INTERNATIONAL MONETARY FUND

Trade Partners' Responses to US Tariffs

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WP/25/147

2025
JUL

WORKING PAPER

 WP/25/147

IMF Working Paper
Strategy, Policy & Review

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Authorized for distribution by Martin Sommer
July 2025

ABSTRACT: Recently announced and enacted US tariffs reduce partners' access to the US market and lead to trade diversion. Impacted countries may respond in (at least) three ways: imposing retaliatory tariffs on the US, resorting to industrial policy to support their producers, and/or signing trade agreements to find new market access opportunities. Relying on a quantitative trade model, we study the trade and welfare implications of these policy responses. Retaliation hurts US exports, can improve the terms of trade, but also creates distortions. Subsidies can expand exports, making up for lost markets in the US, but they are costly, increase distortions especially for the subsidizers, and worsen trade diversion effects that could eventually lead to new tariffs targeting subsidizers. Seeking deeper integration with other partners can help countries expand trade while reducing distortions. Even in presence of US tariffs, real income for the liberalizing countries and the world is higher when partners choose to deepen integration as part of their policy strategy.

JEL Classification Numbers:	F12, F14
Keywords:	Tariffs; retaliation; industrial policy; trade agreements.

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* We are grateful to Diego Cerdeiro, Kenneth Kang, Martin Sommer, and participants at the IMF internal seminar and Banque de France "International Trade and Industrial Policy in A changing World" conference for useful comments and discussions. The views expressed in this paper are those of the authors and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

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Trade Partners' Responses to US Tariffs *

Lorenzo Rotunno† Michele Ruta‡

July 3, 2025

Abstract

Recently announced and enacted US tariffs reduce partners' access to the US market and lead to trade diversion. Impacted countries may respond in (at least) three ways: imposing retaliatory tariffs on the US, resorting to industrial policy to support their producers, and/or signing trade agreements to find new market access opportunities. Relying on a quantitative trade model, we study the trade and welfare implications of these policy responses. Retaliation hurts US exports, can improve the terms of trade, but also creates distortions. Subsidies can expand exports, making up for lost markets in the US, but they are costly, increase distortions especially for the subsidizers, and worsen trade diversion effects that could eventually lead to new tariffs targeting subsidizers. Seeking deeper integration with other partners can help countries expand trade while reducing distortions. Even in presence of US tariffs, real income for the liberalizing countries and the world is higher when partners choose to deepen integration as part of their policy strategy.

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1 Introduction

The recent announcements and imposition of new import tariffs by the US administration have opened a policy and academic debate on the impacts of the tariffs on the US, its trading partners and the global economy more generally (Baqaee and Malmberg, 2025; Clausing and Lovely, 2024; Bouët et al., 2024; IMF, 2025; WTO, 2025). As the tariffs reshape trade flows, trading partners may adopt various policy strategies to support their producers and mitigate potential negative spillovers. This paper quantitatively assesses the trade effects of US tariffs and examines the implications of different policy responses by trading partners.

The tariffs imposed by the US would reduce access to a large export market for trading partners, negatively impacting their terms of trade. How are they likely to respond? In this paper, we consider three sets of non-exclusive and non-exhaustive policy responses. First, trade partners may choose to exploit their own market power and implement retaliatory tariffs on US goods to offset the negative terms-of-trade externality. Second, they could adopt industrial policies to support domestic producers impacted by diminished market access in the US and by increased import competition in the domestic market due to the diversion of trade flows resulting from US tariffs. Lastly, trading partners could choose to deepen economic integration through new and enhanced trade agreements with other countries, creating new market opportunities for their producers.[1]

This paper employs a standard quantitative trade model to illustrate the potential trade and welfare implications of US tariffs and different policy responses of trading partners. Although the findings and the magnitudes of the effects would vary depending on the specific policy scenarios assumed, our analysis offers a structured way to think about different economic channels through which the tariffs and the policy responses impact the world economy, offering insights that can help evaluating policy actions.

The quantitative model utilized in this study is based on Caliendo and Parro (2015), extended to allow for production subsidies (see also Rotunno et al. (2025) and Ju et al. (2024)). This model features firms that use a single factor of production and traded intermediate inputs, operating under constant returns to scale and perfect competition. The model is solved in changes relative to a baseline with pre-2025 tariffs and is calibrated for 73 countries and a rest-of-the-world aggregate, across 20 sectors (19 goods sectors and one service sector aggregate), using data from the OECD TiVA

[1] Since the introduction of new import tariffs by the US in February 2025, targeted countries have hinted at, announced or adopted examples of these three policy responses. Canada and China have implemented retaliatory tariffs targeted on products imported from the US. Governments from Canada, Korea, Japan and China have announced government support measures to ease the negative impact of US tariffs on targeted firms and sectors (Reuters, 2025; Bloomberg, 2025; AlJazeera, 2025a,b). China, Japan and Korea have intensified talks around a possible free trade agreement, supposedly also in response to the US tariffs (Choi and Nohara, 2025), while the EU is considering negotiations with new partners, including East Asian economies (France24, 2025).

inter-country input-output (ICIO) tables for trade flows, ITC MacMap, TRAINS, and Bown (2021) for tariffs, and Rotunno et al. (2025) for estimates of subsidy rates.

The model captures the aggregate trade and efficiency effects of changes in tariffs, bilateral trade costs and other industrial policies resulting from the reallocation of resources across sectors. This setting has the benefit of simplicity, allowing the exercise to be transparent on the key mechanisms at work in the general equilibrium model. The impacts should be interpreted as long-run effects derived from the comparison of steady-state equilibria induced by different policies by the US and its trade partners. Given the model assumptions, however, the simulated effects of the tariffs are likely to represent a lower bound of the actual impacts, which may encompass static distortionary negative effects due to reduced market access and the entry of less productive firms (both of which can be represented in a Melitz-style model (Caliendo et al., 2023)), as well as dynamic factors such as lower capital accumulation (Anderson et al., 2020).[2] In addition, our model focuses on changes in actual policies, thereby overlooking the potentially significant (and efficiency-reducing) effects of increased trade policy uncertainty.

Four counterfactual policy scenarios are employed to examine potential medium- to long-term effects of trade and industrial policies. The first scenario considers increases in US import tariffs announced until April 2 2025, consistent with the reference point scenario used in the WEO April 2025 (IMF, 2025). These include the tariffs imposed on China, Mexico and Canada, and on imports of steel, aluminum, auto and auto parts before April 2, and the country-specific tariff hikes announced on April 2, with the associated product exemptions. These rounds of tariff increases would bring the US effective tariff rate to 25 percent, with significant variation across countries and sectors. In an additional scenario, we consider tariff announcements until April 11, which brought down the country-specific tariff increases announced on April 2 to 10 percentage points, and increased the nominal tariff on imports from China to 125 percent.[3]

The remaining three scenarios incorporate various responses from trading partners. The first scenario assumes that all countries will enact tit-for-tat retaliatory tariffs on US goods. The second scenario assumes that countries reallocate subsidies towards sectors that suffer the greatest reduction in exports as simulated under the US tariff scenario. Finally, we simulate an "economic integration" scenario, which includes the full implementation of major trade agreements recently signed and under

[2] In (IMF, 2025, Box 1.2), the output effects of different tariff scenarios found with a variant of the comparative advantage model used here are indeed lower than those found using the model by Caliendo et al. (2023), and using a DSGE model which emphasizes dynamic investment responses (Kumhof et al., 2010).

[3] As of June 17 2025, the US and China have agreed to a 90 days pause in the escalated bilateral tariffs rates and lowered the increase in the nominal bilateral tariff rates since April 2 to 10 percentage points. The US has also lowered tariff increases on imports of cars and metals from the UK, while it has raised tariff hikes on imports of metals from other countries to 50 percentage points.

negotiation, such as those between the EU and Mercosur, UK and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) countries, and Canada and India, as well as the implementation of agreements that authorities are considering, such as the EU-CPTPP and the deepening of the Regional Comprehensive Economic Partnership (RCEP). Additionally, this scenario considers a reduction in intra-EU trade barriers in line with estimated trends from 2010 to 2020 (Adilbish et al., 2025). Each response scenario is introduced separately alongside the US tariffs, and we explore the effects of combined policy responses in extensions.

The results from the counterfactual simulations underscore the significant potential trade effects of the assumed US tariffs. Two main implications arise from the findings. First, the US moves closer to a closed economy, with the value of US imports declining by 32 percent and US domestic sales increasing by 15 percent. Second, the higher tariffs on China, combined with varying levels of exposure to the US market (with Canada and Mexico being the most exposed), lead to a reallocation of trade flows and a diversion of Chinese exports to third markets.

Different policy responses from trading partners have markedly different implications for global trade. Tit-for-tat tariff retaliation results in a 49 percent reduction in US exports compared to a baseline scenario without US tariffs, as access to foreign markets for US goods is diminished. However, these retaliatory tariffs weaken the competitiveness of trading partners in global markets, as they increase local factor prices and make US imported inputs more expensive. In contrast, the increase in subsidies to worst-hit sectors boosts production and exports especially in China. China's exports to large markets including Canada, the UK and the EU increase the most, driven by export-oriented sectors such as electronics, textile and other manufacturing (including furniture and precision instruments). Economic integration is found to enhance exports from liberalizing countries, particularly among East Asia economies and EU countries.

The welfare effects indicate that a response strategy centered on deepening economic integration is the only approach that enhances global welfare in the presence of US tariffs. Due to distortionary effects, US and global real income decrease under the baseline scenario involving US tariffs only. Tit-for-tat retaliation deepens losses for the US, without generating net increases in real GDP for other countries and hence aggravating global welfare losses. Subsidies increase production and exports, but the distortions and fiscal costs they generate lead to real income losses globally and for subsidizing countries, especially China. The assumed economic integration scenario boosts the welfare of liberalizing countries as the market lost in the US can be compensated (and, in some cases, more than compensated) by increasing access to other markets. Overall, world real GDP increases by 0.3 percent, more than offsetting the welfare loss from the US tariff increases. Importantly, the simulations suggest that only policy mixes that include economic integration emerge as increasing world welfare even in the presence of US tariffs.

While these results are specific to the assumed policy scenarios, they convey broader insights on the effects of different policy responses by trading partners to higher tariffs in the US. Retaliatory tariffs do not produce global welfare gains. Although they may offset the terms-of-trade effects of the initial US tariffs, they also introduce costly distortions and can provoke further tariff increases, leading to a detrimental tariff escalation. Industrial policy measures such as production subsidies are inefficient tools for addressing the externalities resulting from tariffs; in fact, they may worsen the terms-of-trade effect of tariffs by lowering the world price of subsidized goods and may trigger countermeasures, often in the form of increased import tariffs targeting the subsidizers.[4] Deeper economic integration can help reduce distortions and create new market opportunities. While regional trade agreements may lead to negative trade diversion effects (which tend to be minor for recent deep trade agreements and with global input-output linkages (Mattoo et al., 2022)), our findings suggest that the gains from economic integration between two countries become increasingly significant when the integrating economies are targeted by the tariffs of a large trading partner—a result consistent with the logic discussed in Baldwin (2025). In the simulations, we find that the real income of countries that deepen integration increases more relative to a situation with US tariffs than relative to a baseline without tariff increases.

This paper connects to the vast literature on the evaluation of trade policies, with a focus on optimal policies. A long tradition of theoretical work has studied the characteristics of unilaterally optimal, retaliatory (Nash) and cooperative import tariffs in both neoclassical (Johnson, 1953; Bagwell and Staiger, 1999; Costinot et al., 2015) and imperfectly competitive frameworks (Gros, 1987; Demidova and Rodríguez-Clare, 2009). While tariffs create welfare losses by introducing distortions, they can also produce beneficial terms-of-trade responses. In models with increasing returns to scale, additional profit shifting (Ossa, 2014) or production relocation (Venables, 1987) effects can arise, and with heterogeneous firms and fixed market entry costs, other adjustments through the entry and exit of firms selection further affect welfare (Caliendo et al., 2023). Potential benefits from terms-of-trade manipulation however disappear in the presence of optimal (Nash) retaliatory tariffs.[5]

This paper is closely related to recent and ongoing work using general equilibrium models to assess the economic implications of the proposed and observed US tariffs and retaliation by trading partners in 2025 (Rodríguez-Clare et al., 2025; Alessandria et al., 2025; Baqaee and Malmberg, 2025; Ignatenko et al., 2025; WTO, 2025; Auray et al., 2025; Conteduca et al., 2025). In IMF (2025, Box 1.2), we employ a slightly different quantitative trade model to assess the export and real GDP impact of US tariffs and countermeasures introduced until April 4, and compare the findings with an alternative trade model and a global macro model. We contribute to this body of

[4]The justification for subsidies as a policy tool to correct market failures such as production externalities and economies of scale remains valid regardless of the presence of tariffs by a trading partner.

[5]A few recent papers (see the review by Ossa (2016)) have used quantitative trade models to identify the unilaterally optimal, Nash and cooperative tariffs.

work by comparing the effects of different trade policy instruments – tariffs, subsidies and changes in non-tariff barriers – that US trade partners can adopt in response to the tariffs.

Theoretical work has analyzed the use and implications of domestic subsidies to address terms of trade externalities produced by tariffs (Lee, 2016). Empirically however, there has been little effort to quantify the effects of subsidies in the presence of or as a response to import tariffs. Notable exceptions are Bartelme et al. (2024) and Lashkaripour and Lugovskyy (2023), who assess the welfare consequences of unilaterally optimal subsidies and tariffs, and Ju et al. (2024), who study the effects of China's subsidies and the US-China tariffs during 2018-19.[6] These papers use different quantitative trade models with production externalities to introduce an efficiency motivation to subsidies. We omit external economies of scale, since the focus of our analysis is to identify the role of subsidies as a response to tariffs – the use of industrial policies to correct market failures such as externalities can be justified regardless of the tariffs.

Our results highlight the potential for economic integration through new and deep Preferential Trade Agreement (PTAs) to offset losses in market access and welfare from US tariffs. While numerous papers have found positive welfare effects of PTAs both on member countries and, to a lesser extent, on third countries (e.g. Mattoo et al. (2022), Lee et al. (2023), and Fontagné et al. (2023)), the implications of deeper economic integration have not been assessed in the presence of rising tariffs by countries outside the PTAs, and in comparison with other policy responses.[7] Our result that regional integration increases welfare in the presence of US tariffs, may support the intuitive argument that the value of regional integration increases with the level of tariffs and the economic size of the excluded countries.

The rest of the paper is organized as follows. Section 2 briefly presents the quantitative trade model and the data, and discusses the policy scenarios. Section 3 describes the quantitative results on trade and real GDP for each of the simulated scenarios. Section 4 concludes by highlighting the implications of our analysis and identifying areas for future work.

[6] Hodge et al. (2024) assess the efficiency effects of different sectoral industrial policies and subsidies in the EU.

[7] The literature has investigated both theoretically and empirically the effect of preferential liberalization on the level of external tariffs by member countries and by outsiders (Estevadeordal et al. (2008); Ornelas (2005); Baldwin and Robert-Nicoud (2015) and the reviews by Freund and Ornelas (2010) and Maggi (2014)), but not how the role of trade agreements varies with tariffs imposed by third countries. Baldwin (2025) argues how the reduction in access to a large market like the US one can prompt domestic interest groups in trading partners to lobby for PTAs with other economies to make up for tariff-induced export losses.

2 Model, data and policy counterfactuals

2.1 Quantitative model and data construction

The model is from Caliendo and Parro (2015), extended to having production subsidies (Rotunno et al. (2025), which is the model by Ju et al. (2024) but without external economies of scale). In this model, firms produce output utilizing a single factor of production and traded intermediate inputs under conditions of constant returns to scale and perfect competition. The output from firms can be directed toward final demand or used as intermediate inputs by other firms through roundabout production. Net government revenues, defined as the difference between tariff revenues and subsidy expenditures, are rebated lump sum to consumers. Importantly, aggregate trade deficits are held fixed in the model, while sectoral and bilateral net exports adjust endogenously.

In this type of comparative advantage models, changes in bilateral trade costs (resulting from changes in tariffs and non-tariff measures) influence trade and welfare by affecting relative prices, leading to two opposing adjustments. First, import tariffs create a wedge between domestic and international prices, thus distorting consumption and production, potentially shifting specialization patterns away from countries' comparative advantages. In the absence of other distortions, as assumed in this model, this effect lowers welfare. Second, import tariffs imposed by a country that has market power in the targeted products (i.e. large country hypothesis) reduces the world price of imports relative to exports of the imposing country. This terms-of-trade effect increases the welfare of the large country imposing the tariffs at the expenses of its trade partners.[8]

The simulations derived from this standard quantitative trade model can be understood as providing long-run static effects of changes in policies and trade costs resulting from the reallocation of resources across sectors. Consequently, the simulated trade and welfare effects are likely to underestimate the actual impacts of policy changes. The perfectly competitive framework of the model does not account for additional static effects of tariffs and other policies on market size and sectoral productivity, which can be captured in Melitz-style models (Caliendo et al., 2023). Additionally, the model assumes that the primary factor of production can move freely across sectors, thereby excluding adjustment frictions (Ahn and Tan, 2025). As a static model, it cannot capture the likely negative effects of higher tariffs on growth and productivity due to reduced investment (Anderson et al., 2020). Finally, the model emphasizes changes in policy levels while neglecting the potentially significant channel of policy uncertainty (Handley and Limão, 2022).

[8] While the model does not incorporate nominal exchange rates, adjustments in relative wages and producer prices can be interpreted as mimicking the expected exchange rate responses – e.g., following an increase in import tariffs, the country's wage increases and the exchange rate appreciates.

By solving the model in changes (Dekle et al., 2007), the data requirements for the counterfactual analysis are minimal. The calibrated version of the model encompasses 73 countries and a rest-of-the-world aggregate, along with 20 sectors (19 goods sectors and one service sector aggregate). Data on bilateral trade, expenditure, value added, and input-output shares are obtained from the OECD TiVA inter-country input-output (ICIO) tables, with the most recent year available, 2020, used for model calibration at the baseline. Bilateral applied tariffs at the product level are sourced from the ITC MacMap database for 2022, supplemented by TRAINS for missing countries and data from Bown (2021) for US-China tariffs as of 2020. These tariffs are aggregated at the sector level of the ICIO tables using import-weighted averages.[9] Estimates of subsidy rates per dollar of output by country and sector are drawn from Rotunno et al. (2025).

The only parameters that need to be calibrated in the model are the trade elasticities, which govern the direct effects of trade costs on bilateral trade flows. We obtain their values from Giri et al. (2021), who estimate elasticities for the same manufacturing sectors in our dataset using micro price data and the simulated method of moments approach developed by Simonovska and Waugh (2014). Trade elasticities for primary sectors are sourced from Fontagné et al. (2022). Across the 19 goods sectors, the elasticity values range from 3 to 8.9 (with higher values in primary sectors), and the average of 4.6 is close to the 4.5 found by Head and Mayer (2014) in their meta-analysis. We assign this average value to the aggregate service sector.

2.2 Policy scenarios

Our simulations implement policy experiments based on four main policy changes. Given the long-run nature of the model, these policy scenarios reflect current or likely changes in trade and industrial policies. While the simulated policy shocks may be implemented over different time horizons (e.g., when implemented, retaliatory tariffs can normally be introduced faster than subsidies or PTAs – the latter requiring negotiations over multiple years), the results from the counterfactual simulations should be interpreted as effects over the medium-to-long run after the policy has been implemented.

(i) US import tariffs

The primary policy change present in all policy scenarios is an increase in US import tariffs. While the specifics of US trade policy continue to evolve, we apply the increases featured in the reference scenario of the WEO April 2025, which includes US import tariffs and countermeasures implemented until April 4, 2025. In particular, we

[9]For changes in US tariff, we use product-level import values from USITC for 2024. For other countries and to aggregate tariffs at baseline, we use import values for 2023 from the BACI CEPII database.

include the US tariffs announced until April 2, namely[10]: (i) the 20 percentage points increase on all imports from China; (ii) 10 percentage points on energy and potash and 25 percentage points on all other goods for Canada, and 25 percentage points on imports from Mexico, with USMCA-compliant goods being exempted; (iii) a 25 percent tariff on all imported steel, aluminum and derivatives; (iv) a 25 percentage point increase in tariffs on auto and auto parts; and (v) the tariff increases detailed in the US Fair and Reciprocal Plan of April 2, which consisted in a 10 percent minimum tariff on all countries other than Canada and Mexico, and country-specific rates as high as 50 percent for roughly 60 countries, with important product exemptions. [11] The universal 10 percent tariff increase took effect on April 5, while the higher tariffs were postponed for 90 days. In the following days, US-China trade tensions escalated bringing the overall increase in nominal US tariffs on imports from China to 145 percentage points on April 11 (with the addition of electronics to the list of exempted products), while the tariff increases above 10 percentage points for other countries have been paused for 90 days. As of June 17, the US had concluded preliminary deals with China – lowering the US-China tariffs announced after April 2 to the common 10 percentage point increase – and the UK – reducing the US-UK tariffs on cars and eliminating those on aircraft and parts. The tariffs hike on steel and aluminum has been increased to 50 percentage points, and the March 2025 tariff increases on Canada and Mexico have been eliminated for in the auto and metals sectors, where the Section 232 tariffs apply (only on the non-US content of imported cars). In our analysis, we take the US tariffs announced until April 11 to explore the implications of a scenario with higher tariffs on China.

These policy actions have substantially increased US tariff rates, with important variation across trade partners and sectors. As shown in Figure 1, the average US tariff rate has increased from around 3 to 25 percent, without any notable change between the April 2 and Apr 11 scenarios used in the counterfactual, as the increase in the

[10]The WEO April 2025 reference point scenario includes retaliatory tariffs by China which were announced right after, on April 4.

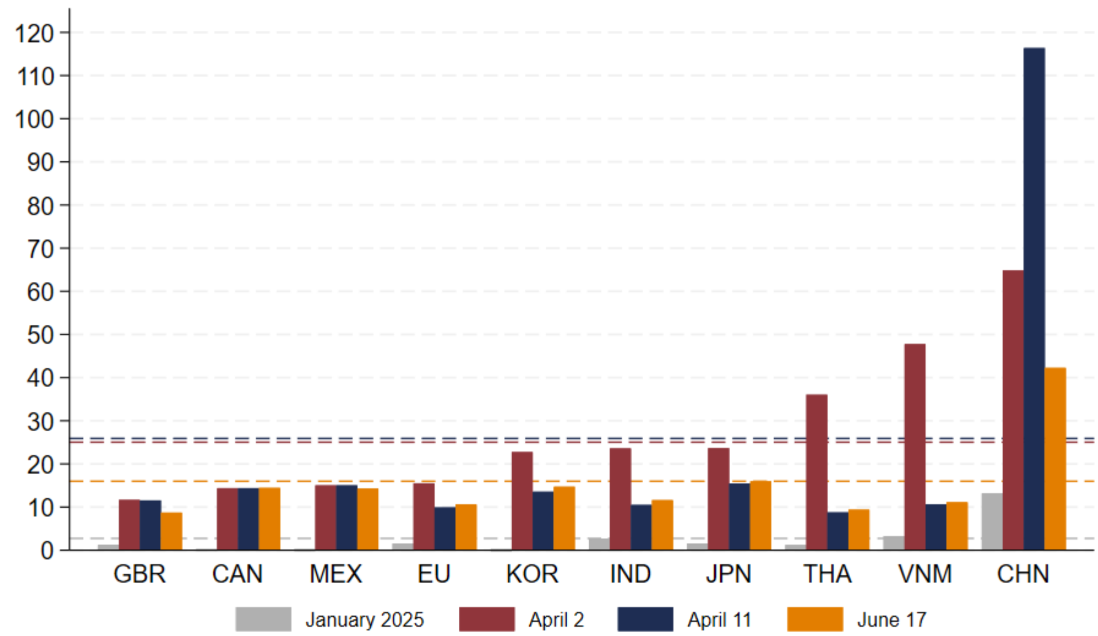
[11]The tariff increases for Canada and Mexico at the product level are reduced by the observed preference utilization rates in 2024 (sourced from USITC). This approach likely overestimates the US tariff increases since it ignores any behavioral response by firms increasing preference utilization to avoid the tariffs. Potash is defined as the HS 6-digit product 281520, while energy products are under the HS 2-digit section 27. We assume that the 25 percentage point increases in tariffs on Mexico and Canada announced do not apply to steel, aluminum, auto and auto parts, since these products are targeted by section 232 sectoral tariffs – an assumption that has been confirmed by Executive Orders by the US government in May and June 2025. Steel, aluminum and their derivatives are defined as products falling under HS 2-digit sections 72, 73 and 76. Products under HS 4-digit 8702, 8703, 8706, 8707 and 8708 are considered for the auto and auto parts tariffs. For simplicity, the tariff increase on auto and auto parts imported from Canada and Mexico are halved under the assumption that half of USMCA auto imports have significant US content. The tariff increases announced on April 2 as well as the list of product exemptions are taken from Annexes I and II to the US Government Executive Order published on the same day. Besides Canada and Mexico, the tariffs announced on April 2 did not apply to countries with which the US does not have Normal Trade Relations (NTR) and thus are subject the the so-called "column 2" tariffs – these are Belarus, Cuba, North Korea and Russia.

tariffs on China under April 11 has offset the lower tariff rise on other countries. US effective tariffs as of April 2 vary substantially across the main trade partners, with the largest increases being faced by China and other East Asian exporters such as Vietnam and Thailand. The April 11 scenario models a hypothetical situation with even higher tariffs imposed on China.[12] The reduction of the US tariff increase on China after May has lowered the average tariff rate to around 16 percent as of June 17. While the size of the effects in the simulations would vary with the evolving trade policy landscape, the economic channels presented in the paper – which are anchored on the the WEO April 2025 (IMF, 2025) reference point scenario – remain valid.

Product-specific exemptions and different specialization patterns across countries drive substantial differences in the import-weighted US tariff rates across sectors, as shown in Figure 2. Sectors such as textile, electronics, electrical equipment and other manufacturing (including furniture, toys, and precision instruments), which have minor exemptions and where US imports from China and East Asia are concentrated, experience the largest tariff increases under the April 2 scenario (reduced for electronics under the April 11 scenario following the announced exemption). Conversely, the mining and oil as well as chemical (including pharmaceutical products) sectors receive relatively mild tariff increases because most of the products in these sectors are exempted. As of June 17, the reduction of the April 11 tariffs on China brought down average US tariffs across all sectors except metals, where the changes in tariffs for most products was brought up to 50 percentage points.

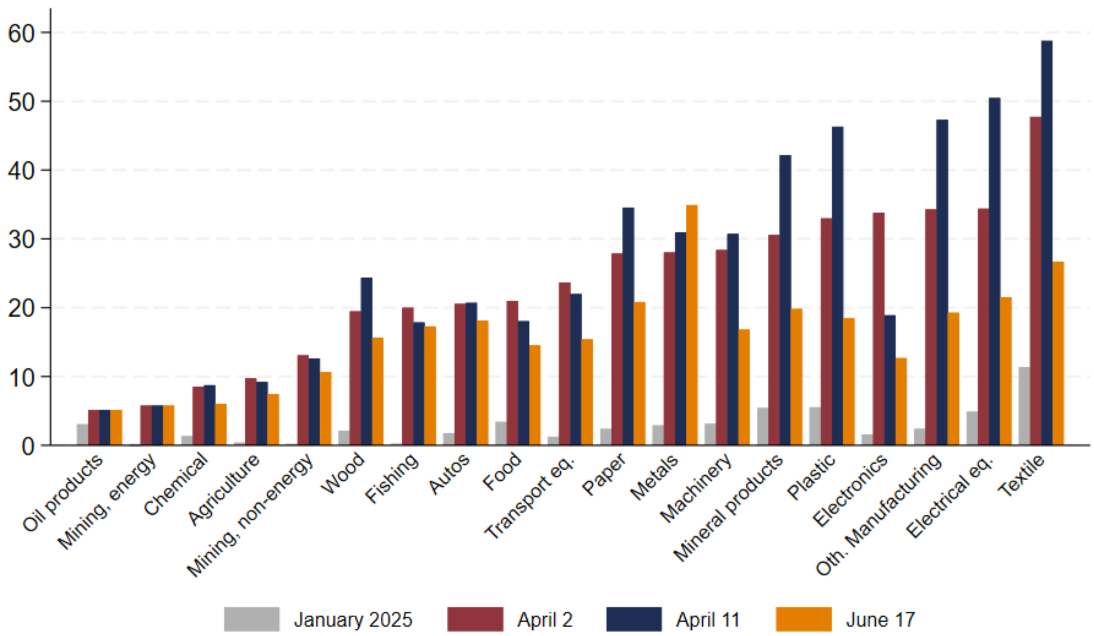
[12] The country-specific US tariffs announced on April 2 and then suspended are higher for some developing economies such as Lesotho, Cambodia and Madagascar, which are not shown in the chart.

Figure 1: Changes in US effective tariff rates by country



Note: In percent. Import-weighted averages of US import tariffs for the ten largest exporters to the US as of 2024 (EU-27 is treated as a country). "January 2025" tariffs are as of 2022, including Section 232 applied tariffs on China. "April 2" adds tariffs announced until April 2, "April 11" incorporates changes in US tariffs that occurred up to and including April 11 2025, and "June 17" adds changes up to and including June 17 2025 – see the text for details.

Figure 2: Changes in US effective tariff rates by sector



Note: In percent. Import-weighted averages of US import tariffs as of 2024. “January 2025” tariffs are as of 2022, including Section 232 applied tariffs on China. “April 2” adds tariffs announced until April 2, “April 11” incorporates changes in US tariffs up to April 11, 2025, and “June 17” further adds changes up to and including June 17 2025 – see the text for details.

(ii) Retaliatory tariffs

Each of the other three policy scenarios incorporates a specific type of response from trading partners to the US tariffs. In the retaliation scenario, we assume tit-for-tat retaliatory tariffs imposed by all countries on US goods at the product level. Specifically, we apply the same US tariff increases until April 2 to the initial tariffs applied by other countries on imports from the US. While assuming that countries match US tariff increases at the product level generates variation in retaliatory tariffs across sectors, it introduces a mismatch between the country-level tariff increase by the US and those retaliated by other countries.[13] As shown in Figure A.1 in Appendix, the assumed tit-for-tat retaliation results in effective tariff rates on imports from the US that are lower than those imposed by the US (13 percent overall, compared to the 25 effective rate applied by the US), since many of products exempted from US tariffs and hence from the tit-for-tat retaliation (e.g., oil, energy, pharmaceuticals and electronics) are major US exports.

[13] After the US tariff announcements of April 2, China did retaliate tit-for-tat to the further nominal (i.e., ignoring exemptions) increases in US bilateral tariffs. Canada has also retaliated tit-for-tat to the US auto tariffs. Other countries such as the EU have hinted at retaliatory schemes that rebalance bilateral trade through tariffs on selected products.

(iii) Industrial policy

In the industrial policy or subsidies scenario, we introduce changes in subsidy rates reflecting government support to goods sectors that are most affected by the US tariffs.[14] Subsidy rates for country i and sector j, s_i^j, in 2023 from Rotunno et al. (2025) are used to calibrate the model at baseline and to compute total subsidy expenditure $S_i = \sum_j s_i^j y_i^j$, where y_i^j denotes total output for each country and sector. Estimated subsidy rates as a share of gross output are largest in China and the US (around 0.7 percent), while other large economies including the EU, Russia, the UK and Canada have lower subsidy rates between 0.2 and 0.5 percent.[15] In the subsidy scenario, we keep the total amount of subsidy expenditure fixed and redistribute it towards sectors that are most affected by US tariffs. Counterfactual subsidies $s_i^{j'}$ to a sector negatively by the US tariffs are assumed to be proportional to the sector's share in the total decline in the country's goods exports to the US under the US tariff only scenario:

$$(1) \quad s_i^{j'} = \frac{dx_{iUS}^j}{\sum_{j \in \Omega_i} dx_{iUS}^j} \frac{S_i}{y_i^j}$$

where we denote by dx_{iUS}^j the simulated drop in country i and sector j exports to the US under the US tariff scenario and by Ω_i the country-specific set of sectors whose exports to the US experience a decline following US tariffs. For sectors where exports to the US increased, we assume that the counterfactual subsidy rate is zero. Within each country, there is significant variation across sectors, which reflects both the export effect of the US tariffs and the initial level of the subsidy rate.[16] For China for instance, the "other manufacturing" sector – which includes major export industries such as furniture, precision instruments and toys – experiences the largest increase in subsidy rate (3.8 percentage points), as it accounts for 12 percent of the reduction in China's goods exports to the US and has a low subsidy rate at baseline (0.5 percent). Other large China export sectors such as electronics and electrical equipment receive smaller increases in subsidies as their initial subsidy rates are among the highest (1.1 and 1.2 percent respectively), whereas other highly subsidized sectors such as autos and chemicals receive less subsidies as they represent relatively small shares of China's losses in exports to the US (4 and 3 percent respectively). Subsidy changes for other countries are less important, reflecting the bigger size of China's subsidies.[17] For the EU for instance, the largest subsidy increases are in the transport equipment sector

[14] Throughout the analysis, we set subsidy rates to zero for the service aggregate sector at baseline and in the counterfactual.

[15] In the model, the relevant subsidy rate is as a share of gross output at the sector level. In terms of goods value added, China has the largest subsidy share at around 2.6 percent, followed by the US at 1.6 percent. In the simulations, we apply the same sector-specific subsidy rates estimated for the EU bloc to all EU member countries.

[16] The counterfactual subsidy rate increases also with the size of exports to the US relative to output.

[17] Garcia-Macia et al. (2025) also estimate subsidy expenditure levels for China that are higher than for other countries.

(0.6 percentage points), while chemicals – which is an important export sector for many EU countries – receive zero subsidies in the counterfactual (down from 0.2 percent at baseline) as the sector increases its exports to the US following the exemption from US tariffs under the April 2 scenario.

(iv) Economic integration

Finally, the economic integration scenario introduces new and/or deeper trade agreements. Specifically, we assume a reduction in trade costs among signatories of major trade agreements that were signed between 2023 and 2025, such as the EU-Mercosur and the UK-CPTPP. We also consider agreements that are under negotiation, namely the ones between Canada and Mercosur and Indonesia, and the EU with India and Indonesia. Finally, we include three major cases of integration for which negotiations could start in the future: a deepening of the Regional Comprehensive Economic Partnership (RCEP) agreement between countries that are not already CPTPP members, the accession of the EU into the CPTPP, and a deepening of EU integration through the reduction of barriers to intra-EU trade. Table A.1 in the Appendix lists the PTAs and deepening of existing agreements that we include in the scenario. While some agreements, like the the EU-CPTPP and the deepening of RCEP, may be challenging to realize in the short term, this scenario serves as a stylized example of the deeper economic integration that countries could potentially achieve.

The reduction in trade costs associated to new and deeper trade agreements comes from two sources. Entry into a trade deal brings the bilateral tariffs among signatories to zero in all sectors. Importantly, these agreements extend beyond mere tariff reductions by also aiming to reduce non-tariff barriers in both goods and services. We model these policy changes by decreasing the bilateral trade costs (excluding tariffs) between member countries by the percentage implied by the gravity estimates of the trade effects of trade agreements. In their gravity model, Mattoo et al. (2022) find a significant point estimate of 0.267 (column (2) in their Table 3) for a measure of the depth of trade agreements, which ranges from 0 to 1.[18] Assuming that all new bilateral agreements introduced in the integration scenario have maximum depth, the implied trade effect of these agreements is thus calculated as $(\exp(0.267) - 1) \times 100 =$ 31 percent increase in bilateral trade. For agreements that overlap with existing ones, we assume that the new arrangements entail a doubling in the depth index, from 0.5 to 1, which leads to a $(\exp(0.267) - \exp(0.5 \times 0.267)) \times 100 = 16$ percent increase in bilateral trade.[19] Counterfactual changes in bilateral trade costs are calculated by inverting the gravity relationship – e.g., for new trade agreements, $\widehat{\tau_{in}}^{j} = 1.31^{-\frac{1}{\theta^j}}$, where

[18] We omit their coefficient on a dummy variable indicating the existence of a trade agreement between two countries (interpreted as the effect of an agreement with zero depth) since not significant.

[19] In particular, the EU and the UK already have agreements with some CPTPP member countries: Canada, Chile, Japan, Mexico, Peru and Vietnam. We assume no changes in bilateral trade costs between the EU and the UK even if they both enter CPTPP. Similarly, non-tariff trade costs between RCEP members that are also in CPTPP remain unchanged, under the assumption that the 'new' RCEP is not deeper than the CPTPP.

θ^j is the sector specific trade elasticity. To simulate the effects of EU integration, we utilize sector-specific estimates of the level of intra-EU trade barriers from Adilbish et al. (2025), and assume that these barriers decrease by the same amount observed between 2010 and 2020 – a rather moderate integration leading to a 3 percent reduction on average across sectors (5 percent for services).[20]

Figure A.2 in the Appendix displays the changes in effective tariffs (panel (a)) and (non-tariff) trade costs (panel (b)) for countries in the sample that are involved in the simulated trade agreements. The changes that each country faces as an exporter are plotted against the changes for the country on its imports. All changes, which are negative, are shown in absolute values. The simulated tariff changes from the economic integration are relatively small. They are close to zero for EU countries, where most trade is intra-EU and hence already tariff-free, and equal to 1.5 percentage point at most. These small changes are the result of generally low applied tariffs at baseline, and low trade in high-tariff sectors. Trade agreements bring about more significant reductions in non-tariff trade barriers. These are important for EU countries because of the assumed deepening of EU integration, and for some small East Asian economies such as Cambodia and Laos on the import side, given their dependence on imports from other larger RCEP members like China.

3 Results

In this section, we present the results from the quantitative trade model when we introduce the four policy scenarios (the US tariffs and the three possible responses by trade partners – retaliatory tariffs, industrial policy, and economic integration). We first discuss the trade effects, and then compare the implications of the different policies for welfare.

3.1 Trade effects

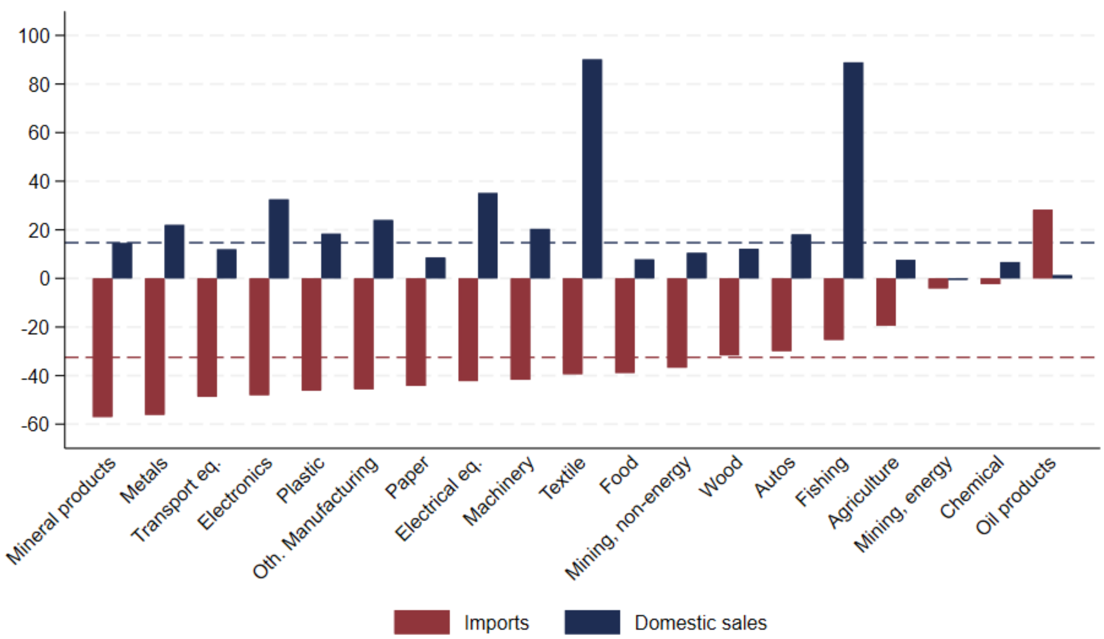
US tariffs. The direct effect of the April 2 US tariff scenario (IMF, 2025) is to push the US economy closer to a closed economy. As shown in Figure 3, the value of US goods imports is expected to decline by 32 percent. Imports decline strongly in sectors that experience high tariff increases such as plastic and electronics, and in sectors such as metals and mineral products where the substitution between imported and domestic goods is relatively high – i.e., sectors characterized by high trade elasticity

[20] Adilbish et al. (2025) find that the level of estimated intra-EU trade barriers for goods is roughly twice the level of barriers between US states found by Head and Mayer (2021). Baba et al. (2023) simulate that a 10 percent decrease in intra-EU barriers to trade goods and innovation flows can increase EU welfare by 7 percent of its GDP.

and significant domestic production. Imports in some large sectors with relatively low tariff hikes such as oil and chemicals change little.

A substantial 15 percent increase in domestic sales is expected to substitute for the drop in imports. This increase impacts all goods sectors, with a relatively stronger percent effect observed in sectors where baseline domestic production is lower (e.g., textile and apparel). Overall, the domestic share of total US expenditure on goods rises from 77 percent to 85 percent.

Figure 3: Simulated changes in US imports and domestic sales across goods sectors – US tariff scenario

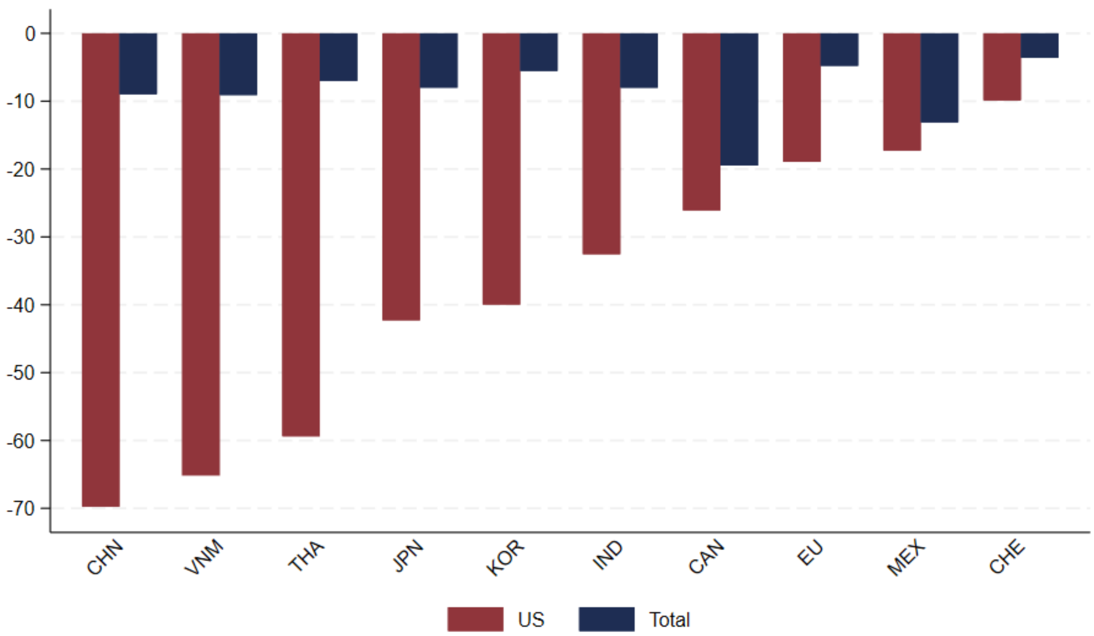


Note: Percent changes. US tariff scenario using tariff changes as of Apr 2 – see subsection 2.2. Simulated change in sales values relative to a baseline with the current tariffs.

The reduction in US imports varies among trading partners, reflecting both differences in tariff hikes (see Figure 1) and the differential exposure to the US market. Given the largest percentage-point increase in US tariffs, China's real exports to the US are projected to collapse by 70 percent (see Figure 4). In contrast, the average drop for other major trading partners is 35 percent, with more pronounced effects on exports to the US from other East Asian economies like Vietnam and Thailand.[21] Countries like Mexico and Canada, which are heavily reliant on access to the US market, are expected to experience reductions of approximately 13 and 19 percent in total exports, respectively.

[21] A few countries including Argentina, Russia and Turkiye facing relatively low hikes in US tariffs increase their real exports to the US.

Figure 4: Simulated changes in goods exports to the US and to all countries – US tariff scenario



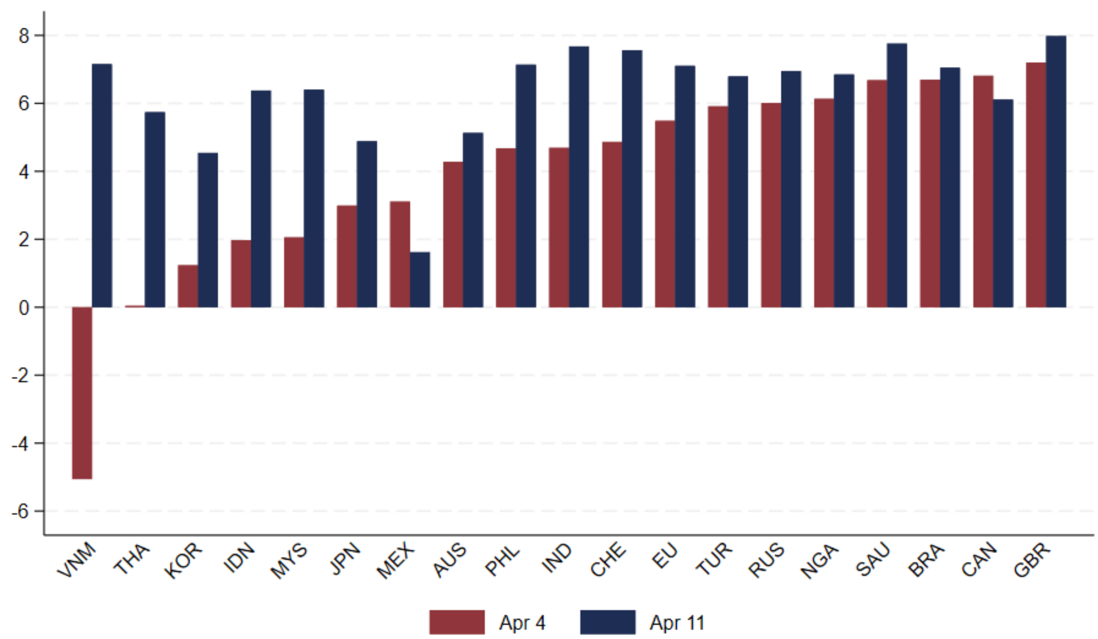
Note: Percent changes. US tariff scenario using tariff changes as of Apr 2 – see subsection 2.2. Top 10 exporters to US at baseline. Simulated change in real exports relative to a baseline with the current tariffs.

The higher tariffs faced by China lead to a diversion of China's exports away from the US market. Figure 5 illustrates the percent change in China's goods exports to its largest 20 non-US destinations. The overall increase is at 4 percent, with more significant increases observed in markets that face relatively modest US tariffs such as EU, UK, Mexico and Canada. In contrast, China's exports to other East Asian economies increase modestly or even decrease to Vietnam and Thailand. In these countries, the terms-of-trade effect of US tariffs lowers significantly wages and producer prices, making imports from China less competitive relative to domestic products. This finding suggests that the US tariff hikes simulated in this exercise would weaken the incentives for triangulating trade flows – i.e., diversion of US imports towards non-China East Asian sources that in turn rely more on Chinese imports of intermediate and final goods (Freund et al., 2024 and Gopinath et al., 2025).

Importantly, the size and geography of China's export diversion depend crucially on the extent to which US tariffs target China compared to other countries. As a hypothetical scenario featuring high tariffs on China, we take the US tariff increases announced until April 11. In this scenario, the effective rate on China shoots up to 115 percent and those on other countries are decreased (see Figure 1). With this counterfactual, China's exports to East Asian countries increases as shown in Figure 5, while some of those countries like Vietnam also increase their exports to the US (see

Figure A.3 in the Appendix). Overall, China's goods real exports to non-US markets are expected to increase by 6.4 percent. Under this scenario, the drop in China's real exports to the US increases to 88 percent, suggesting that the tariff increase on China in the Apr 2 scenario – which is roughly half of that under the April 11 one, can already displace most of US imports from China.[22] As a results, the total value of US goods imports declines less under the April 11 tariffs – 27 percent, compared to the 32 percent decrease under the April 2 tariff scenario.

Figure 5: Simulated changes in China's goods exports to non-US markets – US tariff scenarios

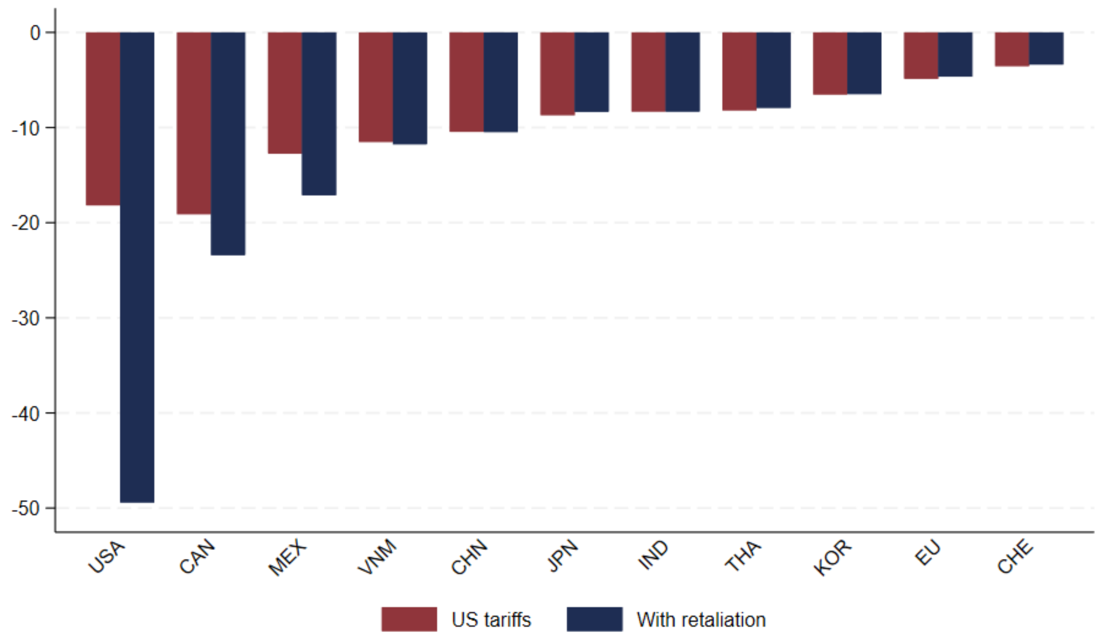


Note: Percent changes. US tariff scenarios as of April 2 and as of April 11 (see subsection 2.2 for details). Top 20 non-US destinations of China's goods exports at baseline. Simulated change in real exports relative to a baseline with the current tariffs.

Retaliatory tariffs. Tit-for-tat retaliation reduces US exports by up to 49 percent due to the higher tariffs imposed in all markets (see Figure 6). This retaliation does not result in increased exports for other countries. In fact, exports from countries like Mexico and Canada, which are heavily reliant on the US market, decline further as their production is reoriented towards the domestic market to substitute for imports from the US. As part of this substitution effect, these countries also increase their imports from China, as illustrated in Figure A.4 in the Appendix.

[22] WTO (2025) finds that China's exports to the US decline by 77 percent in 2025 in their simulations of a policy scenario similar to our April 11 one, including also the effects of trade policy uncertainty.

Figure 6: Simulated changes in goods exports – Retaliation scenario

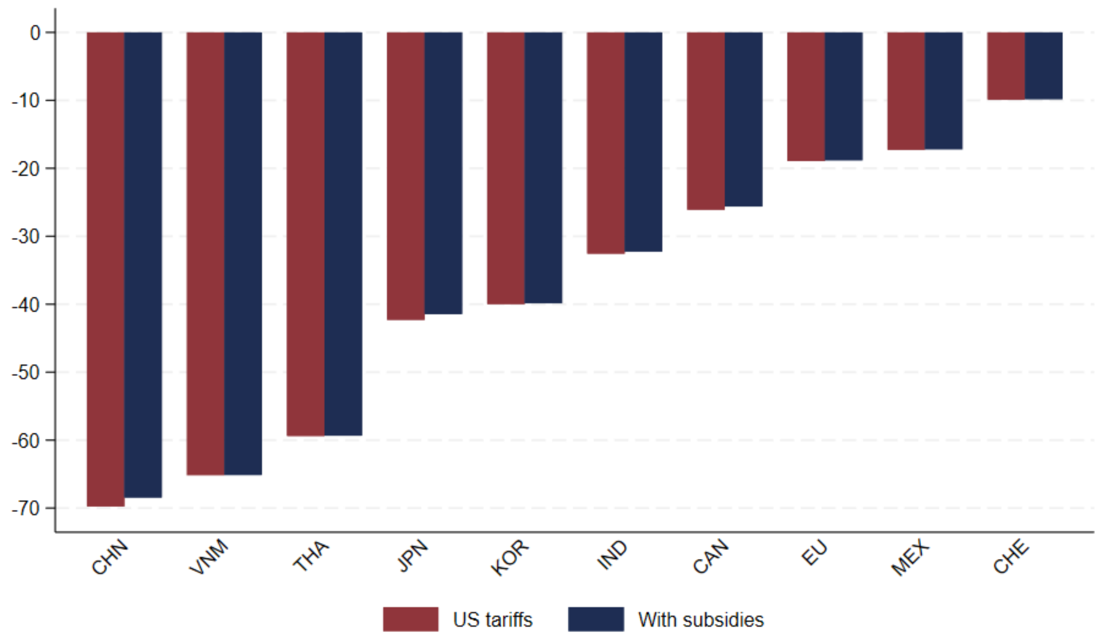


Note: Percent changes. The US tariffs scenarios include US tariff increases as of April 2. The "with retaliation scenarios" scenario adds tit-for-tat increases in imports tariffs on US goods at the product level by all countries (see subsection 2.2 for details). Top 10 exporters to the US and the US itself. Changes in real sales relative to a baseline with the current tariffs.

Industrial policy. In response to the US tariffs, trade partners could enhance support for domestic firms through industrial policy and subsidies aimed at compensating for the lost access to the US market. In the theoretical framework of the model, which assumes no market failures, subsidies reduce the consumer price of the subsidized goods. Since this support is provided regardless of the destination market for the output, it can boost both the output and exports of the subsidizing countries.

In our "industrial policy" scenario, we change subsidy rates for each country other than the US proportionally to the drop in each sector's exports to the US due to US tariffs – see subsection 2.2 for details. In spite of the targeting to the most hit sectors, the results shown in Figure 7 suggest that subsidies are ineffective in offsetting the drop in exports to the US caused by the tariffs. Two mechanisms can explain this finding. First, domestic subsidies do not target output sold to the US or to any other destination. Second, the estimated level of support for all countries is small relative to the US tariff hikes. As a result, the drop if exports to the US across trading partners is unchanged under the industrial policy scenario.

Figure 7: Simulated changes in goods exports to the US – Subsidies scenario



Note: Percent changes. The US tariffs scenarios include US tariff increases as of April 2. The "with subsidies" scenario adds changes in subsidies that are proportional to the decrease in exports to the US simulated under the US tariffs scenario (see subsection 2.2 for details). Top 10 exporters to the US at baseline. Changes in real exports relative to a baseline with the current tariffs.

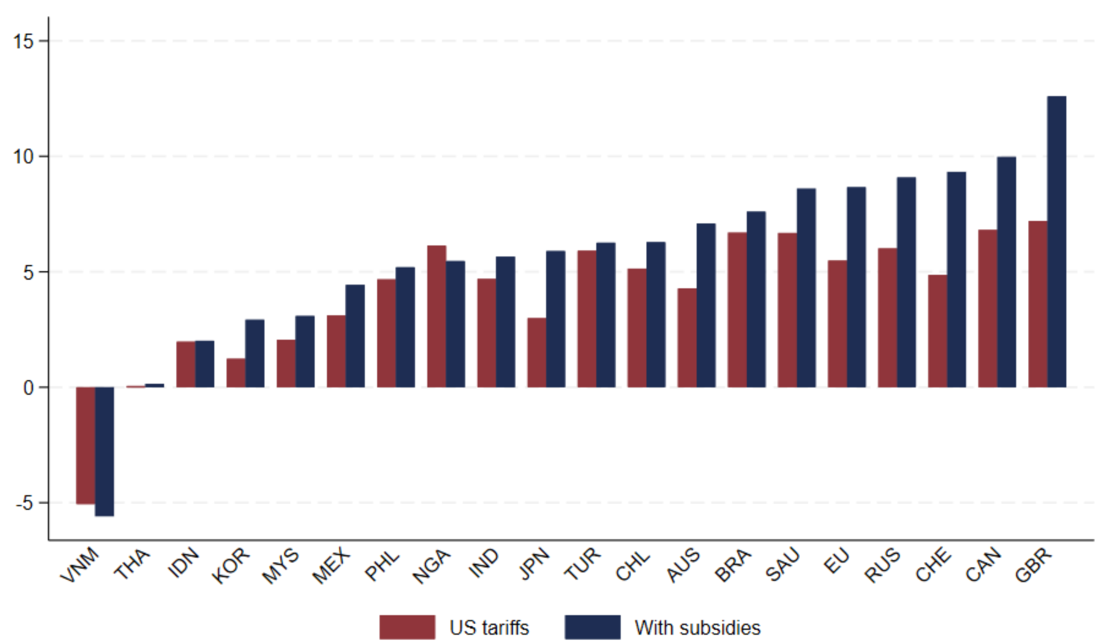
Because of their size and the targeting of export-oriented industries, China's subsidies create significant spillovers by exacerbating diversion of exports to non-US markets.[23] Overall, the reduction in total China's exports is attenuated under the subsidies scenario from 10 to 8 percent, whereas export losses for other countries are roughly unchanged. As shown in Figure 8, China's exports to non-US destinations increase especially to large markets such as EU, Canada and the UK, with increases between 8 and 13 percent.

As displayed in Figure A.6, panel (b) in Appendix, this rise in China's exports to non-US markets is concentrated in export-oriented sectors such as other manufacturing (including furniture, precision instruments and toys), electronics and textile, reflecting also the large increases in subsidies received by these sectors, especially other manufacturing. Important export sectors for China such as chemicals, machinery and autos experience small changes in exports to non-US markets, as these sectors are relatively less affected by US tariffs and hence receive less subsidies. Without subsidies (panel (a)), China's exports to non-US destinations increase across all sectors, with strongest

[23]These findings of a strong export effect of China's subsidies extend the reduced-form evidence from Rotunno and Ruta (2024a) and IMF (2024) on China, and Rotunno and Ruta (2024b) across countries.

percent effects in relatively small export industries that are mildly affected by US tariffs (e.g., oil products and mining). In values, these sectoral effects are significant especially under a subsidies scenario. China's exports to non-US markets increase by around 24 billions $ in the other manufacturing sector, 27 billions $ in electronics and 18 billions $ in textile and apparel. Overall, the simulated increases in China's goods exports to the EU, Canada, Mexico and the UK under the subsidies scenario are roughly equivalent to between 1 and 2 percent of those economies GDPs in goods in 2020 (the latest year available in the OECD data and used to calibrate the model). While not modeled here, this subsidy-led diversion of China's exports could lead importing countries to enact countermeasures such as countervailing duties to offset the surge in imports namely in strategic sectors, leading to an escalation in trade restrictions.

Figure 8: Simulated changes in China's goods exports – Subsidies scenario

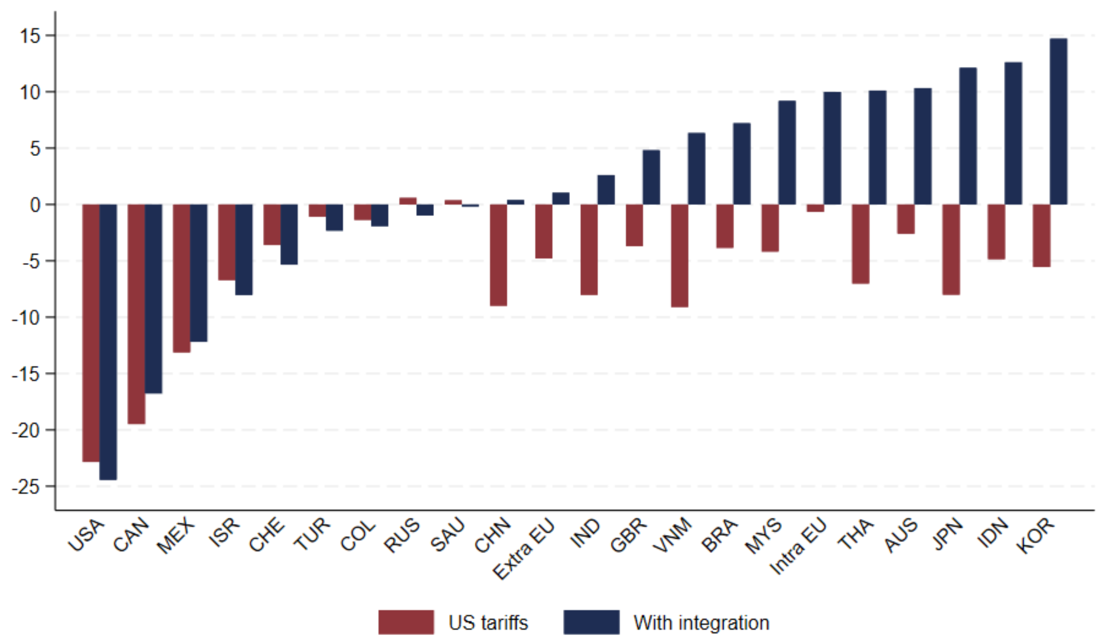


Note: Percent changes. The US tariffs scenarios include US tariff increases as of April 2. The "with subsidies" scenario adds changes in subsidies that are proportional to the decrease in exports to the US simulated under the US tariffs scenario (see subsection 2.2 for details). Top 20 non-US destinations of China's exports at baseline. Changes in real exports relative to a baseline with the current tariffs.

Economic integration. By creating new market opportunities, new and deeper trade agreements increase the exports of liberalizing countries (see Figure 9). Some large members of RCEP, including Japan and Korea, experience increases in real exports of up to 15 percent, outweighing the export losses caused by US tariffs, whereas China's goods exports increase only slightly. The simulated deepening of EU integration leads to a 10 percent boost in intra-EU trade, while the EU's external agreements with some

CPTPP members, Mercosur, India and Indonesia outweigh the export loss in exports to non-EU destinations caused by US tariffs. The drops in exports from Canada and Mexico are marginally reduced, as the simulated new trade agreements in which they participate (e.g., CPTPP enlargement, Canada-India, Canada-Indonesia and Canada-Mercosur) can substitute only partially for the loss in access to the US market. Exports from countries not involved in the assumed network of new trade agreements (e.g., Colombia, Israel, Russia, Saudi Arabia, Switzerland and Turkiye) generally experience a further slight decline, as they are adversely affected by trade diversion.

Figure 9: Simulated changes in goods exports – Integration scenario



Note: Percent changes. The US tariffs scenarios include US tariff increases as of April 2. The "with integration" adds reductions in bilateral tariffs and non-tariff trade barriers among members of new PTAs (see subsection 2.2 for details). Top 20 exporters to the US and the US itself at baseline. Changes in real sales values relative to a baseline with the current tariffs.

3.2 Welfare effects

How US tariffs ultimately impact welfare in large part depends on the policy response by trade partners. Figure 10 shows the predicted changes in real income – the welfare-relevant measure in the model – under the US tariffs and the three policy response scenarios for the 10 largest economies, as well as for the world. Other countries are aggregated into regional groups (other Asia, other LAC) or in the Rest of the World (RoW) category.

In the absence of any reaction by trade partners, US tariffs results in welfare losses for most countries, including the US, where the unilateral tariffs announced until April 2 would cause a decline of 0.2 percent in real income. The tariff-induced increase in the price index of 4.7 more than offsets the increase in US wages of 4 percent (4.4 in nominal income after incorporating changes in net transfers from the government). This finding of a negative effect on US welfare is consistent with the results of Conteduca et al. (2025) and Baqaee and Malmberg (2025), and indicates that the distortionary effect of the proposed tariffs (given the strong variation across countries and sectors) dominates any potential terms-of-trade welfare gains.[24] Real income losses are larger in smaller economies targeted by high tariff rates (e.g., East Asian economies) and in countries more exposed to the US market (e.g., Canada and Mexico). As discussed in section 2.1, these welfare losses from US tariffs are likely to be lower bound especially for the tariff-imposing country as they do not incorporate other distortions (e.g., from capital accumulation and within-sector reallocation (IMF, 2025, Box 1.2)) as well as the effect of policy uncertainty.

The assumed tit-for-tar retaliation deepens the losses for the US (-0.4 percent) and more importantly does not improve real income for most trading partners – see also Ignatenko et al. (2025). As a result, the decrease in world real income is even greater than in a scenario where only the US imposes tariffs – it goes from -0.16 to -0.2 percent.

Subsidies are purely distortive for the subsidizing countries in the model used for the analysis, as there are no market failures such as production externalities that subsidies could potentially correct. This explains why subsidies reduce welfare for the subsidizers. Indeed, welfare costs are especially large for China, since it is the country with the largest subsidies. Intuitively, these unilateral industrial policies do not alleviate the distortions introduced by US tariffs, and actually worsen these distortions for the subsidizers. Tariffs reduce the demand for the targeted products, while subsidies increase their supply, thus widening the mismatch between global demand and supply.

For China, the subsidies depress local wages and producer prices (-1.7 percent compared to the -1.5 percent with US tariffs only), driving a 0.4 percent decline in real income. Given its relative size, Chinese subsidies also have cross-border spillover effects as they impact trade flows – a point that we have further studied in Rotunno

[24]Using different multi-country and multi-sector general equilibrium models, Baqaee and Malmberg (2025) finds that country-level tariff increases announced by the US on April 2 would decrease real wages by 1 percent in the US, while Conteduca et al. (2025) find a larger 2 percent drop in welfare – both measures being different from the real income considered here as the welfare-relevant metric. Ignatenko et al. (2025) also find that US welfare decreases in a counterfactual with April 2 tariffs, using a single-sector model with input-output linkages and with tariff revenues rebated lump sum to consumers. Using a two-country macro model and a stylized tariff scenario, Auray et al. (2025) find that unilateral US tariffs are contractionary, although welfare increases for the US because of terms-of-trade gains. In comparative advantage such as the one we use, the unilaterally optimal tariff is uniform (Costinot et al., 2015; Lashkaripour, 2021). A uniform tariff can achieve terms-of-trade improvements (equivalent to increasing the home producer price relative to the foreign one) while distorting production and consumption as little as possible.

and Ruta (2024a). Specifically, in the policy scenario assumed here, welfare losses are slightly reduced for all other countries, as cheaper imports from China lower prices for consumers and firms and local subsidies limit the decrease in wages and nominal income. Overall, however, the losses for China are large enough that the decline in world welfare is as in a scenario with only US tariffs.

Finally, economic integration more than compensates the negative welfare effects of US tariffs, raising real income for the countries that sign new and deeper agreements and for the world as a whole. Japan, the EU and smaller East Asian economies experience the strongest welfare gains, ranging between 0.5 and 1.2 percent, and driven by the hypothetical EU-CPTPP agreement and RCEP deepening. For the EU, deepening the single market has the largest potential in terms of welfare gains. China's welfare losses due to US tariffs are completely offset by a potential deepening of RCEP, and the assumed trade agreements also reduce the declines in real income for Canada and Mexico. While economic integration is likely to deliver gains for the liberalizing economies also in the absence of US tariffs, with these tariffs in place the gains are more significant as they allow to offset the negative terms-of-trade externality and create incentives to allocate resources efficiently and in line with these economies' comparative advantage.[25] Of course, regional trade agreements also come with costs to non-members due to trade diversion. However, relative to a scenario with US tariffs only, non-member countries suffer fairly small losses. In fact, overall world real income increases by 0.3 percent even if US tariffs are still in place.

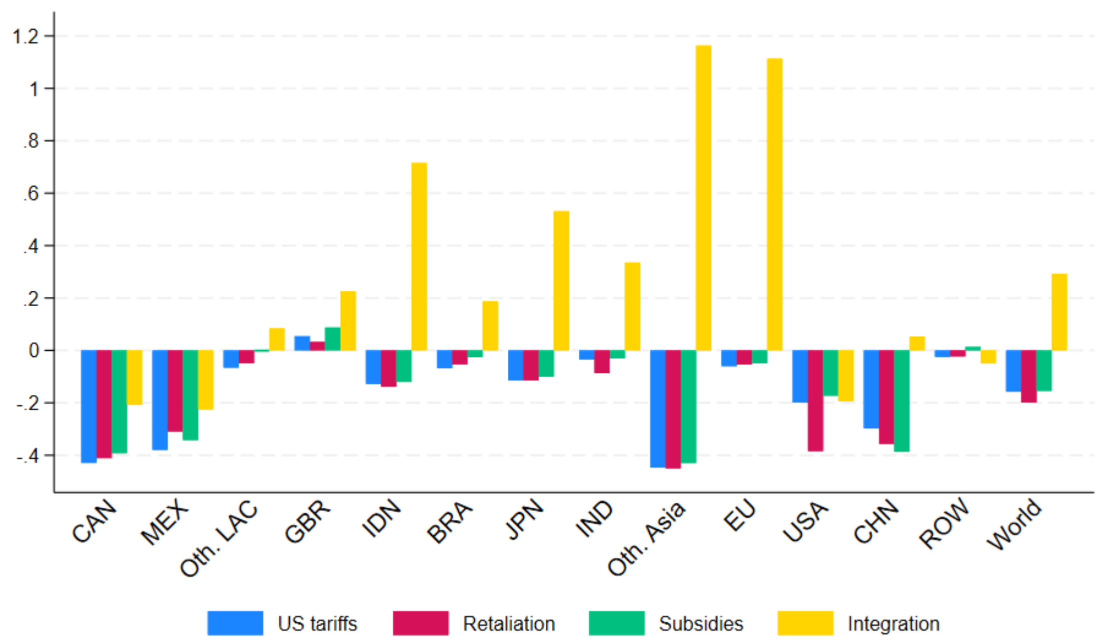
Further economic integration emerges as the *dominant* policy response to the US tariffs: no matter how partners respond, economic integration should be part of the mix. As shown in Figure A.7 in Appendix, only policy mixes that include deeper economic integration can offset the negative effects of US tariffs on global welfare. These patterns highlight the distortions introduced by retaliatory tariffs and subsidies and the potential for economic integration to offset the distortions of US tariffs.[26]

[25]In additional simulations, we compare the welfare effects of the economic integration scenario relative to a baseline without US tariffs to a simulation of the same scenario relative to a baseline with US tariffs as of April 2. The increase in real income is higher when starting from a baseline with US tariffs for 38 of the 47 countries that in our sample deepen integration. The difference however is small: overall, welfare increase by roughly the same 0.46 percent relative to a baseline with US tariffs and relative to a baseline without tariff increases.

[26]Trading partners may respond to US tariffs also by offering tariff cuts. Recent examples of this approach are the US-UK and the US-China deals in May 2025, which reduced part of the previously enacted US tariffs on these countries. Figure A.8 in the Appendix shows the simulated effects of two stylized "US deals" scenarios on welfare. Because of the long-run interpretation of the mechanisms in the model, we consider two scenarios without any tariff increase. In a first "preferential" scenario, trading partners bring down bilateral product-level tariffs on US imports to the level imposed by the US. In another "MFN" scenario, these tariff reductions are extended to all trading partners (a WTO-consistent case of unilateral tariff liberalization). Under the preferential scenario, real income changes little, as the difference between partners' tariffs and US tariffs is limited. Gains are more significant if the tariff liberalization is 'multilateralized' – global welfare increases 0.17 percent when trading partners extend the bilateral tariff reductions to all countries.

While the specific magnitudes of the effects depend on the configuration of the policy scenarios, the direction of the impacts illustrates the trade-offs that countries may face when confronted with an increase in US tariffs. Retaliation can potentially offset the international externalities introduced by US tariffs, but it also introduces distortions and may trigger further tariff escalation. Subsidies can help compensate for the loss of revenues associated to lower access to the US market, but they are costly and may provoke countermeasures from countries on the receiving end of the export surge that these measures imply. Conversely, economic integration through new and deeper trade agreements reduces distortions and can yield aggregate benefits, even in the context of US tariffs.

Figure 10: Simulated changes in real income across policy scenarios



Note: Percent changes. See main text for a description of the policy scenarios. Ten economies with largest real GDP in 2023, plus Canada. Changes for regional groups and world aggregate are computed as a GDP-weighted average of simulated changes in real income.

4 Concluding remarks

In this paper, we assess the trade and welfare implications of different policy responses by trading partners to a surge in US tariffs. Simulations from a standard quantitative trade model indicate that US tariffs announced until April 2 2025 would significantly reduce US trade and redirect exports toward non-US markets. In the absence of a policy response, US tariffs would improve its terms of trade and create consumption and production distortions. The net effects for the US and for the world are found to be negative, and likely to underestimate the impact from additional distortions and heightened trade policy uncertainty.

The policy response by trading partners analyzed in this paper would impact trade flows and the welfare effects of the tariffs. Tit-for-tat retaliation could offset the negative terms-of-trade externality from the tariffs, reducing the initial welfare loss for the retaliating countries and affecting the US negatively. However, retaliatory tariffs create consumption and production distortions in imposing countries which explains why welfare decreases in many countries and for the world economy. While subsidies can boost exports for the subsidizing countries, they are costly and may provoke additional rounds of trade restrictive measures from non-subsidizing countries. These measures also lower global welfare as they raise distortions by increasing the mismatch between global demand and supply. In contrast, economic integration fosters market opportunities for liberalizing countries at a time when US tariffs have reduced them and allows resources to allocate where they can be most efficiently used, thus enhancing global welfare despite the presence of US tariffs. Our simulations suggest that world real GDP increases by 0.3 percent when US trade partners respond to the US tariffs by deepening economic integration.

Through our analysis, we aim to offer structured insights into the trade-offs that countries may encounter when the world's largest economy adopts higher tariffs. Future research can further enhance our empirical and conceptual understanding of the policy responses available. Empirically, trade policies are in flux and tariff scenarios continue to change–this will also impact how trade partners respond to US trade policy, including through bilateral negotiations. Developing a theoretical model could further help understanding the main mechanisms at work and refine our understanding of the welfare implications of different policy responses by US trading partners. For instance, the assertion that the marginal benefit of preferential trade liberalization rises with the tariffs imposed by external countries – an idea supported by our results – could be analyzed in a theoretical model which identifies conditions that would maximize these gains.

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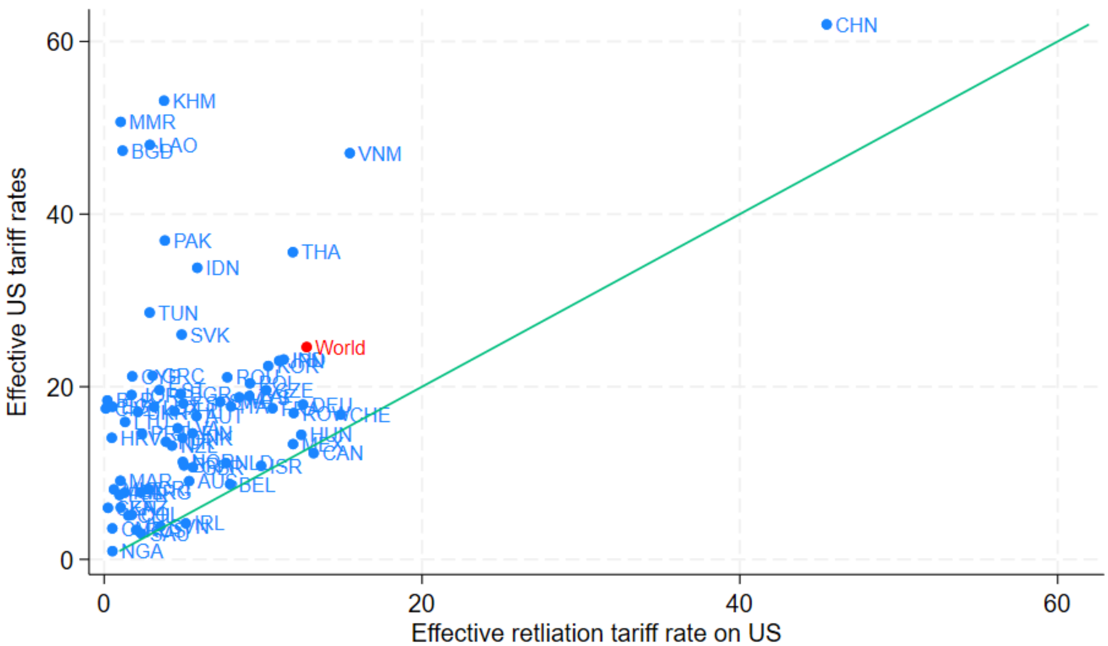
A Appendix

Figure A.1: US effective tariffs and tit-for-tat retaliatory tariffs by country



Note: Import-weighted US tariffs based on announcements made until April 2. Import-weighted tariffs applied by other countries in imports from the US is based on the same increases in US tariffs applied to initial tariffs at the product-level.

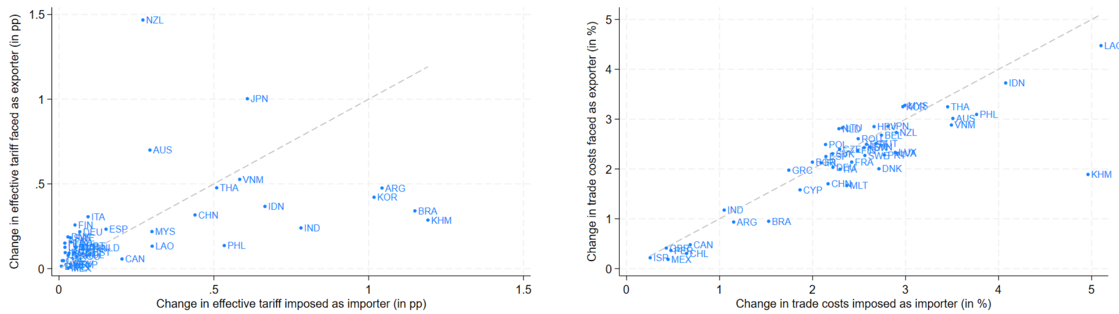
Table A.1: List of trade agreements in the economic integration scenario

List of PTAs	Countries	Assumptions
Signed in 2023-25:		
EU-Mercosur	EU 27, ARG, BRA, PRY, URY	New PTA with max depth
UK-CPTPP◇	GBR, AUS, NZL MYS, MEX, PER, VNM, CAN, CHL, JPN	New PTA with max depth Deepening of existing PTAs to max depth
UK-India	GBR, IND	New PTA with max depth
Under negotiation:		
Canada-India	CAN, IND	New PTA with max depth
Canada-Mercosur	CAN, ARG, BRA, PRY, URY	New PTA with max depth
Canada-Indonesia	CAN, IDN	New PTA with max depth
EU-India	EU 27, IND	New PTA with max depth
EU-Indonesia	EU 27, IDN	New PTA with max depth
Possible negotiations:		
EU-CPTPP	EU 27, AUS, NZL, CAN, CHL, JPN, MYS, MEX, PER, VNM	New PTA with max depth Deepening of existing PTAs to max depth
RCEP	AUS, BRN, KHM, CHN, JPN, LAO, NZL, SGP, THA, VNM, KOR, MYS, IDN, PHL	New PTA with max depth between non-CPTPP members
EU integration	EU 27	Same reduction in trade costs as over 2010-20

Note: Bilateral tariffs are brought to zero for liberalizing country-pairs. Estimates from Mattoo et al. (2022) and Adilbish et al. (2025) for EU integration are used to quantify the reduction in non-tariff trade costs – see main text for details.

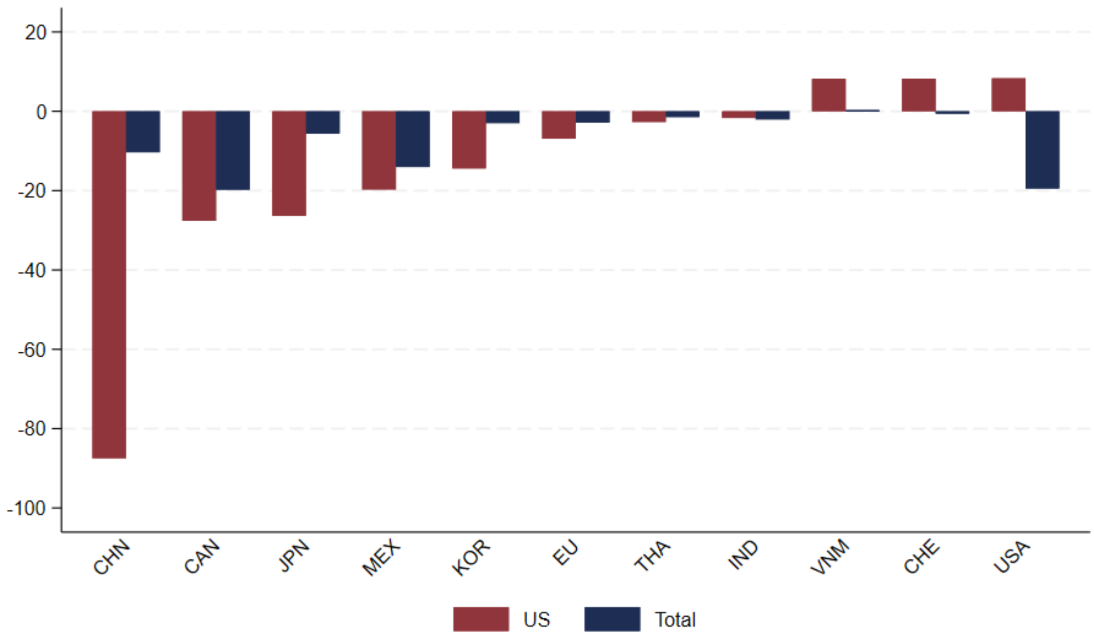
Figure A.2: Counterfactual changes in effective tariffs and trade costs due to economic integration

(a) Tariffs (b) Non-tariff trade costs



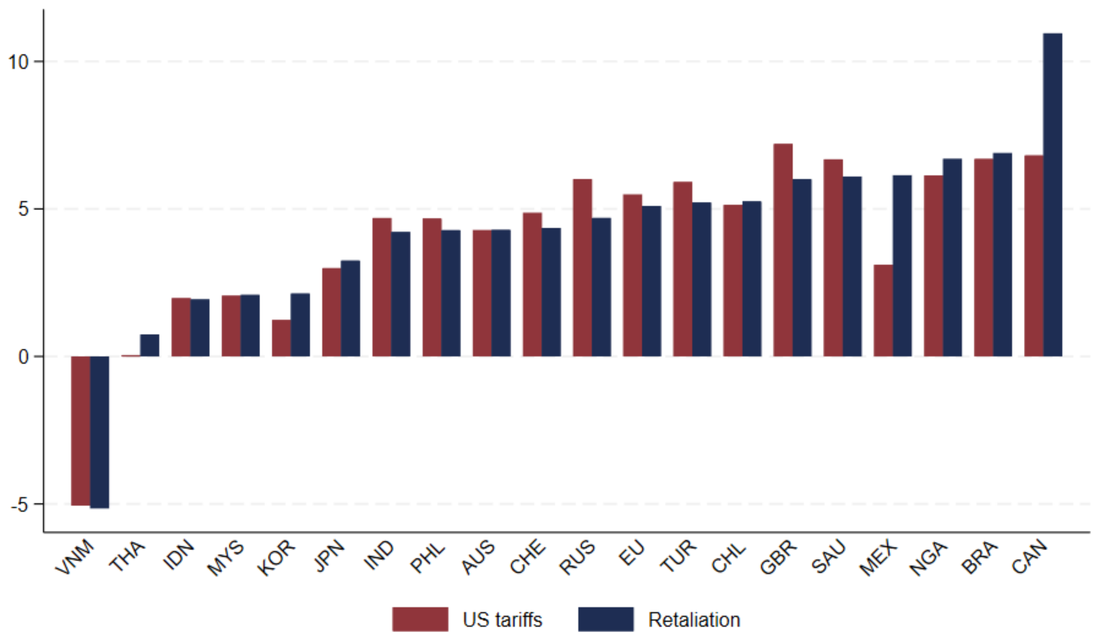
Note: Panel (a) shows the trade-weighted country average of differences in tariffs between a counterfactual scenario where the trade agreements under the economic integration are implemented, and baseline. Panel (b) shows the trade-weighted country average percent change between a counterfactual scenario where the trade agreements under the economic integration are implemented, and baseline. The y-axis use exports as weight and reports average tariffs from the exporter's perspective. The x-axis use imports as weight and reports average tariffs from the importer's perspective. Both panels include only countries that in the economic integration scenarios participate in at least one trade liberalization shock.

Figure A.3: Simulated changes in sales to the US and total exports – US tariffs as of April 11



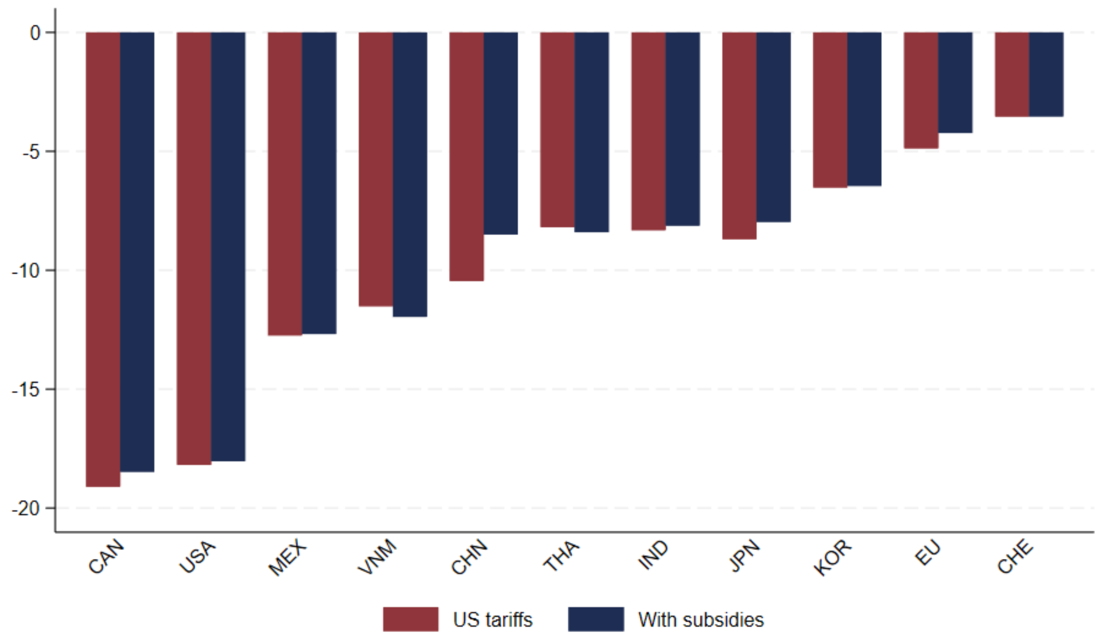
Note: Top 10 exporters (plus USA) to US. Scenario with US tariffs announced until April 11 (see subsection 2.2 for details). Simulated change in real exports relative to a baseline with the current tariffs.

Figure A.4: Simulated changes in China's goods exports to non-US markets – US tariffs and retaliation scenarios



Note: Percent changes. The US tariffs scenarios include US tariff increases as of April 2. The "with retaliation scenarios" scenario adds tit-for-tat increases in imports tariffs on US goods at the product level by all countries (see subsection 2.2 for details). Top 20 non-US destinations of China's exports at baseline. Changes in real exports relative to a baseline with the current tariffs.

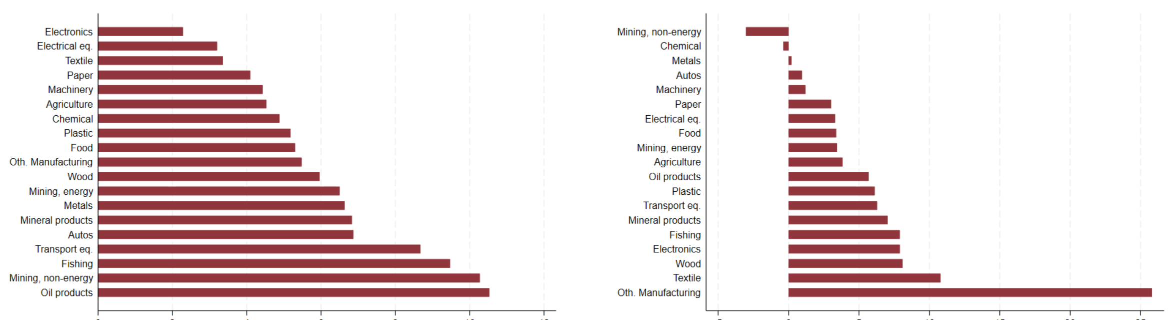
Figure A.5: Simulated changes in goods exports – US tariffs and subsidies scenarios



Note: Percent changes. The US tariffs scenarios include US tariff increases as of April 2. The “with subsidies” scenario adds changes in subsidy rates proportional to the losses in exports to the US caused by US tariffs (see subsection 2.2 for details). Top 10 exporters to the US at baseline. Changes in real exports relative to a baseline with the current tariffs.

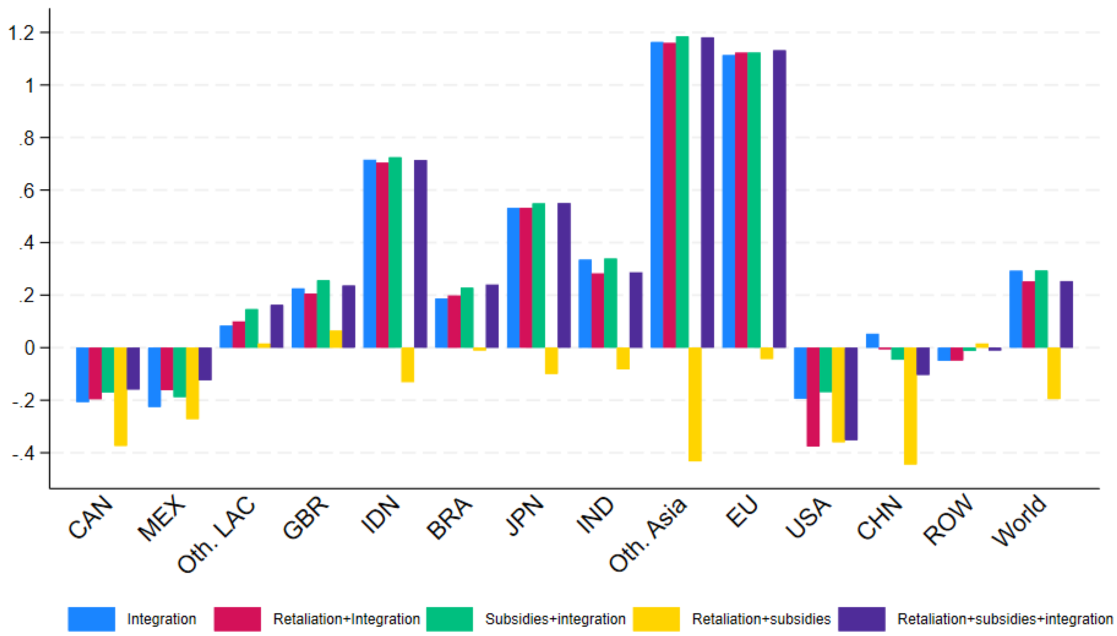
Figure A.6: Simulated changes in China’s exports to non-US countries by sector – US tariffs and subsidies scenarios

(a) US tariffs (b) With subsidies



Note: Percent changes. The US tariffs scenarios include US tariff increases as of April 2. The “with subsidies” scenario adds changes in subsidy rates proportional to the losses in exports to the US caused by US tariffs (see subsection 2.2 for details). Changes in real exports relative to a baseline with the current tariffs.

Figure A.7: Simulated changes in real income across policy mixes



Note: Percent changes. See main text for a description of each component of the policy scenarios. All scenarios include the "US tariff" policy changes as of April 2. Ten economies with largest real GDP in 2023, plus Canada. Changes for regional groupings and world aggregate are computed as a GDP-weighted average of simulated changes in real income.

Figure A.8: Simulated changes in real income under "US deals" scenarios

Note: Percent changes. The "US tariffs" scenario include the changes in US tariffs as of April 2. The "US deals (preferential)" scenario simulates reductions in the bilateral product-level tariffs of each country to the level of the bilateral tariff imposed by the US (if lower). The "US deals (MFN)" scenario extends the bilateral tariff reductions to all other countries within the same product. Product-level tariff changes are aggregated to the sector level using import weights. Ten economies with largest real GDP in 2023, plus Canada. Changes for regional groupings and world aggregate are computed as a GDP-weighted average of simulated changes in real income.