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Trade Policy Shocks under the Second Trump Administration

Houssein Guimbard

Highlights

- Between January 2025 and March 2026, the U.S. average applied tariff rose sharply, reaching more than 15% by March 2026.
- Under sustained policy uncertainty, the legally durable instruments — such as Section 232 — captured a rising share of aggregate protection and came to dominate the residual structure once the emergency IEEPA layer was removed.
- A counterfactual general-equilibrium analysis indicates that a legally durable Section 301 regime could approximate the tariff regime in force in November 2025, on the reindustrialisation objective, without recourse to legally fragile emergency instruments.
- The resulting gains in manufacturing value added reflect a sectoral reallocation achieved at an aggregate cost — U.S. GDP declines — while the cross-country incidence is governed as much by instrument design as by the average tariff level.

Abstract

This paper asks how a legally durable tariff regime could reproduce the "ideal" structure that the second Trump administration had assembled by November 2025 high, country-differentiated tariffs combining Section 232 protection, IEEPA reciprocal tariffs and framework deals — after the Supreme Court struck down the IEEPA tariffs in February 2026. From a product-level database of every U.S. tariff action of 2025–2026, I distinguish each statutory instrument and assess five configurations through counterfactual general-equilibrium analysis, measuring how far each realistic, durable regime stands from that November 2025 target and through which instrument the administration could return to it. Every configuration lowers U.S. GDP (by 0.37 to 1.37%) while improving the terms of trade; but on the metric tied to the stated objective — the reindustrialisation of manufacturing — a prospective, legally durable Section 301 regime can produce similar results to those of the target, raising U.S. manufacturing value added by +3.6% against +4.4% for the November 2025 hybrid and +1.9% for Section 232 alone. Instrument design — coverage breadth and partner targeting — matters as much as the average tariff level for the cross-country incidence, targeted Section 301 tariffs creating winners among non-targeted economies while broad-based configurations produce near-universal losses.

Keywords

Trade Policy, Tariffs (Sections 232, 301, IEEPA), Computable General Equilibrium, Reindustrialisation, Trade Diversion.

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1 Introduction

The inauguration of the second Trump administration in January 2025 marked the beginning of a renewed and intensified phase of U.S. trade unilateralism. Within a remarkably short timespan, the United States reactivated and expanded a set of legal instruments granting the executive branch broad discretionary power over trade policy. These included national-security tariffs under Section 232 of the Trade Expansion Act of 1962, economy-wide tariffs imposed under the International Emergency Economic Powers Act (IEEPA)—a statute historically designed for financial sanctions rather than trade regulation—and, following the judicial invalidation of IEEPA tariffs by the Supreme Court in February 2026, emergency tariffs under Section 122 of the Trade Act of 1974, supplemented by sweeping investigations under Section 301 of the same act.

What distinguishes this episode from earlier waves of U.S. protectionism is not only the magnitude of tariff increases, but the institutional hybridity of the policy framework. Trade measures justified on national security grounds coexist with emergency-based tariffs whose legal basis proved contested, while bilateral and plurilateral negotiations selectively offset these measures for specific partners. The effective trade regime faced by firms and consumers is therefore highly asymmetric, volatile, and difficult to assess using partial or descriptive approaches alone.

From an economic standpoint, the stakes are substantial. Tariffs applied to upstream sectors—metals, semiconductors, automotive inputs, intermediate manufactures—propagate through global value chains, affecting downstream production costs, consumer prices, and international competitiveness. The breadth of tariff measures amplifies these effects by directly targeting final goods, increasing the likelihood of consumer welfare losses. Negotiated deals with major partners (notably the European Union, Japan, and South

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Korea) introduce differentiated treatment and reshape bilateral trade patterns, generating trade diversion effects whose net impact requires a general equilibrium framework to assess.

A substantial literature emerged following the first wave of U.S. protectionism in 2018. Early contributions measured the direct trade and welfare effects of U.S.-China tariffs using partial equilibrium models and customs data (Amiti et al., 2019; Fajgelbaum et al., 2020), documenting significant pass-through into domestic prices and concentrated welfare losses among U.S. consumers. Fajgelbaum et al. (2020) estimated that the combined effect of U.S. tariffs and foreign retaliation reduced U.S. income by approximately $7.2 billion per year by end-2018. Subsequent work extended these analyses to general equilibrium settings: using CGE models, Itakura (2020), Ciuriak et al. (2018), and Bellora and Fontagné (2019) emphasized trade diversion, global value chain linkages, and retaliation, showing that while some countries benefit from diversion, global welfare losses dominate. A smaller but growing literature examines the use of national security and emergency provisions in trade policy. Some scholars have highlighted risks of institutional erosion and WTO inconsistency (Bown, 2020; Lester and Manak, 2019); Harpaz (2020) anticipated the constitutional tensions that the Supreme Court ultimately resolved in February 2026. Considering counterfactual scenarios on a temporal perspective, Bouët et al. (2025) use the MIRAGE model to assess the consequences of Liberation Day and contemporaneous scenarios, finding negative impacts on the U.S. economy and differentiated effects across trading partners. This paper also builds on research emphasizing fragmentation and discrimination in modern trade agreements (Mattoo et al., 2022), interpreting bilateral deals as second-best responses to unilateral protectionism, and on Limão and Maggi (2022), who formalize conditions under which bilateral agreements between asymmetric partners can be welfare-improving even when generating trade diversion.

Relative to the existing literature, this paper makes two contributions. First, it explicitly models distinct legal instruments rather than aggregating all tariffs into a single shock, drawing directly on executive orders and proclamations at the product level. To this end I assemble, from the roughly thirty executive orders and proclamations issued between January 2025 and March 2026, a product-level database (HS6 $\times$ exporter) of the applied U.S. tariff at each policy date, allowing its average to be decomposed into ten statutory components and making it possible to isolate any instrument in the counterfactual scenarios. This institutional distinction is essential, as the economic mechanisms and legal durability of Section 232 measures, IEEPA-based tariffs, Section 122 emergency tariffs, and Section 301 investigations differ substantially.

The tariff-data work yields four descriptive stylized facts. First, the average applied U.S. tariff rose roughly threefold—from 4.9% in January 2025 to 15.3% by February 2026—after peaking at 24.2% on Liberation Day (2 April 2025), about five times its initial level and the highest of the post-war period. Second, the share of the durable, legally robust instruments grew steadily: Section 232 national-security tariffs alone rose from about 9% to over 40%

of the total average as the emergency IEEPA layer collapsed, so that the durable core came to dominate the structure. Third, policy uncertainty rose markedly—the average was adjusted more than twenty times in fourteen months, and its largest component, the IEEPA reciprocal tariff, rested on non-economic emergency grounds (trade-deficit "national emergency", fentanyl, migration) that the Supreme Court ultimately struck down. Fourth, the November 2025 target configuration identified above sits at 19.7% and is already dominated by durable and country-specific instruments—a Section 232 core (6.2 pp) layered with IEEPA reciprocal tariffs (5.4 pp) and targeted surcharges, partially offset by framework deals. This is precisely why the question of reproducing it with a legally robust instrument arises.

The second contribution is to answer a politically relevant question with a counterfactual general-equilibrium assessment. Its central object is a target tariff structure: by November 2025 the administration had assembled what can be read as its "ideal" configuration—high, country-differentiated tariffs reflecting each partner's bilateral, economic and political relationship with the United States, combined with sector-specific Section 232 protection and targeted exemptions—whose legal backbone the Supreme Court removed in February 2026 by invalidating the IEEPA tariffs. Section 122 provides only a temporary +10 pp "patch," but it signals an intent to keep tariffs durably high and, above all, buys time to open Section 301 investigations, a far more durable instrument (the Section 301 tariffs on China have been in force since 2018). Of the two Section 301 strands under way—industrial overcapacity and forced/child labour—I model a stylised version of the overcapacity strand, focused on the sixteen investigated economies. Embedding the resulting instruments in the MIRAGE model (developed at CEPII, open-source and fully documented), I organise the five scenarios not as a chronology but around this target, so as to ask how far each realistic, durable configuration stands from the November 2025 regime and through which instrument the administration could return to it: Section 232 alone isolates the sectoral backbone and provides the natural benchmark; the Section 122 patch stacked on Section 232 measures how far a temporary instrument remains from the target; Section 232 combined with a stylised Section 301 overcapacity surcharge is the durable candidate for returning to it; and the Liberation Day peak is retained as an upper-bound reference. Throughout, I evaluate these configurations on the metric most directly tied to the administration's stated objective—the reindustrialisation of manufacturing, proxied by U.S. manufacturing value added—rather than on aggregate GDP alone, while still tracing the trade-diversion and welfare-redistribution effects that a complex trade policy of a large economy generates.

Three results stand out from the simulations. First, Section 232 alone already accounts for a meaningful share of the effects—about 34% of the U.S. GDP loss of the hybrid November 2025 regime (Scenario 2), a share that varies widely across partners. Second, on the indicator most directly tied to the administration's stated objective, the reindus-

trialisation of manufacturing, the scenario on Section 301 largely reproduces the hybrid regime: U.S. manufacturing value added rises by +3.6% under Scenario 301 against +4.4% under Scenario Nov. 2025 (and +1.9% under Section 232 alone)—a comparable positive outcome achieved through a legally more durable instrument. Third, every configuration nonetheless generates aggregate U.S. welfare and GDP losses (U.S. GDP from −0.37% to −1.37%), together with positive terms-of-trade effects and a reallocation of activity toward protected manufacturing at the expense of energy, agriculture and services.

The remainder of the paper is organized as follows. Section 2 provides a detailed analysis of U.S. tariffs and their chronological evolution from January 2025 to March 2026, including negotiated framework deals and retaliatory measures adopted by U.S. trading partners. Section 3 presents the MIRAGE model, the retained geographical and sectoral aggregation, and how the macroeconomic baseline is computed. Section 4 defines the simulation scenarios. Section 5 presents and discusses the simulation results. Section 6 concludes and discusses broader policy implications.

2 U.S. trade policy instruments and architecture, 2025–2026

The trade policy implemented by the second Trump administration between January 2025 and March 2026 is best understood as a layered and adaptive architecture, in which successive legal instruments were deployed, challenged, and partially replaced in response to judicial constraints and negotiating dynamics. Rather than constituting a coherent *ex ante* strategy, this architecture exhibits a pattern of adaptive escalation: each legal or practical obstacle to one statutory instrument prompted recourse to an alternative authority, producing an evolving and highly asymmetric tariff regime. All tariff measures described below are additional to pre-existing protection (hence, any increase of tariff labelled with a percent unity, e.g. 25%, means in reality +25 percentage points - pp), including MFN applied tariffs, preferential rates and first-term Section 301 tariffs on Chinese goods. Note that those additonal duties also stack to all temporary trade remedies such as antidumping and countervailing duties, but, due to data limitation and additional requested assumptions to translate those duties into manageable *ad valorem* equivalents (from firm specific level to HS6 products), those are not modeled in this paper.

2.1 The instruments used by the Trump administration

2.1.1 Section 232: National security as a trade policy lever

Section 232 of the Trade Expansion Act of 1962 authorizes the President of the USA to impose trade restrictions whenever imports are found to threaten national security.

Although historically invoked rarely, this provision became a pillar of U.S. trade policy in 2018 with tariffs on steel and aluminum, and gained renewed and considerably expanded prominence under the second Trump administration.

In addition to re-establish the steel tariff (+25 pp) and the aluminum tariff (raised to +25 pp on most products), the administration initiated new Section 232 investigations covering: automobiles and auto parts (building on a 2019 investigation, culminating in a +25 pp tariff effective May 2025);[1] copper products (March 2025);[2] timber and lumber (March 2025);[3] pharmaceuticals and pharmaceutical ingredients (April 2025); semiconductors and semiconductor manufacturing equipment (April 2025);[4] unmanned aircraft systems (July 2025); robotics and industrial machinery (September 2025); and medical equipment and personal protective equipment (September 2025).

This proliferation of investigations reflects the administration's explicit strategy, articulated in the "America First Trade Policy" executive order of January 20, 2025,[5] of using national security determinations as a broad lever to reshape industrial supply chains. From an economic perspective, Section 232 tariffs exhibit three defining characteristics: they are sector-specific, often targeting upstream industries; legally durable, as national security determinations are difficult to challenge before international tribunals; and they create strong relative-price effects propagating through downstream value chains (Bown, 2020).

As of March 2026, the Section 232 architecture comprises seven active tariff orders: steel, aluminum derivatives, aluminum, automobiles and light trucks, copper, timber and lumber, and advanced semiconductors. Figure 1 illustrates the scale of imports covered by each measure: the automobile tariff (effective May 2025) dominates by import value, covering approximately $220 billion in annual imports; steel and aluminum measures, while smaller in aggregate value, affect a broader set of downstream industries. Canada, China, and the European Union are the dominant source economies across most measures, while the sectoral composition shifts markedly toward Asia for advanced semiconductors.

[1] Presidential Proclamation on Adjusting Imports of Automobiles and Automobile Parts into the United States, April 3, 2025, 90 *Fed. Reg.* 14,891. [2] Executive Order 14,272, "Adjusting Imports of Copper into the United States," March 25, 2025, 90 *Fed. Reg.* 13,841. [3] Executive Order 14,264, "Adjusting Imports of Timber and Lumber into the United States," March 1, 2025, 90 *Fed. Reg.* 11,727. [4] Federal Register Notice, Bureau of Industry and Security, "Initiation of Section 232 Investigation: Semiconductors and Semiconductor Manufacturing Equipment," April 1, 2025. [5] Executive Order 14,257, "America First Trade Policy," January 20, 2025, 90 *Fed. Reg.* 8,507.

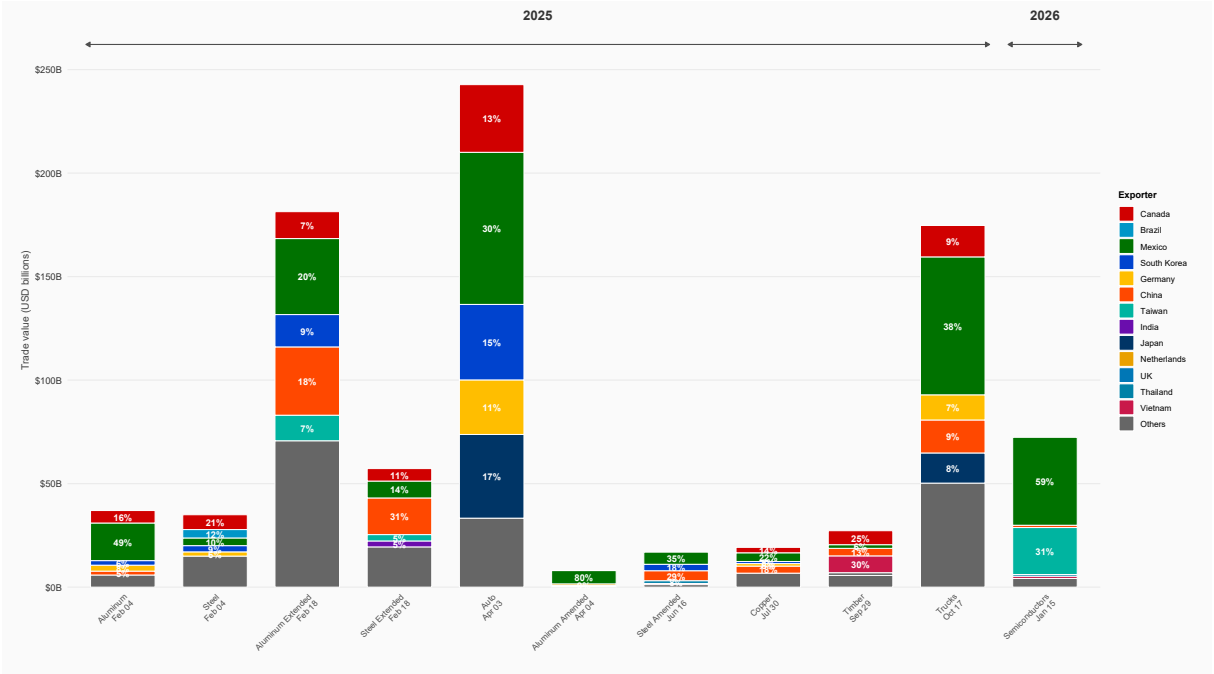

Figure 1: Section 232 tariff measures – stacked bar chart of U.S. imports subject to each Section 232 measure, by exporter (billion USD, 2024). Each bar represents a specific measure-date pair; country segments show the top 5 exporters. Source: author's calculations based on BACI (v202501), executive orders and proclamations.

2.1.2 IEEPA: Emergency powers and broad-based tariffs (February 2025 – February 2026)

The International Emergency Economic Powers Act of 1977 (IEEPA) grants the President broad authority to regulate international economic transactions in declared national emergencies. Unlike Section 232, IEEPA was not designed as a trade policy instrument; its deployment to impose across-the-board tariffs represented a significant institutional innovation with no clear historical precedent (Harpaz, 2020; Lester and Manak, 2019).

Beginning in February 2025, the administration invoked IEEPA to justify sweeping tariff increases. An additional 10% tariff on most Chinese imports—subsequently raised to 20%—was imposed on the basis that fentanyl trafficking constituted an "unusual and extraordinary threat."[6] In March 2025, tariffs of 25% were applied to most imports from Canada and Mexico, later modified for USMCA-compliant goods.[7]

On April 2, 2025 ("Liberation Day"), the administration imposed a baseline 10 percent tariff on almost all trading partners, with country-specific reciprocal rates substantially higher for 57 partners such as Vietnam (+46 pp), India (+26 pp), and the European Union

[6] Executive Order 14,195, "Imposing Duties to Address the Synthetic Opioid Supply Chain," February 1, 2025, 90 *Fed. Reg.* 9,121; Executive Order 14,228, "Further Imposing Duties Addressing the Synthetic Opioid Supply Chain," March 3, 2025, 90 *Fed. Reg.* 11,463. [7] Executive Order 14,193, "Imposing Duties to Address the Situation at Our Northern Border," February 1, 2025; Executive Order 14,194, "Imposing Duties to Address the Situation at Our Southern Border," February 1, 2025, 90 *Fed. Reg.* 9,113.

(+20 pp).[8] These were partially paused on April 9, 2025 for 90 days, maintaining the baseline additional 10 percent floor while country-specific escalatory rates were suspended pending negotiations.[9] On July 31, 2025, the 90-day pause expired; it was extended for an additional 90 days for partners engaged in active negotiations, while higher rates were reinstated for non-cooperating economies, end of July-beginning of August 2025. Products exemptions were subsequently granted in April, September, and November 2025; targeted increases were also applied to Brazil and India for political reasons. Russia, Belarus, Cuba and North Korea (here after RBCNC), all subject to various sanctions, were exempted from the IEEPA, but not from sections 232 additional tariffs. Additional IEEPA tariffs did not stack with Section 232 tariffs.

IEEPA tariffs faced legal challenges from the outset. In May 2025, two federal courts ruled against them. The U.S. Court of International Trade (CIT), in *V.O.S. Selections v. Trump*, held that IEEPA does not authorize the President to impose these specific tariffs and vacated the orders. The U.S. District Court for the District of Columbia, in *Learning Resources v. Trump*, held more broadly that IEEPA does not authorize the imposition of tariffs at all. Both decisions were stayed pending appeal. In August 2025, the U.S. Court of Appeals for the Federal Circuit, sitting en banc, affirmed the CIT decision, characterizing the tariffs as "unbounded in scope, amount, and duration," while vacating the nationwide injunction pending Supreme Court review. Finally, on February 20, 2026, the Supreme Court confirmed that IEEPA does not authorize the President to impose tariffs. This lead to President Trump signed an executive order on February 20, 2026 terminating all IEEPA tariff orders (effective February 24, 2026).[10] U.S. Customs and Border Protection ceased collecting IEEPA tariffs on the same date. Cumulative IEEPA tariff collections are estimated at over $150 billion, and the CIT is overseeing a complex process of reliquidation and refund distribution.[11]

2.1.3 Section 122: Emergency tariffs as a bridge instrument

Within hours of the Supreme Court's February 20, 2026 ruling, President Trump announced the imposition of a new additional 10% global tariff under Section 122 of the Trade Act of 1974, effective February 24, 2026.[12] Section 122 grants the President authority to impose tariffs of up to 15% for periods not exceeding 150 days—without congressional authorization—when a "large and serious" U.S. balance-of-payments deficit is found to

[8] Executive Order 14,257, "Regulating Imports with a Reciprocal Tariff to Rectify Trade Practices that Contribute to Large and Persistent Annual United States Goods Trade Deficits," April 2, 2025, 90 *Fed. Reg.* 15,041. [9] Executive Order of April 9, 2025, "Modifying Reciprocal Tariff Rates to Reflect Trading Partner Retaliation and Alignment," 90 *Fed. Reg.* 15,623. [10] Executive Order of February 20, 2026, "Terminating IEEPA Tariff Orders," 91 *Fed. Reg.* 13,887. [11] "Tariff Refund Mechanism Takes Shape," Skadden Insights, March 2026, skadden.com. [12] Presidential Proclamation of February 20, 2026, "Imposing a Temporary Tariff under Section 122 of the Trade Act of 1974," 91 *Fed. Reg.* 13,901.

exist.

Several features distinguish Section 122 tariffs from their IEEPA predecessors. First, they are explicitly time-limited: the 150-day statutory maximum beginning February 24, 2026 implies expiration by approximately July 23, 2026. Second, they are capped at +15 pp, substantially below the country-specific reciprocal rates previously applied under IEEPA for a large number of countries. Third, certain goods are exempted, including civil aviation products eligible for duty-free treatment under the 1979 Agreement on Trade in Civil Aircraft. Fourth, Section 122 tariffs do not stack with pre-existing Section 232 tariffs. Secretary Bessent has publicly stated that the combined effect of Section 122, Section 232, and Section 301 tariffs is designed to maintain "virtually unchanged tariff revenue in 2026" relative to the IEEPA period.

The legal durability of Section 122 tariffs is itself contested. Two groups of importers filed lawsuits shortly after their imposition, arguing inter alia that the balance-of-payments justification is pretextual (Greer, 2026). The administration views the Section 122 window as a 150-day bridge during which Section 301 investigations are to be concluded, with the resulting tariffs designed to succeed the Section 122 measures before their statutory expiration. The additional tariff due to section 122 has been set to +10 pp (applied to all exporters).

2.1.4 Section 301: A return to unfair trade practice investigations

Section 301 of the Trade Act of 1974 empowers the USTR to investigate foreign acts, policies, and practices that burden or restrict U.S. commerce, and to impose tariffs or other trade countermeasures where such practices are found unreasonable or discriminatory. Unlike IEEPA and Section 122, which vest authority directly in the President, Section 301 requires a formal investigative process including public comment periods, partner consultations, and inter-agency review. These procedural requirements render Section 301 measures more legally robust but slower to implement than emergency instruments.

The tariff baseline used in this paper incorporates first-term Section 301 tariffs on Chinese goods across a wide range of manufacturing sectors—including electronics, machinery, and intermediate goods, where bilateral rates of 7.5 to 25% overlay standard MFN schedules. These tariffs remained in effect throughout the Biden administration and were retained at the onset of the second Trump term.

On March 11, 2026, USTR Jamieson Greer announced the initiation of new Section 301 investigations targeting 16 major trading economies: China, the European Union, Japan, India, South Korea, Taiwan, Vietnam, Mexico, Singapore, Switzerland, Norway, Indonesia, Malaysia, Cambodia, Bangladesh, and Thailand.[13] The investigations examine whether these economies' acts, policies, and practices relating to "structural excess capacity and

[13] Office of the United States Trade Representative, "Initiation of Section 301 Investigations into Structural Excess Capacity and Manufacturing Practices," March 11, 2026.

production in manufacturing sectors" are unreasonable or discriminatory and burden U.S. commerce. On March 12, 2026, a second wave of investigations was announced targeting approximately 60 economies under the lens of insufficient enforcement against goods produced with forced labor.[14]

The strategic rationale is transparent: by launching these investigations early in the 150-day Section 122 window, the administration aims to conclude formal proceedings and propose tariff remedies before Section 122 expires in late July 2026, thereby providing a legally defensible replacement for the IEEPA reciprocal tariffs. From an analytical standpoint, Section 301 measures differ structurally from IEEPA tariffs in ways that matter for quantitative modeling and mid-run quantitative assessments. They are not time-limited, offering more persistent price signals to economic agents. They are product- and partner-specific, enabling more targeted calibration. And the excess-capacity framing may generate different sectoral incidence patterns than the balance-of-payments framing underlying Section 122. However, at the date of writing, results of investigations and associated tariff increases are highly uncertain.

2.2 Evolution of tariffs between January 2025 and March 2026

This section presents how the different tariff instruments evolved across months, between January 2025 and March 2026, starting with the pre-Trump situation.

2.2.1 Initial tariff protection structure (2022 baseline)

The tariff baseline used in this paper reflects the trade policy environment as of 2022, before the onset of second-term measures. This baseline includes worldwide applied tariffs for all countries in the world, taken from the MAcMap-HS6 database (Guimbard et al., 2012). For the US, more specifically, it means that tariffs were made of MFN applied tariffs as notified to the WTO, preferential rates under various trade agreements (USMCA, the U.S.-South Korea FTA, U.S.-Japan partial agreements, and other arrangements...), the general tariff applied to specific countries, such as Cuba and North Korea. To complete this picture, the first-term Section 301 tariffs on Chinese goods across relevant HS6 categories are also included; Column 2 rates on Russian and Belarusian imports reinstated from April 2022 following the revocation of their normal trade relations status are also integrated.

Without considering Section 301 applied to China and sanctions applied to Russia, average tariff protection in the United States is low: 2.1%. Industrial goods' average tariff is about 1.8% while the tariff protection of the agricultural sector is about 5.6%. The Section 301 tariffs on Chinese goods substantially raise effective protection in specific manufacturing categories and have an important impact on the U.S. average tariff in 2022:

[14] Office of the United States Trade Representative, "Initiation of Section 301 Investigations into Forced Labor Practices," March 12, 2026.

the Section 301 stack alone adds about +2.7 pp. Together with the reinstated Column 2 rates on Russian and Belarusian imports—which, for metals, fertilizers, and selected chemical products, reach multiples of their MFN equivalents, in some cases exceeding 50%—this brings the full 2022 baseline to 4.9%, though the macroeconomic weight of the Russia–Belarus component is modest given the low share of these economies in U.S. import volumes.

2.2.2 Methodology

The tariff dataset used throughout this paper is constructed at the HS6 product-level × exporter-level from the MAcMap-HS6 database (2022 base year), complemented by a systematic encoding of every executive order and presidential proclamation issued between January 2025 and March 2026.

The starting point is the MAcMap-HS6 database (Guimbard et al., 2012), which provides bilateral *ad valorem* equivalents at the HS6 level (revision 2022, i.e. 5,612 product categories) for all country pairs. For the United States, these tariffs incorporate MFN applied rates as notified to the WTO, preferential rates under USMCA, the U.S.–South Korea FTA, U.S.–Japan partial agreements, and other arrangements. The reference-group weights, constructed to mitigate the endogeneity between tariff levels and trade volumes and provided by MAcMap-HS6, are used for aggregation throughout the analysis.

Each executive order, presidential proclamation, and Federal Register notice affecting U.S. tariff rates during the period is encoded as a set of product-level × partner-level dummy variables. The encoding specifies the HS6 products covered, the affected partners, the date of entry into force, and the additional *ad valorem* percentage-point increase. Where an executive order references a product list by HTS8 or HTS10 codes, these are concorded to the HS6 level using the U.S. HTS classification structure (simple average). Where an executive order or proclamation specifies a *percentage* increase (e.g., +25%), this is interpreted as a percentage *point* addition to the existing applied tariff.

A distinctive feature of the IEEPA tariffs on Canada and Mexico is that USMCA-compliant goods were exempted from the additional duties. The share of bilateral trade eligible for USMCA preferences is estimated using USITC DataWeb[15] that provides import values at the HTS10 level organized by customs preference program for the reference year (2024 baseline) For each HS6 product and each of Canada and Mexico, the USMCA utilization rate, u_{ip}, is defined as the ratio of imports entering under USMCA preference

[15] https://dataweb.usitc.gov/

program to total imports from the partner:

$$u_{ip} = \frac{V_{ip}^{\text{USMCA}}}{V_{ip}^{\text{USMCA}} + V_{ip}^{\text{non-USMCA}}},$$

where V_{ip}^{USMCA} denotes the value of imports of HS6 product i from partner p entering under USMCA preference, and $V_{ip}^{\text{non-USMCA}}$ the remainder. Products with utilization rates $u_{ip} \geq 0.50$ are treated as largely USMCA-compliant: the IEEPA exemption is assumed to apply to most of the bilateral flow, and the effective additional tariff is set to zero ($\Delta\tau = 0$).[16] Products with $u_{ip} < 0.50$ are not considered USMCA-compliant and face additional duties, depending on the nature of the HS6 product. $\Delta\tau = +10$ pp for energy products from Canada and potassium from Mexico and Canada. Othewise, $\Delta\tau = +25$ pp or +35 pp (for Canada, depending on the period). Section 232 tariffs do not stack with theses IEEPA increases and the concerned products face their own increase as described in Section 2.1.1.

Finally, for partners that concluded framework deals with the United States (United Kingdom, June 2025; European Union, Japan, and South Korea, September 2025), the IEEPA reciprocal surcharges were replaced—on covered HS6 lines—by a uniform 15% floor, as explained in Section 2.2.5.

2.2.3 Temporal evolution and decomposition by instrument

Figure 2 traces the reference group-weighted[17] average U.S. applied tariff rate from January 2025 through March 2026, decomposed into ten instrument-level contributions using a stacked step-function representation. Each coloured band shows the additive contribution of a distinct statutory authority, making it possible to read simultaneously the temporal phase structure and the relative weight of each instrument at any given date.

For each date t, every bilateral tariff line (i, p)—where i denotes an HS6 product and p a trading partner—is assigned to exactly one instrument category $k \in \mathcal{K}$. Let τ_{ipt} denote the applied ad-valorem tariff and w_{ip} the MAcMap-HS6 reference-group weight.

[16] This threshold is a modelling assumption on the USMCA-compliant share. In the polar case where all Canadian and Mexican exports were treated as USMCA-compliant, both partners would be fully exempt from the Section 122 (and IEEPA) surcharge, and their outcomes—notably under Scenarios 1 and 4—would improve further. They would not, however, be unaffected: Section 232 duties (steel, aluminium, automobiles, copper, etc.) apply irrespective of USMCA compliance, so even a fully-compliant Canada and Mexico would still face the Section 232 increase relative to January 2025. [17] Reference-group weights from MAcMap-HS6 (2022) are used instead of observed import values to avoid the endogeneity between tariff levels and trade flows. See (Guimbard et al., 2012) for a discussion of the weighting scheme.

The reference-group-weighted average tariff is

$$\bar{\tau}_t \;=\; \frac{\sum_{(i,p)} \tau_{ipt}\, w_{ip}}{\sum_{(i,p)} w_{ip}}$$

and the contribution of instrument k is

$$C_{kt} \;=\; \frac{\sum_{(i,p)\in k} \tau_{ipt}\, w_{ip}}{\sum_{(i,p)} w_{ip}} \quad \text{so that} \quad \bar{\tau}_t \;=\; \sum_{k\in\mathcal{K}} C_{kt}\,.$$

The decomposition is additive: each tariff line is allocated sequentially across instruments using a capped waterfall. The MFN/Preferential component defines the base layer; the pre-existing Section 301 premium on China is isolated as a second layer; sanctions premia, Section 232 rates, fentanyl surcharges, USMCA add-ons, deal-related offsets, and Brazil–India surcharges are attributed in order of policy priority; any residual is assigned to IEEPA reciprocal tariffs. In 2026, all IEEPA components are replaced by Section 122, while sanctions and Section 232 persist.

The ten categories $\mathcal{K}$ are as follows. The first three were already in place before President Trump's second term and are incorporated in the tariff baseline. *Initial (MFN/Preferential)* covers baseline applied rates, excluding the pre-existing Section 301 premium on China. *Section 301 China* isolates that pre-existing premium on Chinese goods in the 2022 baseline. *Sanctions* captures Column 2 rates on Russia, Belarus, Cuba, and North Korea.

The remaining seven instruments are specific to the 2025–2026 tariff escalation. *Section 232* covers national-security tariffs on steel and aluminum (+25 pp to +50 pp), automobiles and light trucks (+25 pp), copper, timber and lumber, and a narrow subset of advanced semiconductors (+25 pp); these measures do not stack with other tariff increases. *IEEPA USMCA* covers additional duties (+10 pp, +25 pp, or +35 pp) on Canadian and Mexican goods that do not comply with USMCA rules of origin. *IEEPA Fentanyl China* adds +10–20 pp on Chinese imports from February 4, 2025. *IEEPA Reciprocal* captures the Liberation Day reciprocal tariffs (from April 2, 2025) and their July 2025 update. *IEEPA Brazil–India* comprises the targeted surcharges of +40 pp on Brazil and +25 pp on India from August–September 2025. *Deals* records deal-related tariff offsets for the EU, Japan, South Korea, and the UK. Finally, *Section 122* covers the +10 pp global surcharge effective from February 24, 2026; it does not stack with Section 232 but compounds with pre-existing Section 301 duties on China.

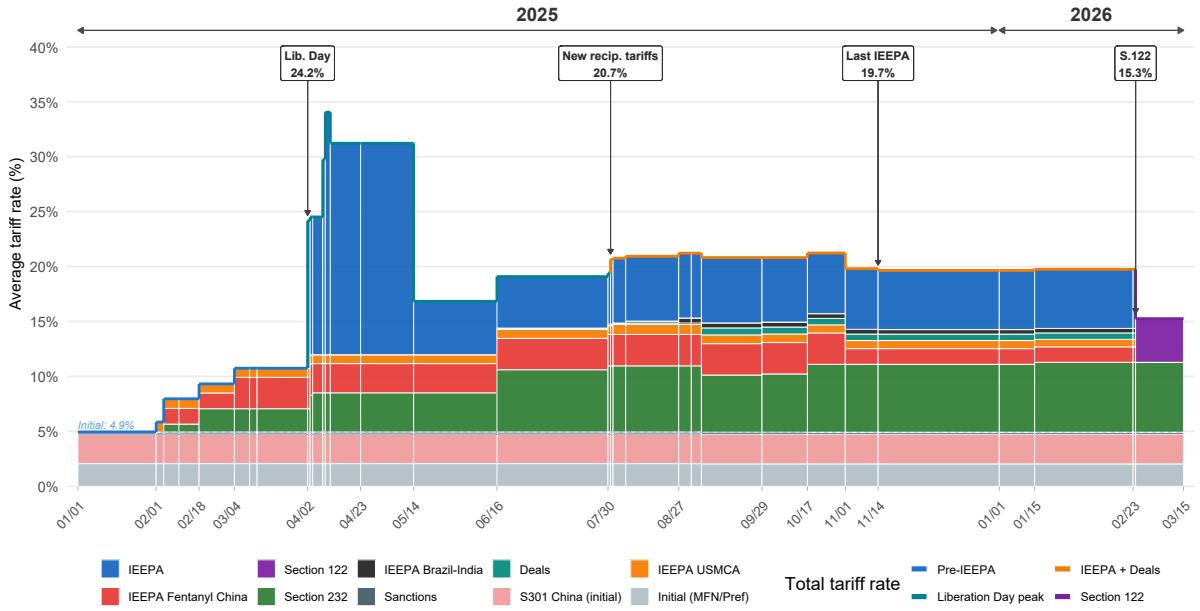

Figure 2: U.S. average tariff rate: decomposition by instrument, January 2025 – March 2026 (reference group-weighted). Each band represents the additive contribution of a single statutory instrument to the overall average tariff rate. The coloured line traces the total average tariff rate, coloured by tariff phase (blue: Pre-IEEPA, teal: Liberation Day peak, orange: IEEPA+Deals, purple: Section 122). Source: author's calculations based on MAcMap-HS6 (2022), executive orders and proclamations.

The same representation can be applied at the bilateral level to track how the all-partners average translates into country-specific tariff trajectories; Figure A1 in Appendix F reports the corresponding panels for the four exposed partners (China, Japan, South Korea, Brazil) and highlights how heterogeneously the same instruments translate into bilateral tariff levels — driven by partner-specific baselines (Section 301 on China since 2018), framework deals (Japan, South Korea), and country-targeted IEEPA surcharges (Brazil from August 2025).

Four stylized facts of the 2025–2026 trajectory stand out and motivate the analysis that follows. *(i)* The average applied tariff rose several-fold. The average climbed from 4.9% in January 2025 (2.1% on a conventional MFN-Preferential basis) to 15.3% by February 2026—roughly a threefold increase—after peaking at 24.2% on Liberation Day (2 April 2025), about five times the initial level and the highest U.S. average tariff of the post-war period. Adding the prospective Section 301 overcapacity tariffs would bring the average to about 21.8%, some 4.4 times the January 2025 level. *(ii)* The durable, legally robust instruments gained a growing share. Section 232 national-security tariffs—the most legally resilient layer—rose from 2.1 pp in early April 2025 to 6.4 pp by February 2026; as the volatile IEEPA layer collapsed, their share of the total average jumped from about 9% at the Liberation Day peak to roughly 41% by February 2026. The durable core (Section 232,

Column-2 sanctions, and the pre-existing Section 301 premium on China) thus came to dominate the structure. *(iii)* Policy uncertainty rose sharply. The average tariff was adjusted more than twenty times in fourteen months, and its largest single component—the IEEPA reciprocal tariff (13.4 pp on Liberation Day)—rested on emergency, largely non-economic justifications (a trade-deficit "national emergency", fentanyl, migration) that proved legally fragile: its overnight invalidation by the Supreme Court in February 2026 produced the sharp discontinuity visible in the figure. The combination of frequent discretionary changes and a legally contested backbone made the effective tariff both high and unpredictable. *(iv)* November 2025 marks the administration's "target" structure. At 19.7% the November 2025 configuration assembles what can be read as the intended regime—a durable Section 232 core (6.2 pp) layered with IEEPA reciprocal tariffs (5.4 pp) and country-specific surcharges, partially offset by framework deals. It is against this "ideal" target that the realistic, durable configurations of Section 4 are assessed.

The figure further reveals four distinct phases within this trajectory. **Phase 1 (January–March 2025): Onset of second-term measures.** Starting from 4.9% once pre-existing Section 301 measures on China are included (2.1% on a conventional MFN basis), the weighted average had already reached **10.75%** by end-March 2025, reflecting the rapid stacking of IEEPA measures on Canada, Mexico, and China combined with the reconstituted Section 232 steel and aluminum tariffs.

Phase 2 (April–August 2025): Peak IEEPA coverage. The Liberation Day reciprocal tariff framework applied differentiated rates to virtually all U.S. trading partners, pushing the weighted average to approximately 24.2% at its peak—the highest U.S. average tariff rate in the post-WWII era. IEEPA reciprocal tariffs accounted for 13.4 pp at that peak, IEEPA Fentanyl China for a further 2.9 pp, and Section 232 for 2.1 pp. The partial 90-day pause from April 9 maintained a +10 pp global floor while suspending country-specific escalatory rates for partners in active negotiations.

Phase 3 (September–November 2025): Partial reversal and deals. Framework deals with the EU, Japan, and South Korea (effective September 2025) and the UK (effective June 2025) generated visible offsets of approximately 3.1–3.4 pp.Section 232 continued to grow—from 2.1 pp in early April to 6.4 pp by February 2026—as national-security tariffs were extended beyond steel and aluminum into automobiles, copper, timber, and semiconductors. By November 14, the weighted average stood at approximately 19.7%.

Phase 4 (February 2026 onward): Post-IEEPA pivot. The sharp discontinuity in late February 2026 marks the overnight transition from IEEPA to Section 122, which contributes 4.0 pp alongside the persistent Section 232 (6.4 pp) layer, yielding approximately 15.3%. Should the Section 301 overcapacity investigations result in additional tariffs as

modeled in Scenario 4, the average rate could rise to approximately 21.8%.[18]

2.2.4 Retaliatory measures by U.S. trading partners

The unprecedented breadth and speed of U.S. tariff escalation prompted swift retaliatory responses from several major trading partners. Despite the focus on the unilateral U.S. tariff architecture, those retaliatory tariffs are incorporated in the MIRAGE simulation scenarios. I briefly document them in this sub-section as they remain useful for interpreting the simulation results. However, I do not discuss their broader implications on trade war dynamics, as the 2025-2026 period has shown that retaliatory measures by partners, with the exception of Canada and China, were not the strategy adopted.[19]

Canada responded to U.S. tariffs through four waves of countermeasures, each imposing a +25 pp surcharge on selected U.S. products.[20]

- **March 4, 2025**: 1,256 U.S. product lines subject to +25 pp, covering steel, aluminum, consumer goods, and agricultural products.
- **March 13, 2025**: 539 additional product lines subject to +25 pp, broadening coverage to industrial inputs and machinery.
- **April 23, 2025**: 19 automotive product lines subject to +25 pp, specifically targeting USMCA non-compliant vehicles and parts.
- **September 1, 2025**: A consolidated list of 314 product lines subject to +25 pp replaced the earlier tranches, resetting Canadian retaliatory tariffs to a streamlined structure while dropping some earlier products.

In total, Canadian retaliatory measures covered up to 1,814 U.S. tariff lines at their peak (summing the first three waves of retaliation), all at a uniform +25 pp rate. The September 2025 consolidation suggests a strategic recalibration, narrowing the scope of retaliation to minimize harm to Canadian consumers and downstream users while maintaining political leverage.

China implemented retaliatory tariffs in two stages.[21]

[18] Russia is excluded from the reference-group-weighted average: the MAcMap-HS6 2022 trade weights predate the post-2022 trade embargo, so retaining Russia would overstate the average via phantom trade flows at Column 2 rates. Belarus, Cuba, and North Korea remain in the Sanctions band but their combined contribution is negligible (<0.1 pp). [19] The European Union adopted a more restrained approach, leveraging framework deal negotiations to limit tariff escalation while reserving the right to impose countermeasures. As of March 2026, formal EU retaliatory tariffs had not been implemented, though the European Commission publicly announced a list of U.S. products eligible for rebalancing measures in the event of deal breakdown. [20] Government of Canada, Department of Finance, "Canadian Countermeasures in Response to U.S. Tariffs," various dates (March–September 2025). [21] Ministry of Finance of the People's Republic of China, "Notice on Adding Tariffs on Certain U.S. Products," various dates (February–March 2025).

- **February 10, 2025**: A first tranche of tariff increases at variable rates (product-specific), announced on February 4 in response to the initial IEEPA fentanyl tariffs on Chinese goods.
- **March 10, 2025**: A second tranche covering two categories—29 tariff lines at +15 pp (chicken, wheat, corn, cotton) and 711 tariff lines at +10 pp (sorghum, soybeans, pork, beef, aquatic products, fruits, vegetables, dairy products).

Chinese retaliatory measures targeted primarily U.S. agricultural exports, reflecting China's strategic focus on politically sensitive sectors in key U.S. states. The concentration on agricultural products is consistent with the trade war literature documenting the political economy of retaliation (Fajgelbaum et al., 2020).

Beyond these formal retaliatory waves, the April–May 2025 period saw an acute bilateral escalation between the United States and China constituting a de facto trade war: following Liberation Day, China raised tariffs on U.S. goods progressively, matching each successive U.S. increase, with Chinese effective tariffs on U.S. goods reaching approximately 125% and U.S. tariffs on Chinese goods reaching 145% before the May 12, 2025 pause agreement. This bilateral escalation is captured in the descriptive tariff data and is visible in Figure 2 as the peak of Phase 2. However, given the rapid de-escalation following the May 12 pause—which brought Chinese and U.S. tariffs back toward pre-war levels within weeks—this trade war peak is excluded from the MIRAGE simulation scenarios. Scenario 5 (Liberation Day) therefore corresponds to the post-Liberation Day IEEPA rate structure *without* the bilateral U.S.–China tariff war escalation.

Canadian and Chinese retaliatory tariffs are incorporated in the MIRAGE scenarios, amplifying the negative effects on U.S. exports—particularly in agriculture, where China's targeted retaliation directly reduces U.S. market access—and further reducing U.S. welfare. EU retaliatory tariffs, not formally imposed as of March 2026, are not modeled.

2.2.5 Negotiated trade deals

Alongside unilateral tariff measures, the United States pursued negotiated framework arrangements with four major partners: the European Union, the UK, Japan, and South Korea. These deals do not eliminate tariffs but cap the applicable rate, grant product-specific exemptions, or delay escalation.

Several clarifications are warranted about the scope of this selection. Numerous other bilateral framework discussions and product-specific understandings were announced throughout 2025–2026, but the texts of many of these arrangements are vague or unofficial, limiting their tractability for modelling purposes. The four partners retained here are selected as sufficiently documented and economically significant to model. A reduction in fentanyl-related tariffs on China (−10 pp, November 2025) also occurred in the context of bilateral negotiations; it is treated as a deal in the tariff data but differs in nature from

the EU, Japan, and South Korea framework deals, which introduce a 15% tariff floor on broader product coverage. Finally, the UK arrangement, while incorporated in the tariff data (effective from June 16, 2025), has no material impact on the quantitative scenarios given the UK's trade structure and the model's sectoral aggregation.

The 2025 U.S.–UK agreement is a sectoral arrangement that reduces tariffs and expands market access in selected goods and services while leaving the core U.S. trade defence framework intact. In industrial goods, it provides expanded tariff-rate quota access and more flexible treatment under Section 232 for UK exports of steel and aluminium, including adjusted quotas and more accessible exclusion procedures. In the automotive sector, it improves market access conditions through reduced tariff pressure on a limited volume of UK vehicle exports, subject to quota management.

For the EU, Japan, and South Korea, the general structure of the framework deals follows a common template. For each covered partner, the effective tariff on a given product is set to:

$$\tau^{\text{deal}} = \max\Big(0.15,\ \tau^{\text{MFN}}\Big),$$

where τ^{MFN} denotes the pre-existing MFN applied rate. In other words, the deal imposes a floor of 15% on covered products—equivalent to a minimum additional tariff of +15 pp over zero—while allowing products whose MFN rates already exceed 15% to retain the higher rate. This floor ensures that even preferential partners face non-trivial tariff levels, consistent with the administration's "reciprocity" rhetoric.

In addition, each deal includes sector-specific exemptions under which certain products—typically automobiles, pharmaceuticals, or agricultural goods subject to parallel negotiations—are excluded from the general cap and instead face product-specific rates negotiated bilaterally. The EU framework deal, for instance, exempts steel and aluminum products (which remain subject to Section 232 rates), while incorporating partial caps on automobile tariffs at a level below the full Section 232 rate of 25 %. The Japan arrangement focuses on preserving existing automotive trade flows and includes investment commitments. The South Korea deal combines tariff adjustments with technology and defense procurement provisions.

Several sources of uncertainty surround the implementation and durability of these deals as of March 2026. First, the transition from IEEPA to Section 122 on February 24, 2026 raises the question of whether deal commitments negotiated under the IEEPA regime continue to apply under the new statutory authority; administration officials have stated that deals remain "in force" but no new executive orders have formally re-established them under Section 122. Second, all three deal partners—the EU, Japan, and South Korea—are among the 16 economies subject to the Section 301 overcapacity investigations launched in March 2026. If Section 301 tariffs are ultimately imposed, their interaction with existing deal commitments is legally and practically uncertain: the +25 pp overcapacity surcharge

modeled in Scenario 4 would likely supersede the deal caps, effectively unwinding the preferential access that the framework agreements were designed to preserve. Third, the 150-day statutory limit on Section 122 tariffs (expiring approximately July 23, 2026) implies that in the absence of a successor instrument, the entire tariff architecture—including the deals predicated on it—would lapse, reverting to the pre-second-term baseline plus Section 232 measures only.

3 Model and data

This section describes the quantitative framework used to simulate the effects of U.S. tariff scenarios. Section 3.1 briefly presents the MIRAGE computable general equilibrium model, its structural features, and dynamic properties. Section 3.1.3 describes the data used by the model, with an emphasis of the MAcMap-HS6 database, input at the heart of this paper. Section 3.2 details the geographical and sectoral aggregation chosen to capture the most relevant policy instruments and affected industries.

3.1 The MIRAGE model

3.1.1 Overview

MIRAGE (Modelling International Relationships in Applied General Equilibrium) is a multi-region, multi-sector dynamic computable general equilibrium (CGE) model developed at CEPII since 2001. It has been widely used for the *ex-ante* quantitative assessment of trade policy changes, environmental policies, and long-term structural transformation. The model is fully open-source, with its complete code and documentation publicly available on a GitLab repository.[22] The model is fully documented in Bouët et al. (2026).

3.1.2 Core structural features

In each region and sector, production is modeled using nested constant elasticity of substitution (CES) functions. The top-level production function combines intermediate consumption (IC) and a "value-added and energy" (VA&E) composite in fixed (Leontief) proportions. Within the VA&E nest, five primary factors—land, natural resources, unskilled labor, skilled labor, and capital—are combined with energy inputs through a multi-level CES hierarchy. At the first level, land and natural resources enter alongside a labor-quality composite. Unskilled labor combines with a quality bundle Q that itself nests skilled labor and a capital-energy bundle. Within this bundle, capital substitutes with an energy composite, which further distinguishes power (electricity) from fossil fuels. Fossil fuels are disaggregated into coal and a non-coal bundle comprising oil, gas, and refined

[22] https://gitlab.com/mirage-model/mirage-public

petroleum products. This nesting structure captures the limited short-run substitutability between capital and energy while allowing greater flexibility among fossil fuel sources. Capital and skilled labor are mobile across sectors within a region, while natural resources and land are sector-specific.[23]

Capital stock dynamics follow a putty-clay structure: installed capital is assumed to be immobile across sectors within a period, so that capital reallocation occurs only through the combined effect of depreciation and new investment. The model operates in a recursive-dynamic mode, simulating the economy period by period as an overlapping sequence of short-run equilibria connected through capital accumulation and the exogenous baseline.

Final demand is represented using a Linear Expenditure System (LES) nested within a CES structure, which allows income elasticities to differ across goods without excessive computational complexity. Household preferences incorporate a hierarchy of substitution: first between domestic and imported varieties (Armington substitution), then among imported varieties by origin. Intermediate demand follows a Leontief structure with respect to the aggregate bundle, combined with CES substitution between domestic and imported intermediates. This specification ensures that input-output relationships are maintained while allowing trade policy shocks to affect input costs and sectoral competitiveness throughout the (embedded) supply chain.

In manufacturing sectors where scale economies matter, MIRAGE incorporates a Dixit-Stiglitz monopolistic competition structure (Bouët et al., 2026). Each variety is produced by a single firm, and the markup over marginal cost is constant—determined solely by the elasticity of substitution between varieties. The number of varieties—and hence the number of active firms—is endogenous: free entry drives profits to zero, so the equilibrium number of varieties adjusts each period through the zero-profit condition.

3.1.3 Related data

MIRAGE is calibrated on the GTAP database, which provides global social accounting matrices (SAMs) linking production, consumption, trade, and factor markets for 160 countries and 65 sectors. The version used in this paper is GTAPpower 11, with 2017 as the reference year.

Trade policy data are drawn from several satellite databases produced by CEPII and partner institutions. The core tariff data come from the MAcMap-HS6 database (Guimbard et al., 2012), which provides ad valorem equivalents (AVEs) of applied tariffs at the HS6 product level for bilateral trade flows between approximately 160 countries.

[23] The model documentation (Bouët et al., 2026) presents several sector-specific variants of this nesting for agriculture, fossil energy, and electricity production sectors.

MAcMap-HS6 covers MFN rates, preferential rates under regional and bilateral agreements, and specific and compound duties converted to ad valorem equivalents using unit values. The reference group weighting methodology developed in Bouët et al. (2008) and Guimbard et al. (2012) is used to aggregate HS6 tariff lines to the model's sectoral classification, avoiding endogeneity bias.

For non-tariff measures (NTMs) in services sectors, MIRAGE draws on the AVEs-Services database (Fontagné et al., 2016), which provides estimated *ad valorem* equivalents of regulatory barriers to services trade across countries and services sectors. These AVEs are held constant in the scenarios analyzed in this paper, which focus exclusively on goods tariff shocks; services NTMs do not change across simulations.

Trade elasticities governing the Armington substitution between domestic and imported varieties, and among imported varieties by origin, are calibrated using the "Product Level Trade Elasticities" dataset of Fontagné et al. (2022). These tariff-based elasticities are estimated at the product level and aggregated to the model's sectoral classification, providing empirically grounded parameters for the CES demand structure.

3.1.4 Macroeconomic baseline

The macroeconomic baseline of MIRAGE is anchored to long-run growth projections produced by the MaGE (Macroeconometrics of the Global Economy) model (Fontagné et al., 2013), whose outputs are collected in the EconMap database. MaGE provides consistent projections for 167 countries based on a three-factor production function combining capital K_{rt}, labor L_{rt}, and energy E_{rt}.

The model is fitted using UN population projections and econometric estimates for capital accumulation (*via* a Feldstein–Horioka-type investment–savings relationship), education attainment, female labor force participation, and two types of technical progress. Savings rates are driven by demographic structure through a life-cycle mechanism. Capital stock follows a permanent inventory process with a 6% depreciation rate. TFP growth is fueled by education levels through a catch-up process, while energy productivity growth is tempered by GDP per capita levels, reflecting the impact of structural change during development.

From EconMap, MIRAGE draws the following exogenous trajectories for its baseline:

- GDP growth rates,
- Population and labor force (skilled and unskilled),
- Saving rates and current account balances,
- Energy productivity projections.

In addition, fossil energy price trajectories are calibrated according to International Energy Agency (IEA) projections, and sector-level TFP growth differentials (agriculture, manufacturing, services) are imposed exogenously.

The MIRAGE baseline is constructed in two sequential steps. The first step consists

of the calibration of the Total Factor Productivity (TFP). To do so, GDP trajectories from MaGE/EconMap are imposed exogenously, and TFP is calibrated endogenously to reproduce the target GDP growth path. Agricultural TFP follows exogenous sector-specific projections, while manufacturing and services TFP are determined residually with a constant 2 percentage-point growth differential between them. At the end of this step, the model possesses a calibrated trajectory for TFP consistent with projected macroeconomic outcomes.

The second step is the construction of a policy baseline. In the dynamic path, TFP becomes exogenous (fixed at the values calibrated in Step 1) and GDP becomes endogenous. This step allows the introduction of baseline policy changes—such as Brexit (included in the current configuration), pre-existing trade agreements, and other structural assumptions—whose effects on GDP can be captured because productivity is no longer forced to absorb them. The resulting trajectory serves as the counterfactual against which simulation scenarios are compared. The tariff baseline reflects the trade policy environment as of 2022, incorporating worldwide applied tariffs from the MAcMap-HS6 database (Guimbard et al., 2012). For the United States specifically, this includes (components 1 and 2 explained in Section 2.2.3): MFN applied tariffs as notified to the WTO; preferential rates under USMCA, bilateral trade preferences such as the U.S.–South Korea FTA, and other agreements; first-term Section 301 tariffs on Chinese goods; and Column 2 rates on Russian and Belarusian imports reinstated from April 2022.

3.2 Geographical and sectoral aggregation

The model is aggregated into 22 regions, selected to identify the major targets of U.S. trade measures and their principal trading partners: the United States, Canada, Mexico, four EU member states (France, Germany, Italy, Spain), the Rest of the EU27, the United Kingdom, EFTA, China, Japan, South Korea, India, ASEAN, Brazil, Australia and New Zealand, the CIS, Rest of Latin America, the Middle East and North Africa, Sub-Saharan Africa, and the Rest of World. The full correspondence between GTAP countries and model regions is reported in Appendix E, Table A17.

In terms of partner exposure, Canada and Mexico are the most directly affected economies through their deep integration in U.S. manufacturing supply chains—particularly automotive under USMCA—and their exposure to both Section 232 and, during Phase 3, IEEPA Canada/Mexico tariffs. China faces the highest nominal tariff stack, with Section 301, Section 232, and IEEPA measures layering to produce effective rates well above 40% on many categories. European exporters face primarily the automobile Section 232 tariff and, during Phase 3, the +20 pp IEEPA reciprocal rate.

Table 1 reports U.S. import values by partner in 2024. Total U.S. goods imports amounted to $3,132.2 billion across 1,335,656 HS6 bilateral lines, of which $2,917.9 billion

(93.2%) were non-agricultural and $214.3 billion (6.8%) agricultural. The European Union is the largest source of U.S. imports ($543.0 billion), followed by Mexico ($495.5 billion), China ($455.4 billion), Canada ($400.6 billion), Japan ($141.0 billion), Vietnam ($140.5 billion), and South Korea ($130.7 billion).

Table 1: U.S. Imports by Major Trading Partner, 2024 (billion USD)

Partner	Import Value	Share (%)
EU27	543.0	17.3
Mexico	495.5	15.8
China	455.4	14.5
Canada	400.6	12.8
Japan	141.0	4.5
Vietnam	140.5	4.5
South Korea	130.7	4.2
Other partners	825.5	26.4
Total	**3,132.2**	**100.0**

Source: Author's calculations based on BACI, CEPII (v202501).

As shown in Figure 1, the sectoral distribution of Section 232 tariffs is particularly important for understanding the supply-chain propagation of shocks. The automobile and light truck tariff (+25 pp from May 2025) is the most economically significant action of the second term given the scale of U.S. auto imports—approximately $220 billion in 2024. Steel and aluminum tariffs directly affect a wide range of downstream manufacturing sectors, raising input costs for producers of machinery, packaging, construction materials, and consumer durables. The semiconductor proclamation of January 2026, while narrow in its first-phase scope, targets the most technologically sensitive upstream input in advanced manufacturing.

Hence, sectors are disaggregated to capture the most affected industries, with particular granularity for metals (iron and steel, non-ferrous metals), motor vehicles and parts, electronic equipment, chemicals, rubber and plastics, and wood products (see Appendix E, Table A18 for the full GTAP sector correspondence). Section 232 tariffs are mapped to the following GTAP sectors: iron and steel (*i_s*), non-ferrous metals (*nfm*), motor vehicles and parts (*mvh*), electronic equipment (*ele*), and wood products (*lum*). Service sectors are highly aggregated due to the focus on tariff measures (those sectors are only affected through general equilibrium effects).

4 The design of the scenarios

Five scenarios are defined to capture the key policy configurations of the second Trump administration's trade policy. Each represents a distinct legal and institutional configuration, allowing identification of the economic contribution of specific instruments and the role of negotiated deals. All scenarios are implemented in a single shock, occurring in 2025.[24] Hence, they are simulated as changes relative to the 2022 tariff baseline (assumed to be constant) and results are reported as percentage deviations from the counterfactual baseline in 2040.

The simulation horizon extends to 2040, a choice motivated by the recursive-dynamic structure of MIRAGE. Because capital accumulation and sectoral reallocation operate through putty-clay investment dynamics—with installed capital immobile across sectors within a period and reallocation occurring only through depreciation and new investment—the model requires a medium-term horizon to capture the full adjustment to tariff shocks. A 2040 endpoint provides approximately 15 years of adjustment from the shock date, sufficient for the capital stock to turn over substantially (at a 6% depreciation rate, roughly 60% of the 2025 capital stock will have been replaced by 2040) and for trade and production patterns to converge toward their new steady-state configuration. Shorter horizons would understate the allocative costs by truncating the adjustment process, while longer horizons would not generate any additional effects beyond those already in effect by 2040 (relative to the baseline). This medium-term, recursive-dynamic horizon is moreover the natural one for the question posed in this paper. Because I ask whether a legally durable instrument can reproduce the November 2025 target, the object of interest is the lasting reindustrialisation that a durable regime would eventually deliver—once installed capital has depreciated and investment has redirected labour and capital toward the protected sectors—rather than the transitory impact effect of the shock. A long-run, dynamic evaluation therefore matches the very notion of durability at the heart of the research question: a temporary patch (Section 122) and a durable instrument (Section 301) are meaningfully compared only at a horizon over which durability actually bites.

An important caveat concerns the legal-institutional durability of the instruments modeled. Section 232 tariffs are legally robust and have proven durable across administrations. Section 122 tariffs are explicitly time-limited (150 days) and legally contested. Section 301 measures, while procedurally robust, are subject to ongoing investigations and potential WTO disputes. More durable tariffs may induce stronger behavioral responses if perceived as persistent changes to the trade environment; temporary or uncertain measures may have muted effects if agents anticipate reversal. The model does not capture these expectations, implying that results for scenarios involving Section 122 (that is not supposed to last in

[24] The scenario on section 122 occurs, in reality, in 2026. Given the endpoint of each simulation, it does not change the results if implemented in 2025 instead. The same logic is applied to the prospective scenario on sections 301.

the long run) and nascent Section 301 measures should be interpreted as upper bounds on their potential impact.

Scenario 1: March 2026 — Section 122 and Section 232. This scenario captures the current trade regime as of March 2026, following the judicial invalidation of IEEPA tariffs. It combines the global +10 pp Section 122 tariff (effective February 24, 2026) with all active Section 232 measures: steel (+50 pp), aluminum (+50 pp) and the +25 pp automobiles and light trucks, copper, timber and lumber. The 2026 advanced semiconductors section 232 is also integrated (+25 pp on covered products). No framework deals are incorporated, representing the unilateral post-IEEPA baseline before any negotiated offsets. Section 122 tariffs do not stack with Section 232 measures, but both 122 and 232 stack with applicable MFN rates, preferential tariffs and the pre-existing Section 301 tariffs on Chinese goods in force since 2018-2022.

Scenario 2: November 2025 — Section 232, IEEPA, and Deals. This scenario represents the trade regime prevailing in November 2025, approximately midway through the IEEPA operational period and following the partial pausing of country-specific reciprocal tariffs in July 2025. It combines Section 232 measures (as in Scenario 1) with IEEPA-based tariffs at the rates applicable after the 90-day pause: a global +10 pp floor for most partners, with higher residual rates for 65 partners whose "reciprocal" tariffs exceeded the floor (see Appendix D, Table A15). Rates range from 15 pp (e.g. Afghanistan, Norway, Turkey, most African and Latin American partners) to 41 pp (Syria), with notable clusters at 19–20 pp for Southeast Asian economies (Vietnam, Indonesia, Cambodia, Thailand, Malaysia, Philippines) and 25 pp for India, Brunei, and Kazakhstan. China is excluded from the reciprocal tariff list and handled separately: IEEPA fentanyl tariffs (+10 pp after the November 2025 deal, reduced from +20 pp) stack with a +10 pp residual reciprocal component and with all applicable Section 232 and legacy Section 301 tariffs, yielding effective Chinese tariff rates in the range of 50-70 pp depending on the product. Framework deals for the EU, Japan, and South Korea are incorporated, reflecting partial caps on tariff escalation negotiated during this period. This scenario captures the hybrid protectionism-plus-deals configuration that characterized the mid-IEEPA period.

Scenario 3: Section 232 Only. This scenario isolates the effect of Section 232 tariffs alone, providing the purest assessment of the national-security tariff instrument. All Section 232 measures in effect as of March 2026 are applied, but no IEEPA, Section 122, or Section 301 tariffs are incorporated, and no framework deals are modeled. Partners are treated symmetrically under MFN rates / Preferential rates plus Section 232 sector-specific measures. This scenario serves as the analytical anchor for identifying the incremental contributions of other instruments and corresponds broadly to the trade regime that

prevailed in the first months of the second Trump administration, before IEEPA measures came into effect.

Scenario 4: Section 301 — Prospective Overcapacity Tariffs. This scenario simulates a prospective trade regime in which Section 301 investigations into "structural excess capacity" conclude in favor of the U.S. administration, resulting in additional tariffs on targeted partners. All Section 232 tariffs remain in effect. Section 122 is assumed to expire and is removed. For the 16 economies subject to the overcapacity investigation—China, the EU, Japan, India, South Korea, Taiwan, Vietnam, Mexico, Singapore, Switzerland, Norway, Indonesia, Malaysia, Brazil, Turkey, and South Africa—an additional +25 pp tariff is applied to all products not already covered by Section 232, but does not apply to Section 122 exemptions. Products already subject to Section 232 measures retain their existing tariff levels. This configuration raises the weighted average U.S. tariff to approximately 21.8%, with partner-level rates reaching 42.8% for China, 21.5% for India, 20.5% for the EU, 17.8% for Japan, 15.6% for South Korea, 22.9% for Mexico, and 6.7% for Canada. This stylized scenario assesses the potential impact of a legally durable, partner-specific tariff regime replacing the time-limited Section 122 bridge.

Scenario 5: Liberation Day — IEEPA at Peak Rates (April 2025). This scenario captures the tariff regime at its most restrictive, corresponding to the aftermath of the April 2, 2025 Liberation Day executive order (the short U.S.-China trade war rising reciprocal tariffs to +125 pp is not included) before the 90-day pausing of country-specific reciprocal tariffs and before any bilateral framework deals. All IEEPA reciprocal tariffs are applied at their unadjusted partner-specific rates, and all Section 232 measures are fully active. No framework deals are incorporated. The weighted average tariff reaches 26.7%, the highest across all five scenarios, with China facing rates of 69.9%, Japan 21.5%, South Korea 16.9%, and the EU 18.9%. This scenario serves as the upper bound on the protectionist stance of the second Trump administration and represents the peak realized tariff configuration before strategic moderation through deal-making began.

Table 2: Scenario Comparison Matrix (composition by statutory instrument, with the IEEPA layers distinguished)

Instrument	Sc. 1 Current (Mar 2026)	Sc. 2 Hybrid (Nov 2025)	Sc. 3 S232 only	Sc. 4 S301 overcap.	Sc. 5 Lib. Day (Apr 2025)
Objective	*"Short-term patch post-IEEPA"*	*"Ideal Pr. Trump tariff structure"*	*"Durable instruments scenario"*	*"Post-S122, with assumptions"*	*"Shocking announcement"*
Section 232	✓	✓	✓	✓	✓
Section 122 (+10 pp global)	✓				
IEEPA Fentanyl (China)		✓			✓
IEEPA USMCA (Canada, Mexico)		✓			✓
IEEPA Reciprocal		✓†			✓
IEEPA Brazil–India (+40/ + 25 pp)		✓			
Framework deals (EU, Japan, S. Korea)		✓			
Section 301 (overcapacity, +25 pp)				✓	

Source: Author. The 2022 baseline (common to all scenarios) already embeds the legacy Section 301 tariffs on China (since 2018) and the Column 2 sanctions rates (Russia, Belarus, Cuba, North Korea). †Under Scenario 2 the IEEPA reciprocal layer is the residual +10 pp floor in force after the July 2025 pause (higher for the 65 partners whose reciprocal rate exceeds the floor); under Scenario 5 it is applied at the unadjusted Liberation-Day peak rates.

The value of this design lies in the deliberate separation of statutory instruments, which turns the five scenarios into a set of comparable counterfactuals around the November 2025 target (Scenario 2, the "ideal" Trump tariff structure). Isolating Section 232 (Scenario 3) provides a clean sectoral benchmark against which the target can be measured. Comparing the temporary Section 122 patch (Scenario 1) with the Section 232-only anchor (Scenario 3) reveals the marginal footprint of the +10 pp Section 122 floor—and, with it, whether a provisional patch already signals the intent to keep tariffs durably high. Contrasting the target with the prospective Section 301 overcapacity regime (Scenario 4) asks whether a legally durable instrument can reproduce the target's outcomes, notably on U.S. manufacturing value added. The Liberation Day peak (Scenario 5) is retained only as an upper-bound reference and is not discussed as a policy option in what follows.

Table 3 presents the average tariff rates (reference group weighted) by partner across the key tariff configurations analyzed in this paper.

Table 3: Average U.S. tariff rates by main partner and scenario (%)

Partner	Reference		Scenarios				
	Conventional	Baseline	Feb. 2026 (S1)	Nov. 2025 (S2)	S232 only (S3)	S301 overcap. (S4)	Lib. Day peak (S5)
All partners	2.1	7.5	17.8	22.2	14.1	21.8	26.7
Canada	0.1	0.1	8.4	17.5	6.7	6.7	13.3
China	2.7	21.6	36.1	44.9	31.7	42.8	69.9
EU27	2.8	2.8	13.9	16.0	9.6	20.5	18.9
India	3.0	3.0	13.9	36.9	8.8	21.5	21.5
Japan	1.6	1.6	12.8	17.1	9.5	17.8	21.5
Mexico	0.1	0.1	16.1	22.9	14.7	22.9	14.1
South Korea	0.0	0.0	11.9	18.7	9.4	15.6	16.9

Source: Author's calculations based on executive orders and MAcMap-HS6.

Notes: Reference group-weighted averages computed at the HS6 bilateral level. "Conventional" denotes MFN or preferential applied rates; "Baseline" includes pre-existing Section 301 tariffs and Column 2 rates. It also includes a subset of Russian products subject to embargo imposed by the U.S. and modelled in the baseline as a 200% tariffs (leading to an average U.S. tariff of 7.5% in the baseline).

Several patterns emerge. First, China faces by far the highest tariff rates across all configurations, reflecting the layering of pre-existing Section 301 measures with second-term instruments: the Liberation Day peak reached 69.9%, declining to 36.1% by February 2026 (still around +15 pp as compared to January 2025) and rising to 42.8% under S301 overcapacity. Second, Canada faces a moderate S301 rate of 6.7% (identical to its Section 232-only rate, since it is not among the 16 economies subject to the S301 overcapacity investigation, so Scenario 4 leaves its tariff unchanged relative to Section 232 alone). Third, Mexico faces an important tariff increase in Scenario 4, 22.9%—well above its Section 232-only rate of 14.7%—, consistent with its markedly larger GDP loss under Scenario 4 than under Section 232 alone (Section 5.3). The EU faces a higher rate of 20.5% under S301, reflecting broader product coverage from overcapacity-related duties. Fourth, Japan and South Korea face average rates of 17.8% and 15.6% respectively under S301 (S4), above their S232-only levels but well below S2 and S5 peaks.

5 Results

This section presents the MIRAGE simulation results for Scenarios 1 through 5 as defined in Section 4, reported as percentage deviations from the counterfactual baseline in 2040. Results are organized along three dimensions: global macroeconomic effects, impacts on the United States, and distributional consequences across trading partners. Tables present

scenarios in increasing order (S1–S5) to facilitate comparison across policy configurations.

5.1 Global macroeconomic effects

All five scenarios produce negative effects on global GDP and trade volumes relative to the baseline. In the Armington trade framework underlying MIRAGE, tariffs introduce a wedge between world and domestic prices, generating allocative inefficiency by distorting the composition of demand across origins.

Table 4: Global macroeconomic effects (% deviation from baseline, 2040)

	Sc. 1 S122+S232	Sc. 2 S232+IEEPA +Deals	Sc. 3 S232 only	Sc. 4 S232+S301	Sc. 5 Lib. Day
World GDP (vol)	−0.39	−0.60	−0.26	−0.48	−0.65
World Welfare	−0.36	−0.56	−0.23	−0.45	−0.61
World merch. exports (vol)	−2.84	−3.71	−2.06	−3.03	−3.41

Scenario 3 (Section 232 only) generates the smallest global effects, with world GDP declining by 0.26% and world welfare by 0.23%. Although Section 232 measures target a narrow set of upstream sectors, these sectors occupy critical positions in global supply chains. In MIRAGE's Leontief input-output structure, tariffs on upstream intermediates propagate to downstream sectors by raising input costs, reducing their competitiveness even when not directly targeted. The imperfect-competition framework further amplifies losses: because the Dixit–Stiglitz markup is constant (pinned down by the CES variety elasticity), the additional loss stems not from higher markups but from the fall in the equilibrium number of varieties—as output contracts, firms exit through the zero-profit condition and consumers bear a love-of-variety loss. It is worth noting that this scenario alone generated approximately 66% of the world losses (in terms of GDP or welfare) of Scenario 1 and about 43% of Scenario 2.

Scenario 1 (Section 122 + Section 232) raises the welfare loss by more than half (to −0.36%) relative to Scenario 3, reflecting the broad product coverage of the 10% Section 122 tariff applied to virtually all trading partners. While Section 232 affects specific value chains, Section 122 raises the cost of imports across the entire goods spectrum, including final consumer goods. Under the LES demand system in MIRAGE, broad-based tariffs impose welfare costs distributed unevenly across consumption baskets, with larger relative burdens on goods with lower substitutability. The incremental effect on global trade volumes—which contract by nearly 3%—reflects the Armington substitution mechanism: higher import prices reduce demand for foreign varieties, but finite substitution elasticity implies that tariffs generate deadweight losses rather than full import replacement.

Scenario 2 (Section 232 + IEEPA + Deals) produces larger global effects than Scenario 1,

with world GDP declining by 0.60% and welfare by 0.56%. Despite the moderating effect of framework deals with the EU, Japan, and South Korea, the breadth of IEEPA coverage—including elevated rates for Vietnam (+46 pp), India (+26 pp), and China (+20 pp on top of Section 301 tariffs)—generates efficiency losses exceeding those of the post-IEEPA Section 122 architecture. The deals partially offset these losses for covered partners but cannot prevent the aggregate welfare reduction, because even partially offset tariffs distort relative prices and misallocate demand across origins within the Armington framework.

Scenario 4 (Section 301 overcapacity) generates world GDP losses of 0.48%—between Scenario 1 (0.39%) and Scenario 2 (0.60%)—with an average tariff of 21.8%. Despite its more targeted design (16 specific economies), the heavy surcharges concentrated on large exporters (notably China and India, whose average U.S. tariff rises to 42.8% and 21.5% respectively) make its GDP impact comparable to the broad-based Scenario 1. In trade terms, however, targeting still matters: world trade contracts by about 3.0%, less than the 3.7% under the more broadly applied IEEPA regime of Scenario 2. The breadth of tariff coverage shapes aggregate trade disruption, but the depth of the surcharge on a few major exporters governs the GDP cost.

The Liberation Day scenario (Scenario 5) produces the largest global effects, with world GDP declining by 0.65% and welfare by 0.61%. This scenario represents the peak realized tariff configuration, combining IEEPA reciprocal tariffs at their unadjusted rates without any framework deals. The absence of deal-based moderation means that all major partners face elevated tariff rates simultaneously, maximizing the aggregate allocative distortion.

5.2 Effects on the United States

For the United States, the natural yardstick is not aggregate activity but the objective the tariffs are meant to serve. The administration's stated goal is the reindustrialisation of U.S. manufacturing, so the decisive outcome can be seen through the response of manufacturing value added, not of GDP, despite the political importance of this macroeconomic indicator.

Table 5: Effects on the United States (% deviation from baseline, 2040) — macroeconomics, terms of trade and broad-sector value added

	Sc. 1 Current (S122+S232)	Sc. 2 Hybrid (Nov 2025)	Sc. 3 S232 only	Sc. 4 S301 overcap.	Sc. 5 Lib. Day (ref.)
Macroeconomic effects					
GDP (vol)	−0.65	−1.08	−0.37	−0.80	−1.37
Welfare	−0.42	−0.81	−0.18	−0.53	−1.17
Exports (vol)	−17.81	−23.85	−12.06	−19.33	−21.92
Imports (vol)	−12.45	−16.95	−8.18	−13.15	−16.00
Terms of trade	+2.51	+3.68	+1.86	+3.39	+3.48
Sectoral value added (broad sectors)					
Energy	−3.62	−3.07	−2.52	−3.87	−3.94
Agriculture	−2.73	−3.26	−2.23	−2.18	−2.63
Manufacturing	+2.91	+4.43	+1.91	+3.63	+4.86
Services	−0.76	−1.19	−0.53	−0.97	−1.45

On this metric the durable Section 301 candidate (Scenario 4) essentially delivers the November 2025 target: U.S. manufacturing value added rises by +3.6%, close to the +4.4% of the hybrid regime (Scenario 2) and well above the +1.9% obtained under Section 232 alone (Scenario 3); the within-manufacturing detail—ferrous metals and motor vehicles expand strongly, while import-dependent downstream sectors such as pharmaceuticals and chemicals contract—is reported in Appendix B. A legally more durable instrument thus reproduces most of the reindustrialisation effect of the hybrid regime. This is a sectoral reallocation rather than a net expansion: the manufacturing gain is mirrored by contractions in energy (−3.9% under Scenario 4), agriculture and services, and, as shown next, by an aggregate GDP loss; the model is moreover silent on employment[25], so these value-added gains should not be read as job creation.

U.S. GDP contracts by 0.37% under Section 232 alone (Scenario 3), rising to 0.65% under Section 122 plus Section 232 (Scenario 1), to 1.08% under the IEEPA architecture with deals (Scenario 2), and 0.80% under Section 301 (Scenario 4). Under the Liberation Day peak (Scenario 5), U.S. GDP declines by 1.37%. Welfare effects are negative across all scenarios, ranging from −0.18% under Scenario 3 to −1.17% under Liberation Day. The gap between GDP and welfare effects reflects is due to a positif terms of trade effetc. Under Scenario 3, the welfare loss remains modest, reflecting the partial offset from the optimal

[25] MIRAGE assumes fully-employed factor endowment in each region. Total employment is therefore exogenous, and the model pins down only the allocation of a fixed (in the baseline and in the simulation) labour force across sectors and the associated factor prices, not the number of jobs. The rise in manufacturing value added is thus a reallocation of labour and capital toward the protected sector, drawn from the rest of the economy, and cannot be read as net job creation.

tariff effect—when tariffs are narrowly targeted on sectors where the United States has market power and finite foreign supply elasticity, the terms-of-trade improvement partially offsets the allocative efficiency loss for the tariff-imposing country. Under broader tariff configurations, the welfare loss increases from −0.42% (Scenario 1) to −0.81% (Scenario 2) and −1.17% under Liberation Day (Scenario 5). Scenario 4 (Section 301) produces a U.S. welfare loss of −0.53%, well below Scenario 2's −0.81%, reflecting the more targeted nature of the S301 surcharges relative to the broad IEEPA base.

A notable finding is the asymmetry between import and export contractions. U.S. exports decline substantially more than imports across all scenarios—the export-minus-import gap is approximately 4% in Scenario 3 and 6–7% in Scenarios 2 and 4. This asymmetry is driven primarily by general equilibrium price adjustments rather than by foreign retaliation alone. As U.S. tariffs reduce import volumes and improve the trade balance in nominal terms, the real exchange rate appreciates. This appreciation erodes U.S. export competitiveness across all sectors, including those not directly targeted by tariff measures. Simultaneously, partner countries whose exports to the U.S. market are displaced redirect productive capacity toward third markets, intensifying competitive pressure on U.S. exporters abroad. Canadian and Chinese retaliatory tariffs, which are incorporated in the simulations, further reinforce the export contraction through direct barriers to U.S. export market access.

5.3 Macroeconomic effects on trading partners

This subsection concentrates on the individually modelled economies. For each partner, Table 6 gathers in a single block the three headline indicators—economic welfare, real GDP and the terms of trade; the corresponding figures for the aggregated regions are relegated to Appendix Table A1.

Table 6: Macroeconomic effects on individually modelled partners — welfare, GDP and terms of trade (% deviation from baseline, 2040)

Country	Indicator	Sc. 1 Current	Sc. 2 Hybrid	Sc. 3 S232	Sc. 4 S301	Sc. 5 Lib. Day
Canada	Welfare	−1.68	−3.56	−1.32	−0.95	−2.14
	GDP	−1.69	−2.79	−1.35	−0.88	−1.02
	Terms of trade	+0.31	−2.26	+0.04	−0.33	−3.51
Mexico	Welfare	−6.14	−8.07	−5.95	−8.61	−1.26
	GDP	−6.59	−7.89	−6.38	−8.60	−1.03
	Terms of trade	−0.72	−1.75	−0.82	−1.58	−0.53
China	Welfare	−0.17	−0.28	−0.10	−0.24	−0.53
	GDP	−0.19	−0.37	−0.11	−0.27	−0.72
	Terms of trade	−0.15	−0.12	−0.13	−0.29	−0.09
Germany	Welfare	−0.44	−0.32	−0.28	−0.84	−0.76
	GDP	−0.43	−0.33	−0.29	−0.86	−0.78
	Terms of trade	−0.20	−0.17	−0.15	−0.31	−0.34
France	Welfare	−0.06	−0.04	−0.01	−0.19	−0.24
	GDP	−0.03	+0.12	−0.00	−0.17	−0.27
	Terms of trade	−0.12	−0.41	−0.03	−0.17	−0.05
Italy	Welfare	−0.34	−0.13	−0.17	−0.68	−0.41
	GDP	−0.31	−0.10	−0.16	−0.64	−0.37
	Terms of trade	−0.23	−0.16	−0.12	−0.38	−0.31
Spain	Welfare	−0.14	−0.10	−0.07	−0.27	−0.22
	GDP	−0.11	−0.10	−0.07	−0.25	−0.20
	Terms of trade	−0.14	−0.12	−0.05	−0.19	−0.20
UK	Welfare	−0.09	−0.05	−0.01	+0.17	−0.07
	GDP	−0.12	−0.11	−0.02	+0.17	−0.12
	Terms of trade	+0.01	+0.08	+0.02	+0.07	+0.03
Japan	Welfare	−0.19	−0.23	−0.14	−0.39	−0.61
	GDP	−0.17	−0.19	−0.15	−0.34	−0.51
	Terms of trade	−0.30	−0.41	−0.21	−0.57	−1.15
South Korea	Welfare	−0.52	−0.98	−0.37	−0.78	−0.73
	GDP	−0.35	−1.09	−0.17	−0.54	−0.15
	Terms of trade	−0.55	−0.63	−0.46	−0.79	−1.11
India	Welfare	−0.24	−0.77	−0.04	−0.52	−0.46
	GDP	−0.25	−0.93	+0.02	−0.62	−0.54
	Terms of trade	−0.27	−0.61	−0.20	−0.35	−0.29
Brazil	Welfare	−0.01	−0.58	−0.07	−0.08	+0.08
	GDP	+0.08	−0.89	−0.01	+0.13	+0.10
	Terms of trade	−0.10	+0.18	−0.23	−0.52	+0.03

Aggregated regions (Rest of EU27, EFTA, ASEAN, etc.) in Appendix Table A1.

Compared to the November 2025 target (Scenario 2), the burden on partners is highly uneven. Among the individually modelled economies the deepest losses fall on the two USMCA partners most tightly woven into U.S. manufacturing supply chains: Mexico (GDP −7.89%, welfare −8.07%) and Canada (GDP −2.79%, welfare −3.56%). Asian and European exporters lose an order of magnitude less at the aggregate level (Korea −1.09% GDP, India −0.93%, China −0.37%, Germany −0.33%, Japan −0.19%). The sectoral benchmark, Section 232 alone (Scenario 3), reproduces only part of these target losses, but the share is highly partner-specific: for the United States the S232 GDP loss is about 34% of the hybrid value, and it ranges from roughly 30% for China to about 80% for Mexico and over 90% for Germany—which quantifies how much of the November 2025 damage is attributable to the sectoral pillar as opposed to the IEEPA/deal overlay for each partner.

The temporary +10 pp patch (Scenario 1) moves most partners toward the target, but the USMCA carve-out substantially shields the two North American partners: because Section 122 applies only to their non-USMCA-compliant goods, Canada's Scenario 1 GDP loss (−1.69%) is about 60% of the hybrid value and Mexico's (−6.59%) about 84% of the hybrid target (−7.89%)—less than a uniform floor would imply. The durable Section 301 candidate (Scenario 4) instead concentrates incidence on the sixteen named economies: Mexico (−8.60%), Germany (−0.86%), India (−0.62%) and Korea (−0.54%) bear the largest GDP losses, while non-targeted economies gain relative market access—the United Kingdom (+0.17% GDP). Canada, although outside the Section 301 list, still records a GDP loss (−0.88%)—its smallest across the scenarios—because its large Section 232 exposure (steel, aluminium, autos) outweighs the relief its USMCA-compliant goods obtain from escaping the overcapacity surcharge; it is nonetheless relatively spared, gaining access as the targeted economies are hit.

The terms-of-trade rows are the mirror image of the U.S. gain documented above: partners' terms of trade deteriorate almost everywhere, most sharply for the two NAFTA partners under the target—Canada (−2.26%, deepening to −3.51% under Liberation Day) and Mexico (−1.75%)—followed by Japan and Korea (down to −1.1% under Liberation Day). Within the European Union the incidence is composition-driven: Germany is the most exposed member through its automotive core, France is near-neutral (even +0.12% GDP under Scenario 2) given its lighter Section 232 exposure, and Italy and Spain sit in between. Brazil finally illustrates the sensitivity to instrument *design* rather than to the tariff level: it is near-neutral under a broad, non-discriminatory floor (+0.08% GDP in Scenario 1) but turns sharply negative under the target (−0.89% in Scenario 2), which activates the IEEPA Brazil surcharge (+40 pp) on nearly all of its exports.

5.4 Bilateral trade effects and trade diversion

Beyond aggregate import and export volumes, the MIRAGE simulations reveal substantial bilateral trade reallocation across partners. Table 7 decomposes, for each individually modelled exporter, the change in total exports to the United States and to the rest of the world (RoW, excluding the U.S.), all FOB volumes at constant 2017 prices.

Table 7: Trade diversion: exports to the United States and to the rest of the world by exporter (FOB volume, % deviation from baseline, 2040)

Exporter	Destination	Sc. 1 Current	Sc. 2 Hybrid	Sc. 3 S232	Sc. 4 S301	Sc. 5 Lib. Day
Canada	→ USA	−23.03	−33.41	−20.50	−12.50	+0.88
	→ RoW	+3.35	+10.62	+4.93	−1.86	−3.70
Mexico	→ USA	−31.61	−35.91	−31.02	−39.16	−3.35
	→ RoW	+4.85	+4.20	+5.34	+6.62	−9.85
China	→ USA	−14.68	−26.74	−9.87	−22.38	−64.54
	→ RoW	+0.25	+0.57	+0.38	+0.85	+2.27
Germany	→ USA	−14.21	−8.24	−8.58	−22.92	−22.83
	→ RoW	+0.92	+0.48	+0.24	+1.13	+1.10
Japan	→ USA	−8.71	−5.52	−6.44	−14.27	−34.30
	→ RoW	+0.93	+0.56	−0.07	+1.01	+3.10
South Korea	→ USA	−13.10	−23.80	−12.15	−14.04	+2.87
	→ RoW	+0.51	−0.29	+0.80	+0.37	−0.20
India	→ USA	−6.62	−25.58	+0.79	−15.35	−11.06
	→ RoW	+1.05	+3.54	+0.18	+1.96	+1.36
Brazil	→ USA	+7.17	−30.63	+3.44	+7.93	+11.82
	→ RoW	−0.65	+0.91	−0.68	−0.20	−2.01

Under the November 2025 target (Scenario 2) the U.S. corridor collapses for every large exporter, but very unevenly. The deepest contractions fall on the economies hit by the IEEPA reciprocal surcharge—Mexico (−35.9%), Canada (−33.4%), Brazil (−30.6%), China (−26.7%), India (−25.6%) and Korea (−23.8%)—whereas the two economies covered by framework deals, Germany (−8.2%) and Japan (−5.5%), are by far the least affected: the tariff caps embedded in the deals preserve their bilateral access. Mexico's position is the sharpest correction relative to earlier readings: far from being shielded under the target, its deep integration with U.S. manufacturing and its inclusion in the Section 301 list make it the most exposed exporter. The USMCA carve-out becomes decisive only under Liberation Day (Scenario 5), where Mexico's U.S. shipments fall just −3.3% while competitors facing higher tariff increases collapse (China −64.5%, Japan −34.3%).

The RoW leg is the mirror image, and it is positive for the diversified Asian and European exporters in essentially every configuration: displaced volumes are genuinely redirected outward rather than lost. Under the target, China's shipments to the rest of the world rise by +0.6%, Japan's by +0.6%, Germany's by +0.5% and India's by +3.5%; because the U.S. absorbs only a minority of these exporters' sales in the model baseline ($\approx$ 9% for China, $\approx$ 16% for Japan), even a modest RoW gain offsets a large part of the U.S.-corridor loss. The strongest redirection is recorded by the two NAFTA partners—Canada (+10.6%) and Mexico (+4.2%)—whose production is so U.S.-concentrated that, once shut out, they push aggressively into third markets (the destination-by-destination breakdown below, and Appendix C, traces exactly where these volumes go). The exceptions to the positive RoW pattern are the two commodity exporters most exposed as destinations: Brazil's RoW leg is slightly negative under the sectoral scenarios, and both NAFTA partners' RoW gains turn negative under Liberation Day (Canada −3.7%, Mexico −9.8%) once the USMCA preference pulls their production back toward the protected U.S. market.

Comparing configurations against the target isolates the role of each instrument. The sectoral benchmark, Section 232 alone (Scenario 3), produces the mildest U.S.-corridor contractions (China −9.9%, Korea −12.2%, Germany −8.6%), quantifying how much of the target's bilateral damage is sectoral. The durable Section 301 candidate (Scenario 4) reconcentrates the shock on the named economies (Mexico −39.2%, Germany −22.9%, China −22.4%, Korea −14.0%, India −15.4%) while relatively sparing the others: Canada's U.S. shipments still fall (−12.5%), but by less than under Section 232 alone (−20.5%), because its USMCA-compliant goods escape the S301 surcharge and gain relative access as competitors are hit; the Mexican RoW redirection remains the largest (+6.6%). The temporary +10 pp patch (Scenario 1) now sits below the target on the U.S. leg for the USMCA partners—for Mexico the Scenario 1 cut (−31.6%) is clearly milder than the target (−35.9%) because Section 122 exempts USMCA-compliant goods—whereas for the other partners the patch already delivers much of the intended bilateral compression.

The aggregate rest-of-world figures of Table 7 mask substantial reallocation within the non-U.S. destinations. The bilateral structure of MIRAGE makes it possible to trace the displaced flows destination by destination: Appendix C reports, for twelve major exporters, the percentage change in their exports to every major destination across the five scenarios, together with the 2040 baseline level of each flow (Tables A3–A14; all figures are FOB volumes at constant 2017 prices, the baseline column in $bn). In each table the bolded USA row is the reference shock and the remaining rows show where the displaced volumes are redirected or where demand additionally contracts.

Five robust patterns emerge. Canada is the universal sink of redirected exports. Whenever an exporter loses access to the U.S. market, the single largest offsetting gain is almost always its shipments to Canada. Under the Liberation Day peak (Scenario 5) Chinese exports to Canada rise by +28.9%, Japanese by +35.4%, German by +30.9%,

Korean by +27.5%, Indian by +22.5% and EU27 by +20.5% (Tables A3, A4, A5, A7, A8). The mechanism is structural: Canada is a large, open economy with low residual protection against non-U.S. origins and (in the model) no retaliation against third countries, so that displaced supply is mechanically reallocated toward the nearest substitutable market. The effect is strongest in Scenario 5, where the reciprocal shock is largest and undifferentiated across competitors.

Mexico contracts as a destination — an income effect, not a substitution effect. For nearly every exporter, shipments to Mexico fall under Scenarios 1, 3 and 4 (German exports to Mexico −18 to −22%, Chinese −21 to −30%, Japanese −18 to −22%). This is not redirection but second-round propagation: Mexico's own GDP contracts by 6.4 to 8.6% under these scenarios (its manufacturing base is the most U.S.-exposed in the model), which sharply reduces Mexican import demand from *all* origins. Under Scenario 5, where USMCA carve-outs shield Mexico, the sign flips and exports to Mexico rise (German +12.6%, Japanese +12.8%). The targeting of Mexico therefore generates a negative spillover for its suppliers—a channel invisible in the GDP table but first-order for the diversion narrative.

Latin America is the consistent secondary outlet. Brazil and the Rest of Latin America absorb redirected flows across virtually all scenarios and exporters (Chinese exports to the Rest of LatAm +3 to +8%, Indian +2 to +10%, German +2 to +6%). LatAm is the only major region consistently absent from both the IEEPA reciprocal list and the Section 301 investigation list, so its relative-price advantage on third-country supplies improves as displaced exporters seek markets.

Targeted exporters (India, Brazil) redirect toward Canada, LatAm and the EU. India loses heavily on the U.S. leg under the IEEPA Brazil–India surcharge (Scenario 2, −25.6%) and under the Section 301 surcharge (Scenario 4, −15.4%); in both cases it redirects toward Canada (+11.7 and +12.0%), the Rest of LatAm (+9.6 and +9.4%) and the EU+EFTA (+6.9 and +4.1%, Table A8). Brazil exhibits the same logic under Scenario 2 (U.S. leg −30.6%; Table A9). Because the U.S. corridor is a modest share of these exporters' total trade, the redirection leaves their aggregate exports broadly stable.

The USMCA exporters display a mirror-image pattern. Canada and Mexico are not redirectors but "re-concentrators". When their U.S. access is most impaired (Scenarios 1–4) they push exports into third markets—Canadian exports to China, Japan, the EU and Asia rise by +2 to +14% under Scenarios 1–3 (Table A10); Mexican exports to Japan, Korea, India and the Rest of LatAm rise by +9 to +26% (Table A11). But under Scenario 5, where the USMCA carve-out restores their near-tariff-free access to the U.S. market, the flow reverses: their exports to the U.S. recover (Canada +0.9%, Mexico −3.3%) while their shipments to all third markets collapse (Canadian exports to the EU −8.3%, to China −3.4%; Mexican exports to China −27.8%, to ASEAN −28.3%). The USMCA preference thus pulls North American production back toward the protected U.S. corridor

at the expense of diversification.

Finally, the large absorptive markets—EU+EFTA, China, ASEAN, MENA—move only marginally in percentage terms ($\lesssim 3\%$ in absolute value) for every exporter, even when their baseline flows are large. Their size dilutes the redirected volumes, so that the diversion is concentrated on a handful of small, open, low-protection destinations (Canada and Latin America) rather than spread evenly across the world. The EU27, UK and ASEAN exporter tables (Appendix C) confirm the same regularities: the EU27 mirrors Germany, the UK—non-targeted and gaining on the U.S. leg—instead withdraws from third markets, and ASEAN diverts primarily toward China and Latin America.

6 Conclusion

In this paper, I have analyzed the trade policy of the second Trump administration through an institutional lens and a quantitative general-equilibrium framework, organised around a single question: how a legally durable regime could reproduce the administration's revealed target tariff structure once its original legal basis is removed. By November 2025 the administration had assembled that target—a high, country-differentiated regime combining durable Section 232 protection, IEEPA reciprocal tariffs and negotiated deals—whose legal backbone the Supreme Court removed in February 2026 by striking down the IEEPA tariffs. Assembling a product-level database of every tariff action between January 2025 and March 2026 and embedding the resulting instruments in the MIRAGE general equilibrium model, I asked how far each realistic, legally durable configuration stands from that target and through which instrument the administration could return to it.

The central result is that a legally durable instrument can largely reproduce the target on the dimension the policy actually pursues. On U.S. manufacturing value added—the natural gauge of the stated reindustrialisation objective—the prospective Section 301 overcapacity regime delivers a +3.6% gain, close to the +4.4% of the November 2025 hybrid and well above the +1.9% of Section 232 alone. The administration would thus not need the legally fragile IEEPA architecture to obtain most of the industrialeffect of its ideal regime: the more robust Section 301 route suffices. Section 232 alone, the sectoral backbone, already accounts for roughly one third of the hybrid's U.S. GDP cost, so the incremental damage of the broader instruments is concentrated in the IEEPA and deal overlay.

This apparent success is, however, a sectoral reallocation obtained at an aggregate cost. Every configuration lowers U.S. GDP (from -0.37% to -1.37%) and welfare even as manufacturing value added rises, because labour and capital are pulled toward the protected sectors and away from energy, agriculture and services; the improvement in the U.S. terms of trade only partly offsets the allocative loss, and the model is silent on employment. Across partners the incidence is highly uneven and design-dependent: the two

USMCA economies most integrated with U.S. manufacturing—Mexico and Canada—bear the deepest losses; Section 301 targeting creates winners among non-targeted economies (the United Kingdom, the rest of Latin America) alongside the sixteen named losers; and the displaced trade is largely redirected—overwhelmingly toward Canada and Latin America—rather than destroyed.

The distinctive feature of the episode is thus the interaction between legal durability and economic design. The Section 122 patch signaled an intent to keep tariffs high but bought only time; the durable path back to the November 2025 target runs through Section 301, whose incidence is more asymmetric yet whose industrial effect is, on these simulations, nearly equivalent. Several caveats bound the exercise: it abstracts from endogenous retaliation beyond the Canadian and Chinese measures already incorporated, from longer-run global-value-chain reorganisation in exposed sectors such as semiconductors and automobiles, and from employment and transition dynamics. Modelling legal durability and institutional constraints alongside the standard mechanisms of tariff incidence—so as to assess not only how costly a tariff regime is, but how reproducible it remains once its original legal basis is removed—is, in my view, a promising direction for future quantitative work on U.S. trade policy.

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Appendices

A Macroeconomic effects on aggregated partner regions

This appendix reports the three headline indicators—economic welfare, real GDP and the terms of trade (% deviation from baseline in 2040)—for the aggregated partner regions, complementing the individually modelled economies of Table 6.

Table A1: Macroeconomic effects on aggregated partner regions — welfare, GDP and terms of trade (% deviation from baseline, 2040)

Region	Indicator	Sc. 1 Current	Sc. 2 Hybrid	Sc. 3 S232	Sc. 4 S301	Sc. 5 Lib. Day
Rest of EU27	Welfare	−0.40	−0.37	−0.22	−0.73	−0.64
	GDP	−0.38	−0.34	−0.22	−0.73	−0.61
	Terms of trade	−0.13	−0.17	−0.06	−0.18	−0.21
EFTA	Welfare	−0.27	−0.71	−0.08	+0.04	−0.72
	GDP	−0.26	−0.76	−0.06	+0.05	−0.79
	Terms of trade	−0.14	−0.25	−0.07	−0.07	−0.21
ASEAN	Welfare	−0.42	−0.36	−0.22	−0.59	−0.93
	GDP	−0.25	+0.32	−0.20	−0.10	−0.36
	Terms of trade	−0.23	−0.57	−0.11	−0.45	−0.54
Australia & NZ	Welfare	−0.13	−0.20	−0.08	−0.09	−0.21
	GDP	−0.09	−0.13	−0.05	−0.03	−0.12
	Terms of trade	−0.23	−0.35	−0.18	−0.29	−0.45
CIS	Welfare	−0.05	+0.01	−0.07	−0.08	+0.08
	GDP	−0.08	−0.07	−0.07	−0.10	−0.05
	Terms of trade	+0.03	+0.18	−0.05	+0.03	+0.32
Rest of Lat. America	Welfare	−0.09	−0.03	−0.06	+0.30	+0.13
	GDP	−0.03	−0.08	−0.05	+0.42	+0.23
	Terms of trade	−0.27	−0.02	−0.15	−0.33	−0.32
MENA	Welfare	−0.14	−0.06	−0.12	−0.19	+0.13
	GDP	−0.15	−0.09	−0.10	−0.18	+0.06
	Terms of trade	−0.01	+0.04	−0.07	−0.05	+0.18
Sub-Sah. Africa	Welfare	−0.01	−0.00	+0.02	+0.02	−0.11
	GDP	−0.04	−0.06	+0.00	−0.01	−0.22
	Terms of trade	−0.03	+0.06	−0.07	−0.04	+0.21
RoW	Welfare	−0.35	−0.31	−0.23	+0.01	−0.35
	GDP	−0.48	−0.44	−0.33	−0.09	−0.44
	Terms of trade	+0.09	+0.05	+0.09	+0.02	−0.01

B U.S. value added by manufacturing sub-sector

This appendix details the U.S. (production-side) value-added response within manufacturing, complementing the broad-sector figures of Table 5. Protected upstream sectors expand strongly (ferrous metals, motor vehicles) while downstream users of imported

intermediates contract (pharmaceuticals, chemicals, other transport equipment).

Table A2: U.S. Value Added by Manufacturing Sub-sector (% deviation from baseline, 2040)

Sector	Sc. 1 S122+S232	Sc. 2 S232+IEEPA +Deals	Sc. 3 S232 only	Sc. 4 S232+S301	Sc. 5 Lib. Day
Ferrous metals	+25.03	+24.00	+29.17	+27.11	+12.65
Non-ferrous metals	+13.97	+14.88	+15.22	+13.83	+8.24
Motor vehicles	+28.55	+21.41	+40.13	+30.63	−3.33
Electronic equip.	−4.48	−0.86	−2.73	−5.91	+14.82
Chemicals	−5.54	−5.24	−8.62	−5.34	−2.73
Textiles	+3.40	+15.04	−13.42	+10.60	+50.45
Machinery	+6.24	+8.07	+4.70	+8.16	+11.27
Electrical equip.	+12.56	+16.99	+12.17	+13.15	+18.73
Pharmaceuticals	−15.56	−21.18	−11.22	−20.07	−22.84
Rubber & plastics	+1.95	+0.53	+0.64	+2.33	+2.03
Other transport eq.	−11.36	−3.64	−13.02	−11.61	+5.72

C Trade diversion by exporter

This appendix collects the destination-by-destination trade-diversion tables underlying Section 5.4. Tables A3–A11 cover the nine main exporters (China, Japan, Germany, France, South Korea, India, Brazil, Canada, Mexico) and Tables A12–A14 the EU27 aggregate, the United Kingdom and ASEAN. Each entry is the percentage change in the exporter's FOB-volume shipments to the destination (constant 2017 prices), with the 2040 baseline level ($bn) in the second column; the bolded **USA** row is the reference shock. The EU27 aggregate reproduces the German pattern (Canada and Latin America absorbing the redirected flows, Mexico contracting on the income channel); the UK, non-targeted and gaining on the U.S. leg, instead *withdraws* from third markets (the mirror image of a redirector); and ASEAN diverts primarily toward China and Latin America.

Table A3: Trade diversion — China exports by destination (FOB volume, % deviation from baseline, 2040)

Destination	Base ($bn)	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 5
USA (ref.)	774	-14.7	-26.7	-9.9	-22.4	-64.5
Canada	141	+7.7	+6.7	-0.9	+7.9	+28.9
Mexico	178	-21.0	-27.1	-21.8	-29.5	+0.6
Brazil	88	+3.7	+0.4	+2.7	+4.7	+7.0
Rest of LatAm	255	+3.3	+4.7	+2.9	+6.5	+8.4
EU + EFTA	1201	+0.5	+1.5	+1.0	+0.9	+1.6
China	—	—	—	—	—	—
Japan	436	+0.5	+1.2	+0.0	+0.5	-1.6
S. Korea	455	-0.3	-2.3	+0.1	-0.0	+0.0
India	393	-0.2	-2.6	+1.1	-0.5	+0.1
ASEAN	1348	+0.4	+1.4	+0.9	+1.1	+0.2
MENA	489	+0.7	+1.4	+1.0	+1.3	+3.6
Total exports	7705	-1.4	-2.4	-0.8	-1.7	-4.6

Table A4: Trade diversion — Japan exports by destination (FOB volume, % deviation from baseline, 2040)

Destination	Base ($bn)	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 5
USA (ref.)	206	-8.7	-5.5	-6.4	-14.3	-34.3
Canada	19	+33.7	+35.7	-11.0	+6.2	+35.4
Mexico	17	-18.5	-19.1	-22.3	-21.9	+12.8
Brazil	4	+4.7	-0.1	+2.8	+5.9	+7.0
Rest of LatAm	14	+3.2	+4.4	-0.5	+7.2	+2.4
EU + EFTA	129	+0.7	+2.3	-0.4	+2.0	+1.6
China	340	+0.3	-1.4	+0.9	+0.3	+1.6
Japan	—	—	—	—	—	—
S. Korea	71	-0.2	-2.7	+1.0	-0.1	+4.4
India	19	-0.3	-3.6	+1.4	-0.8	+3.7
ASEAN	178	+0.2	+0.3	+0.9	+1.0	+2.5
MENA	41	+0.3	+2.4	-2.7	+2.0	-0.7
Total exports	1212	-0.9	-0.7	-1.3	-1.7	-3.4

Table A5: Trade diversion — Germany exports by destination (FOB volume, % deviation from baseline, 2040)

Destination	Base ($bn)	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 5
USA (ref.)	234	-14.2	-8.2	-8.6	-22.9	-22.8
Canada	23	+23.1	+19.9	-5.2	+6.6	+30.9
Mexico	25	-18.0	-20.6	-20.7	-22.3	+12.6
Brazil	14	+4.0	-1.2	+2.6	+4.7	+4.9
Rest of LatAm	23	+3.2	+2.4	+2.0	+6.4	+5.6
EU + EFTA	1267	+0.8	+0.9	+0.6	+1.4	+1.0
China	265	+0.6	-1.1	-0.3	+0.3	-2.5
Japan	30	+1.1	+1.1	-0.4	+1.1	-3.1
S. Korea	32	-0.1	-2.8	-0.6	-0.1	-0.5
India	25	+0.3	-3.0	+1.4	-0.3	+0.4
ASEAN	63	+0.8	+0.7	+1.0	+1.1	-0.8
MENA	119	+0.9	+0.6	+0.5	+1.3	+2.0
Total exports	2327	-0.7	-0.5	-0.7	-1.4	-1.4

Table A6: Trade diversion — France exports by destination (FOB volume, % deviation from baseline, 2040)

Destination	Base ($bn)	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 5
USA (ref.)	103	+0.0	+2.6	+3.6	-7.4	-7.8
Canada	9	+1.2	-2.7	-2.4	+6.1	+15.6
Mexico	6	-15.3	-16.0	-17.3	-20.2	+7.3
Brazil	6	+3.7	+0.5	+1.6	+4.2	+2.2
Rest of LatAm	9	+2.5	+2.3	+1.4	+5.7	+5.2
EU + EFTA	449	+0.1	+0.6	-0.0	+0.3	+0.3
China	92	+0.2	+0.9	-0.7	-0.0	-3.6
Japan	13	+0.8	+1.8	-0.7	+0.9	-1.5
S. Korea	11	-0.3	+4.7	-0.9	-0.4	-2.8
India	20	+0.0	+13.2	+0.3	-0.6	-6.4
ASEAN	42	+2.2	+6.0	+1.1	+2.4	-4.0
MENA	66	+0.5	+3.0	-0.0	+0.9	+0.2
Total exports	927	+0.2	+1.7	+0.2	-0.4	-1.3

Table A7: Trade diversion — South Korea exports by destination (FOB volume, % deviation from baseline, 2040)

Destination	Base ($bn)	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 5
USA (ref.)	131	-13.1	-23.8	-12.1	-14.0	+2.9
Canada	8	+21.1	+25.6	-7.3	+4.3	+27.5
Mexico	21	-21.1	-27.1	-22.5	-31.0	-2.8
Brazil	8	+3.5	+0.8	+2.5	+3.9	+5.8
Rest of LatAm	10	+2.6	+6.2	+0.6	+5.2	+2.6
EU + EFTA	79	+0.8	+3.8	+0.7	+0.9	+0.6
China	846	+0.2	-2.4	+1.1	-0.1	-2.0
Japan	29	+0.9	+3.0	+0.2	+0.6	-1.8
S. Korea	—	—	—	—	—	—
India	35	+0.4	-0.6	+1.0	-0.1	+1.5
ASEAN	250	+1.6	+2.7	+1.6	+2.5	+2.9
MENA	39	+0.4	+3.4	-0.2	+0.5	+0.6
Total exports	1590	-0.7	-2.4	-0.3	-1.0	-0.0

Table A8: Trade diversion — India exports by destination (FOB volume, % deviation from baseline, 2040)

Destination	Base ($bn)	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 5
USA (ref.)	637	-6.6	-25.6	+0.8	-15.4	-11.1
Canada	30	+9.4	+11.7	+0.5	+12.0	+22.5
Mexico	51	-15.3	-11.8	-19.4	-18.1	+19.5
Brazil	37	+6.0	+6.8	+2.7	+8.3	+7.7
Rest of LatAm	78	+4.4	+9.6	+2.0	+9.4	+8.1
EU + EFTA	458	+2.5	+6.9	+1.4	+4.1	+2.9
China	224	-0.1	-0.3	-0.3	-0.9	-4.6
Japan	38	+2.7	+7.5	+0.7	+3.6	-0.7
S. Korea	40	-0.1	+2.5	-1.4	+0.7	-1.2
India	—	—	—	—	—	—
ASEAN	273	+0.6	+3.8	+0.1	+1.3	-1.6
MENA	399	+0.2	+1.2	+0.2	-0.0	+0.2
Total exports	2975	-0.7	-2.8	+0.2	-1.9	-1.5

Table A9: Trade diversion — Brazil exports by destination (FOB volume, % deviation from baseline, 2040)

Destination	Base ($bn)	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 5
USA (ref.)	75	+7.2	-30.6	+3.4	+7.9	+11.8
Canada	3	+1.3	+0.7	-3.9	+4.4	+20.5
Mexico	6	-19.8	-18.5	-20.6	-23.7	+8.4
Brazil	—	—	—	—	—	—
Rest of LatAm	63	-0.8	+4.9	+0.6	+1.9	+0.6
EU + EFTA	48	-0.4	-0.9	-0.2	+0.5	-3.1
China	138	+0.5	+1.2	-0.8	-0.7	-3.0
Japan	6	+4.2	-2.8	+1.3	+7.0	-3.5
S. Korea	4	-3.5	+0.4	-2.4	-3.5	-3.8
India	28	-2.3	-1.5	-0.6	-2.9	-3.8
ASEAN	19	-2.9	+1.5	-1.2	-2.9	-5.5
MENA	17	-0.3	+0.2	-0.1	+1.0	-1.3
Total exports	448	+0.6	-4.4	-0.1	+1.0	+0.2

Table A10: Trade diversion — Canada exports by destination (FOB volume, % deviation from baseline, 2040)

Destination	Base ($bn)	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 5
USA (ref.)	463	-23.0	-33.4	-20.5	-12.5	+0.9
Canada	—	—	—	—	—	—
Mexico	8	-30.7	-26.0	-27.2	-33.6	+9.5
Brazil	2	+8.2	+11.5	+9.1	+4.3	-3.7
Rest of LatAm	8	-0.7	+9.4	+2.1	-0.4	+4.8
EU + EFTA	54	+1.8	+10.0	+6.7	-2.1	-8.3
China	83	+5.2	+12.2	+4.5	-1.9	-3.4
Japan	13	+5.5	+13.5	+6.2	+0.4	-5.4
S. Korea	6	+3.8	+10.7	+5.2	-1.6	-4.7
India	40	+4.7	+10.0	+6.1	-1.6	-2.4
ASEAN	13	+5.5	+12.6	+7.7	+0.6	-7.9
MENA	13	+1.6	+9.4	+4.0	-2.4	-1.7
Total exports	739	-13.3	-17.1	-11.1	-8.6	-0.9

Table A11: Trade diversion — Mexico exports by destination (FOB volume, % deviation from baseline, 2040)

Destination	Base ($bn)	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 5
USA (ref.)	684	-31.6	-35.9	-31.0	-39.2	-3.3
Canada	23	+6.2	+2.0	-8.2	-3.2	+11.6
Mexico	—	—	—	—	—	—
Brazil	11	-17.4	-19.5	-19.1	-11.8	-1.5
Rest of LatAm	31	+10.1	+10.7	+10.6	+17.0	-8.4
EU + EFTA	39	+0.4	+0.9	+2.9	+3.0	-12.3
China	52	-0.5	-8.3	+2.0	-6.7	-27.8
Japan	8	+11.7	+11.3	+16.5	+13.1	-16.1
S. Korea	6	+13.0	+19.8	+14.1	+24.1	-4.9
India	16	+9.0	+24.2	+10.0	+26.4	+5.9
ASEAN	11	+2.2	-5.9	+5.9	-5.5	-28.3
MENA	4	+17.5	+17.9	+19.4	+21.0	-11.8
Total exports	902	-23.0	-26.6	-22.5	-28.6	-5.4

Table A12: Trade diversion — EU27 exports by destination (FOB volume, % deviation from baseline, 2040)

Destination	Base ($bn)	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 5
USA (ref.)	731	-9.6	-4.3	-3.8	-18.3	-14.9
Canada	77	+10.2	+6.2	-3.5	+5.8	+20.5
Mexico	64	-18.1	-20.4	-20.4	-22.5	+10.9
Brazil	59	+3.2	-1.2	+1.7	+3.8	+3.9
Rest of LatAm	91	+2.6	+2.2	+1.5	+5.7	+5.2
EU + EFTA	985	+1.2	+0.8	+0.9	+2.9	+1.7
China	737	+0.5	-0.7	-0.5	+0.2	-2.4
Japan	104	+1.0	+1.5	-0.4	+1.1	-2.0
S. Korea	82	-0.1	-1.3	-0.7	-0.2	-0.5
India	126	-0.1	-0.9	+0.5	-0.7	-1.2
ASEAN	241	+0.6	+1.2	+0.6	+0.9	-1.8
MENA	472	+0.5	+0.6	+0.1	+0.8	+1.4
Total exports	4660	-1.0	-0.6	-0.7	-1.9	-1.8

Table A13: Trade diversion — United Kingdom exports by destination (FOB volume, % deviation from baseline, 2040)

Destination	Base ($bn)	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 5
USA (ref.)	182	+3.2	+9.2	+5.8	+20.0	+9.8
Canada	18	+4.8	-0.8	-4.6	+1.9	+11.8
Mexico	3	-19.4	-21.7	-20.6	-24.2	+7.9
Brazil	5	+1.6	-3.4	+0.5	+0.4	+1.4
Rest of LatAm	9	+1.2	+0.7	+0.4	+2.4	+2.7
EU + EFTA	392	-1.2	-1.5	-0.9	-3.1	-3.0
China	83	-0.4	-2.0	-1.3	-3.5	-5.2
Japan	16	-0.4	-0.6	-1.3	-2.7	-5.0
S. Korea	14	-1.4	-4.1	-1.5	-3.6	-3.1
India	25	-1.0	-5.9	-0.5	-3.6	-1.7
ASEAN	45	-1.3	-1.9	-0.9	-2.5	-3.4
MENA	77	-0.5	-2.2	-0.9	-2.0	-1.0
Total exports	999	-0.1	+0.1	+0.2	+1.4	-0.2

Table A14: Trade diversion — ASEAN exports by destination (FOB volume, % deviation from baseline, 2040)

Destination	Base ($bn)	Sc. 1	Sc. 2	Sc. 3	Sc. 4	Sc. 5
USA (ref.)	540	-7.3	-3.8	-0.2	-9.7	-19.9
Canada	31	-2.1	-7.5	-1.2	-3.2	+5.5
Mexico	49	-19.7	-25.0	-21.8	-29.8	-1.1
Brazil	17	+3.7	+2.2	+1.6	+5.0	+7.7
Rest of LatAm	42	+3.2	+3.9	+2.6	+5.6	+7.5
EU + EFTA	454	-0.2	+0.4	+0.4	-1.0	-0.3
China	1320	+2.1	+4.5	+0.2	+4.1	+2.9
Japan	184	-0.6	-0.5	-1.1	-1.6	-3.1
S. Korea	153	+0.5	+0.2	-0.1	+1.0	+3.2
India	178	+0.6	-0.8	+0.3	+0.8	+3.6
ASEAN	—	—	—	—	—	—
MENA	143	+1.2	+2.9	+0.2	+2.2	+5.8
Total exports	3579	-0.4	+1.1	-0.2	-0.1	-0.9

D IEEPA reciprocal tariffs

Table A15 lists the 65 countries whose IEEPA reciprocal tariff rates remained above the +10 percentage point floor following the expiration of the 90-day pause on July 31, 2025. The rates shown are additional tariffs (in percentage points) that stack with any applicable Section 232, Section 301, and MFN tariffs. China is not included in the reciprocal tariff list (Annex 1 of the April 2, 2025 executive order) and is subject to a separate regime combining IEEPA fentanyl duties, a residual reciprocal component, and legacy Section 301 tariffs. Japan and South Korea are marked with an asterisk to indicate that their IEEPA rates were superseded by framework deals during this period.

Table A15: Countries with IEEPA Reciprocal Tariff Rates Above +10 pp (End of July 2025)

Country	Rate (pp)	Country	Rate (pp)	Country	Rate (pp)
Syria	+41	Malaysia	+19	Iceland	+15
Myanmar (Burma)	+40	Nicaragua	+18	Israel	+15
Laos	+40	Afghanistan	+15	Jordan	+15
Switzerland	+39	Angola	+15	Lesotho	+15
Serbia	+35	Bolivia	+15	Liechtenstein	+15
Iraq	+35	Botswana	+15	Madagascar	+15
South Africa	+30	Cameroon	+15	Malawi	+15
Algeria	+30	Chad	+15	Mauritius	+15
Libya	+30	Côte d'Ivoire	+15	Mozambique	+15
Bosnia & Herz.	+30	Costa Rica	+15	Namibia	+15
India	+25	DR Congo	+15	Nauru	+15
Tunisia	+25	Ecuador	+15	New Zealand	+15
Kazakhstan	+25	Equatorial Guinea	+15	Nigeria	+15
Moldova	+25	Fiji	+15	North Macedonia	+15
Brunei	+25	Ghana	+15	Norway	+15
Sri Lanka	+20	Guyana	+15	Papua New Guinea	+15
Vietnam	+20	Trinidad & Tobago	+15	Turkey	+15
Taiwan	+20	Uganda	+15	Vanuatu	+15
Bangladesh	+20	Venezuela	+15	Zambia	+15
Philippines	+19	Zimbabwe	+15	Japan*	+15
Pakistan	+19			South Korea*	+15
Indonesia	+19				
Cambodia	+19	*At +10 pp floor:* Brazil, Falkland Islands, United Kingdom			
Thailand	+19	*Excluded (separate regime):* China			

Source: Author's compilation from executive orders and Federal Register notices. Rates are additional IEEPA reciprocal tariffs in percentage points, applicable after the expiration of the 90-day pause (July 31, 2025). *Framework deals superseded these rates for Japan and South Korea. EU member states covered by a framework deal. China subject to a separate regime (see text).

Table A16 lists the country-specific reciprocal tariff rates announced on Liberation Day (April 2, 2025), as specified in the executive order. Rates shown are additional percentage points above the universal +10 pp floor, applied to imports from each partner. These rates were partially paused on April 9, 2025, with the +10 pp floor maintained during the pause. Following the pause expiration (July 31, 2025), higher rates were reinstated for non-cooperating partners.

Table A16: Liberation Day reciprocal tariff rates (additional pp above MFN, April 2, 2025)

Partner	Rate (pp)	Partner	Rate (pp)	Partner	Rate (pp)
China	+34	EU (all members)	+20	Japan	+24
Vietnam	+46	India	+26	South Korea	+25
Taiwan	+32	Thailand	+36	Indonesia	+32
Switzerland	+31	Malaysia	+24	Cambodia	+49
South Africa	+30	Bangladesh	+37	Sri Lanka	+44
Pakistan	+29	Laos	+48	Myanmar	+44
Philippines	+17	Israel	+17	Brazil	+10
Nicaragua	+18	Algeria	+30	Iraq	+39
Libya	+31	Serbia	+37	Syria	+41
Tunisia	+28	Kazakhstan	+27	Moldova	+31
Brunei	+24	UK	+10	Norway	+15
New Zealand	+20	Fiji	+32	Madagascar	+47
Bosnia & Herz.	+35	All others		+10	

Source: Executive Order of April 2, 2025, "Regulating Imports with a Reciprocal Tariff," 90 *Fed. Reg.* 15,041. Rates are additional percentage points above the applied tariff. China's rate is on top of pre-existing Section 301 and IEEPA fentanyl tariffs. EU rate applies to all 27 member states. Partners not listed individually face the universal +10 pp floor.

E Geographical and sectoral aggregation

Tables A17 and A18 detail the geographical and sectoral aggregation used in this paper. The GTAP 11 database (160 countries, 65 sectors) is aggregated into 22 regions and 35 sectors, selected to identify the major targets of U.S. trade measures and their principal trading partners, and to capture the most affected industries.

Table A17: Geographical Aggregation (22 Regions)

Model Region	GTAP Countries/Territories Included
USA	United States
Canada	Canada
Mexico	Mexico
France	France
Germany	Germany
Italy	Italy
Spain	Spain
Rest of EU27	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Rep., Denmark, Estonia, Finland, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden
UK	United Kingdom
EFTA	Switzerland, Norway, Rest of EFTA
China	China
Japan	Japan
South Korea	Republic of Korea
India	India
ASEAN	Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam
Brazil	Brazil
Australia & NZ	Australia, New Zealand
CIS	Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Ukraine, Uzbekistan, Rest of Former Soviet Union
Rest of Latin Am.	Argentina, Bolivia, Chile, Colombia, Costa Rica, Dominican Rep., Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Trinidad & Tobago, Uruguay, Venezuela, Rest of South America, Rest of Caribbean, Rest of Central America
Middle East & NA	Algeria, Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, Palestinian Terr., Qatar, Saudi Arabia, Syria, Tunisia, Turkey, UAE, Rest of North Africa, Rest of Western Asia
Sub-Saharan Africa	Benin, Botswana, Burkina Faso, Cameroon, CAR, Chad, Comoros, Congo, DRC, Côte d'Ivoire, Equatorial Guinea, Eswatini, Ethiopia, Gabon, Ghana, Guinea, Kenya, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe, South Central Africa, Rest of Eastern Africa, Rest of SACU, Rest of Western Africa
Rest of World	Afghanistan, Bangladesh, Georgia, Haiti, Hong Kong, Iran, Israel, Mongolia, Nepal, Pakistan, Serbia, Sri Lanka, Taiwan, Rest of East Asia, Rest of Europe, Rest of Eastern Europe, Rest of North America, Rest of Oceania, Rest of South Asia, Rest of Southeast Asia, Rest of the World

Source: Author's aggregation from GTAP power database (version 11).

Table A18: Sectoral Aggregation (35 Sectors)

Model Sector	Category	GTAP Sectors Included
Oil	Energy	Oil
Gas		Gas, Gas manufacture
Coal		Coal
Refined oil		Petroleum and coal products
TND		Power transmission and distribution
Power		Electricity (nuclear, coal, gas, wind, hydro, oil, solar base/peak)
ElBase		Nuclear, coal, hydro, other base load electricity
ElPeak		Gas, hydro, oil peak load electricity
ElInt		Wind base load, solar peak load electricity
Cereals	Agriculture	Paddy rice, wheat, cereal grains nec
Other crops		Vegetables/fruit/nuts, sugar cane/beet, plant-based fibers, crops nec
Oil seeds		Oil seeds
Animal agri.		Cattle/sheep/goats/horses, animal products nec, raw milk, wool
Forestry/fish		Forestry, fishing
Minerals		Other extraction, mineral products nec
Meat	Manufacturing	Bovine meat, meat products nec
Other food		Vegetable oils, processed rice, sugar, food products nec
Dairy		Dairy products
Bev./tobacco		Beverages and tobacco
Textiles		Textiles, wearing apparel, leather products
Wood/paper		Wood products, paper products/publishing
Chemicals		Chemical products
Pharmaceuticals		Basic pharmaceutical products
Rubber/plastics		Rubber and plastic products
Ferrous metals		Ferrous metals
Non-ferrous metals		Non-ferrous metals, metal products
Electronics		Computer, electronic, and optical products
Electrical equip.		Electrical equipment
Machinery		Machinery and equipment nec
Motor vehicles		Motor vehicles and parts
Other transp. eq.		Transport equipment nec
Other manuf.		Manufactures nec
Services	Services	Water, construction, trade, accommodation, recreation, public admin., education, health, dwellings
Transport		Transport nec, water transport, air transport, warehousing
Business serv.		Communication, financial services, insurance, real estate, business services nec

Source: Author's aggregation from GTAP power database (version 11).

F Tariff evolution by partner

Figure A1 displays the evolution of the U.S. average applied tariff rate on imports from four selected trading partners (China, Japan, South Korea, and Brazil), constructed using a step-function (escalier) representation: the tariff level stays constant between policy changes and jumps vertically at each change date. Curve colours reflect the four tariff phases. Each event label shows the policy name and the tariff level (%) at that date; the dashed reference line indicates the baseline tariff level at January 2025. The all-partners aggregate chart is presented in Figure 2 in the main text.

China stands out with by far the highest applied tariff rate, peaking at 136.5% in the weeks following

Liberation Day (April 2025), before declining to 36.1% by February 2026 as framework deals moderated the IEEPA reciprocal surcharges. Japan and South Korea show more moderate profiles—peaking at 21.7% and 18.7% respectively—consistent with the framework deals concluded with both partners in mid-2025 that partially offset IEEPA escalation. Brazil experienced a specific IEEPA tariff increase in August 2025.

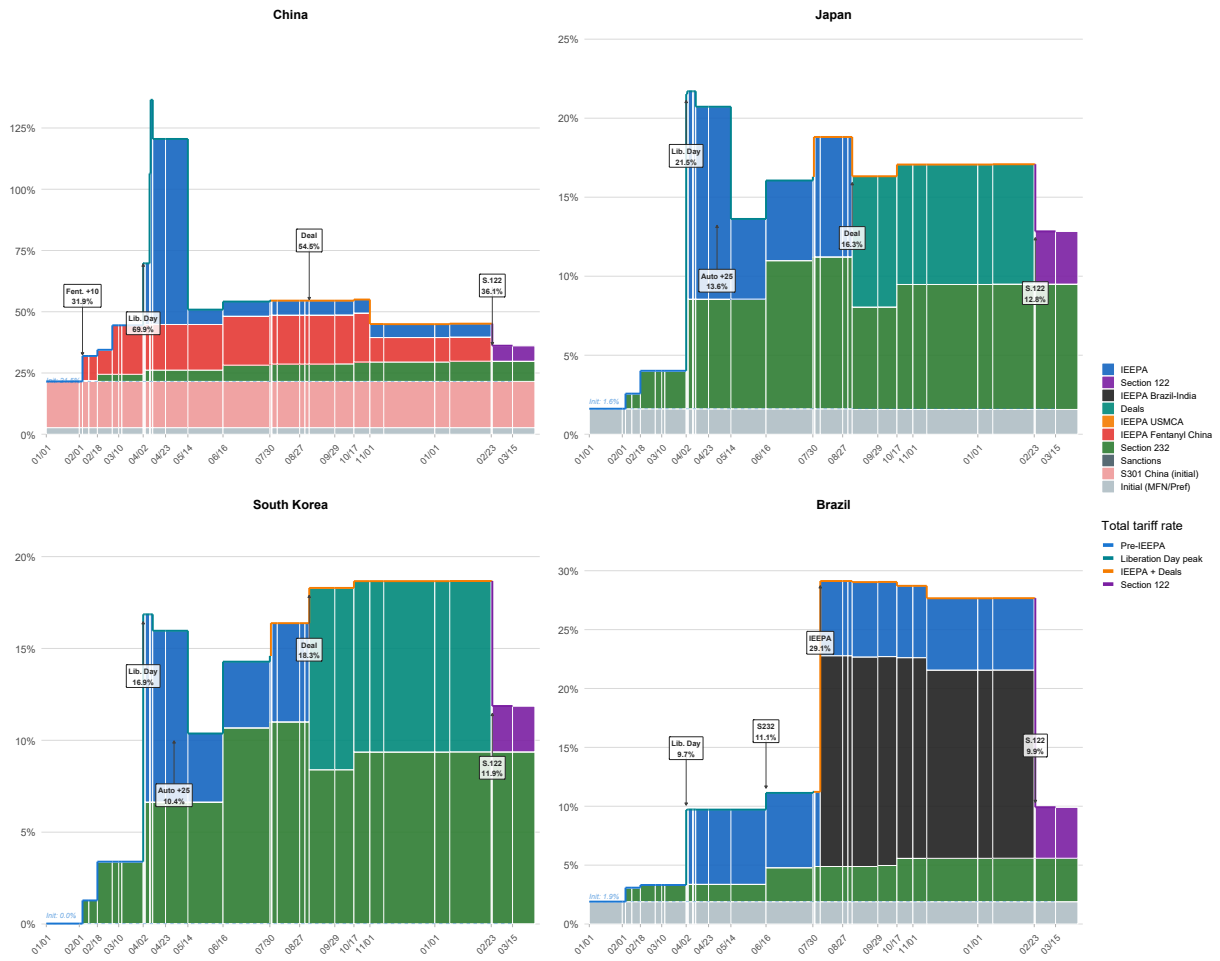

Figure A1: U.S. average applied tariff rate on imports from China, Japan, South Korea, and Brazil (%), January 2025 – March 2026 (reference group-weighted). Each panel shows one country; curve colours indicate the four tariff phases; event labels show the policy name and tariff level at the event date; dashed lines indicate the initial tariff level. Source: author's calculations.