-product-country level, interacting firm-product TPU with each country's "Liberation Day" tariff. This test aims to show that firms with higher TPU exposure have reallocated imports toward countries with relatively low TPU, confirming that our baseline findings are not driven by the subsampling of "10% countries" and high-TPU countries. We also conduct a product-level regression to eliminate concerns about missing firm names. The result is also robust to an alternative measure of TPU based on firm-product import shares from countries subject to announced "Liberation Day" tariffs above 10%., which does not rely on the assumption that countries with higher reciprocal tariffs faced higher TPU. Additionally, we show that the baseline results are not affected by adding or dropping controls for other country characteristics. We then test the baseline's robustness using several sample selection methods: (1) excluding products mostly imported from Canada or Mexico; (2) dropping products exempt from the "Liberation Day" tariff; (3) keeping products targeted by Section 232 (National Security) investigations and assigning their respective tariff rates; (4) keeping "de minimis" imports; and (5) restricting the sample to manufacturing products.

Firm-product-country level analysis. We use the following specification to study whether TPU led firms to source more from low-TPU countries relative to high-TPU countries. This specification demonstrates that our baseline findings are not driven by the subsampling of "10% countries" and high-TPU countries.

$$\begin{aligned} y_{f,p,c,t} = &\sum_{u} \beta_u \mathbb{I}\{u = t\} \times \text{TPU}_{f,p} \times \text{Lib Tariff}_c \\ &+ \sum_{u} \theta_u \mathbb{I}\{u = t\} \times \text{X}_{f,p} \times \text{Lib Tariff}_c + \delta_{f,p,c} + \delta_{p,c,t} + \delta_{f,p,t} + \delta_{f,d,t} + \epsilon_{f,p,c,t}. \end{aligned} \tag{4.2}$$

Equation (4.2) interacts firm-product level TPU with Lib Tariff$_c$, which denotes country c's "Liberation Day" tariff or whether c is a "10% country." Other notations are the same as Equation (3.2).

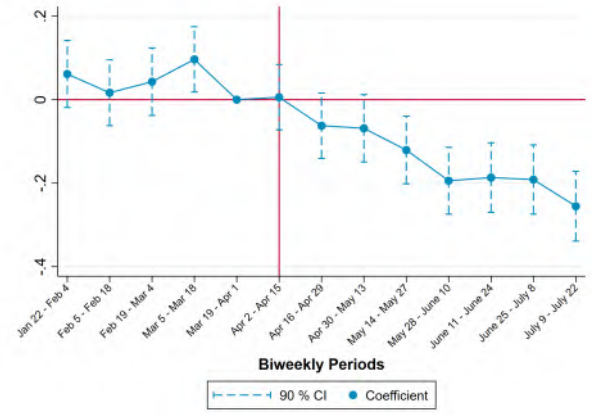
Figure 9 shows that TPU led firms to reduce sourcing from higher TPU countries relative to lower TPU countries and increase sourcing from "10% countries" relative to the rest. Figure C.5

[39] In the context of the 2018 U.S.-China trade war, Benguria and Saffie (2024) find that firms importing more "sticky" and trade-finance-dependent products were more severely affected by tariffs. Alfaro et al. (2025) find that firms that changed suppliers incurred higher interest rates to finance their supply chain adjustments. These findings suggest that contract- and trade-finance-intensive firms were hit hardest by the tariffs.

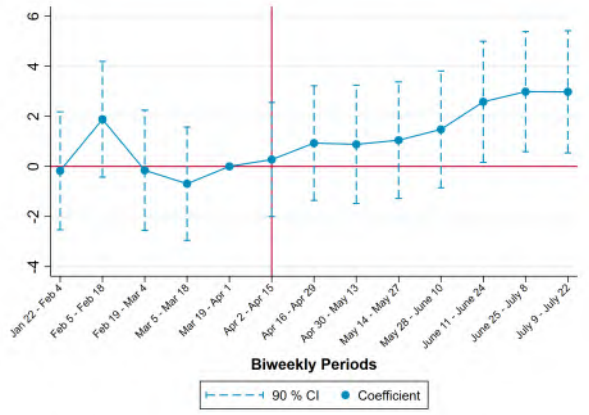
confirms that such an adjustment was driven by firm-product entry and exit into different countries (the extensive margin) rather than the intensive margin.

Figure 9: Effects on Firm-Product-Country Level Import Value

(a) Interaction with "Liberation Day" Tariff



(b) Interaction with $\mathbb{I}\{\text{c is 10\%}\}$



Notes: This figure displays the coefficients and 90% confidence interval from Equation (4.2) where the dependent variable is the import values of product p by firm f from country c in time t. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Product-level analysis. In the baseline analysis, we have excluded "de minimis" trade, which reduced the share of transactions with missing firm identifiers to below 20%. To fully address the concern over missing firm identifiers, we also conduct the corresponding analysis at the product level. This approach includes all imports, aggregating data for firms both with and without identifiers. We consider the following specification:

$$\begin{aligned} y_{p,c,t} = &\sum_u \beta_u \mathbb{I}\{u = t\} \times \text{TPU}_p \times \mathbb{I}\{\text{c is 10\%}\} \\ &+ \sum_u \gamma_u \mathbb{I}\{u = t\} \times \text{X}_p \times \mathbb{I}\{\text{c is 10\%}\} + \delta_{4digit\,p,c,t} + \delta_{p,c} + \delta_{p,t} + \epsilon_{f,p,c,t}. \end{aligned} \tag{4.3}$$

Importantly, we control for the HS 4-digit product-country-time fixed effect, $\delta_{4digit\,p,c,t}$. This allows us to compare products that fall within the same HS 4-digit category, have similar characteristics, but face different levels of TPU. In previous firm-product-level regressions, we similarly control for $\delta_{p,t}$ or $\delta_{p,c,t}$ to compare firms that import the same product but face different TPUs. In the previous analysis, we also control for $\delta_{f,t}$ or $\delta_{f,c,t}$ to compare products facing different levels of TPU but imported by the same firm. Without these fixed effects, we would have to compare adjustments across very different products, which would not be a meaningful comparison.

Figure C.6 shows that the baseline findings remain robust at the product-level. For similar products, TPU reduced product imports from high-TPU countries relative to low-TPU countries, and increased product imports from "10% countries" relative to the rest. These observations alleviate

concerns that firms with missing identifiers might distort the baseline findings.

Measuring TPU as import share from "above-10%" countries. In this robustness test, we measure TPU as the import share from "above-10%" countries. We adopt this specification for two reasons. First, Benguria and Saffie (2025) argue that the sequence of policy announcements before April 2 created expectations of possible new tariffs linked to bilateral trade deficits, but the specific truncation at 10% was unexpected. Second, one may argue that among countries assigned rates above 10%, the severity of TPU may not be fully captured by the announced tariff levels because negotiation prospects differed across countries. While our parallel-trends tests support the view that the official formula determining country-specific tariff magnitudes was not anticipated, and our fixed effects capture time-invariant country characteristics, we further address these concerns by constructing the TPU measure purely from pre-period import shares from all "above-10%" countries. Specifically, for firm f and product p, we define:

$$\text{TPU}_{f,p} = \frac{\sum_{c \neq CN} \text{IMP}_{f,p,c,pre} \text{I}(\Delta\text{Tariff}_{p,c} > 0)}{\sum_{c} \text{IMP}_{f,p,c,pre}}, \tag{4.4}$$

where $\text{IMP}_{f,p,c,pre}$ denotes firm f's total imports of product p from country c (excluding China) in 2023 and 2024, and $\Delta\text{Tariff}_{p,c} = \text{Tariff}_{p,c} - 10\%$ represents the difference between the announced rate and the baseline 10% for country c.

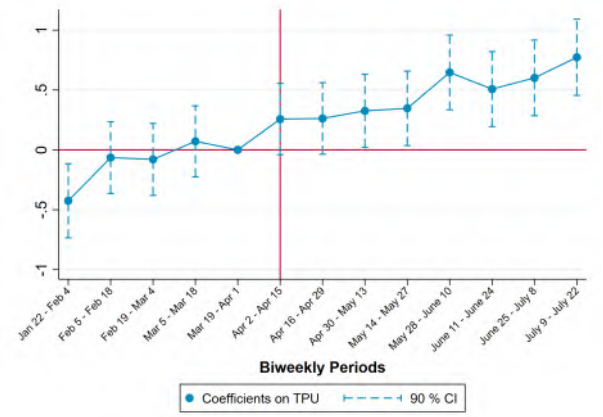
Figure 10 shows that our qualitative results are maintained: TPU reallocated firm imports from high-TPU countries toward low-TPU countries. Importantly, this alternative TPU measure is not influenced by variation in country-specific announced rates above 10%, alleviating concerns that these higher rates may have been partially anticipated or may not fully capture the severity of TPU.

Adding or dropping controls for other country characteristics. We add or drop controls for other country characteristics (except for TPU, China, and trade deficit exposures) to show that these controls do not significantly affect the baseline findings. We add firm-product exposure to cross-country GDP growth rates and export levels to the U.S., following Equation (C.2). Figure C.7, which reports these results, shows that these other controls do not significantly change the baseline findings. Figure C.8 shows the result when Equation (3.2) excludes all controls except for TPU and China exposures, as well as the trade deficit control. The results again do not significantly change. These findings suggest that TPU itself, rather than confounders, is driving the reallocation.

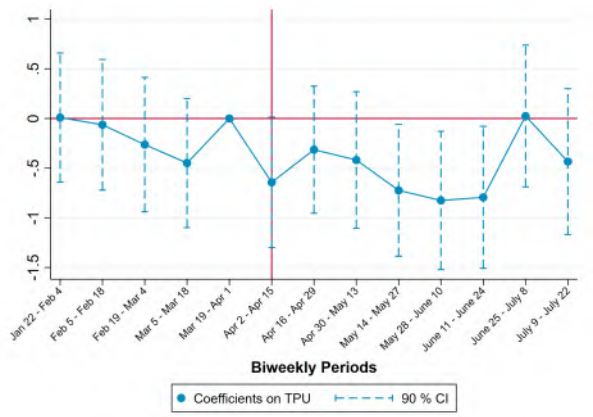
Excluding products mostly imported from Canada or Mexico. As we document in Section 2, we excluded Canada and Mexico from the baseline analysis for two reasons. First, they were not targeted by the "Liberation Day" tariffs on April 2 and thus faced no TPU from the announcement.

Figure 10: Measuring TPU as Import Shares from Above-10% Countries

(a) IHS(Import Value from "10% Countries")



(b) IHS(Import Value from High-TPU Countries)



Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the import values of product p by firm f in time t, and TPU is alternatively measured using the 2023-2024 import shares from countries subject to Liberation Day tariff rates above the 10% baseline. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Second, U.S. imports from these neighbors are primarily by land, but Panjiva's U.S. import data only provides maritime trade information.

Missing these countries should not significantly affect the country-specific TPU in Equation (3.1). However, their omission might affect the pre-period import shares used to construct the TPU (Equation 3.1) and the China exposures (Equation 3.4).

In this robustness test, we address this by dropping HS 6-digit products that were primarily (more than 90%) imported from Canada or Mexico in 2023 and 2024, as identified with UN Comtrade data. We focus on products less imported from Canada and Mexico, as their omission will have a smaller effect on the pre-period import shares. Figure C.9 shows that the baseline findings remain robust under this selection.

Excluding products exempt from "Liberation Day" tariffs. Our baseline assigns zero TPU to products strategically exempt from "Liberation Day" tariffs, assuming they are unlikely to be targeted in the future. In this robustness test, we drop these exempt products. As Figure C.10 shows, the results have barely changed.

Including products targeted by Section 232. The baseline analysis excludes products targeted by Section 232 (National Security) investigations, such as automobiles and steel. In this robustness test, we retain these products but assign them TPU based on their tariff information from PIIE Trump's Trade War Timeline 2.0.[40] Figure C.11 shows that the results remain robust.

[40] If a product has a Section 232 tariff of $\text{Tariff}_{p,c}$, we set its TPU to $\Delta\text{Tariff}_{p,c} = \text{Tariff}_{p,c} - 10\%$.

Including "de minimis" imports. Our baseline excludes "de minimis" imports for two reasons. First, most of these transactions lack importer names. Second, the U.S. also announced on "Liberation Day" that it was ending duty-free treatment for these shipments from China. In this robustness test, we include "de minimis" imports. Figure C.12 shows that including them does not significantly affect the baseline results, as they account for a tiny share of total import values.

Restricting the sample to manufacturing products. Lastly, Figure C.13 restricts the sample to manufacturing products, which shows that our results are not driven by certain agricultural or mining products.

5 Conclusion

President Trump's announcement and subsequent postponement of the "Liberation Day" tariffs generated large cross-country variations in TPU. Leveraging this quasi-experiment, we examine how TPU affected U.S. importers' supply chain reallocation—a critical but underexplored dimension of firm adjustment in an era of heightened global uncertainty.

We find that even a brief period of TPU can significantly disrupt supply chains. Firms more exposed to TPU increased their sourcing from "10% countries" (those facing limited TPU from the announcement) and reduced sourcing from high-TPU countries, with most of the adjustment occurring on the extensive margin. While overall imports at the firm-product level did not change significantly, an average firm experienced higher import prices, driven by those that substantially adjusted their sourcing origins. The speed and magnitude of these responses suggest that even a surge in TPU lasting a few months can induce rapid and substantial adjustments in global sourcing.

The effects were more pronounced among firms importing inventory-intensive, contract-dependent, and trade-finance-dependent products. Because adjusting supply chains—especially entering new sourcing relationships—requires time and investment, these firms preemptively adjusted their sourcing patterns, recognizing that they would face greater profit losses and slower adjustment had tariffs been imposed before they could switch. This highlights that the firms most vulnerable to tariff shocks are precisely those that engage in precautionary reallocation under TPU.

These findings suggest that even when tariffs are used as a negotiating tactic and may not be implemented, firms still incur real reallocation costs. By shifting from high-TPU to low-TPU countries, firms face higher import prices and the costs of establishing new supply relationships while disconnecting from existing ones. Our results also indicate that accommodative financial conditions, particularly access to trade finance, help firms adjust their supply chains in an environment of rising TPU and trade barriers. The "Liberation Day" TPU did not drive U.S. firms to replace imports with domestic production, as it only diverted imports from high-TPU to low-TPU countries without

significantly affecting overall imports. These evidence demonstrates limits to the stated policy goal of using "strategic uncertainty," particularly tariff threats, as a bargaining chip or reshoring incentive.

References

Alessandria, G., Kaboski, J. P., and Midrigan, V. (2010). Inventories, lumpy trade, and large devaluations. *American Economic Review*, 100(5):2304–2339.

Alessandria, G., Khan, S. Y., and Khederlarian, A. (2024). Taking stock of trade policy uncertainty: Evidence from China's pre-WTO accession. *Journal of International Economics*, 150:103938.

Alfaro, L., Brussevich, M., Minoiu, C., and Presbitero, A. F. (2025). Bank financing of global supply chains. Technical report, National Bureau of Economic Research.

Alfaro, L. and Chor, D. (2023). Global supply chains: The looming "great reallocation". Technical report, National Bureau of Economic Research.

Amiti, M., Redding, S. J., and Weinstein, D. E. (2019). The impact of the 2018 tariffs on prices and welfare. *Journal of Economic Perspectives*, 33(4):187–210.

Arkolakis, C., Costinot, A., and Rodríguez-Clare, A. (2012). New trade models, same old gains? *American Economic Review*, 102(1):94–130.

Baker, S. R., Bloom, N., and Davis, S. J. (2016). Measuring economic policy uncertainty. *The Quarterly Journal of Economics*, 131(4):1593–1636.

Benguria, F., Choi, J., Swenson, D. L., and Xu, M. J. (2022). Anxiety or pain? the impact of tariffs and uncertainty on Chinese firms in the trade war. *Journal of International Economics*, 137:103608.

Benguria, F. and Saffie, F. (2024). Escaping the trade war: Finance and relational supply chains in the adjustment to trade policy shocks. *Journal of International Economics*, 152:103987.

Benguria, F. and Saffie, F. (2025). Rounding up the effect of tariffs on financial markets: Evidence from April 2, 2025. Technical report, National Bureau of Economic Research.

Bonadio, B., Huo, Z., Kang, E., Levchenko, A. A., Pandalai-Nayar, N., Toma, H., and Topalova, P. (2025). Playing with blocs: Quantifying decoupling. Technical report, National Bureau of Economic Research.

Caldara, D., Iacoviello, M., Molligo, P., Prestipino, A., and Raffo, A. (2020). The economic effects of trade policy uncertainty. *Journal of Monetary Economics*, 109:38–59.

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

Correa, R., Di Giovanni, J., Goldberg, L. S., and Minoiu, C. (2023). *Trade uncertainty and US bank*

lending, volume 31860. National Bureau of Economic Research.

De Souza, G., Hu, N., Li, H., and Mei, Y. (2024). (Trade) war and peace: How to impose international trade sanctions. *Journal of Monetary Economics*, page 103572.

Dhingra, S., Huang, H., Ottaviano, G., Paulo Pessoa, J., Sampson, T., and Van Reenen, J. (2017). The costs and benefits of leaving the EU: Trade effects. *Economic Policy*, 32(92):651–705.

Dhingra, S., Ottaviano, G. I., Sampson, T., and Reenen, J. V. (2016). The consequences of Brexit for UK trade and living standards.

Fajgelbaum, P., Goldberg, P., Kennedy, P., Khandelwal, A., and Taglioni, D. (2024). The US-China trade war and global reallocations. *American Economic Review: Insights*, 6(2):295–312.

Fajgelbaum, P. D., Goldberg, P. K., Kennedy, P. J., and Khandelwal, A. K. (2020). The return to protectionism. *The Quarterly Journal of Economics*, 135(1):1–55.

Fajgelbaum, P. D. and Khandelwal, A. K. (2022). The economic impacts of the US-China trade war. *Annual Review of Economics*, 14(1):205–228.

Fan, J. and Luo, W. (2025). Global production networks with global uncertainty. *Available at SSRN 5282371*.

Flaaen, A., Haberkorn, F., Lewis, L., Monken, A., Pierce, J., Rhodes, R., and Yi, M. (2023). Bill of lading data in international trade research with an application to the COVID-19 pandemic. *Review of International Economics*, 31(3):1146–1172.

Flaaen, A. and Pierce, J. R. (2019). Disentangling the effects of the 2018-2019 tariffs on a globally connected US manufacturing sector.

Graziano, A. G., Handley, K., and Limão, N. (2021). Brexit uncertainty and trade disintegration. *The Economic Journal*, 131(635):1150–1185.

Graziano, A. G., Handley, K., and Limão, N. (2024). An import (ant) price of Brexit uncertainty. *Journal of International Economics*, 152:104012.

Handley, K., Kamal, F., and Monarch, R. (2024). Supply chain adjustments to tariff shocks: Evidence from firm trade linkages in the 2018-2019 US trade war. *Economics Letters*, 244:112009.

Handley, K., Kamal, F., and Monarch, R. (2025). Rising import tariffs, falling exports: When modern supply chains meet old-style protectionism. *American Economic Journal: Applied Economics*, 17(1):208–238.

Handley, K. and Limão, N. (2017). Policy uncertainty, trade, and welfare: Theory and evidence for China and the United States. *American Economic Review*, 107(9):2731–83.

Heise, S. (2024). Firm-to-firm relationships and the pass-through of shocks: Theory and evidence. *Review of Economics and Statistics*, pages 1–45.

Heise, S., Pierce, J. R., Schaur, G., and Schott, P. K. (2024). Tariff rate uncertainty and the structure of supply chains. Technical report, National Bureau of Economic Research.

Holmstrom, B. and Tirole, J. (1997). Financial intermediation, loanable funds, and the real sector. *Quarterly Journal of Economics*, 112(3):663–691.

Ignatenko, A., Lashkaripour, A., Macedoni, L., and Simonovska, I. (2025). Making America great again? The economic impacts of liberation day tariffs. Technical report.

Iyoha, E., Malesky, E., Wen, J., Wu, S.-J., and Feng, B. (2024). Exports in disguise?: Trade rerouting during the US-China trade war.

Javorcik, B., Pierce, J., and Wisniewski, E. (2025). Importers big and small: The heterogeneous impacts of US-China tariffs on sourcing and prices.

Manova, K. (2013). Credit constraints, heterogeneous firms, and international trade. *Review of Economic Studies*, 80(2):711–744.

Manova, K., Wei, S.-J., and Zhang, Z. (2015). Firm exports and multinational activity under credit constraints. *Review of Economics and Statistics*, 97(3):574–588.

Monarch, R. (2022). "It's Not You, It's Me": Prices, quality, and switching in US-China trade relationships. *Review of Economics and Statistics*, 104(5):909–928.

Monarch, R. and Schmidt-Eisenlohr, T. (2023). Longevity and the value of trade relationships. *Journal of International Economics*, 145:103842.

Nunn, N. (2007). Relationship-specificity, incomplete contracts, and the pattern of trade. *The Quarterly Journal of Economics*, 122(2):569–600.

Paravisini, D., Rappoport, V., and Schnabl, P. (2023). Specialization in bank lending: Evidence from exporting firms. *The Journal of Finance*, 78(4):2049–2085.

Pierce, J. R. and Schott, P. K. (2016). The surprisingly swift decline of US manufacturing employment. *American Economic Review*, 106(7):1632–1662.

Rajan, R. G. and Zingales, L. (1998). Financial dependence and growth. *American Economic Review*, 88(3):559–586.

Rodriguez-Clare, A., Vasquez, J. P., Teti, F. A., Ulate, M., and Zarate, R. D. (2025). The 2025 trade war: Dynamic impacts across U.S. States and the global economy.

Steinberg, J. B. (2019). Brexit and the macroeconomic impact of trade policy uncertainty. *Journal of International Economics*, 117:175–195.

Steinberg, J. B. (2025). Trade policy ambiguity. Technical report, National Bureau of Economic Research.

Tong, H. and Wei, S.-J. (2020). Did unconventional interventions unfreeze the credit market? *American Economic Journal: Macroeconomics*, 12(2):284–309.

Appendix A Institutional Background and Data

A.1 Formula Used by the Trump Administration to Determine the "Liberation Day" Tariffs

The Trump Administration's "Liberation Day"or "reciprocal" tariff framework is intended to identify the tariff rates that would eliminate bilateral trade deficits between the U.S. and each of its trading partners.[41] Formally, let τ_c denote the existing U.S. tariff rate on imports from country c, and $\Delta\tau_c$ the change required to balance bilateral trade. Define $\varepsilon < 0$ as the price elasticity of import demand, $\phi > 0$ as the pass-through of tariffs to import prices, $m_c > 0$ as total U.S. imports from country c, and $x_c > 0$ as total U.S. exports to country c. The reduction in imports resulting from a tariff increase is expressed as:

$$\Delta m_c = \varepsilon \, \phi \, m_c \, \Delta\tau_c. \tag{A.1}$$

Bilateral trade balance requires that post-tariff imports equal exports:

$$m_c + \Delta m_c = x_c. \tag{A.2}$$

Solving for the implied reciprocal tariff yields:

$$\Delta\tau_c = \frac{(m_c - x_c)}{m_c \, \varepsilon \, \phi}, \quad \text{subject to } \Delta\tau_c \geq 0. \tag{A.3}$$

Empirical parameters were selected based on established studies of trade elasticities. The price elasticity of import demand was set at $\varepsilon = 4$, the tariff pass-through rate was set at $\phi = 0.25$, reflecting "limited transmission of tariff changes to retail prices." A 50% "discount" on $\Delta\tau_c$ is further offered. For any country that does not run a bilateral trade surplus with the United States, the "Liberation Day" tariff is set at the policy floor of 10%. Therefore:

$$\text{LiberationDayTariff}_c = \max\left\{\frac{1}{2} \cdot \frac{\text{Surplus}_c}{\text{Imp}_c}, 10\%\right\}.$$

A.2 S&P Panjiva Data for U.S. Imports

We take the following steps to clean the Panjiva U.S. import data for 2023-2025 and report the fraction of transactions removed at each stage. Overall, only a small share of transactions is dropped during the cleaning process:

1. Drop records with missing or empty transaction identifiers (*panjivarecordid*) or missing origin country identifiers (*shpmtorigin*). These account for 0.015% of all transactions before 2024 and

[41] See https://ustr.gov/sites/default/files/files/Issue_Areas/Presidential%20Tariff%20Action/Reciprocal%20Tariff%20Calculations.pdf.

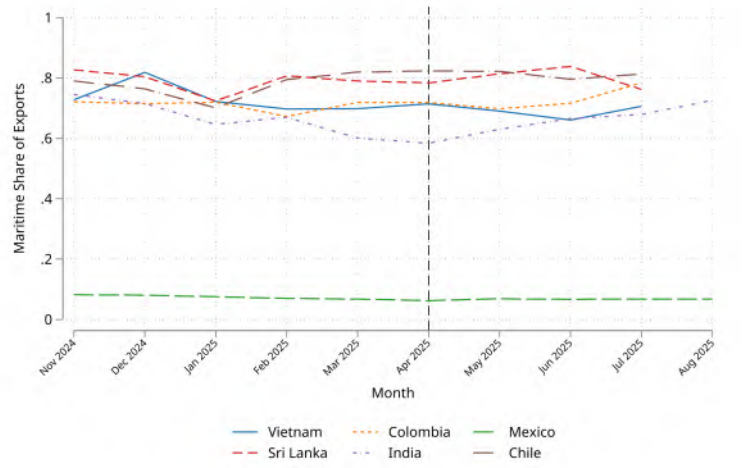
0.038% in 2025.

2. Drop transactions with missing 6-digit HS codes, which represent 0.67% of all transactions before 2024 and 0.57% in 2025.

3. Drop shipments that entered a U.S. port but were not unloaded because they were destined for another country (*frob=1*). These account for 4.36% of transactions before 2024 and 4.01% in 2025.

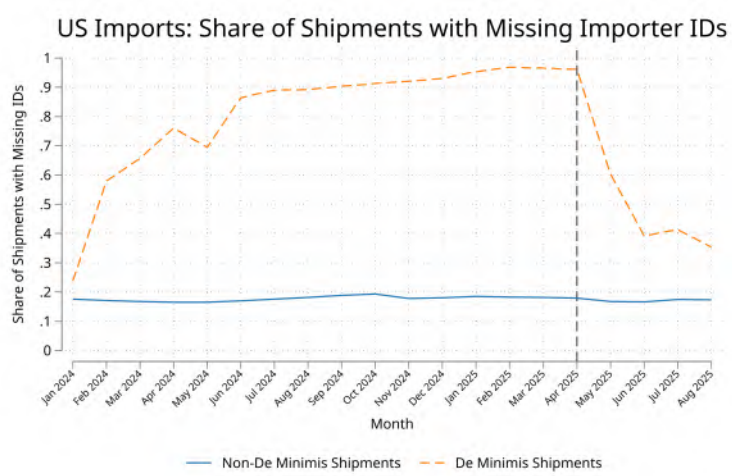
4. Concord the current version of 6-digit HS codes to the 1988/1992 HS code version.

Figure A.1: Stable Maritime Share of Exports to the U.S.



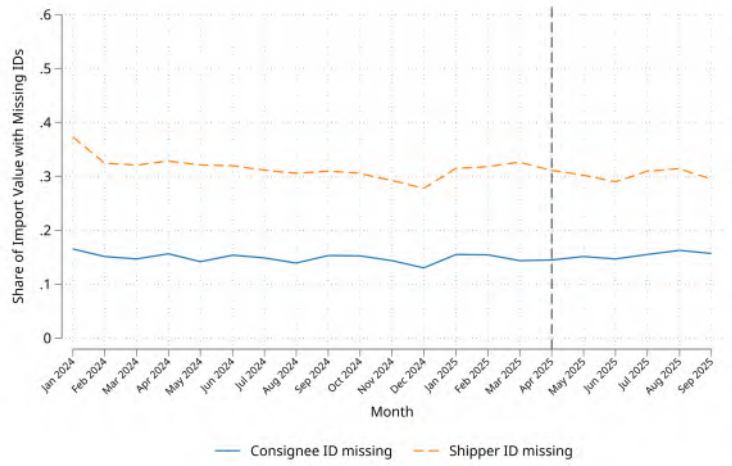
Notes: We use the S&P Panjiva bill of lading data from countries that provide both maritime and non-maritime exports to the U.S.: Vietnam, Colombia, Mexico, Sri Lanka, India, and Chile, to measure the share of maritime export in their total export to the U.S. As Figure A.1 shows, the share of maritime imports from any of these countries to the U.S. remained stable around the "Liberation Day."

Figure A.2: Share of U.S. Import Transactions with Missing Importer IDs



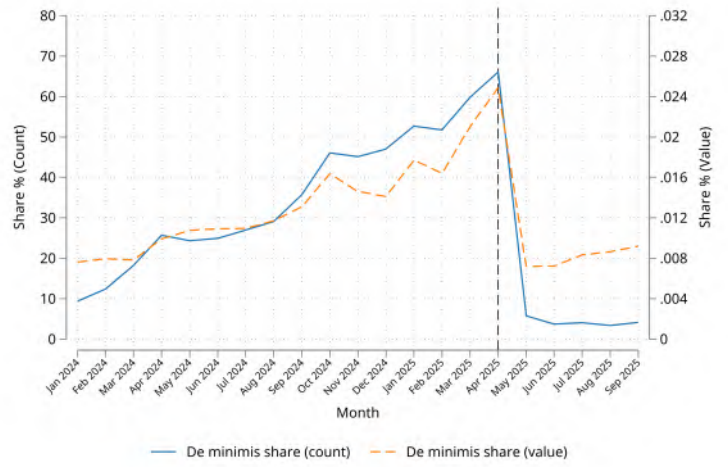
Notes: The figure displays the share of transactions with missing firm names and identifiers for the transactions with values higher than $800 (solid blue) and for those below (dashed orange) from January 2024 to August 2025. Each transaction in the database corresponds to a single bill of lading.

Figure A.3: Share of U.S. Import Values with Missing Firm IDs



Notes: The figure displays the share of transaction values with missing exporter (dashed orange) and missing importer (solid blue) firm IDs from January 2024 to August 2025.

Figure A.4: Share of "De Minimis" Trade in U.S. Import Transactions and Values



Notes: The figure displays the share of "de minimis" trade in U.S. import transactions (solid blue) and values (dashed orange) from January 2024 to August 2025. Each transaction in the database corresponds to a single bill of lading.

Table A.1: Reciprocal Tariff Rates on April 2

Region	April 2	Region	April 2
Afghanistan	10%	Malawi	17%
Algeria	30%	Malaysia	24%
Angola	32%	Mauritius	40%
Bangladesh	37%	Moldova	31%
Bolivia	10%	Mozambique	16%
Bosnia and Herzegovina	35%	Myanmar	44%
Botswana	37%	Namibia	21%
Brazil	10%	Nauru	30%
Brunei	24%	New Zealand	10%
Cambodia	49%	Nicaragua	18%
Cameroon	11%	Nigeria	14%
Chad	13%	North Macedonia	33%
China	34%	Norway	15%
DRC	11%	Pakistan	29%
Equador	10%	Papua New Guinea	10%
Equatorial Guinea	13%	Philippines	17%
European Union	20%	Serbia	37%
Falkland Islands (UK)	41%	South Africa	30%
Fiji	32%	South Korea	25%
Guyana	38%	Sri Lanka	44%
Iceland	10%	Switzerland	31%
India	26%	Syria	41%
Indonesia	32%	Taiwan	32%
Iraq	39%	Thailand	36%
Israel	17%	Tunisia	28%
Ivory Coast	21%	Turkey	10%
Japan	24%	Uganda	10%
Jordan	20%	United Kingdom	10%
Kazakhstan	27%	Vanuatu	22%
Laos	48%	Venezuela	15%
Lesotho	50%	Vietnam	46%
Libya	31%	Zambia	17%
Liechtenstein	37%	Zimbabwe	18%
Madagascar	47%	All others	10%

Notes: This table shows the Liberation Day tariff rates announced on April 2 for the main countries highlighted during U.S. President Trump's press conference on April 2, 2025. See https://www.whitehouse.gov/presidential-actions/2025/04/regulating-imports-with-a-reciprocal-tariff-to-rectify-trade-practices-that-contribute-to-large-and-persistent-annual-united-states-goods-trade-deficits/ for details.

Appendix B Summary Statistics

Table B.1: Summary Statistics

Variable	N	Mean	SD	Min	Max
Panel A. Trade Variables ($f-p-t$)					
Import value from 10% Countries$_{fpt}$	712,556	124,660.78	3096896.82	0.00	1.28e+09
Import weight from 10% Countries$_{fpt}$	712,556	77,233.54	3580715.73	0.00	2.11e+09
Import price from 10% Countries$_{fpt}$	141,512	10.04	54.45	0.01	9,115.14
Import value from High-TPU Countries$_{fpt}$	491,582	98,157.07	1614201.37	0.00	6.34e+08
Import weight from High-TPU Countries$_{fpt}$	491,582	23,005.64	1080373.80	0.00	2.83e+08
Import price from High-TPU Countries$_{fpt}$	105,392	11.02	16.13	0.04	1,236.70
Import value from All Countries$_{fpt}$	5,272,722	84,191.11	1783750.12	0.00	1.28e+09
Import weight from All Countries$_{fpt}$	5,272,722	26,237.25	1585330.00	0.00	2.11e+09
Import price from All Countries$_{fpt}$	1,112,730	10.55	63.54	0.01	17,164.11
Panel B. Exposure and Controls ($f-p$)					
TPU$_{fp}$	405,594	0.07	0.09	0.00	0.40
China exposure$_{fp}$	405,594	0.46	0.48	0.00	1.00
Deficit control$_{fp}$	405,594	0.08	1.51	-410.71	0.50
Finance development control$_{fp}$	405,594	128.29	65.08	0.00	260.01
GDP per capita control$_{fp}$	405,594	9.15	2.24	0.00	12.46
Export to US growth rate control$_{fp}$	405,594	-0.52	0.15	-4.85	2.99
Distance to US control$_{fp}$	405,594	9.26	0.29	0.00	9.70

Notes: This table displays summary statistics for the main variables used in the analysis. Panel A reports firm-product-time level trade variables. Panel B presents firm-product level exposure and control variables.

Appendix C Empirical Analysis

C.1 Estimation Equation for Average Treatment Effect

To estimate the average treatment effect over time, which aggregates the dynamic effects from Equation (3.2), we use the following specification. All variables are defined as in the baseline.

$$\begin{aligned} y_{f,p,t} =& \beta \text{TPU}_{f,p} \times \mathbb{I}\{t \text{ is after "Liberation Day"}\} \\ &+ \theta \text{X}_{f,p} \times \mathbb{I}\{t \text{ is after "Liberation Day"}\} + \delta_{f,p} + \delta_{p,t} + \delta_{f,t} + \epsilon_{f,p,t}. \end{aligned} \tag{C.1}$$

C.2 Other Controls

This section presents the firm-product level exposures to other country characteristics that correlate with TPU and could also affect firm performance, which we include as additional controls.

In addition to countries' trade surpluses with the U.S., we also control for firm-product exposure to cross-country export growth to the U.S. from 2023 to 2024. This captures trends in their trade surpluses, which may influence the U.S. government's decision to implement "Liberation Day" tariffs

after negotiations:

$$\text{TradeGrowthControl}_{f,p} = \frac{\sum_c \text{IMP}_{f,p,c,pre} \left(\log\left(\text{EXP}_{c,US,24}\right) - \log\left(\text{EXP}_{c,US,23}\right)\right)}{\sum_c \text{IMP}_{f,p,c,pre}},$$

where $\text{EXP}_{c,US,23}$ and $\text{EXP}_{c,US,24}$ denote country c's exports to the U.S. in 2023 and 2024, respectively.

We include additional import-weighted, country-level variables to capture economic fundamentals that potentially affect firm imports. These include common gravity variables, such as log distance from the U.S., average 2023-2024 log GDP per capita, and financial development. Following Manova (2013), we measure financial development as the share of private credit in GDP, averaged across 2023 and 2024:

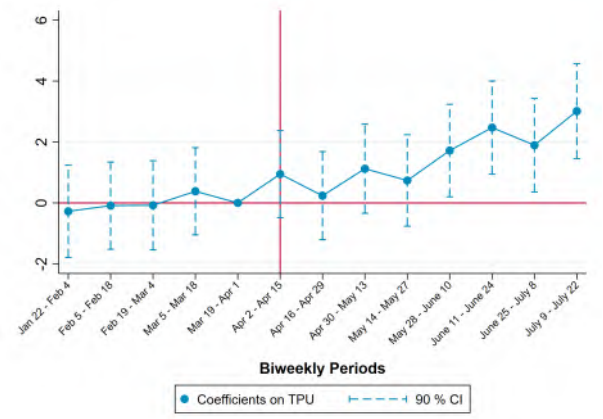
$$\text{OtherControl}_{f,p} = \frac{\sum_c \text{IMP}_{f,p,c,pre} X_c}{\sum_c \text{IMP}_{f,p,c,pre}}. \tag{C.2}$$

While these additional controls strengthen the analysis, they are not strictly necessary. As we show in Section 4.4, the baseline results are robust to adding or dropping these controls.

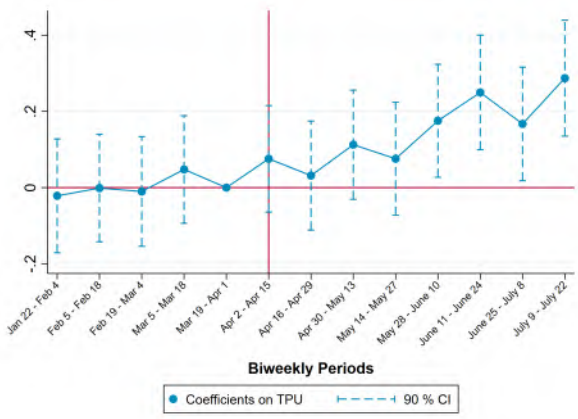
C.3 Other Figures

Figure C.1: Firms Increased Imports from "10% Countries": Weight

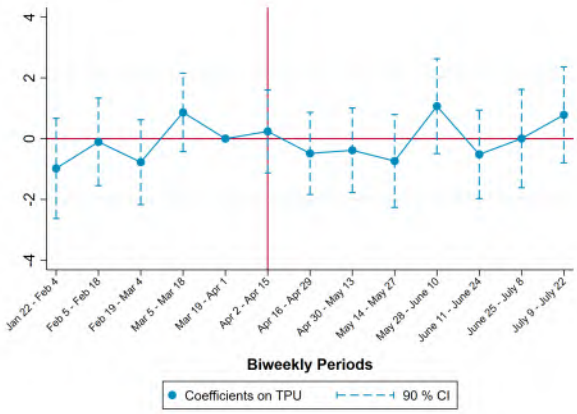
(a) IHS(Weight from 10% Countries)



(b) $\mathbb{I}$(Weight from 10% Countries > 0)



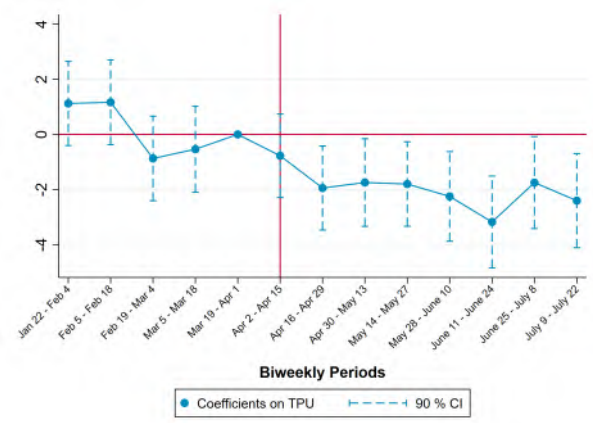
(c) Log(Weight from 10% Countries)



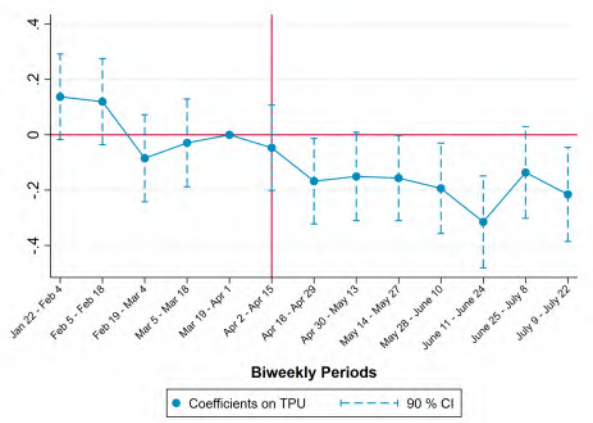
Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the import weights of product p by firm f in time t from "10% Countries." "10% countries" refer to those facing 10% announced "Liberation Day" tariff. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Figure C.2: Firms Decreased Imports from "High-TPU Countries": Weight

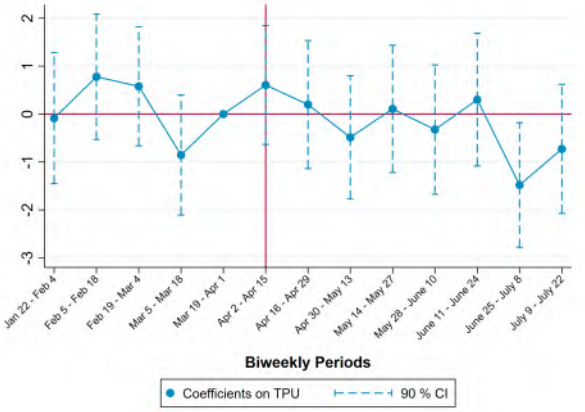
(a) IHS(Weight from High-TPU Countries)



(b) $\mathbb{I}$(Weight from High-TPU Countries > 0)



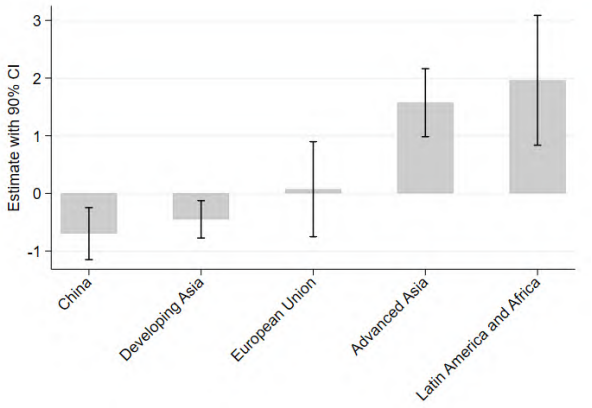
(c) Log(Weight from High-TPU Countries)



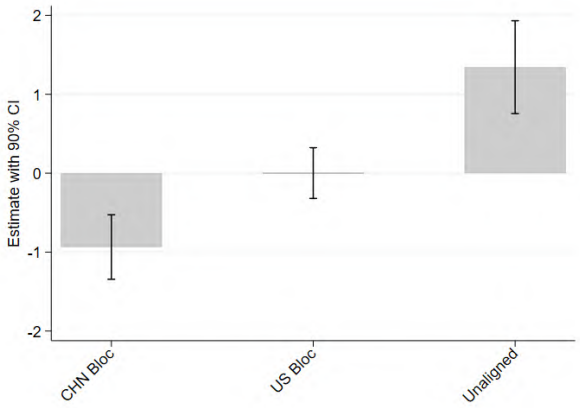
Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the import weights of product p by firm f in time t from high-TPU countries. "High-TPU countries" refer to those facing more than 36% announced "Liberation Day" tariffs, corresponding to the top 15 countries with the highest "Liberation Day" tariffs. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Figure C.3: TPU Effects on Firm Imports from Different Country Groups: Average Treatment Effect over Time

(a) By Region



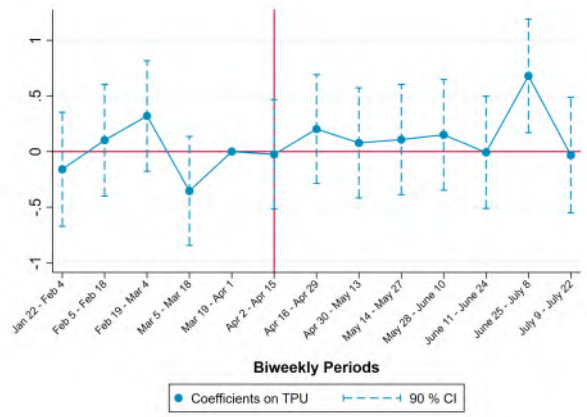
(b) By Geopolitical Block



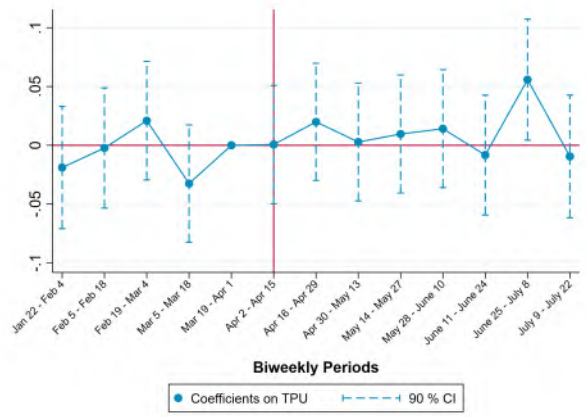
Notes: This figure displays the coefficients and 90% confidence interval from Equation (C.1) where the dependent variable is total imports from the region indicated in the horizontal axis. In Figure C.3b, geopolitical block assignment is based on Bonadio et al. (2025).

Figure C.4: TPU Did Not Significantly Affect Firm-Product Imports from all Countries: Weight

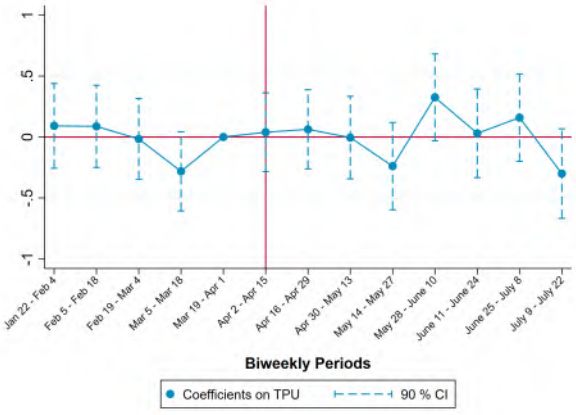
(a) IHS(Weight from All Countries)



(b) $\mathbb{I}$(Weight from All Countries > 0)



(c) Log(Weight from All Countries)



Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the total import weights of product p by firm f in time t. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

C.4 Other Tables

Table C.1: Number of Countries, Imports per Country, and HHI: Average Treatment Effect Over Time

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	10% Countries		High-TPU Countries		All Countries		
	Δ*Number of Countries*	ΔIHS(*Avg Imports per Country*)	Δ*Number of Countries*	ΔIHS(*Avg Imports per Country*)	Δ*Number of Countries*	ΔIHS(*Avg Import per Country*)	ΔHHI
$\text{Post}_t \times \text{TPU}_{ip}$	0.1421***	1.7949***	-0.2009***	-2.5519***	0.0030	0.2148	0.0089
	(0.0478)	(0.5160)	(0.0504)	(0.5714)	(0.0189)	(0.1674)	(0.0148)
R^2	0.650	0.588	0.574	0.580	0.643	0.514	0.685
Firm x Product FE	✓	✓	✓	✓	✓	✓	✓
Product x Time FE	✓	✓	✓	✓	✓	✓	✓
Firm x Time FE	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓
Observations	372502	372502	278590	278590	3561883	3561883	606866

Notes: This table displays estimates from Equation (C.1) where the dependent variable is the number of sourcing countries and average imports per country of product p by firm f in time t from "10% Countries," high-TPU countries, and all countries. It also reports the TPU effect on firm-product level Herfindahl Index of imports from different countries. "10% countries" refer to those facing 10% announced "Liberation Day" tariff. "High-TPU countries" refer to those facing more than 36% announced "Liberation Day" tariffs, corresponding to the top 15 countries with the highest "Liberation Day" tariffs. Standard errors clustered at the firm-product $(f-p)$ level are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table C.2: TPU Effects on Firm Imports: Weight, Long Difference

	(1)	(2)	(3)
	ΔIHS(*Weight of Import from 10 % Countries*)	ΔIHS(*Weight of Import from High-TPU Countries*)	ΔIHS(*Weight of Import from All Countries*)
TPU_{fp}	2.5995***	-2.7005***	0.0470
	(0.6637)	(0.7384)	(0.1818)
R^2	0.426	0.416	0.328
Observations	22638	17762	227730
	ΔI(*Weight of Import from 10 % Countries* >0)	ΔI(*Weight of Import from High-TPU Countries* >0)	ΔI(*Weight of Import from All Countries* >0)
TPU_{fp}	0.2495***	-0.2669***	0.0023
	(0.0640)	(0.0717)	(0.0182)
R^2	0.416	0.409	0.322
Observations	22638	17762	227730
	$\Delta \log$(*Weight of Import from 10 % Countries*)	$\Delta \log$(*Weight of Import from High-TPU Countries*)	$\Delta \log$(*Weight of Import from All Countries*)
TPU_{fp}	-0.0518	-0.7090	0.0709
	(0.5375)	(0.5358)	(0.1266)
R^2	0.424	0.337	0.282
Observations	5238	5462	69307
Firm FE	✓	✓	✓
Product FE	✓	✓	✓
Controls	✓	✓	✓

Notes: This table displays estimates from Equation (3.3) where the dependent variable is the import weight of product p by firm f in time t from "10% Countries," high-TPU countries, and all countries. "10% countries" refer to those facing 10% announced "Liberation Day" tariff. "High-TPU countries" refer to those facing more than 36% announced "Liberation Day" tariffs, corresponding to the top 15 countries with the highest "Liberation Day" tariffs. The long difference is computed by subtracting the average value of the dependent variable before April 2 from its average value after May 28. Standard errors clustered at the firm-product $(f-p)$ level are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table C.3: TPU Effects on Firm Imports: Value, Average Treatment Effect Over Time

	(1)	(2)	(3)
	IHS(Value of Import from 10 % Countries)	IHS(Value of Import from High-TPU Countries)	IHS(Value of Import from All Countries)
$\text{Post}_t \times \text{TPU}_{fp}$	1.7842***	-2.4247***	0.1532
	(0.4911)	(0.5365)	(0.1621)
R^2	0.590	0.579	0.520
Observations	419524	317422	3966298
	I(Value of Import from 10 % Countries > 0)	I(Value of Import from High-TPU Countries > 0)	I(Value of Import from All Countries > 0)
$\text{Post}_t \times \text{TPU}_{fp}$	0.1421***	-0.1908***	0.0125
	(0.0404)	(0.0439)	(0.0136)
R^2	0.556	0.544	0.476
Observations	419524	317422	3966298
	Log(Value of Import from 10 % Countries)	Log(Value of Import from High-TPU Countries)	Log(Value of Import from All Countries)
$\text{Post}_t \times \text{TPU}_{fp}$	0.0104	0.0750	0.0557
	(0.4682)	(0.4264)	(0.1068)
R^2	0.895	0.820	0.850
Observations	50893	54734	657630
Firm x Product FE	✓	✓	✓
Product x Time FE	✓	✓	✓
Firm x Time FE	✓	✓	✓
Controls	✓	✓	✓

Notes: This table displays estimates from Equation (C.1) where the dependent variable is the import value of product p by firm f in time t from "10% Countries," high-TPU countries, and all countries. "10% countries" refer to those facing 10% announced "Liberation Day" tariff. "High-TPU countries" refer to those facing more than 36% announced "Liberation Day" tariffs, corresponding to the top 15 countries with the highest "Liberation Day" tariffs. Standard errors clustered at the firm-product $(f-p)$ level are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table C.4: TPU Effects on Firm Imports: Weight, Average Treatment Effect Over Time

	(1)	(2)	(3)
	IHS(Weight of Import from 10 % Countries)	IHS(Weight of Import from High-TPU Countries)	IHS(Weight of Import from All Countries)
$\text{Post}_t \times \text{TPU}_{fp}$	1.5257***	-2.0321***	0.1225
	(0.4268)	(0.4536)	(0.1390)
R^2	0.600	0.592	0.529
Observations	419524	317422	3966298
	I(Weight of Import from 10 % Countries > 0)	I(Weight of Import from High-TPU Countries > 0)	I(Weight of Import from All Countries > 0)
$\text{Post}_t \times \text{TPU}_{fp}$	0.1421***	-0.1908***	0.0125
	(0.0404)	(0.0439)	(0.0136)
R^2	0.556	0.544	0.476
Observations	419524	317422	3966298
	Log(Weight of Import from 10 % Countries)	Log(Weight of Import from High-TPU Countries)	Log(Weight of Import from All Countries)
$\text{Post}_t \times \text{TPU}_{fp}$	-0.0145	-0.0544	0.0302
	(0.4515)	(0.4096)	(0.1007)
R^2	0.912	0.842	0.877
Observations	50893	54734	657630
Firm x Product FE	✓	✓	✓
Product x Time FE	✓	✓	✓
Firm x Time FE	✓	✓	✓
Controls	✓	✓	✓

Notes: This table displays estimates from Equation (C.1) where the dependent variable is the import weight of product p by firm f in time t from "10% Countries," high-TPU countries, and all countries. "10% countries" refer to those facing 10% announced "Liberation Day" tariff. "High-TPU countries" refer to those facing more than 36% announced "Liberation Day" tariffs, corresponding to the top 15 countries with the highest "Liberation Day" tariffs. Standard errors clustered at the firm-product $(f-p)$ level are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table C.5: Firms with Contract-Intensive or Trade-Finance-Intensive Supply Chains Reallocated Preemptively, Average Treatment Effect Over Time

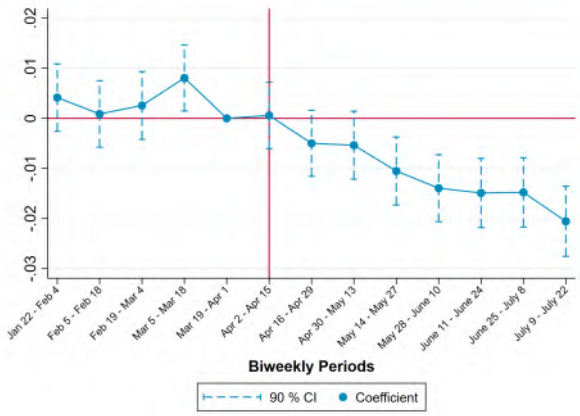
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	IHS(Value of Imports from 10% Countries)							
$\text{Post}_t \times \text{TPU}_{fp} \times$ *Inventory* Import Intensity$_f$	4.1639				3.8206			
	(3.0148)				(3.0061)			
$\text{Post}_t \times \text{TPU}_{fp} \times$ *Contract* Import Intensity$_f$		4.0143**				4.1375**		
		(1.8138)				(1.8099)		
$\text{Post}_t \times \text{TPU}_{fp} \times$ *TCI* Import Intensity$_f$			12.0577***				11.7007***	
			(3.4658)				(3.4850)	
$\text{Post}_t \times \text{TPU}_{fp} \times$ *EFD* Import Intensity$_f$				7.9901***				7.6766***
				(2.6239)				(2.6200)
$\text{Post}_t \times \text{TPU}_{fp} \times$ Total Import$_{fp}$					0.0891	0.0891	0.0932	0.1004
					(0.1219)	(0.1221)	(0.1219)	(0.1218)
$\text{Post}_t \times \text{TPU}_{fp}$	-0.0238	-0.3789	-1.2008	-2.0503*	-0.8579	-1.3873	-2.1325	-3.0185
	(1.1771)	(0.9018)	(0.8405)	(1.2219)	(1.9461)	(1.7792)	(1.7485)	(1.9812)
R^2	0.426	0.426	0.426	0.426	0.427	0.427	0.427	0.427
Firm x Product FE	✓	✓	✓	✓	✓	✓	✓	✓
Product x Time FE	✓	✓	✓	✓	✓	✓	✓	✓
Firm x Time FE	✓	✓	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Observations	712556	712556	712556	712556	712556	712556	712556	712556

Notes: This table displays estimates from Equation (C.1) where the dependent variable is the import values of product p by firm f in time t from "10% Countries." "10% countries" refer to those facing 10% announced "Liberation Day" tariff. Control variables include those in the baseline specification (3.3) and their interactions with the respective firm characteristics. Standard errors clustered at the firm-product $(f-p)$ level are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

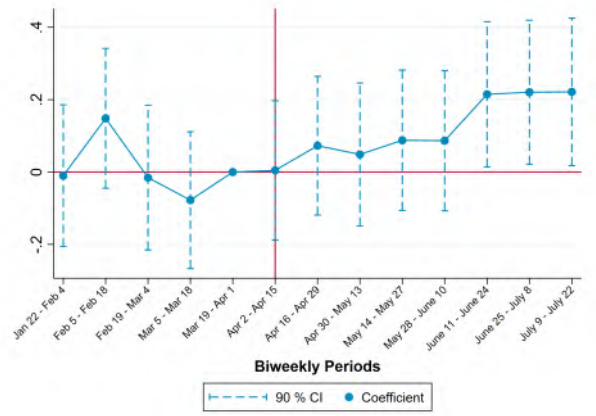
C.5 Robustness Test

Figure C.5: Effects on Firm-Product-Country Level Import Value, Extensive and Intensive Margins

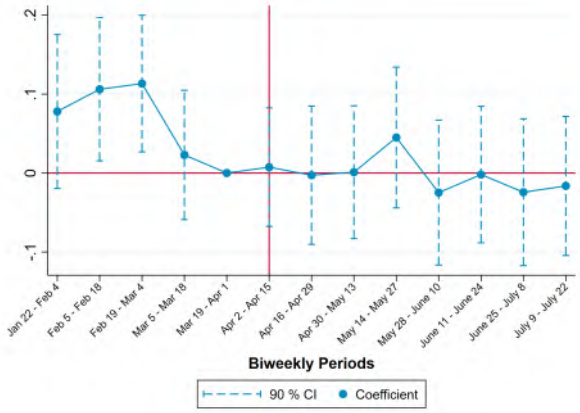
(a) Interaction with "Liberation Day Tariff," Dependent Variable $\mathbb{I}$(Value > 0)



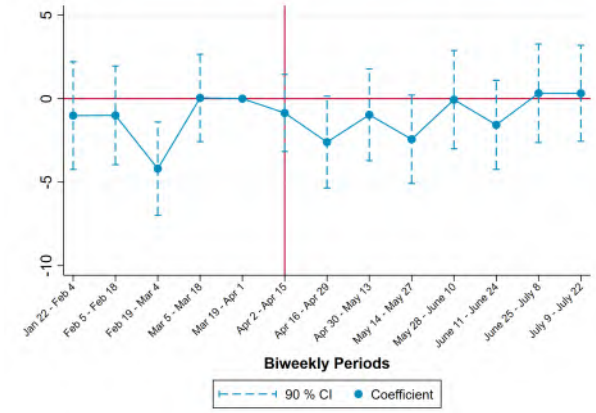
(b) Interaction with $\mathbb{I}$\{c is 10%\}, Dependent Variable $\mathbb{I}$(Value > 0)



(c) Interaction with "Liberation Day Tariff," Dependent Variable Log(Value)



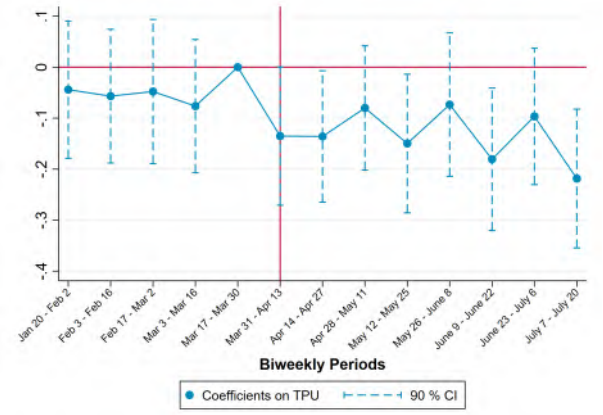
(d) Interaction with $\mathbb{I}$\{c is 10%\}, Dependent Variable Log(Value)



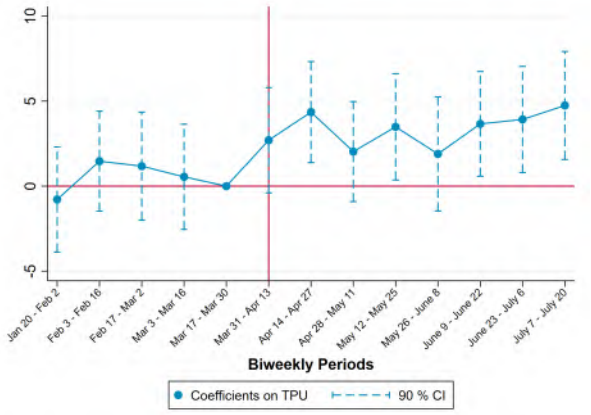
Notes: This figure displays the coefficients and 90% confidence interval from Equation (4.2) where the dependent variable is the variable specified in the subtitle for product p by firm f from country c in time t. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Figure C.6: Effects on Product-Country Level Import Value

(a) Interaction with "Liberation Day Tariff"



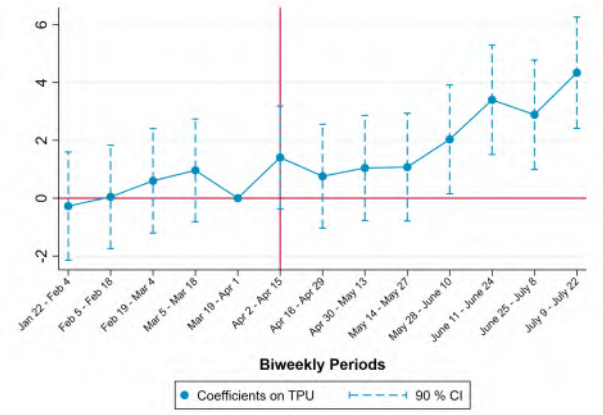
(b) Interaction with $\mathbb{I}$(10% country)



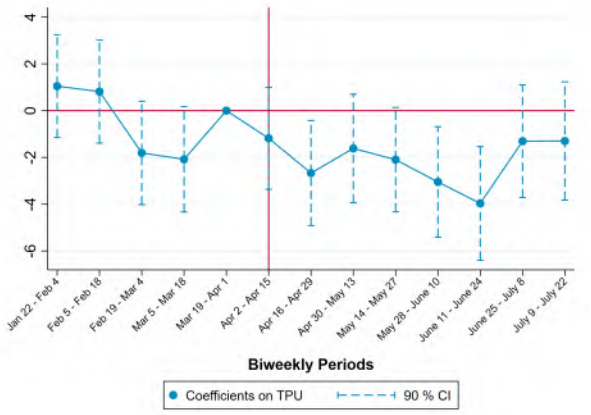
Notes: This figure displays the coefficients and 90% confidence interval from Equation (4.3) where the dependent variable is the import values of product p from country c in time t. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Figure C.7: Controlling for Additional Country Characteristics

(a) IHS(Value of Imports from "10% Countries")



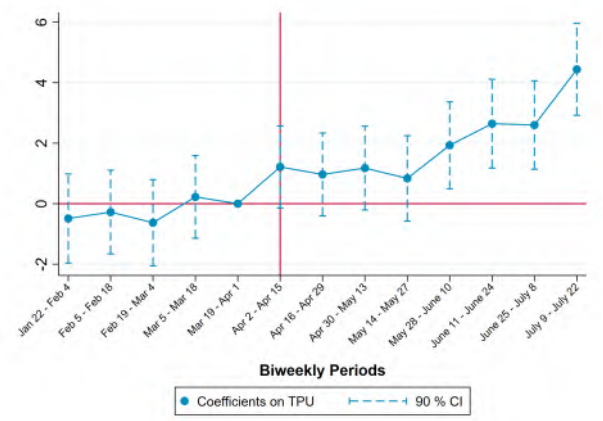
(b) IHS(Value of Imports from High-TPU Countries)



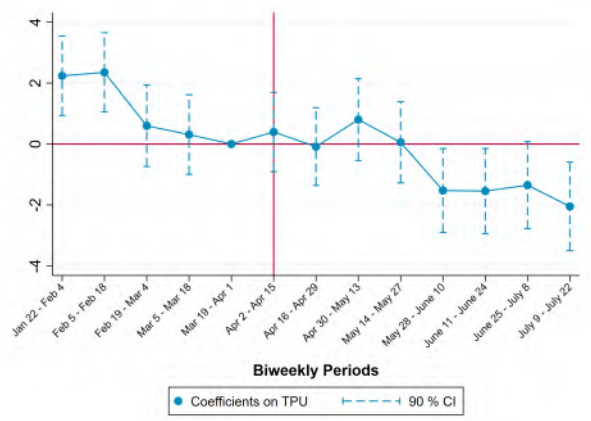
Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the import values of product p by firm f in time t. The regressions additionally include firm-product exposures to cross-country GDP per capita growth rate and the level of export to the U.S. as controls. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Figure C.8: Dropping Additional Country Characteristics

(a) IHS(Value of Imports from "10% Countries")



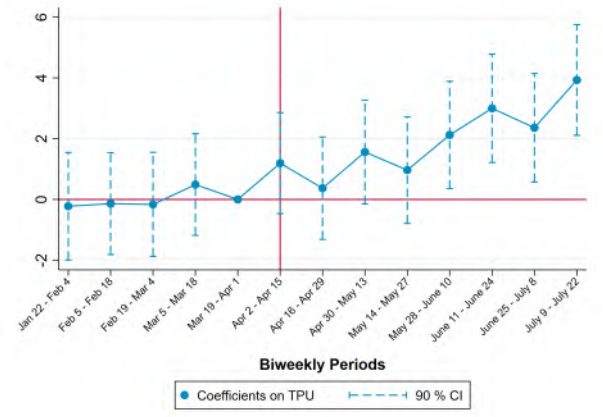
(b) IHS(Value of Imports from High-TPU Countries)



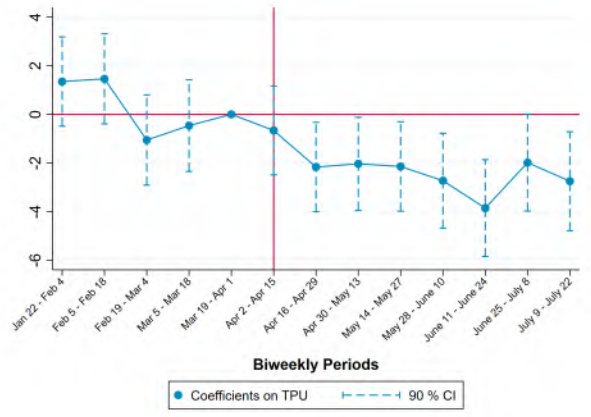
Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the import values of product p by firm f in time t. The regressions only include TPU, China exposure, and deficit control. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Figure C.9: Excluding Products Primarily Imported from Canada or Mexico

(a) IHS(Import Value from "10% Countries")



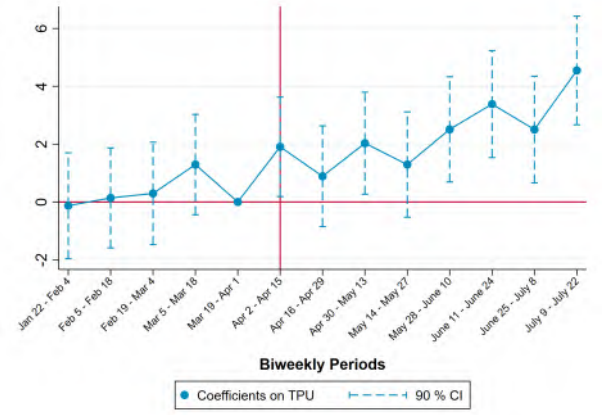
(b) IHS(Import Value from High-TPU Countries)



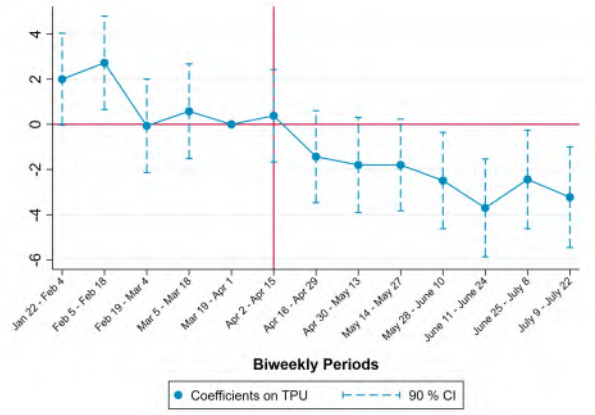
Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the import values of product p by firm f in time t. The regressions drop products whose import shares from Canada and Mexico are more than 90%. These shares are computed with UN Comtrade. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Figure C.10: Excluding Products Exempt from "Liberation Day" Tariffs

(a) IHS(Import Value from "10% Countries")



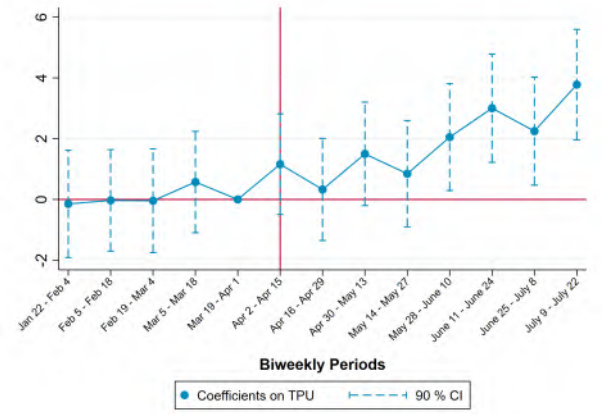
(b) IHS(Import Value from High-TPU Countries)



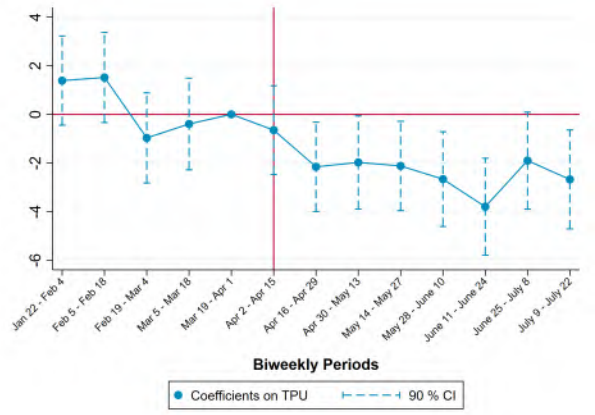
Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the import values of product p by firm f in time t. The regressions drop products that are exempt from "Liberation Day" tariffs. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Figure C.11: Including Products Targeted by Section 232

(a) IHS(Import Value from "10% Countries")



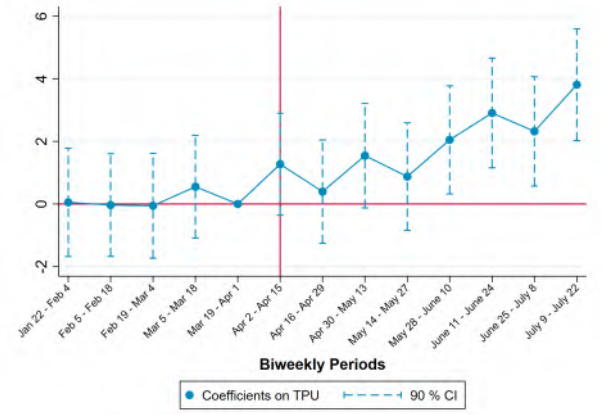
(b) IHS(Import Value from High-TPU Countries)



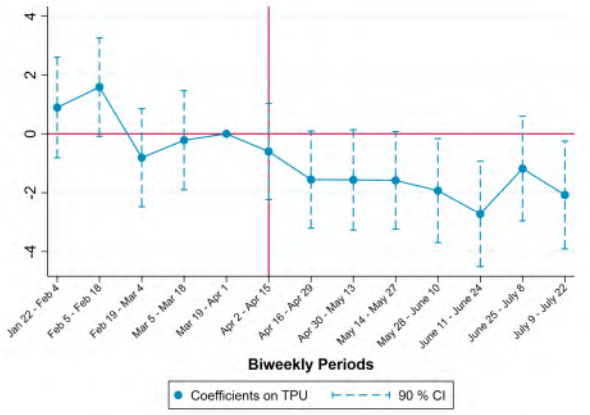
Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the import values of product p by firm f in time t. The regressions additionally include products that are targeted by Section 232 (National Security) tariffs. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Figure C.12: Including "De Minimis" Imports

(a) IHS(Import Value from "10% Countries")



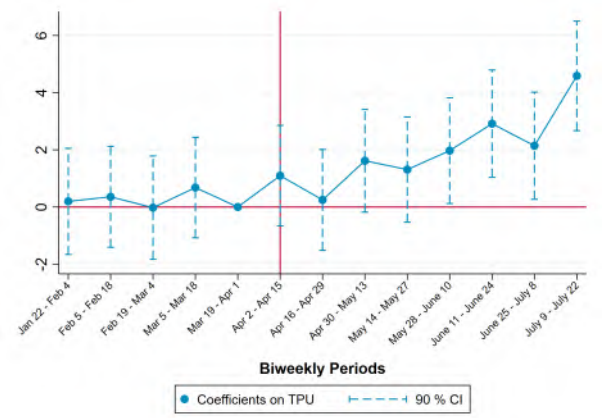
(b) IHS(Import Value from High-TPU Countries)



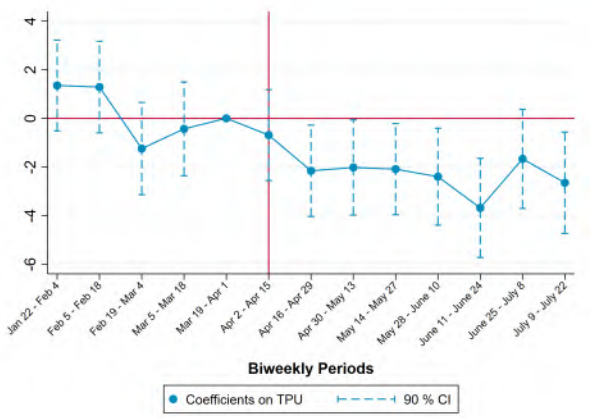
Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the import values of product p by firm f in time t. The regressions also include "de minimis" imports. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.

Figure C.13: Restricting the Sample to Manufacturing Products

(a) IHS(Import Value from "10% Countries")



(b) IHS(Import Value from High-TPU Countries)



Notes: This figure displays the coefficients and 90% confidence interval from Equation (3.2) where the dependent variable is the import values of product p by firm f in time t. The regressions only keep imports of manufaturing products. The bi-week prior to the April 2 announcement of the "Liberation Day" tariff is the omitted reference period.