# Trade Effects of the Trump II Tariffs: Technical Details*

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**Abstract**

This document details the methodology underlying the simulated trade, welfare, and wage effects of the Trump II tariffs reported on the **Trade Dashboard** (https://economics.smu.edu.sg/soetrade/trade-dashboard), hosted by the SMU Center for Research on International Trade.

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# 1 Quantitative Model

The quantitative model follows that of Caliendo and Parro (2015), featuring a multi-country, multi-sector framework with input-output (IO) linkages, trade in intermediate goods, and sectoral heterogeneity in production. Each sector uses labor and composite intermediate goods from all sectors according to Cobb-Douglas technology, implying that cost and price changes propagate through the IO network. Countries are indexed by $i$ and $j$, and sectors by $k$ and $l$. In any pair of country indices, the first index denotes the exporting country and the second denotes the importing country. Similarly, in any pair of sector indices, the first index refers to the originating sector and the second the destination sector.

Define $\hat{x} \equiv x'/x$ as the ratio of the counterfactual value relative to the factual value of a variable $x$. Let $\tau_{ij,k} \equiv (1 + \mathtt{t}_{ij,k})$ denote one plus the ad valorem tariff rate in sector $k$ that importer $j$ levies on exporter $i$. Consider a counterfactual tariff structure $\tau' \equiv \{1 + \mathtt{t}_{ij,k}\}'_{ij,k}$ and the corresponding counterfactual equilibrium, relative to that under the factual tariff structure $\tau \equiv \{1 + \mathtt{t}_{ij,k}\}_{ij,k}$. The following specifies how the endogenous variables change in response to the tariff changes.

**Cost of the input bundles.** Given the Cobb-Douglas production technology, the relative change in the unit cost of sector $k$ in country $j$ is given by:

$$\hat{c}_{j,k} = \hat{w}_j^{\gamma_{j,k}} \prod_l \hat{P}_{j,l}^{\gamma_{j,lk}}, \tag{1}$$

where $c_{j,k}$ denotes the unit cost of production in sector $k$ in country $j$; $w_j$ is the wage rate in country $j$; $P_{j,l}$ the price index for the composite intermediate good of sector $l$ in country $j$; $\gamma_{j,k}$ is the ratio of value added to gross output in sector $k$ of country $j$; and $\gamma_{j,lk}$ is the cost share of sector $k$'s spending on goods from sector $l$ as intermediate inputs in country $j$. Note that $\sum_l \gamma_{j,lk} = 1 - \gamma_{j,k}$, given that the production follows a Cobb-Douglas technology with constant returns to scale using labour and materials from all sectors as intermediate inputs.

**Price index.** The composite intermediate good of each sector is a CES (constant-elasticity-of-substitution) aggregator of a continuum of intermediate goods sourced from the lowest-cost suppliers across countries. Given Fréchet distributions for productivity with a shape parameter $\theta_k$ for sector $k$ (and a location parameter that can possibly vary across countries and sectors), the relative change in the price index for the composite intermediate good of

sector $k$ in country $j$ is given by:

$$\hat{P}_{j,k} = \left[ \sum_i \pi_{ij,k} (\hat{c}_{i,k} \hat{\tau}_{ij,k})^{-\theta_k} \right]^{-1/\theta_k}, \tag{2}$$

where $\pi_{ij,k}$ is the share of country $j$'s expenditure on goods from country $i$ in sector $k$.

**Bilateral trade shares.** The relative change in bilateral trade shares is given by:

$$\hat{\pi}_{ij,k} = \left[ \frac{\hat{c}_{i,k} \hat{\tau}_{ij,k}}{\hat{P}_{j,k}} \right]^{-\theta_k}, \tag{3}$$

where the productivity dispersion parameter $\theta_k$ also translates into the trade elasticity of sector $k$.

**Total sectoral expenditure.** The counterfactual expenditure on goods is given by:

$$X'_{j,k} = \sum_l \gamma_{j,kl} \sum_i \frac{\pi'_{ji,l}}{1 + \mathsf{t}'_{ji,l}} X'_{i,l} + \alpha_{j,k} I'_j, \tag{4}$$

where $X_{j,k}$ refers to country $j$'s aggregate expenditure on goods of sector $k$, including intermediate and final demand; $\alpha_{j,k}$ is the share of country $j$'s final consumption expenditure on goods from sector $k$; and $I_j$ refers to the final absorption of country $j$, which is given by the sum of labour income, tariff revenues, and trade deficit.

**Disposable Income.** Specifically, the counterfactual disposable income is given by:

$$I'_j = \hat{w}_j w_j L_j + \sum_k \sum_i \mathsf{t}'_{ij,k} \frac{\pi'_{ij,k}}{1 + \mathsf{t}'_{ij,k}} X'_{j,k} + D'_j. \tag{5}$$

**Trade Deficit.** We assume that a country's trade deficit is a fixed share $\delta_j$ of the world gross output, which implies that:

$$D'_j = \delta_j \sum_{j'} \sum_k \sum_i \frac{\pi'_{ij',k}}{1 + \mathsf{t}'_{ij',k}} X'_{j',k}. \tag{6}$$

The share $\delta_j$ is the observed trade deficit of country $j$ relative to the world gross output in the baseline economy.

**Trade Balance.** The model is closed by the trade balance condition:

$$\sum_k \sum_i \frac{\pi'_{ij,k}}{1+\mathsf{t}'_{ij,k}} X'_{j,k} - D'_j = \sum_k \sum_i \frac{\pi'_{ji,k}}{1+\mathsf{t}'_{ji,k}} X'_{i,k}. \tag{7}$$

where country $j$'s import expenditure, net of trade deficit, equals its export revenues.

**Welfare.** Finally, the relative change in the welfare of country $j$ can be written as:

$$\widehat{W}_j = \frac{\hat{I}_j}{\prod_k \hat{P}_{j,k}^{\alpha_{j,k}}}. \tag{8}$$

Table 1 summarizes the definitions of the parameters and variables calibrated for the quantitative analyses.

# 2 Mapping the Model to Data

We obtain production and bilateral trade data (in intermediate and final goods) from the OECD-WTO Inter-Country Input-Output (ICIO) tables (OECD, 2025). The 2025 edition records trade flows for 80 economies (and a residual Rest of the World) in 50 sectors (based on ISIC Rev.4) for years 1995–2022.

We follow the sector grouping of Beshkar, Chang and Song (2025); in particular, service sectors are grouped into one combined sector. We also consider countries in the European Union (EU) as one combined entity in setting trade policy. This amounts to a total of 23 individual sectors (including the combined service sectors) and 55 economies/regions to be used in the equilibrium analysis. Tables 2 and 3 provide the list of economies and sectors used in the study.

The data on baseline tariffs for 2022 and 2023 are sourced from the TRAINS database, downloaded via the World Integrated Trade Solution (WITS) interface. Data on U.S. import tariffs effective from 2025 onward are manually collected from the executive orders (EOs) published in the *U.S. Federal Register*. Further details on the compilation of the baseline tariffs and the Trump II tariffs are provided in Appendix A.

We adopt the trade elasticity estimates of Beshkar, Chang and Song (2025) for non-service sectors, as reported in Table 3. For the combined service sector, we set the trade elasticity to 6. This choice is in line with the median estimates for service sectors reported by Ahmad and Schreiber (2024) and Freeman et al. (2025).

# 3 Simulation Design

We evaluate the effects of recent shifts in U.S. trade policy and the subsequent tariff responses by Cambodia, Canada, China, India, Mexico, the United Kingdom, and Zimbabwe,[1] using the quantitative framework laid out in Section 1. The simulation quantifies how unilateral U.S. tariff changes and subsequent tariff responses by the aforementioned trading partners in each episode of tariff escalation or de-escalation from 2025 onward affect international trade flows, factor incomes, and welfare.

Due to data limitation, as the latest OECD ICIO tables are available only up to 2022, we use the trade and production structure of the world economy in 2022 as the baseline. The baseline tariffs for 2022 are measured by the effectively applied tariff rates reported in TRAINS. Because TRAINS does not report Zimbabwe's tariffs as an importer for 2022, we use its 2023 tariff schedule instead to maintain consistent importer-exporter-product coverage.

The information on the U.S. tariff changes from 2025 onward are manually collected from the executive orders (EOs) published in the *U.S. Federal Register*. Each EO specifies both the publication date and the effective date of the tariff changes. Throughout the exercises, all dates refer to the tariff *effective* dates. Retaliatory tariffs by Cambodia, Canada, China, India, Mexico, the United Kingdom, and Zimbabwe are sourced from the WTO–IMF tariff tracker, with all reported tariff change dates referring to effective dates (World Trade Organization, 2025a).

Due to another data limitation, as the TRAINS tariff data are available only up to 2023, we use TRAINS 2023 tariff data and the data collected above on the 2025 tariff changes to construct the 2025 tariff schedule. The WTO Tariff Profiles indicate that tariff structures for both agricultural and non-agricultural goods changed very little from 2023 to 2024 (World Trade Organization, 2024, 2025b).

To conduct the simulation of tariff effects on trade and production, we aggregate the product-level tariff data to the 2-digit ISIC level, aligning the tariff measures with the sectoral structure of the OECD ICIO tables. The U.S. tariff changes specified in the EOs are reported at the HTS 7-digit to 10-digit level. We truncate these codes to the first six digits, which correspond to HS 6-digit product codes (United States International Trade Commission, 2025). Because the TRAINS database reports only goods that are actually traded, HS 6-digit records appear only for country-pair-product observations with positive trade flows. Using concordance tables from WITS and the United Nations, we map HS 6-digit codes to ISIC Rev.4 2-digit industries and compute trade-weighted tariffs at the ISIC Rev.4 2-digit

[1] The list of countries may expand as developments unfold.

level. For country-pair-products with no reported HS 6-digit trade, we assign zero trade values when aggregating tariffs from the HS 6-digit level to the ISIC Rev.4 2-digit level. Further details are provided in Appendix A.

We start the quantitative analysis by conducting two counterfactual simulations:

1. 2023 vs. 2022: This simulation evaluates the effects of any tariff changes in 2023, relative to the baseline tariff of 2022.

2. 2025 vs. 2022: This simulation evaluates the effects of the tariff changes in 2025 by a specified date (based on the U.S. EOs and the retaliatory tariffs effective by the specified date), relative to the baseline tariff of 2022.

In both simulations, the 2022 trade and production structure is used as the baseline with the structural parameters calibrated according to Table 1. By taking the ratio of the simulated outcomes for 2025 relative to 2022 and for 2023 relative to 2022, we net out the effects of tariff changes between 2022 and 2023, thereby isolating the effects of the Trump II tariffs (and the associated retaliatory tariffs). The percentage changes in trade, welfare, and wages reported in the simulation graphs reflect the effects of the Trump II tariffs (and the associated tariff responses by its trading partners).

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# A Tariff Tracker

This appendix documents in detail the compilation of the tariff and trade data underlying the "Tariff Tracker" user interface, which reports the effective tariffs, affected trade values, and the shares of affected trade values and tariff lines at both the HS 6-digit and ISIC Rev.4 2-digit levels. The tariff tracker covers the changes in U.S. tariffs and tariff responses by its trading partners.

The data on baseline tariffs for 2022 and 2023 at the HS 6-digit level are sourced from the TRAINS database and downloaded via the World Integrated Trade Solution (WITS) interface. Specifically, we use the series of effectively applied tariff rates reported in TRAINS. The same source also provides trade values at the corresponding tariff-line level.

The data on U.S. import tariffs effective from 2025 onward are manually collected from the executive orders (EOs) published in the *U.S. Federal Register*. Each EO specifies both the publication date and the effective date of the tariff changes. Throughout the exercises, all dates refer to the tariff *effective* dates. Tariff responses by Cambodia, Canada, China, India, Mexico, the United Kingdom, and Zimbabwe are sourced from the WTO–IMF tariff tracker, with all reported tariff change dates referring to effective dates (World Trade Organization, 2025a).

The U.S. tariff changes specified in the EOs are reported at the HTS 7-digit to 10-digit level. We truncate these codes to the first six digits, which correspond to HS 6-digit product codes (United States International Trade Commission, 2025). Using concordance tables from WITS and the United Nations, we map HS 6-digit codes to ISIC Rev.4 2-digit industries and compute trade-weighted tariffs at the ISIC Rev.4 2-digit level. For country-pair-products

with no reported trade, we assign zero trade values when aggregating tariffs from the HS 6-digit level to the ISIC Rev.4 2-digit level. The following documents the specific methodologies used to compute the tariff rates and affected trade values (shares) reported on the "Tariff Tracker" user interface.

## A.1 Tariffs and affected trade values (shares) at the HS 6-digit and ISIC Rev.4 2-digit levels

Denote the tariff rate and trade value of an HS 6-digit product ($p$) for an exporter $i$ and an importer $j$ at time $t$ by $\mathtt{t}_{ijpt}$ and $X_{ijpt}$, respectively. They are expressed in percentage points and in 1,000 USD, respectively. Let $d_{ijpt}$ be an indicator variable that equals one if the exporter-importer-product $ijp$ is subject to the announced tariff changes up to time $t$, and zero otherwise. Equivalently, $d_{ijpt}$ corresponds to the share of trade value or tariff lines affected by the announced tariff changes at the $ijpt$ level. Thus, at the HS 6-digit level, the reported trade incidence and tariff-line incidence measures are either zero or 100%.

We then apply the following chain of concordances to map HS 6-digit codes to ISIC Rev.4 2-digit sectors (because there is no direct concordance table between the two classifications): HS 6-digit ($p$) $\rightarrow$ ISIC Rev.2 4-digit ($r$) $\rightarrow$ ISIC Rev.3.1 4-digit ($s$) $\rightarrow$ ISIC Rev.4 4-digits ($\ell$) $\rightarrow$ ISIC Rev.4 2 digits ($k$), where $r$, $s$, $\ell$, and $k$ denote the corresponding unit of classification. For example, $k$ indexes an ISIC Rev.4 2-digit sector. The chain weight from an HS 6-digit product $p$ to an ISIC Rev.4 4-digit industry $\ell$ can be derived as:

$$\omega_{p\ell}^{\text{chain}} \equiv \sum_{r,s} \omega_{pr}\, \omega_{rs}\, \omega_{s\ell}, \tag{9}$$

where $\omega_{pr}$ indicates the distribution share of a product $p$ to an industry $r$. In the data, the mapping from $p$ to $r$ is 1-to-1, so $\omega_{pr}$ is either equal to 1 or 0. Similarly, $\omega_{rs}$ indicates the distribution share of an industry $r$ under ISIC Rev.2 to an industry $s$ under ISIC Rev.3.1. Given an 1-to-m mapping, a weight of 1/m is allocated to each $s$ mapped by $r$. The same rule applies in calculating the weight $\omega_{s\ell}$. It follows that these weights satisfy the condition that $\sum_\ell \omega_{p\ell}^{\text{chain}} = 1$ for each HS 6-digit product $p$. The chain weight from HS 6-digit to ISIC Rev.4 2-digit can then be derived as:

$$\omega_{pk} \equiv \sum_{\ell \in k} \omega_{p\ell}^{\text{chain}}. \tag{10}$$

Thus, $\omega_{pk}$ is a chain concordance weight that reflects the implied composition of HS 6-digit product $p$ across ISIC Rev.4 2-digit sectors. For each product-sector pair $(p, k)$, the

concordance provides a weight $\omega_{pk} \in [0,1]$ such that $\sum_k \omega_{pk} = 1$. We use these weights to allocate HS product-level bilateral trade flows across ISIC sectors, and impute the total trade flows at the $ijkt$ level:

$$X_{ijkt} = \sum_p X_{ijpt}\, \omega_{pk}. \tag{11}$$

Similarly, we construct the sector-level trade-weighted tariff rate by:

$$\mathsf{t}_{ijkt} \equiv \frac{\sum_p \mathsf{t}_{ijpt}\, X_{ijpt}\, \omega_{pk}}{\sum_p X_{ijpt}\, \omega_{pk}}. \tag{12}$$

Correspondingly, the *affected trade value* at the sector level is defined as:

$$X_{ijkt}^{affected} \equiv \sum_{p:d_{ijpt}=1} X_{ijpt}\, \omega_{pk}, \tag{13}$$

and the *affected trade share* is:

$$X_{ijkt}^{share,\,affected} \equiv \frac{X_{ijkt}^{affected}}{X_{ijkt}}. \tag{14}$$

When measuring the incidence based on the share of HS 6-digit tariff lines affected, we calculate the number of distinct HS 6-digit lines affected by tariff changes among the set of HS 6-digit tariff lines mapped to sector $k$ ($\Omega_{ijkt}$):

$$\Omega_{ijkt}^{share,\,affected} \equiv \frac{\Omega_{ijkt}^{affected}}{\Omega_{ijkt}}, \tag{15}$$

which captures the fraction of HS 6-digit tariff lines within a given ISIC Rev.4 2-digit sector for an exporter-importer pair that are directly affected by the announced tariff changes up to time $t$ (regardless of their trade values).

The "Tariff Tracker" user interface additionally reports "World" as an exporter at both the HS 6-digit and ISIC Rev.4 2-digit levels. For each HS 6-digit product (or ISIC 2-digit sector), and effective date, the reported tariff corresponds to the simple average of tariff rates across all exporting countries levied by a given importing country. We also report the total import value, affected trade value, and shares of affected trade and tariff lines across all exporting countries, with respect to the given importing country, for each HS 6-digit product (or ISIC 2-digt sector) and by the effective date. This synthetic "World" observation measures the average trade and tariff exposure of the world to an importing country's tariff changes.

## A.2 Methodology for Executive Order Data Collection

### A.2.1 Data Scope and Identification

Executive orders (EOs) issued by President Trump from January 1, 2025, relating to tariffs and trade restrictions were identified and documented from the *U.S. Federal Register* (https://www.federalregister.gov/presidential-documents/executive-orders/donald-trump/2025). Each relevant EO was analyzed to extract structured information about tariff changes.

### A.2.2 Data Collection Process

For each identified executive order, the following information was systematically recorded:

- Administrative Details:
  1. EO number;
  2. Date signed;
  3. Date published;
  4. Date effective (when tariff changes become operative);
- Trade Parameters:
  5. Exporter (affected country/countries; multiple exporters possible within single EO);
  6. Importer (United States in all cases);
  7. Product name (HTSUS product classification, where available);
  8. HTSUS code (7-10 digit U.S.-specific harmonized tariff code);
- Tariff Change:
  9. d_t (change in tariff rate relative to baseline of January 1, 2025);
- Classification:
  10. Remark field indicating scope of application:
      - Not-specific: applies to all products from all countries;
      - Country-specific: applies to all products from one country;
      - Product-specific: applies to one product from all countries;
      - Country-product-specific: applies to one product from one country.

### A.2.3 Tariff Change (d_t) Classification

Three primary forms of tariff modifications were encountered in executive orders:

1. Additional tariff: incremental rate added to the prevailing tariff at time of EO issuance;
2. New effective tariff: absolute rate imposed regardless of existing tariff level;
3. Tariff floor: minimum tariff threshold where rates below the floor are raised to the floor level, while rates above remain unchanged.

### A.2.4 Identifying HTSUS Codes for Vague Definitions

HTSUS codes were reconciled using guidance from U.S. Customs and Border Protection's IEEPA FAQ (https://www.cbp.gov/trade/programs-administration/trade-remedies/IEEPA-FAQ). This source provided official mappings between EO provisions and corresponding HS 6-digit codes, particularly for:

- EO-specific HTSUS codes in special chapters (e.g., Chapter 99) that do not directly correspond to standard HS 6-digit classifications;
- Broad categorical descriptions requiring clarification (e.g., "energy and energy resources" subject to 10% tariff on Canada under EO 14193).

Government agency interpretations referenced in the IEEPA FAQ were used to determine which HS 6-digit codes fell under specific EO provisions.

### A.2.5 Summary of Executive Orders Identified

The date in brackets refers to the date on which the EO was signed.

EO 14193 (Feb 1, 2025): Imposed 25% tariff on most Canadian imports and 10% on Canadian energy/energy resources to address fentanyl trafficking and illegal migration across the northern border.

EO 14194 (Feb 1, 2025): Imposed 25% tariff on all Mexican imports to address fentanyl trafficking and illegal migration across the southern border.

EO 14195 (Feb 1, 2025): Imposed 10% additional tariff on all goods from China and Hong Kong to address the synthetic opioid supply chain.

EO 14197 (Feb 3, 2025): Paused implementation of Canadian tariffs until March 4, 2025, recognizing Canada's cooperation in addressing drug trafficking and illegal immigration (amendment to EO 14193).

EO 14198 (Feb 3, 2025): Paused implementation of Mexican tariffs until March 4, 2025, recognizing Mexico's cooperation in addressing drug trafficking and illegal immigration (amendment to EO 14194).

EO 14228 (Mar 3, 2025): Increased the tariff on Chinese goods from 10% to 20%, citing inadequate steps by China to alleviate the illicit drug crisis (amendment to EO 14195).

EO 14231 (Mar 6, 2025): Exempted USMCA-compliant goods from the 25% Canadian tariff and reduced potash tariff to 10% (amendment to EO 14193).

EO 14232 (Mar 6, 2025): Exempted USMCA-compliant goods from the 25% Mexican tariff and reduced potash tariff to 10% (amendment to EO 14194).

EO 14256 (Apr 2, 2025): Suspended duty-free de minimis treatment for low-value imports from China starting May 2, 2025, ensuring tariffs apply to all Chinese goods regardless of shipment value.

EO 14257 (Apr 2, 2025): Imposed "reciprocal tariffs" with a 10% baseline on all countries effective April 5, and country-specific higher rates (initially 34% on China, up to 50% on others) effective April 9 to address persistent trade deficits.

EO 14259 (Apr 8, 2025): Raised China's reciprocal tariff from 34% to 84% in response to Chinese retaliation and increased de minimis postal duties on Chinese goods.

EO 14266 (Apr 9, 2025): Raised China's reciprocal tariff to 125% and temporarily suspended country-specific tariffs for 90 days (returning to 10% baseline) for all other countries to allow for negotiations.

EO 14298 (May 12, 2025): Temporarily reduced China's tariff from 125% to 10% for 90 days following trade discussions in Geneva, while maintaining the 20% fentanyl-related tariff.

EO 14309 (Jun 16, 2025): Implemented the U.S.-U.K. Economic Prosperity Deal, reducing U.S. tariffs on British automobiles and aerospace materials.

EO 14316 (Jul 7, 2025): Extended the suspension of country-specific reciprocal tariffs from July 9 to August 1, 2025, to allow additional time for trade negotiations.

EO 14323 (Jul 30, 2025): Imposes a new, broad 40% ad valorem tariff on most U.S. imports from Brazil.

EO 14325 (Jul 31, 2025): Raised the tariff on certain Canadian goods from 25% to 35% (amendment to EO 14193).

EO 14326 (Jul 31, 2025): Established new country-specific reciprocal tariff rates for over 60 countries with a minimum floor of 10%, effective August 7, 2025.

EO 14329 (Aug 6, 2025): Addressed threats from the Russian Federation by raising tariffs on India due to India's trade with Russia.

EO 14334 (Aug 11, 2025): Extended the temporary 10% tariff rate on Chinese goods

established in May 2025 beyond the initial 90-day period pending ongoing trade discussions.

EO 14345 (Sep 4, 2025): Implemented the United States-Japan Agreement, establishing a trade deal with a 15% tariff on most Japanese imports.

EO 14346 (Sep 5, 2025): Modified the scope of reciprocal tariffs to exempt certain products from countries that concluded trade and security framework agreements with the U.S. (including EU implementation).

EO 14357 (Nov 4, 2025): Reduced the 20% tariff rate from EO 14228 to 10% on Chinese goods.

EO 14358 (Nov 4, 2025): Extends the suspension of heightened tariffs on Chinese goods from EO 14334 to Nov 10, 2026.

EO 14360 (Nov 14, 2025): Modified the scope of reciprocal tariffs from EO 14257 (and later 14346) to exclude certain agricultural products.

EO 14361 (Nov 20, 2025): Modified the scope of reciprocal tariffs from EO 14323 on Brazil to exclude some products, including agricultural products.

Table 1: Calibration of Parameters and Measurement of Variables

| **Parameters/Variables** | **Description** |
|---|---|
| $\gamma_{j,k} = VA_{j,k}/Y_{j,k}$ | The ratio of value added $VA_{j,k}$ to gross output $Y_{j,k}$ in sector $k$ of country $j$ |
| $\gamma_{j,lk} = \frac{Z_{j,lk}}{\sum_{l'} Z_{j,l'k}} \times (1 - \gamma_{j,k})$ | The cost share of sector $k$'s spending $Z_{j,lk}$ on goods from sector $l$ as intermediate inputs in country $j$ |
| $\pi_{ij,k} = \frac{X_{ij,k}}{\sum_{i'} X_{i'j,k}}$ | The share of country $j$'s expenditure $X_{ij,k}$ in sector $k$ on goods from country $i$ |
| $D_j = \sum_k \sum_i \left( \frac{X_{ij,k}}{1+\mathtt{t}_{ij,k}} - \frac{X_{ji,k}}{1+\mathtt{t}_{ji,k}} \right)$ | The trade deficit of country $j$ |
| $\delta_j = \frac{D_j}{\sum_i \sum_k Y_{i,k}}$ | The ratio of country $j$'s trade deficit to world gross output |
| $R_j = \sum_k \sum_i \mathtt{t}_{ij,k} \frac{X_{ij,k}}{1+\mathtt{t}_{ij,k}}$ | The tariff revenue of country $j$, imputed by tariff rates multiplied by import values |
| $I_j = w_j L_j + R_j + D_j = VA_j + R_j + D_j$ | The final absorption of country $j$, imputed by the sum of value added, tariff revenue, and trade deficit |
| $\alpha_{j,k} = \left( \sum_i X_{ij,k} - \sum_l \gamma_{j,kl} Y_{j,l} \right) / I_j$ | The share of country $j$'s final consumption expenditure on goods from sector $k$ |
| $\theta_k$ | Productivity dispersion (or trade elasticity) of sector $k$ |

Table 2: Country List

| OECD Economies | | | Non-OECD Economies | | |
|---|---|---|---|---|---|
| ISO | Country Name | Country Grouping | ISO | Country Name | Country Grouping |
| AUS | Australia | | AGO | Angola | |
| AUT | Austria | European Union | ARG | Argentina | |
| BEL | Belgium | European Union | BGD | Bangladesh | |
| CAN | Canada | | BLR | Belarus | |
| CHL | Chile | | BRA | Brazil | |
| COL | Colombia | | BRN | Brunei Darussalam | |
| CRI | Costa Rica | | BGR | Bulgaria | European Union |
| HRV | Croatia | European Union | KHM | Cambodia | |
| CZE | Czech Republic | European Union | CMR | Cameroon | |
| DNK | Denmark | European Union | CHN | China | |
| EST | Estonia | European Union | CIV | Côte d'Ivoire | |
| FIN | Finland | European Union | HRV | Croatia | European Union |
| FRA | France | European Union | CYP | Cyprus | European Union |
| DEU | Germany | European Union | COD | Democratic Republic of the Congo | |
| GRC | Greece | European Union | EGY | Egypt | |
| HUN | Hungary | European Union | HKG | Hong Kong, China | |
| ISL | Iceland | | IND | India | |
| IRL | Ireland | European Union | IDN | Indonesia | |
| ISR | Israel | | JOR | Jordan | |
| ITA | Italy | European Union | KAZ | Kazakhstan | |
| JPN | Japan | | LAO | Laos | |
| KOR | Korea | | MYS | Malaysia | |
| LVA | Latvia | European Union | MLT | Malta | European Union |
| LTU | Lithuania | European Union | MAR | Morocco | |
| LUX | Luxembourg | European Union | MMR | Myanmar | |
| MEX | Mexico | | NGA | Nigeria | |
| NLD | Netherlands | European Union | PAK | Pakistan | |
| NZL | New Zealand | | PER | Peru | |
| NOR | Norway | | PHL | Philippines | |
| POL | Poland | European Union | ROU | Romania | European Union |
| PRT | Portugal | European Union | RUS | Russian Federation | |
| SVK | Slovak Republic | European Union | STP | Saõ Tomé and Príncipe | |
| SVN | Slovenia | European Union | SAU | Saudi Arabia | |
| ESP | Spain | European Union | SEN | Senegal | |
| SWE | Sweden | European Union | SGP | Singapore | |
| CHE | Switzerland | | ZAF | South Africa | |
| TUR | Turkey | | TWN | Chinese Taipei | |
| GBR | United Kingdom | European Union | THA | Thailand | |
| USA | United States | | TUN | Tunisia | |
| | | | ARE | United Arab Emirates | |
| | | | VNM | Viet Nam | |
| | | | ROW | Rest of the World | |

Table 3: Sector Classification and Trade Elasticity Estimates

| Sector | ICIO Industry Code | ISIC Rev.4 | Sector Description | Trade Elasticity |
|---|---|---|---|---|
| 1 | A01-A02 | 01-02 | Agriculture and hunting; Forestry and logging | 8.11* |
| 2 | A03 | 03 | Fishing and aquaculture | 8.11* |
| 3 | B05-B06 | 05-06 | Mining of coal and lignite; Extraction of crude petroleum and natural gas | 15.72* |
| 4 | B07-B08 | 07-08 | Mining of metal ores; Other mining and quarrying | 15.72* |
| 5 | B09 | 09 | Mining support service activities | 15.72* |
| 6 | C10T12 | 10-12 | Manufacture of food products; beverages and tobacco products | 1.72† |
| 7 | C13T15 | 13-15 | Manufacture of textiles, wearing apparel, leather and related products | 1.26 |
| 8 | C16 | 16 | Manufacture of wood and of products of wood and cork | 2.66 |
| 9 | C17T18 | 17-18 | Manufacture of paper and paper products; Printing and reproduction of recorded media | 2.29 |
| 10 | C19 | 19 | Manufacture of coke and refined petroleum products | 1.72† |
| 11 | C20-C21 | 20-21 | Manufacture of chemicals and chemical products; Manufacture of basic pharmaceutical products and pharmaceutical preparations | 2.59 |
| 12 | C22 | 22 | Manufacture of rubber and plastic products | 1.25 |
| 13 | C23 | 23 | Manufacture of other non-metallic mineral products | 0.48 |
| 14 | C24A-C24B | 241, 2431, 242, 2432 | Manufacture of basic iron and steel; Manufacture of basic precious and other non-ferrous metals | 2.59 |
| 15 | C25 | 25 | Manufacture of fabricated metal products | 1.72† |
| 16 | C26 | 26 | Manufacture of computer, electronic and optical products | 1.72† |
| 17 | C27 | 27 | Manufacture of electrical equipment | 1.72† |
| 18 | C28 | 28 | Manufacture of machinery and equipment n.e.c. | 0.44 |
| 19 | C29 | 29 | Manufacture of motor vehicles, trailers and semi-trailers | 1.72† |
| 20 | C301-C302T309 | 301-309 | Building of ships and boats; Manufacture of other transport equipment | 1.93 |
| 21 | C31T33 | 31-33 | Manufacture of furniture; other manufacturing; repair and installation of machinery and equipment | 1.72† |
| 22 | D | 35 | Electricity, gas, steam and air conditioning supply | 10.00‡ |
| 23 | E, . . . , T | 36-39, . . . , 97-98 | Service sectors combined | 6§ |

*Note*: The table reports the list of sectors used in the study. We adopt the trade elasticity estimates of Beshkar, Chang and Song (2025) for non-service sectors.

* The elasticity estimates for these agriculture and mining sectors are negative, and are replaced by the estimate from Caliendo and Parro (2015).

† The elasticity estimates for these manufacturing sectors are negative, and are replaced by the mean across the manufacturing sectors with positive elasticity estimates.

‡ The elasticity estimate for this sector is negative, and is replaced by a large number (10). The choice is based on the consideration that trade flows and tariffs are sparse in this sector. Using a large elasticity value mutes the optimal tariff consideration in this sector and neutralizes its role in the analysis.

§ We choose a trade elasticity of 6 for the combined service sector, in line with the median estimates for the service sectors reported by Ahmad and Schreiber (2024) and Freeman et al. (2025).