Board of Governors of the Federal Reserve System

International Finance Discussion Papers

ISSN 1073-2500 (Print)
ISSN 2767-4509 (Online)

Number 1436

March 2026

The Design and Effect of Tariff Retaliation: Evidence from the European Union

Ece Fisgin, Johannes Fleck, Keith Richards

Please cite this paper as:
Fisgin, Ece, Johannes Fleck, Keith Richards (2026). "The Design and Effect of Tariff Retaliation: Evidence from the European Union," International Finance Discussion Papers 1436. Washington: Board of Governors of the Federal Reserve System, https://doi.org/10.17016/IFDP.2026.1436.

The Design and Effect of Tariff Retaliation: Evidence from the European Union*

Ece Fisgin† Johannes Fleck‡ Keith Richards§

March 16, 2026

Abstract

We show that the EU's 2018 retaliation against US steel and aluminum tariffs targeted goods with low US import dependence and high substitutability. For the majority of tariffed goods, the US share of EU imports declined notably and remained below pre-2018 levels even after the retaliatory tariffs were lifted, reflecting asymmetric effects of tariffs on trade diversion. Moreover, although the retaliatory tariffs were instantly and fully passed through to EU importers, the retaliation did not lead to domestic price pressures as we find no evidence for inflationary effects on consumer and producer prices.

Keywords: Trade Wars, Retaliatory Tariffs, Tariff Pass-Through, Inflation, US-EU Trade Relations

JEL Classification: E31, F13, F14, F42, F62

*We thank seminar participants at the Federal Reserve Board for comments. We are also thankful to Harun Alp, Justin Pierce, Mariano Somale and Francois de Soyres for helpful conversations and especially to Aaron Flaaen for detailed comments. The views expressed herein are those of the authors and not necessarily those of the Board of Governors of the Federal Reserve System.

†Board of Governors of the Federal Reserve System; Ece.Fisgin@frb.gov

‡Board of Governors of the Federal Reserve System; Johannes.Fleck@frb.gov

§Board of Governors of the Federal Reserve System; Keith.P.Richards@frb.gov

1 Introduction

The recent sharp US tariff hikes represent a historic departure from the decades-long trend of global trade liberalization. In response to such tariff increases, it is natural to ask what the effects of foreign retaliation might be. While there were retaliatory threats from other economies early on during the current and ongoing episode, they largely eased, partly in response to bilateral trade deals. But these truces are fragile as the deals are often incomplete and commitments uncertain, most notably regarding foreign investment pledges. More generally, if there was a breakdown of the global trading order due to ever-stronger protectionist policies, it would likely result in substantial retaliation.

Despite this rising relevance of tariff retaliation, there is only scant evidence regarding its impact on the retaliating economies. Indeed, the focal point of the recent literature on the effects of tariffs is their impact on the US economy. This evidence is not informative about potential retaliation and its effects on the retaliator. Moreover, the design of retaliatory tariffs can take many shapes. Therefore, understanding the effects of retaliation on the retaliator necessarily requires examining particular episodes of retaliation.

Our paper closes this gap in the literature by assessing the trade destruction and domestic price effects of the European Union's (EU) 2018 tariff retaliation package. This package was compliant with World Trade Organization (WTO) provisions and represented a "rebalancing" response to US steel and aluminum tariffs. Between June 2018 and January 2022, it applied 10 and 25 percent ad-valorem duties on a $3.3bn list of US imports ranging from steel and aluminum to consumer goods like bourbon, motorcycles, and apparel. With this selection of products, the EU sought to minimize domestic economic disruptions while maximizing pressure on the US to rescind the steel and aluminum tariffs.

Standard trade theory suggests that the incidence of tariffs, whether they are borne by exporters through lower pre-tariff prices or by importers through higher post-tariff prices, depends on the relative, product-specific elasticities of supply and demand. Hence, if the EU's demand for the tariffed US imports was inelastic, or if EU importers could not easily find substitutes, either from domestic or third-country suppliers, the retaliatory tariffs would have materialized as a tax on European businesses and consumers, resulting in inflationary pressures. We assess these mechanisms from an empirical perspective by studying the evolution of import quantities and prices of tariffed and non-tariffed products in a difference-in-difference framework.

Our key findings are as follows: First, the retaliatory tariffs had a lasting destructive effect on

US imports to the EU. The import value of the tariffed products fell to about half from the second month after the tariffs were implemented. Moreover, tariffed US imports did not recover fully after the retaliatory tariffs were suspended but remained persistently below the pre-tariff levels. Our estimate of the import demand elasticity to tariff suspension is just slightly larger than half of that to tariff implementation, demonstrating that both had asymmetric effects. Thus, as lifting the tariffs failed to reverse the earlier decline in US imports, the retaliation left permanent scars in US-EU trade flows.

Second, US exporters did not lower their pre-tariff prices to absorb the costs of the retaliatory tariffs. Instead, they were rapidly and comprehensively passed-through into the "at-the-dock" import prices of European importers. This finding is consistent with Amiti, Redding, and Weinstein (2019), Fajgelbaum, Goldberg, Kennedy, and Khandelwal (2020) and Cavallo, Gopinath, Neiman, and Tang (2021) for US tariffs and emphasizes that, even if tariffs target comparably small import values and a large variety of products, they are still associated with high domestic price pass-through in the short run.

However, despite their immediate passthrough, we find that the retaliatory tariffs did not lead to inflationary pressures in the EU. We arrive at this conclusion by regressing changes in category-specific tariff rates on measures of excess inflation over consecutive month windows as other researchers, for example Minton and Somale (2025) have done to track the price effects of US tariffs. We do so separately for producer and consumer prices.

We rationalize our findings on trade and price effects by highlighting several features of the retaliation package. First, it was moderate in size, applying to only 1.5 percent of all US goods imports to the EU, and to be rolled out in two stages. As the second stage never went into effect, the tariffed import volume was less than half of the US steel and aluminum tariffs. Based on 2017 import figures and abstracting from any substitutions or import price reductions, the cumulative tariff cost would have amounted to approximately $2.9bn during the 3.5 years in which the retaliation was active – compared to about $7trn in total EU imports. Thus, the tariff costs had little efficacy to noticeably drive up aggregate domestic prices.

Second, the retaliation package was asymmetric and distributed potential tariff costs over a variety of products as it did not exclusively apply to steel and aluminum imports. Most of these categories had a low US share of EU imports, reflecting little import dependence and enabling EU importers to quickly and efficiently source tariffed US imports from cheaper alternative suppliers.

Our findings contribute a new perspective to a growing body of literature on the 2018-2020 and the ongoing 2025 trade wars. Most of these studies focus on the impact of US tariffs on domestic prices, product varieties and production relocation choices, such as Amiti, Redding, and Weinstein (2019), Cavallo, Gopinath, Neiman, and Tang (2021), Flaaen, Hortaçsu, and Tintelnot (2020), and Flaaen and Pierce (2024). Some also assess the effects of foreign retaliation on prices and quantities of US exporters, especially for the agricultural sector (Fajgelbaum, Goldberg, Kennedy, and Khandelwal (2020), Grant, Arita, Emlinger, Johansson, and Xie (2021) Morgan, Arita, Beckman, Ahsan, Russell, Jarrell, and Kenner (2022)). Our work is a counterpoint to these studies as it provides results on the trade disruptive and domestic inflationary effects on the retaliating economy.

There is currently only little and narrow evidence regarding the "self-harm" effect of retaliatory tariffs. For China, Chor and Li (2024) and Li, Balistreri, and Zhang (2020), provide estimates on how retaliation against US tariffs in 2018/2019 reduced activity and increased production costs. For the 2018 EU's retaliation, the few available studies, such as Fetzer and Schwarz (2021) and Braml (2020) focus on the political motives behind the design of the retaliation package.[1] As the retaliation package which the EU compiled in 2025 subsumes and extends many design elements of the 2018 package, our findings are also informative about the economic effects of future US-EU retaliation episodes.[2]

The remainder of the paper is organized as follows. Section 2 describes the institutional background of the EU's 2018 retaliation and the design of the EU's tariff retaliation package. Section 3 investigates the effect of the retaliation on US import shares and quantities, including the asymmetric effects. Section 4 details and applies our empirical strategy for identifying tariff pass-through and price effects on EU producer and consumer prices. Section 5 concludes.

[1]They point out that certain tariffed products, such as whiskey or motorcycles, were produced in areas which predominantly voted for Trump in the 2016 election or national icons sure to receive ample public attention. Bown, Jung, and Lu (2018) and Andersson (2019) provide select stylized descriptions of the 2018 retaliation package.

[2]Fleck and Pradhan (2026) compute and compare the distributional impact on American and European households of the US 2025 tariffs on EU imports and the proposed but suspended EU retaliation. Gnocato, Gunnella, Montes-Galdon, Schuler, and Stamato (2025) assess the domestic macroeconomic effects of hypothetical tariff retaliation schemes focusing on the intermediate versus final goods composition. See Khan, Zulfiqar, and Chunjie (2025) for a recent survey of the literature on the effects of trade wars, including the use of tariff retaliation.

2 The EU's 2018 Tariff Retaliation

2.1 Timeline

On March 8, 2018, President Trump signed executive orders which invoked Section 232 of the 1962 Trade Expansion Act to impose a tariff rate of 25 percent on imports of steel and a 10 percent tariff rate on imports of aluminum. While imports from the EU were initially exempt, they were added from June 1, 2018 and targeted about €6.4bn ($7.5bn at the time) EU imports. The EU responded by filing a complaint with the WTO and announced two sets of retaliatory tariffs, referred to as Annex 1 and 2. Together, these tariffs represented WTO compliant rebalancing measures and amounted to the same value the US tariffs were targeting and mirrored the US tariff rates. The Annex 1 tariffs took effect from June 22, 2018 and included tariffs of 10 and 25 percent on 86 select imports from the US, totaling about €2.8bn ($3.3bn).[3]

These tariffs remained in place until January 1, 2022 when they were suspended following a joint EU-US statement in October 2021 in which both sides committed to remove the steel and aluminum tariffs as well as the retaliation. For our analysis, we focus on these product-level tariffs to study the design and effect of tariff retaliation.[4] In Appendix A, we discuss the other two other episodes in which the EU retaliated against US imports while the 2018 Annex 1 tariffs were in place. They only took effect from May 2020 and targeted distinct goods, providing us ample opportunity to study the short-term effects of the 2018 retaliation without concern about confounding effects, including from extreme movements in prices due to the onset of the Covid-19 pandemic.

2.2 Design

We now present several key features of the Annex 1 tariff design. These are critical to understand our findings on the trade diversion and inflationary effects we present later. First,

[3]See European Commission (2018a) and European Commission (2018b). The 10 percent tariff rate applied only to playing cards. All other products were tariffed at a rate of 25 percent. The EU published the tariffs using its Combined Nomenclature (CN) eight-digit codes, listing 182 products. However, as trade data are generally classified according to the six-digit codes of the Harmonized System (HS), we aggregate the CN codes into HS codes throughout this paper. This aggregation does not omit information which is relevant for our analysis. For illustration, consider HS code 100630 which refers to "Rice; Semi-milled or wholly milled rice, whether or not polished or glazed." The CN Annex 1 tariffs have 16 subcategories for this product which provide only minor additional details, such as grain shapes, length-width ratios, semi vs. wholly milled etc.

[4]See European Commission (2021a) and European Commission (2021b). The Annex 2 tariffs were scheduled to complement the Annex 1 tariffs from June 2021 unless the US tariffs had been suspended by then. The Annex 2 tariffs applied to an additional 158 products, according to the CN classification, with tariff rates of 10, 25 and 50 percent, respectively, and targeted another €3.6bn ($4.2 bn) in US imports, bringing the total to €6.4bn ($7.5bn). Yet, as the US and EU had entered negotiations aiming to remove mutual trade barriers in early 2021, the EU postponed the implementation of the Annex 2 tariffs on May 28, 2021, and suspended them indefinitely on January 1, 2022, together with the Annex 1 tariffs.

relative to the EU's total imports from the world and even relative to total imports from the US, the share of imports affected by the retaliatory tariffs was very small. Expressed in values of 2017 trade data, they only applied to 1.5 percent of the value of all goods imported from the US and to 0.2 percent of the EU's total goods imports. Thus, the retaliatory tariffs had a negligible effect on the EU's weighted average tariff rate and overall import costs.[5]

Second, the EU's retaliatory tariffs were asymmetric to the US steel and aluminum tariffs as they focused on a broader set of products. They included a number of particular final goods aiming to create political pressure in the US, as discussed by, for example, Fetzer and Schwarz (2021), while limiting domestic costs by avoiding key inputs in downstream industries. To provide more details on the composition of the tariff list and the pre-tariff import trends of the product codes, we study trade data from 2017, the year before the implementation of the retaliatory tariffs. Figure 1 shows that only 31.5 percent value of tariffed US imports belonged to product categories which include aluminum and steel. Meanwhile, final goods categories like "Beverages, spirits, and vinegar", "Ships and boats", "Vehicles", and "Cereals" contributed about 37.2 percent of the value and included high visibility imports such as Harley Davidson motorbikes and Bourbon whiskey. Moreover, comparing the number of individual products tariffed within sectors also emphasizes that the set of tariffed final goods had a disproportionally smaller number of products relative to its overall import value. In other words, the retaliatory tariffs were designed to target a few high-value products other than inputs from steel and aluminum sectors and were highly diversified within the steel and aluminum category.

Third, the value of final or processed products targeted by the retaliatory tariffs was larger than that of any raw or intermediate products. To illustrate this dimension of the tariff design, we classify the HS product codes into Broad Economic Categories (BEC) by mapping product codes through concordances provided by the World Integrated Trade Solution (WITS). By incorporating a System of National Accounts (SNA) end-use dimensions, such as intermediate consumption, capital goods, and final consumption, BEC categories allow us to identify which stages of production the EU targeted to avoid spillovers in downstream industries.

Figure 2 shows that 48 percent of tariffed imports are considered intermediate goods. Thus, the share applied to products typically for final consumption was marginally later than those used as inputs in production. This breakdown contrasts sharply with the US tariffs, which applied to intermediate products (steel and aluminum) exclusively, and reinstates that the design of the retaliatory tariffs was deliberately chosen to minimize supply chain disruptions for European

[5] According to World Bank (2024), this rate was 4.42 percent in 2017, 4.36 in 2018 and 4.70 in 2019.

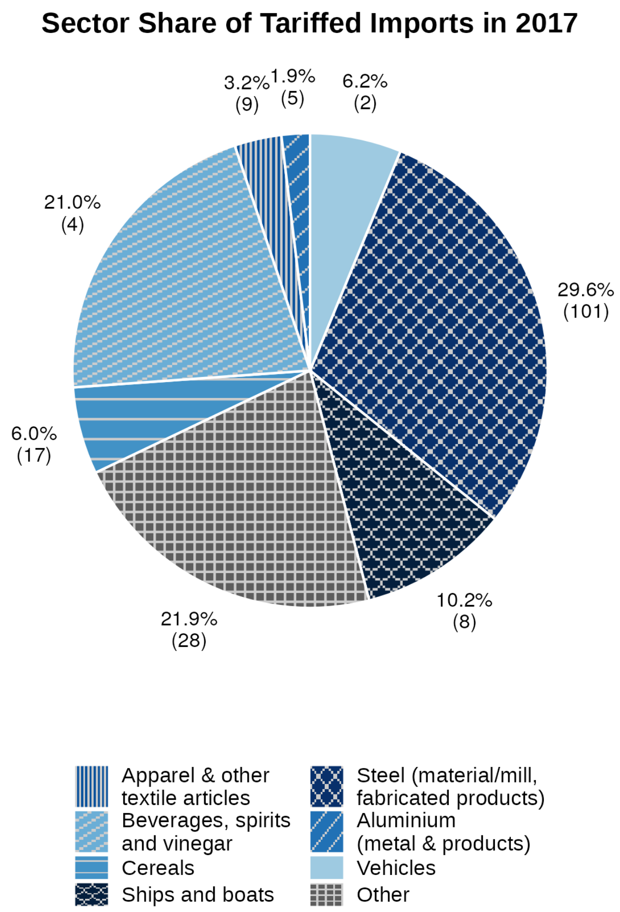

Figure 1: *Breakdown of the EU's 2018 Annex 1 tariffs on US imports using 2017 trade values at the eight-digit CN level. Product classifications are aggregated to the two-digit HS2 chapters. "Apparel & other textile articles" includes HS2 chapters 61, 62, and 63. "Steel (material/mill, fabricated products)" includes HS2 chapters 72 and 73 (which include products with iron content). Fabricated refers to more refined and final products, while material/mill refers to products at the initial state of production. Numbers in parenthesis are total number of products grouped under each HS2 chapter at eight-digit CN product classification. Source: UN Comtrade.*

companies and to curtail any negative effects on domestic employment and activity. Instead, the design aimed to incentivize European consumers to substitute final goods imported from the US by goods supplied by EU and third-party producers.

Fourth, the retaliatory tariffs targeted product categories in which the EU had minimal import dependence on the US. To illustrate this point in more detail, Figure 3 plots the relationship between the US import share of tariffed products grouped under HS2 chapters, and the tariffed product share of imports from all partners within total imports of two-digit HS2 chapters. To define the former more formally let T_h denote the set of tariffed products within chapter h, and M_{lp} be the 2017 import value of tariffed product l from partner p. We define total imports of

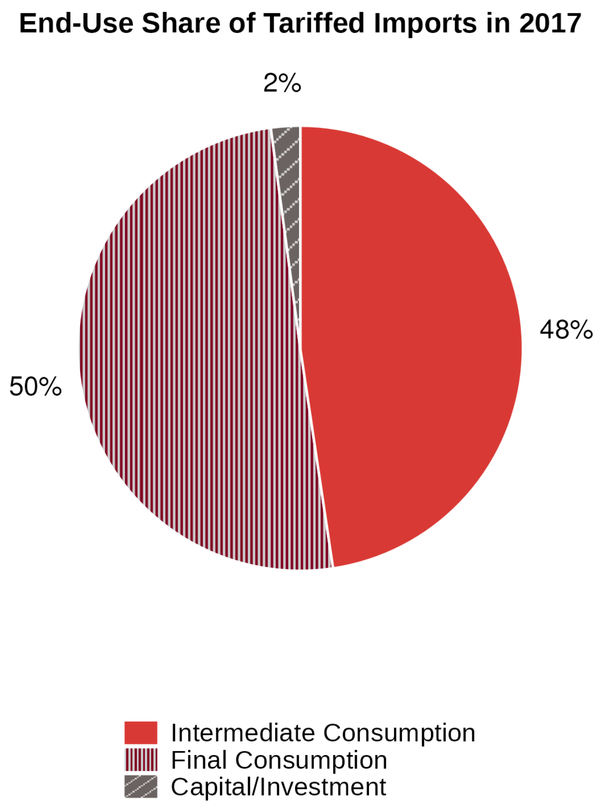

Figure 2: *Breakdown of the EU's 2018 Annex 1 tariffs on U.S. imports using 2017 trade values as classified under Broad Economic Categories (BEC). Source: UN Comtrade.*

tariffed products in chapter h as $M_h^T = \sum_{l \in T_h} \sum_p M_{l,p}$. The US import share for chapter h is computed as the share of those tariffed imports sourced from the US.

$$s_h^{US} = \frac{\sum_{l \in T_h} M_{l,US}}{M_h^T} \times 100 \tag{1}$$

To measure how large the tariffed subset of products is relative to the chapter as a whole, let M_h^{All} denote total 2017 imports in HS2 chapter h. The within-chapter import coverage of tariffed product codes is then,

$$c_h = \frac{M_h^T}{M_h^{All}} \times 100 \tag{2}$$

By plotting these two shares, we capture not only the US footprint in the tariffed subset of products as a trading partner for the EU, but also how significant these products are in comparison to the entire basket of goods under an HS2 chapter As Figure 3 illustrates, there is a strong negative relationship between the two measures. For example, only two HS2 chapters with tariffed products had more than 20 percent of all EU imports from the U.S. However, in both of them, the within-chapter value of total imports from all partners was just above 10 percent and almost 0 percent within their respective HS2 chapters. Conversely, in those two categories with high import coverage of tariffed products, only less than 10 percent of tariffed imports came from the US. Finally, for the overall majority of categories, both measures were below 20 percent, meaning the US was not a dominant source of imports for these tariffed products, and additionally that the products themselves when grouped under HS2 chapters did not represent a large value share.

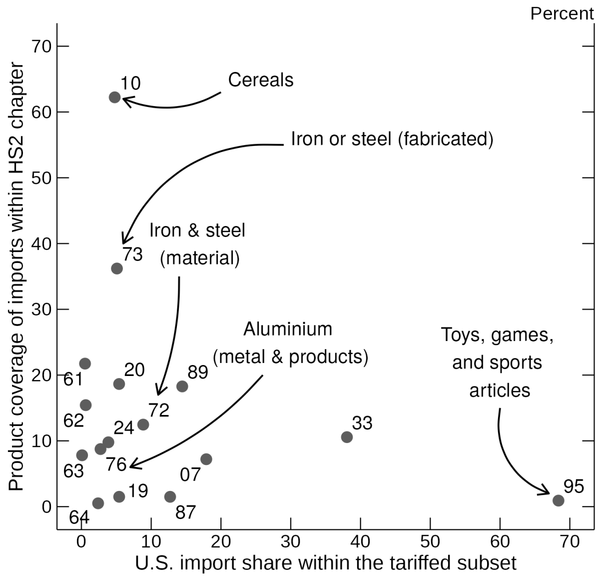

Figure 3: *Comparison of the EU's 2018 Annex 1 tariffs on imports using 2017 trade values by partner share and by total import coverage. Tariffed product codes at the eight-digit CN level have been grouped under HS2 chapters. Source: UN Comtrade.*

Finally, we compute the import-partner concentration for tariffed products using the Herfindahl-Hirshman Index (HHI) calculated at the HS6 subheading level from 2017 import values of tariffed products. This provides a simple proxy for substitutability of imports within a product group: when imports are concentrated in a small number of partners, replacing a tariffed supplier is likely to be more difficult in the short run. For each HS6 subheading i, define s_{hp} as partner p's share of EU imports within the tariffed products of the HS6 code. The concentration index is

$$HHI_i = \sum_p s_{hp}^2 \qquad 0 < HHI_i \leq 1 \tag{3}$$

Higher values in this index indicate that imports are sourced from fewer partners, making them harder to substitute if the dominant supplier becomes more expensive, while lower values indicate a more diversified supplier base. Notably, partner counts can be high even when concentration is high; several categories may have many partners while exhibiting a high HHI_i.

However, this indicates that one or a few suppliers make up for a majority of imports.

Figure 4 shows the top 5 and bottom 5 tariffed products ranked by their import-partner concentration. Notably, only 34 products out of the 180 that were tariffed and traded in 2017 had an HHI above 0.5, meaning that the vast majority of products were not at risk of supply chain disruptions due to dependence on a few partners, including the US. The figure also illustrates that final use products tend to rank higher in HHI_i while products in steel and iron, or aluminum subheadings, generally range around 0.1 or 0.2.

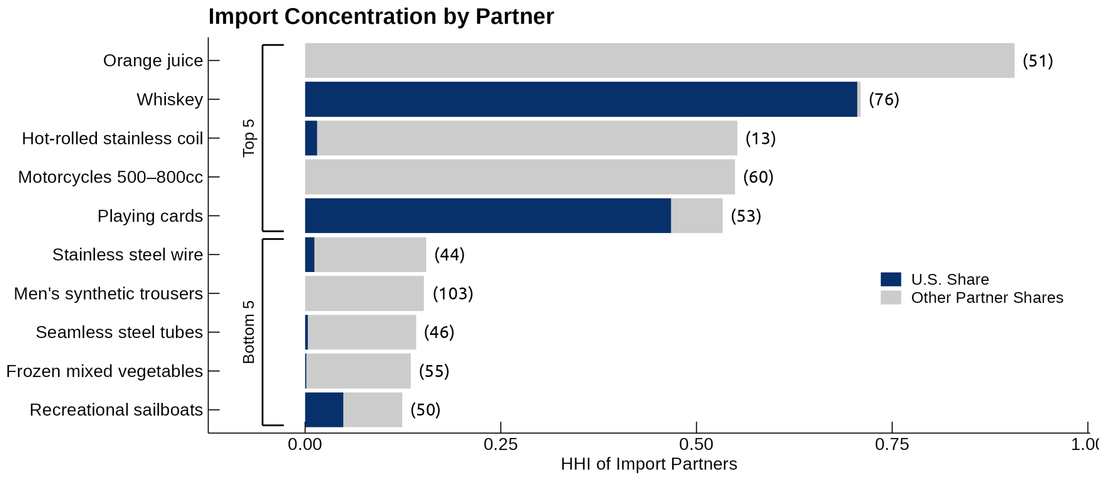

Figure 4: *Import-partner concentration for the EU's 2018 Annex 1 tariffs products using 2017 trade values at eight-digit CN level products grouped by six-digit HS6 subheadings. Top 5 and bottom 5 products ranked by their Herfindahl-Hirschman Index (HHI) are shown. Numbers in parentheses denote the total number of import partners for all tariffed products combined under each HS6 subheading. Source: UN Comtrade...*

Figure 4 further decomposes HHI_i into the US contribution, $s^2_{(h,US)}$, indicated with blue shading. Crucially, high concentration does not automatically imply US dependence. In the subset of US-traded tariffed products with an HHI_i above 0.5, only six are majority sourced from the US. These are concentrated in a small set of salient goods, most notably (Bourbon) whiskies, cranberry juice, ground nuts, and playing cards, which are in line with the types of products that have the capacity to generate political pressure but have little downstream industrial exposure. By contrast, some highly concentrated categories like orange juice have very low US import shares despite high HHI_i, indicating concentration is focused on non-U.S. suppliers.

In summary, the retaliatory tariffs were designed to result in minor disruptions to domestic producers as the tariffs balanced final and intermediate products. This design is consistent with the broader insight that tariffing final goods is generally less distortionary than tariffing intermediate inputs, because input tariffs propagate through supply chains and raise production costs as argued by, for example Antràs, Fort, Gutiérrez, and Tintelnot (2024). Moreover, the structure of EU import sourcing suggests the measures were crafted to keep substitution costs low; most targeted product groups were supplied by multiple partners and exhibited low import concentration, implying that European importers could reallocate purchases away from the US without major disruption. Where concentration was high, reliance on a dominant US supplier was limited to a small subset of politically salient goods, reinforcing the interpretation that the retaliation balanced domestic cost containment with external political leverage.

3 Effect on Import Shares, Quantities and Prices

The four panels of Figure 5 show the evolution of EU annual imports between the years 2010 and 2024 for each of the product categories subject to the 2018 retaliatory tariffs. The black bars represent the value of total imports (from all partners, including the US) in current US-Dollars (left axis). The blue line represents the imports from the US to the EU as a share of total category import values (right axis). In each panel, the vertical black line indicates the introduction of the EU's retaliatory tariffs in June 2018.

For all categories except Textiles and Apparel, we find that US import shares to the EU fell notably and persistently after 2017. While import values from all partners decreased during the first two years following the tariff implementation—also due to the onset of the Covid19-pandemic in 2020—they eventually returned to trend-growth. However, the US share did not recover to its pre-tariff level but remained below, even after the suspension of the retaliatory tariffs on January 1, 2022. In other words, the retaliatory tariffs resulted in lasting trade diversion as European importers substituted away from tariffed US imports and sourced them from non-U.S. suppliers.[6]

This finding is consistent with other papers studying the effect of foreign tariff retaliation in 2018 on US exports. For example, Carter and Steinbach (2020) find that foreign tariffs on US agricultural products significantly reduced exports, already in the short-run, and resulted in a re-configuration of trade relationships as retaliators started sourcing tariffed products from countries not affected by retaliatory tariffs. Our results show that this mechanism also applied to other export sectors and that the US import shares have not recovered even six years after the application of the EU's retaliatory tariffs and about four years after their suspension.

[6]Figure C1 in Appendix C shows the change in total import values of all tariffed goods at the monthly frequency for the 30 months before and the first twelve months after the tariffs were imposed. It shows that, already in the first year, year-over-year growth in import values had fallen to about half of that seen before June 2018.

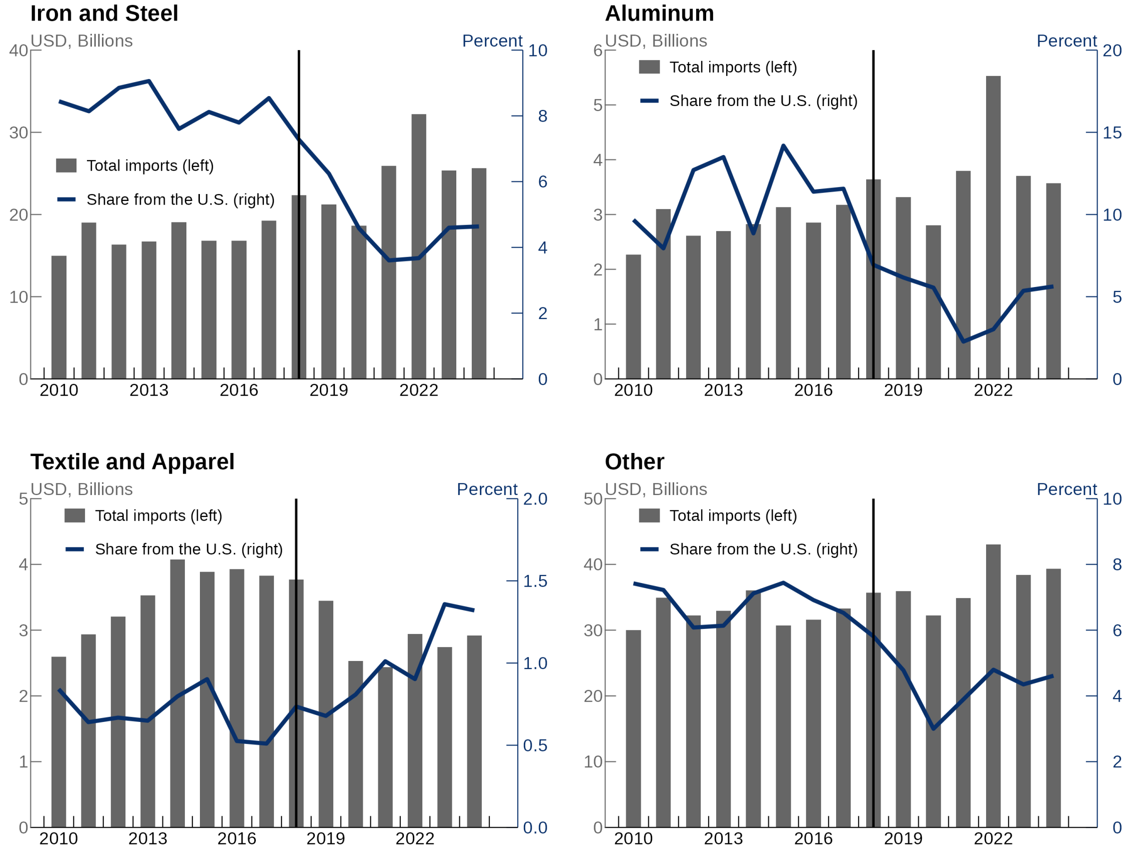

Figure 5: *Total import values from all partners and US import share of the EU's 2018 Annex 1 tariffed products using trade values at six-digit HS6 subheadings, concorded across HS 2007 to HS 2022 using WITS concordance tables. Source: UN Comtrade.*

To investigate how the retaliatory tariffs affected the EU's import prices, we now use monthly data on import quantities and prices (before tariffs) at the CN product level to construct and inspect unit values of tariffed and non-tariffed goods. To this end, we multiply goods subject to tariff retaliation with the applicable rates, aggregate imports into tariffed and non-tariffed goods and normalize their twelve-month price changes to zero for the month before the tariff was implemented. Figure 6 shows both time series.

Prior to the implementation of the tariffs, untreated prices barely fluctuate, indicating that substantial movements are likely related to tariffs. Moreover, there is no evidence of a difference in price trends between tariffed and non-tariffed goods pre-2018. However, after the tariff implementation, the twelve-month change in tariff-inclusive import prices for the tariffed goods climbed roughly 20 to 30 percentage points relative to the pre-tariff month. This range is commensurate with the actual tariff rate applied to almost all tariffed goods (25 percent) indicating that the retaliatory tariffs were rapidly and fully passed through to European importers. Finally, the series shows no evidence for price increase spillovers from tariffed to non-tariffed goods as import prices of tariffed goods remained permanently higher after the tariff implementation.

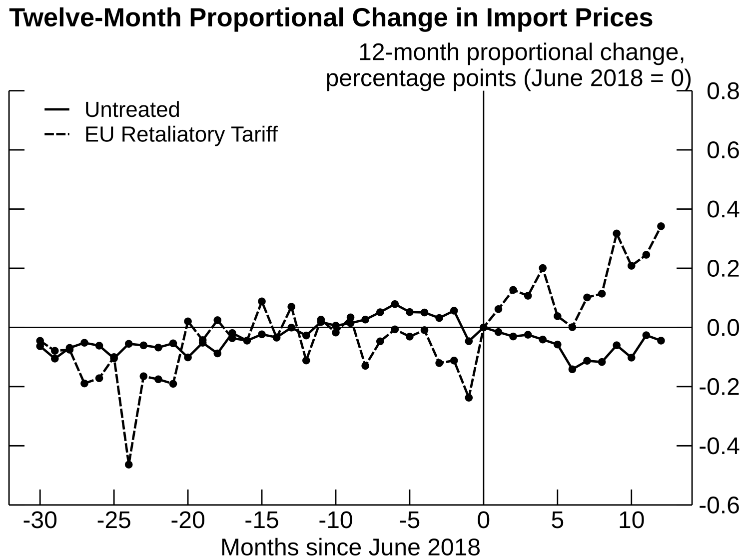

Figure 6: *"Untreated" includes all goods and countries that do not face retaliatory tariffs. June 2018 is set as month 0 as tariffs were effective on June 22, 2018, i.e. after the middle of the month. Data for the change in import prices is the geometric mean of the 12-month tariff-inclusive unit value relatives, weighted by the logarithmic mean of their import shares by value. In the left panel, prices are normalized so that so a zero is a price change that equals its value before the tariffs were implemented. In the right panel, import values are normalized to one in month zero so the import values are relative to imports in the last month before the tariffs were implemented. Petroleum products (HS chapters 2709-2715) are removed. Source: UN Comtrade.*

To formally quantify the effects of the EU's retaliation on imports and prices, we now study twelve-month changes, expressed in logs, in tariffed imports and their prices between June 2017 and June 2019, i.e. about one year before and eleven months after the tariffs became active (on June 22, 2018). In our regressions, we use the EU's statutory retaliatory tariffs as an independent (exogenous) variable and include product-level and monthly time controls to account for changes in other variables which can lead to changes in trade quantities and values, such as movements in the exchange rate.[7]

Panel A of Table 1 presents results for the period of June 2017 to June 2019, capturing the import demand elasticity of US tariffed imports in quantities and values in the wake of the Annex I tariffs. Panel B spans the period of December 2020 to December 2022, studying the effects on import demand elasticity following the suspension of Annex I tariffs on January 1, 2022. The first column of Panel A shows the result of regressing the change in foreign exporter prices

[7] Our econometric approach is similar to Amiti, Redding, and Weinstein (2019) but considers a longer time horizon after the tariff implementation. Note that, unlike the recent US tariffs, the EU's 2018 retaliatory tariffs did not feature initial incomplete enforcement and numerous exemptions. See, for instance, Gopinath and Neiman (2026). Thus, there is no meaningful difference between statutory (announced) and *effective* tariff rates.

on product specific tariff rates. The estimated impact of tariffs on unit values of 0.336, which is statistically insignificant, and suggests that tariff retaliation had no discernible impact on prices received by foreign exporters. Thus, it validates the finding in Figure 6 which pointed to substantial tariff pass through to prices being paid by EU importers.

This finding on the passthrough of the EU's tariff retaliation costs in 2018 is consistent with evidence on US tariff passthrough in 2018 and 2025, as documented by, for example, Amiti, Redding, and Weinstein (2019) and Gopinath and Neiman (2026). Thus, a key finding of our analysis is that there is no difference in the pass-through of tariffs applying to a large share of total imports–as for the US "reciprocal tariffs"–and tariffs targeting a small share and products with low import concentration–as for the EU's retaliation.

The remaining columns of Panel A show that the introduction of EU retaliatory tariffs in June 2018 led to sharp declines in US imports. In column 2, we regress changes in tariffs on changes in import quantities to obtain an estimate of the import demand elasticity. The coefficient is precisely estimated and suggests that a one percent increase in the tariff rate reduced import quantities by 2.9 percent. In column 3, we run the same regression but apply an inverse hyperbolic since (IHS) transformation to import quantities of zeros instead of dropping them. While our estimate of 4.8 percent is slightly below the analogous estimate reported by Amiti, Redding, and Weinstein (2019) for the US tariffs against China in 2018, it still falls into the typical range of trade elasticity estimates.

In columns 4 and 5, we replace import quantities with import values. The resulting estimates suggest that import values fell by about 3.6 or 5.2 percent, respectively in response to a one percent increase in the tariff rate. Again, the IHS estimate is somewhat below that reported by Amiti, Redding, and Weinstein (2019) but still indicates that the EU retaliatory tariffs reduced affected US imports by sizable amounts compared to the non-affected imports.

Finally, Table 1 sheds more light on the asymmetry between the trade-destroying effects of tariff imposition and the trade-restoring effects of tariff suspension. While the results in Panel A show that EU importers substituted away from US goods as the EU's tariffs became active, Panel B estimates how they responded to the tariff suspension on January 1, 2022. All estimates are notably smaller than their corresponding Panel A estimates, providing clear evidence of only partial recovery of tariffed US imports. This suggests that tariff removal failed to reverse the full extent of the initial trade destruction, suggesting that a substantial share of the disrupted trade relationships did not renew once the tariffs were lifted, likely reflecting the sunk costs involved in supply-chain reconfiguration and consistent with scarring effects of tariffs.

Table 1: Effect of Retaliatory Tariffs on US Imports

	(1) *Log change foreign exporter prices*	(2) *Log change import quantities*	(3) *IHS change import quantities*	(4) *Log change import values*	(5) *IHS change import values*
Panel A					
$\Delta \ln(1 + \text{Tariff}_{\text{it}})$	0.336	-2.916^{***}	-4.758^{***}	-3.558^{***}	-5.241^{***}
	(0.202)	(0.374)	(0.811)	(0.457)	(0.864)
Observations	98 249	118 586	144 278	153 772	177 433
R^2	0.074	0.111	0.100	0.090	0.083
Panel B					
$-\Delta \ln(1 + \text{Tariff}_{\text{it}})$		1.418^{***}	1.464^{*}	1.964^{***}	2.971^{***}
		(0.348)	(0.815)	(0.383)	(0.781)
Observations		115 699	148 348	154 575	184 272
R^2		0.120	0.213	0.095	0.217

Source: UN Comtrade.
Note: Data are at the CN2018 product level with a monthly frequency. Panel A is the period between June 2017 to June 2019, and Panel B is the period between December 2020 to December 2022. In Panel A, $\Delta \ln(1 + \text{Tariff}it)$ reflects tariff imposition; in Panel B, $-\Delta \ln(1 + \text{Tariff}it)$ reflects tariff suspension. EU Legislation 2018/886 Annex I tariffs were implemented on June 22, 2018, and suspended on January 1, 2022. IHS is the inverse of hyperbolic sine to handle zero-value trade data in t or *t-12*. Columns 1-3 exclude unit value ratios of t and $t - 12$ that are greater than 3 or less than 1/3. Standard errors in parentheses and are clustered at the CN2018 eight-digit level, noted *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4 Effect on EU Domestic Prices

4.1 Producer Prices

In the previous section, we show evidence that the EU's retaliatory tariffs did not result in lower prices charged by US exporters. In other words, European business and consumers bore the brunt of the tariff costs. Yet, we also found that the tariffed imports were small and that imports from the US in the tariffed categories declined after the tariffs were implemented. To see which of these offsetting forces had a stronger impact, we now conduct a formal passthrough analysis which maps the use of tariffed goods in each sector to a sector specific European price index. This analysis will provide quantitative insights on if and how the EU's tariff retaliation affected domestic prices. Since the retaliation had a roughly even split for tariffed goods between intermediate and final use, as detailed in Figure 2, our analysis estimates price effects borne by both consumers and producers separately.

Looking first to producers, we examine the passthrough of tariffs into the EU Producer's Price Index (PPI) which is classified according to the NACE Rev. 2 system and available at a quarterly frequency. Using data from the 2017 edition of the European Union's Full International and Global Accounts for Research in Input-Output Analysis (FIGARO) tables, we can observe how products—categorized according to the classification of products by activity (CPA)—are used by various NACE Rev. 2 industries as inputs for production. Most importantly, the FIGARO tables also provide an account of where these products were originally imported from.

We map the original list of tariffed CN codes and their associated tariff rates to the 64 CPA 2.1 product categories provided in the FIGARO tables. Using correspondence tables provided by the European Commission we are able to link the tariffed goods to CPA products at the six-digit level. As the product data in the FIGARO tables is aggregated to the CPA two-digit level we aggregate the tariff rates accordingly. To do this, we compute an average tariff rate for each two-digit category, weighted by the respective US import share for that six-digit product.[8]

Finally, for each PPI (NACE Rev. 2) industry, we compute a weighted average tariff rate as

$$\bar{T}_k = \sum_i \sum_j \omega_{ijk} \, \tau_{ij} \tag{4}$$

where

$$\omega_{ijk} = \frac{s_{ijk}}{\sum_i \sum_j s_{ijk}} \tag{5}$$

In these equations, s_{ijk} is the value of product i from country j used in sector k and τ_{ij} is the tariff rate corresponding to product i from country j which is assumed to be zero for all imported goods other than the tariffed ones from the US.

Producer price indices are not published by Eurostat for every sector and for many collection began only in 2021. Thus, to study price changes in the aftermath of the 2018 tariff implementation, we have to restrict our sample to 31 industries. Using this data, we estimate the following linear regression of the sector specific tariff rate $\bar{T}_k$ on changes in quarterly PPI, π_k, to assess the inflationary effect of the tariffs:

$$\pi_k = \alpha + \beta \, \bar{T}_k + \varepsilon \tag{6}$$

Since the tariffs were effective as of June 22, 2018, we look at changes in producer prices in the third quarter of 2018 and consider three different measures for PPI changes; quarter-over-quarter percent change, 4-quarter percent change and *excess* 4-quarter inflation. The excess inflation measure is adapted from Minton and Somale (2025) and computes the difference be-

[8] This ensures that that products where the EU does not import any goods from the US do not bias tariff rates downward. Also, to ensure that we are not artificially inflating the tariff rate for a given sector by including all tariffs that were in place as of 2018, we define our tariff rate as the additional duties levied in the 2018 EU tariff announcement. Computationally, this results in tariff rates of 0 percent for all products imported from countries that are not the United States.

tween the 4-quarter inflation in 2018:Q3 and the average 4-quarter inflation from 2000:Q1 to 2018:Q1. Our results displayed in Table 2 indicate no statistically significant relationship between higher 2018 tariff rates and increased producer prices. This finding is consistent across all inflation measures, including when we replicate our analysis but use 2018Q2 and 2018Q4 PPI data as benchmarks.

Table 2: 2018:Q3 Tariff Passthrough Regressions

	Dependent variable: 2018:Q3 Producer Price Index		
	(1) Q-o-Q Change	(2) 4-quarter change	(3) Excess 4-quarter inflation
Tariff Rate	−902.1	−4946.7	−7157.5
	(2304.0)	(10230.9)	(8661.7)
Observations	31	31	31
R^2	0.005	0.008	0.023
Adjusted R^2	−0.029	−0.026	−0.011

Note: Large coefficient estimates are driven by volatility in coke and refined petroleum products.
$^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$

Finding that the retaliation did not affect European producer prices is consistent with the design of the retaliation presented earlier. Recall that retaliatory tariffs were small and targeted sectors that were not overly reliant on US imports for production. As such, even if there was complete tariff passthrough as argued previously, there was no discernible transmission to EU domestic prices. Yet, given the limitations on PPI data, we cannot categorically conclude that PPI price effects were negligible and thus turn to investigate consumer prices next.

4.2 Consumer Prices

The EU's Harmonized Index of Consumer Prices (HICP) is categorized according to the Classification of Individual Consumption According to Purpose (COICOP) framework. We use correspondence tables provided by Cai and Vandyck (2020) to map the use of 63 CPA products into 36 COICOP inflation categories.[9]

Using data on imports provided in our FIGARO tables, we compute a weighted average tariff rate for each consumption category k given by

$$\bar{T}_k = \sum_i s_{ik}\, \omega_i^{US}\, \tau_i \tag{7}$$

where s_{ik} is the share of product i in category k, ω_i^{US} is the share of US imports in product i

[9] See Cai and Rueda-Cantuche (2018) for details on the generation of this correspondence.

and τ_i is the product specific tariff rate. Stated simply, this COICOP specific tariff considers both how much each product factors into a given category but also how much of that product is imported from the United States. We then use these tariff rates to estimate

$$\pi_k^{\text{excess}} = \alpha + \beta\, \bar{T}_k + \varepsilon \tag{8}$$

where, again as in Minton and Somale (2025), $\pi_k^{\textbf{excess}}$ are HICP category specific differences between average 3-month inflation from 2000 to 2017 and the 3-month inflation rate following tariff implementation. Table 3 reports our findings. Columns 1-3 estimate excess inflation at 3 different monthly horizons after implementation. Consistent with our analysis for producer prices, we find no discernible effect of tariffs on consumer prices as all coefficients are not statistically significant. Again, this finding is consistent with our analysis of the tariff package which found that it was small and extremely targeted. It is also worth noting that we are only required to drop 2 out of 36 HICP categories due to data limitations.

Table 3: Consumer Price Passthrough Regressions

	Dependent variable: Excess Inflation		
	(1) $\pi_{t+1}^{\text{excess}}$	(2) $\pi_{t+2}^{\text{excess}}$	(3) $\pi_{t+3}^{\text{excess}}$
Tariff Rate	-12.5	9.20	19.88
	(14.5)	(16.24)	(23.54)
Observations	34	34	34
R^2	0.023	0.010	0.022
Adjusted R^2	-0.008	-0.021	-0.009

Note: The subscript $t+i$ corresponds to the 3 month excess inflation in the months following tariff implementation, where $t+1$ denotes September.
*p < 0.1; **p < 0.05; ***p < 0.01

5 Conclusion

A growing body of literature studies the effect of US tariffs and potential foreign retaliation on the US economy. However, retaliatory tariff strategies can take many shapes, which may not just reflect tit-for-tat tariff increases, and little is known about the effects of tariff retaliation on the retaliator. This stands at odds with the increasingly relevant role of retaliation in a less multilateral trade order.

Our paper studies the domestic effects of tariff retaliation by a group of large advanced economies, the EU, that publishes high-quality data on import quantities and prices as well as producer and consumer prices. We find that the EU's retaliation against US tariffs in 2018 was minor in scope and highly diversified. Its design targeted intermediate and final goods in about equal proportions and focused on goods which EU importers could easily obtain from non-US suppliers, leveraging that the EU only increased tariffs on one of its many trading partners.

The EU's retaliatory tariffs had an asymmetric and lasting effect on the US shares in EU imports in most of the tariffed categories. These shares decreased notably in the wake of the tariffs and did not recover after the retaliatory tariffs they were lifted but left scars in US-EU trade relations. Moreover, even though the tariffs costs were rapidly and fully passed through to European importers, we do not find evidence that they led to upward pressure on domestic producer or consumer prices, reflecting the small size of the retaliation, as well as its careful targeting and the rapid substitution to non-US suppliers.

References

AMITI, M., S. J. REDDING, AND D. E. WEINSTEIN (2019): "The Impact of the 2018 Tariffs on Prices and Welfare," *Journal of Economic Perspectives*, 33(4), 187–210.

ANDERSSON, S. (2019): "The Price, Quantity, and Welfare Impacts on the EU Following Increased Import Tariffs," Master thesis, Lund University.

ANTRÀS, P., T. C. FORT, A. GUTIÉRREZ, AND F. TINTELNOT (2024): "Trade Policy and Global Sourcing: An Efficiency Rationale for Tariff Escalation," *Journal of Political Economy Macroeconomics*.

BOWN, C. P., E. JUNG, AND Z. LU (2018): "Harley is a tariff trend setter–but not in a good way," Policy brief, Peterson Institute for International Economics.

BRAML, M. (2020): "Beggar-thy-Neighbor or Favor thy Industry? An Empirical Review of Transatlantic Tariff Retaliation," ifo Working Paper Series 326, ifo Institute.

CAI, M., AND J. M. RUEDA-CANTUCHE (2018): "Bridging macroeconomic data between statistical classifications: the count-seed RAS approach," *Economic Systems Research*, 31(3), 382–403.

CAI, M., AND T. VANDYCK (2020): "Bridging between economy-wide activity and household-level consumption data: Matrices for European countries," *Data in Brief*, 30, 105395.

CARTER, C. A., AND S. STEINBACH (2020): "The Impact of Retaliatory Tariffs on Agricultural and Food Trade," Working Paper 27147, National Bureau of Economic Research.

CAVALLO, A., G. GOPINATH, B. NEIMAN, AND J. TANG (2021): "Tariff Pass-Through at the Border and at the Store: Evidence from US Trade Policy," *American Economic Review*, 111(8), 2701–33.

CHOR, D., AND B. LI (2024): "Illuminating the effects of the US-China tariff war on China's economy," *Journal of International Economics*, 147, 103852.

EUROPEAN COMMISSION (2018a): "Commission Implementing Regulation (EU) 2018/886 of 20 June 2018 on certain commercial policy measures concerning certain products originating in the United States of America," Official Journal of the European Union.

——— (2018b): "EU adopts rebalancing measures in reaction to US steel and aluminium tariffs," Press Release.

——— (2021a): "Commission Implementing Regulation (EU) 2021/2083 of 26 November 2021 on suspending commercial policy measures concerning certain products originating in the United States of America imposed by Implementing Regulations (EU) 2018/886 and (EU) No 2020/502," Official Journal of the European Union.

——— (2021b): "Joint EU-US Statement on a Global Arrangement on Sustainable Steel and Aluminium," Joint Statement/Press Release.

FAJGELBAUM, P. D., P. K. GOLDBERG, P. J. KENNEDY, AND A. K. KHANDELWAL (2020): "The Return to Protectionism," *The Quarterly Journal of Economics*, 135(1), 1–55.

FETZER, T., AND C. SCHWARZ (2021): "Tariffs and Politics: Evidence from Trump's Trade Wars," *The Economic Journal*, 131(636), 1717–1741.

FLAAEN, A., A. HORTAÇSU, AND F. TINTELNOT (2020): "The Production Relocation and Price Effects of US Trade Policy: The Case of Washing Machines," *American Economic Review*, 110(7), 2103–27.

FLAAEN, A., AND J. PIERCE (2024): "Disentangling the Effects of the 2018–2019 Tariffs on a Globally Connected U.S. Manufacturing Sector," *The Review of Economics and Statistics*.

FLECK, J., AND A. PRADHAN (2026): "The Distributional Effects of the US-EU Trade War," Working Paper.

GNOCATO, N., V. GUNNELLA, C. MONTES-GALDON, T. SCHULER, AND G. STAMATO (2025): "Tariffs across the supply chain," Policy insight, VoxEU.org.

GOPINATH, G., AND B. NEIMAN (2026): "The Incidence of Tariffs: Rates and Reality," Working Paper 34620, National Bureau of Economic Research.

GRANT, J. H., S. ARITA, C. EMLINGER, R. JOHANSSON, AND C. XIE (2021): "Agricultural exports and retaliatory trade actions: An empirical assessment of the 2018/2019 trade conflict," *Applied Economic Perspectives and Policy*, 43(2), 619–640.

KHAN, H., A. ZULFIQAR, AND Q. CHUNJIE (2025): "Economic, Institutional, and Strategic Effects of Tariff Wars: Systematic Literature Review," *Journal of Economic Surveys*.

LI, M., E. J. BALISTRERI, AND W. ZHANG (2020): "The U.S.–China trade war: Tariff data and general equilibrium analysis," *Journal of Asian Economics*, 69, 101216.

MINTON, R., AND M. SOMALE (2025): "Detecting Tariff Effects on Consumer Prices in Real Time," Feds notes, Board of Governors of the Federal Reserve System.

MORGAN, S., S. ARITA, J. BECKMAN, S. AHSAN, D. RUSSELL, P. JARRELL, AND B. KENNER (2022): "The Economic Impacts of Retaliatory Tariffs on U.S. Agriculture," Economic Research Report 304, U.S. Department of Agriculture, Economic Research Service.

WORLD BANK (2024): "Tariff rate, applied, weighted mean, all products (percent)," World Integrated Trade Solution (WITS), Accessed: 2025-11-21.

Supplemental Appendix

Supplemental appendix to "The Design and Effect of Tariff Retaliation: Evidence from the EU" (Fisgin, Fleck and Richards, 2026)

A Other EU-US Tariff Retaliation Episodes between 2018 and 2022

In addition to the 2018 retaliation episode we study in this paper, the EU also implemented retaliatory tariffs against US imports on two other occasions, in May and November 2020. Importantly, all of these additional tariffs applied to products other than those included in the 2018 episode. While the retaliation in May 2020 was related to the 2018 retaliation in the sense that it was in response to US tariffs on steel and aluminum derivatives, it was much smaller in magnitude and applied to different products which than those targeted in the 2019 retaliation. Figure A1 provides a timeline and illustrates the relative magnitudes of the different retaliation episodes while the next two paragraphs summarize the implementation and design details.

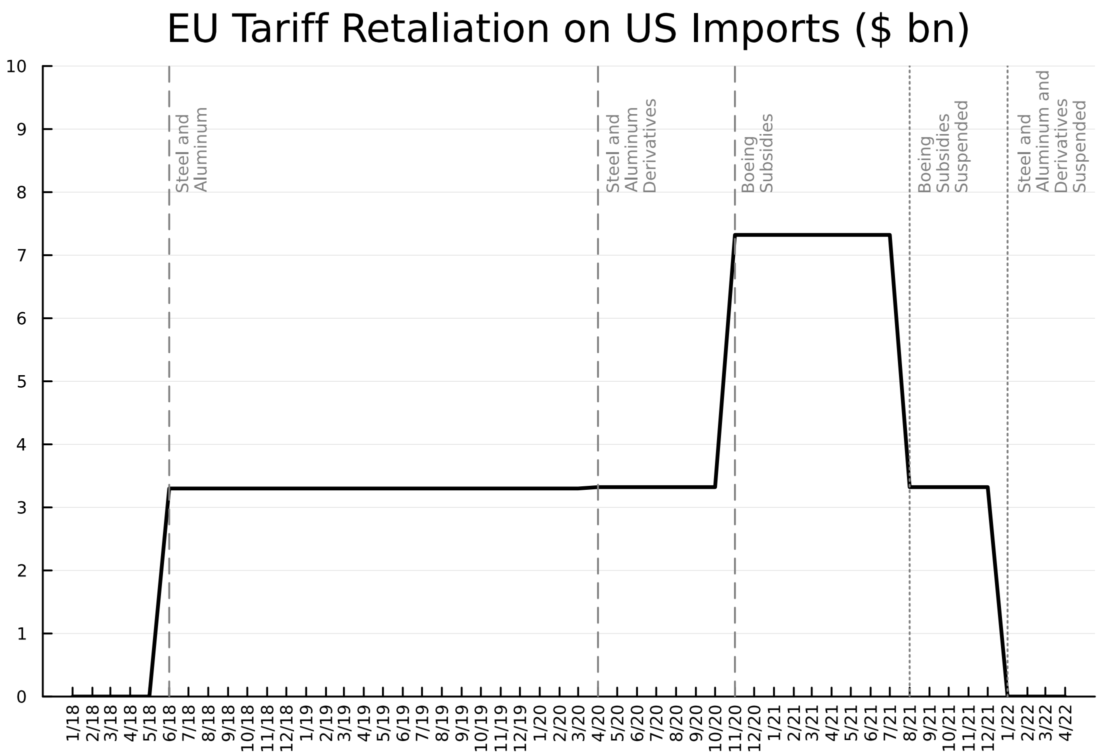

Figure A1: *Episodes of EU tariff retaliation against US imports between 2018 and 2022. Imports subject to retaliatory tariffs are measured in current bn USD. Compiled from information provided in European Commission (2018a,b, 2020b,a, 2021b,c).*

On April 7, 2020, the EU responded to US tariffs on derivative steel and aluminum imports from the EU with regulation European Commission (2020c). This regulation applied tariffs on three US import products in two annexes. The first applied 20 percent and 7 percent on lighters and plastic fittings from May 8, 2020, worth about $21.7 mio. The second applied 4.4 percent on imported plastic fittings from February 8, 2023, worth about $21.3 mio. Together, these two sets of tariffs amounted to about $43 mio worth of US imports, mirroring the target of the US tariffs, as required by WTO provisions. Like the 2018 Annex 1 tariffs, the first set of these additional tariffs first were suspended indefinitely from January 1, 2022. The second set had not yet been implemented and was equally suspended. See European Commission (2021b).

Second, on November 10, 2020, as part of the WTO dispute regarding US subsidies to Boeing, the EU implemented additional tariff measures, unrelated to the US steel and aluminum tariffs. See European Commission (2020b) and European Commission (2020a). Again, they were published in two annexes and Annex 1 listed tariffs of 15 percent on "Aeroplanes and other aircraft" while Annex 2 applied 25 percent to accessories, agricultural and manufactured products as well as agricultural utility vehicles and leisure items. Together, they were applying to imports worth about $4bn. They were suspended from July 9, 2021, for a period of five years, following a joint US-EU statement of understanding on a cooperative framework for large civil aircraft disputes. See European Commission (2021a).

B Additional results on the design of the EU's 2018 tariff retaliation package

In Figure B1, we provide a breakdown of the tariffed products by BEC category which goes beyond intermediate, final, and capital/investment goods.

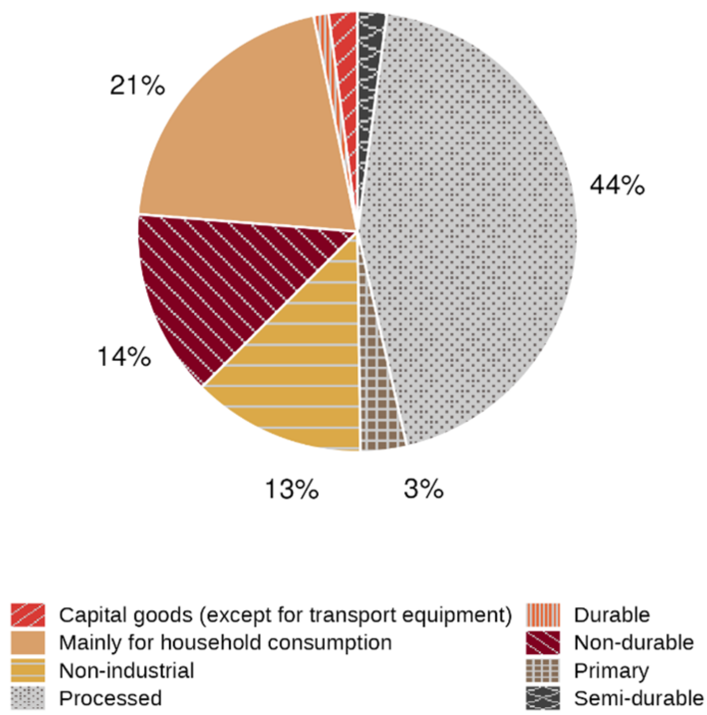

Figure B1: *Breakdown of the EU's 2018 Annex 1 tariffs on U.S. imports using 2017 trade values as classified under Broad Economic Categories (BEC). Data source: UN Comtrade.*

C Additional results on the effect of the EU's 2018 tariff retaliation on imports

Figure C1 shows the change in total import values of tariffed goods following the imposition of the EU's retaliation in June 2018. Two months prior to the imposition of the tariffs, there appears to be a spike in imports, potentially indicating tariff "front-running" by EU importers. However, given the historical volatility of the series, the evidence is limited. In contrast, year-over-year growth in total import values in the twelve months following the imposition of retaliatory tariffs was less than half of that seen in the month prior. By contrast, unaffected products and partners remained relatively steady, highlighting the impact of retaliation in shifting imports away from tariffed US products.

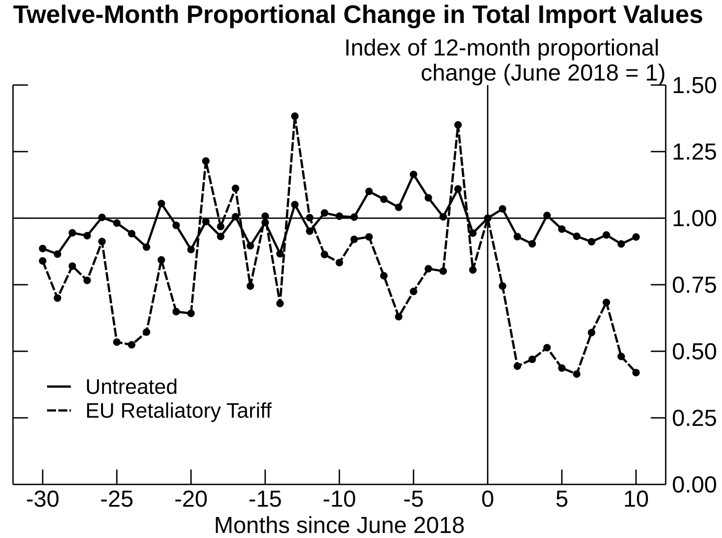

Figure C1: *"Untreated" includes all goods and countries that do not face retaliatory tariffs. June 2018 is set as month 0 as tariffs were effective on June 22, 2018, i.e. after the middle of the month. Data for the change in import prices is the geometric mean of the 12-month tariff-inclusive unit value relatives, weighted by the logarithmic mean of their import shares by value. In the left panel, prices are normalized so that so a zero is a price change that equals its value before the tariffs were implemented. In the right panel, import values are normalized to one in month zero so the import values are relative to imports in the last month before the tariffs were implemented. Petroleum products (HS chapters 2709-2715) are removed. Source: UN Comtrade.*

References

EUROPEAN COMMISSION (2018a): "Commission Implementing Regulation (EU) 2018/886 of 20 June 2018 on certain commercial policy measures concerning certain products originating in the United States of America," Official Journal of the European Union.

——— (2018b): "EU adopts rebalancing measures in reaction to US steel and aluminium tariffs," Press Release.

——— (2020a): "Boeing WTO case: The EU puts in place countermeasures against U.S. exports," Press Release.

——— (2020b): "Commission Implementing Regulation (EU) 2020/1646 of 7 November 2020 on commercial policy measures concerning certain products from the United States of America following the adjudication of a trade dispute under the Dispute Settlement Understanding of the World Trade Organization," Official Journal of the European Union.

——— (2020c): "Commission Implementing Regulation (EU) 2020/502 of 6 April 2020 on certain commercial policy measures concerning certain products originating in the United States of America," Official Journal of the European Union.

——— (2021a): "Commission implementing Regulation (EU) 2021/1123 of 8 July 2021 suspending commercial policy measures concerning certain products from the United States of America imposed by Implementing Regulation (EU) 2020/1646 following the adjudication of a trade dispute under the Dispute Settlement Understanding of the World Trade Organization," Official Journal of the European Union.

——— (2021b): "Commission Implementing Regulation (EU) 2021/2083 of 26 November 2021 on suspending commercial policy measures concerning certain products originating in the United States of America imposed by Implementing Regulations (EU) 2018/886 and (EU) No 2020/502," Official Journal of the European Union.

——— (2021c): "Joint EU-US Statement on a Global Arrangement on Sustainable Steel and Aluminium," Joint Statement/Press Release.