BIS Working Papers
No 1316

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by Hongyan Zhao

Monetary and Economic Department

December 2025

JEL classification: F13, F41, E31, C68

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This publication is available on the BIS website (www.bis.org).

ISSN 1020-0959 (print)
ISSN 1682-7678 (online)

Assessing the Macroeconomic Impacts of the 2025 US Tariffs*

Hongyan Zhao

November 2025

Abstract

This paper develops a multi-country, multi-sector trade model with input-output linkages to analyze the global macroeconomic effects of the United States'(US) 2025 tariff policies. The model incorporates endogenous labor supply and captures the transmission of tariff-induced shocks through global value chains (GVCs). By simulating both short-run and long-run adjustments, the analysis demonstrates how trade shocks are amplified by sectoral interdependence and labor market dynamics. The results reveal substantial short-run output losses and inflationary pressures, especially for economies deeply integrated into US supply chains, while long-run reallocations partially mitigate—but do not fully offset—these impacts.

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*Hongyan Zhao, The Bank for International Settlements, Email: hongyan.zhao@bis.org. The views expressed in this publication are those of the authors and do not necessarily reflect the views of the BIS or its member central banks. We thank Benoit Mojon, Philip Wooldridge, and colleagues at the BIS MA thematic seminar for their helpful comments.

1 Introduction

Tariffs have re-emerged as a key tool of trade policy, carrying significant implications for global macroeconomic outcomes in an era of extensive cross-border production fragmentation. In 2025, the United States (US) implemented an unprecedented set of broad and sector-specific tariff measures, surpassing the scope of previous actions and raising the average effective tariff rate from 2.4% at the end of 2024 to 17.4%.[1] These measures provoked retaliation and heightened attention to their impact on the global economy.

To better understand these dynamics, this paper develops a framework to estimate the macroeconomic impacts of the 2025 trade war. We develop a multi-country, multi-sector quantitative trade model that incorporates three essential elements: (1) World input-output linkages; (2) endogenous labor supply and frictional labor market; (3) limited sourcing capacity for importers in the short-run but not in the long run.

These three features are crucial for evaluating the global impacts of the US tariff war. First, with the world economy now highly integrated, modeling global input-output linkages allows us to capture the cascading effects of tariffs throughout global supply chains. Second, many classic trade models (Eaton and Kortum, 2002; Melitz, 2003) assume exogenous labor supply and full employment, restricting the impact of openness to wages and prices alone. By allowing endogenous labor supply, we can better capture the potential impacts of tariff shocks on labor supply adjustment, which may amplify their effects on output and welfare. Thus, we follow Bonadio et al. (2021) to extend the framework of Caliendo and Parro (2015) to allow endogenous labor supply and frictional reallocation of labor across industries. Third, a key concern with US tariffs is their potential to disrupt existing supply chains, making it difficult for importers to find new suppliers in the short run. To take this into account, we follow Dekle et al. (2008) and assume that importers can not switch suppliers between countries in the short run but can source freely in the long

[1] The estimated effective tariff rate is provided by the Budget Lab at Yale, assuming no changes in the import shares across countries.

run. This assumption effectively lowers trade elasticities in the short run compared to the long run, consistent with recent studies by Boehm et al. (2023) and Boehm et al. (2024).

The key findings of our approach are as follows. Broad-based tariffs result in widespread output losses, with the largest impacts observed in economies closely linked to the US through supply chains. At the sectoral level, manufacturing is the most affected due to its high intermediate input intensity and central role in input-output networks. However, services also experience notable output declines through input-output linkages, even in the absence of direct tariffs.

Price responses vary across countries, shaped by the interplay between cost-push and demand effects. While the US experiences a significant inflationary impulse, some close trading partners—most notably Mexico—see short-run price declines despite output losses, as negative external demand outweighs cost-push pressures. In other regions, small positive price changes are observed as rising imported input costs are offset by weaker US absorption. The amplification effects of GVCs are evident when comparing the direct effect of tariffs on prices to the total effect, which includes production chain linkages.

In the long run, heterogeneous trade elasticities mitigate—but do not fully eliminate—the real and price effects of tariffs. US output losses narrow, and domestic inflation eases modestly as firms adjust by re-sourcing from untariffed suppliers. Labor-supply elasticity serves as a critical amplifier: higher elasticity intensifies the feedback loop from real-wage compression to labor input, exacerbating output losses for a given tariff configuration.

The design of tariff policies plays a crucial role. A comparison between a broad-based tariff regime and a narrower configuration—targeting China and specific industries while lifting generalized measures on other trading partners—reveals significantly smaller global output losses and price increases under the narrower regime. This is mainly attributed to fewer disruptions in input-output linkages and a weaker multiplier effect. Additionally, trade diversion becomes more pronounced under the narrower regime: Vietnam, for instance, shifts from experiencing losses to gains as US imports pivot away from China.

This paper contributes to the growing body of literature on quantifying the impacts of the 2018-2019 and 2025 US tariff wars on the global economy by using tractable general equilibrium models. For example, right before President Trump announced tariff hikes in March 2018, Guo et al. (2018) adopt the standard quantitative trade model of Caliendo and Parro (2015) and estimate the welfare cost of the hypothetical US-China trade war if bilateral trade costs between the two countries increase by 45%. They find that the welfare losses for the US and China are moderate and similar. Since then, it has become popular in both academia and policy circles to use quantitative trade models to estimate the potential macroeconomic impact of the trade war (Caliendo and Parro, 2022; Lashkaripour, 2021; Ju et al., 2024).

Our paper is closely related to two recent studies on the US 2025 trade war, namely Ignatenko et al. (2025) and Rodríguez-Clare et al. (2025a). Ignatenko et al. (2025) derive the optimal tariffs under a general one-sector trade model and find that the US tariffs announced on the "Liberalization Day", based on bilateral trade deficits, differ substantially from the optimal design. They also find that the welfare impacts of the 2025 trade war hinge on the US trade partners' retaliatory behavior and the world input-output linkages. Our paper differs from their approach by allowing labor market frictions across sectors, and we also compare the short-run and long-run scenarios. Moreover, we highlight the importance of input-output linkages in propagating the impact of US tariffs.

Rodríguez-Clare et al. (2025a) adopt a dynamic trade and reallocation model to quantify the impact of 2025 tariffs, based on their early work Rodríguez-Clare et al. (2025b). By introducing downward nominal wage rigidities in labor supply, they can study the short-run impact of the tariff on US employment. They find that higher tariffs lead to a rise in US manufacturing employment but declines in service and agricultural jobs. We also find similar results for labor inputs. However, their study focuses on the impact across states in the US, while we emphasize the global impact of US tariffs across countries.

Our paper also contributes to the empirical literature on the impact of tariffs. Fajgelbaum et al. (2020) estimate that the 2018 US tariffs, along with retaliatory measures, resulted in declines in both imports and exports, as well as aggregate real income losses. Additionally, Amiti et al. (2019) find that US consumers and importing firms bore the majority of the cost, as there was nearly complete pass-through of tariffs to US import prices. Furthermore, Sheng et al. (2025) highlight the presence of vertical trade diversion, where Chinese exporters responded to US tariff hikes by moving down the quality ladder of their export destinations.

One caveat of our paper is that we do not model the uncertainty of the US tariffs regarding their implementation and persistence. The literature has documented that trade policy uncertainty has substantial impacts on firm entry, exports, employment, and investment (Pierce and Schott, 2016; Handley and Limão, 2017; Alessandria et al., 2025; Benguria et al., 2022). Moreover, our model does not include financial frictions, and the impact of the trade war on the financial market is muted in our quantitative exercise (Huang et al., 2023). Thus, our findings should be viewed as part of the potential costs of the Liberation Day tariffs for the US and the rest of the world.

The remainder of the paper proceeds as follows. Section 2 presents the quantitative trade model. Section 3 reports the counterfactual estimation results for output and prices in the baseline and alternative tariff scenarios, and decomposes the amplification into direct exposure, IO multipliers, and labor-supply channels. Section 4 concludes.

2 A Quantitative Trade Model

In this section, we develop a multi-country, multi-sector general equilibrium trade model with input-output linkages to evaluate the global impact of US tariffs and possible retaliatory tariffs from its trade partners.

2.1 Model Setup

We assume that there are N countries, each with J industries or sectors. Each country has representative households that consume final goods and provide labor to different industries. Following Bonadio et al. (2021), households in the country n face a trade-off between consumption and leisure, represented by the utility function

$$U_n = C_n - \sum_{j=1}^{J} \left(L_n^j\right)^{1+\frac{1}{\psi}}. \tag{1}$$

Here C_n is a Cobb-Douglas aggregator of sectoral final consumption bundles

$$C_n = \prod_{j=1}^{J} \left(\frac{C_n^j}{\alpha_n^j}\right)^{\alpha_n^j}, where \sum_{j=1}^{J} \alpha_n^j = 1. \tag{2}$$

L_n^j represents the labor provided to the sector j. Given the wage rate w_n^j and the price of the final consumption bundle P_n, the labor supply to the sector j is determined as

$$L_n^j \propto \left(\frac{w_n^j}{P_n}\right)^{\psi}, \tag{3}$$

where $\psi > 0$ is the elasticity of the labor supply. Wages vary by sector, and labor allocation is influenced by sector-specific real wages, with labor being imperfectly mobile across sectors. Endogenous labor supply implies that when sectoral output and real wages decline due to a hike in trade costs, the labor supply to that sector also declines, which in turn amplifies the output loss. This helps to address the common issue that trade shocks often result in small output effects in many quantitative trade models with inelastic labor supply.

We follow Eaton and Kortum (2002) and Caliendo and Parro (2015) to model GVCs.

Within sector j, a continuum of intermediate goods $\omega_j \in [0,1]$ is produced using the following production function

$$y_n^j(\omega_j) = z_n^j(\omega_j) \left(L_n^j(\omega_j)\right)^{\gamma_n^j} \prod_{k=1}^{J} \left(Y_n^k(\omega_j)\right)^{\gamma_n^{k,j}}, \tag{4}$$

where $z_n^j(\omega_j)$ is productivity, drawn i.i.d. from a country-sector-specific Fr$\acute{e}$chet distribution $F(z) = \exp\{-T_n^j z^{-\theta_j}\}$. Here, T_n^j is the location parameter(higher values indicate higher average productivity), and θ_j is the shape parameter (lower values imply greater productivity dispersion). Y_n^k is the composite intermediate input from sector k. The parameter γ_n^j represents the share of value added, while $\gamma_n^{k,j}$ represents the share of composite intermediate goods of sector k used in the production of intermediate goods in sector j, with $\sum_{k=1}^{J} \gamma_n^{k,j} = 1 - \gamma_n^j$. Firms operate under perfect competition and price their products at unit cost, $c_n^j / z_n^j(\omega_j)$, where c_n^j is the unit input bundle cost

$$c_n^j \propto \left(w_n^j\right)^{\gamma_n^j} \prod_{k=1}^{J} \left(P_n^k\right)^{\gamma_n^{k,j}}. \tag{5}$$

The cost depends on the wages and the price of all composite intermediate goods P_n^k, which means that changes in any sector indirectly affect all others through input-output linkages.

Producers of composite intermediate goods in the country n and sector j source intermediates ω_j from the lowest-cost supplies across countries, integrating them into a sectoral final good using a CES form

$$Q_n^j = \left(\int_0^1 \left(q_n^j(\omega_j)\right)^{\frac{\sigma-1}{\sigma}} d\omega_j\right)^{\frac{\sigma}{\sigma-1}}, \tag{6}$$

where σ is the substitution elasticity in intermediate products within the sector j. Higher σ values indicate greater ease of substitution in response to price shocks. The sectoral final good is either consumed as C_n^j by households or is used as an input in the production of intermediate goods $y_n^j(\omega_j)$. The price of composite intermediate goods is

$$P_n^j = \left(\int_0^1 \left(p_n^j(\omega_j) \right)^{1-\sigma} d\omega_j \right)^{\frac{1}{1-\sigma}}. \tag{7}$$

Intermediate goods are tradable across countries, subject to bilateral trade costs κ_{ni}^j. The price of intermediate goods is $p_n^j(\omega_j) = min_i \frac{\kappa_{ni}^j c_i^j}{z_i^j(\omega_j)}$. Under the assumption that productivity follows a Fr$\acute{e}$chet distribution and that these distributions are independent across goods, sectors, and countries, the price of composite intermediate goods can be represented as

$$P_n^j = \Upsilon^j \left(\sum_{i=1}^{N} T_i^j \left(\kappa_{ni}^j c_i^j \right)^{-\theta_j} \right)^{-\frac{1}{\theta_j}}. \tag{8}$$

Trade cost shocks (κ_{ni}^j) affect sectoral prices (P_n^j), and their total effect on inflation is amplified through input-output linkages (c_i^j). The consumption price index is then given by

$$P_n = \prod_{j=1}^{J} (P_n^j)^{\alpha_n^j}. \tag{9}$$

The total expenditure on goods in sector j in country n is given by $X_n^j = P_n^j Q_n^j$, and the expenditure share on sector j goods from country i is $\pi_{ni}^j = \frac{X_{ni}^j}{X_n^j}$. Using the properties of the Fréchet distribution, the share of expenditure is expressed as a function of technologies (T_i^j), unit costs (c_i^j), and trade costs (κ_{ni}^j):

$$\pi_{ni}^j = \frac{T_i^j \left(\kappa_{ni}^j c_i^j \right)^{-\theta_j}}{\sum_{h=1}^{N} T_h^j \left(\kappa_{nh}^j c_h^j \right)^{-\theta_j}}. \tag{10}$$

The clearing condition for the goods market is

$$X_n^j = \sum_{k=1}^{J} \gamma_n^{j,k} \sum_{i=1}^{N} \pi_{in}^k X_i^k + \alpha_n^j \sum_{k=1}^{J} w_n^k L_n^k. \tag{11}$$

2.2 Short-Run and Long-Run Adjustments

The impact of tariffs on supply chains varies in the short and long run. In the short run, firms face rigidities in adjusting supply chains due to intra-firm trade and contractual obligations (Antràs, 2003; Antràs et al., 2022). Adjustments occur primarily through the intensive margin, with limited changes on the extensive margin. In contrast, the long run allows firms to reallocate suppliers and form new trade relationships, easing supply chain restrictions.

Following Dekle et al. (2008), let the costs of the input bundles in each country i for sector j change from c_i^j to $c_i^{j\prime}$, and let the bilateral trade costs change from κ_{ni}^j to $\kappa_{ni}^{j\prime}$. These changes can be expressed as ratios: $\hat{\kappa}_{ni}^j = \frac{\kappa_{ni}^{j\prime}}{\kappa_{ni}^j}$ and $\hat{c}_i^j = \frac{c_i^{j\prime}}{c_i^j}$. Under these conditions, the counterfactual trade shares and prices can be represented as:

$$\pi_{ni}^{j\prime} = \frac{\pi_{ni}^j \left(\hat{\kappa}_{ni}^j \hat{c}_i^j\right)^{-\lambda_j}}{\sum_{h=1}^N \pi_{nh}^j \left(\hat{\kappa}_{nh}^j \hat{c}_h^j\right)^{-\lambda_j}} \tag{12}$$

$$p_n^{j\prime} = p_n \left(\sum_{i=1}^N \pi_{ni}^j \left(\hat{\kappa}_{ni}^j \hat{c}_i^j\right)^{-\lambda_j} \right)^{-\frac{1}{\lambda_j}}, \tag{13}$$

where the elasticity λ_j differs between the short run and the long run. [2] In the long run, the parameter θ, which reflects differences in productivity, determines how changes in costs translate into trade shares and prices. However, when the extensive margin is excluded, the parameter that determines how costs influence trade shares and prices changes to $\sigma - 1$, as in the Armington model, where σ represents the within-sector substitution elasticity among intermediate products.

$$\lambda_j = \begin{cases} \theta_j, & \text{long run} \\ \sigma - 1, & \text{short run} \end{cases} \tag{14}$$

Elasticity λ is critical in determining the welfare implications of international trade (Arko-

[2] For a detailed derivation, see Dekle et al. (2008).

lakis et al., 2012). Studies by Chaney (2008) and Bas et al. (2017) hint that short-run elasticity is driven by the demand side, while long-run elasticity originates from the supply side. In the short run, supply shocks are absorbed by importers due to sticky supply adjustments, whereas in the long run, supply chains adjust to a new equilibrium, partially offsetting the short run effects.

3 Counterfactual Analysis

3.1 Data and parameters

We used the 2023 Asian Development Bank Multiregional Input-output Table (ABD MRIO) to approximate global supply chains. This IO table, the most up-to-date, covers 62 countries-including major developed and emerging market economies-and the rest of the world. It identifies 35 industries, which we have aggregated into 16 for our analysis. Table 1 lists the key model parameters for the counterfactual analysis. The bilateral trade share (π^j_{ni}), value-added share (γ^j_n), share of materials from sector k used to produce intermediate goods in sector j ($\gamma^{j,k}_n$), and consumption expenditure share (α^j_n) are all derived from the 2023 IO table. Labor supply elasticity ψ is set at 0.3.[3] A higher value indicates greater responsiveness of labor to cost shocks, which will be discussed in detail later.

The main difference between short- and long-run impacts arises from adjustment elasticity, as discussed in Section 2.2. Long-run elasticity is typically larger than short-run elasticity, as shown in studies such as Dekle et al. (2008) and Bonadio et al. (2021). Higher long-run elasticity enables markets to adjust more easily by shifting away from the original supply chains and forming new trade relationships. For the short-run case, we set $\sigma = 2.75$, corresponding to a substitution elasticity of 1.75, consistent with the estimates of Huo et al. (2025).[4] For the long-run case, we follow the sectoral elasticity estimates

[3] Greenwood et al. (1988) reported intertemporal labor elasticity values ranging from 0.3 to 2.2. We adopt the lower bound to ensure that the impact on output remains moderate.

[4] Dekle et al. (2008) used $\sigma = 2$ in their seminal work on global trade imbalances, while a value of

from Caliendo and Parro (2015), detailed in Table 2.[5]

3.2 Impact of Tariffs on output and prices

We simulate the effects of the announced tariffs as of 25 August 2025. These tariffs include sector-specific rates—25% on transports and 50% on metals—as well as country-specific tariffs imposed by the US and retaliatory tariffs from China and Canada. For details, see Table 3. Changes in tariffs directly translate into changes in trade costs. Assuming tariffs and non-tariff trade costs are multiplicative, and all other factors in trade costs remain constant, the changes in trade costs are one-to-one with the tariff adjustments. Note that changes in trade costs are applied to intermediate inputs, and thus the effect of trade cost shocks will be amplified by the global supply chain. To assess the impacts of these newly announced tariffs, we present the deviations in output and prices from a counterfactual scenario where tariffs remained at their end-2024 levels.

Figure 1 shows that output declines in nearly all economies compared to a non-tariff baseline. The US itself suffers a significant output drop of 0.9%, driven by higher imported input costs, increased unit costs for firms, and compressed real wages and value added. Canada and Mexico face deeper downturns due to their strong manufacturing linkages with the US. In contrast, China, the European Union, and ASEAN economies fare somewhat better in the short run, either because their exposure to the highest tariffs is limited or because diversified export markets dilute direct tariff shocks. Manufacturing bears the largest burden, reflecting its high reliance on intermediate inputs and its central role in inter-sectoral flows. Services also contract, despite not being directly levied tariffs, due to input-output linkages.

Price changes vary across countries, shaped by the direct pass-through of higher trade costs and amplification through input-output networks.[6] Figure 2 shows that tariffs are

$\sigma = 3.79$ was used in Bernard et al. (2003).

[5] Dekle et al. (2008) set $\theta = 8.28$ for all sectors, following Eaton and Kortum (2002).

[6] In our model, the c.i.f import price is the product of the exporter's f.o.b price and trade costs (including

inflationary in the US, raising its price level by 2.6% in the short run. However, the negative external demand effect exerts deflationary pressure on some US trade partners, such as Mexico, where it outweighs cost-push effects, leading to price declines. In Europe and Asia, small positive price changes reflect a mix of higher imported input costs and weaker external demand, with the balance determined by each economy's bilateral exposure and position in global production networks. Retaliatory tariffs from Canada and China further increase price levels in those countries. Sectorally, services contribute the most to price changes in most countries.

The impact on labor also deserves attention. Figure 3 illustrates that while labor in the US manufacturing sector increases—particularly in the metals sector, where the US imposes uniformly high tariffs on all countries—this comes at the expense of declines in other sectors, including agriculture, mining, utilities, construction, and services.

Tables 4 and 5 highlight the differences between short- and long-run results. Changes in US output improve from -0.9% to -0.7% in the long run as sourcing adjusts, and inflation eases marginally due to the rebalancing of expenditure shares. However, persistent losses in key partners, such as Mexico, underscore that not all economies benefit equally from reallocation. Geographic, contractual, and regulatory frictions can constrain alternative sources, while retaliatory structures may prolong or worsen long-run outcomes. Similarly, economies experiencing short-run deflation due to weak demand may see less deflation—or even inflation—in the long run as supply chains reconfigure and new cost structures emerge.

3.3 Supply Chain Effect on Inflation

To understand the transmission mechanism of the tariff effect on inflation, we combine equations 5 and 8 and apply a first-order Taylor expansion at the point $(\hat{p}_n^j = 1, \hat{\kappa}_{ni}^j =$

tariff). However, it does not imply the complete pass-through, as the exporter's f.o.b price will also adjust to the trade cost shocks.

$1, \hat{w}_i^j = 1)$, where $\hat{x} - 1 = \frac{dx}{x} = d\log x$

$$d\log p_n^j \approx \sum_i^N \pi_{ni}^j d\log \kappa_{ni}^j + \sum_i^N \pi_{ni}^j \left(\gamma_i^j d\log w_i^j + \sum_{k=1}^J \gamma_i^{k,j} d\log p_i^k \right) + O(2), \tag{15}$$

where $O(2)$ represents higher order effects. This equation provides a theoretical measure of shock intensity at the country-sector level, i.e., $\sum_i^N \pi_{ni}^j d\log \kappa_{ni}^j$.[7] Rearranging the equation separates the direct impact from the general equilibrium effects of labor market adjustments, expressed in matrix form

$$d\log P = (I - \mathcal{G})^{-1} \Pi \left(d\log \kappa + \Gamma d\log W \right), \tag{16}$$

where $d\log \kappa$ captures the direct tariff shock on trade costs, and the matrix Π resembles transmission through supply chains. The matrix $\mathcal{G}$, involving Π and Γ, amplifies the multiplier $(I - \mathcal{G})^{-1}$ based on the degree of reliance on intermediate inputs. Adjustments in labor markets further influence inflation through changes in wages $d\log W$ in supplier countries.

Figure 4 illustrates the multiplier effects of GVCs. Plotting $(I - \mathcal{G})^{-1} \Pi dlog\kappa$ against direct tariff exposure $\Pi dlog\kappa$ shows that most observations lie above the 45^o line, visually confirming that input–output linkages amplify direct shocks. Cross-sector linkages indicate that cost increases in one sector raise input prices for downstream users, who then pass these costs further along the supply chains.

3.4 Sensitivity Analysis

The estimated effect on output and prices will depend on the parameters. The elasticity of labor supply (ψ) plays a critical role in amplifying output losses. Households balance consumption against the dis-utility of work, meaning tariff-induced price increases re-

[7] Most of the $d\log \kappa$ terms are zero, so $\sum_i \pi_{ni}^j d\log \kappa_{ni}^j$ primarily measures exposure to tariff-imposing countries.

duce real wages and curtail labor supply across sectors. When ψ is higher, this feedback loop is stronger: a given cost shock results in a larger contraction in labor input and, consequently, output. Economies with more elastic labor supply experience greater real-side amplification of trade shocks. Figure 5 shows that when ψ is greater than the baseline value, output losses increase for all countries. Conversely, if ψ is significantly smaller, output losses decrease.

As mentioned in 2.2, the substitution elasticity within sectors, σ, is a key parameter that measures how trade shares and prices respond to cost changes when firms adjust only on the intensive margin. This elasticity is lower than the long-run substitution parameter for each sector, so we use different values for short-run and long-run analyses. Intuitively, even in the short run, if the substitution elasticity increases, the impacts on output and prices become smaller as firms adjust more actively in allocating spending across goods. This relationship is clearly illustrated in Figure 6, where high elasticity results in reduced output losses in all sectors.

3.5 Different Tariff Scenarios

Tables 6 and 7 show the role of tariff breadth. When the US retains sector-specific tariffs on steel, aluminum, and cars, along with China-focused measures, but removes generalized tariffs on other partners, both global output losses and inflation are significantly lower compared to a scenario with broad-based tariffs. This aligns with the implications of the model's matrices Π and G: a narrower set of κ shocks reduces the propagation channels through the network, thereby reducing the magnitude of the multiplier $(I - G)^{-1}$. In this narrower regime, trade diversion becomes more prominent. Vietnam shifts from a small output loss to a gain as US imports pivot away from China, reallocating market share to other suppliers. For Canada and Mexico, reduced direct tariff exposure lowers cost-push pressures, but weaker US demand in affected categories still depresses prices, deepening short-run deflationary pressures even as output remains strained by demand-side spillovers.

4 Conclusion

This paper employs a multi-country, multi-sector model with input–output linkages and endogenous labor supply to assess the macroeconomic consequences of the US 2025 tariff policies. The results demonstrate significant short-run output losses and inflationary pressures, particularly in economies tightly integrated into US supply chains, such as Canada and Mexico. Manufacturing sectors are the most affected due to their heavy reliance on intermediate inputs, while services experience indirect effects through input-output linkages.

The model is able to analyze both the direct effects of tariffs and the indirect effects transmitted through the structure of supply chains. The inclusion of an endogenous labor supply assumption enables a more meaningful estimation of GDP losses compared to models without this feature. Additionally, the model is versatile and can be applied to various scenarios, such as tariffs imposed on specific countries, country groups, or between country blocs, as well as their effects on different sectors.

However, the model has certain limitations. It is real and static, relying on adjustments in relative wages and prices while excluding the influence of exchange rates and monetary policy. Additionally, it does not account for transitional dynamics, such as capital accumulation or adjustment costs. Addressing these limitations would require expanding the model and integrating it into more comprehensive macroeconomic frameworks.

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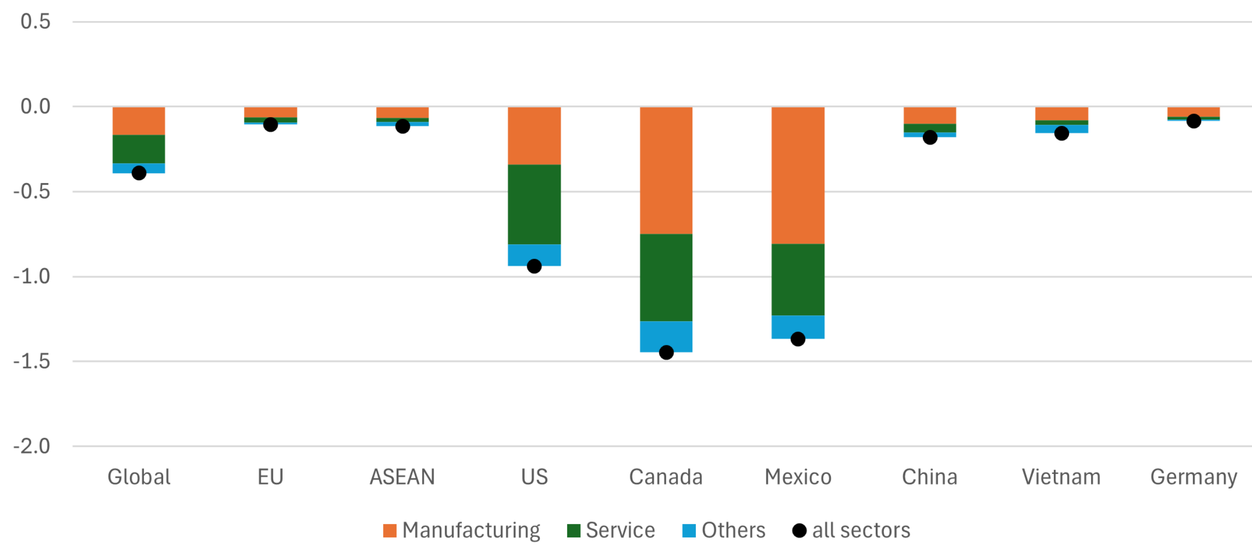
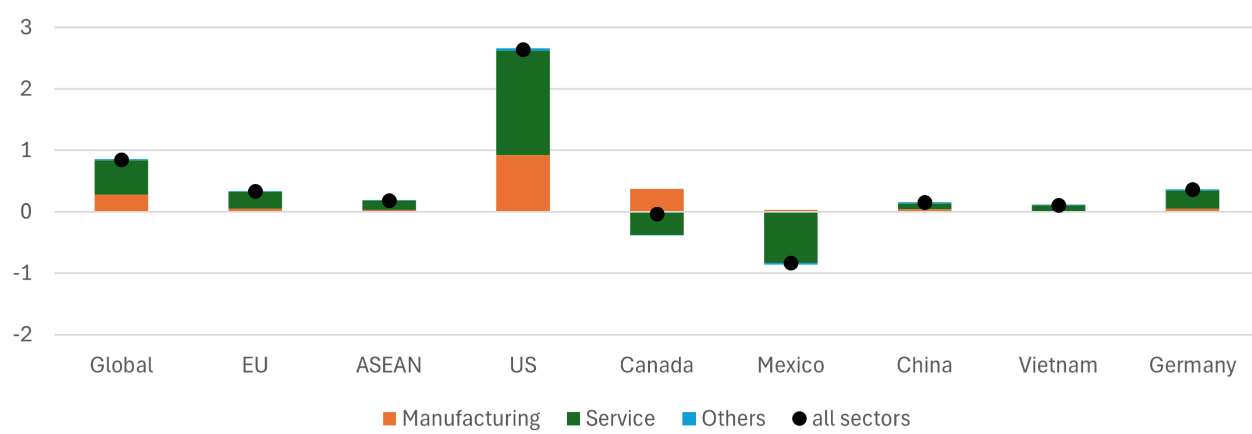
Tables and Figures

Figure 1: Estimated output changes by sector for selected countries (%)



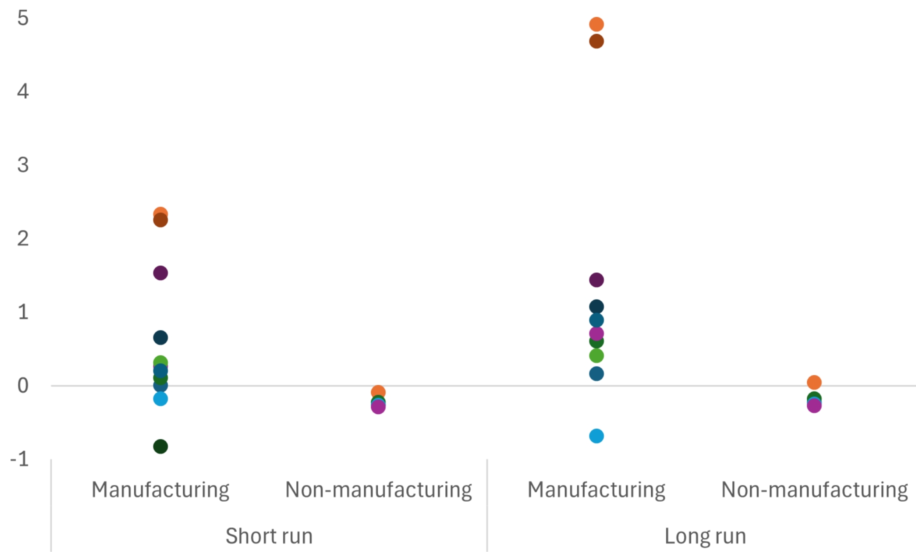
Note: The figure illustrates the short-run impacts of announced tariffs as of 25 August, based on trade model simulations. These impacts are shown as deviations from a counterfactual scenario in which tariffs remain at their end-2024 levels.

Figure 2: Estimated price changes by sector for selected countries (%)



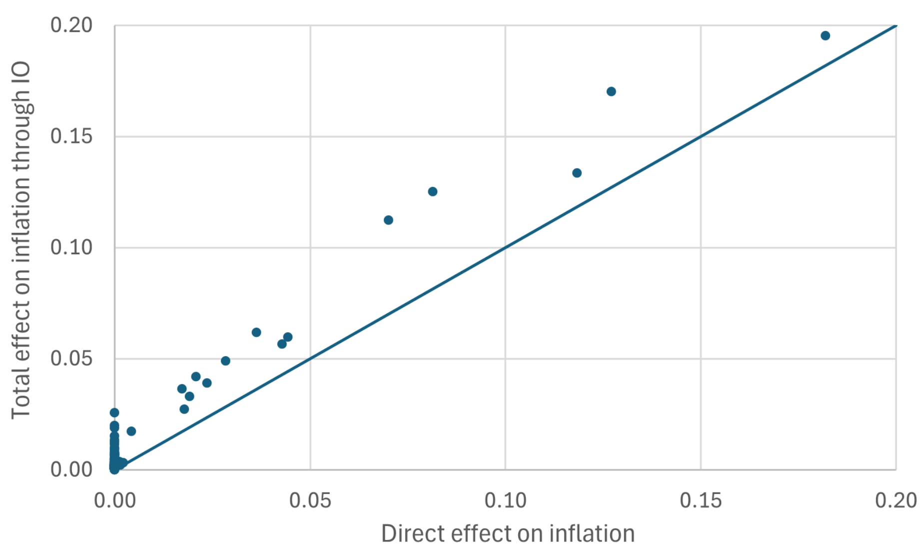
Note: The figure illustrates the short-run impacts of announced tariffs as of 25 August, based on trade model simulations. These impacts are shown as deviations from a counterfactual scenario in which tariffs remain at their end-2024 levels.

Figure 3: Estimated changes in labor (%)



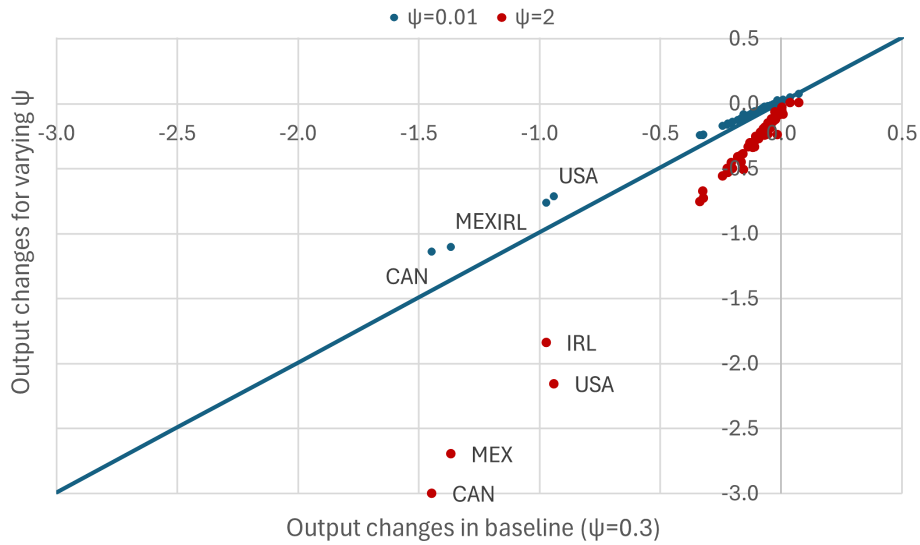
Note: Each dot represents the percentage change in deviations from a counterfactual scenario where tariffs remain at their end-2024 levels for a specific sector within a country. Sectors 3-13 in Table 2 are classified as manufacturing sectors, while sectors 1-2 and 14-16 are categorized as non-manufacturing sectors.

Figure 4: Influence of supply chains



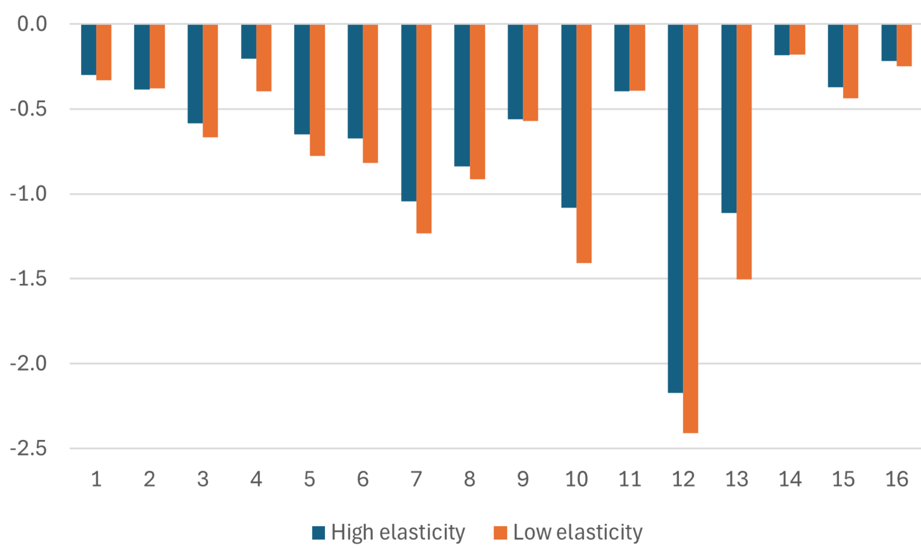
Note: Each dot represents a sector within a country.

Figure 5: Impact of labor supply elasticity



Note: Each dot represents a country. ψ is labor supply elasticity.

Figure 6: Impact of substitution elasticity



Note: Each cluster of columns represents the output changes for a specific sector (a total of 16 sectors, see Table 2), globally averaged and weighted by each country's output. The low elasticity value used in this analysis matches our baseline value of 2.75. To approximate high elasticity, we double this value. The resulting differences illustrate the impacts of substitution elasticities.

Table 1: Model Parameters

Parameters	Description	Value	Source
π_{ni}^{j}	Bilateral trade share	-	ADB MRIO
γ_{n}^{j}	Value added share	-	ADB MRIO
$\gamma_{n}^{j,k}$	Share of goods from k to produce ω_j	-	ADB MRIO
α_{n}^{j}	Consumption expenditure share	-	ADB MRIO
σ	Intermediate substitution elasticity	2.75	Huo et al. (2025)
ψ	Labor supply elasticity	0.3	Greenwood et al. (1988)
θ^{j}	Long-run trade elasticity	Table 2	Caliendo and Parro (2015)

Table 2: Industries and their long-run trade elasticities

Code	Description	θ_j
1	Agriculture	8.11
2	Mining, petroleum, and natural gas	15.72
3	Food, beverages, and tobacco	2.55
4	Textiles and textile products; leather, leather products, and footwear	5.56
5	Wood and products of wood and cork; pulp, paper, paper products, printing, and publishing	9.95
6	Coke, refined petroleum, and nuclear fuel	51.08
7	Chemicals and chemical products	4.75
8	Rubber and plastics	1.66
9	Other nonmetallic minerals	2.76
10	Basic metals and fabricated metal	6.15
11	Electrical and optical equipment; machinery, nec.	10.60
12	Transport equipment	7.07
13	Manufacturing, nec; recycling	1.52
14	Electricity, gas, and water supply	4.00
15	Construction	4.00
16	Service	4.00

Note: We aggregate the 35 industries in the Asian Development Bank Multiregional Input-Output Table into 16 industries. The long run elasticity θ_j is adopted from Caliendo and Parro (2015). For non-manufacturing sectors, including codes 14, 15, and 16, the value is set to 4. These sectors are largely non-tradable across countries, so this choice has minimal impact on international spillovers.

Table 3: Tariffs by Country

Country	US Tariffs	Retaliatory Tariffs
World	0% S11-electrical & machinery (excl. KR 15%) 50% S10-metals (excl. UK 25%) 25% S12-transport equipment (excl. EU, JP, and KR 15%, UK 10%)	
China	30%	20% S1-agriculture 25% S2-mining, petroleum and gas 10% all other sectors
Canada	5% S2-mining, petroleum and gas 17.5% all other sectors	12.5% S10-metals 12.5% S12-transport equipment
Mexico	12.5% all sectors except services	
Brazil	50%	
India	50%	
Laos	40%	
Switzerland	39% (excl. S7-chemicals at 0%)	
Hong Kong SAR	30%	
Brunei	25%	
Kazakhstan	25%	
Bangladesh	20%	
Sri Lanka	20%	
Vietnam	20%	
Cambodia	19%	
Indonesia	19%	
Malaysia	19%	
Pakistan	19%	
Philippines	19%	
Thailand	19%	
Fiji	15%	
Japan	15%	
Korea	15%	
Norway	15%	
Turkey	15%	
EU 27	15%	
United Kingdom	10%	
Others	10%	

Note: The tariff assumptions are based on the White House Executive Orders issued before 25 August 2025. Tariffs are applied to tradable sectors, specifically sectors 1-13 listed in Table 2. Assume that 50% of imports by value from Mexico and Canada are USMCA-compliant, based on data from The Budget Lab at Yale. As a result, tariffs of 10%, 35%, and 25% on Canada's mining sectors, other sectors, and Mexico's imports across all sectors translate to effective rates of 5%, 17.5%, and 12.5%, respectively. Additionally, we assume that 50% of Canada's imports from the US in the steel, aluminum, and automotive industries are non-USMCA compliant, resulting in an effective tariff rate of 12.5% from the 25% tariff.

Table 4: Short-run and long-run impacts on output across countries

Country	SR	LR	Country	SR	LR
Australia	-0.09	-0.08	Latvia	-0.04	-0.01
Austria	-0.10	-0.12	Lithuania	-0.13	-0.14
Bangladesh	0.00	0.01	Luxembourg	-0.32	-0.33
Belgium	-0.17	-0.16	Malaysia	-0.09	-0.06
Bhutan	0.01	0.02	Maldives	0.07	0.06
Brazil	-0.22	-0.14	Malta	-0.05	0.01
Brunei	-0.07	-0.05	Mexico	-1.37	-1.10
Bulgaria	-0.01	0.00	Mongolia	-0.12	-0.11
Cambodia	-0.01	0.03	Nepal	0.04	0.03
Canada	-1.45	-1.52	Netherlands	-0.16	-0.14
China	-0.18	-0.12	Norway	-0.08	-0.06
Croatia	-0.01	0.01	Pakistan	-0.08	-0.07
Cyprus	-0.04	-0.03	Philippines	-0.08	-0.07
Czechia	-0.04	-0.03	Poland	-0.05	-0.02
Denmark	-0.11	-0.09	Portugal	-0.04	-0.03
Estonia	-0.03	-0.02	Romania	0.00	0.02
Fiji	-0.32	-0.39	ROW	-0.11	-0.07
Finland	-0.13	-0.16	Russia	-0.04	-0.04
France	-0.05	-0.04	Singapore	-0.16	-0.10
Germany	-0.08	-0.10	Slovakia	0.03	0.02
Greece	-0.07	-0.07	Slovenia	-0.03	-0.05
Hong Kong SAR	-0.05	-0.03	Spain	-0.05	-0.05
Hungary	-0.13	-0.16	Sri Lanka	-0.01	-0.01
India	-0.21	-0.16	Sweden	-0.14	-0.15
Indonesia	-0.06	-0.06	Switzerland	-0.22	-0.20
Ireland	-0.97	-1.15	Chinese Taipei	-0.20	-0.16
Italy	-0.07	-0.07	Thailand	-0.24	-0.20
Japan	-0.07	-0.06	Turkey	-0.07	-0.04
Kazakhstan	-0.07	-0.06	United Kingdom	-0.09	-0.07
Korea	-0.34	-0.32	USA	-0.94	-0.72
Kyrgyzstan	-0.02	-0.01	Vietnam	-0.16	-0.10
Laos	-0.06	-0.04			

Note: SR represents the short-run change in real value added, while LR stands for the long run. The values are expressed as percentage changes. ROW refers to the rest of the world.

Table 5: Short-run and long-run impacts on prices across countries

Country	SR	LR	Country	SR	LR
Australia	0.29	0.46	Latvia	0.28	0.38
Austria	0.26	0.39	Lithuania	0.32	0.41
Bangladesh	0.18	0.29	Luxembourg	0.50	0.50
Belgium	0.40	0.59	Malaysia	0.37	0.42
Bhutan	-0.17	0.08	Maldives	0.24	0.38
Brazil	-0.33	0.13	Malta	0.31	0.39
Brunei	0.25	0.42	Mexico	-0.84	-1.00
Bulgaria	0.24	0.35	Mongolia	-0.28	0.44
Cambodia	0.18	0.32	Nepal	-0.03	0.15
Canada	-0.03	-0.06	Netherlands	0.43	0.54
China	0.16	0.35	Norway	0.31	0.41
Croatia	0.26	0.38	Pakistan	0.33	0.39
Cyprus	0.32	0.45	Philippines	0.21	0.37
Czechia	0.30	0.40	Poland	0.29	0.39
Denmark	0.40	0.52	Portugal	0.26	0.39
Estonia	0.27	0.38	Romania	0.27	0.38
Fiji	0.11	0.12	ROW	0.28	0.42
Finland	0.18	0.29	Russia	0.15	0.30
France	0.36	0.48	Singapore	0.52	0.50
Germany	0.36	0.46	Slovakia	0.26	0.38
Greece	0.24	0.39	Slovenia	0.26	0.39
Hong Kong SAR	0.32	0.49	Spain	0.27	0.40
Hungary	0.32	0.42	Sri Lanka	0.16	0.39
India	-0.16	0.09	Sweden	0.35	0.40
Indonesia	0.06	0.21	Switzerland	0.42	0.50
Ireland	0.78	0.82	Chinese Taipei	0.36	0.40
Italy	0.22	0.34	Thailand	0.16	0.34
Japan	0.36	0.47	Turkey	0.28	0.40
Kazakhstan	0.14	0.31	United Kingdom	0.52	0.50
Korea	0.11	0.32	USA	2.64	2.50
Kyrgyzstan	0.22	0.32	Vietnam	0.11	0.28
Laos	0.12	0.30			

Note: SR represents the short-run change in real value added, while LR stands for the long run. The values are expressed as percentage changes. ROW refers to the rest of the world.

Table 6: Output changes under two different tariff scenarios

Output	**Tariff 1**	**Tariff 2**
Global	-0.39	-0.23
EU	-0.10	-0.03
ASEAN	-0.12	0.03
Global excl. US	-0.19	-0.12
United States	-0.94	-0.56
Canada	-1.45	-0.66
Mexico	-1.37	-0.99
China	-0.18	-0.22
Vietnam	-0.16	0.32
Germany	-0.08	-0.04

Note: Tariff 1 represents the scenario with current tariffs as of August 25, where the US imposes tariffs on most of its trading partners, with varying rates across countries and industries. In contrast, Tariff 2 assumes that the US retains its sector-specific tariffs and tariffs on China but removes tariffs on general goods for other countries.

Table 7: Price changes under two different tariff scenarios

Price	**Tariff 1**	**Tariff 2**
Global	0.85	0.23
EU	0.34	0.08
ASEAN	0.18	0.06
Global excl. US	0.20	-0.06
United States	2.64	1.05
Canada	-0.03	-0.23
Mexico	-0.84	-0.91
China	0.16	-0.29
Vietnam	0.11	0.25
Germany	0.36	0.07

Note: Tariff 1 represents the scenario with current tariffs as of August 25, where the US imposes tariffs on most of its trading partners, with varying rates across countries and industries. In contrast, Tariff 2 assumes that the US retains its sector-specific tariffs and tariffs on China but removes tariffs on general goods for other countries.

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