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

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Abstract

We show that the EU's 2018 retaliation against US steel and aluminum tariffs was small and primarily targeted goods with low US import dependence. The retaliation had two complementary outcomes: First, for the majority of tariffed goods, the US import share declined notably and remained below pre-2018 levels even after the retaliatory tariffs were lifted, reflecting asymmetric and permanent effects of tariffs on trade diversion. Second, although the retaliatory tariffs were instantly and fully passed through to EU importers, they had no inflationary effects, not even in EU economies with the highest exposures.

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

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

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1 Introduction

The foreign response to recent US trade policy changes emphasizes that tariff retaliation is an inextricable element of a less multilateral and more protectionist global trade order. While most of the latest retaliatory threats against the US have been suspended following bilateral trade deals, these truces are often incomplete and fragile as US commitments are subject to legal challenges and fast-paced political developments. Thus, the risk of foreign tariff retaliation remains exceptionally high.

Despite the growing relevance of tariff retaliation in the current trade landscape, there is only scant evidence regarding its impact on the retaliating economies. While there is a burgeoning literature studying the effects of US tariffs on the domestic economy, its findings cannot be generalized to the foreign effect of retaliatory tariffs. First, the design of retaliatory tariffs differs profoundly from US tariffs. Second, most economies depend more strongly on international trade than the US. Thus, understanding the effects of retaliation on the retaliator necessarily requires examining particular retaliatory episodes and foreign data.

Our paper closes this gap in the literature by assessing the trade destruction and inflationary effect of the EU's 2018 retaliation against US steel and aluminum tariffs. Between June 2018 and January 2022, the EU applied 10 and 25 percent ad-valorem duties on US imports which equaled about $3.3bn in 2017. Tariffed products ranged 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.

Our key findings are: First, the EU's import values of tariffed products fell by about half from the second month after the tariffs were implemented and did not recover fully after the retaliatory tariffs were suspended. Indeed, our estimate for the import demand elasticity of tariff implementation is about twice as large as that of tariff suspension. As a result of these asymmetric effects, the retaliation left permanent scars in US-EU trade flows.

Second, US exporters did not lower their pre-tariff prices to absorb 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 pass-through evidence for recent US tariffs[1] but emphasizes that, even when tariffs target comparably small import values and a large variety of products, they are still associated with high pass-through.

However, despite their immediate passthrough, we find that the retaliatory tariffs did not lead to inflationary pressures in the EU. To arrive at this conclusion, we develop concordances between classification schemes of European trade and price data and construct granular measures of tariff exposure for EU price indices, including country-consumer category specific exposures. When then regress measures of producer and consumer excess inflation on these exposures on and also conduct an investigation using a difference-in-difference approach.

Two particular features of the EU's tariff retaliation explain its effect. First, the retaliation was asymmetric to the triggering US tariffs as it did not exclusively tariff steel and aluminum imports but distributed tariff costs over a large number of different import products. Most of these had low US import dependence, enabling EU importers to quickly and efficiently source tariffed products from non-US suppliers.

Second, it was moderate in size, applying to only 1.5 percent of all US goods imports to the EU. Based on 2017 import figures and abstracting from any substitutions or import price reductions, the cumulative tariff cost would have amounted to approximately \$2.5bn during the 3.5 years in which the retaliation was active – compared to about \$7trn in total EU imports. Moreover, due to the rapid and sustained decline of tariffed imports, *realized* tariff costs were even smaller and added up to just about \$1.4bn. Accordingly, when computing the hypothetical inflationary effect of the tariffs on the most exposed consumer products in the EU, we find a maximum impact of only 0.02 percentage points on their aggregate price index. In other words, the tariff retaliation was too small to noticeably drive up domestic prices.

Our findings contribute a new perspective to the literature on the 2018-2020 and the ongoing

[1] See, for example, Amiti, Redding, and Weinstein (2019), Fajgelbaum, Goldberg, Kennedy, and Khandelwal (2020), Cavallo, Gopinath, Neiman, and Tang (2021) and Gopinath and Neiman (2026).

2025 trade wars. Most of this literature focuses 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). Those papers which study foreign effects typically investigate how the US-China trade war of 2018/19 re-configured global trade relationships and directed trade flows to third countries, for example Fajgelbaum, Goldberg, Kennedy, Khandelwal, and Taglioni (2024) and Iyoha, Malesky, Wen, and Wu (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 we shift the focus away from the US and present trade disruptive and domestic inflationary consequences of a particular retaliation against US tariffs. For this "self-harm" effect, there is currently only little and narrow evidence, especially for the EU. For China, Chor and Li (2024) and Li, Balistreri, and Zhang (2020), provide estimates on how retaliation against US tariffs in 2018/2019 reduced domestic activity and increased production costs. For the EU, the few available studies, such as Fetzer and Schwarz (2021) and Braml (2020) focus on the political motives behind the design of the 2018 tariff retaliation while Bown, Jung, and Lu (2018) and Andersson (2019) provide stylized descriptions of its composition.[2] In contrast, our paper provides a rigorous and comprehensive empirical analysis of the trade diversion and inflationary effects of this retaliation. Finally, we contribute a methodology to construct tariff exposures of EU price indices which can be used to assess the inflationary effects of other EU tariff retaliation packages.[3]

The remainder of this paper is organized as follows. Section 2 describes the timeline and design of the EU's 2018 tariff retaliation. Section 3 investigates the effect of the retaliation on the EU's import prices and quantities, including the effect of tariff suspension. Section 4 explains and applies our empirical strategy to estimate effects on EU producer and consumer prices. Section 5 concludes.

[2] These studies 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.

[3] Fleck and Pradhan (2026) study the inflationary and distributional impact of the EU's proposed retaliation against the 2025 US tariffs. Gnocato, Gunnella, Montes-Galdon, Schuler, and Stamato (2025) assess the domestic macroeconomic effects of hypothetical EU tariff retaliation schemes focusing on the intermediate versus final goods composition.

2 The EU's 2018 Tariff Retaliation: Timeline and Design

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 applied to about $7.5bn (€6.4bn at the time) worth of imports from the EU based on 2017 trade data, according to EU Regulation 2018/724. 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 as had the same target value as the US tariffs and mirrored the US tariff rates.

We focus on the Annex 1 tariffs to study the design and effect of tariff retaliation. They took effect on June 22, 2018 and included tariffs of 10 and 25 percent on 182 products imported from the US.[4] The EU suspended them after about 3.5 years, on January 1, 2022, following a joint EU-US statement in October 2021 which included a commitment to relinquishing the steel and aluminum tariffs as well as the retaliation.[5]

Four features of the retaliatory tariffs are critical to contextualize their effects on EU trade flows and domestic inflation. First, they only applied to imports valued about $3.3bn (€2.8bn) in 2017 and the EU expected to collect just about $0.7bn in tariff duties, per annum.[6] Hence, relative to EU total imports and even relative to EU imports from the US, the share of imports affected by the retaliatory tariffs was very small; 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, in 2017 trade values. Thus, the retaliatory tariffs had a negligible effect on the EU's overall import costs and its realized effective tariff rate.[7]

Second, the EU's retaliatory tariffs were asymmetric to the US steel and aluminum tariffs as they focused on a larger set of products. Figure 1a) shows that only 31.5 percent of the value of tariffed US imports included aluminum and steel products. Final good categories like "Beverages, spirits, and vinegar", "Ships and boats", "Vehicles", and "Cereals" contributed about 37.2 percent and included high visibility imports such as Harley Davidson motorbikes and

[4]See EU Regulation 2018/886 and European Commission (2018c). The 10 percent tariff rate applied only to playing cards. 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, resulting in a total of 86 products.

[5]See EU Regulation 2021/2083 and European Commission (2021b). Appendix A provides additional details the Annex 2 tariffs as well as on other EU retaliation episodes against the US between 2018 and 2022.

[6]Computed from Eurostat data, see European Union (2018). When computed from Comtrade data, the import value is slightly lower ($3.0bn). See note under Figure A1.

[7]The right panel of Figure A1 in Appendix A shows that this rate remained at 1.38 percent.

Bourbon whiskey. Moreover, comparing the number of individual products tariffed within categories also reveals that the set of these final goods had a disproportionally smaller number of products relative to its overall import value. Thus, the retaliatory tariffs were designed to target a few final good products and were highly diversified within the steel and aluminum categories. This design points to the EU's intent to target a small number of "high-visibility" products to stir political pressure in the US, as discussed by, for example, Fetzer and Schwarz (2021).

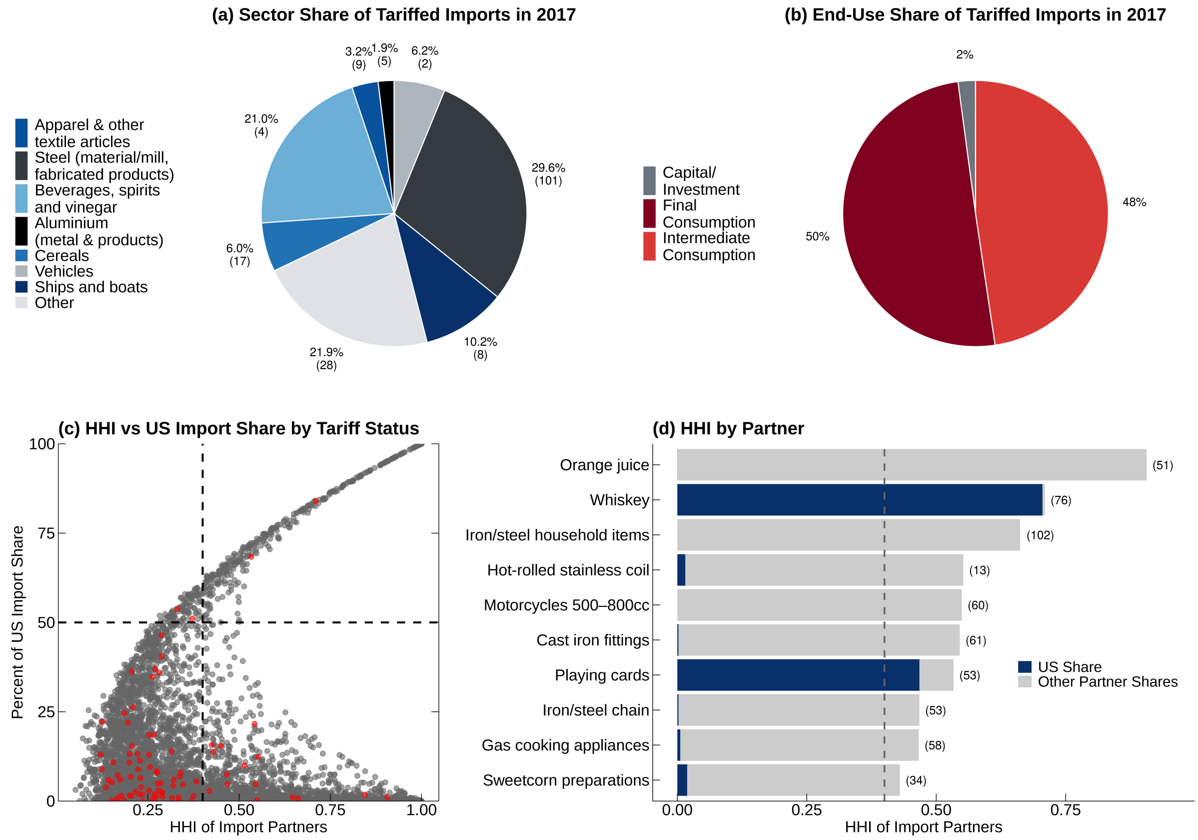

Figure 1: *EU 2018 Annex 1 retaliatory tariffs on US imports, 2017 trade values. (a) Breakdown by HS2 chapter (eight-digit CN level); numbers in parentheses indicate product count per chapter. (b) Breakdown by Broad Economic Categories (BEC). (c) Herfindahl-Hirschman Index (HHI) versus US import share at six-digit HS6 level; red dots denote tariffed products; dashed vertical line at HHI = 0.4 and dashed horizontal line at US import share = 50 percent represents the European Commission's thresholds for high import-partner concentration. (d) Top ten tariffed distinct products ranked by import-partner concentration (HHI) at six-digit HS6 level; numbers in parentheses indicate total import partners per HS6 subheading; dashed vertical line at HHI = 0.4 represents the European Commission's threshold for high import-partner concentration.*

Third, the value of final or processed products targeted by the retaliatory tariffs was about the same as that of raw or intermediate products, as shown by Figure 1b).[8] Thus, the share of

[8]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).

products typically used for final consumption was almost identical to that of products typically used as inputs for production. This breakdown contrasts sharply with the US tariffs, which exclusively applied to intermediate products (steel and aluminum) and emphasizes that the design of the retaliatory tariffs was chosen to minimize supply chain disruptions for European companies, to avoid putting pressure on input prices of domestic downstream industries 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 suppliers.

Finally, except for two products, the EU's retaliatory tariffs applied to US imports with low import dependence. We arrive at this finding by measuring import-partner concentration for tariffed products at the HS6 subheading level using the Herfindahl–Hirschman Index (HHI). This index shows how concentrated import sourcing is across trading partners within each product group. While it does not directly capture substitutability across suppliers, it is informative about the extent to which imports are sourced from a narrow versus diversified set of partners. When imports are concentrated in a narrow set, replacing a tariffed product is likely to be more difficult in the short run.

For each HS6 subheading i the HHI concentration index is

$$HHI_i = \sum_p s_{i,p}^2 \qquad 0 < HHI_i \leq 1. \tag{1}$$

where $s_{i,p}$ is partner p's share of EU imports within the tariffed products of the HS6 code. Higher values of this index indicate that imports are sourced from a small number of partners, while lower values reflect a more diversified supplier base.

Concentration can be high even when partner count is high. This is the case when one or a few suppliers make up for a majority of imports while many others contribute small shares. Hence, in order to identify US import dependence, both HHI and US import share need to be considered. Figure 1c) shows both dimensions for all EU import categories, tariffed (red dots) and non-tariffed (gray dots). The dashed vertical line indicates an HHI value of 0.4, while the dashed horizontal line indicates a US import share of 50 percent. These are the thresholds which the European Commission uses to establish import dependence as a "strategic vulnerability".[9] Only 59 products of the 180 that were tariffed (and traded in 2017) had an HHI value above the threshold. Moreover, just two categories had simultaneously high HHIs and high US

[9] See European Commission (2021c).

import shares, meaning that the vast majority of tariffed products were not at risk of supply chain disruptions due to reliance on US exporters.

In Figure 1d) we show ten select tariffed products which are from differentiated HS4 categories and have high HHI values, with the US import share in blue shading. "Whiskey" and "Playing cards" are the two categories in the upper-right quadrant of Figure 1c). While they had outstandingly large US import shares, they still had 75 and 53 non-US suppliers. Thus, the EU's retaliation only featured significant import dependence on two goods which had no implications for European downstream industries and could be substituted by imports from non-US suppliers.

In summary, the EU's 2018 retaliatory tariffs were designed to result in minor disruptions to domestic consumers and producers as the tariffs balanced final and intermediate products. This design is consistent with the 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, most targeted products had low US import dependence and instances where reliance on a dominant US supplier was high were 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 EU Import Prices and Quantities

To investigate how the retaliatory tariffs affected the EU's import prices, we 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 2 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 higher after the tariff implementation.

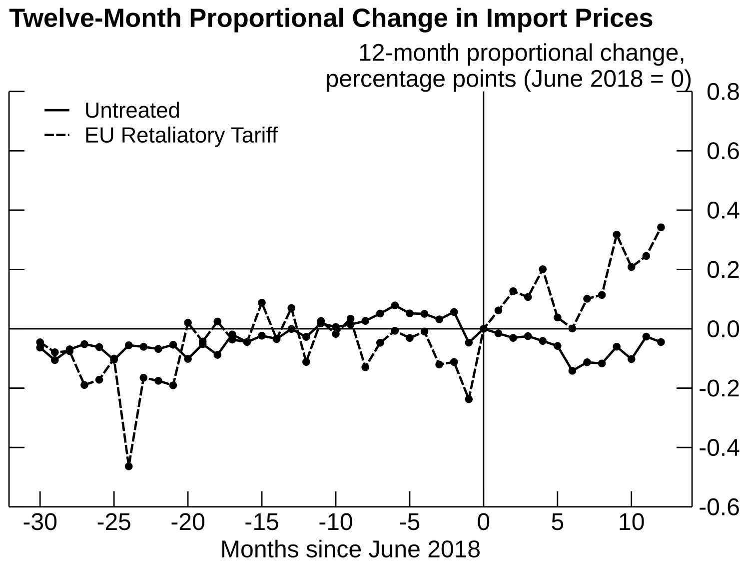

Figure 2: *"Untreated" includes all goods and countries that do not face retaliatory tariffs. June 2018 is set as month 0 as tariffs were effective on June 22, 2018, i.e. after the middle of the month. Data for the change in import prices is the geometric mean of the 12-month tariff-inclusive unit value 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 rigorously quantify the effects of the EU's retaliation on imports and prices, we now formally investigate 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 were implemented. 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 may lead to changes in trade quantities and values, such as movements in the exchange rate.[10]

The first column of Table 1 shows the result of regressing the change in foreign exporter prices

[10]Our approach is similar to Amiti, Redding, and Weinstein (2019) but uses a much longer time window before and after the tariff implementation as we have data for the entire period during which the retaliatory tariffs were active (about 3.5 years). Including many months of data before and after tariff implementation allows us to capture anticipatory or delayed price effects. Finally, while the recent US tariffs feature time-varying enforcement and numerous exemptions, as documented by Gopinath and Neiman (2026), Eck, Hoang, Mix, and Ray (2026) and others, this did not apply to the EU's 2018 retaliatory tariffs. Thus, there is no meaningful difference between statutory (announced) and realized tariff rates.

on product specific tariff rates. The estimated impact of tariffs on unit values is 0.163, which is statistically insignificant, and suggests that tariff retaliation had no discernible impact on prices received by foreign exporters. Thus, it confirms the visual evidence shown in Figure 2 which pointed to substantial tariff pass through to prices paid by EU importers. This finding is consistent with estimates on the passthrough of the large and universal tariffs introduced by the US in 2025, as documented Gopinath and Neiman (2026) and others. Thus, a key finding of our analysis is that large pass through also affects tariffs targeting a small import share and products with low import dependence.

Regarding the effect of the tariffs on US imports, Figure C1 in Appendix C shows the evolution of EU imports between 2010 and 2024 for each of the product categories shown in Figure 1a). For most categories, US import shares fell notably and persistently after 2017. While import *values* from all partners of most categories decreased during the first two years following the tariff implementation — 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 depressed, even after the suspension of the retaliatory tariffs on January 1, 2022. Thus, the retaliatory tariffs appear to have resulted in lasting trade diversion as European importers substituted away from tariffed US imports and sourced them from non-US suppliers.[11]

To substantiate this evidence, columns 2 to 5 in panel A of Table 1 present estimates for the import demand elasticity of tariffed US imports in quantities and values in the wake of the EU's retaliatory tariffs, i.e. for the period from June 2017 to June 2019. Panel B spans December 2020 to December 2022, showing import demand elasticity estimates following the suspension of these tariffs on January 1, 2022.

Panel A confirms that the introduction of the EU's retaliatory tariffs in June 2018 led to notable declines in US imports. In column 2, we regress changes in import quantities on changes in tariffs 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 2.92 percent. In column 3, we run the same regression but apply an inverse hyperbolic sine (IHS) transformation to import quantities of zeros instead of dropping them. The estimate of 4.76 percent is within the typical range of trade elasticity estimates but is slightly below the analogous estimate reported by Amiti, Redding, and Weinstein (2019) for the US tariffs against

[11]Figure C2 in Appendix C shows the change in total import values of tariffed and non-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 tariffed import values had fallen by about half relative to before June 2018.

Table 1: Effect of Retaliatory Tariffs on US Imports

	(1)	(2)	(3)	(4)	(5)
	Log change foreign exporter prices	*Log change import quantities*	*IHS change import quantities*	*Log change import values*	*IHS change import values*
Panel A					
$\Delta \ln(1 + \text{Tariff}_{\text{it}})$	0.163	-2.916^{***}	-4.758^{***}	-3.558^{***}	-5.241^{***}
	(0.192)	(0.374)	(0.811)	(0.457)	(0.864)
Observations	132 895	118 586	144 278	153 772	177 433
R^2	0.058	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 Regulation 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 *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

China in 2018.

In columns 4 and 5, we replace import quantities with import values. The resulting estimates suggest that import values fell by about 3.56 or 5.24 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's retaliation reduced tariffed US imports by a sizable magnitude.

Table 1 also 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 shown in Panel A demonstrate that EU importers substituted away from US goods as the EU's tariffs became active, Panel B shows how they responded to the suspension of the tariffs. While all Panel B estimates have the opposite signs of their corresponding Panel A estimates, all are notably smaller, providing clear evidence of only partial recovery of tariffed US imports to the EU. This finding indicates that tariff removal failed to reverse the full extent of the initial trade destruction. In other words, the EU's temporary retaliatory tariffs left scarring effects in US-EU trade flows. A plausible mechanism explaining this finding is that irreversible costs involved in supply-chain reconfiguration made EU importers maintain their newly-established import relationship with non-US suppliers even after prices of US import products fell.

This scarring effect of the EU's 2018 retaliatory tariffs is consistent with other findings on the effect of foreign tariff retaliation in 2018. 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 US import shares in the EU have not recovered even about four years after the EU suspended its retaliation.

Finally, recall that steel and aluminum made up roughly half of the value of goods hit by the EU's retaliation. Steel and aluminum also faced the US Section 232 tariffs which triggered the retaliation in the first place. These tariffs acted to reduce US imports of steel and aluminum, resulting in excess global supply, putting downward pressure on EU prices, and making it easier for EU importers to turn to non-US suppliers once the retaliatory tariffs took effect. In other words, the two-sided nature of the tariffs on steel and aluminum might amplify the measured import response relative to the rest of the tariffed products.

To investigate this hypothesis, we repeat the estimation using a split-sample specification. The results are reported in Tables C1 and C2 in Appendix C. The import demand elasticity estimate for steel and aluminum is larger (in absolute values) than that for the remaining tariffed goods (-3.05, compared with -2.21). The elasticity estimates using import value and IHS specifications are consistent with this pattern. These estimates confirm that steel and aluminum imports from the US collapsed more sharply than other retaliated products, consistent with the idea that EU importers found it particularly easy to substitute toward non-US suppliers.

The estimated import demand elasticity in response to tariff suspension for steel and aluminum is 1.37 using import quantities, and 1.47 using import values, while the IHS transformed estimates are somewhat larger. All these estimates indicate that EU imports of US steel and aluminum recovered after the suspension of the tariffs. However, the import surge was insufficient to compensate for the earlier import collapse due to the implementation of the tariffs.

This pattern is different for other tariffed products, as shown in Table C2. The import demand elasticity estimates for tariff suspension are also smaller than those for tariff implementation. However, the tariff suspension elasticity estimates using import quantities are statistically insignificant and those estimates using import values are significant only at the 10 percent level. Thus, these estimates indicate that tariff suspension failed to re-vitalize US imports in tariffed categories other than steel and aluminum.

Accordingly, most of the asymmetric trade response we report for all tariffed products in Table 1 is driven by steel and aluminum products. Their import elasticity estimates are precise enough to confirm that imports recovered, albeit not to pre-retaliation levels. For other tariffed products, our findings document that tariffs reduced imports but they only provide suggestive evidence for import recovery after tariff suspension. This finding is consistent with the view that the underlying trade deflection channel did not reverse when the retaliation was suspended, as EU imports had been reconfigured toward alternative suppliers during the retaliation window, and US exporters were unable to reclaim their former share.

4 Effect on EU Domestic Prices

In the previous section, we showed that the EU's retaliatory tariffs were not absorbed by US exporters so European businesses and consumers bore the tariff costs. Yet, we also found that tariff costs were negligibly small and that tariffed imports from the US declined notably after the retaliation was implemented. Which of these offsetting forces had a stronger impact on EU domestic prices? To answer this question from a quantitative perspective, we construct an exposure measure for EU price indices and conduct a formal difference-in-difference analysis where we compare the price evolution of low and high exposure products. Since the retaliation had a roughly even split for tariffed goods between intermediate and final use, we construct these exposure measures separately for producer and consumer price indices.

4.1 Constructing Tariff Exposure Measures for EU Price Indices

As mentioned earlier, there is a flourishing literature which uses a variety of data sources and methodological approaches to track the effect of tariffs on US domestic prices.[12] As there are no comparable studies for the EU, a key contribution of our paper is to develop and apply a methodology to construct tariff exposure measures of European domestic prices. In the following paragraphs, we provide a brief summary of our approach. Appendix D has additional details.

Producer Prices EU Producer Price Indices (PPI) are classified according to the NACE Rev. 2 system. Using 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,

[12] For example, Minton and Somale (2025) construct measures of the import share of PCE categories and multiply them by tariff rates while Cavallo, Llamas, and Vazquez (2025) match price data of US retailers to country-product tariff rates.

categorized according to the classification of products by activity (CPA), are used by each of the 31 NACE Rev. 2 industries as inputs for production. Importantly, the FIGARO tables also show which trading partner supplied these products to a given industry. As a first step, we map the list of tariffed CN codes and their associated tariff rates to the six-digit CPA product categories using correspondence tables provided by the European Commission. As the CPA product data in the FIGARO tables is aggregated to the CPA two-digit level, we aggregate the products and their tariff rates accordingly. To do this, we compute an average tariff rate, τ, for each two-digit CPA product, weighted by the respective US import shares of the subsumed six-digit CPA products.

Next, to construct a tariff exposure for each PPI NACE Rev. 2 industry, $\bar{T}_k$, we map the average tariff rates from two-digit CPA products to NACE industries as

$$\bar{T}_k = \sum_i \sum_j \omega_{ijk} \, \tau_{ij} \tag{2}$$

where

$$\omega_{ijk} = \frac{s_{ijk}}{\sum_i \sum_j s_{ijk}} \tag{3}$$

In these equations, ω_{ijk} represents the import weight, calculated as the value of two-digit CPA product i from country j used by industry k (s_{ijk}) as a share of total use. τ_{ij} is the tariff rate corresponding to product i from country j.[13]

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. To construct COICOP category specific tariff exposure measures, we start from the CPA two-digit product specific tariff rates, τ, which we computed above, and use the correspondence tables provided by Cai and Vandyck (2020). These map 63 out of 64 CPA products into 34 out of 36 two-digit COICOP categories. Thus, using data on import shares by country provided in the FIGARO tables, we compute a weighted average tariff exposure for each consumption category l given by

$$\bar{T}_l = \sum_i s_{il} \, \omega_i^{US} \, \tau_i^{US} \tag{4}$$

where s_{il} is the share of CPA two-digit product i in category l, ω_i^{US} is the share of US imports in product i and τ_i^{US} is the product specific tariff rate for the US. Stated simply, the COICOP

[13] We set tariff rates on all products that are not tariffed and imported from the US to zero.

specific tariff exposure measure $\bar{T}_l$ considers both how much each product factors into a given category and also how much of that product is imported from the US.

4.2 Estimating Price Effects

EU-level Price Effects Armed with these tariff exposure measures, we first study if the EU's retaliatory tariffs left noticeable traces in aggregate prices. For producer prices, we estimate the inflationary effect by regressing data for categories of European producer price indices (PPI) on the tariff exposure measure of each category. Put differently, we investigate if producer categories with high input values of tariffed US imports experienced higher price growth following the implementation of the tariffs. Yet, even though we consider a variety of different measures of PPI changes and search for effects in different time periods to capture any anticipatory or delayed effects, we do not find evidence that the retaliation increased PPI prints as all our estimates are statistically insignificant (see Appendix E.1). For aggregate consumer prices, we also find no evidence of a upward pressure on HICP prices attributable to tariffs (see Appendix E.2). Both findings are consistent with the design of the retaliation presented earlier – retaliatory tariffs were small and targeted products that were not overly reliant on US imports. However, this aggregate analysis is hampered by coarse aggregation as we can only study variation across 31 PPI and 34 COICOP categories and the small size of the sample results in low statistical precision of our estimates.

Country-Category Price Effects To overcome these data limitations, we turn to exploiting differences in EU *country*-category level exposures to tariffed US imports.[14] To construct category specific tariff exposure measures for all COICOP categories and all 27 EU member countries, we apply the approach shown in equation (4) to country-level data which provides us with a total of 913 country-category tariff exposures, $\bar{T}_{l,c}$.[15] Figure E1 in Appendix E.3 illustrates the distribution of the resulting country-category tariff exposures. Average exposure is small and indicates that the EU's aggregate consumer price index would have increased by 0.006 percentage points, under the assumption of full tariff pass through. Moreover, the majority of observations have exposures only marginally different from zero. To generate two groups of country-categories which differed meaningfully in tariff exposures, we stratify the sample into "high exposure" if a country-category exposure is in the upper quartile of the distribution and

[14] While the average share of US goods imports to the EU subject to tariffs was relatively low (1.5 percent), the within-EU country level exposure ranged from 0.45 percent (Austria) up to 24.85 percent (Malta), as shown in Table E5 in Appendix E.3.

[15] Not all of the COICOP category data are available for all countries.

into “low exposure” otherwise.[16]

Figure 3a) visualizes the evolution of inflation across the high and low exposure groups. It plots realized aggregate EU inflation between June 2017 and June 2019 (one year before and one year after tariffs implementation) for the high exposure (red) and low exposure (blue) groups, reconstructed from the weighted country-category HICP data. Both series are indexed to 100 in May 2018, just before the tariffs were implemented. The solid and dashed black lines are ”maximum” full-tariff-passthrough estimates for both groups which were constructed under the assumption that tariffs are instantaneously and fully passed through into consumer prices, that consumers do not substitute tariffed products and that prices of all non-tariffed products remain unaffected. Thus, these black lines represent upper bounds for the domestic price effects of the EU’s retaliatory tariffs for each group. As illustrated by these lines, the retaliatory tariffs had a small effect for both the high and low exposure groups, even under the assumption of full and immediate passthrough. They could have lifted the month-over-month growth rate of the price indices between June and July 2018 only by an additional 0.02 and 0.001 percentage points, respectively.

Finally, while Figure 3a) shows that prices of both groups grew in tandem before the implementation of the tariff retaliation, the price of the low exposure group fell notably about six months later. When investigating the underlying HICP category data, we find that this decline is primarily attributable to strong deflation in transportation and related categories, reflecting declining energy costs, unrelated to tariff policy and trade developments.[17]

To isolate the effect of the EU’s retaliatory tariffs on domestic prices from these and other confounding time, category and country specific effects, we estimate an event study framework:

$$\Delta \ln P_{ict} = \sum_{t \neq \text{June 2018}} \beta_t (High\ Exposure_{ic} \times \mathbb{I}(T = t)) + \delta_{it} + \gamma_{ct} + \epsilon_{ict} \tag{5}$$

where the left-hand side captures the log change in prices of category i in country c between months t and $t-1$. $\mathbb{I}(T = t)$ is an indicator function for each month t in the sample (June 2017 to June 2019), excluding the reference month June 2018. δ_{it} and γ_{ct} are category-month and country-month fixed effects which absorb all time-varying shocks specific to a country or a COICOP category. β_t identifies the differential price change in a specific country-category

[16] Table E6 in appendix E lists the high and low exposure categories by country and Table E7 provides key moments from the data. It shows that mean exposure in the “low exposure” group was only 0.001, i.e. effectively not different from zero.

[17] Oil prices fell more than 20 percent in November 2018.

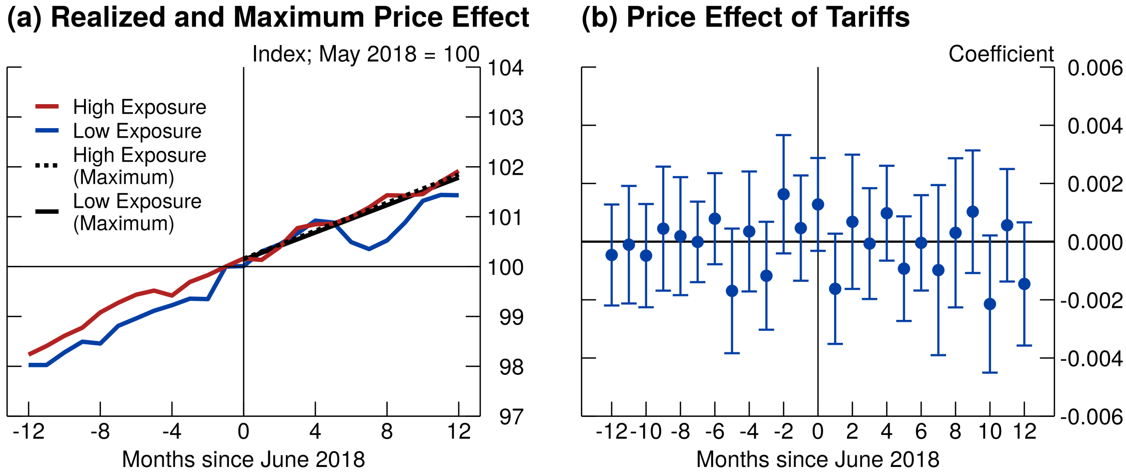

Figure 3: *(a): "Maximum" lines represent full and immediate tariff passthrough into HICP country-categories. They consist of a one-time increase in June 2018 by the group tariff exposure and the historical average monthly growth rate between January 2017 and May 2018 for June 2018 onward. "High Exposure" ("Low Exposure") refers to exposures above (below) the 75th percentile of the* $\bar{T}_{l,c}$ *distribution. All four lines are constructed using country-category specific HICP weights. (b): Estimates of* β_t *from equation (5). Standard error bars represent the 95 level of statistical significance.*

that was more exposed to US tariffs relative to less exposed country-categories, as captured by the $High\ Exposure_{ic}$ indicator. Thus, estimating β_t provides the conditional treatment effect of tariff exposure expressed as a percentage point increase in the price index of the high exposure country-category products relative to the low exposure ones.

Figure 3b) displays the results of estimating equation (5). In both pre- and post-treatment periods, we observe no discernible difference in the inflation rate between the two groups, as none of the β_t estimates are different from zero. While some of the estimates differ from zero at low levels of significance, their magnitudes are economically negligible. For example, the largest positive post-event estimate implies that the EU's retaliatory tariffs resulted in a price increase of 0.001 percentange points for the most exposed consumer product categories. Moreover, the variability in the sign of the effect estimate indicates that tariff exposure cannot conclusively explain the residual price variation between high and low exposure categories which is unexplained by the other controls.

To sum up, even prices of those country-COICOP categories with the highest exposures did not experience meaningful inflationary pressure due to the tariff retaliation. This finding is robust to alternative specifications, such as different percentiles defining exposure groups, and corroborates our earlier finding that the EU's 2018 tariff retaliation did not increase domestic prices, even in countries and categories that were disproportionately exposed.[18]

[18]We re-estimate equation (5) using May 2018 as the cutoff in the indicator function. This addresses concerns

5 Conclusion

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. Addressing this gap, this paper studies the domestic effects of the EU's 2018 tariff retaliation against US steel and aluminum tariffs. We find that this retaliation 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.

The EU's retaliatory tariffs had an asymmetric and scarring effect on most of the tariffed US import categories. They decreased notably in the wake of the tariffs and did not recover after the retaliatory tariffs were lifted. Moreover, even though the tariff costs were rapidly and fully passed through to European importers, our analysis suggests that they did not lead to upward pressure on domestic producer or consumer prices. This finding is consistent with the small size of the retaliation, as well as its careful targeting, and the rapid substitution to non-US suppliers of tariffed products.

that prices might have already adjusted in May 2018, when European Commission (2018a) was published, which already contained the tariff codes which were formally adopted by European Commission (2018b) in June 2018. We obtain the same results, as shown in Figure E2 in Appendix E. We also rerun alternative specifications of equation (5) using non-discretized tariff exposures and again obtain small effect estimates which are not statistically different from zero.

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 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.

Cavallo, A., P. Llamas, and F. M. Vazquez (2025): "Tracking the Short-Run Price Impact of U.S. Tariffs," Working Paper 34496, National Bureau of Economic Research.

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.

Eck, S., T. Hoang, C. Mix, and M. Ray (2026): "Mind the Gap: Announced versus Implied Tariff Rates in Recent Trade Policy Episodes," Feds notes, Board of Governors of the Federal Reserve System.

European Commission (2018a): "Commission Implementing Regulation (EU) 2018/724 of 16 May 2018 on certain commercial policy measures concerning certain products originating in the United States of America," Regulation, Official Journal of the European Union, Brussels.

——— (2018b): "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.

——— (2018c): "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.

——— (2021c): "Strategic Dependencies and Capacities," Commission Staff Working Document SWD(2021) 352 final, European Commission, Brussels.

EUROPEAN UNION (2018): "Immediate Notification under Article 12.5 of the Agreement on Safeguards to the Council for Trade in Goods of Proposed Suspension of Concessions and Other Obligations Referred to in Paragraph 2 of Article 8 of the Agreement on Safeguards," Notification G/L/1237, G/SG/N/12/EU/1, World Trade Organization.

FAJGELBAUM, P., P. GOLDBERG, P. KENNEDY, A. KHANDELWAL, AND D. TAGLIONI (2024): "The US-China Trade War and Global Reallocations," *American Economic Review: Insights*, 6(2), 295–312.

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 a 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.

IYOHA, E., E. J. MALESKY, J. WEN, AND S.-J. WU (2024): "Exports in Disguise? Trade Rerouting During the US-China Trade War," Working Paper 24-072, Harvard Business School.

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.

Supplemental Appendix

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

- Appendix A provides additional details on all tariff retaliations the EU implemented against the US between 2018 and 2022.
- Appendix B shows a breakdown of the products the EU tariffed in its 2018 retaliation by granular BEC categories.
- Appendix C illustrates the change in US import values to the EU, for products subject and not subject to the EU's 2018 retaliation. It also reports the demand elasticity estimates of tariff implementation and suspension, separately for steel and aluminum and all other imports subject to tariff retaliation.
- Appendix D explains the construction of tariff exposures for aggregate and category-specific EU price indices (PPI and HICP).
- Appendix E contains detailed results of the response of EU aggregate price indicators to the 2018 tariff retaliation, summary materials on the country-category tariff exposure measure as well as the result of alternative estimation specifications on the inflationary effect of the tariff retaliation.

A EU Tariff Retaliations against US Imports between 2018 and 2022

The 2018 Annex 2 tariffs were scheduled to complement the Annex 1 tariffs from June 2021 unless the US tariffs had been suspended by then. 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. The EU implemented two other tariff retaliation packages against the US while the 2018 Annex 1 tariffs were in place but they took effect on May 2020 or later and both targeted distinct products.

While the retaliatory tariffs of June 2018 were active, the EU implemented two sets of additional retaliatory tariffs against US imports. Both of these additional retaliation packages were implemented about two years later, in May and November 2020, and applied to products other than those included in the 2018 package. Figure A1 provides a timeline and illustrates the relative magnitudes of each retaliation episode (left panel) as well as their specific and cumulative tariff rates and their effects on the EU's overall ("world") realized effective tariff rate (right panel). We provide further details on the implementation and design of the two additional retaliatory episodes in the next two paragraphs.

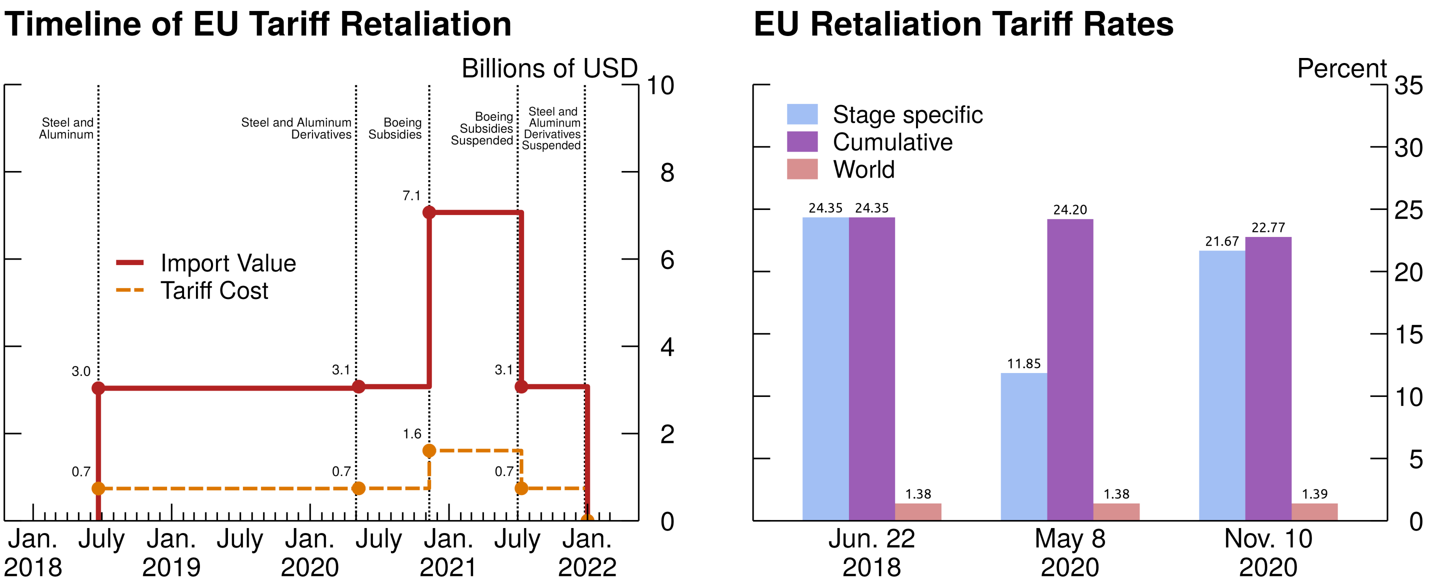

Figure A1: *Left: Import values and tariff costs are computed using 2017 Comtrade data. Right: Stage-specific shows tariff costs divided by import values of each tariff package. Cumulative refers to the total cost of all active packages divided by their total import value. World is the sum of the EU's 2017 realized effective tariff rate (RETR, 1.38 percent) and the cumulative tariff cost divided by total 2017 imports. Source: UN Comtrade, EU Regulation 2018/886, EU Regulation 2020/502, EU Regulation 2020/1646. Authors calculations.*
Note 1: We compute the import value of the June 2018 tariff retaliation ($3.0bn) from Comtrade data which we use throughout our analysis. The pertinent number computed from Eurostat, and stated by the European Commission, is slightly larger ($3.3bn). This is due to minor differences in data processessing. For example, Comtrade omits data for some imports at the original customs level due to confidentiality reasons.
Note 2: To compute the EU's RETR, we obtain data from Eurostat on customs collected by EU institutions and add back the share which member states retain to cover their administrative cost of customs collection. In 2017, this share was 20 percent. See 3.2. (Traditional Own Resources) of the "Annual Accounts of the European Union, 2017": https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0521&from=EN
Note 3: Annex 1 of the Boeing Subsidies package of November 2020 uses 10-digit TARIC codes (8-digit CN and two more digits of specification). See EU Regulation 2020/1646. However, UN Comtrade data is only disaggregated to the 8-digit CN level. To avoid inflating the import value and tariff cost of this package, we obtain the WTO's upper estimate on the package volume ($3.993bn), subtract the import value of Annex 2 ($2.7bn) and consider the residual as the import value of Annex 1 (about $1.2bn). All products in Annex 1 faced a uniform 15% tariff rate, making computation of the tariff cost straightforward.

Effective from February 8, 2020, the US imposed new tariffs on derivative steel and aluminum imports from the EU. These imports were worth about $44.7 mio and the expected additional duty collections amounted to about $10.2 mio. On April 7, 2020, the EU retaliated with regulation EU Regulation 2020/502. This regulation applied tariffs on three US import products in two annexes. Annex 1 applied 20 percent and 7 percent on lighters and plastic fittings from May 8, 2020, worth about $36.5 mio in imports and $4.3 mio in additional duties. Annex 2 applied 4.4 percent on imported plastic fittings from February 8, 2023, worth about $132.4 in imports and $5.8 mio in additional duties. Like the 2018 Annex 1 tariffs, the first set of these additional tariffs were suspended indefinitely from January 1, 2022. The second set had not yet been implemented and was equally suspended. See EU Regulation 2021/2083.

On November 10, 2020, as part of the WTO dispute regarding US subsidies to Boeing, the EU implemented additional retaliatory tariff measures, unrelated to US steel and aluminum tariffs. See EU Regulation 2020/1646 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 to agricultural utility vehicles and leisure items. Together, they were applying to imports worth about $4bn, resulting in additional duties of about $1bn.[19] 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 EU Regulation 2021/1123.

[19]See here https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds353_e.htm

B Additional Materials on the Design of the EU's 2018 Tariff Retaliation Package

Figure B1 provides a breakdown of the tariffed products by BEC category beyond intermediate, final, and capital/investment goods.

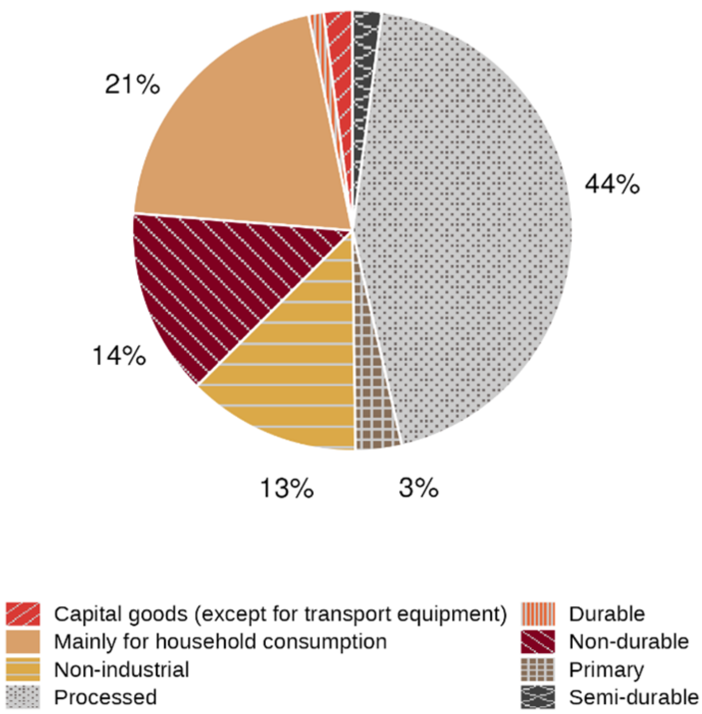

Figure B1: *Breakdown of the EU's 2018 Annex 1 tariffs on US imports using 2017 trade values as classified under Broad Economic Categories (BEC). Data source: UN Comtrade.*

C Additional Results on the Effect of the EU's 2018 Tariff Retaliation on Imports

C.1 Import Values and US Shares by six-digit HS6 Subheadings

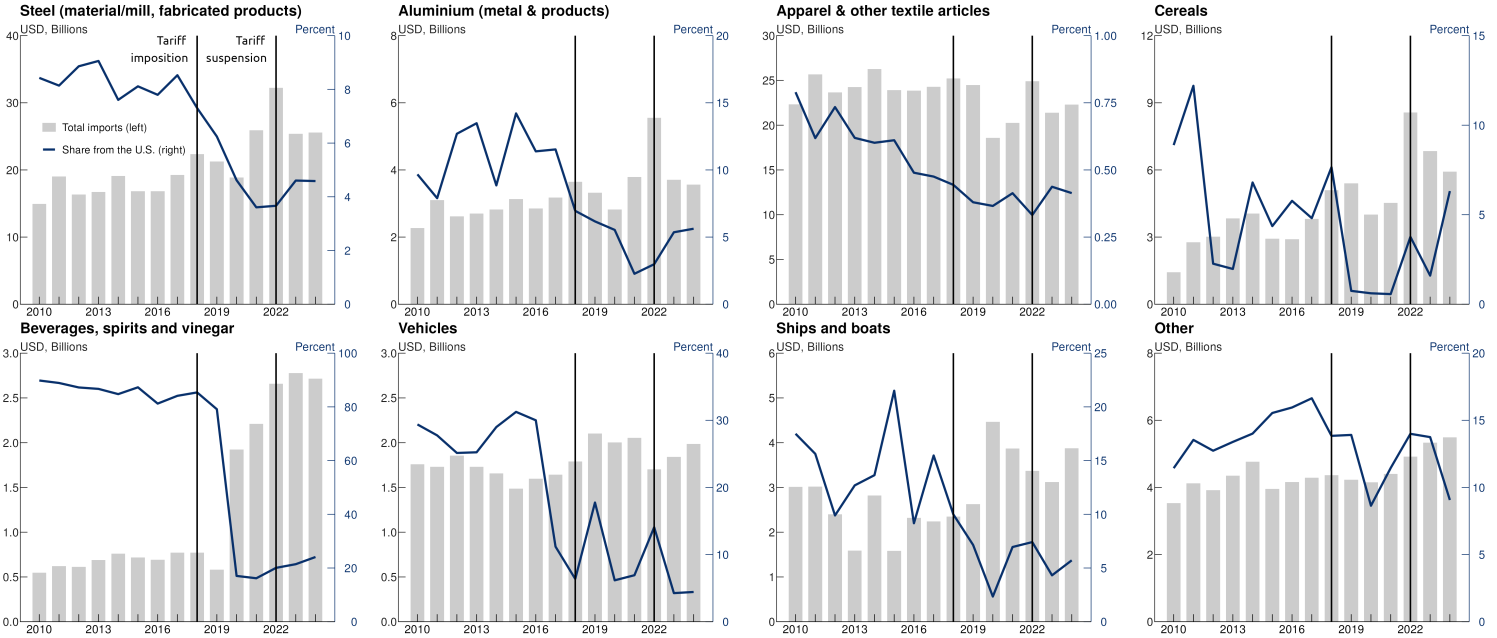

Figure C1: *Total import values from all partners and US import share of the EU's 2018 Annex 1 tariffed products using trade values at six-digit HS6 subheadings, concorded across HS 2007 to HS 2022 using WITS concordance tables. Source: UN Comtrade.*

The gray bars in Figure C1 represent the value of total EU imports (from all partners, including the US) in current US-Dollars (left axis). The black line show US imports as a share of total category import values (right axis). The vertical black lines indicate the introduction of the EU's retaliatory tariffs in June 2018 and their suspension in January 2022.

C.2 Aggregate Import Values

Figure C2 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 conclusiveness of this 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. At the same time, import values of untariffed products remained relatively steady, highlighting the contribution of the EU's retaliation in shifting imports away from tariffed US products.

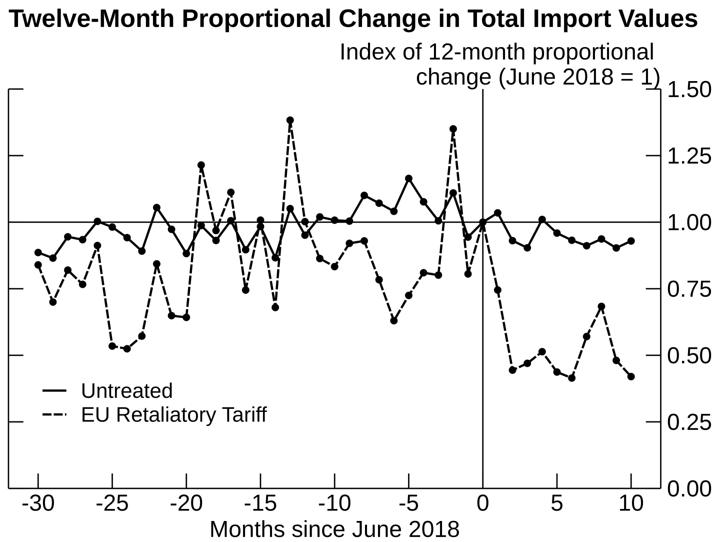

Figure C2: *"Untreated" includes all goods and countries that do not face retaliatory tariffs. June 2018 is set as month 0 as tariffs were effective on June 22, 2018, i.e. after the middle of the month. Data for the change in import prices is the geometric mean of the 12-month tariff-inclusive unit value 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.*

C.3 Import Elasticities by Product Groups

Table C1: Effect of Retaliatory Tariffs on US Imports for Steel and Aluminum Products

	(1) *Log change import quantities*	(2) *IHS change import quantities*	(3) *Log change import values*	(4) *IHS change import values*
Panel A				
$\Delta \ln(1 + \text{Tariff}_{it})$	-3.054^{***}	-4.734^{***}	-3.808^{***}	-5.005^{***}
	(0.539)	(1.169)	(0.625)	(1.204)
Observations	8110	10 467	11 166	13 406
R^2	0.128	0.094	0.111	0.079
Panel B				
$-\Delta \ln(1 + \text{Tariff}_{it})$	1.366^{**}	2.728^{*}	1.472^{**}	3.704^{**}
	(0.516)	(1.269)	(0.525)	(1.232)
Observations	7536	10 727	10 617	13 581
R^2	0.117	0.209	0.096	0.203

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 *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table C2: Effect of Retaliatory Tariffs on US Imports for Products Other than Steel and Aluminum

	(1) *Log change import quantities*	(2) *IHS change import quantities*	(3) *Log change import values*	(4) *IHS change import values*
Panel A				
$\Delta \ln(1+\text{Tariff}_{\text{it}})$	-2.211^{***}	-3.843^{***}	-2.575^{***}	-4.595^{***}
	(0.461)	(1.070)	(0.628)	(1.180)
Observations	110 476	133 811	142 606	164 027
R^2	0.109	0.100	0.087	0.084
Panel B				
$-\Delta \ln(1+\text{Tariff}_{\text{it}})$	0.862	0.391	1.552^{*}	2.347^{*}
	(0.565)	(1.132)	(0.698)	(1.146)
Observations	108 163	137 621	143 958	170 691
R^2	0.120	0.214	0.095	0.218

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 *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

D Concording Data Classifications

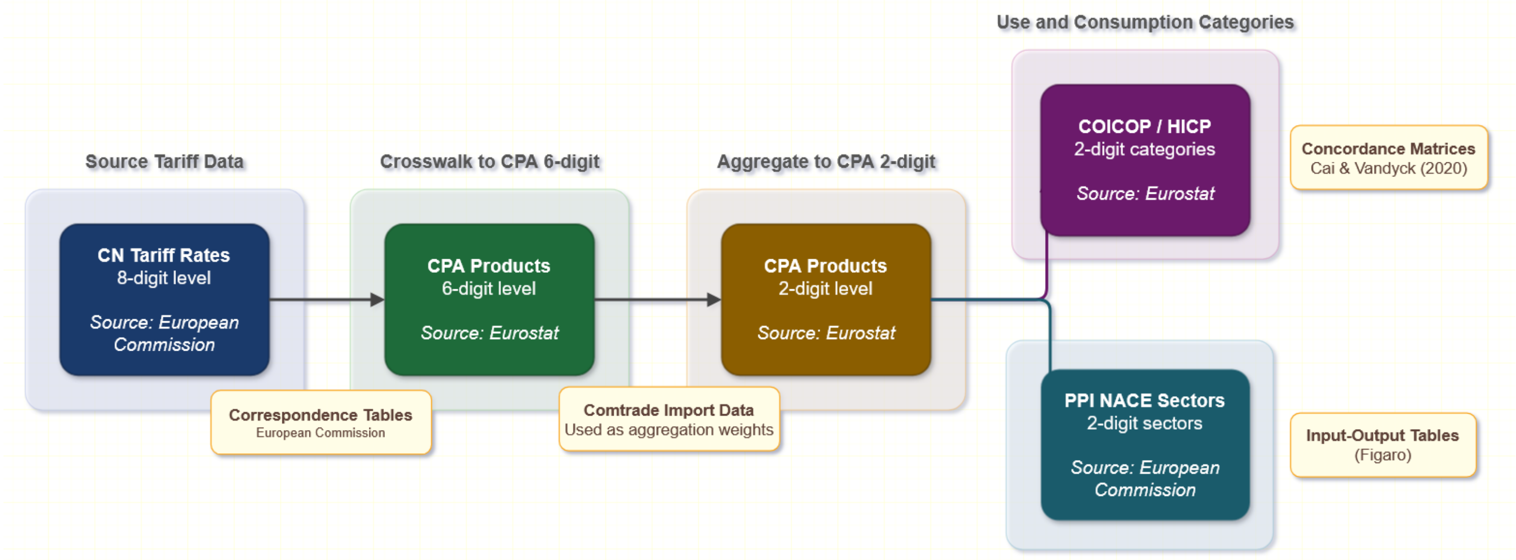

Figure D1: Construction of Tariff Exposures

Figure D1 details how we transform the list of tariffed US import products to ultimately associate them with European producer and consumer price data. The initial tariff list, sourced from European Commission (2018b), is disseminated at the Common Nomenclature (CN) 8-digit level. To avoid inflating the tariff rate for a given product category by including all EU tariffs that were in place as of 2018, i.e. before the implementation of the retaliatory tariffs against select US imports, we define the tariff rate we are working with as the *additional* duties levied in the EU's 2018 tariff announcement. This results in tariff rates of zero percent for all products that are not tariffed and imported from the US.

The input-output (FIGARO) tables which we use to link statistical classification of products by activity (CPA) data to producer price categories are available for the CPA 2-digit level. The same is true for the concordance tables we use to map CPA data to consumer price categories. Using correspondence tables provided by the European Commission, we convert the tariffed goods from the 8-digit CN level to the 6-digit CPA level.[20] In order to collapse the tariff rates from the CPA 6-digit to the CPA 2-digit level, we compute a weighted average of the tariff rates of each 6 digit product within a 2-digit category, where the weight is the 2017 import share of a 6-digit product within a broader 2-digit category. This ensures that our CPA 2-digit tariff rates are not biased in cases where, for example, there are 100 6-digit products in a 2-digit category but only five of those goods have non-zero imports from the US. Put differently, a simple average tariff rate across all products would artificially deflate the CPA 2-digit tariff rates.

Once we have tariff rates for the 63 distinct CPA 2-digit products, our analysis branches off into intermediate (producer) and final (consumer) use. Starting with final use, we use concordance matrices provided by Cai and Vandyck (2020) to map the use of the 63 CPA products into the 34 categories of the Classification of Individual Consumption According to Purpose (COICOP) framework, according to which European inflation data are classified.[21] As detailed in equation (4), this gives us a category (and eventually country) specific tariff exposure based on which products are used in that consumption category and where those products originate. Symmetrically, we use the FIGARO tables from the

[20] Tables obtained from `https://ec.europa.eu/eurostat/web/cpa/correspondence-tables`
[21] See Cai and Rueda-Cantuche (2018) for details on the generation of this correspondence.

European Commission to observe how CPA 2-digit products are used in the 64 distinct NACE Rev. 2 categories, which is the classification used to measure European producer prices (PPI).

Equations (2) and (4), which compute the tariff exposure for NACE sectors and COICOP categories, respectively, are not identical because we do not observe where the CPA products in the COICOP correspondences come from. As a result, we opt to weight the COICOP category specific tariff exposures by the share of a product in that category and the US share of total supply of that product which we obtain from the FIGARO tables. Ultimately, although we have both highly disaggregated product and price data (six digit), the crosswalks that allow us to link these datasets together are only available at the two-digit level thereby restricting the scope and granularity of our analysis.

E Domestic Inflationary Effects of the EU Retaliation

E.1 Producer Prices (PPI)

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 changes in k categories of quarterly PPI on the category specific tariff exposure $\bar{T}_k$, π_k, to assess the inflationary effect of the tariffs:

$$\pi_k = \alpha + \beta \bar{T}_k + \varepsilon \tag{E1}$$

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.[22] Our results displayed in Table E1 indicate no statistically significant relationship between higher 2018 tariff rates and increased producer prices. This finding is consistent across all inflation measures, including an additional set of regressions where we replicate our analysis using 2018Q2 and 2018Q4 PPI data. See Tables E2 and E3.

	Dependent variable based on 2018:Q3 Producer Price Indices		
	(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

Table E1: PPI 2018:Q3 Tariff Passthrough Regressions

	Dependent variable based on 2018:Q2 Producer Price Indices		
	(1) Q-o-Q Change	(2) 4-quarter change	(3) Excess 4-quarter inflation
Tariff Rate	−2706.3	−4586.4	−6797.2
	(3139.7)	(8021.7)	(6451.9)
Observations	31	31	31
R^2	0.025	0.011	0.037
Adjusted R^2	−0.009	−0.023	0.0037

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

Table E2: PPI 2018:Q2 Tariff Passthrough Regressions

[22] This excess inflation approach is adapted from Minton and Somale (2025) and based on the difference between the 4-quarter inflation in 2018:Q3 and the average 4-quarter inflation from 2000:Q1 to 2018:Q1.

	Dependent variable based on 2018:Q4 Producer Price Indices		
	(1) Q-o-Q Change	(2) 4-quarter change	(3) Excess 4-quarter inflation
Tariff Rate	576.3	−4149.8	−6360.6
	(1756.8)	(6419.5)	(4909.8)
Observations	31	31	31
R^2	0.004	0.014	0.055
Adjusted R^2	−0.03	−0.020	0.022

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

Table E3: PPI 2018:Q4 Tariff Passthrough Regressions

E.2 Consumer Prices (HICP)

To assess the effect of EU tariff retaliation on l categories of domestic consumer prices, we estimate:

$$\pi_l^{\text{excess}} = \alpha + \beta \, \bar{T}_l + \varepsilon \tag{E2}$$

Since EU price indices are available at a monthly frequency, $\pi_l^{\textbf{excess}}$ is the HICP category specific differential between average 3-month inflation from 2000 to 2017 and the 3-month inflation rate following tariff implementation. Table E4 reports our findings. Columns 1 to 3 estimate excess inflation at three different monthly horizons after tariff 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.

Table E4: 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	−0.13	0.092	0.199
	(0.145)	(0.162)	(0.235)
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

E.3 Country-Category Price Effects

Country	Tariffed US Import Share (%)
Austria	0.45
Belgium	0.83
Bulgaria	3.60
Croatia	4.70
Cyprus	6.59
Czechia	1.85
Denmark	1.57
Estonia	2.28
Finland	1.33
France	1.40
Germany	1.56
Greece	6.13
Hungary	2.08
Ireland	0.52
Italy	2.45
Latvia	3.30
Lithuania	3.66
Luxembourg	1.01
Malta	24.85
Netherlands	1.00
Poland	1.95
Portugal	3.00
Romania	2.38
Slovakia	1.25
Slovenia	1.63
Spain	1.94
Sweden	1.69

Table E5: Share of US goods imports subject to the EU's 2018 retaliatory tariffs. Computed from 2017 UNComtrade CN 6 digit trade data by dividing value of imports from the US subject to tariffs by value of total US imports.

Country	High Exposure	Low Exposure
Austria	27	7
Belgium	24	10
Bulgaria	27	7
Croatia	30	4
Cyprus	23	11
Czechia	26	8
Denmark	21	13
Estonia	22	11
Finland	22	12
France	22	12
Germany	21	13
Greece	27	7
Hungary	25	9
Ireland	20	14
Italy	27	7
Latvia	29	4
Lithuania	26	8
Luxembourg	23	11
Malta	27	7
Netherlands	17	16
Poland	28	6
Portugal	33	1
Romania	28	5
Slovakia	28	5
Slovenia	25	9
Spain	28	6
Sweden	22	12

Table E6: Number of COICOP categories assigned into the high and low tariff exposure groups. Low refers to tariff exposure values in the lowest three quartiles while treated refers to values in the upper quartile. Totals do not add up to the 34 COICOP categories for each country because some category data are missing for select countries.

	Mean	Min	Max	N
Full Sample	0.006	0	0.11	913
High Exposure	0.020	0.008	0.11	230
Low Exposure	0.001	0	0.0079	683

Table E7: Summary statistics of COICOP category tariff exposures: Summary Statistics. Low refers to tariff exposure values in the lowest three quartiles while treated refers to values in the upper quartile.

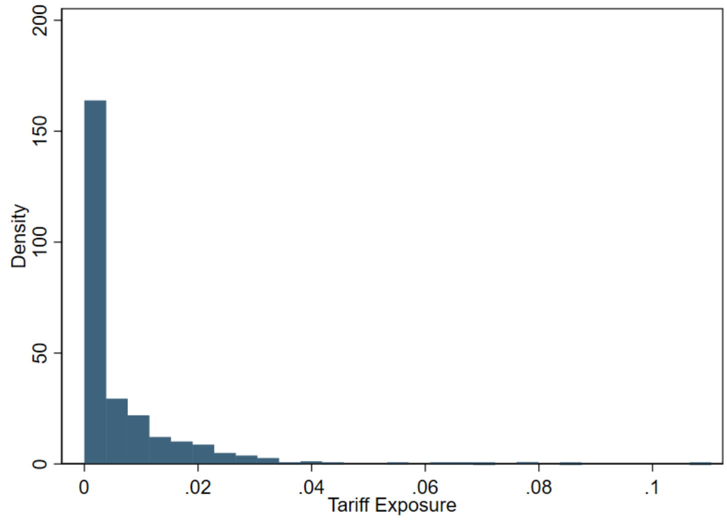

Figure E1: Distribution of COICOP country-category tariff exposures. Computed as described in section 4.2.

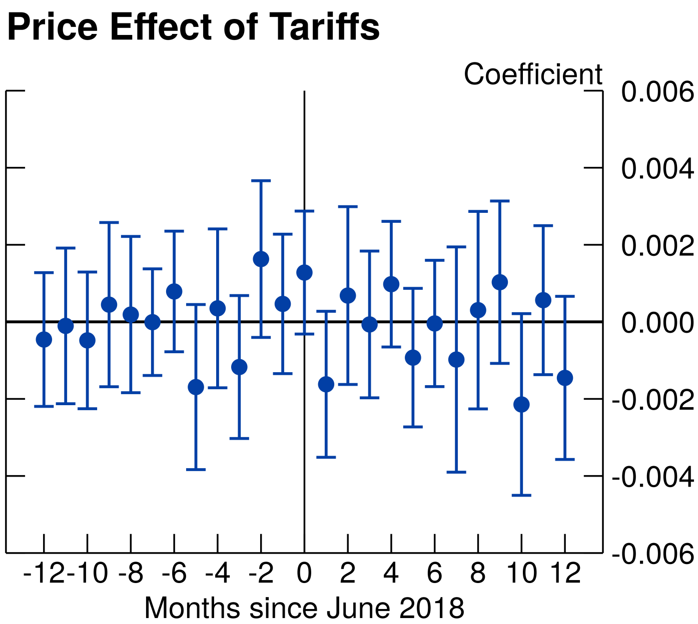

Figure E2: Results of estimating equation (5) using May 2018 instead of June 2018 as a cutoff for tariff implementation.

The EU already listed the Annex 1 and 2 product codes considered for retaliation in European Commission (2018a), which was published on May 16, 2018, i.e. about one month before the official implementation of the tariffs. Thus, it is possible that EU domestic prices might have adjusted already before the tariffs were implemented. To address this concern, we repeat the estimation of the price effect equation (5) but use May 2018 as a cutoff month. The results are reported in Figure E2. It shows that our findings are unchanged relative to the baseline estimation (shown in the right hand panel of Figure 3).

References

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.

European Commission (2018a): "Commission Implementing Regulation (EU) 2018/724 of 16 May 2018 on certain commercial policy measures concerning certain products originating in the United States of America," Regulation, Official Journal of the European Union, Brussels.

——— (2018b): "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.

——— (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.

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.