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Pablo Fajgelbaum (University of California, Los Angeles & NBER)

Amit Khandelwal (Yale University & NBER)

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Pablo Fajgelbaum
UCLA and NBER

Amit Khandelwal
Yale & NBER

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Abstract

In 2025, the U.S. raised average tariff duties from 2.4% to 9.6%, bringing protectionism to its highest level in eighty years. We explore the structure of these tariffs, estimate their short-run impacts, and summarize the growing literature on their effects. Across trade partners, the tariffs are correlated with trade deficits but not with geopolitical or strategic industrial goals, other than targeting China. In our baseline estimate, 90% of the tariffs are passed through to tariff-inclusive prices paid by U.S. importers. Incorporating the estimated price and trade responses into a static trade framework, we find an overall welfare impact ranging from a loss of 0.13% of GDP to a gain of 0.10%. These small net welfare impacts reflect sizable consumption losses roughly offset by income and revenue gains, with their sign hinging on whether U.S. terms-of-trade adjusted (on which the data are inconclusive). Among their stated rationales, the tariffs have been effective at raising federal revenue and diverting trade from China. However, it remains uncertain whether they will reduce the trade deficit, lower prices set by foreign exporters, promote manufacturing jobs, increase "friend-shoring" among aligned countries, or reshore key sectors; evidence from 2018-19 and 2025 indicators suggests a narrow path towards achieving these goals.

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COSTANZA — “The Duty Free Shop? Duty free is the biggest sucker deal in retail. Do you know how much duty is?”

KRAMER — “No, I dunno how much duty is.”

COSTANZA — “Duty is *nothing*. It’s like sales tax.”

- *Seinfeld*, "The Airport", November 1992

1 Introduction

In 1992, George Costanza faced tariffs averaging 3.3%. Are duties still nothing? In December 2025, the average tariff was 9.6% (12.5% when weighted by 2024 imports), the highest level in 80 years.

America’s return to protectionism is roughly a decade in the making. The first wave of tariffs, enacted in 2018 during the first Trump Administration, predominantly targeted imports from China. Those tariffs were largely maintained by the Biden Administration, which also raised tariffs on sectors like electric vehicles. The 2025 tariffs targeted China again, but have been different from 2018 in two key ways: they apply to virtually all trading partners and are much larger. Beginning in the first quarter of 2025 and accelerating through "Liberation Day" in April, by December 2025 this protectionist turn pushed tariff revenue over GDP above the 1930s Smoot-Hawley period.

What have been the short-run consequences of the 2025 tariffs on the U.S. economy? Has this shift in U.S. trade policy achieved its stated goals? The dice are still rolling as insufficient time has passed for the full ramifications to unfold. Nevertheless, this paper combines *ex post* empirical analysis, *ex ante* model-based quantification, and a review of a rapidly growing literature to assess the short-run impacts on the U.S. economy.

Our analysis uses data through December 2025 along with a static trade framework, originally developed in Fajgelbaum et al. (2020), to quantify the impacts on the aggregate U.S. economy. After summarizing the data in Section 2, we proceed in four steps:

- Section 3 provides a comprehensive look at the 2025 tariff landscape. We describe the structure of the tariff changes: how they compare in historical perspective, how they vary across countries and products, and what drivers explain (or fail to explain) their variation.
- Section 4 estimates the causal impacts of U.S. and retaliatory tariffs on trade and border prices. This analysis provides estimates of trade elasticities and tariff pass-through, but is insufficient for extrapolating to the economy-wide impacts of tariffs because of a standard “missing intercept” challenge: the reduced-form evidence absorbs impacts of tariffs that are common across all shipments. We address this issue in the next step.
- Section 5 uses a multi-sector, multi-country trade model with input-output linkages to measure aggregate welfare and macroeconomic effects. We use the tariff changes to estimate the key short-run supply and demand parameters of the model. The model is static, has exogenous trade deficits, and lacks monetary frictions and uncertainty, and we discuss how relaxing these assumptions could change our welfare estimates.

- Section 6 summarizes the literature and provides additional analysis in the context of discussing eight stated policy rationales for the tariffs: 1) lowering before-tariff import prices; 2) reducing trade deficits; 3) raising government revenue; 4) creating manufacturing jobs and redistributing income; 5) decoupling from China; 6) friend-shoring and targeting geopolitical rivals; 7) reshoring strategic sectors; and 8) securing better deals for U.S. exports.

Our main findings are:

- The tariff hike is historically unprecedented, but three facts temper its magnitude. First, by December 2025, U.S. trade policy allowed a large share of imports to enter duty-free (57%). Second, the statutory tariffs widely reported in the press exceed the actual tariffs applied at the border. Third, with the exception of China, the majority of U.S. exports have not faced retaliatory tariffs, muting a key channel through which a trade war reduces welfare. Across trade partners, applied tariffs in December 2025 are strongly correlated with 2024 bilateral trade deficits (consistent with the formula used for the "Liberation Day" tariffs), but much variation remains that seems uncorrelated with geopolitical or strategic industrial goals, other than targeting China.

- Pass-through of the tariffs to tariff-inclusive prices is high, but not complete: between 80% and 100%, depending on controls and time horizon, and equal to 90% in our baseline specification.

- We estimate a net welfare impact (i.e., a real consumption change) of the 2025 tariffs between 0.10% and -0.13% of GDP, depending on whether or not U.S. terms-of-trade responded.[1] This net welfare effect masks large gross transfers from consumers to producers, with the distortions from higher tariff-inclusive prices offset by wage gains and federal revenue. The small aggregate magnitude is not surprising given that imports accounted for 10.8% of GDP in 2024 and applied tariffs increased by 7.3% (or by 10.1% using 2024 weights), resulting in new tax payments of 0.80% of GDP.[2] Despite small aggregate welfare effects, the tariff shocks were far from negligible regarding key macroeconomic outcomes such as real GDP, the trade-to-GDP ratio, prices, and real wages.

- We estimate that, in a scenario where every country responds in kind, assuming terms-of-trade do adjust, U.S. real income would fall by 0.34%.

- Turning to the rationales offered by policymakers, we find that the tariffs have been successful at raising federal revenue and decoupling trade with China. Revenue from tariffs accounted for about 4.9% of 2025 federal receipts, up from 1.6% in the past decade.

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[1] These results assume no labor mobility across sectors, an assumption consistent with studying short-run responses. With mobility, both the distortions and the scope for terms-of-trade adjustments increase, with the resulting welfare impacts ranging from -0.50% to 0.28% of GDP.

[2] Our estimate gives an MVPF (marginal value of public funds, defined as net benefit of the policy over its fiscal cost) of -0.12 to 0.08, below the MVPF for the 2017 Tax Cuts and Jobs Act (Barro and Furman, 2018; Kennedy et al., 2026).

In December 2025, China's import share was just 7%, down considerably from the 23% share in December 2017. Our estimates of the causal effects of tariffs on revenue and imports from China confirm that much of these changes in the raw data were driven by the tariffs. However, we find no evidence that tariffs have increased "friend-shoring", defined as greater imports from historically geopolitically aligned countries. It also remains to be seen whether the tariffs will reduce the trade deficit, lower before-tariff import prices, promote manufacturing jobs, or reshore key sectors. Based on the *ex post* analysis of the 2018-19 tariffs and indications from 2025 so far, these objectives seem difficult to achieve simultaneously.

2 Data

2.1 Tariffs on U.S. Imports

We have compiled statutory tariffs from the Harmonized Tariff Schedule (HTS) from 2017 to 2025.

The 2018-19 tariffs were imposed using three provisions of U.S. trade law. Section 301 of the Trade Act of 1974 authorizes tariffs in response to unfair foreign trade practices and was the primary mechanism for raising duties on Chinese imports. Section 232 of the Trade Expansion Act of 1962 permits tariffs when imports are deemed to threaten national security, and was used for steel and aluminum products. Section 201 of the Trade Act of 1974 provides temporary safeguard measures to assist domestic industries harmed by import surges; in 2018, it was used to impose tariffs on solar panels and residential washing machines.

In 2025, the Trump Administration has continued to use these sections to invoke new tariffs, but has also used three additional statutes to modify tariffs. In March 2025, the Administration invoked tariffs on China, Mexico, and Canada through the International Emergency Economic Powers Act (IEEPA), which allows the President to regulate trade in response to a national emergency; the declared emergency was "the extraordinary threat posed by illegal aliens and drugs, including deadly fentanyl." In April 2025, IEEPA was used to justify tariffs on virtually all countries in response to the "large and persistent" bilateral goods deficits; specifically, trade partners' high tariff and non-tariff barriers and their policies that suppress domestic wages and consumption. IEEPA was challenged by U.S. states and private companies, and was struck down by the Supreme Court in February 2026. Shortly thereafter, the Trump Administration invoked Section 122 of the Trade Act of 1974 to replace the IEEPA tariffs with a 15% uniform rate across most trade partners to address balance-of-payments deficits; these tariffs are limited to 150 days unless extended by Congress. The Administration has also revoked Section 321 of the 1930 Tariff Act, which had allowed U.S. consignees to import up to $800 per day free of duties; the exemption was eliminated for Chinese shipments in May and ended for all countries in August.

The statutory rates in the HTS may deviate from the applied tariffs for several reasons (Gopinath and Neiman, 2026). First, the statutory rates can change mid-month, while the applied rates are calculated from monthly duties. For example, if a new tariff is imposed towards the end of the month but the bulk of the shipments are cleared by U.S. Customs Border and Protection earlier in the month, the applied rate could be lower than the statutory rate that month. When merging the statutory tariffs into the monthly import data, we scale the tariff level by time in effect, but this nonetheless creates some discrepancy between the two. Second, the effective date of a statutory tariff change could apply to when a good is entered for consumption (or withdrawn from a bonded warehouse for consumption), or to when a good begins transit to the U.S. In the latter case, Gopinath and Neiman (2026) show that this creates a lag between the statutory and applied tariff changes. Third, some Section 232 tariffs were also applied on products that used foreign steel and aluminum as inputs, with a different rate depending on the metal origin, making it difficult to know precisely what the statutory tariff would be. Fourth, although imports from Canada and Mexico are subject to IEEPA tariffs, USMCA-compliant shipments have continued to enter duty-free. Finally, the government may grant tariff exclusions for certain products.[3] For these reasons, we instead measure changes in tariffs using the applied tariff, constructed from the monthly import data (see below), but will rely on the statutory tariffs for a few parts of the analysis, including the structural estimation of key model parameters.

Given the Supreme Court's decision on the IEEPA tariffs, there is uncertainty about how U.S. tariff policy will evolve in 2026 and beyond. Our goal in this analysis is to shed light on the tariff changes that did occur in 2025.

2.2 Tariffs on U.S. Exports

We obtain trade partners' tariffs from TRAINS and retaliatory tariffs for the following countries directly from their respective government websites: China (2018-19 and 2025), Canada (2018-19 and 2025), European Union (2018-19), India (2018-19), Mexico (2018-19), Turkey (2018-19 and 2025), and Russia (2018-19). As with non-tariff barriers imposed on U.S. exports, we also do not capture non-tariff measures on exports to the U.S., such as China's bans on rare-earth elements in 2025.

2.3 U.S. Trade Data

We match the import and retaliatory tariffs to the U.S. Census Monthly International Trade Datasets (MITD) that track imports and exports by product, origin (or destination), and month. For imports, the data record value and quantities for consumption, and a duty calculated on the dutiable value. We construct an applied tariff, defined as the duties divided by import value, for each origin-product (variety) and month.

For each imported product-origin-month record, the Census provides the value, quantity and duty across 15 rate provisions. The first nine rate provisions track imports that enter the country duty-free, either because they are not subject to tariffs based on the General Rates of Duty columns of the HTS chapters 01 to 97 (rate provision 10), because they are classified under trade agreements as duty-free (rate provision 18), or because of other special cases. The next six rate provisions track imports that are subject to non-zero tariffs because there are dutiable rates prescribed under

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[3] Chor et al. (2025) find that roughly 15% of imports targeted in 2018-19 were exempted from duties.

chapters 01 to 97, dutiable rates on imports entering through trade agreements, and/or because of the temporary tariffs that appear in Chapter 99 (rate provision 69). Imports of a variety in a given month could be spread across rate provisions.[4]

The export data do not track duties applied on U.S. exports so we apply statutory rates imposed by those countries as our measure of the tariffs faced by U.S. exports.

2.4 U.S. Domestic Data

To calibrate the model, we rely on several sources of U.S. domestic data. Changes in sectoral output are measured using the Federal Reserve's G.17 Industrial Production Index. Information on production linkages across sectors comes from the BEA Input–Output Tables, using the 2016 table for the 2018-19 impacts and the 2023 table for the 2025 impacts. We map sectors to the HS schedule using the crosswalk developed by Pierce and Schott (2012). County-level employment and wage data for non-farm sectors are obtained from the Census County Business Patterns dataset. Employment and income for the farm sector are taken from the BEA Local Area Personal Income and Employment series. For both sources, we use data from the 2016 and 2023 benchmark years. Finally, aggregate macroeconomic data include monthly series for aggregate PPI and quarterly measures of aggregate imports, exports, and GDP from FRED. We also obtain Producer Price Index (PPI) and the Consumer Price Index (CPI) from the Bureau of Labor Statistics.

2.5 China Trade Data

For a subset of the analysis, we access China's monthly product-level trade data from U.N. Comtrade for 2016-2024.

3 The 2025 Tariffs

In this section, we examine the structure of tariffs across time, countries, and sectors. Four takeaways emerge from this descriptive exercise:

1. U.S. import tariffs have declined steadily from high levels during the 20th century until the first Trump Administration, and trade partners likewise reduced tariffs on U.S. exports steadily over the preceding three decades, a trend that also reversed during that Administration.
2. In 2025, tariffs increased across the board, and currently average 9.6%, the highest level in 80 years. However, this applied rate is lower than statutory announcements, and the majority

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[4] For example, in 2025m12, 82.8% of imports from Mexico under HS 6104332000 ("women's or girls' suit-type jackets and blazers, knitted or crocheted, of synthetic fibers, containing <23% wool or fine animal hair") entered through rate provision 69 with a 38.1% tariff while the remainder entered duty-free through USMCA (rate provision 18), resulting in an overall applied tariff of 31.5%. Note that imports under rate provision 79 are subject to Chapter 99 tariffs, but Census does not report calculated duties for these entries; in 2025, they accounted for only 1.2% of total imports. Note also that tariff refunds are updated retroactively, and are unlikely to be reflected in the recent data.

of imports continue to enter the country duty-free. Thus, the 2025 tariff shock is perhaps smaller than headlines have implied.

3. Tariff retaliation has been minimal, aside from China, relative to expectations set during the 2018–19 tariff episode.
4. Although China faced high 2025 tariffs, some countries faced even higher tariffs, with the tariff variation being seemingly unrelated to pre-existing geopolitical alignment. Instead, when correlating tariffs with different observables, the tariff variation is only correlated with existing goods deficits and foreign barriers imposed on U.S. services exports.

3.1 U.S. Tariffs in Historical Perspective

We begin by situating current U.S. tariff policy within its historical context; we refer readers to Irwin (2017) for a comprehensive analysis. Figure 1 shows the annual tariff imposed by the U.S. on its imports from 1915 to 2025. The series is constructed as total duties divided by total import value, and thus measures the overall applied tariff across imported goods. The figure also reports (goods) imports to GDP as a way to gauge the magnitude of the tariffs as a share of the economy. Import tax revenue as share of GDP, also shown in the figure, is the product of the two series.

The U.S. entered the 20th century with tariffs as a central fiscal instrument. In 1915, U.S. tariffs were about 12.5%. Several protectionist measures were implemented in response to increased competition that followed World War I, and protectionism peaked at nearly 17.8% shortly after the passage of the Smoot-Hawley legislation in 1930. In 1934, Roosevelt signed the Reciprocal Trade Agreements Act, giving the President the power to negotiate bilateral trade agreements with foreign trade partners and setting off a decline in tariffs from that peak to 7.9% in 1947, when the GATT was created. A reversal in the applied rate occurred over the next 15 years without major policy changes (Irwin, 2017), implying that composition and price effects were the main drivers of the rise. The applied rates then drifted down until the first Trump Administration, driven by policy, including multilateral GATT rounds and the Generalized System of Preferences granting access to developing countries, and because of inflation eroding the "bite" of specific tariffs (fixed dollar duty per unit imported; see Irwin (1998) and Greenland and Lopresti (2024)). Since the mid-1980s, as part of the "Washington Consensus", the U.S. engaged in reciprocal tariff reductions through bilateral and regional free-trade agreements.

The recent turn towards protectionism started in 2018, when the first Trump Administration raised tariffs first in a few sectors and, most notably, on imports from China. The overall applied rate increased from 1.4% in 2017 to 3.0% by December 2019. While the 2018-19 tariff hike appears historically small by just looking at the overall tariff, it was, in fact, on par with Smoot-Hawley tariffs considering the expenditures being taxed: in 2018-2019 taxes increased by 1.5% on imports representing 11.0% of GDP, whereas Smoot-Hawley tariffs represented a 5% increase on imports equivalent to a much smaller 2.7% of GDP; in both cases, import tax revenue as a share of GDP increased by a similar magnitude.

In 2025, the overall applied tariff increased sharply, reaching 9.6% as of 2025m12. Using 2024 import weights, the average tariff as of December is even higher: 12.5%. Alternatively, measured by tariff revenue as a share of GDP, U.S. trade policy is more restrictive than at any point in the last 110 years.

Figure 1B reports the weighted-average statutory tariff rates faced by U.S. exporters in China and other trading partners from 1995-2025. The tariff faced by U.S. exports fell through 2017, particularly to China, although the level still exceeded the import tariffs that the U.S. generally imposed during this period. Since 2018, tariffs imposed by China have ratcheted up in response to the U.S. tariffs. However, tariffs imposed by the rest of the world have largely remained constant, including in 2025, as we discuss further below. The figure also shows U.S. goods exports to GDP over the same period, as a way to assess the economic importance of these foreign tariffs. During this period, U.S. goods exports as a share of GDP increased to just under 10% in the mid-2010s alongside lower foreign protection, and have fallen a few percentage points since then. Thus, these two metrics suggest that, until 2025, U.S. goods exports have still faced higher tariffs than what the U.S. imposes on its imports, but the gap between import and export tariffs has been declining steadily over the 30 years preceding the tariff hikes.

As a result of the historic trade policy changes in 2025, Figure A.1 shows that by December 2025 the U.S. import tariffs were among the highest in the world, comparable to rates in Latin America, South Asia, and Sub-Saharan Africa. This is a sharp reversal from 2020, when the U.S. rate was among the lowest, even after the 2018-19 tariffs.[5]

3.2 A Closer Look at the Recent Tariffs

We now examine the recent tariffs in more detail. Figure 2A reports the evolution of statutory and applied tariffs from 2017 to 2025m12. During both the 2018-19 and the 2025 episodes the tariff changes came in waves. There are important differences between the two episodes, with the 2025 tariff hikes being both much larger and imposed on virtually all countries. In contrast to 2018-19, in 2025 the statutory and applied tariffs diverged, as discussed in Section 2. Additionally, Figure 2B shows that in recent years roughly 70% of imports have entered duty-free. That fraction fell to around 50% in June 2025 but then *increased* back to 57% by 2025m12. So, while the average tariff on tariffed goods increased, the majority of U.S. imports still entered duty-free. These facts suggest the actual magnitude of the tariff increases is smaller than what the public perceives based on statutory rates reported in the press.[6]

Panel A of Table 1 summarizes the tariff changes in the two episodes by region. In 2017, 31.1% of the $2.3 trillion total imports into the U.S. were subject to a tariff rate of 4.6%, and so the overall tariff, accounting for the remaining 68.9% of imports that enter duty-free, was 1.4%. In December

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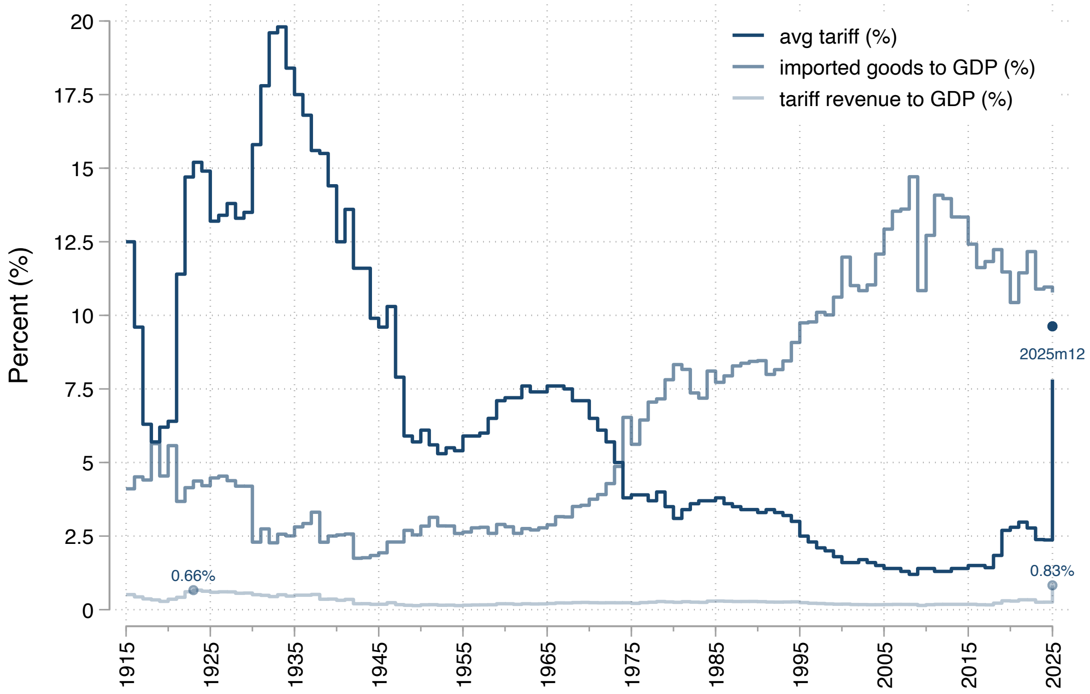
[5] An important caveat, discussed in Section 6.8, is that protectionism is often implemented through non-tariff barriers. Ederington and Ruta (2016) show that the use of non-tariff barriers had been rising before 2018.

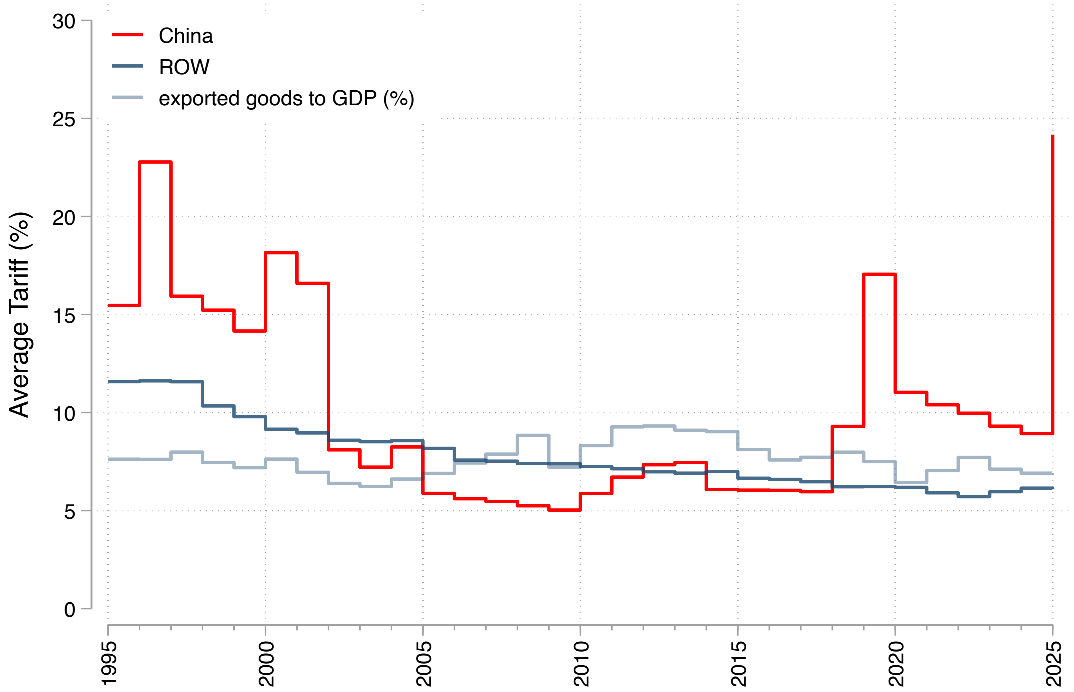
[6] Gopinath and Neiman (2026) arrive at same conclusion, while Waugh (2025) argues that the tariffs are even more restrictive than the value of the overall applied rate because of dispersion across varieties. Our quantification accounts for tariff dispersion.

FIGURE 1: U.S. TARIFFS ON IMPORTS AND EXPORTS

Panel A: U.S. Import Tariffs, 1915–2025



Panel B: Foreign Tariffs on U.S. Exports, 1995–2025



Notes: Panel A reports the annual average applied tariff from 1915-2024. For 2025, we report the year-to-date average and the tariff as of 2025m12, the latest available data. These tariffs use time-varying imports as weights. Sources: 1915-2016 tariffs and 1915-1946 goods imports from USITC (2025); 2017-2025 tariffs and 2025 goods imports (Census MITD); 1947-2024 goods imports from FRED series NA000343Q; 1915-1946 GDP data from Gordon (2019). Panel B plots the weighted average statutory tariff faced by U.S. exporters, using time-varying exports as weights. Data for 1995-2017 are from the Global Tariff Database (Teti, 2024); data for 2018-2025 extend this series using Census MITD, TRAINS, and authors' compilation of retaliatory tariffs. Goods exports from 1988-2024 from FRED NA000353Q, goods exports for 2025 from Census MITD, and GDP from FRED series GDP.

2019, 34.0% of imports were targeted with tariffs of, on average, 8.7% resulting in an overall tariff of 3.0%. The fraction of imports from China targeted with a tariff increased from 41.5% to 60.2%. The average tariff on tariffed Chinese imports went from 6.3% to 18.8%, resulting in the overall increase in tariffs on China from 2.6% to 11.3% in December 2019. The overall average tariff had doubled to 3.0% compared to 2017.

Panel B reports the tariff changes as of December 2025. Both the fraction of imports tariffed and the average tariff on the tariffed have increased almost across the board. Virtually all products imported from China are subject to duties as of 2025m12, resulting in an average tariff of 31.7% on China. The majority of imports from Europe, Latin America and South Asia are also subject to tariffs, with South Asia facing the highest average tariffs after China. Only the Middle East has seen a non-trivial decline in the fraction of imports subject to tariffs, but the average tariff on tariffed products has increased, resulting in an overall tariff increase from 0.7% to 6.4%. Compared to 2024, imports from Canada and Mexico have largely remained USMCA compliant, and roughly 15% of imports continue to face non-zero tariffs; however, for these non-compliant imports, the average tariff has increased quite substantially from 1.2% to 25.3%; thus, the overall tariff rate in 2025m12 on Canada and Mexico was 3.9%.[7] By that month, the average tariff was 9.6%.

Although China faces high average tariffs (31.7%), some countries face even *higher* tariffs–Myanmar (45.3%), Laos (39.7%), Moldova (36.7%), Lesotho (36.3%), Serbia (33.5%), and Bangladesh (32.7%)–with several additional countries facing tariffs just slightly below China's level: Azerbaijan (30.4%), Sri Lanka (29.6%), and Bosnia & Herzegovina (29.4%). The full set of current applied tariffs is reported in Table A.1. Of course, the applied tariffs reflect, in part, the composition of a country's export basket, and some products, such as oil, currently enter duty-free; this explains why, for instance, Iraq's overall applied tariffs are 0.0%. Column 4 constructs a weighted-average of a country's applied tariff after de-meaning from the HS10 average in 2025m12; even here, we see that three countries have higher demeaned tariffs relative to China: Myanmar, Laos, and Moldova.

Table 2 reports the analogous statistics on U.S. exports targeted by U.S. trade partners in 2018-19 and 2025. The table confirms that China is, by and large, the main region to retaliate against the U.S. in 2025, targeting all of U.S. exports with tariff increases from 12.1% to 20.2%. Canada and Mexico increased their tariffs from 8.6% to 11.4%, a proportionally large increase but small in absolute terms (with only Canada retaliating against the U.S.). On average, U.S. exports faced a similar average tariff increase in 2025 as in 2018-19.

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[7] As mentioned above, the "de minimis" exemption was also eliminated. Low-value shipments grew dramatically in recent years due to higher tariffs on China and innovations in direct-to-consumer shipments (Fajgelbaum and Khandelwal, 2024). According to Customs and Border Protection (CBP), these fell 31%, from 1.36 billion in 2024 to 942.5 million in 2025, with import values declining from $64.6 billion to $48.1 billion.

3.3 Determinants of the 2025 Tariffs Variation

What drove the variation in 2025 tariff levels across countries? The USTR explained that the "Liberation Day" tariffs were based on trade deficits.[8] But, by 2025m12, the applied tariffs had a correlation of 0.49 with those announcements. Overall, country variation explains a large fraction of the variation in applied rates, but far from all; regressing variety-level tariffs on country fixed effects yields an R2 of 0.37. Adding HS10 fixed effects raises the R2 to 0.66, suggesting much residual variation in tariffs remains unexplained.

To dig deeper, we run a regression of the 2025m12 tariffs on a set of country characteristics: 1) the "Liberation Day" deficit formula; 2) trade barriers that U.S. goods and services exports face from the ESCAP-World Bank Trade Cost database and CEPII, respectively; 3) GDPPC; 4) distance to the U.S.; 5) a common language indicator; and, 6) a measure of a country's geopolitical "ideal" point, where a high number indicates closer alignment to the U.S.-led international world order (Bailey et al., 2017). With the exception of common language, all measures are standardized.[9]

Figure 3 reports the coefficients from these regressions. Across the specifications, we observe a consistently positive correlation between tariffs and bilateral deficits, with one standard deviation in the deficit formula leading to around 2.92 percentage points in tariffs; for example, Lesotho has one of the highest deficit ratios and, as mentioned above, also currently faces among the highest tariffs. Higher tariffs also correlate with countries' barriers on U.S. services, but not goods barriers, a point we expand upon in Section 6.8. We observe no statistical relationship with a country's geopolitical alignment with the U.S., a point we expand upon in Section 6.6, nor with distance, common language, or income per capita. These findings remain robust to including region fixed effects, and running the variety-level regressions that control for product fixed effects.

Table 3 reports tariffs across broad sectors. The U.S. has continued to maintain virtual duty-free imports of minerals and energy as it did in 2024. Those imports (HS4 2709), along with computer and telecommunications equipment (HS 8471, 8473, 8517), entered duty-free in 2025m12, accounting for 23% of total imports that month. Tariffs on agriculture, chemicals and plastics, and machinery and electronics have also increased, but by less than other sectors. Metals, which were protected through Section 232, received the largest increase–20.1%. However, Apparel, Textiles and Footwear–arguably not as critical for national security–had the highest tariffs (28.1%). We discuss tariff levels as they relate to advanced technology and geopolitics in Section 6.7.

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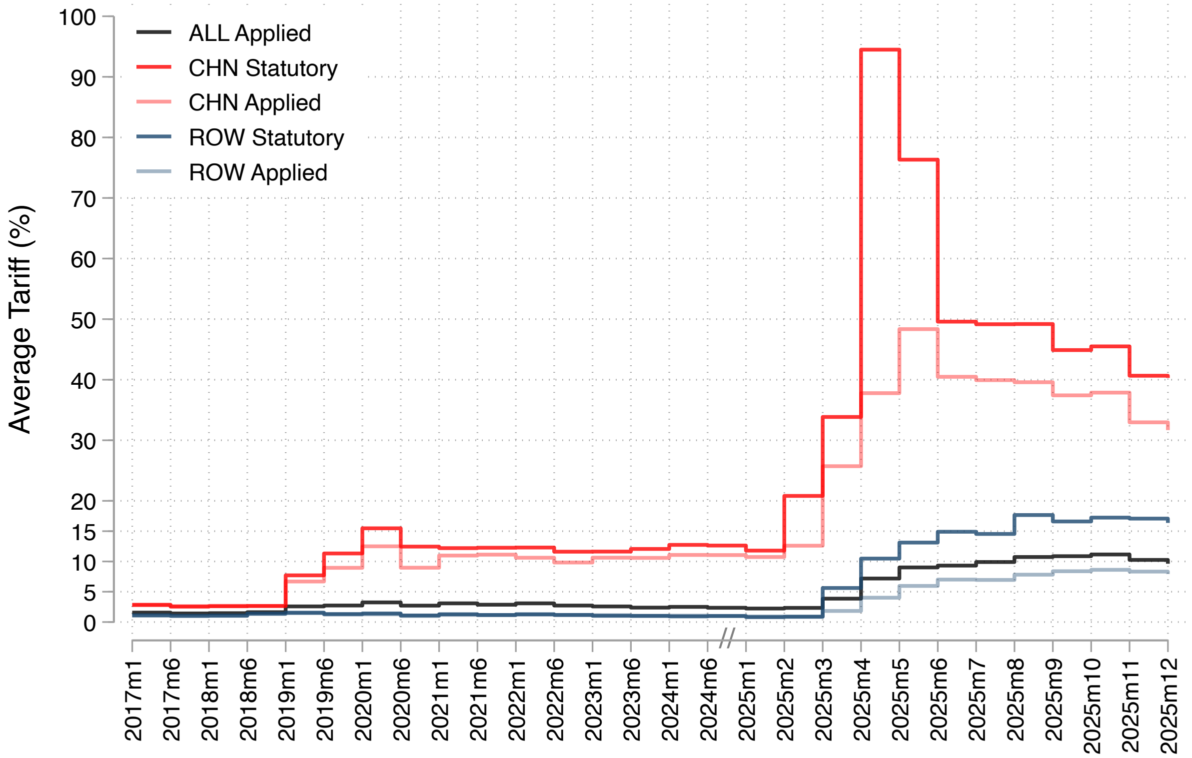
[8] The formula is $\min\left\{10\%, 0.5 \times \left(\frac{\text{US trade deficit with } i \text{ in 2024}}{\text{USimports from } i \text{ in 2024}}\right)\%\right\}$ according to USTR (2025b) and New York Times (2025). Start from a zero tariff. Then, by accounting, the tariff change that brings the bilateral trade deficit to zero is $\Delta\tau_i = -\frac{1}{\varepsilon}\frac{DEF_i}{IMP_i}$ under the following assumptions: i) exports to that country do not respond; ii) imports respond to tariffs on origin i with a constant semi-elasticity of ε; and, iii) imports from any origin i do not respond to tariffs from any other origin $i' \neq i$. To see why, start from a bilateral deficit of $DEF_i = IMP_i - EXP_i$; then, when tariffs change, imports change according to $\frac{\Delta IMP_i}{IMP} = -\varepsilon\Delta\tau_i$ and (assuming $\Delta EXP_i = 0$) we need $\Delta\tau_i$ such that $\Delta D_i = \Delta IMP_i = -D_i$, implying $\Delta\tau_i = -\frac{1}{\varepsilon}\frac{D_i}{IMP}$. USTR assumed $\varepsilon = 1$, and divided by two to get the resulting tariff.

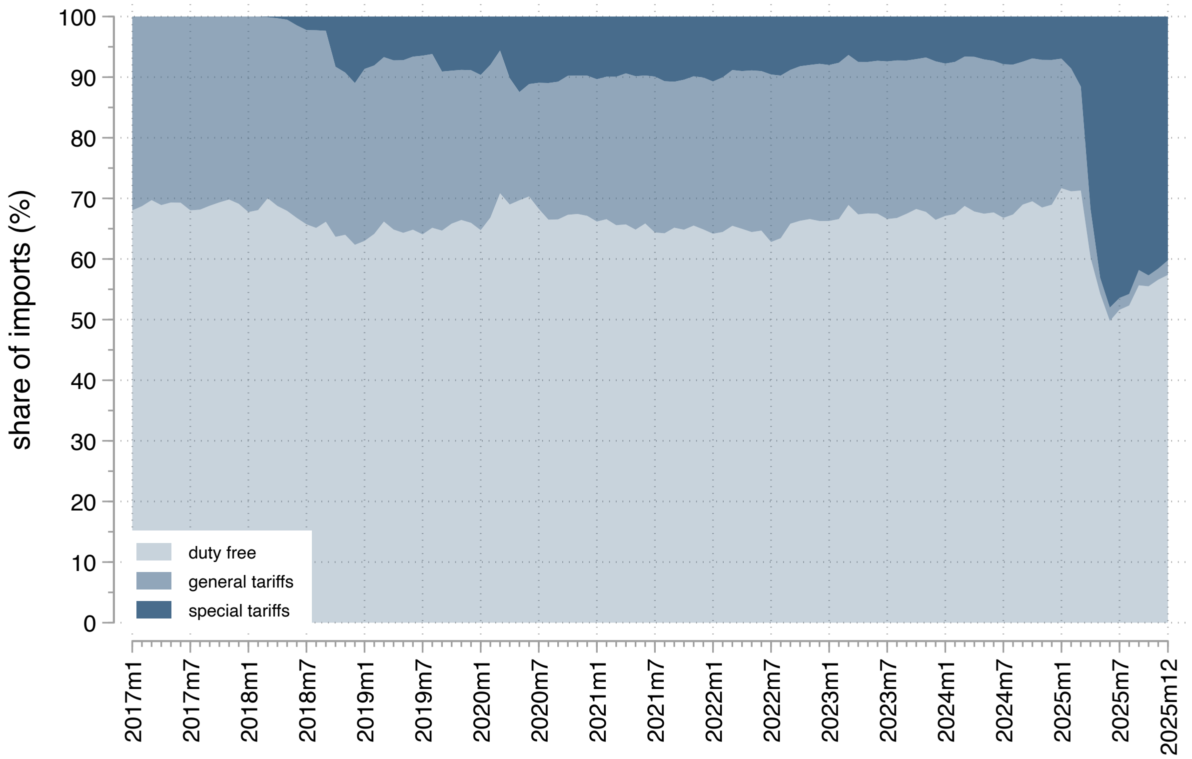
[9] Goods trade costs are from the ESCAP-World Bank Trade Cost database, which uses a gravity framework to infer costs from gaps between international and intra-national trade following Novy (2013); we average U.S. export barriers in each country over 2010-23. Services barriers are ad-valorem equivalents from CEPII's gravity model across 9 sectors in 2011 (Fontagne et al. 2016). GDP per capita is from the World Bank; distance and common language from CEPII (Conte et al., 2022). Missing values are set to zero with an indicator.

Figure 2: U.S. Import Tariffs, 2017m1 - 2025m12

Panel A: Tariffs on Trading Partners



Panel B: Import Composition by Rate Provision



Notes: Figure reports monthly weighted average applied and statutory tariff rates from January 2017 through 2025m12. Statutory rates (lighter lines) are constructed from USITC tariff schedules and trade-weighted using contemporaneous monthly import values. Applied rates (darker lines) are the ratio of collected duties to customs value. Panel A reports the overall tariff across all partners (black) and for China (red) and rest of world (navy). Note that the // denotes a switch from semi-annual to monthly ticks. Panel B shows the share of U.S. imports entering duty-free, subject to general tariffs, and subject to special tariffs. Source: U.S. Census MITD and USITC.

Table 1: Targeted U.S. Imports, 2018-19 and 2025

Panel A: 2018-19 Tariffs on U.S. Imports

	U.S. Imports and Tariffs: Region						
	Imports $bn	Fraction Tariffed (%)		Avg Tariff on Tariffed (%)		Avg Tariff (%)	
Region	2017	2017	2019m12	2017	2019m12	2017	2019m12
China	518	41.5	60.2	6.3	18.8	2.6	11.3
Canada and Mexico	594	10.1	14.0	0.9	0.7	0.1	0.1
East Asia and Pacific	437	37.8	34.2	5.6	6.3	2.1	2.1
Europe and Central Asia	482	39.3	37.1	3.2	3.7	1.3	1.4
Latin America and Caribbean	113	26.2	20.7	2.2	2.9	0.6	0.6
South Asia	62	42.8	54.0	9.9	8.4	4.3	4.6
Middle East and North Africa	71	38.5	45.4	0.6	1.3	0.2	0.6
Sub-Saharan Africa	26	7.9	20.5	0.9	1.6	0.1	0.3
All Countries	2,302	31.1	34.0	4.6	8.7	1.4	3.0

Panel B: 2025 Tariffs on U.S. Imports

	U.S. Imports and Tariffs: Region						
	Imports $bn	Fraction Tariffed (%)		Avg Tariff on Tariffed (%)		Avg Tariff (%)	
Region	2024	2024	2025m12	2024	2025m12	2024	2025m12
China	441	65.0	95.1	16.3	33.3	10.6	31.7
Canada and Mexico	897	15.6	15.5	1.2	25.3	0.2	3.9
East Asia and Pacific	780	27.9	45.2	6.0	20.4	1.7	9.2
Europe and Central Asia	729	34.3	55.0	3.6	16.5	1.2	9.1
Latin America and Caribbean	160	27.1	42.3	2.4	16.8	0.7	7.1
South Asia	108	48.1	52.0	8.1	42.4	3.9	22.0
Middle East and North Africa	69	45.4	35.3	1.5	18.1	0.7	6.4
Sub-Saharan Africa	31	21.0	19.8	1.4	23.5	0.3	4.7
All Countries	3,214	32.0	42.6	7.4	22.6	2.4	9.6

Notes: Table reports statistics on U.S. import exposure to tariffs. "Fraction Tariffed" is the share of total import value entering under a dutiable rate provision (including MFN duties and special tariffs under Section 201, 232, 301, and IEEPA), i.e., dutiable imports which are subject to non-zero tariffs. "Average Tariff on Tariffed" is the import weighted-average applied rate on dutiable imports. "Average Tariff" is the weighted-average applied rate across all imports: "fraction tariffed" × "average tariff on the tariffed" + (100%−"fraction tariffed"). Source: Census MITD.

TABLE 2: TARGETED U.S. EXPORTS, 2018-19 AND 2025

Panel A: 2018-19 Tariffs on U.S. Exports

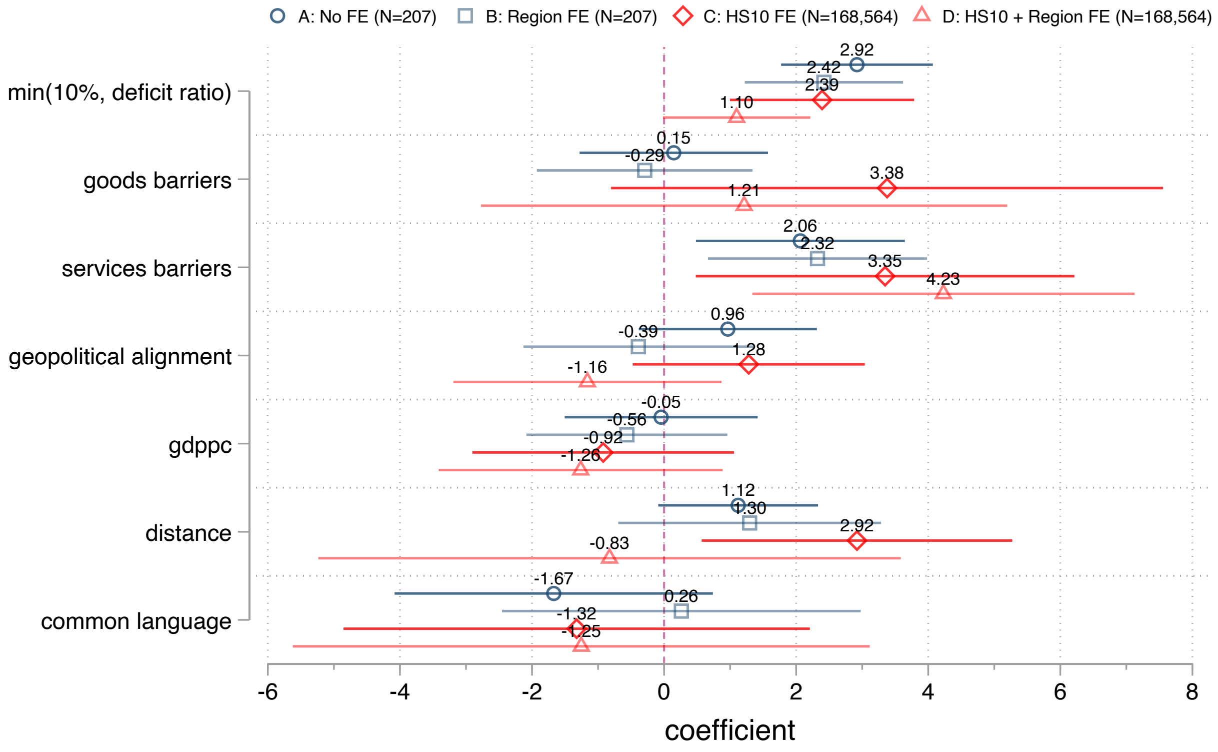
	U.S. Exports and Tariffs: Region						
	Exports $bn	Fraction Tariffed (%)		Avg Tariff on Tariffed (%)		Avg Tariff (%)	
Region	2017	2017	2019m12	2017	2019m12	2017	2019m12
China	129	78.3	93.9	8.4	19.1	6.6	17.9
Canada and Mexico	512	23.5	22.6	7.7	8.2	1.8	1.9
East Asia and Pacific	283	37.7	38.0	12.2	11.6	4.6	4.4
Europe and Central Asia	322	44.1	39.0	4.4	5.2	1.9	2.0
Latin America and Caribbean	144	75.6	70.0	9.0	9.2	6.8	6.4
South Asia	31	86.8	89.8	10.3	11.6	9.0	10.5
Middle East and North Africa	71	66.3	65.0	5.8	6.3	3.9	4.1
Sub-Saharan Africa	13	69.0	68.3	11.6	12.9	8.0	8.8
All Countries	1,504	44.0	43.6	8.1	10.1	3.5	4.4

Panel B: 2025 Tariffs on U.S. Exports

	U.S. Exports and Tariffs: Region						
	Exports $bn	Fraction Tariffed (%)		Avg Tariff on Tariffed (%)		Avg Tariff (%)	
Region	2024	2024	2025m12	2024	2025m12	2024	2025m12
China	141	73.5	100.0	12.1	20.2	8.9	20.2
Canada and Mexico	649	24.8	25.3	8.6	11.4	2.1	2.9
East Asia and Pacific	369	32.8	33.4	11.7	16.5	3.8	5.5
Europe and Central Asia	485	32.8	30.6	4.5	4.0	1.5	1.2
Latin America and Caribbean	197	66.2	67.0	9.9	9.8	6.5	6.6
South Asia	46	87.1	89.6	11.3	10.7	9.9	9.6
Middle East and North Africa	80	65.7	64.2	6.3	6.5	4.1	4.2
Sub-Saharan Africa	18	56.8	66.3	11.8	12.1	6.7	8.0
All Countries	1,985	39.2	39.7	9.0	11.0	3.5	4.4

Notes: Table reports statistics on U.S. export exposure to foreign statutory tariffs. Trade values are from Census MITD, and statutory tariff rates on U.S. exports are from foreign government websites.

FIGURE 3: CORRELATES OF U.S. IMPORT TARIFFS



Notes: Figure reports coefficients from four different regressions examining correlates of the applied tariffs as of 2025m12. Specification A regresses countries' average applied tariff on country covariates. Specification B adds region fixed effects. Specification C regresses variety-level applied rates on country covariates and product fixed effects, clustering standard errors by country. Specification D adds region fixed effects to C. All covariates are standardized except the common language indicator.

TABLE 3: TARGETED U.S. IMPORTS IN 2025, BY SECTOR

	U.S. Imports and Tariffs: Sectors						
	Imports $bn	Fraction Tariffed (%)		Avg Tariff on Tariffed (%)		Avg Tariff (%)	
Sectors	2024	2024	2025m12	2024	2025m12	2024	2025m12
Agriculture	241	22.5	47.2	6.5	16.4	1.5	7.7
Minerals & Energy	252	70.8	1.3	0.2	1.5	0.1	0.0
Chemicals & Plastics	495	20.9	33.3	7.7	19.1	1.6	6.4
Apparel, Textiles & Footwear	169	79.1	90.1	14.9	31.1	11.8	28.1
Metals	169	36.7	62.3	11.3	38.9	4.1	24.2
Machinery & Electronics	1,005	22.6	33.5	8.7	22.3	2.0	7.5
Transport Equipment	437	39.3	67.1	4.6	19.1	1.8	12.8
Furniture & Misc. Mfg	447	21.6	53.5	10.1	20.4	2.2	10.9
All Products	3,214	32.0	42.6	7.4	22.6	2.4	9.6

Notes: Table is constructed analogously to Table 1. HS chapters are divided into broad sectors: Agriculture (1-24), Minerals & Energy (27), Chemicals & Plastics (25-26, 28-40), Apparel, Textiles & Footwear (41-43, 50-67), Metals (72-83), Machinery & Electronics (84-85), Transport Equipment (86-89), and Furniture & Miscellaneous Manufacturing (44-49, 68-71, 90-97).

4 Tariff Impacts on U.S. Trade and Prices

4.1 Long-Run U.S. Trade Shares

Our goal is to trace the causal impact of tariffs on U.S. trade and prices. But, before examining these effects more closely, it is worth reviewing the long-run trajectory of U.S. import and export shares.

Figure A.2 plots the evolution of U.S. and China's import and export shares since 1972 across regions. Of course, the trends reflect a confluence of forces, including global growth, structural transformation, tariff and trade policies, and technological change. The figure shows three broad phases. First, prior to 2001, China grew steadily starting from near zero (with the U.S. maintaining an embargo on Chinese imports until 1970 and allowing normal trade relations in 1980). Second, since 2001 China continued to grow, peaking at above 20% by 2017, with Autor et al. (2013) and Pierce and Schott (2016) pointing to productivity growth and the permanency of normal trade relations in 2000, respectively, as the primary drivers. Third, strikingly, after 2017 China's share of U.S. imports fell rapidly, with the pace of decline exceeding the rate of increase observed in previous decades. The decline begins around 2018, coinciding with U.S. tariffs on China, and accelerated markedly in 2025. In 2025m12, the U.S. imported $19.4 billion, accounting for just 7% of total imports, a sharp drop from that same month in 2017 when it accounted for 23% of U.S. imports. In fact, the dollar value of imports from China declined in absolute terms: from $45.6 billion in 2017m12 to just $19.4 billion in 2025m12.

Where did China's market share go? One possibility is that the U.S. reallocated mostly towards itself. However, Figure 1 shows that the U.S. imports to GDP ratio remained fairly stable at around 11%, suggesting a low elasticity of import expenditures to tariffs (an elasticity we will estimate formally below). In contrast, East Asia appears to be the primary beneficiary of the expenditure reallocations triggered by the tariffs, with market shares as of 2025m12 at 34.1% of U.S. imports, up from about 18.5% in 2017m12. Even though tariffs on East Asia increased considerably, as shown in Table 1, they increased even more on China, likely triggering this reallocation; we examine this further in Section 6.6.

On the export side, U.S. export shares to China grew to about 10% by the mid 2010s, and fell to 7.1% in 2025. Europe's share of U.S. exports increased over this period.

4.2 Effects of Tariffs on Imports and Import Prices

4.2.1 Event Study

We move to gauging causal impacts of the tariffs on trade and import prices using reduced-form specifications. These specifications compare the responses of varieties subject to larger tariff increases to those facing smaller increases. Two issues arise immediately. First, what is the control group? Second, what fixed effects should we specify to account for confounding shocks? In our baseline specification, we control for product-time effects and origin-specific time trends.

However, as shown in Section 5, general equilibrium responses to the tariffs may themselves be absorbed by these controls, in which case the specification risks over-controlling. We examine robustness around various controls, and examine the full GE responses in the subsequent section.

To visualize the impacts and assess pre-existing trends, we use an event study research design that compares imports targeted by tariffs (or exports targeted by retaliations) to trade not targeted by tariffs using a local projections estimator (Dube et al., 2023):

$$y_{ig,t+h} - y_{ig,t-1} = \alpha_{gt} + \alpha_i + \beta_h \Delta D_{igt} + \epsilon_{igt} \qquad \text{for } h = \{-H_0, ..., 0, ...H_1\} \tag{1}$$

where i denotes an origin country, g denotes a ten-digit HS product code, t is month, and $y_{ig,t}$ is an outcome of interest. At each horizon h, β_h is estimated by comparing newly treated observations to those untreated as of $t+h$ (these are observations that will never be treated or treated at a later date). We include α_{gt} to control for product-time shocks, and the origin fixed effect (α_i) controls for (linear) trends. Standard errors are clustered by origin and HS8 for imports, and by destination and HS6 for exports. We examine six months of pre-trends, and track impacts up to 12 months for the 2018-19 tariffs and six months for the 2025 tariffs.

We define treated varieties based on the timing of the change in the applied tariff:[10]

$$\Delta D_{igt} = \begin{cases} 1 & \text{if } \tau_{igt} > \max_{t \in T_0} \tau_{igt} + 2\%, \\ 0 & \text{otherwise.} \end{cases} \tag{2}$$

That is, we compare the applied tariff in time t with the maximum applied tariff in the year prior to the trade war ($T_0 = 2017$ for the 2018-19 episode and $T_0 = 2024$ for the 2025 episode), and switch treatment on if τ_{igt} exceeds that maximum by at least 2% threshold. Treatment is an absorbing state that remains on even if the applied rate falls in subsequent months. We add the small buffer of 2% since applied rates can be noisy. For U.S. exports, we do not observe the applied tariffs and therefore define treatment based on the statutory retaliatory tariffs (and do not impose a buffer).[11]

Figure 4A plots the results for four outcomes: applied tariffs, import values, before-tariff unit values (the ratio of import values to import quantities), and the duty-inclusive unit value. The impact of the 2018-19 tariffs are in orange and the 2025 impacts are in blue. The upper left panel reports the applied tariff; by construction, the applied tariffs increase when treatment is defined, but the figure is still useful to gauge the relative magnitude of the shock in these specifications. In

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[10] We could define targeted varieties using the statutory tariff; however, as discussed above, the statutory rate often increased before the applied rate (due to shipping lags) or it increased despite no changes in the applied rate due to exemptions or USMCA compliance.

[11] This event study specification differs from Fajgelbaum et al. (2020) in three ways. First, that paper defined targeted varieties using the statutory tariff. Second, it did not rely on an estimator that ensures clean comparisons between treated and untreated varieties in a staggered treatment setting. Third, those specifications included origin-time fixed effects α_{it} which control for exchange rates and other country-time shocks, and therefore relied both on within-origin and across-product tariff variation to estimate impacts. In 2025, introducing an α_{it} fixed effect would remove a large amount of tariff variation given that tariffs were often set uniformly across varieties within countries. We therefore use a more restrictive time-invariant α_i to absorb country trends, and discuss robustness to including α_{it} or excluding α_i from the analysis. It is also the case that not all varieties within products are hit with tariff changes: by 2025m12, 56.2% of HS10 codes had at least one imported variety not targeted by a tariff increase.

2018-19, we see that targeted varieties on average are hit a second time approximately 8 months after the initial targeting, reflecting the subsequent waves of tariffs on Chinese imported varieties. In 2025, the applied rate increases as event time elapses, and, of course, applies to a much larger set of imported varieties.

The upper right panel shows the impact on import values. This specification reveals no clear pre-trend in the 2025 tariffs. This evident lack of pre-trends runs against aggregate import series showing front-running of the tariffs in early 2025. A possible explanation for why this anticipation does not appear in the event study is that it was product-specific rather than variety-specific, and is therefore controlled for through the product-time fixed effects. The relative decline in targeted imports in 2025 matches the pattern from 2018-19, although after six months the decline is slightly smaller than in the previous episode despite the higher average tariffs.

Extensive research on the 2018-19 tariffs found robust evidence of essentially complete pass-through of the tariffs into the unit values (Fajgelbaum and Khandelwal, 2022). The bottom left panel confirms those findings for that episode, showing that the before-tariff unit values of targeted varieties did not change relative to untargeted varieties, even 12 months after being hit with tariffs. The blue series shows the price responses in 2025. The results here suggest some before-tariff unit value declines, but the estimates are noisy; below, we estimate pass-through regressions to recover the pass-through coefficients. These before-tariff price effects can only be measured conditional on fixed effects, a point to which we return below. However, because the regression does not include country-time FEs, country-level impacts of tariffs are accounted for in the estimate. The bottom-right panel shows tariff-inclusive import unit values during both episodes. Six months after being targeted with tariffs, treated varieties in 2018-19 were roughly 10% more expensive relative to untargeted varieties.

Panel B separates the response by China and rest of world. Chinese imports have faced higher tariff increases, and their exports to the U.S. have fallen quite substantially, confirming the descriptive evidence discussed above. On average, six months after being targeted by a tariff, Chinese imports are around 50% lower than in the pre-period, suggestive of an implied elasticity of 2.5. For the rest of the world, we observe about a 20% decline suggestive of an implied elasticity of around 2. However, there is substantial heterogeneity in responses within the rest of world, including countries targeted with tariffs for which exports to the U.S. increased due the even larger tariffs on China. Our model assumes a common elasticity across countries, but we examine heterogeneous elasticities in Section 6.6. For both China and rest of world, the point estimates suggest incomplete pass-through but the standard errors are quite large, so the null of complete pass-through cannot be rejected.

Figure 4C reports the impacts of retaliatory tariffs on U.S. exports in both episodes. The upper left panel reports the statutory tariffs. In 2025, we observe the large retaliatory spike at nearly 50% when China raised its tariffs briefly in May before bringing them down. In both episodes, we observe that the retaliations reduced U.S. exports by roughly similar magnitudes. The bottom left panel reports the before-tariff unit values. In 2018-19, we observe an absorption of the tariffs by

U.S. exports, with targeted varieties roughly 5% lower than untargeted varieties after 12 months. In 2025, the event study suggests a complete pass-through of retaliatory tariffs to foreign buyers of U.S. goods, but there is a pre-trend making it difficult to conclude definitively; we note that the export data are not used in the estimation of the model parameters.

4.2.2 Pass-Through

We can estimate elasticities of trade and price responses to the tariffs through the following specification:

$$\Delta \ln y_{igt} = \alpha_{gt} + \alpha_i + \beta \Delta \ln \left(1 + \tau_{igt}\right) + \epsilon_{igt} \tag{3}$$

We collapse the data to the quarterly level and estimate parameters for the 2018-19 tariffs using data from 2017q1-2019q4, and estimate the 2025 parameters using data from 2024q1-2025q4 (with the last quarter having data through November). The Δ denotes quarter-to-quarter differences. In the case of the import specifications, we instrument the applied tariff with the statutory tariff to mitigate concerns of division bias. We cluster standard errors by HS8 and origin for imports, and by HS6 and origin for exports.

Table 4 reports the results. The first column reports the first-stage regression of the applied tariff against the statutory tariff change in both episodes. The correlation between the changes in applied and statutory rates is lower in 2025, likely because of the divergence between the statutory and applied rates noted above.

The next two columns show impacts on import values and quantities. At this horizon, we estimate a larger elasticity of import values to tariffs in 2025, -1.81, compared to 2018-19, -1.39.

Column 4 reports the impacts on before-tariff prices. The coefficients are similar in both episodes, suggestive of some incomplete pass-through; for 2025, the coefficient is -0.10 (s.e. 0.06). At this quarterly horizon, foreign exporters have absorbed approximately 10% of the tariffs, or, as shown in column 5, the duty-inclusive pass-through rate is 90% (by construction, column 5 is equal to one plus the coefficient in column 4). This is high pass-through but not 100%.

Table A.2 examines the sensitivity of the pass-through estimate to different sets of controls. Column 1 replicates the impact on (before-tariff) prices in the baseline specification. Column 2 removes the country time trend, which captures, for instance, country-specific linear productivity trends. Doing so does not qualitatively change the result. Column 3 moves instead towards a more flexible specification by including country-time fixed effects, which would capture time-varying country shocks, such as the exchange rate or an origin's wage. Here, we observe a lower pass-through rate of 80%.[12] This raises the possibility that our baseline specification is not capturing the full impact of exchange rate movements (or trade partners' real wage adjustments).[13] To explore this, columns 4 and 5 re-estimate the baseline specification and the specification without

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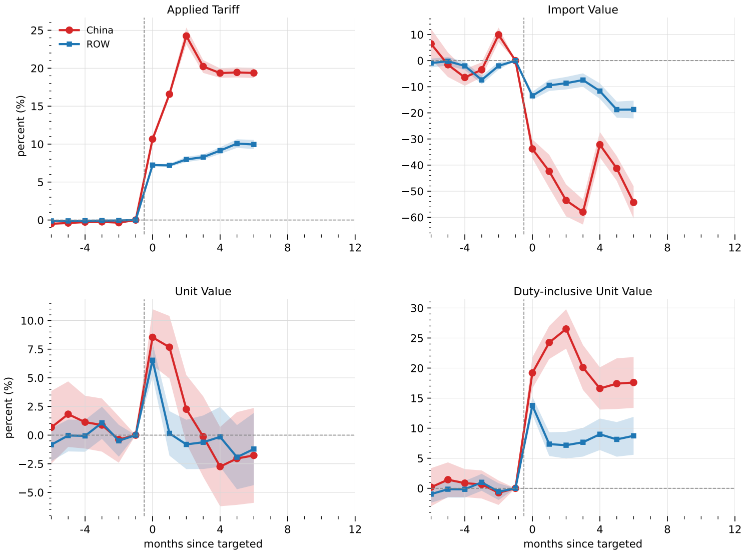
[12] It is possible that α_{it} in this specification absorbs a lot of the tariff variation. This is consistent with the adjusted R2s from regressing the change in statutory tariffs (the instrument) on only: α_{gt} FEs (R2=0.47), $\alpha_{gt} + \alpha_i$ (R2=0.49), and $\alpha_{gt} + \alpha_{it}$ (R2=0.82). As a comparison, in the 2018-19 period, the R2 explained by the $\alpha_{gt} + \alpha_{it}$ fixed effects is 0.52.

[13] Standard trade models would predict that including country-time fixed effects should increase rather than reduce pass-through, as country-level wage effects go in the direction of reducing the pass-through.

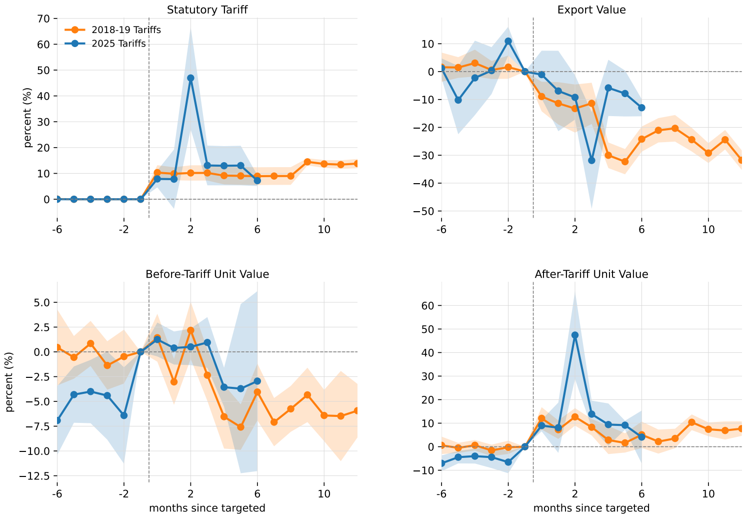
FIGURE 4: 2018-19 TARIFFS VS 2025 TARIFFS: IMPORT AND EXPORT RESPONSES

Panel A: U.S. Import Responses, 2018-19 vs 2025

Panel B: U.S. Import Responses, China and Rest of World in 2025



Panel C: U.S. Export Responses, 2018-19 vs 2025



Notes: Figure reports event-study coefficients estimated using approach from Dube et al. (2023). Dependent variables are log (1+tariff) (top left), log trade value (top right), log before-tariff unit value (bottom left), and log duty-inclusive unit value (bottom right). The 2018-19 series (orange) is estimated on monthly variety-level data from 2017m1-2019m12; the 2025 series (blue) uses 2024m1–2025m12. Standard errors are clustered by origin and HS8 for Panels A and B, and by destination and HS6 for Panel C; 95% CIs reported.

origin FEs, and include a control for the change in the bilateral exchange rate. However, the point estimates are quite stable, suggesting that the result in column 3 cannot be explained by changes in exchange rates. Nevertheless, in the quantitative framework below, we examine sensitivity of the parameters necessary for the quantification to different sets of fixed effects.

Table A.3 estimates the pass-through coefficient at different horizons: monthly, quarterly (the benchmark), semi-annual, and annual. At the monthly horizon, we estimate essentially complete pass-through across the different specifications. At a semi-annual horizon, our estimates look very similar to the quarterly horizon. At the annual level, where we take year-on-year differences in quarterly data, irrespective of the sets of fixed effects and controlling for exchange rates, we cannot reject complete pass-through. We reserve Section 6.1 for further discussion about tariff pass-through estimates from the 2018-19 and 2025 tariff episodes.

Panels C and D of Table 4 examine U.S. export responses to the retaliatory tariffs in 2018-19 and 2025. Here, we only observe the statutory rate, so there is no first-stage regression as in the previous panels. We estimate that the negative response of U.S. exports to retaliatory tariffs was roughly twice as large in 2018-19 as in 2025. In both episodes, we do not find evidence that U.S. exporters absorbed the retaliatory tariffs at this quarterly horizon (and if anything, the estimates suggest more-than-complete pass-through in 2018-19). Table A.2 (Panels C and D) explore the sensitivity of the retaliatory pass-through estimates to the different sets of fixed effects, with similar estimates across the specifications.

Table 4: Import Responses to Tariffs

Panel A: 2018-19 Tariffs: Import Responses

	(1) $\Delta\ln(1+\tau_{igt})$	(2) $\Delta\ln p^*_{igt}m_{igt}$	(3) $\Delta\ln m_{igt}$	(4) $\Delta\ln p^*_{igt}$	(5) $\Delta\ln p_{igt}$
$\Delta\ln(1+\tau^{\text{stat}}_{igt})$	0.64***				
	(0.08)				
$\Delta\ln(1+\tau_{igt})$		-1.39***	-1.26***	-0.13**	0.87***
		(0.19)	(0.20)	(0.06)	(0.06)
Fixed Effects	gt+i	gt+i	gt+i	gt+i	gt+i
1st-Stage F		69.9	69.9	69.9	69.9
R2	0.20	0.00	0.00	.	0.00
N	1,464,263	1,464,263	1,464,263	1,464,263	1,464,263

Panel B: 2025 Tariffs: Import Responses

	(1) $\Delta\ln(1+\tau_{igt})$	(2) $\Delta\ln p^*_{igt}m_{igt}$	(3) $\Delta\ln m_{igt}$	(4) $\Delta\ln p^*_{igt}$	(5) $\Delta\ln p_{igt}$
$\Delta\ln(1+\tau^{\text{stat}}_{igt})$	0.42***				
	(0.06)				
$\Delta\ln(1+\tau_{igt})$		-1.81***	-1.71***	-0.10*	0.90***
		(0.50)	(0.54)	(0.06)	(0.06)
Fixed Effects	gt+i	gt+i	gt+i	gt+i	gt+i
1st-Stage F		52.4	52.4	52.4	52.4
R2	0.16	0.00	0.00	.	0.00
N	1,192,687	1,192,687	1,192,687	1,192,687	1,192,687

Panel C: 2018-19 Tariffs: Export Responses

	(1) $\Delta\ln p^*_{US,igt}m^*_{igt}$	(2) $\Delta\ln m^*_{igt}$	(3) $\Delta\ln p^*_{US,igt}$	(4) $\Delta\ln p^*_{US,igt}(1+\tau^*_{igt})$
$\Delta\ln(1+\tau^*_{igt})$	-0.48**	-0.62***	0.15**	1.15***
	(0.19)	(0.18)	(0.07)	(0.07)
Fixed Effects	gt+i	gt+i	gt+i	gt+i
R2	0.00	0.00	0.00	0.00
N	1,631,678	1,631,678	1,631,678	1,631,678

Panel D: 2025 Tariffs: Export Responses

	(1) $\Delta\ln p^*_{US,igt}m^*_{igt}$	(2) $\Delta\ln m^*_{igt}$	(3) $\Delta\ln p^*_{US,igt}$	(4) $\Delta\ln p^*_{US,igt}(1+\tau^*_{igt})$
$\Delta\ln(1+\tau^*_{igt})$	-0.31***	-0.30***	-0.00	1.00***
	(0.04)	(0.04)	(0.01)	(0.01)
Fixed Effects	gt+i	gt+i	gt+i	gt+i
R2	0.00	0.00	0.00	0.00
N	1,225,287	1,225,287	1,225,287	1,225,287

Notes: Table reports tariff impacts on U.S. imports and exports at the quarterly horizon. Panels A and C cover 2017m1-2019m12 and Panels B and D covers 2024q1-2025q4. In Panels A and B, Column 1 regresses the change in applied U.S. import tariffs on the change in U.S. statutory import tariffs. Columns 2-5 regress import values, quantities, pre-tariff and post-tariff unit values on applied tariffs instrumented by statutory tariffs. All regressions include product-time and origin fixed effects. Standard errors clustered by HS8 and origin. Panels C and D examine U.S. exports responses to (statutory) retaliatory tariffs, clustering standard errors by HS6 and origin.

5 Aggregate Impacts

Having estimated the impact of the tariffs on variety-level imports and prices, we now quantify their aggregate effects on the U.S. economy. We use a static quantitative trade framework with perfect competition. Tariffs distort the relative prices faced by producers and consumers, thus leading to income losses, but may also improve the terms-of-trade (prices of exports relative to imports). The tariffs are welfare-enhancing when terms-of-trade benefits more than offset the distortions.[14] Despite the near-complete pass-through at the variety level that we estimate, there may be terms-of-trade benefits stemming from export price increases due to general equilibrium channels: U.S. buyers reallocate partially into U.S. goods, raising their prices in world markets. The model quantifies these potential benefits.

5.1 Framework

5.1.1 Sector-Level Demand and Supply

We use the model in Fajgelbaum et al. (2020).[15] We relegate a description of the model with regions and equilibrium conditions to the appendix.

The U.S. economy trades with countries in the world, indexed by i. The representative domestic consumer has preferences over non-tradeables and tradeable sectors, $s = 1, .., S$:

$$U = \beta_{NT} \ln C_{NT} + \sum_{s \in S} \beta_s \ln C_s. \tag{4}$$

The demand for tradeables, C_s, aggregates differentiated goods as described below, while non-tradeables are homogeneous. Consumers maximize utility subject to expenditures:

$$X = \underbrace{w_{NT} L_{NT} + \sum_{s \in S} w_s L_s + \sum_{s \in S} \Pi_s}_{\text{GDP}} + TR + D. \tag{5}$$

The representative consumer earns non-tradeable wages, tradeable sector wages and profits, all of which add up to (nominal) GDP. The consumer also receives the tariff revenue TR and the (exogenously given) trade deficit D. The U.S. economy imposes import tariffs τ_{ig} on each good g

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[14] The framework does not quantify dynamic impacts of tariffs, such as changes in the capital stock or changes in the returns to innovation. It also ignores how tariffs interact with pre-existing distortions due to imperfect competition or with increasing returns, as well as potential impacts from the uncertainty caused by the rapid changes in trade policy throughout 2025. We discuss some of these issues in Section 5.5.

[15] An important difference, however, concerns the solution method. Fajgelbaum et al. (2020) used first-order approximations to solve for the impact of tariffs around the initial pre-tariff equilibrium. Here, given the much larger tariff shock, first-order approximations are less reliable. Therefore, similar to Adao et al. (2024), we use the nonlinear solution to that model and solve it exactly in relative changes around the pre-tariff equilibrium. Due to this updated solution method, the updated data to quantify the initial equilibrium, and the re-estimated parameters, our results differ from those in Fajgelbaum et al. (2020).

imported from i, so tariff revenue is:

$$TR = \sum_{g \in \mathcal{G}} \sum_{i \in \mathcal{I}} \tau_{ig} p_{ig} m_{ig}, \tag{6}$$

where $\mathcal{G}$ is the set of all goods in the economy (across all sectors) and $\mathcal{I}$ is the set of all countries.

On the domestic supply side, output of sector s uses intermediate inputs $I_{ss'}$ from sector s' and labor L_s:

$$Q_s = Z_s L_s^{\alpha_{L,s}} \prod_{s'} I_{ss'}^{\alpha_{ss'}}. \tag{7}$$

The gross production shares add to less than one, ($\sum_{s'} \alpha_{ss'} + \alpha_{Ls} < 1$), with the remaining output share going to capital-owners. We assume capital is fixed by sector and labor may be fixed (in our benchmark) or perfectly mobile. Fixed-capital owners demand labor and intermediates to maximize profits taking as given the domestic producer price p_s in sector s,

$$\Pi_s = \max_{Q_s, L_s, I_{ss'}} p_s Q_s - w_s L_s - \sum_{s'} P_{s'} I_{ss'}, \tag{8}$$

where $P_{s'}$ is the price index of inputs in sector s'. Appendix A.2 shows the solution to the optimization problem.

5.1.2 Goods-Level Demand and Supply

Output in sector s is differentiated across goods g. On the demand side, both final consumption C_s and intermediate use I_s are defined as a three-tier nested CES demand system across these goods (see Appendix A.1 for the demand system). At the highest sector-level tier, consumers substitute between domestic and imported goods with elasticity κ, with associated price indexes P_{Ds} and P_{Ms}; in the middle tier, heterogeneous goods g (an HS10 code) are substituted with elasticity η, with associated price index p_{Mg}; and, for a given imported good in a sector (a NAICS code), consumers substitute among origins with elasticity σ. This nesting structure allows for flexible substitution patterns; specifically, two imported varieties of the same product, a domestic and an imported variety of the same product, and two imported products from the same origin can substitute against one another at different rates.

The demand for each imported variety is

$$m_{ig} = a_{ig} \frac{E_s}{P_s} \left(\frac{P_{Ms}}{P_s} \right)^{-\kappa} \left(\frac{p_{Mg}}{P_{Ms}} \right)^{-\eta} \left(\frac{p_{i,g}}{p_{Mg}} \right)^{-\sigma}, \tag{9}$$

where a_{ig} is an exogenous demand shifter, E_s are U.S. expenditures in sector s, P_s is a sector-level price index, P_{Ms} is an import price index, p_{Mg} is the price index of imported good g. The domestic price $p_{i,g}$ of good g imported from country i equals the international price $p^*_{i,g}$ times the tariff rate:

$$p_{i,g} = (1 + \tau_{ig}) \, p^*_{i,g}. \tag{10}$$

The domestic demand for the U.S.-made variety of good g is

$$d_g = a_{Dg} \frac{E_s}{P_s} \left(\frac{P_{Ds}}{P_s} \right)^{-\kappa} \left(\frac{p^*_{US,g}}{P_{Ds}} \right)^{-\eta}, \tag{11}$$

where a_{Dg} is an exogenous demand shifter, E_s are U.S. expenditures in sector s, P_s is a sector-level price index, P_{Ds} is the domestic price index, and p_{Mg} is the price index of imported good g. We assume no export taxes, hence the international price of U.S. goods ($p^*_{US,g}$) is also the domestic price faced by U.S. producers and consumers.

On the supply side, we assume a constant marginal rate of transformation across the differentiated products $g \in \mathcal{G}_s$ within sector s, with one unit of Q_s needed to produce z_g units of good g. Therefore, the international price of U.S. goods is proportional to the sector-level price:[16]

$$p^*_{US,g} = \frac{p_s}{z_g}. \tag{12}$$

5.1.3 Welfare and International Price Determination

How do tariffs impact aggregate welfare? A classic general result from Dixit and Norman (1980) is that tariffs improve real income when they improve the terms-of-trade but reduce it via distortions in consumption and production choices. In the model, real income is $U = X/P$, expenditures over the price index. Letting $\hat{x}$ denote the (first-order) percentage change in a given variable x, the change in real income due to tariff changes is:

$$\hat{U} = \underbrace{\sum_{g \in \mathcal{G}} \left(\frac{EXP_g}{X} \right) \left(\frac{\Delta p^*_{US,g}}{p^*_{US,g}} \right) - \sum_{g \in \mathcal{G}} \sum_{i \in \mathcal{I}} \left(\frac{IMP_{ig}}{X} \right) \left(\frac{\Delta p^*_{i,g}}{p^*_{i,g}} \right)}_{\text{Terms of Trade}} + \underbrace{\sum_{g \in \mathcal{G}} \sum_{i \in \mathcal{I}} \left(\frac{R_{ig}}{X} \right) \left(\frac{\Delta m_{i,g}}{m_{i,g}} \right)}_{\text{Distortions}}, \tag{13}$$

where EXP_g is the dollar value of U.S. exports of good g, IMP_{ig} is the value of U.S. imports of good g from i, R_{ig} is tariff revenue generated by imports of g from i, and X are national expenditures defined in (5), with all these variables defined before the tariff shock.

Our quantification entertains two alternative assumptions regarding the impact of tariffs on U.S. goods prices $p^*_{US,g}$ and import prices $p^*_{i,g}$:

Without Terms-of-Trade Adjustments The first alternative is that there are no terms-of-trade effects: both the U.S. prices $p^*_{US,g}$ and the import prices p^*_{ig} are fixed. In this case, both foreign demand for U.S. goods and foreign supply of imports to the U.S. are infinitely elastic. As a result, when the U.S. taxes imports, tariff-inclusive import prices rise 1-1 with tariffs, U.S. consumers reallocate to domestic goods, and both imports and exports fall. Only the "distortions" term in (13) is present in this case and tariffs *necessarily* lower U.S. welfare.

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[16] This assumption allows for price differences across goods within sector, but all goods prices change in the same proportion due to tariffs within a sector. This assumption can be relaxed assuming specific factors in each good, but doing so would require (unavailable) good-level production data to quantify the model.

With Terms-of-Trade Adjustments The second alternative is that there are terms-of-trade adjustments: import prices $\hat{p}^*_{i,g}$ and export prices $\hat{p}^*_{US,g}$ may change. Now, both foreign demand for U.S. goods and foreign supply of imports have finite elasticities. Import tariffs improve the terms-of-trade through two main channels. First, by lowering demand for imports, foreign producers may lower the (before-tariff) prices they charge, causing $\hat{p}^*_{i,g}$ to fall. Second, by reallocating U.S. demand into domestically-produced goods, U.S. producer prices (and therefore export prices and wages) increase. If the terms-of-trade gain in (13) more than compensates for the distortions term, U.S. real income rises with higher tariffs. In this case:

- The prices $p^*_{US,g}$ of U.S. goods are determined such that supply q_g equals domestic demand d_g defined in (11) plus foreign export demand from all countries, where country i's demand for U.S. exports of g is
$$x_{ig} = a^*_{ig}\left(\left(1+\tau^*_{ig}\right)p^*_{US,g}\right)^{-\sigma^*}, \tag{14}$$
where a^*_{ig} incorporates demand shifters, trade costs, and the exchange rate; that is, $p^*_{US,g}$ adjusts such that:
$$q_g = \underbrace{a_{Dg}\frac{E_s}{P_s}\left(\frac{P_{Ds}}{P_s}\right)^{-\kappa}\left(\frac{p^*_{US,g}}{P_{Ds}}\right)^{-\eta}}_{\text{US demand for US good } g} + \sum_i \underbrace{a^*_{ig}\left(\left(1+\tau^*_{ig}\right)p^*_{US,g}\right)^{-\sigma^*}}_{\text{Country } i \text{ demand for } US \text{ good } g}. \tag{15}$$
Retaliatory foreign tariffs $1+\tau^*_{ig}$ enter through this market clearing condition by shifting down foreign demand for U.S. goods.

- The price $p^*_{i,g}$ of imported good g from i equals the foreign inverse export supply curve,
$$p^*_{i,g} = z^*_{ig}m^{\omega^*}_{ig} \tag{16}$$
where the U.S. import demand m_{ig} is given in (9).

In Section 5.2.1 we estimate ω^* (which largely determines terms-of-trade effects on the import side), and in 5.2.2 we further explore empirically whether there is evidence of terms-of-trade effects on the export side. Our empirical evidence is ambiguous about which of the two cases (with or without terms-of-trade effects) is more plausible. Therefore, our quantifications will be implemented under both assumptions (with and without terms-of-trade adjustments).

5.2 Parametrization

5.2.1 Key Elasticities

We follow the parametrization strategy in Fajgelbaum et al. (2020) to estimate the key demand and supply parameters in the model: $\{\sigma, \eta, \kappa, \sigma^*, \omega^*\}$. As discussed in that paper, under the assumption that the tariff changes are unrelated to shocks to supply and demand, the U.S. import tariffs τ can be used to recover $\{\sigma, \eta, \kappa, \omega^*\}$ using U.S. import data. The retaliatory tariffs τ^* recover σ^* using China's import data.

Specifically, expressing (9) and (16) in logs and taking time differences,

$$\Delta \ln m_{igt} = \psi_{gt} + \psi_i - \sigma \Delta \ln \left(\left(1 + \tau_{igt}\right) p^*_{igt} \right) + \epsilon_{igt}, \tag{17}$$

$$\Delta \ln p^*_{igt} = \eta_{gt} + \eta_i + \omega^* \Delta \ln m_{igt} + \nu_{igt}, \tag{18}$$

where $\Delta x_t \equiv x_t - x_{t-1}$, the ψ and η terms are U.S. demand shocks and endogenous demand shifters, and ϵ_{igt} and ν_{igt} are residual variation in these terms. Conditional on the fixed effects, regressing imports on tariff-inclusive prices recovers σ and regressing before-tariff prices on imports recovers ω^*. Once σ and ω^* are estimated, we use the structure of the demand system to aggregate the data and tariff shocks over products and sectors to recover the substitution across imported products (η) and between imports and domestic products (κ); see Fajgelbaum et al. (2020) for details.

Table 5A reports the estimates of $\{\sigma, \omega^*\}$. Columns 3 and 4 correspond to (18) and (17); with columns 1 and 2 their respective first stages. As a baseline specification, we include α_{gt} and α_i fixed effects. The structural estimate of ω^* in column 3 is 0.06 (s.e. 0.05). We detect a modestly upward sloping foreign export supply curve, consistent with the estimated imperfect pass-through earlier, but quite close to perfectly elastic. Column 4 reports the estimates for $\sigma = 1.91$ (s.e. 0.51).[17]

Panel B reports analogous regressions using Chinese import data and the (statutory) tariffs imposed on its trade partners between 2016 and 2024. The structural estimate of σ^* is in column 2, with the first-stage regression in column 1.

Table A.4 shows the results for η and κ. We summarize the full set of parameters used to quantify the model in Panel C of Table 5. That summary also shows the parameters for the 2018-19 tariff episode.[18]

5.2.2 Are There Terms-of-Trade Effects?

On the import side, our evidence so far does not suggest significant terms-of-trade effects; the inverse foreign export supply elasticity ω^* is low implying a high (near complete) pass-through. On the export side, the price effects of U.S. tariffs are harder to pin down empirically, particularly since examining variation across products cannot reveal aggregate impacts.

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[17] As a comparison, Boehm et al. (2023) and Alessandria et al. (2025a) estimate a short-run tariff elasticity of 0.76 and 2.29, respectively. The former use MFN tariff changes across 183 countries, while the latter examine U.S. import responses to tariffs on China between 1974-2008.

[18] The parameter estimates for 2018-19 tariffs are slightly different from Fajgelbaum et al. (2020) for four reasons: 1) here, we estimate parameters over a quarterly horizon, rather than monthly; 2) we use data through December 2019, rather than through April 2019; 3) we corrected some errors in the tariff data during that period; and 4) previously, we included origin-time instead of only origin fixed effects to estimate (18) and (17). Table A.5A reports parameter estimates under different controls in (18) and (17). Panel A uses only product-time FEs, and the results are similar to the benchmark. Panel B uses product-time and origin-time FEs; here, the 2025 estimates are much noisier with none of the parameters statistically significant, which is consistent with this specification absorbing much of the tariff variation; see footnote 12. Panel C reports estimates of medium-run parameters using year-over-year changes in the quarterly data.

TABLE 5: PARAMETERS

Panel A: U.S. Import Demand (σ) & Foreign Supply (ω^*)

	(1) $\Delta \ln m_{igt}$	(2) $\Delta \ln p_{igt}$	(3) $\Delta \ln p^*_{igt}$	(4) $\Delta \ln m_{igt}$
$\Delta \ln(1+\tau^{\text{stat}}_{igt})$	-0.72***	0.38***		
	(0.15)	(0.04)		
$\Delta \ln m_{igt}$			0.06	
			(0.05)	
$\Delta \ln p_{igt}$				-1.91***
				(0.51)
Fixed Effects	gt+i	gt+i	gt+i	gt+i
1st-Stage F			22.3	108.9
ω^*			0.06 (0.05)	
σ				1.91 (0.51)
R2	0.00	0.00	.	0.07
N	1,192,687	1,192,687	1,192,687	1,192,687

Panel B: China Import Demand (σ^*)

	(1) $\Delta \ln p^*_{US,igt}(1+\tau^*_{igt})$	(2) $\Delta \ln m^*_{igt}$
$\Delta \ln(1+\tau^*_{igt})$	0.80***	
	(0.13)	
$\Delta \ln p^*_{US,igt}(1+\tau^*_{igt})$		-2.54***
		(0.45)
Fixed Effects	gt+i	gt+i
1st-Stage F		37.8
σ^*		2.54 (0.45)
R2	0.56	.
N	82,238	82,238

Panel C: Summary of Parameters

Tariff Episode	σ	ω^*	η	κ	σ^*
2018-19 Tariffs	1.45	0.11	1.38	1.21	2.54
	(0.22)	(0.06)	(0.42)	(0.36)	(0.45)
2025 Tariffs	1.91	0.06	1.90	1.12	2.54
	(0.51)	(0.05)	(0.18)	(0.21)	(0.45)

Notes: Panel A reports structural regressions for U.S. imports to estimate $\{\sigma, \omega^*\}$ using data from 2024q1 to 2025q4. Column 3 estimates the inverse foreign export supply elasticity (ω^*), with the first-stage being column 1. Column 4 estimates the import demand elasticity (σ), the first-stage is column 2. All regressions include product-time and origin fixed effects. Standard errors clustered by HS8 and origin. Panel B reports analogous regressions on quarterly Chinese imports from 2016q1 to 2024q4. The data are collapsed to two origins: U.S. and rest of world. Since Teti (2024) does not include 2024 tariffs, we assume that China's 2024 non-U.S. tariffs are equal to those in 2023. Column 2 estimates σ^*, with column 1 showing the first stage. Regressions include product-time and origin fixed effects, standard errors clustered by HS6. Panel C reports the parameter estimates for the 2018-19 tariffs and 2025 tariffs.

One way to ask whether terms-of-trade adjustments have occurred, potentially sidestepping the challenge of not being able to measure country-level effects, is to implement the test in Adao et al. (2024). Their test rejects a model if its predictions for how the determinants of aggregate welfare (import prices, export prices, and imported quantities) vary with exogenous tariff changes are statistically different from the relationship between these variables and tariffs in the data. Crucially, the model predictions may include country-level responses in terms-of-trade that cannot be estimated in regressions, but which do affect the model's predictions for how import prices, export prices, and imports behave. Hence, this method can bypass the previous challenges based on cross-sectional variation. However, when we implement their tests we cannot reject the model, making it difficult to conclude from this test which assumption is better supported by the data thus far.[19]

Alternatively, we can focus directly on producer and export prices for a sharper test, as this is the key difference between the two models. The model without terms-of-trade assumes no response of either, while the model with terms-of-trade implies that, across sectors, producer and export prices increase with import tariffs, fall with retaliation tariffs, and increase with input tariffs. Figure A.3 shows scatterplots of sector-level export price indices (XPI) in data and model versus these shocks, and Table A.7 shows the test for PPI and XPI. We find no evidence that the PPI or XPI co-move with the 2025 tariffs in the data, implying no cross-sectional evidence on terms-of-trade. However, the cross-sectional model-based regressions are also weak or flat regardless of whether terms-of-trade are included in the model. As a result, we are also unable to distinguish between the models based on this metric.

In sum, nothing jumps out to suggest that significant terms-of-trade effects are present in the data, so far; but we also cannot formally distinguish between the versions of the model with and without country-level terms-of-trade. One possible interpretation is that more time may be needed for terms-of-trade adjustments, particularly country-level wage responses, to appear more sharply in the data. For this reason, we implement our counterfactuals under both assumptions. Given the importance of this assumption, we believe testing for price responses to the tariffs remains an important area for future work.

5.3 Aggregate Impacts

We now compute the aggregate effects of tariffs by simulating tariff changes from 2024 to 2025m12. In addition to the estimated demand and supply elasticities, the model matches the distribution of economic activity (wages, employment, and intermediate inputs) across sectors and the distribution of imports and exports across goods and countries. For each case, we report

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[19] Table A.6 shows the test in response to the 2025 tariffs, where the first column regresses the pooled welfare-relevant predictions allowing for terms-of-trade adjustments against the tariff instrument while column 2 uses the model without ToT adjustments; both specifications weight the predictions by their trade shares. Columns 3 and 4 repeat the test using unweighted specifications, and here the point estimate, although very close to zero, rejects both models.

the aggregate welfare impacts, $\hat{U}$:

$$\hat{U} = \frac{\hat{X}}{\hat{P}_{NT}^{\beta_{NT}} \prod_s \hat{P}_s^{\beta_s}}, \tag{19}$$

$$\hat{P}_s = \left(\lambda_D \hat{p}_s^{1-\kappa} + (1-\lambda_D)\,\hat{P}_{M_s}^{1-\kappa}\right)^{\frac{1}{1-\kappa}}, \tag{20}$$

$$\hat{X} = 1 + \frac{GDP}{X}\left(G\hat{D}P - 1\right) + \frac{TR}{X}\left(T\hat{R} - 1\right). \tag{21}$$

where λ_D is the domestic share of expenditures in sector s, $\frac{GDP}{X}$ is the share of GDP in aggregate expenditures, and $\frac{TR}{X}$ is the share of tariff revenue. In these counterfactuals, the predicted price and wage outcomes are measured relative to wages in foreign countries, which are held constant in the model. Therefore, in the model predictions, price changes are interpreted relative to wages in the rest of the world.

For each counterfactual we report four measures of welfare change:[20]

1. changing import prices only ($\hat{P}_{M_s}$ as in the counterfactual and $\hat{p}_s = \hat{P}_{NT} = G\hat{D}P = T\hat{R} = 1$),
2. changing domestic prices only ($\hat{p}_s$ and $\hat{P}_{NT}$ as in the counterfactual and $\hat{P}_{M_s} = G\hat{D}P = T\hat{R} = 1$),
3. changing factor income only ($G\hat{D}P$ as in the counterfactual and $\hat{P}_{M_s} = \hat{p}_s = \hat{P}_{NT} = T\hat{R} = 1$),
4. changing tariff revenue only ($T\hat{R}$ as in the counterfactual and $\hat{P}_{M_s} = \hat{p}_s = \hat{P}_{NT} = G\hat{D}P = 1$).

Table 6 shows the welfare impacts of the 2024-2025m12 applied tariffs. Table 7 shows the impacts on macro outcomes and their counterparts in the raw data: CPI, PPI, real wages, GDP, and the trade-to-GDP ratio.

We present all results without and with terms-of-trade adjustments, as described in Section 5.1.3. To recap, without terms-of-trade adjustments the prices of all tradeables (both imported and U.S. made) are assumed to be constant. In contrast, with terms-of-trade adjustments, both import prices and producer and export prices in the U.S. may adjust.

5.3.1 Welfare

The net impact of the 2025 tariffs (including both U.S. tariffs and retaliation) is small, between 0.10% of GDP (assuming terms-of-trade change) and -0.13% (assuming they do not). Despite the historically large tariff increases in 2025, the small short-run aggregate impact is perhaps not too surprising given the low share of trade in U.S. GDP. However, the small aggregate impact hides large gross effects between firms and consumers buying imported goods, producers, and

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[20] Specifically, from (19)-(21), the four measurements correspond to the following four equations: $\hat{U}^{\text{Import Prices}} = \left(\prod_s \left(\frac{P_{D_s}D_s}{E_s} + \left(1 - \frac{P_{D_s}D_s}{E_s}\right)\hat{P}_{M_s}^{1-\kappa}\right)^{\frac{\beta_s}{1-\kappa}}\right)^{-1}$, $\hat{U}^{\text{Domestic Prices}} = \left(\hat{P}_{NT}^{\beta_{NT}} \prod_s \left(\frac{P_{D_s}D_s}{E_s}\hat{p}_s^{1-\kappa} + \left(1 - \frac{P_{D_s}D_s}{E_s}\right)\right)^{\frac{\beta_s}{1-\kappa}}\right)^{-1}$, $\hat{U}^{\text{Factor Income}} = 1 + \frac{GDP}{X}\left(G\hat{D}P - 1\right)$, and $\hat{U}^{\text{Tariff Revenue}} = 1 + \frac{TR}{X}\left(T\hat{R} - 1\right)$.

the government. Regardless of whether terms-of-trade adjust, the gross loss of consumers and gross gain for producers is at least an order of magnitude larger than the net effect. Thus, while there may be a slight gain or loss to the economy overall, the tariffs do transfer large amounts of resources from one group to another.[21]

Without Terms-of-Trade Adjustments Column 1 of the first panel of Table 6 shows the welfare cost from higher import prices alone is equivalent to -0.85% of GDP, a somewhat larger loss than a back-of-the-envelope calculation multiplying the applied tariffs increase of 7.3% by the 10.8% import-to-GDP ratio in 2024. Column 2 shows the consumer welfare change due to domestic price changes only is -1.69% of GDP.[22] The factor income gains from protection are more than offset by higher prices, with real wages falling. These losses are partially offset by new tariff revenue that amounts to 1.08% of GDP. As expected from the theory, the aggregate impact is negative: a loss of 0.13% of GDP.

With Terms-of-Trade Adjustments Further including terms-of-trade adjustments has only a small impact on import prices because of the high foreign export supply elasticity. The main difference is that producer prices in the tradeable sector now increase with U.S. tariffs and fall with retaliation. We estimate that the PPI increases by 4.3%, real wages rise by 0.1% in non-tradeables, and change by -2.5% in the tradeable sector. The increase in producer prices triggers a larger CPI increase than without terms-of-trade. Consumers now experience a welfare change of -5.01% of GDP due to higher domestic prices, but factor income gains amount to 5.16% of GDP. On net, aggregate welfare rises by 0.10% of GDP.

With Labor Mobility Table A.8 reports the welfare effects of 2025 tariffs allowing for labor mobility across sectors. Broadly speaking, this case captures a longer-run response since labor can adjust. Here, there is a greater scope for both distortions and terms-of-trade adjustments: as labor moves into protected sectors, imports fall more than in the case without labor adjustments (raising the distortions term in (13)) and exports fall more than in that case (raising the export prices). Without terms-of-trade adjustments, the aggregate effect is -0.50% (versus the baseline -0.13% without labor mobility). With terms-of-trade adjustments, the aggregate effect is 0.28% (versus 0.10% in the baseline).

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[21] Ignatenko et al. (2025) and Rotunno and Ruta (2025) simulate tariff impacts in versions of the canonical quantitative trade framework using elasticities calibrated to the existing literature (Costinot and Rodriguez-Clare, 2014). Their estimates–small and positive net impacts due to terms-of-trade improvements, large gross negative consumer losses that are offset by revenue and wage gains, and net losses from coordinated in-kind global retaliation–are consistent with our findings (and expected since we work within the same class of models).

[22] Because this case assumes away terms-of-trade impacts, there are no PPI responses in the tradeable sector. These domestic price increases capture responses in non-tradeable prices.

TABLE 6: WELFARE IMPACT OF 2025 APPLIED TARIFFS

	2025 Tariffs (without ToT Effects)				
	Import Prices	Domestic Prices	Factor Income	Tariff Revenue	Total
	(1)	(2)	(3)	(4)	(5)
Change ($ b)	-254	-503	410	323	-38
Change (% GDP)	-0.85	-1.69	1.37	1.08	-0.13

	2025 Tariffs (with ToT Effects)				
	Import Prices	Domestic Prices	Factor Income	Tariff Revenue	Total
	(1)	(2)	(3)	(4)	(5)
Change ($ b)	-262	-1494	1538	344	29
Change (% GDP)	-0.88	-5.01	5.16	1.15	0.10

Notes: Table shows the total welfare impact corresponding to the 2024 to 2025m12 change in applied tariffs. The different components do not enter additively, hence the 4 columns do not sum to the aggregate effect.

TABLE 7: AGGREGATE OUTCOMES, 2025 TARIFFS

2025 Tariffs (without ToT Effects)					
CPI (1)	PPI (2)	Real Wage (T) (3)	Real Wage (NT) (4)	Real GDP (5)	$\frac{\text{Trade}}{\text{GDP}}$ (6)
2.6%	0.0%	-4.3%	-0.1%	1.5%	-1.4 p.p.

2025 Tariffs (with ToT Effects)					
CPI (1)	PPI (2)	Real Wage (T) (3)	Real Wage (NT) (4)	Real GDP (5)	$\frac{\text{Trade}}{\text{GDP}}$ (6)
6.2%	4.3%	-2.5%	0.1%	1.3%	-1.2 p.p.

Observed Changes					
CPI (1)	PPI (2)	Real Wage (T) (3)	Real Wage (NT) (4)	Real GDP (5)	$\frac{\text{Trade}}{\text{GDP}}$ (6)
2.8%	3.0%	2.0%	0.9%	2.0%	-1.1 p.p.

Notes: Table shows the change in aggregate variables predicted by the model corresponding to the 2024 to 2025m12 change in applied tariffs. The CPI includes tradeables and non-tradeables. The PPI is a sales weighted average of price changes in tradeables. CPI and PPI are relative to foreign wages, which are kept constant in the model. Panel A reports outcomes in the model without terms-of-trade so the PPI is zero by construction. In model and data, Tradeable (T) and non-tradeable (NT) real wages are wages in each sector normalized by the CPI. In the model, real GDP is total factor income normalized by the PPI. The third panel reports observed changes in aggregate variables in the data computed between 2024q4 and 2025q4. The units in columns 1 to 5 are percent changes, and in column 6 is percentage points.

5.3.2 Macro Aggregates

Table 7 compares the model predictions for the key macro aggregates against raw data changes from 2024q4 to 2025q4. This comparison isolates the contribution of tariff shocks to the observed changes, which result from many economic shocks beyond tariffs. The results suggest that, despite small aggregate welfare effects, the trade shocks were far from negligible regarding key macroeconomic outcomes, with the predicted changes for some outcomes lining up in terms of order of magnitude against the raw data.

The model with terms-of-trade adjustment predicts a CPI increase of 6.2% (2.6% without terms-of-trade), against 2.8% in the data. We emphasize our model lacks a domestic supply chain margin with wholesalers and retailers, and as a result it almost surely over-predicts the final consumer price increase of imported goods, a point we return to in Section 6.1. We estimate a PPI increase of 4.3% against 3.0% in the data (the no-terms-of-trade model sets this to a 0% change by construction).

The tariffs lead to mild adjustments in the trade-to-GDP ratio, largely a consequence of a low elasticity of substitution between imports and domestic goods, with the trade share (imports and exports relative to GDP) changing by -1.2 to -1.4 percentage points starting from a goods trade share of 17%, compared to a -1.1 percentage point change in the raw data.[23]

5.3.3 Alternative Scenarios: 2018-19 Tariffs, Retaliations, Medium-Run Parameters, Sec. 122

Figure 5 shows components of welfare under alternative scenarios (in the model with terms-of-trade). The baseline scenario corresponds to the previously discussed applied 2025 tariffs. Appendix A.4 shows the corresponding numbers for the model with no ToT adjustments.

We first implement the analysis for 2018-19 tariffs, in which case we re-estimate all the elasticities and calibrate the baseline economy to 2017 (Table 5C reports the parameters). Comparing 2018-19 and 2025 tariffs, we see the same qualitative patterns. But, as expected, the magnitudes are much larger in 2025. Roughly speaking, the aggregate welfare effects, both the total impact and each component, are five times larger in 2025, broadly consistent with the average tariff increase being about five times larger.[24]

As discussed earlier, the retaliations in 2025 have been modest, apart from China. However, if the tariffs remain in place over the medium and longer-run, it is possible trade partners may eventually retaliate. We therefore simulate a retaliatory scenario where every country responds in kind (with retaliation set to the increase imposed by the U.S. on the corresponding country). This global response reduces aggregate U.S. welfare by 0.34%, more than offsetting the aggregate gains stemming from terms-of-trade improvements. This channel of retaliation only works with aggregate terms-of-trade adjustments, on which, as we have discussed, the data is inconclusive.

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[23] In the counterfactual, the trade deficit is exogenously fixed at its 2024 level. Therefore, imports and exports change by the same amount in model-generated outcomes.

[24] We also quantify the model using the alternative parameters estimated from just using α_{gt} fixed effects (the parameters in Table A.5A) and find an overall impact of 0.17% with ToT adjustments or -0.11% without. The parameters in Panel B are too noisy so we do not report the model quantification with those.

Next, we re-estimate the parameters using annual changes in the quarterly data; see Table A.5C. These parameters reflect trade and price responses in the medium-run. In this case, the headline aggregate impact (inclusive of terms-of-trade adjustments) is roughly the same as the baseline, equal to 0.10%, and to a relatively larger loss, equal to -0.18%, if terms-of-trade do not adjust.

The last scenario replaces IEEPA tariffs with uniform tariffs under Section 122. We specify a uniform 15% tariff increase on all origins, except for Mexico and Canada; for China, we assume the actual 2025 tariff changes. Overall, the effects are quite similar to the baseline.

5.4 Taking Stock

A takeaway of these results is that the net real income impact of tariffs on the U.S. economy appears somewhat small, between a gain of 0.10% of GDP and a loss of 0.13% of GDP. Are these model predictions reasonable?

One view is that relatively small net effects are realistic. Indeed, economic activity in the U.S. did not experience evidently large swings, and as we have seen the model-based predictions for aggregate outcomes such as real income, aggregate prices, and trade appear of roughly similar magnitudes to the raw data. Moreover, as discussed earlier, the shock was smaller than what headlines had reported. Nevertheless, this does not mean tariffs are not impactful in terms of net value created per dollar taxed. The numbers imply an MVPF (marginal value of public funds, defined as net benefit over taxes raised) of -0.12 to 0.08. Kennedy et al. (2026) estimate 0.47 dollars of private income gained per dollar of tax cut for the 2017 Tax Cuts and Jobs Act, roughly in line with calculations by Barro and Furman (2018) for the same event, and Hendren and Sprung-Keyser (2020) report MVPFs of 0.2 and 0.12 for the 1986 and 1993 EITC expansions.

In contrast, an alternative interpretation is that the U.S. experienced larger losses or gains from tariffs than what our analysis implies, but these effects were obscured in the raw data by contemporaneous shocks (such as the boom in artificial intelligence in 2025). Indeed, our framework lacks several forces that may magnify the losses or benefits from tariffs. For example, tariff hike announcements were accompanied by immediate sharp declines in stock prices in both 2018-19 (Amiti et al., 2021) and 2025 (Benguria and Saffie, 2025), likely reflecting expected long-run changes in determinants of firm profitability or increases in uncertainty. Pierce and Schott (2016) and Handley and Limão (2017) find large impacts of removing tariff uncertainty on China's export growth during the early 2000s, and Alessandria et al. (2025a) find a larger role for tariff policy uncertainty in the earlier 1980s. Our model has no dynamics, omitting capital accumulation, international capital mobility, inter-temporal substitution and trade deficits. It also lacks imperfect competition and increasing returns. We cover some of these topics in the next sections by considering the literature and additional evidence.

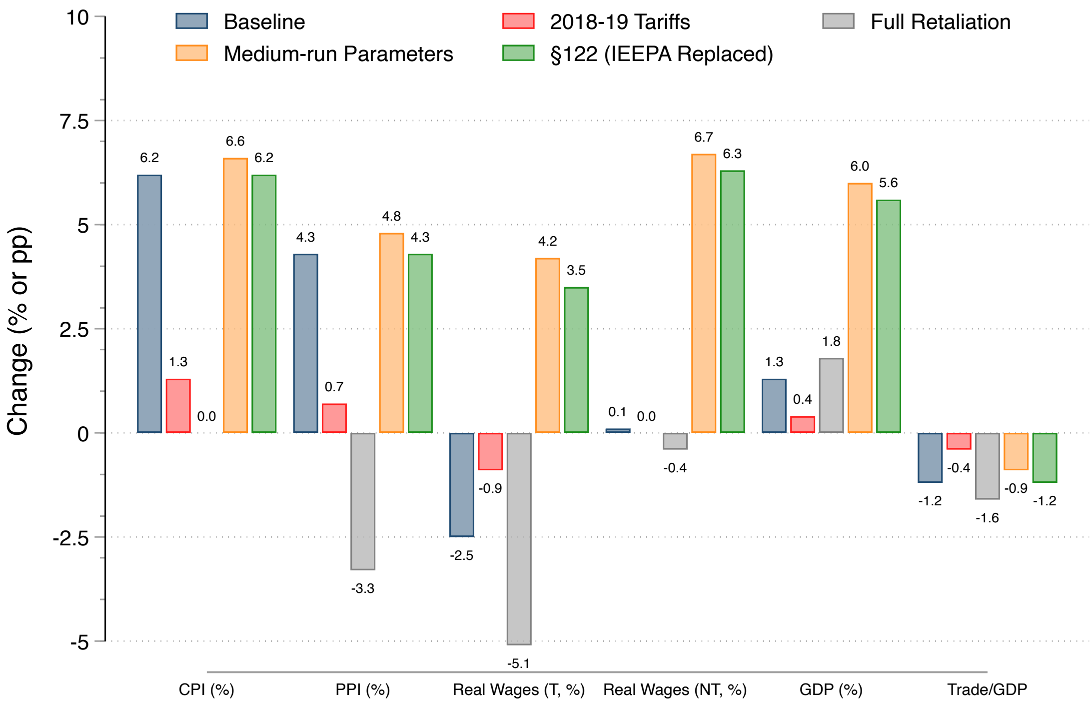
5.5 Dynamic Impacts

An argument for larger losses than what our analysis implies, in line with the view that tariffs lead to large reductions in stock-market valuations, is that we have excluded dynamic impacts, both

FIGURE 5: WELFARE IMPACTS OF DIFFERENT SCENARIOS (MODEL WITH TOT EFFECTS)

Panel A: Components of Welfare

Panel B: Aggregates



Notes: Figure reports impacts in the model with terms-of-trade adjustments. Panel A reports the components of welfare and Panel B report aggregate statistics under different configurations of tariff changes.

at low frequencies affecting growth and at high frequencies affecting the business cycle. Many studies have incorporated the 2025 tariffs in models of growth or the business cycle, with the details varying across studies using alternative computable equilibrium models or quantitative trade models.[25] A message emerging from this literature is that the static frameworks likely underestimate the gross losses from tariffs compared to dynamic models.

First, in response to permanent tariff shocks, negative capital accumulation responses may lead to long-run losses (Baqaee and Malmberg, 2025a; Kleinman et al., 2023). As long as the production of investment goods uses imports, tariffs have long-run negative impacts because they increase the cost of investment and therefore reduce the long-run level of the capital stock. Baqaee and Malmberg (2025b) incorporate capital accumulation in a quantitative trade framework and simulate the Liberation Day tariffs assuming in-kind retaliation. They show that reductions in U.S. consumption and real wages are at least twice as large when capital adjusts in every country in response to a permanent trade war.

Second, at business-cycle frequencies, temporary tariff shocks may be expansionary by incentivizing substitution towards domestic goods, but may also be contractionary via distortions and higher imported input costs. The same forces are also present in the static models, resulting in a loss of real GDP when the export supply elasticity is high or the import demand elasticity is low; however, in addition, the inter-temporal substitution of expenditures now plays a key role, with stagflation more likely if this substitution is higher, i.e., if the higher prices today strongly incentivize postponing consumption (Auclert et al., 2025). Simulations of open-economy frameworks with nominal rigidities suggest net contractionary effects from 2025 tariffs alongside higher prices (Auray et al. 2025, Jouvanceau et al. 2025, Kalemli-Ozcan et al. 2025).[26]

Third, if the adjustment dynamics to trade shocks are driven by slow labor mobility across sectors–the main source of adjustment typically considered in quantitative trade models–the recovery from a temporary trade war can be fast. Rodriguez-Clare et al. (2025) simulate U.S. tariffs and retaliation in a model with disaggregated regions where workers can move across sectors within a region (subject to mobility costs as in Caliendo et al., 2019), and where involuntary unemployment arises due to downward nominal wage rigidity. They assume tariffs revert back to initial levels after four years. Aggregates, such as real wages, real value added, and GDP, recover quickly, back to near 2024 levels when the trade war ends. Still, they measure aggregate real income losses of Liberation Day tariffs on the order of 0.4% in the last year the tariffs are assumed to be active, a larger value than is typically encountered in static setups nested in their analysis.

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[25] For example, see Giesecke and Waschik (2025), McKibbin et al. (2025), Congressional Budget Office (2025), Wharton Penn Budget Model (2025), and The Budget Lab at Yale (2025) for dynamic estimates using CGE models.

[26] Using historical time series data and macroeconomic aggregates in the U.S., Schmitt-Grohe and Uribe (2025) argue that tariff hikes had mild effects on inflation and output, while using a narrative approach to identify the shocks, den Besten and Känzig (2026) argue that tariff shocks have been contractionary and have had time-dependent price responses. A related theme is whether and how monetary policy should respond to tariff shocks given objectives of real activity and low inflation. Papers studying the monetary policy response to tariffs find that tariff shocks operate like cost-push shocks in a closed economy (Werning et al., 2025), hence optimal monetary policy should be expansionary, supporting activity at the cost of inflation in the short run (see also Mehrotra and Waugh 2025, Bianchi and Coulibaly 2025, and Monacelli 2025).

Of course, the persistence of the trade war is an open question: it took several decades to fully unwind the protectionism from the Smoot-Hawley period.[27]

6 Rationales for the Tariffs

Why has the U.S. returned to protectionism? This section discusses the rapidly growing literature on the 2025 tariffs around several stated rationales: 1) lowering before-tariff import prices; 2) reducing trade deficits; 3) raising government revenue; 4) distributional concerns; 5) decoupling trade from China; 6) geopolitics and friend-shoring; 7) reshoring strategic sectors; and, 8) increasing foreign market access. These motivations are often in conflict. For example, lowering before-tariff import prices cuts against both job creation and reshoring in manufacturing, which require higher tariff-inclusive import prices in order to maintain higher producer prices. An obvious tension also exists between reducing trade deficits and raising tariff revenue. Moreover, these rationales have a tenuous or even negative relationship with aggregate welfare. For example, in the recent literature, the theoretical channels linking tariffs to trade deficits often point to lower deficits precisely when higher tariffs lower welfare. More time and data will be needed to assess these objectives.

6.1 Lowering Import Prices

Getting foreign exporters to absorb the tariffs through lower before-tariff prices is a stated goal of the tariffs, as this would shift the tariff incidence onto the exporters. As we have discussed, our estimates have shown that the prices faced by U.S. importers of varieties receiving higher tariffs did fall to some extent, but exporters absorbed only 10% of the tariffs in our baseline estimates. This means a 90% pass-through, substantial but not complete. At the monthly or annual horizon the pass-through is closer to complete, as shown in Table A.3. Our takeaway from these various checks is that pass-through to border prices has been less complete in 2025 than in the 2018-19 episode, but still quite high.[28] For comparison, Gopinath et al. (2025) estimate a 12-month pass-through of 94%, Hinz et al. (2026) estimate a pass-through of 96%, which is slightly higher than our preferred estimates, and Amiti et al. (2026) estimate 90%. Fair (2026) estimates that tariffs have increased the non-farm price deflator by 1.7%.[29] Our analysis and these papers use

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[27] The allowance for tariff exemptions could result in rent-seeking costs such as wasted resources and misallocation (Bhagwati, 1982). Evidence for this channel would require linking lobbying activity to the exemptions or to firm-specific tariffs.

[28] Fajgelbaum and Khandelwal (2022) review the early evidence of the 2018-19 tariffs on import prices. Earlier studies such as Amiti et al. (2019) and Fajgelbaum et al. (2020) found complete pass-through, with Amiti et al. (2020) documenting high pass-through over the longer-run across all goods except iron and steel. Ganapati and Hottman (2026) argue that complete pass-through conflates price cuts by exporters with a price rise due to the loss of scale economies.

[29] There are several differences between our specifications compared to Gopinath et al. (2025): they include only product dummies, do not instrument the applied tariff with the statutory rate, and they compare imported varieties in September 2024 and September 2025 (whereas we collapse varieties to their annual imports, which substantially increases the number of observations compared to their 12-month specification). Hinz et al. (2026) specify their

product-level data, which have the benefit of being released at a two-month lag and are publicly available. However, product-level unit values are not the same quality of price data as detailed invoices, and more work is necessary to uncover estimates of tariff pass-through into border prices.

So far we only considered pass-through from tariffs to tariff-inclusive prices at the border. The pass-through to the price paid by final consumers depends on the share of the import price in the final consumer price.[30] For the 2018 episode, Flaaen et al. (2020) found complete pass-through of tariffs on washing machines into final retail prices, Flaaen et al. (2025) estimate more than complete pass-through to final consumers, and Bai et al. (2025) estimate retail prices increasing by about 50% of the tariff shock using a sample of barcodes and the 2018-19 tariffs, while Cavallo et al. (2021) estimate a low retail pass-through using data from two large retailers. In 2025, Cavallo et al. (2025) have tracked prices from five retailers and estimate retail price increases equal to about 20% of tariff increases through early September; this corresponds to complete pass-through of tariffs to final consumers if the import price is a 20% share of the retail price.

6.2 Reducing Trade Deficits

Shrinking the trade deficit, which was 3.1% of 2024 GDP, was another stated goal. Trade deficits are shaped both by intra-temporal relative prices and by inter-temporal savings and investment decisions. While there is no clear theoretical foundation for shrinking trade deficits as a goal of real income maximization, developing countries concerned with balance-of-payments crises and sudden reversals in international capital flows have historically used protectionist trade policy with an explicit goal of controlling external imbalances.[31]

The raw data indicate an overall *increase* of 2.2% in the U.S. goods trade deficit between 2024 and 2025. Figure 6 plots the changes in bilateral trade deficits against the 2024-2025 tariff change (here, we use the full 12-month 2025 average since we examine the annual change in deficits). Excluding China, we find essentially no correlation between the two. Including China makes the relationship negative and significant, with higher tariffs associated with reductions in bilateral trade deficits.[32] This correlation, of course, is not causal, and estimating how tariffs affect trade deficits is an active area of research that we now review.

A first reason why tariffs impact trade deficits is valuation effects (Itskhoki and Mukhin, 2025; Aguiar et al., 2025). With foreign countries holding dollar-denominated debt, tariff increases may improve the U.S. terms-of-trade, appreciate the dollar, and close the trade deficit. However, the

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regressions in levels, as opposed to differences, and also do not instrument the applied rate with the statutory rate. Amiti et al. (2026) run regressions using 12-month changes at the monthly level. Fair (2026) estimates aggregate price regressions in a macro-econometric framework.

[30] If the import price is a fraction $X < 1$ of the retail price of a final consumer good due distribution margins, then the retail price increases by X times the increase in the tariff-inclusive import price if payments to intermediaries do not change. Therefore, the pass-through from a tariff increase $\Delta\tau$ to the final consumer price measured in the CPI is "complete" if the retail price increases by $X\Delta\tau$ (and more or less than complete if it increases by more or less than that).

[31] See Obstfeld (2025) and Ossa and Redding (2026) for discussions of the determinants of the U.S. trade deficit.

[32] Simple correlations also suggest that changes in U.S. bilateral trade deficits have been uncorrelated with tariff changes over a longer horizon. Regressing the 2000-25 change in bilateral deficit against the change in U.S. import tariffs yields a slope of 0.37 (se 0.27); excluding China, the slope is -0.01 (se 0.27).

real cost of servicing U.S. debt rises, reducing real U.S. welfare. A back-of-the-envelope calculation suggested by Itskhoki and Mukhin (2025) implies that the trade deficit reduction equals the value of foreign-owned U.S. assets times the increase in producer prices due to tariffs. When terms-of-trade effects are included in our model, we calculate a PPI of 4.3% in response to the 2025 tariffs, implying a trade deficit reduction of 0.34% of GDP.[33] This revaluation translates one-to-one into a welfare loss (as the U.S. gives up consumption), fully eroding the aggregate gains stemming from terms-of-trade improvements we have computed.[34]

Second, Caliendo et al. (2025) find that a unilateral tariff increase would reduce trade deficits through a different mechanism: international risk sharing. Increasing tariffs leads to an increase in U.S. income relative to global income through a favorable terms-of-trade shift. But spending rises by less than income since consumers use asset markets to smooth consumption, leading to a narrowing of the U.S. deficit. Welfare declines because the tariffs raise prices such that real consumption falls.

Third, as shown by Costinot and Werning (2025), permanent tariff shocks can shrink the trade deficit if imports are a superior good (expenditure share increases with aggregate consumption). The intuition is that higher current deficits are associated with higher current real consumption, so when imports are superior goods, permanent tariffs reduce imports more than exports. Assuming fixed import prices, they demonstrate imports are a superior good if the set of imported goods broadens and that of exported goods shrinks with aggregate consumption. We conjecture that their channel would reduce the trade deficit if our setup extended to multiple periods.

Finally, temporary tariff shocks naturally affect deficits by creating substitution away from periods in which tariff-inclusive prices are higher and into periods where incomes are higher. Auclert et al. (2025) shows that in general it is ambiguous whether temporary tariff shocks worsen the imbalance. In their preferred parametrization, in which temporary tariffs are contractionary, the trade deficit shrinks. Quantifications in larger-scale New-Keynesian models such as Kalemli-Ozcan et al. (2025) and Jouvanceau et al. (2025) reach a similar conclusion.[35]

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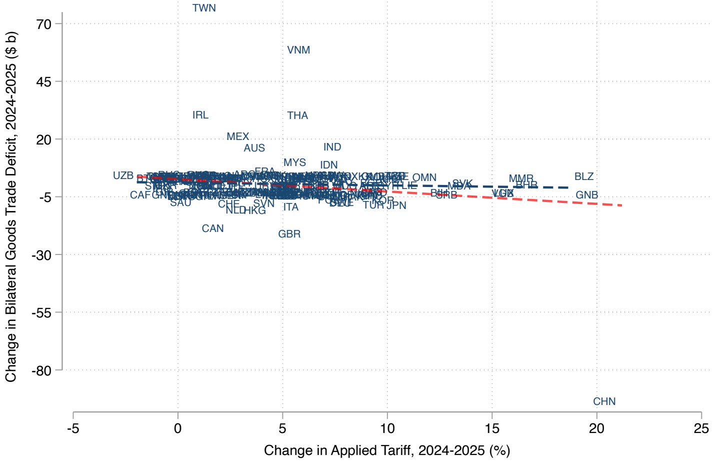
[33] With foreign-owned U.S. assets (including debt, FDI, and portfolio investment) of approximately 200% of GDP, assuming a discount rate of 4%, the annualized revaluation is 200% times 4% times 4.3% PPI.

[34] The U.S. dollar depreciated sharply through 2025. Standard simulations of terms-of-trade effects of tariffs, including ours, uniformly predict terms-of-trade improvements, if any (a consequence of the U.S. starting from low tariff rates in 2025). As a result, a real depreciation of the U.S. dollar must reflect changes in fundamentals other than tariffs that shift investors away from U.S. assets.

[35] Permanent tariff changes can trigger asymmetric responses over time if their standard static effects of distorting real consumption happen in asymmetric ways across periods. Such asymmetric impacts are absent in inter-temporal versions of the standard trade framework often used for quantifications of tariffs (see Caliendo and Parro (2022) for a review) but this independence breaks with nominal rigidities; Auray et al. (2025) show that the 2025 U.S. tariffs, if permanent, temporarily worsen the trade balance with costly price adjustment by firms as a key difference.

FIGURE 6: DEFICITS AND TARIFFS, 2024-2025



Notes: Figure plots the 2024-25 change in bilateral goods deficit against the 2024-25 applied tariff change. The 2025 tariff is the 12-month weighted average. A negative number indicates the deficit has shrunk (export changes exceed import changes).

6.3 Raising Government Revenue

The 2025 tariffs have been touted as an effective instrument to finance government spending. This is a potentially important channel in a context with increasing concerns about the capacity to service future debt obligations and with policy goals that prioritize lowering other taxes (e.g., income or corporate). This rationale, however, runs against the previous motivation of shrinking the trade deficit: all else equal, a given tariff increase maximizes tariff revenue the smaller the reduction in quantities imported, but it closes the trade deficit the bigger the reduction is.

In 2025, the government collected $264 billion in customs revenue, 3.3 times the 2024 collection. To put this in perspective, the 2025 tariffs accounted for 4.9% of total federal receipts, up from about 1.6% in the past decade (and compared to 57.9% for income and corporate taxes). However, the increase is considerably below the approximately five-fold increase in the applied tariff. The gap between the tariff revenue increase and the applied rate reflects the Laffer curve: the U.S. clearly lies on its increasing portion, but imports fall with the tariffs, capping tariff revenue growth. Our model predicts a similar three-fold increase in tariff revenue to what is observed in the data, suggesting that most of the observed tariff revenue increase was due to the tariffs increasing.

These numbers highlight that tariffs, while effective at raising revenue, have only limited potential to substitute for other taxes. Figure A.5 shows that even after the historically unprecedented tariff spike of 2025, tariff revenue as a share of federal receipts is well below the contribution of income and corporate taxes. In 2024, as mentioned earlier, imported goods as a share of GDP was 10.8%, whereas income plus corporate taxes were 9.9% of GDP in 2024; so it would take a 90% average tariff to fully substitute for income and corporate taxes under the implausible assumption that the import share of GDP stays constant.[36]

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[36] The limited potential of tariffs to raise revenue is covered in detail by Clausing and Obstfeld (2025), who summarize the calculations from a range of policy institutions such as Wharton Penn Budget Model (2025) and Tax Foundation

The fact that tariffs can only go so far in financing the federal government does not mean they are, on the margin, a less efficient way of doing so than other taxes. Ignatenko et al. (2025) show that using 2025 tariff revenue to substitute for income taxes (which distort labor supply) increases welfare by more than distributing the taxes lump-sum, as is usually assumed (including in our quantitative analysis). In a dynamic model, Alessandria et al. (2025b) find that substituting labor or capital income taxes for tariffs is welfare enhancing, and that tariff revenue is better used subsidizing physical capital investments than either substituting other taxes or redistributed lump-sum. However, these answers crucially depend on elasticities in each of the margins being considered–import and export supply elasticities versus labor and investment elasticities. Depending on the configuration of these elasticities, the incentives for protectionism can be larger, smaller, or the same when labor income taxes are also used to finance spending (Kocherlakota, 2025). Given the time frame, these quantitative papers use elasticities from the literature, but measuring them in the context of the 2025 trade reform is a key step to fully assess the tax implications of the tariffs.

6.4 Addressing Distributional Concerns

Distributional concerns loom large as another rationale for the U.S. return to protectionism. As we have emphasized above, one broad notion of the distributive effects of tariffs is consumers versus producers. Policymakers have explicitly focused on tariffs as a way to promote U.S. manufacturing, which employed 12.76 million workers in 2024, down from its peak of 19.33 million in 1978. There are many forces driving that trend, such as automation and technical change (Acemoglu and Restrepo, 2019) and international trade (Autor et al., 2013; Pierce and Schott, 2016). Although manufacturing value added has continued to increase, stemming the job losses in this broad sector is a stated objective of the return to protectionism.

Trade models generally predict that tariffs will transfer surplus towards manufacturing firms and workers, and towards regions with high manufacturing shares. Two broad forces, however, blunt these gains: increasing tariffs on intermediate inputs, and foreign retaliations that reduce global demand for U.S. goods. In the 2018-19 episode, Flaaen and Pierce (2024) construct exposure to output tariffs, input tariffs, and retaliations, and find that the impact of each tariff exposure aligns with the predictions from standard trade models: higher tariffs raised employment, but when those tariffs also raise input costs employment falls. Retaliations also reduced sectoral employment. When comparing sectors, the latter two channels outweigh the benefits of protection. Autor et al. (2024) reach similar conclusions across regions: employment in commuting zones relatively more protected by import tariffs did not grow by statistically

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(2026). They show that, in the standard quantitative trade frameworks often used to simulate the static impacts of tariffs, tariff revenue can at most grow to twice its post-2025 level; i.e., around 20% of federal revenue. Because the revenue-maximizing tariff is above the welfare-maximizing tariff (Johnson, 1950), their analysis implies that increasing the tariff to that level would necessarily entail lower real income, even with terms-of-trade adjusting. Pujolas and Rossbach (2026) place the revenue-maximizing U.S. tariff at 20%-30% and suggests that a large fraction of U.S. tariffs were beyond their Laffer peaks by the end of 2025.

significant differences compared to less-protected zones, while regions hit relatively harder by China's retaliatory tariffs experienced declines, a finding consistent with Waugh (2019) who shows that these counties experience lower auto sales. Autor et al. (2024) and Blanchard et al. (2024) further document that these regions received offsetting agricultural subsidy transfers from the government. Standard models assume lump-sum rebates back to all residents, and there has been little research examining the politics driving tariff revenue redistribution.

Hence, *ex post* reduced-form studies of the 2018-19 tariffs have not found a positive effect on employment in the most protected industries and regions, but they have found negative impacts on those most impacted by retaliation. However, these studies do not consider wages and income, and it is possible employment did not adjust but factor income did. In simulation of the 2018-19 tariffs, Fajgelbaum et al. (2020) assume no factor mobility (as we have done here) and calculate positive relative impacts of local incomes in more protected regions, with relative losses in the Rust Belt, with Adão et al. (2023) showing that the model predictions for region and sector incomes are not rejected in the data.[37] Hence, while the reduced-form empirical evidence suggests weak employment responses, the quantitative evidence is consistent with relative income gains in more protected industries and regions.

Turning to the 2025 tariffs, given the short timeline the literature has so far only offered *ex ante* model simulations. The quantifications using our model shown in Table 7 imply increasing wages in the tradeable sector but only if aggregate terms-of-trade respond (which as we have argued, remains uncertain). The appendix describes the spatial extension to the quantitative model we have used to compute welfare effects. Figure A.6 reports nominal wage gains across U.S. counties based on the 2025 tariffs. Interestingly, we find essentially no correlation between the regional wage gain in the model and the 2024 nominal wage level, suggesting that the tariffs have not favored lower-income regions. Rodriguez-Clare et al. (2025) simulate the 2025 tariffs through a regional model with nominal wage rigidities, finding that 34 states would experience real wage gains as high as 1.9% but more populous states (like California, New York, and Texas) would suffer real-wage declines of 1.4%.

However, policymakers face an uncomfortable tradeoff: the mechanism that generates gains for workers comes at the expense of raising the cost of living for consumers. Acosta and Cox (2019) show that U.S. tariffs have historically been biased against low-unit value products which are more likely to be consumed by lower-income consumers, while Ma et al. (2025) argue that the distribution of 2018-19 tariff shocks led to a higher increase in the consumption basket of lower-income households. In the context of the 2025 tariffs, Fajgelbaum and Khandelwal (2024) examine the impacts of completely eliminating Section 321, which ultimately occurred in August 2025. Using data from three large carriers and CBP, they find that the de minimis exemption is a progressive policy and that eliminating Section 321 will disproportionately hurt lower-income

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[37] Adão et al. (2023) project changes in earnings per worker across sectors and regions on tariff shocks, with the exposure of region-sector earnings per worker to variety-level tariffs constructed using the gradient of earnings to tariffs in Fajgelbaum et al. (2020). They find that the model-based and empirical responses of earnings per worker to tariff shocks are statistically indistinguishable, therefore the model predictions for this outcome are not rejected.

households.

Overall, the evidence does not suggest that the current tariffs, were they to remain in place permanently, would stem the long-run decline in manufacturing as a share of U.S. employment or improve distributional outcomes.[38] A key question is the extent to which protected industries and regions will grow in employment with tariffs, and the evidence based on the 2018-19 tariffs does not offer an optimistic view in this regard. In fact, U.S. manufacturing employment declined by 0.53% in 2025 compared to the previous year, despite the tariffs.

6.5 Decoupling from China

Making the U.S. less reliant on imports from China has been a stated goal of the U.S. tariffs. In this section, we show that the tariffs have been successful in decoupling trade with China, and that most of the trade reallocated away from China has been redirected into imports from other Asian countries.

As we have discussed in Section 4.1, the U.S. has considerably reduced its import shares from China since 2018, and more strongly so since 2025. The event study in Section 4.2.1 shows strong variety-level reductions in imports of targeted Chinese varieties. In the model, we find a -1.3 percentage points reallocation of the import share away from China due to the tariffs (-7.0 pp in the data), although no reallocation of exports away from China.

Our analysis has assumed constant demand and supply elasticities across all origins, but this need not be the case. Indeed, Fajgelbaum et al. (2024) and Alfaro and Chor (2025) argue that some countries such as Vietnam experienced relatively larger gains in U.S. market shares in the 2018-20 episode. In 2025, one might again expect heterogeneity in responses because tariffs on China have risen substantially more than on other countries, because some countries produce closer substitutes of China's exports than others, and because some countries have more flexible factor markets and can adjust supply more quickly.

The framework in Fajgelbaum et al. (2024) can be used to estimate the direct impacts of the tariffs on countries' exports to the U.S. Using this empirical framework, we can more flexibly predict each country's export response and estimate if, indeed, the U.S. tariffs led to "friend-shoring". A country i's export growth to the U.S. depend on three tariff terms: the tariff change directly imposed on the exporter, the tariff change imposed on China, and a composite tariff reflecting the tariff change on other competitors,

$$\Delta \ln y_{igt} = \alpha_{st} + \beta_i^1 \Delta \ln\left(1 + \tau_{igt}^{\text{stat}}\right) + \beta_i^2 \Delta \ln\left(1 + \tau_{CHN,gt}^{\text{stat}}\right) + \beta_i^3 \sum_{j \neq i, CHN} \Delta \ln\left(1 + \tau_{jgt}^{\text{stat}}\right) + \epsilon_{igt}. \quad (22)$$

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[38] Nor, for that matter, do other episodes of U.S. protection in the recent past. Metals, and steel in particular, have been among the earliest and most heavily protected sectors since 2018. Collard-Wexler and De Loecker (2015) show that employment in the steel industry contracted by 80% between 1972 and 2002 (compared to 5% in the average manufacturing sector), but import penetration in steel increased by only half as much as in other sectors. The authors attribute the employment decline to the adoption of labor-saving technologies. The Bush administration imposed steel tariffs during 2002 and 2003; steel jobs did not fall during 2002 but resumed their downward trend in 2003, and Cox (2026) shows large, long-lasting, and negative employment impacts from these temporary tariffs in downstream industries using steel.

where $\Delta \ln y_{igt}$ is country i's export growth to the U.S., τ^{stat}_{igt} is the statutory tariff imposed by the U.S. on product g from country i. The coefficient β^1_i captures i's direct response to the U.S. tariffs, β^2_i captures i's export response to U.S. tariffs on China, and β^3_i captures $i's$ response to the tariffs that the U.S. imposes on all other countries besides country i and China. We use the statutory rates to mitigate possible division bias, and sector-time fixed effects α_{st}. This specification compares the responses of more versus less tariffed products by the U.S. within sector. We run the regression separately for each country i, examining their export response between 2024 and 2025 (so here, t is a year). We then aggregate the predicted responses using 2024 variety export shares, λ_{ig}:

$$\Delta \hat{\ln} X_i = \sum_{ig} \lambda_{ig} \left\{ \hat{\beta}^1_i \Delta \ln \left(1 + \tau^{\text{stat}}_{igt}\right) + \hat{\beta}^2_i \Delta \ln \left(1 + \tau^{\text{stat}}_{CHN,gt}\right) + \hat{\beta}^3_i \sum_{j \neq i, CHN} \Delta \ln \left(1 + \tau^{\text{stat}}_{jgt}\right) \right\} \tag{23}$$

Figure 7A plots the export growth to the U.S. from the tariffs estimated for the top 50 non-oil exporters. Because these predictions follow from a reduced form regression, the assumption is that products facing zero tariffs from a country would not have changed their exports to the U.S.

With this more flexible specification, we find a 30% reduction in exports from China to the U.S. with the U.S. tariffs, a number that roughly matches what happened in the raw data. According to this metric, the five top "winners" are: Cambodia, Thailand, Vietnam, Bangladesh, and Indonesia. Thus, it appears that Asian countries have benefited from the 2025 tariffs. The five largest "losers" are: Honduras, Brazil, Israel, Switzerland, and Taiwan. Hence, tariffs have been successful in triggering decoupling from China.[39]

6.6 Geopolitical Targeting and Friend-Shoring

A closely related goal to decoupling from China has been to redirect U.S. economic ties towards countries that may be perceived as more politically aligned. Using tariffs as tools of geopolitical alignment is a central tenet of the recent literature in geoeconomics (Clayton et al. 2026, Becko et al. 2025). Gopinath et al. (2025) estimate that, since the Ukraine-Russia conflict and prior to 2025, global trade and FDI flows between geopolitical blocs have decreased, whereas Bonadio et al. (2025) estimate that between 2015 and 2023 about a quarter of countries' trade has shifted towards the U.S. bloc and another quarter towards China's bloc.

We provide a preliminary assessment of whether the 2025 tariffs have achieved this goal thus far. First, as already shown in Section 3.3, we do not find evidence that the tariffs correlated with countries' geopolitical alignment as measured by countries' "ideal" point according to Bailey et al. (2017). Second, we re-examine this result in Panel A of Table 8 using a different measure of political proximity. This table examines the use of tariffs as geopolitical instruments by examining the pattern of tariff protection (rather than of import reallocations) across defense allies.[40] As of

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[39] Imports from East Asia may still indirectly expose the U.S. to China through global trade in intermediates (Baldwin et al., 2023), or goods may be re-routed from China through third countries (Arora et al., 2025).

[40] The panel divides regions into China, the 32 NATO allies, allies with formal defense treaties or strong defense alliances (Korea and Philippines, and Israel and Taiwan), members of Quadrilateral Security Dialogue (Australia, India,

2025m12, tariffs on NATO and strong defense allies are only slightly lower than tariffs on the rest of world, and tariffs on the Quad members are about 1.5 times those of the rest of the world (Australia at 6.4%, India at 20.5% and Japan at 13.4%). Only the two newly designated major non-NATO allies, Peru and Saudi Arabia, have lower average tariffs than the rest of world.

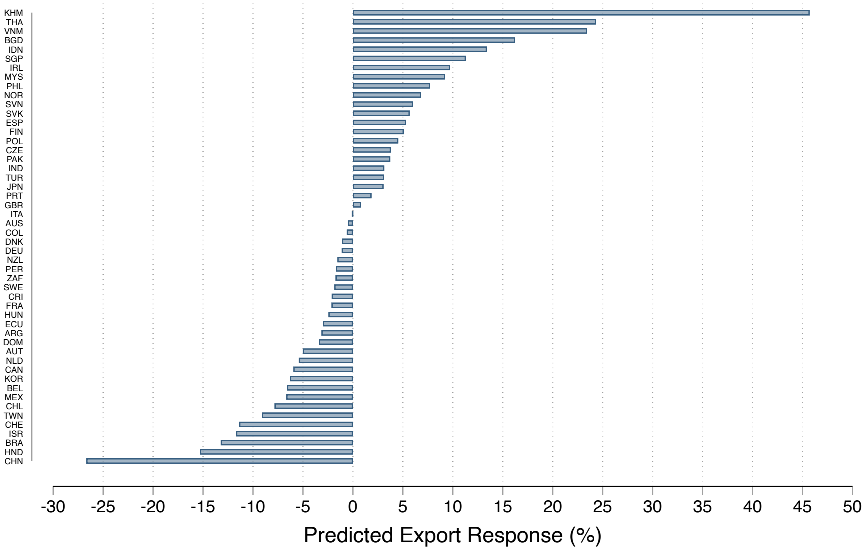
Third, rather than examining the distribution of tariffs, we can inspect whether the observed trade reallocations triggered by tariffs correlate with geopolitical alignment. We correlate the predictions for the export growth to the U.S. triggered by the 2025 tariffs computed in the previous subsection with the previous geopolitical measures. Figure 7B plots the tariff change and the export response against the country's ideal point. The countries cluster in two blocs, with one more aligned to the U.S. The correlation between both the U.S. tariff changes and the countries' export response is flat.

We conclude from this basic exercise that the U.S. tariff policy has neither sought nor achieved realignment with historical geopolitical allies. It is possible that other policies, such as defense cooperation or export controls, unwind this conclusion, or that the tariffs reflect an alternative set of geopolitical allies favored by the Trump Administration. Digging further into these possibilities remains an interesting avenue for future research.

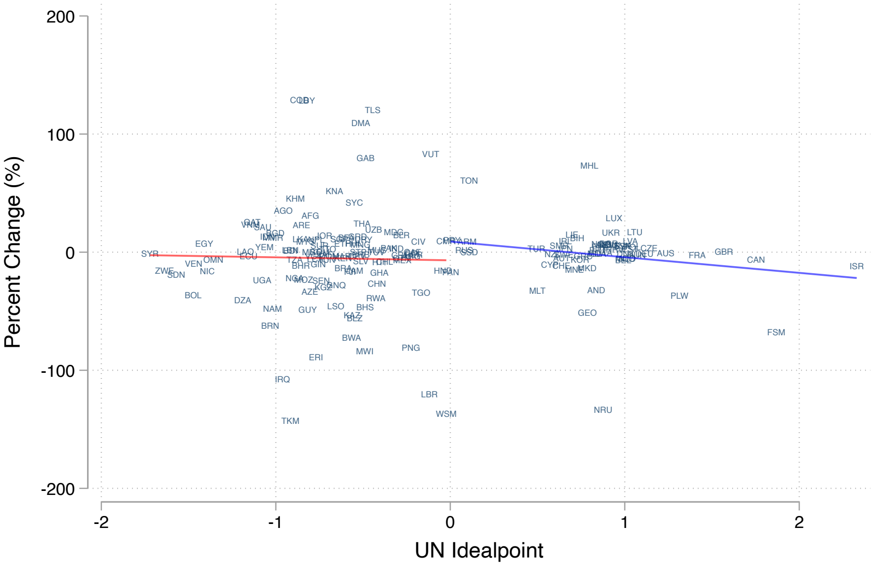
Japan), Peru and Saudi Arabia as two new designated "Major Non-NATO Allies" in 2026, and the rest of world. The White House designated Peru and Saudi Arabia as Major Non-NATO allies in January 2026 (Executive Office of the President, 2026b,a). In the past decade, several countries have also been designated as Major Non-NATO allies, but not by the second Trump Administration and so we do not include them in this group: Tunisia (2015), Brazil (2019), Afghanistan (2022), Colombia (2022), Qatar (2022), and Kenya (2024).

Figure 7: Countries' Export Responses to the U.S. and Geopolitical Alignment

Panel A: Export Responses of Largest 50 Exporters



Panel B: Export Responses and Geopolitical Alignment



Notes: Panel A plots the predicted export response to the U.S. using the parameters estimated from (22) and aggregated to the country level using (23) for the largest 50 non-oil exporters to the U.S. Panel B plots the export response against the country's ideal point as of 2015, as measured by Bailey et al. (2017). Panel B excludes outliers beyond the 5th and 95th percentiles.

6.7 Reshoring Strategic Sectors

In the past decade, the world has experienced rising geopolitical tensions and a resurgence in industrial policies around the world in critical sectors. The policies include production subsidies, directed credit, price controls, export bans, and tariffs (Juhasz et al., 2025). The U.S. has justified the use of export bans and tariffs, in particular, as instruments to reshore strategic sectors via domestic and foreign investment. We explore to what extent the tariffs reflect these goals.

In theory, targeting key sectors is a reason why the gains from the tariffs may be larger than what our quantitative analysis implies. Tariffs can have positive impacts via reallocation of capital, as they incentivize foreign companies to make indivisible investments via horizontal FDI (Dehejia and Weichenrieder, 2001), although no clear empirical evidence has been put forth in this direction with respect to tariffs since 2018.

Industrial policy can also raise welfare when it targets sectors with stronger scale economies (Bartelme et al., 2025; Lashkaripour and Lugovskyy, 2023). However, a first pass at the tariff structure reveals no systematic pattern based on strategic sector concerns or geopolitical alignment. Table 8B reports the breakdown in tariffs using Census' classification of advanced technology products (ATPs). The two ATPs that received the most protection in 2025 are flexible manufacturing goods (e.g., robots, numerically-controlled machine tools) and weapons (e.g., products with military application such as bombs, torpedoes and rocket launchers). The other products have experienced lower increases in tariffs. Surprisingly, the tariff change among non-ATP products is larger than for ATP products. This could reflect the fact that ATPs are used as critical upstream inputs for production. Nevertheless, as of 2025m12, the tariff structure does not appear to be using tariffs to promote the re-shoring of advanced technologies.[41] Based on this table, it is difficult to conclude that the U.S. has fine-tuned its tariff policy as an instrument for reshoring these strategic sectors.

6.8 Improving U.S. Market Access

In February 2025, USTR released its 2025 National Trade Estimates (NTE) report (USTR, 2025a). The report documents barriers that U.S. products and services face in nearly 60 foreign markets across 14 categories: import policies (tariffs, quantitative restrictions), technical barriers to trade, sanitary and phytosanitary measures, government procurement, intellectual property protection, services barriers, e-commerce and digital trade barriers, investment barriers, subsidies, anti-competitive practices, and state-owned enterprises. Observers have noted that raising tariffs on trade partners creates leverage for subsequent negotiations, with reductions offered in exchange for improved market access and increased foreign investment into the U.S.

According to the Council on Foreign Relations, the U.S. negotiated six trade agreements in 2025: Cambodia, Malaysia, Argentina, El Salvador, Guatemala, Taiwan–with another 13 at a framework agreement stage subject to ongoing negotiations: U.K., Indonesia, Japan, E.U., Vietnam, Thailand, South Korea, Ecuador, Switzerland, Liechtenstein, India, Bangladesh, North Macedonia. The agreements appear to cover a range of topics related to the barriers listed in the NTE report, such as export controls, unfair trade practices, digital trade barriers, and procurement, but also aspects related to national security like supply chain resilience, and access to critical minerals. For example, the U.S.-E.U. framework has provisions for the E.U. to make commitments to purchase U.S. energy and semiconductor chips, and to address "unjustified digital trade barriers." We note

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[41] It is possible that the U.S. is using export controls to prevent the diffusion of ATPs to foreign countries; see Limao et al. (2025) for a recent contribution studying export controls.

TABLE 8: TARGETED U.S. IMPORTS IN 2025, BY DEFENSE ALLIES AND TECHNOLOGY CLASS

Panel A: Defense Allies

	U.S. Imports and Tariffs: Region						
	Imports $bn	Fraction Tariffed (%)		Avg Tariff on Tariffed (%)		Avg Tariff (%)	
Region	2024	2024	2025m12	2024	2025m12	2024	2025m12
China	441	65.0	95.1	16.3	33.3	10.6	31.7
NATO	954	33.5	40.2	2.7	17.6	0.9	7.1
Defense Treaty/Treaty-Like	349	15.9	31.6	4.6	18.9	0.7	6.0
Quad	255	45.5	62.5	3.8	24.2	1.7	15.1
Newly Desig. Major Non-Nato Ally	23	48.9	41.2	0.5	11.0	0.2	4.5
Rest Of World	1,193	20.0	35.5	5.8	22.7	1.2	8.1
All Countries	3,214	32.0	42.6	7.4	22.6	2.4	9.6

Panel B: Advanced Technology Products

	U.S. Imports and Tariffs: Technology Class						
	Imports $bn	Fraction Tariffed (%)		Avg Tariff on Tariffed (%)		Avg Tariff (%)	
Technology Class	2024	2024	2025m12	2024	2025m12	2024	2025m12
Advanced Materials	4	11.0	49.0	16.4	16.2	1.8	7.9
Aerospace	55	6.2	15.2	6.3	14.9	0.4	2.3
Biotechnology	106	0.1	3.4	12.8	7.3	0.0	0.2
Electronics	124	24.6	38.7	5.2	19.5	1.3	7.6
Flexible Manufacturing	45	42.8	55.0	5.8	20.5	2.5	11.3
Information & Communications	297	4.6	5.2	11.3	19.4	0.5	1.0
Life Science	140	4.2	14.8	8.0	17.2	0.3	2.6
Nuclear Technology	5	9.6	6.9	6.2	12.6	0.6	0.9
Opto-Electronics	30	15.4	45.3	9.6	19.4	1.5	8.8
Weapons	3	31.5	55.2	8.5	22.3	2.7	12.3
ATP	809	9.8	13.6	7.0	18.7	0.7	2.5
Non-ATP	2,405	39.4	58.0	7.4	23.1	2.9	13.4
All Products	3,214	32.0	42.6	7.4	22.6	2.4	9.6

Notes: This table is constructed analogously to Table 1. Panel A classifies countries into different defense agreements: 32 NATO allies, allies with formal defense treaties or strong defense alliances (Korea and Philippines, and Israel and Taiwan), members of Quadrilateral Security Dialogue (Australia, India, Japan), and newly designated "Major Non-NATO Allies" in 2026 (Peru and Saudi Arabia), and the rest of world. Panel B is constructed using Census' crosswalk between HS codes and Advanced Technology Product codes.

that many of the barriers noted in the NTE report could be addressed within existing institutions, namely the WTO, but proponents argue that the U.S. can secure better deals through bilateral, rather than multilateral, negotiations. A second objective of these negotiations has been to secure foreign investments into U.S. manufacturing. For example, Japan agreed to invest $550 billion into U.S.-based production of critical sectors: semiconductors, pharmaceuticals, critical minerals, shipbuilding, energy, artificial intelligence, and quantum computing (Govt of Japan and USA, 2025). We anticipate future work exploring the magnitude of these investments and the resulting impacts. Of course, all else equal, increasing FDI into the U.S. necessarily needs to be balanced by an increase in the current account deficit.

Examining the impact on U.S. exports from these (and future) agreements is beyond the scope of our analysis, as it would require more time and examination of services exports. As such, it remains to be seen if, and to what extent, these agreements will improve U.S. market access.

7 Conclusion

Although there is uncertainty regarding how U.S. tariff policy will evolve in 2026 and beyond, we believe that tariffs will remain an active instrument of U.S. international policy. Many areas remain open for further research:

- How will businesses manage the uncertainty and what are the impacts on the aggregate economy?
- What are the long-term dynamic impacts of the tariffs through their effects on capital accumulation, labor adjustments, and productivity?
- What are the market access and foreign investment gains obtained through bilateral U.S. agreements? Will these gains be durable for the U.S., or will other countries seek trade arrangements that exclude the U.S.?
- How can we credibly identify the terms-of-trade effects that determine whether tariffs yield a net gain or loss for the U.S. economy?
- What are the distributional consequences of tariffs across importers, consumers, workers, firms, sectors, and regions?
- How should we analyze tariffs not in isolation but alongside other trade policy instruments such as export controls, subsidies, and state ownership in critical sectors?

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A Model Appendix

A.1 Demand System

Consumers and producers substitute between domestic production D_s and imports M_s in sector s with constant elasticity κ:

$$C_s + I_s = \left(A_{Ds}^{\frac{1}{\kappa}} D_s^{\frac{\kappa-1}{\kappa}} + A_{Ms}^{\frac{1}{\kappa}} M_s^{\frac{\kappa-1}{\kappa}} \right)^{\frac{\kappa}{\kappa-1}} . \tag{A.1}$$

Both D_s and M_s aggregate the heterogeneous goods g with elasticity η:

$$D_s = \left(\sum_{g \in G_s} a_{Dg}^{\frac{1}{\eta}} d_g^{\frac{\eta-1}{\eta}} \right)^{\frac{\eta}{\eta-1}} , \tag{A.2}$$

$$M_s = \left(\sum_{g \in G_s} a_{Mg}^{\frac{1}{\eta}} m_g^{\frac{\eta-1}{\eta}} \right)^{\frac{\eta}{\eta-1}} . \tag{A.3}$$

For example,D_s and M_s are domestic and imported furniture, and the products are chairs and tables.

Finally, the imported products m_g are differentiated across origins $i \in \mathcal{I}_g$ with constant elasticity σ (e.g., Chinese- and German-made chairs):

$$m_g = \left(\sum_{i \in \mathcal{I}_g} a_{ig}^{\frac{1}{\sigma}} m_{ig}^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}} . \tag{A.4}$$

Consumer optimization leads to the following demand for good$g$ from i,

$$m_{ig} = a_{ig} \frac{E_s}{P_s} \left(\frac{P_{Ms}}{P_s} \right)^{-\kappa} \left(\frac{p_{Mg}}{P_{Ms}} \right)^{-\eta} \left(\frac{p_{i,g}}{p_{Mg}} \right)^{-\sigma} , \tag{A.5}$$

where $a_{ig} \equiv A_{Ms} a_{Mg} \tilde{a}_{ig}$ is an exogenous demand shifter, and to the following demand for domestic variety$g$,

$$d_g = a_{Dg} \frac{E_s}{P_s} \left(\frac{P_{Ds}}{P_s} \right)^{-\kappa} \left(\frac{p_{US,g}}{P_{Ds}} \right)^{-\eta}, \tag{A.6}$$

where $a_{Dg} \equiv A_{Ds} \tilde{a}_{Dg}$ is an exogenous demand shifter. In (A.5) and (A.6), E_s corresponds to aggregate U.S. expenditures in sector s:

$$E_s = \beta_s X + \sum_{s' \in S} \alpha^s_{s'} p_{s'} Q_{s'}. \tag{A.7}$$

where X is given in (5). The price indexes are:

$$P_s = \left(A_{Ds} P_{Ds}^{1-\kappa} + A_{Ms} P_{Ms}^{1-\kappa} \right)^{\frac{1}{1-\kappa}}, \tag{A.8}$$

$$P_{Ds} = \left(\sum_{g \in G_s} a_{Dg} p_{Dg}^{1-\eta} \right)^{\frac{1}{1-\eta}}, \tag{A.9}$$

$$P_{Ms} = \left(\sum_{g \in G_s} a_{Mg} p_{Mg}^{1-\eta} \right)^{\frac{1}{1-\eta}}, \tag{A.10}$$

$$p_{Mg} = \left(\sum_i a_{ig} p_{ig}^{1-\sigma} \right)^{\frac{1}{1-\sigma}}. \tag{A.11}$$

A.2 Producer Optimization

The producer problem (8) can be written as follows after minimizing costs:

$$\Pi_s = \max_{Q_s} p_s Q_s - (\alpha_{Is} + \alpha_{Ls}) \left(\frac{\phi_s^{\alpha_{Is}} w_s^{\alpha_{Ls}}}{Z_s} Q_s \right)^{\frac{1}{\alpha_{Is}+\alpha_{Ls}}}, \tag{A.12}$$

where $\alpha_{I,s} = \sum_{s'} \alpha_{ss'}$, and where

$$\phi_s \propto \prod_{s' \in S} P_{s'}^{\alpha_{ss'}/\alpha_{I,s}}. \tag{A.13}$$

The associated supply for sector s is:

$$p_s Q_s = \left(\frac{p_s Z_s}{\phi_s^{\alpha_{Is}} w_s^{\alpha_{Ls}}} \right)^{\frac{1}{\alpha_{Ks}}}, \tag{A.14}$$

and the associated labor demand is

$$w_s = \left(\frac{p_s Z_s}{\phi^{\alpha_{I,s}} \left(\frac{L_s}{\alpha_{L,s}} \right)^{\alpha_{K,s}}} \right)^{\frac{1}{1-\alpha_{I,s}}}. \tag{A.15}$$

A.3 Equilibrium

An equilibrium is given by prices of imported goods $p^*_{i,g}$, sector-level prices p_s, tradeable wages w_s, and a non-tradeable wage w_{NT} such that:

- the supply of each U.S. variety g equals demand,

$$q_g = \underbrace{a_{Dg} \frac{E_s}{P_s} \left(\frac{P_{Ds}}{P_s} \right)^{-\kappa} \left(\frac{p_{US,g}}{P_{Ds}} \right)^{-\eta}}_{d_g} + \sum_{i \in I} \underbrace{a^*_{ig} \left(\left(1+\tau^*_{ig}\right) p_{US,g} \right)^{-\sigma^*}}_{x_{ig}} \tag{A.16}$$

  where E_s is given in (A.7), the U.S. price $p_{US,g}$ is given by (12), and the price indexes P_s and P_{Ds} are given in (A.8) and (A.9);

- the foreign supply of each imported variety (i, g) equals U.S. demand according to (9) to (16);

- the output supply at the sector level s equals the demand to produce each good,

$$Q_s = \sum_{g \in G_s} \frac{q_g}{z_g} \tag{A.17}$$

  where the sector-level supplyQ_s is given by (A.14);

- the non-traded goods market clears,

$$p_{NT} Q_{NT} = \beta_{NT} X \tag{A.18}$$

- the local labor market clears, with wages w_s given by (A.15) if we assume labor is fixed by sector, or with a common wage $w_s = w$ such that $\sum_s L_s = L$ if we assume labor is perfectly mobile across sectors.

A.4 Model with Regions

Compared to the baseline model, we divide U.S. economy into R counties. Each U.S. county r has L_r residents with Cobb-Douglas preferences defined as in 4. We assume all counties have the same preferences, and that tariff revenue and the trade deficit are evenly owned across the population, so expenditures in region r are:

$$X_r = w_{NT,r} L_{NT,r} + \sum_{s \in S} w_{sr} L_{sr} + \sum_{s \in S} \Pi_{sr} + \frac{L_r}{L} (R + D). \tag{A.19}$$

In each county r, output of sector s uses intermediate inputs I_{sr}, labor L_{sr}, and capital K_{sr} with TFP Z_{sr} as in 7. We assume no internal trade costs in the U.S., so regional consumption C_{sr} and intermediate use I_{sr} aggregates to U.S. demand by sector, $C_s + I_s = \sum_r C_{sr} + I_{sr}$, and regional output aggregates to national output, $Q_s = \sum_r Q_{sr}$. The aggregate equilibrium conditions are identical to the baseline model, with regional heterogeneity stemming from heterogeneity in sector-region TFP shifters Z_{sr}. The parametrization of the model uses labor shares L_{sr} in the initial equilibrium to exactly recover those shifters.

Appendix Figures and Tables

TABLE A.1: TARIFFS, BY COUNTRY

country	2024	2025m12	change	demeaned	country	2024	2025m12	change	demeaned	country	2024	2025m12	change	demeaned
Myanmar	6.9	45.3	38.5	24.6	Slovenia	0.4	10.7	10.3	-2.3	St Maarten	0.3	5.1	4.8	-0.5
Laos	4.9	39.7	34.8	20.2	Syria	1.7	10.7	9.0	5.4	Maldives	0.8	4.8	4.0	-5.5
Moldova	3.2	36.7	33.5	16.7	El Salvador	1.0	10.5	9.5	-10.8	St Lucia	0.0	4.8	4.8	-3.3
Lesotho	0.1	36.3	36.3	12.0	Poland	1.4	10.4	9.0	-4.5	Costa Rica	0.1	4.5	4.4	-5.0
Serbia	1.2	33.5	32.3	11.8	Estonia	1.1	10.3	9.2	-1.7	Mexico	0.3	4.5	4.2	-8.1
Bangladesh	14.5	32.7	18.2	11.0	Djibouti	0.8	10.3	9.6	-7.5	Antigua & Barbuda	0.1	4.4	4.4	-1.0
China	10.6	31.7	21.1	14.7	Montenegro	0.9	10.3	9.4	-2.4	Curacao	0.7	4.4	3.7	-1.0
Azerbaijan	8.4	30.4	22.0	-1.1	Lithuania	1.1	10.1	9.0	-2.0	Tonga	0.6	4.3	3.7	-6.3
Sri Lanka	9.7	29.6	19.9	9.0	Ethiopia	7.3	10.1	2.8	-9.2	Belarus	7.2	4.3	-2.8	-13.0
Bosnia & Herzegovina	2.8	29.4	26.6	8.4	San Marino	2.4	10.0	7.5	-5.7	Ghana	0.1	4.3	4.3	-0.1
Cambodia	6.7	28.1	21.4	6.9	Seychelles	0.5	9.9	9.4	-3.0	Chile	0.0	3.6	3.6	-1.9
Luxembourg	1.2	27.6	26.4	-1.8	Germany	1.4	9.8	8.4	-2.1	Grenada	0.0	3.5	3.5	-1.8
Madagascar	0.6	27.5	26.9	8.3	Honduras	0.5	9.5	9.1	-6.8	Singapore	0.1	3.3	3.2	-4.4
Pakistan	9.1	27.1	18.0	7.1	Denmark	0.6	9.5	8.9	-1.7	Bolivia	0.3	3.2	2.9	0.2
Kenya	0.2	25.4	25.2	4.6	Mozambique	1.3	9.5	8.3	0.3	Canada	0.1	3.2	3.1	-5.4
Bahrain	2.1	24.6	22.5	-1.6	Sierra Leone	0.4	9.5	9.1	-4.8	St Vincent & Grenadines	0.0	3.2	3.1	-1.8
Tunisia	2.1	23.0	20.9	8.7	Nepal	1.6	9.4	7.9	-5.5	Taiwan	0.9	3.1	2.2	-3.0
India	2.3	20.5	18.1	10.3	Cape Verde	0.3	9.4	9.1	-3.4	Samoa	0.5	3.1	2.6	-1.7
Indonesia	4.6	19.9	15.3	1.9	Aruba	0.4	9.4	9.0	-4.3	Brunei	0.4	3.0	2.6	-2.4
Oman	2.7	19.7	17.1	-3.9	Fiji	0.1	9.3	9.2	-2.0	Colombia	0.1	2.9	2.7	-2.3
Georgia	1.2	19.0	17.7	-1.2	Togo	0.1	9.3	9.2	-1.2	Uruguay	8.5	2.7	-5.8	-2.0
UAE	2.6	17.8	15.2	-4.1	Niger	1.2	9.2	8.0	-2.7	Ireland	0.2	2.3	2.1	-2.7
Haiti	0.3	17.7	17.5	-5.2	South Korea	0.2	9.0	8.8	-4.2	Saudi Arabia	0.4	2.3	1.9	-0.9
Turkey	3.2	17.2	13.9	0.1	Malaysia	0.7	9.0	8.4	-1.2	Qatar	1.2	2.1	0.9	-0.6
Zimbabwe	3.6	17.2	13.6	-3.4	Malta	1.0	8.9	7.9	-3.4	Venezuela	0.1	1.5	1.4	0.2
British Virgin Islds	0.0	17.2	17.1	-4.3	Paraguay	6.2	8.8	2.7	-3.3	Palestine	0.2	1.5	1.3	-12.9
Hong Kong	1.8	15.9	14.0	2.2	Iceland	0.3	8.7	8.4	-1.5	Gabon	0.1	1.5	1.3	-0.5
Brazil	1.3	15.8	14.5	5.1	Portugal	2.4	8.7	6.3	-3.8	Rwanda	0.3	1.4	1.1	-1.3
Slovak Republic	2.4	15.0	12.6	-1.2	Thailand	1.5	8.6	7.1	-1.3	Bahamas	0.4	1.1	0.8	-0.5
Ukraine	1.3	14.9	13.6	-1.4	Croatia	1.7	8.5	6.9	-2.3	Mali	0.4	1.0	0.6	-14.6
Botswana	0.0	14.9	14.9	4.1	Mauritius	0.5	8.5	8.0	1.5	Mongolia	1.4	0.9	-0.5	-1.1
Uzbekistan	2.8	14.8	12.1	-2.9	Suriname	0.2	8.5	8.3	-4.3	Zambia	0.5	0.9	0.4	-1.5
Kosovo	0.6	14.6	14.1	-3.2	Norway	0.6	8.5	7.9	-1.1	Uganda	0.1	0.9	0.8	-0.9
Namibia	0.0	14.5	14.5	-0.2	Finland	0.7	8.5	7.7	-2.2	Kazakhstan	0.6	0.8	0.3	-1.5
Gambia	0.0	14.4	14.3	-2.7	Benin	0.0	8.4	8.4	-1.5	Algeria	0.1	0.6	0.5	0.3
N. Macedonia	1.9	14.3	12.5	2.5	Bermuda	0.2	8.4	8.2	-2.0	Cayman Islds	1.6	0.5	-1.1	-1.9
Chad	0.1	14.3	14.2	2.5	Faroe Islds	0.0	8.4	8.4	-0.6	Equatorial Guinea	0.0	0.5	0.5	0.2
Albania	2.0	14.3	12.2	-1.2	Kyrgyzstan	2.0	8.3	6.3	-2.5	Russia	0.6	0.4	-0.2	-1.6
Reunion	0.0	14.0	14.0	-7.1	Greenland	0.0	8.1	8.1	0.7	Cote d'Ivoire	0.0	0.3	0.3	-2.2
Latvia	0.9	14.0	13.1	-2.4	Hungary	1.4	8.0	6.6	-2.9	Nigeria	0.1	0.2	0.2	-0.1
Greece	2.7	13.9	11.3	-2.7	Barbados	0.2	7.9	7.7	-3.6	Guyana	0.1	0.2	0.1	-0.2
Romania	2.3	13.9	11.5	-3.6	United Kingdom	1.0	7.8	6.7	-4.6	Cameroon	0.1	0.1	0.1	-0.1
Eswatini	0.5	13.8	13.3	-3.4	Belize	0.0	7.7	7.7	-2.7	Papua New Guinea	0.0	0.1	0.1	-0.9
Vanuatu	0.0	13.7	13.7	-0.5	Kiribati	0.2	7.7	7.4	-1.5	Republic of Congo	0.0	0.1	0.1	-0.7
Japan	1.5	13.4	11.8	-2.3	French Polynesia	0.5	7.6	7.1	-3.6	Kuwait	0.1	0.1	-0.0	-0.1
Afghanistan	1.3	13.3	12.0	-1.0	Switzerland	0.6	7.6	7.0	-0.5	Liberia	0.0	0.1	0.1	-0.0
Guadeloupe	1.2	13.0	11.8	-1.8	Andorra	0.3	7.5	7.2	-5.5	Iraq	0.1	0.0	-0.1	-0.1
Sweden	1.3	12.8	11.5	-1.6	Turks & Caicos	0.1	7.3	7.2	-0.9	Congo, DRC	0.0	0.0	0.0	-1.4
Jordan	0.1	12.7	12.6	-10.8	Dominican Republic	0.4	7.1	6.7	-6.7	Burundi	1.5	0.0	-1.5	-0.9
Morocco	2.9	12.6	9.8	-2.9	Guatemala	0.8	7.1	6.3	-4.7	Libya	0.1	0.0	-0.1	-0.0
Vietnam	3.7	12.4	8.8	0.8	Marshall Islds	0.1	6.6	6.4	-4.0	Angola	0.1	0.0	-0.1	-0.1
Czech Republic	1.3	12.3	11.1	-2.7	Australia	0.1	6.4	6.3	1.5	Anguilla	2.7	0.0	-2.7	-15.2
Cyprus	1.8	12.3	10.4	-1.7	St Kitts & Nevis	0.4	6.4	6.0	-10.5	Bhutan	1.2	0.0	-1.2	-18.3
Italy	2.3	12.2	10.0	-3.8	Ecuador	0.4	6.3	5.9	-0.3	Burkina Faso	0.3	0.0	-0.3	-4.3
Austria	1.4	12.2	10.8	-3.2	France	1.2	6.3	5.0	-3.0	Comoros	0.0	0.0	-0.0	-2.8
Nicaragua	1.3	12.1	10.9	-1.6	Jamaica	0.1	6.2	6.1	-3.6	Cook Islds	1.3	0.0	-1.3	-17.8
Armenia	1.1	12.0	11.0	-2.4	Trinidad & Tobago	0.0	6.1	6.0	0.8	Dominica	0.4	0.0	-0.4	-2.0
Solomon Islds	0.5	11.8	11.3	-3.3	Egypt	1.7	6.0	4.3	-12.7	Eritrea	0.4	0.0	-0.4	-18.4
Liechtenstein	2.3	11.7	9.4	-8.2	Belgium	1.0	5.9	4.9	-2.4	French Guiana	0.0	0.0	-0.0	-15.1
Macao	10.4	11.7	1.3	-2.1	Argentina	1.0	5.9	4.8	-1.4	Gibraltar	1.6	0.0	-1.6	-14.8
Bulgaria	2.1	11.6	9.6	-3.3	Monaco	1.4	5.8	4.4	-3.4	Iran	0.0	0.0	-0.0	-3.4
New Zealand	1.1	11.6	10.4	0.3	Israel	0.1	5.8	5.6	-3.2	Mauritania	1.1	0.0	-1.1	-4.3
Tanzania	0.3	11.5	11.2	-9.1	Netherlands	0.8	5.7	4.9	-1.8	Micronesia	1.3	0.0	-1.3	-5.6
Malawi	0.1	11.4	11.3	-2.6	Guinea	0.3	5.7	5.4	-3.5	New Caledonia	0.1	0.0	-0.1	-1.2
Spain	1.9	11.2	9.4	-2.2	Peru	0.1	5.7	5.6	-4.0	Palau	0.0	0.0	-0.0	-7.7
Senegal	0.1	11.1	11.0	-4.8	Yemen	2.1	5.6	3.5	-0.8	Somalia	1.2	0.0	-1.2	-14.1
Philippines	1.4	11.0	9.6	0.3	South Africa	0.3	5.4	5.1	0.7	Sudan	0.0	0.0	0.0	-11.9
Turkmenistan	0.1	10.9	10.9	-6.2	Panama	0.2	5.2	5.0	-3.2	Tajikistan	0.2	0.0	-0.2	-11.4
Lebanon	1.1	10.8	9.7	-4.4	Martinique	0.4	5.1	4.7	-1.8	Timor-Leste	0.2	0.0	-0.2	-0.8

Notes: Table reports country tariffs in 2024, 2025m12, and the change. Sorted by column 2. The fourth column constructs a weighted average of a country's applied tariff after de-meaning from the HS10 average in 2025m12.

TABLE A.2: PASS-THROUGH ESTIMATES, ALTERNATIVE FIXED EFFECTS

Panel A: 2018-19 Tariffs: Import Responses

	(1)	(2)	(3)	(4)	(5)
	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$
$\Delta \ln(1+\tau_{igt})$	-0.13**	-0.16***	-0.07	-0.13**	-0.16***
	(0.06)	(0.05)	(0.08)	(0.06)	(0.05)
$\Delta \ln(xr_{it})$				0.00	-0.00
				(0.00)	(0.00)
Fixed Effects	gt+i	gt	gt+it	gt+i	gt
1st-Stage F	69.9	77.8	65.8	69.9	77.8
N	1,464,263	1,464,263	1,464,263	1,464,263	1,464,263

Panel B: 2025 Tariffs: Import Responses

	(1)	(2)	(3)	(4)	(5)
	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$
$\Delta \ln(1+\tau_{igt})$	-0.10*	-0.12**	-0.20**	-0.10*	-0.12**
	(0.06)	(0.06)	(0.08)	(0.06)	(0.06)
$\Delta \ln(xr_{it})$				-0.00	-0.00***
				(0.00)	(0.00)
Fixed Effects	gt+i	gt	gt+it	gt+i	gt
1st-Stage F	52.4	42.4	26.6	52.2	42.2
N	1,192,687	1,192,687	1,192,687	1,192,687	1,192,687

Panel C: 2018-19 Tariffs: Export Responses

	(1)	(2)	(3)	(4)	(5)
	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$
$\Delta \ln(1+\tau^{*}_{igt})$	0.15**	0.15**	0.08	0.15**	0.15**
	(0.07)	(0.06)	(0.08)	(0.07)	(0.06)
$\Delta \ln(xr_{it})$				0.00***	0.00***
				(0.00)	(0.00)
Fixed Effects	gt+i	gt	gt+it	gt+i	gt
R2	0.00	0.00	0.00	0.00	0.00
N	1,631,678	1,631,681	1,631,620	1,631,678	1,631,681

Panel D: 2025 Tariffs: Export Responses

	(1)	(2)	(3)	(4)	(5)
	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$	$\Delta \ln p_{igt}$
$\Delta \ln(1+\tau^{*}_{igt})$	-0.00	0.00	-0.02	-0.00	0.00
	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
$\Delta \ln(xr_{it})$				-0.00	-0.00
				(0.00)	(0.00)
Fixed Effects	gt+i	gt	gt+it	gt+i	gt
R2	0.00	0.00	0.00	0.00	0.00
N	1,225,287	1,225,289	1,225,241	1,225,287	1,225,289

Notes: Table reports tariff impacts on U.S. imports and export prices at the quarterly horizon with different sets of fixed effects: column 1 includes product-time FEs, column 2 includes product-time and origin-time FEs, column 3 includes product and time FEs, and column 4 includes product, time and origin FEs. In Panels A and B, the applied rate is instrumented by the statutory rate. Panels C and D are OLS regression using the statutory foreign tariffs. See Table 4 for additional notes.

TABLE A.3: PASS-THROUGH ESTIMATES FOR 2025 IMPORT TARIFFS, ALTERNATIVE HORIZONS

Panel A: Monthly

	(1) $\Delta \ln p_{igt}$	(2) $\Delta \ln p_{igt}$	(3) $\Delta \ln p_{igt}$	(4) $\Delta \ln p_{igt}$	(5) $\Delta \ln p_{igt}$
$\Delta \ln(1+\tau_{igt})$	-0.05	-0.06	-0.01	-0.05	-0.06
	(0.05)	(0.05)	(0.18)	(0.05)	(0.05)
$\Delta \ln(xr_{it})$				0.00	0.00
				(0.00)	(0.00)
Fixed Effects	gt+i	gt	gt+it	gt+i	gt
1st-Stage F	92.6	78.2	41.2	92.3	78.1
N	2,724,371	2,724,371	2,724,371	2,724,371	2,724,371

Panel B: Quarterly

	(1) $\Delta \ln p_{igt}$	(2) $\Delta \ln p_{igt}$	(3) $\Delta \ln p_{igt}$	(4) $\Delta \ln p_{igt}$	(5) $\Delta \ln p_{igt}$
$\Delta \ln(1+\tau_{igt})$	-0.10*	-0.12**	-0.20**	-0.10*	-0.12**
	(0.06)	(0.06)	(0.08)	(0.06)	(0.06)
$\Delta \ln(xr_{it})$				-0.00	-0.00***
				(0.00)	(0.00)
Fixed Effects	gt+i	gt	gt+it	gt+i	gt
1st-Stage F	52.4	42.4	26.6	52.2	42.2
N	1,192,687	1,192,687	1,192,687	1,192,687	1,192,687

Panel C: Semi-Annual

	(1) $\Delta \ln p_{igt}$	(2) $\Delta \ln p_{igt}$	(3) $\Delta \ln p_{igt}$	(4) $\Delta \ln p_{igt}$	(5) $\Delta \ln p_{igt}$
$\Delta \ln(1+\tau_{igt})$	-0.15*	-0.17**	-0.22***	-0.14	-0.16**
	(0.09)	(0.08)	(0.07)	(0.09)	(0.08)
$\Delta \ln(xr_{it})$				-0.00	-0.00***
				(0.00)	(0.00)
Fixed Effects	gt+i	gt	gt+it	gt+i	gt
1st-Stage F	24.8	29.1	55.1	24.7	29.0
N	624,610	624,610	624,610	624,610	624,610

Panel D: Annual

	(1) $\Delta \ln p_{igt}$	(2) $\Delta \ln p_{igt}$	(3) $\Delta \ln p_{igt}$	(4) $\Delta \ln p_{igt}$	(5) $\Delta \ln p_{igt}$
$\Delta \ln(1+\tau_{igt})$	-0.08	-0.08	-0.12	-0.08	-0.08
	(0.05)	(0.05)	(0.21)	(0.05)	(0.05)
$\Delta \ln(xr_{it})$				-0.00	-0.00
				(0.00)	(0.00)
Fixed Effects	gt+i	gt	gt+it	gt+i	gt
1st-Stage F	1421.4	1472.4	28.8	1427.5	1483.7
N	532,390	532,390	532,390	532,390	532,390

Notes: Table reports tariff impacts on U.S. imports in 2025 over four horizons. For monthly, quarterly, and semi-annual specifications, the dependent variable is the period-over-period change. For the annual horizon, we use year-over-year changes measured quarterly (e.g., 2025q1-2024q1). Panel B is identical to Table A.2B and re-produced here to facilitate comparisons across horizons. See Table 4 for additional notes.

TABLE A.4: 2025 MIDDLE AND UPPER TIER DEMAND ELASTICITIES: η AND κ

Middle Nest: η

	(1) $\Delta\ln s_{Mgt}$	(2) $\Delta\ln p_{Mgt}$	(3) $\Delta\ln s_{Mgt}$
$\Delta\ln Z^{stat}_{Mgt}$	-0.46***	0.52***	
	(0.09)	(0.07)	
$\Delta\ln p_{Mgt}$			-0.90***
			(0.18)
Sector-Time FE	Yes	Yes	Yes
1st-Stage F			52.9
$\hat{\eta}$ (se[$\hat{\eta}$])			1.90 (0.18)
R2	0.03	0.08	.
N	111,374	111,374	111,374

Upper Nest: κ

	(1) $\Delta\ln(\frac{P_{Mst}M_{st}}{P_{Dst}D_{st}})$	(2) $\Delta\ln\left(\frac{P_{Mst}}{p_{st}}\right)$	(3) $\Delta\ln(\frac{P_{Mst}M_{st}}{P_{Dst}D_{st}})$
$\Delta\ln Z^{stat}_{Mst}$	-0.35	2.82	
	(0.59)	(1.86)	
$\Delta\ln\left(\frac{P_{Mst}}{p_{st}}\right)$			-0.12
			(0.21)
NAICS2-time FE	Yes	Yes	Yes
1st-stage F			2.31
$\hat{\kappa}$ (se[$\hat{\kappa}$])			1.12 (0.21)
R2	0.14	0.20	.
N	690	690	690

Notes: Table reports estimates for the upper-level U.S. demand elasticities using quarterly data from 2024q1-2025q4. The left panel estimates the cross-product elasticity η. Column 1 reports product-level import shares against the product-level instrument, which is constructed as the change in the (simple) average statutory rate between $t-1$ and t. Column 2 is the first-stage regression of the product-level price index on the instrument. Column 3 reports the structural IV regression that estimates η. Standard errors clustered by HS8. Right panel estimates domestic versus imports elasticity κ. Column 1 is the change in the sectoral import value relative to the change in domestic production on the instrument, constructed as the simple average change in the statutory rate. Column 2 is the first-stage regression of the relative sectoral price index on the instrument. Column 3 is reports the structural IV regression that estimates κ. Standard errors clustered by sector.

TABLE A.5: SUMMARY OF PARAMETERS, ALTERNATIVE SPECIFICATIONS AND HORIZONS

Panel A: Product-Time FEs

Tariff Episode	σ	ω^*	η	κ	σ^*
2025 Tariffs	1.84	0.07	1.87	1.13	1.76
	(0.54)	(0.06)	(0.18)	(0.22)	(0.15)

Panel B: Product-Time and Origin-Time FEs

Tariff Episode	σ	ω^*	η	κ	σ^*
2025 Tariffs	0.82	0.30	0.58	0.84	2.51
	(0.51)	(0.26)	(0.11)	(0.44)	(0.51)

Panel C: Medium-Run Parameters

Tariff Episode	σ	ω^*	η	κ	σ^*
2025 Tariffs	3.44	0.03	1.89	0.55	1.36
	(0.87)	(0.02)	(0.26)	(0.94)	(0.49)

Notes: Table reports the parameter estimates using alternative fixed effects for (17) and (18). Panel A reports parameter estimates using product-time fixed effects only, while Panel B reports estimates using product-time and origin-time fixed effects. Panel C estimates the baseline specifications using the year-over-year changes in the quarterly data.

TABLE A.6: TESTING WELFARE-RELEVANT MODEL PREDICTIONS

	Weighted		Unweighted	
	with ToT (1)	without ToT (2)	with ToT (3)	without ToT (4)
Tariff Instrument	0.0013	0.0024	-0.0029	-0.0030
	(0.0041)	(0.0045)	(0.0006)	(0.0006)
p-value	0.75	0.60	0.00	0.00
N	78999	78999	78999	78999

Notes: This table reports tests of model predictions following Adao et al. (2024). The test regresses the model prediction error for each outcome on a shift share instrument, where the shifters correspond to tariff shocks. We report the pooled specification that stacks the three welfare-relevant predictions (import prices, import quantities, export prices), and adds category fixed effects. The null hypothesis of correct model specification implies $\beta = 0$. Columns 1-2 reported weighted regressions, and columns 3-4 report unweighted regressions. Odd columns test the model with terms-of-trade adjustments, and even columns test the model without terms-of-trade adjustments. For computational feasibility, the sample is limited to varieties that collectively account for the top 90% of total import or export value.

TABLE A.7: TESTING PPI AND XPI

2025 Tariffs (without ToT Effects)

	PPI (1)	PPI (2)	PPI (3)	XPI (4)	XPI (5)	XPI (6)
Tariff Instrument	0.0002	0.0004	0.0004	0.0001	0.0005	0.0008
	(0.0002)	(0.0007)	(0.0003)	(0.0003)	(0.0016)	(0.0007)
p-value	0.37	0.56	0.16	0.79	0.77	0.23
N	79	79	79	30	30	30
Instrument	Export Tariff	Import Tariff	Input Tariff	Export Tariff	Import Tariff	Input Tariff

2025 Tariffs (with ToT Effects)

	PPI (1)	PPI (2)	PPI (3)	XPI (4)	XPI (5)	XPI (6)
Tariff Instrument	0.0002	0.0003	0.0004	0.0001	0.0003	0.0008
	(0.0001)	(0.0006)	(0.0002)	(0.0002)	(0.0013)	(0.0006)
p-value	0.18	0.62	0.13	0.80	0.79	0.21
N	79	79	79	30	30	30
Instrument	Export Tariff	Import Tariff	Input Tariff	Export Tariff	Import Tariff	Input Tariff

Notes: This table reports tests of model predictions following Adao et al. (2024). Columns 1-3 report results for PPI outcomes, while columns 4-6 report results for XPI outcomes. The instrument used in each specification is listed in the last row.

TABLE A.8: WELFARE IMPACT (WITH LABOR MOBILITY), 2025 TARIFFS

	2025 Tariffs (without ToT Effects)				
	Import Prices	Domestic Prices	Factor Income	Tariff Revenue	Total
	(1)	(2)	(3)	(4)	(5)
Change ($ b)	-248	81	-288	306	-150
Change (% GDP)	-0.83	0.27	-0.97	1.02	-0.50

	2025 Tariffs (with ToT Effects)				
	Import Prices	Domestic Prices	Factor Income	Tariff Revenue	Total
	(1)	(2)	(3)	(4)	(5)
Change ($ b)	-261	-1281	1361	342	84
Change (% GDP)	-0.87	-4.30	4.56	1.15	0.28

Notes: Table shows the total welfare impact from the 2025 tariffs allowing for labor mobility. Note that the components do not enter additively, hence the 4 columns need not sum to the aggregate effect.

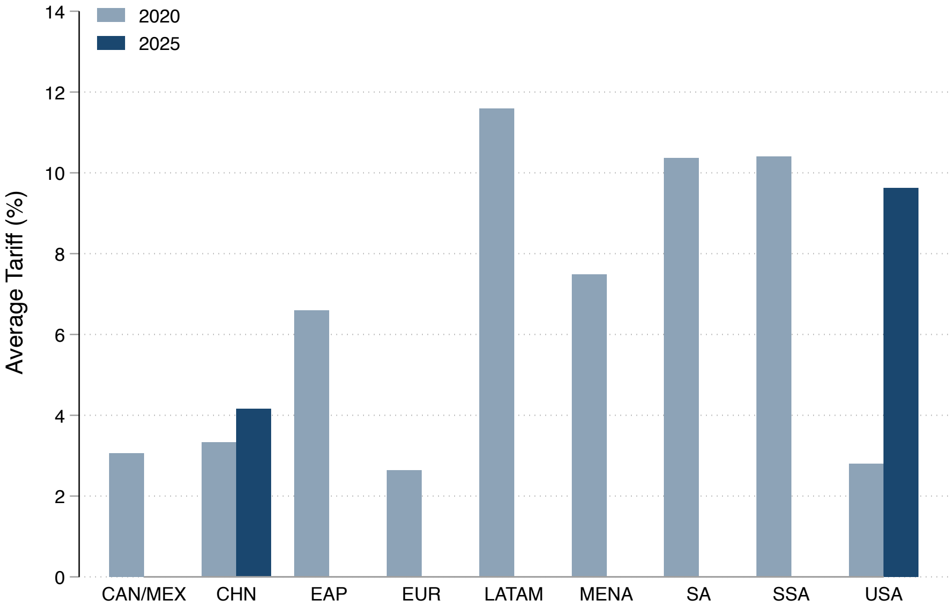
TABLE A.9: WELFARE IMPACT OF 2018-19 TARIFFS

	2018-19 Tariffs (without ToT Effects)				
	Import Prices	Domestic Prices	Factor Income	Tariff Revenue	Total
	(1)	(2)	(3)	(4)	(5)
Change ($ b)	-42	-94	78	57	-2
Change (% GDP)	-0.21	-0.47	0.39	0.28	-0.01

	2018-19 Tariffs (with ToT Effects)				
	Import Prices	Domestic Prices	Factor Income	Tariff Revenue	Total
	(1)	(2)	(3)	(4)	(5)
Change ($ b)	-44	-218	211	58	4
Change (% GDP)	-0.22	-1.09	1.06	0.29	0.02

Notes: Table shows the total welfare impact corresponding to the 2018-19 applied tariffs.

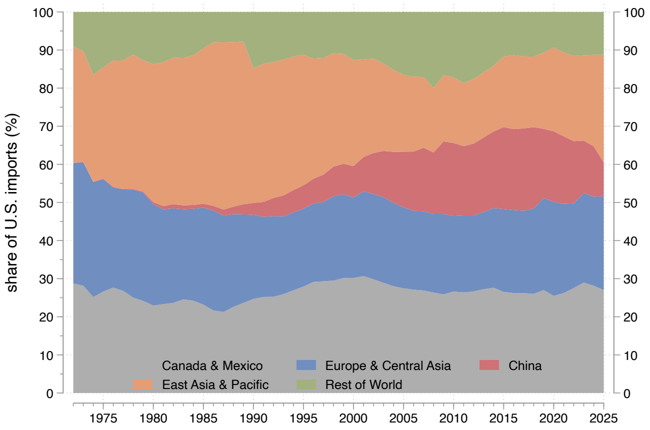
FIGURE A.1: GLOBAL TARIFFS LANDSCAPE



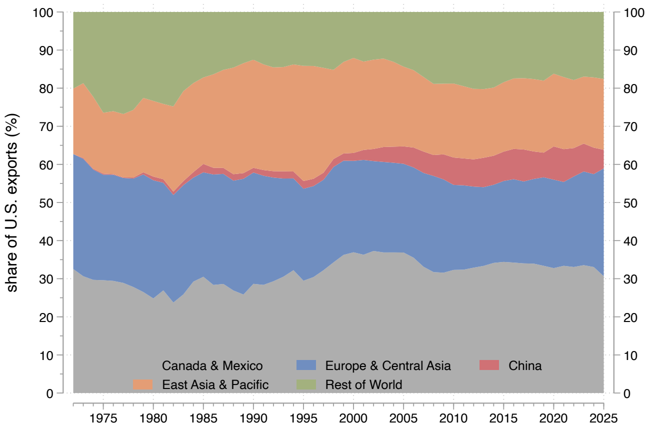
Notes: Figure reports weighted average statutory import tariffs across major regions. The 2020 data taken from Teti (2024). The U.S. tariff in 2025 is the applied rate as of 2025m12. China's 2025 (statutory) tariff is derived its 2023 tariffs from TRAINS and retaliations on U.S. in 2025; we assume China's tariffs on all other trade partners have remained the same in 2025.

FIGURE A.2: U.S. IMPORT AND EXPORT SHARES, 1972-2025

Panel A: U.S. Import Shares

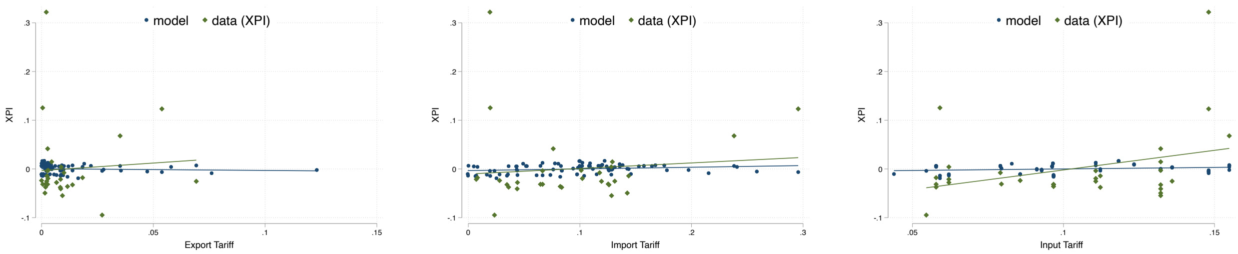


Panel B: U.S. Export Exports

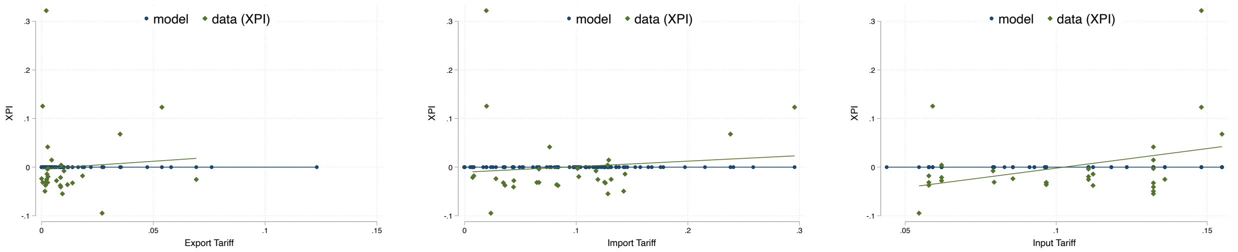


Notes: Figure plots import and export shares for U.S. goods trade. Source: U.S. data for 1972-1989 are from Peter Schott's website and data for 1990-2025 are from Census MITD.

FIGURE A.3: DATA VERSUS MODEL PREDICTIONS: EXPORT PRICE INDEX (XPI)



Panel A: Export Tariff (w/ ToT) **Panel B: Import Tariff (w/ ToT)** **Panel C: Input Tariff (w/ ToT)**

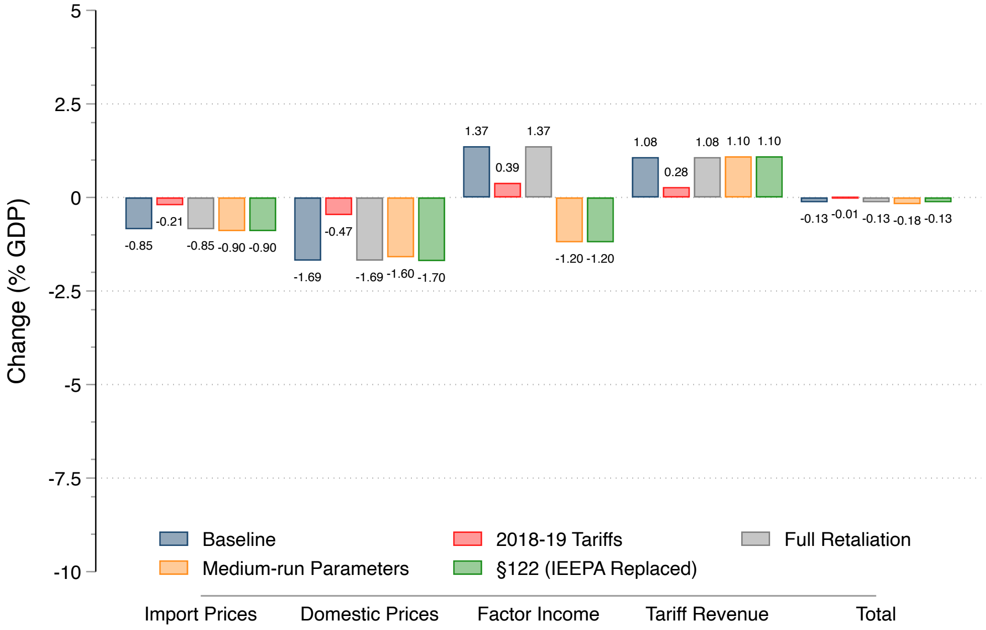


Panel D: Export Tariff (w/o ToT) **Panel E: Import Tariff (w/o ToT)** **Panel F: Input Tariff (w/o ToT)**

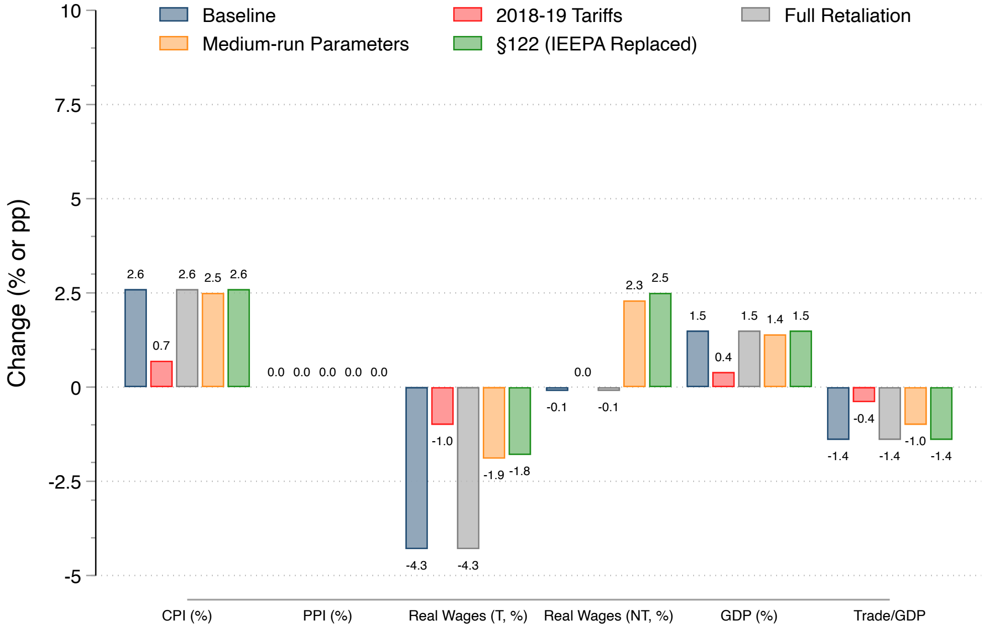
Notes: Figure shows plot of changes in XPI as observed in data and its model predictions against import (export) weighted import tariff (export tariff) shock at sector level. These changes are between 2024m12 to 2025m12.

FIGURE A.4: WELFARE IMPACTS OF DIFFERENT SCENARIOS (MODEL WITHOUT TOT)

Panel A: Components of Welfare

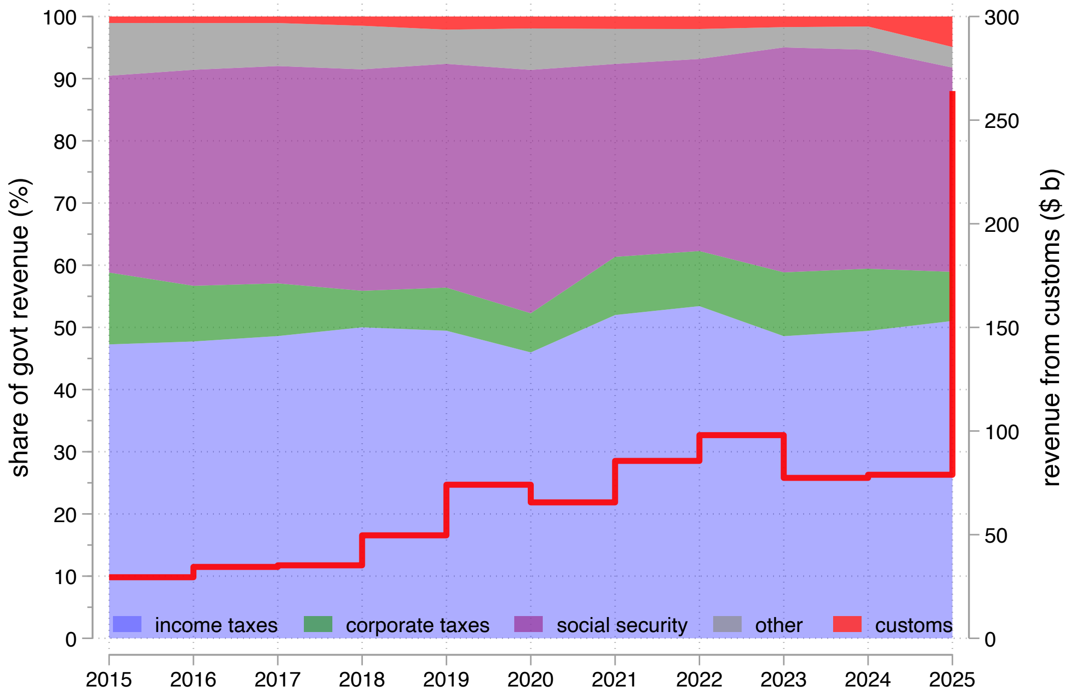


Panel B: Aggregates



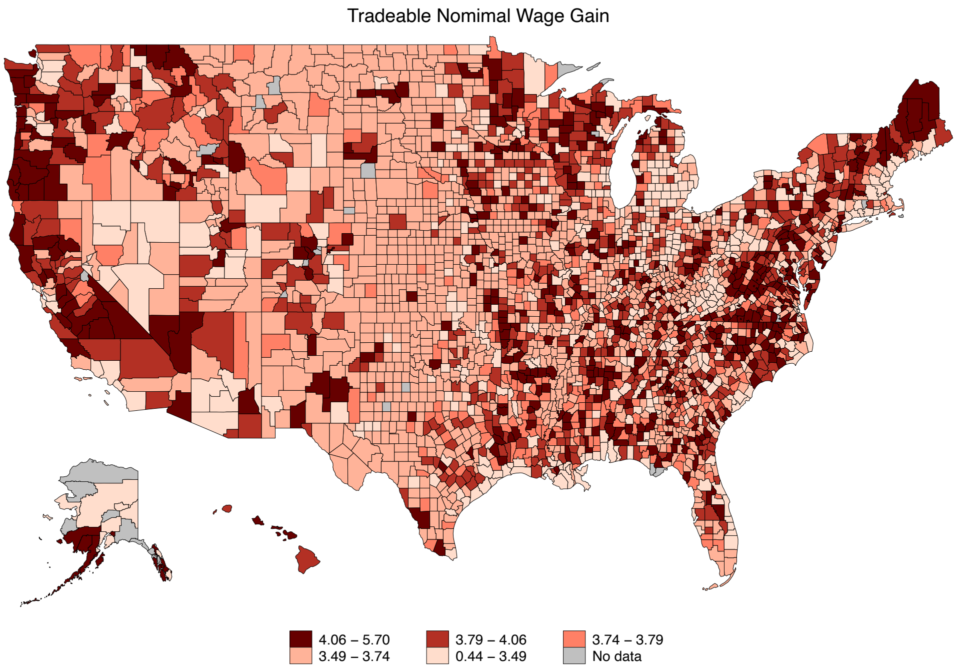
Notes: Figure reports impacts in the model that shuts down terms-of-trade adjustments. Panel A reports the components of welfare under different configurations of tariff changes. Panel B reports aggregate statistics that are generated by the model.

FIGURE A.5: FEDERAL REVENUE



Notes: Figure reports federal revenue across categories from the Monthly Treasury Statement through December 2025.

FIGURE A.6: WAGE PREDICTIONS



Notes: Figure reports predictions of nominal wage changes across counties from the model that assumes no labor mobility.