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Tariffs, supply chains and EU retaliation

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Abstract

This note examines the macroeconomic implications of tariffs imposed on the European Union, with a focus on alternative retaliation strategies. Using a two-region, multi-sector DSGE model with international production networks, the analysis shows that the effects of tariffs depend critically on where they are applied along the supply chain. Tariffs on intermediate inputs are considerably more disruptive than tariffs on final goods, as they raise production costs and propagate through production networks, generating larger and more persistent output losses and inflationary pressures. Broad-based retaliation amplifies domestic economic costs, while a strategy focused on final goods is less disruptive because it limits the transmission of shocks through supply chains. These findings remain robust under limited tariff pass-through. While local-currency pricing and sticky import prices dampen inflationary pressures by shifting part of the adjustment to firms' margins, they do not alter the ranking of retaliation strategies. Overall, the results highlight the central role of tariff composition and production networks in shaping the macroeconomic consequences of trade policy.

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Keywords: Tariffs, Inflation, Retaliation, European Union, Production networks

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Executive Summary

Recent increases in foreign tariffs and the renewed risk of trade fragmentation have brought to the forefront the question of how the European Union (EU) should respond to external trade shocks. In particular, policymakers have faced the challenge of whether, and how, to retaliate against foreign trade restrictions while limiting the costs for domestic economic activity. Against this backdrop, this note uses a two-region, multi-sector DSGE model with international production networks to examine the macroeconomic implications of tariffs for the EU, with a particular focus on the design of alternative retaliation strategies.

The analysis shows that tariffs are not a uniform policy instrument: their effects depend critically on where along the supply chain they are applied. Tariffs on intermediate inputs are significantly more disruptive than those on final goods, as they raise production costs and propagate through supply chains, leading to more persistent losses in economic activity and stronger cost pressures.

The composition of retaliation emerges as a key policy dimension. While retaliation can partly mitigate the decline in external demand, by supporting substitution toward domestic production, broad-based measures targeting both final and intermediate goods tend to amplify domestic costs and result in larger and more persistent output losses. By contrast, a more targeted approach focusing on final goods is less detrimental, as it limits the transmission of the shock through production networks and contains its impact on domestic activity.

These findings are robust under limited pass-through. Local-currency pricing and sticky import prices dampen the transmission of both tariffs and exchange-rate movements to domestic prices, shifting part of the adjustment to firms' margins. However, limited pass-through does not eliminate the real costs of retaliation or alter the ranking of alternative strategies.

Finally, international production networks play a central amplification role. They magnify output losses and prolong inflationary pressures. Overall, the results suggest that for highly integrated economies such as the EU, the composition of tariffs is central to mitigating the costs of trade tensions.

1. Introduction

Recent increases in foreign trade barriers and the renewed risk of trade fragmentation have intensified the debate on how policymakers should design and implement effective stabilization responses. In this context, a key issue for the EU is whether, and, if so, how to retaliate against external tariffs while limiting the potential costs for domestic economic activity. While recent developments in U.S. trade policy provide a particularly relevant motivation for this discussion, the underlying questions are broader and apply more generally to episodes of rising trade tensions.

This note argues that tariffs should not be viewed as a uniform policy instrument. Their macroeconomic implications depend critically on how they are designed — most notably, on whether they target final consumption goods or intermediate inputs embedded in production processes. This distinction is particularly relevant for the EU, which is deeply integrated into global value chains and relies heavily on imported intermediate goods. As a result, trade measures can affect not only external demand, but also domestic production costs and competitiveness.

To assess these mechanisms, in this note I provide a quantitative model-based analysis, focusing on tariffs on trade in goods. I first document key features of EU trade patterns, highlighting the prominent role of intermediate goods and the importance of production networks. I then use a two-region multi-sector DSGE model with international production linkages to evaluate the macroeconomic implications of alternative retaliation strategies. I compare three scenarios: (i) no retaliation — capturing a situation in which the EU absorbs foreign tariffs without responding; (ii) broad-based retaliation targeting both final and intermediate goods; and (iii) a more targeted approach focusing on final goods only. The analysis also examines the implications of local-currency pricing and sticky import prices and evaluates the importance of production networks through a counterfactual exercise.

A limitation of the analysis is that the model uses a two-region framework, distinguishing between the EU and the rest of the world. This structure does not allow for a full representation of trade diversion across multiple partner countries, so the quantitative results should be interpreted with caution. Nonetheless, the framework captures the key transmission channels of tariff shocks and provides robust qualitative insights on the design of retaliation policies.

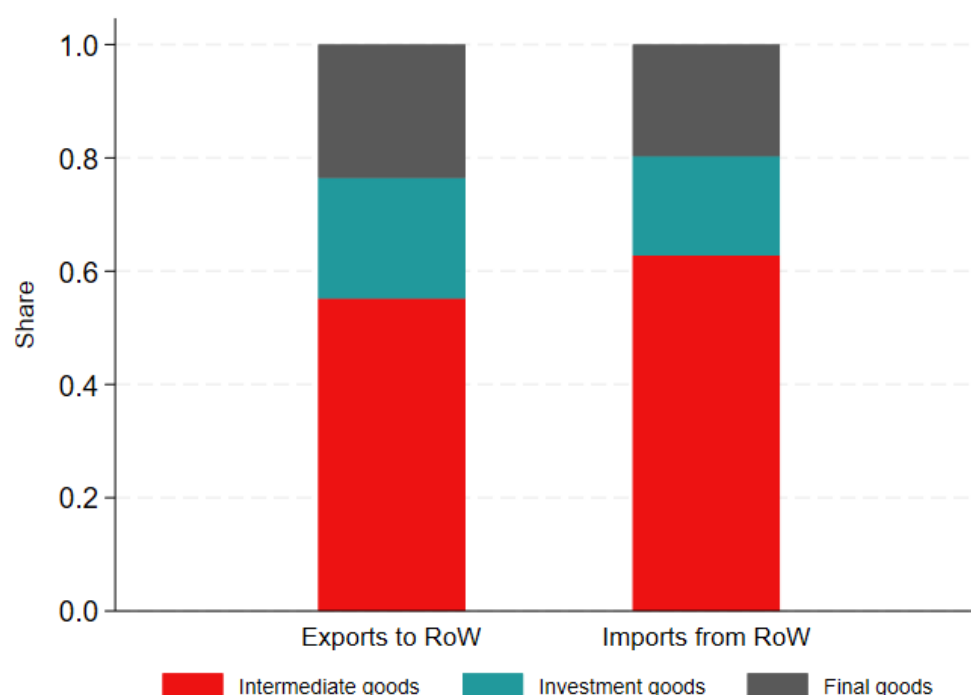
2. Are all tariffs equal?

Tariffs are often discussed as a single policy instrument, yet their macroeconomic implications can differ significantly depending on how they are implemented and which goods they target.

A key distinction concerns the stage of production targeted by tariffs — that is, whether measures apply to final consumption goods or to intermediate inputs used in production. This distinction is particularly relevant for the European Union, where a large share of trade — especially imports — consists of intermediate goods used by domestic firms in production (see **Figure 1**). In particular, intermediate goods account for around 60% of extra-EU goods imports. As a result, trade restrictions can affect not only consumption but also the cost structure of domestic industries.

Tariffs on imports of final goods primarily affect consumer prices and demand. By increasing their price, they reduce real purchasing power and lead to a reallocation of expenditure toward domestic or third-country suppliers. As a result, their impact tends to operate mainly through demand substitution and trade diversion, with relatively limited direct effects on domestic production costs. While tariffs on final goods can generate an initial increase in consumer prices, this effect is typically temporary, as it reflects a one-off adjustment in the price level rather than a sustained increase in production costs. Over time, substitution toward alternative suppliers and weaker demand help contain further price pressures. Consequently, the impact on activity is often more contained, especially when alternative suppliers are readily available.

Figure 1: European Union trade in goods by end use
(share)



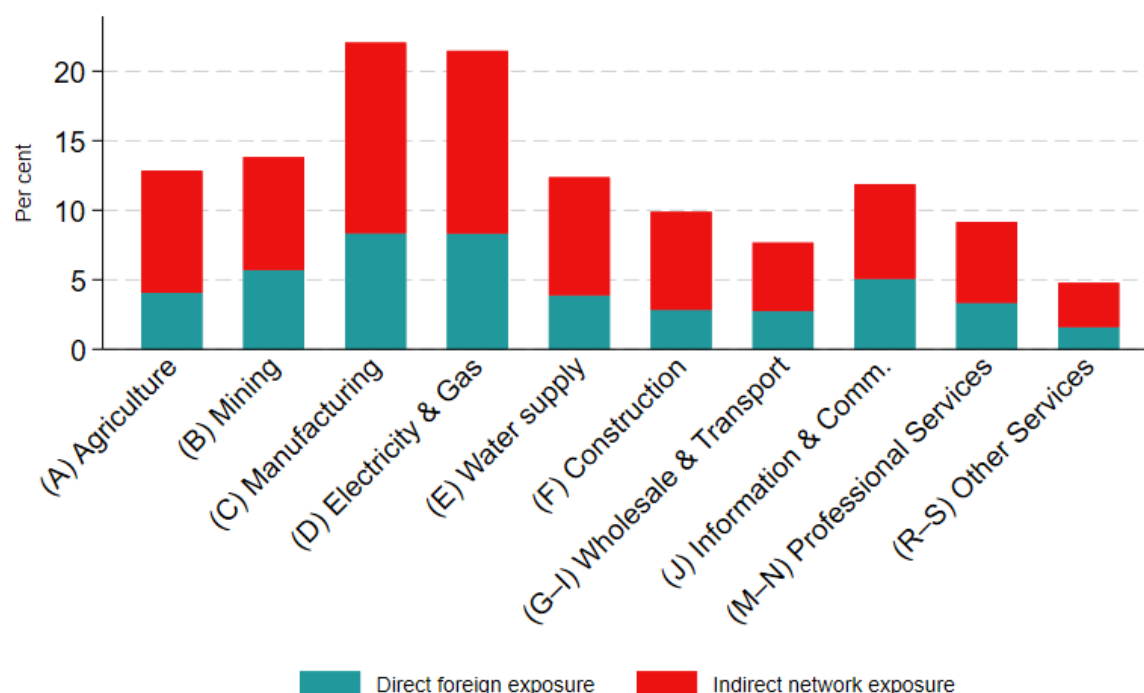
Source: Asian Development Bank Multi-Region Input Output Tables, 2022 and Author's calculations.

Notes: Only goods are considered.

Tariffs on intermediate inputs, by contrast, operate through production costs. They raise input costs for firms that rely on foreign suppliers and can propagate through supply chains, affecting a wide range of sectors beyond those directly targeted. This mechanism is illustrated in **Figure 2**, which quantifies the European Union's dependency on both direct and indirect foreign-sourced inputs for domestic production across sectors.

A substantial share of foreign dependence arises through indirect network linkages, reflecting the role of upstream sectors in supplying inputs to downstream industries. For instance, a car manufacturer may source components from domestic suppliers located upstream in the supply chain but those suppliers rely on imported metals or energy, even further upstream. In this way, foreign input costs are transmitted along the value chain, affecting sectors that are not directly engaged in international trade. Exposure is particularly pronounced in sectors such as manufacturing and energy (electricity and gas), where imported inputs account for around 20% of total intermediate goods used in domestic production. This reflects the high degree of vertical specialisation in these industries, where production processes are split across countries and depend on a wide range of imported raw materials and intermediate goods. On the other hand, more service-oriented sectors tend to exhibit lower overall exposure, although they are not fully insulated due to their dependence on goods-producing sectors. These considerations are central in the policy debate on possible EU retaliation to foreign tariffs. In particular, for the EU this implies that the effectiveness of retaliation depends not only on its magnitude, but crucially on where along the supply chain it is applied.

Figure 2: European Union dependency on foreign intermediate inputs by sector
(per cent of total intermediate inputs)



Source: WIOD Input Output Table, 2014 and Author's calculations based on Baldwin et al. (2023).²

Notes: Foreign input exposure is measured as the share of total inputs used in domestic production that originate abroad. Direct and indirect exposures are computed based on the methodology of Baldwin et al. (2023). Only goods are considered.

The extent to which tariffs alter trade patterns also depends on the substitutability of the affected goods. When close alternatives exist – either from domestic producers or from other trading partners – firms and consumers may shift their preferences away from tariffed products. In such cases, tariffs mainly lead to trade diversion, with production and trade flows adjusting toward alternative suppliers. By contrast, when goods are highly specialised or when global supply is inelastic, switching suppliers may be more difficult. In these cases, trade patterns may adjust more slowly, and the effects of tariffs on costs can propagate more strongly through production networks and sectoral linkages.

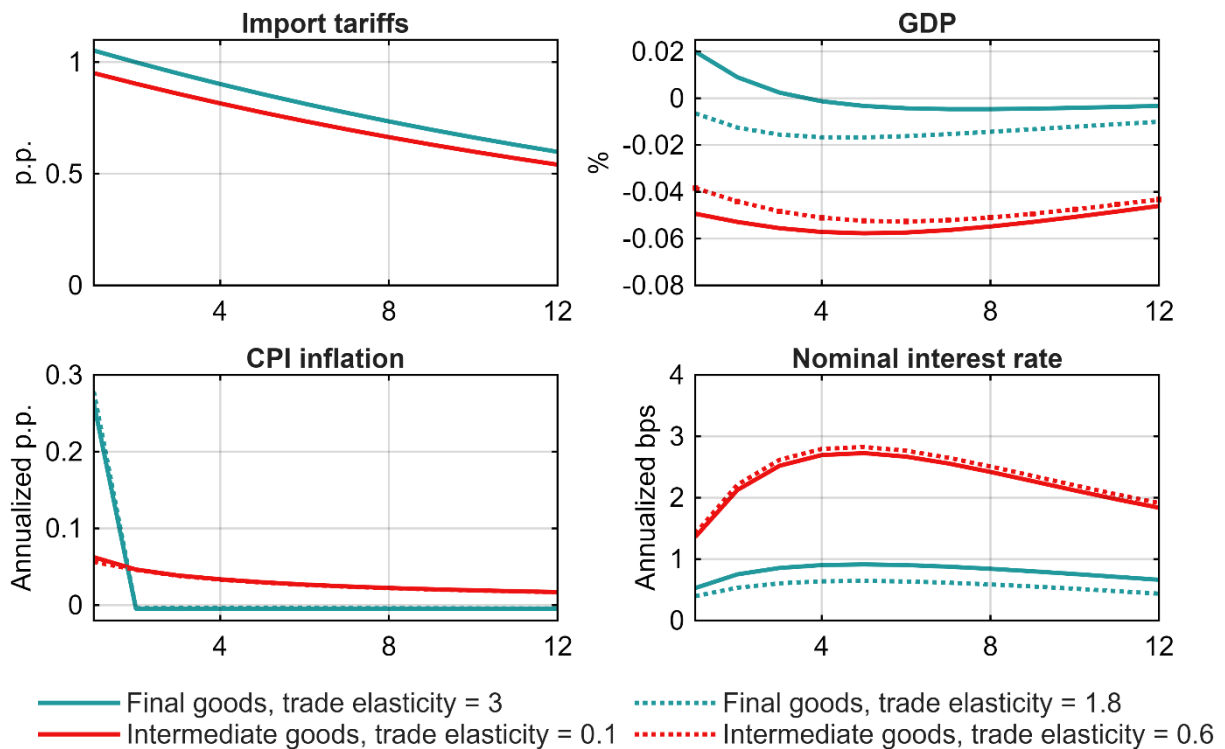
Another important factor is the extent to which firms along the supply chain adjust their profit margins in response to tariffs. When competitive pressures are strong or when firms seek to preserve market shares, exporters may absorb part of the tariff by lowering their export prices. Importers, wholesalers or retailers in the destination market may also compress their margins to remain competitive. As a result, tariffs are often only partially passed through along the supply chain, implying a smaller impact on final retail prices. This means that part of the adjustment may occur through lower profitability for firms rather than immediate changes in selling prices or demand patterns. The degree of pass-through therefore depends on market structure, the availability of substitutes and the bargaining power of firms at different stages of the supply chain.

² For more information on the methodology to compute foreign direct and indirect exposure of domestic production the reader is referred to Baldwin et al. (2023).

3. Do tariffs on final and intermediate goods have different macroeconomic effects?

To assess whether the stage of production targeted by tariffs matters, I use a quantitative two-region, multi-sector DSGE model with global production networks.³ The model allows tariff shocks to affect the economy not only through final consumer prices, but also through firms' input costs and supply-chain linkages. **Figure 3** reports the model-implied impulse responses to two separate tariff shocks: one applied to imported final goods, and one applied to imported intermediate inputs.⁴ The shocks are assumed to be highly persistent.

Figure 3: Macroeconomic implications of import tariffs on final and intermediate goods
(per cent and percentage points from steady state)



Source: Author's calculations.

Notes: The horizontal axis denotes quarters after the shock. Tariff rates on imported final and intermediate goods are adjusted such that the steady-state tariff revenues are the same. Tariff shocks are expressed as percentage point deviations from steady state. GDP is expressed in percentage deviations, CPI inflation is expressed as annualized percentage point deviations, and the nominal interest rate is expressed in ann. basis points.

The results show that the macroeconomic effects differ substantially. Tariffs on final goods mainly operate through consumer prices. They raise the price of imported consumption goods, leading to an immediate but short-lived increase in CPI inflation. As these tariffs do not directly increase firms' production costs, the impact on GDP is slightly positive initially, but this favourable effect is relatively limited and declines in the medium term. Over time, households partly substitute away from more

³ The model features sticky prices and wages, investment dynamics, and input-output linkages within and across regions, allowing tariffs to affect both final demand and the production structure of the economy. The model features 10 sectors, based on NACE Revision 2 classification. In all simulations, monetary policy is assumed to follow a Taylor rule, reacting to GDP and PPI inflation deviations from the target. Following Coenen et al. (2013), the Taylor rule parameter for the deviations of inflation from target is 1.9, while the parameter for GDP is 0.1. Monetary policy is modelled symmetrically across the two regions. Consequently, second-round effects are limited. For more information about the model the reader is referred to Gnecato et al. (2025).

⁴ We consider an increase in tariffs on imports of agriculture and manufacturing products, distinguishing between tariffs on final and on intermediate goods.

expensive imported goods, and the inflationary effect gradually fades. The central bank responds to higher inflation by tightening monetary policy leading to an increase in the nominal interest rate.

By contrast, tariffs on intermediate inputs act as a negative supply shock. By increasing the cost of imported inputs, they raise firms' marginal costs and reduce productive capacity at given prices. Through input-output linkages, these cost increases propagate along supply chains, affecting not only directly exposed firms but also downstream sectors. As a result, GDP declines more strongly and remains below baseline for longer than in the case of tariffs on final goods, while underlying cost pressures are more persistent, with CPI inflation remaining above the baseline for an extended period. Given the more persistent inflation, the monetary policy tightening is stronger.

The counterfactual exercises, shown by the dotted lines in Figure 3, highlight the role of substitutability in shaping these effects. The parameters governing the trade elasticity, i.e., the elasticity of substitution between domestic and foreign varieties, are consistent with benchmark estimates in the literature. For final goods, the baseline elasticity of substitution between domestic and foreign varieties is set to 3, while the counterfactual value of 1.8 corresponds to the lower bound of the confidence interval reported by Bajzik et al. (2020). For intermediate goods, the baseline elasticity is set to 0.1, reflecting evidence that imported and domestic inputs behave as close complements in the short run (Boehm et al., 2019). Since this baseline elasticity is extremely low already, the sensitivity analysis considers a higher elasticity of 0.6, consistent with the calibration used by Kalemli-Özcan et al. (2025).

For final goods, reducing the trade elasticity from 3 to 1.8 weakens the expenditure-switching channel. As households face greater difficulty in substituting away from more expensive imported goods, the support to domestic production is reduced and the decline in GDP becomes more pronounced relative to the baseline. For intermediate inputs, the counterfactual moves in the opposite direction: the trade elasticity is increased from 0.1 to 0.6. The dotted red line shows that greater substitutability mitigates the negative supply shock. Firms can more easily replace tariffed foreign inputs with domestic or alternative suppliers, limiting the increase in marginal costs and dampening the propagation of the shock through production networks. As a result, the decline in GDP is smaller; however, the effect remains persistently negative, reflecting the cost-push nature of tariffs on intermediate inputs.

4. What are the macroeconomic implications of tariff retaliation for the EU?

To assess the macroeconomic implications of foreign tariffs on EU exports and possible retaliation strategies, I rely on the same two-region multi-sector DSGE model with global production networks introduced in the previous section. This model is calibrated on the EU and the Rest of the World.

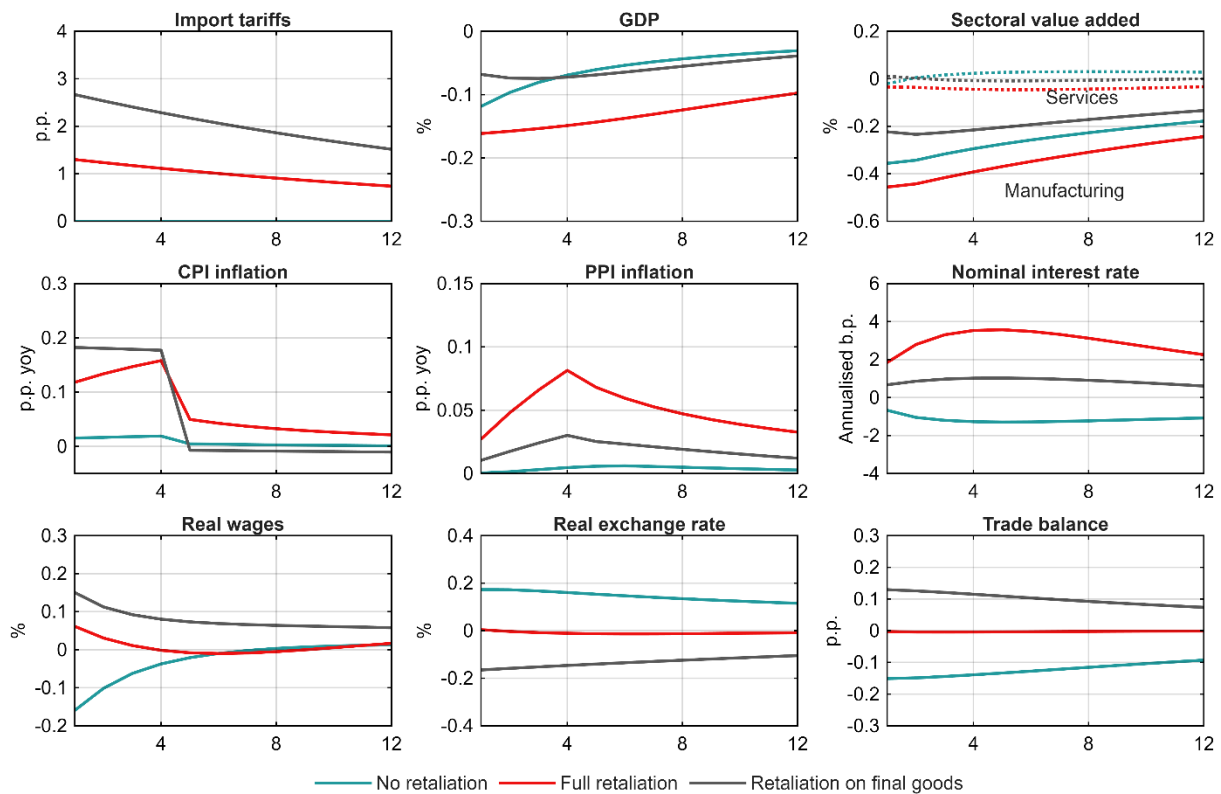
To explore these issues, I exploit the sectoral breakdowns embedded in the model. The model distinguishes between tradable and non-tradable sectors, with agriculture and manufacturing representing the main tradable sectors exposed to tariff measures, while services are largely non-tradable. It also separates goods by their use in the economy: final consumption goods, investment goods and intermediate inputs used in production. Sectoral heterogeneity is captured through differences in factor intensities, contributions to final demand, trade exposure, and reliance on domestic and foreign intermediate inputs. Sectors also differ in markups and price rigidities, which shape the extent and speed of tariff pass-through. In the baseline calibration, export prices are set in producer currency, implying a relatively high degree of pass-through to import prices. The calibration matches key features of the EU and the Rest of the World, including sectoral production structures, trade exposures, and input-output linkages, allowing tariff shocks to propagate differently across sectors and along supply chains.⁵ Trade elasticities are set in line with baseline calibration in previous section.

⁵ Sectoral parameters governing factor intensities, import shares, and domestic and foreign input-output linkages are calibrated using the 2014 World Input-Output Database. Sector-specific price rigidities are based on Gautier et al. (2024), while the remaining EU calibration parameters follow Coenen et al. (2013).

The tariff shock considered in this section is highly persistent and affects the two main tradable sectors targeted by trade restrictions in the model, namely agriculture and manufacturing. It applies to both final and intermediate goods exports from the EU. The baseline calibration of the tariff rate is designed to capture the increase in foreign tariffs faced by EU exporters in 2025, largely driven by U.S. trade barriers. The size of the shock is based on the ex-ante effective tariff rate on U.S. imports from the EU in 2025, estimated at 6.4% by Cumbo et al. (2026, forthcoming). As the model aggregates all non-EU economies into a single rest-of-the-world block, this rate is scaled by the share of EU exports exposed to the U.S. market, resulting in an equivalent 1.3 percentage-point (pp) increase in tariffs on EU exports of agricultural products and manufactured goods. Given the two-region structure of the model, the quantitative effects should be interpreted with caution, as global trade diversion effects are not explicitly captured. The qualitative insights, however, are expected to remain robust.⁶

Figure 4: Macroeconomic effects of retaliation for the EU

(per cent and percentage points from steady state)



Source: Author's calculations.

Notes: The horizontal axis denotes quarters after the shock. Lines are expressed as percentage deviation from steady state. CPI and PPI inflation are shown as year-on-year percentage point deviations. The nominal interest rate is expressed in annualised basis points. The trade balance is expressed in percentage points deviations. An increase in the real exchange rate corresponds to a depreciation of the euro.

Three scenarios have been considered. First, the EU does not retaliate to foreign tariffs. In the second scenario, the EU retaliates by imposing tariffs on both final and intermediate goods imports sourced from the rest of the world. In the third, EU retaliation is restricted to final goods imports only. To ensure

⁶ This approach complements recent quantitative open-economy DSGE contributions by placing greater emphasis on medium-scale dynamics and richer real-side adjustment channels. See Auray et al. (2025), who analyse the short-run effects of tariffs and retaliation in a two-country New Keynesian model calibrated to the U.S. and the rest of the world, and Kalemli-Özcan et al. (2025), who study recent tariff shocks in a smaller-scale multi-country, multi-sector New Keynesian model with production networks.

comparability, tariffs in the third scenario, which involve a smaller subset of imports, are scaled in revenue-equivalent terms.

The results are shown in **Figure 4**, which highlights three main findings. First, foreign tariffs on EU exports have a clear contractionary effect on economic activity. In the absence of retaliation (teal line), GDP declines by around 0.1% on impact (from steady state), before gradually recovering. This reflects a sharp drop in exports (by about 1% on impact). Despite the depreciation of the real exchange rate, which tends to increase the cost of imported goods, the overall impact on CPI inflation remains limited. This reflects weak foreign demand, which puts downward pressure on domestic prices, and the absence of direct tariff effects on import prices. With subdued inflationary pressures, monetary policy becomes accommodative to support domestic demand.

Second, full retaliation by the EU introduces persistent cost pressures and has the largest negative impact on activity. When the EU retaliates uniformly across both final and intermediate goods (red line), the contraction in GDP is larger, reaching around -0.2% on impact and remaining close to -0.1% in the medium term. While retaliation partly offsets the fall in exports, by diverting demand towards domestic producers, it raises production costs, which propagate through supply chains, weighing on economic activity. This is also reflected in stronger producer price pressures. Precisely, full retaliation implies an increase in CPI inflation by around 0.15pp (year-on-year) on average in the first year, with persistent upward pressures over the medium term. The central bank responds to heightened inflationary pressures by tightening monetary policy, as can be seen by the increase in the nominal interest rate.

Third, a strategy focused on imposing tariffs on final goods only (black line) performs better than full retaliation. The decline in GDP is more limited — around -0.1% on impact — and the recovery is stronger over time. CPI inflation rises by about 0.2pp (year-on-year) on average in the first year, due to the direct effect of the change in tariffs, and subsequently converges back to baseline, as producer cost pressures are contained. This scenario also induces a reallocation towards services on impact, which are not directly affected by tariffs, as relative prices shift away from tradable goods. Manufacturing value added still declines, but less than in the other scenarios. Imports of final goods plunge more than in the full-retaliation case, pushing a real exchange rate appreciation which helps to offset the increased price of imported materials. By targeting consumption goods rather than production inputs, this approach limits the transmission of the shock through domestic supply chains, thereby containing cost pressures and the impact on manufacturing activity.⁷

The real exchange rate behaves differently across scenarios, as each gives rise to a distinct macroeconomic adjustment. In the absence of retaliation, foreign tariffs on EU exports generate a negative external demand shock, causing exports to fall and the euro to depreciate in real terms, partly absorbing the loss in competitiveness. Under full retaliation, this adjustment is weaker, as higher domestic cost pressures and inflation reduce the scope for real depreciation. By contrast, when retaliation is restricted to final goods, the sharp decline in imports improves the trade balance and leads to a real appreciation of the euro. This reflects the higher tariff rate applied on a narrower import basket, which induces a larger drop in imported final-goods volumes.

Real wages also react differently on impact across scenarios. Under no retaliation, real wages fall reflecting the drop in aggregate demand, which drives down labour demand. When the EU retaliates on final goods only, this downward impact is countered by the expenditure-switching channel which raises labour demand. Under full retaliation, the adverse impact on aggregate demand is larger and real wages increase only slightly on impact.⁸ However, the impact of tariffs on labour supply, which also affects real wages, is not assessed in this note.

⁷ Results are robust to an alternative monetary policy rule reacting to CPI inflation instead of PPI inflation.

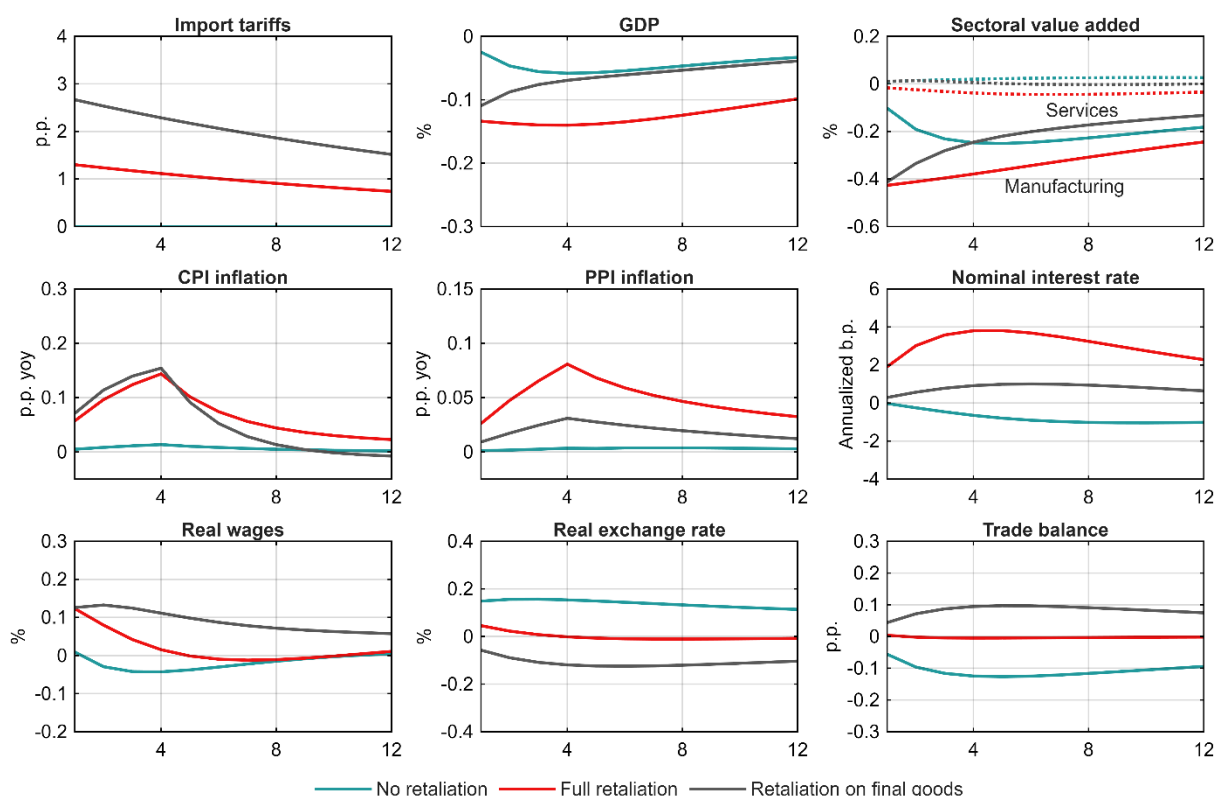
⁸ When monetary policy reacts to CPI inflation, real wages fall across all retaliation scenarios on impact. The results are available upon request.

5. Do firms' pricing decisions alter the costs of retaliation?

The baseline results assume that tariffs are largely passed through to domestic prices. In practice, however, pass-through may be incomplete. A large share of international trade is invoiced in the currency of the destination market or in the dominant international currencies, and firms often adjust prices only gradually. As a result, tariff changes may not be immediately reflected in retail prices. Instead, part of the adjustment can be absorbed through lower margins by exporters, importers, wholesalers or retailers along the supply chain. This is consistent with evidence showing that the retail-price impact of tariffs can be more limited than the border-price impact, implying margin compression along the distribution chain (Cavallo et al., 2021).

To capture this mechanism, I consider an alternative pricing specification featuring local-currency pricing and sticky import prices. Under local currency pricing, exporters set prices in the currency of the destination market, which makes import prices less responsive to exchange rate movements in the short run. Sticky import prices further slow the adjustment of prices faced by domestic firms and consumers, including in response to tariff changes. As a result, both exchange-rate pass-through and tariff pass-through are lower than in the baseline model. This is consistent with empirical evidence showing that the currency of invoicing is a key determinant of exchange-rate pass-through, with destination-currency pricing associated with lower pass-through (see Gopinath et al., 2010). The model is calibrated so that the pass-through of tariffs to domestic consumer prices in the manufacturing sector is 6% on impact, compared with approximately 12% in the baseline model. This lower pass-through is in line with recent empirical evidence showing limited pass-through of tariffs to retail prices.⁹

Figure 5: Macroeconomic effects of retaliation for the EU with limited pass-through
(per cent and percentage points from steady state)



Source: Author's calculations.

⁹ Precisely, for U.S. tariffs on Chinese imports in 2018-19, Cavallo et al. (2021) estimate retail-price pass-through of around 4.5% for household goods and around 7% for electronics.

Notes: The horizontal axis denotes quarters after the shock. Lines are expressed as percentage deviation from steady state. CPI and PPI inflation are shown as year-on-year percentage point deviations. The nominal interest rate is expressed in annualised basis points. The trade balance is expressed in percentage points deviations. An increase in the real exchange rate corresponds to a depreciation of the euro.

The main results are shown in **Figure 5**. Qualitatively, the previous findings are confirmed, but the transmission of tariffs differs. Limited pass-through dampens the immediate impact of tariffs on CPI inflation. In the retaliation scenarios, where the EU imposes tariffs on imports, part of the tariff is absorbed through lower margins rather than being fully reflected in consumer prices. As a result, the increase in CPI inflation is more contained than under complete pass-through. Specifically, CPI inflation in the retaliation scenarios rises by about 0.15pp on average in the first year, compared with around 0.2pp in the baseline model. At the same time, the slower adjustment of prices weakens expenditure switching and delays the response of investment and capital accumulation.

The muted inflation response is particularly visible in the no-retaliation scenario. Since the EU does not impose tariffs on imports, domestic prices are affected mainly through weaker external demand and exchange-rate movements. With sticky export and import prices, exchange-rate depreciation is passed through only to a limited extent. As a result, the inflationary impact of the shock is almost fully absorbed, leaving CPI inflation close to zero throughout. This contrasts with the baseline model, where exchange-rate movements are passed through more strongly to domestic prices.

GDP responses are also affected by the lower degree of pass-through, although the impact differs across scenarios. In the no-retaliation case, the decline in GDP is substantially smaller than in the baseline model. With local currency pricing and sticky import prices, imported input costs rise less sharply, cushioning the contraction in manufacturing activity and limiting the overall reduction in output. At the same time, exports decline less than under complete pass-through, providing additional support to economic activity.

The effect of limited pass-through is less favourable in the retaliation scenarios. Notably, GDP declines slightly more under limited pass-through than under complete pass-through when retaliation is concentrated on final goods. This reflects a weaker response of manufacturing activity, which contracts more sharply than in the baseline model. Because tariffs are only partially transmitted to domestic prices, the increase in the relative price of imported final goods is more muted. As a result, imports decline by less than under complete pass-through, indicating weaker expenditure switching towards domestic producers and reducing the support that retaliatory tariffs provide to economic activity.

Overall, limited pass-through changes the transmission of tariffs but not the ranking of retaliation strategies. By compressing margins and slowing the transmission of tariffs to domestic prices, local-currency pricing and sticky import prices dampen inflationary pressures and cushion the effects of foreign tariffs. At the same time, they weaken the adjustment of trade flows following retaliatory measures, reducing the benefits of retaliation on final goods. If the EU retaliates, retaliation focused on final goods remains the least less costly option, while full retaliation is still the most damaging strategy, as tariffs on intermediate inputs continue to operate as a negative supply shock.

6. How do international production networks amplify the effects of tariffs?

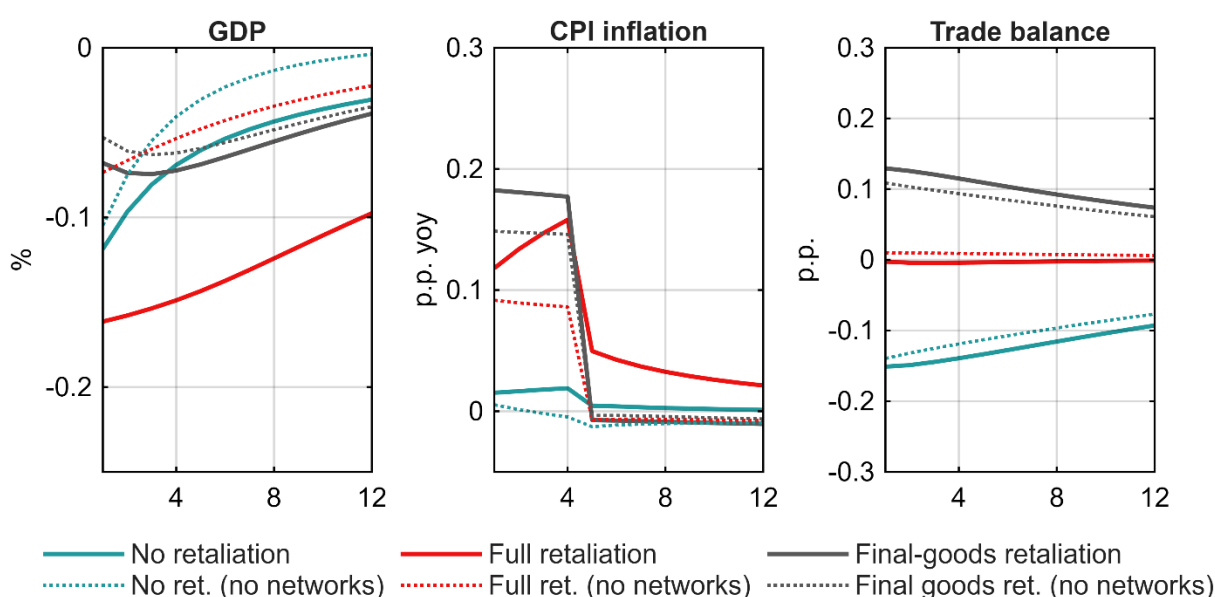
In a sensitivity analysis, I assess the importance of international production networks by considering a counterfactual economy in which cross-border input-output linkages are switched off. This exercise should not be interpreted as a realistic alternative for the EU economy, which is deeply integrated into global value chains. Rather, it provides a useful benchmark to isolate the extent to which production networks amplify the transmission of tariff shocks. The counterfactual retains the baseline assumptions regarding trade elasticities, isolating the role of international production linkages as the only source of variation relative to the benchmark economy. This approach is motivated by a growing literature highlighting the role of production networks in shaping the transmission of shocks. In sticky-price economies, production networks amplify the persistence of inflation by propagating cost pressures

across sectors (Afrouzi and Bhattarai, 2023), while their international dimension further magnifies the response of inflation to external sectoral shocks (Aguilar et al., 2025).

Results are shown in **Figure 6**. Solid lines correspond to the baseline results shown in Figure 4, while dotted lines represent the counterfactual without international production networks. International production networks act as an amplification mechanism for the impact of tariff shocks, especially under retaliation. When global value chains are active, tariffs on intermediate inputs propagate through supply chains, affecting a broad range of sectors beyond those directly targeted. This is particularly evident in the case of full retaliation, where the presence of production networks significantly magnifies both the decline in activity and the increase in inflation. The transmission operates through higher input costs, which cascade across sectors, raising production costs and making inflationary pressures more persistent.

Figure 6: Macroeconomic effects of retaliation for the EU: the role of production networks

(per cent and percentage points from steady state)



Source: Author's calculations.

Notes: The horizontal axis denotes quarters after the shock. GDP is expressed as percentage deviation from steady state, CPI inflation is shown as year-on-year percentage point deviations, while the trade balance is shown as percentage point deviations.

Importantly, production networks also matter in the absence of retaliation. When foreign tariffs reduce external demand for EU goods, the shock affects not only exporting sectors directly, but also upstream domestic suppliers linked to those sectors. These sectoral linkages amplify the decline in activity and can generate additional cost pressures relative to a setting without cross-border production networks. When international production networks are switched off, these amplification effects are mechanically absent, and the impact of tariffs appears more contained. This should not be interpreted as evidence that weaker integration is desirable. Rather, it shows that accounting for production networks is essential to properly capture the transmission of trade shocks in highly integrated economies such as the EU.

7. Conclusion and Policy Recommendations

This note shows that tariffs are not a uniform policy instrument: their macroeconomic impact depends critically on where along the supply chain they are applied, how firms set prices, and how the economy is structured. A first key insight is that tariffs on intermediate inputs are significantly more disruptive than tariffs on final goods. Tariffs on final goods mainly operate through consumer prices and expenditure

switching, generating a relatively short-lived increase in inflation and more contained effects on domestic production. By contrast, tariffs on intermediate inputs act as a negative supply shock: by raising firms' marginal costs and propagating through supply chains, they generate larger and more persistent losses in economic activity and more persistent cost pressures.

Second, the analysis highlights that, for the EU, the design of retaliation strategies matters as much as their size. While retaliation can partly offset the decline in exports by redirecting demand towards domestic producers, broad-based retaliatory tariffs tend to amplify domestic costs and weigh on activity. A more targeted approach focused on final goods appears less detrimental, as it limits the transmission of the shock through supply chains and contains the impact on firms' production costs.

These results are qualitatively robust when pass-through is limited. Local-currency pricing and sticky import prices reduce the transmission of both exchange-rate movements and tariffs to domestic prices, dampening the inflationary impact of tariff shocks and shifting part of the adjustment to firms' margins. The effects on GDP, however, differs across scenarios. In the absence of retaliation, lower pass-through cushions the decline in activity by limiting increases in imported input costs and supporting manufacturing output and exports. By contrast, when retaliation is concentrated on final goods, lower pass-through weakens the adjustment of relative prices and trade flows, reducing the support provided to domestic production. Nevertheless, limited pass-through does not eliminate the real costs of retaliation, nor does it alter the ranking of alternative strategies. In case the EU retaliates, full retaliation remains the most damaging scenario, while retaliation focused on final goods remains the least disruptive for domestic activity.

The analysis also underscores the role of international production networks. These act as a powerful amplification mechanism, especially when tariffs affect intermediate inputs. By transmitting higher input costs across sectors, production linkages magnify the decline in activity and prolong inflationary pressures. This is particularly relevant for highly integrated economies such as the EU, where firms rely heavily on cross-border supply chains. Taken together, the results suggest that the composition of tariffs is a central policy dimension.

Beyond their short-run effects on activity and inflation, higher tariffs may also weigh on investment, reduce productive capacity, and ultimately affect potential output over the medium to long run. These channels, however, are not explored in the present analysis.

Finally, some caveats are in order. The analysis is based on a two-region framework, distinguishing between the EU and the rest of the world. This structure captures the main transmission channels of tariff shocks but does not allow for a full representation of trade diversion across alternative partner countries. Extending the framework to explicitly model major economies such as the U.S. and China would allow for a richer evaluation of alternative trade reallocation patterns. Moreover, the analysis focuses on tariff shocks in isolation, does not assess non-tariff barriers or tariffs on services, and does not incorporate broader uncertainty or risk-premia channels that may accompany episodes of trade tensions. Finally, the ranking of alternative retaliation strategies is based on macroeconomic outcomes, such as GDP, inflation and sectoral activity. A full welfare assessment is left for future research.

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