QUANTITATIVE ANALYSIS OF U.S. TARIFF POLICIES: A MULTI-SECTOR RICARDIAN APPROACH*

NÍCOLAS DE MOURA†

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1 Introduction

This project quantifies the welfare effects of contemporary U.S. tariff policies using structural estimation of a multi-sector general equilibrium trade model. While standard trade theory predicts that unilateral tariffs reduce global welfare, the magnitude of these losses and their distribution across countries and sectors remains an empirical question requiring careful quantitative analysis.

We employ the Costinot et al. (2012) framework to evaluate tariff impacts through structural estimation. The CDK model's multi-sector structure captures sectoral interdependencies via input-output linkages, enabling analysis of how tariff shocks propagate across industries within and between countries. This approach provides precise welfare measurements by accounting for general equilibrium adjustments in prices, wages, and trade flows.

Our analysis addresses three key questions. First, what are the aggregate welfare effects of recent U.S. tariff increases on domestic and international economies? Second, how do these effects vary across sectors and countries depending on trade linkages and comparative advantage patterns? Third, how do short-run adjustments (immobile labor) compare with long-run equilibrium outcomes (mobile labor)?

The empirical strategy combines WIOD input-output data from 2009 with contemporary HTS-level U.S. tariff data from 2024-2025. We estimate the model using method of moments, targeting observed bilateral trade shares while satisfying trade balance and price consistency constraints. Trade costs are parameterized using a decomposed structure that separates bilateral, importer-specific, and exporter-specific components, reducing computational complexity while maintaining economic interpretability.

We construct three temporal tariff scenarios, 12-month rolling averages, year-to-date rates, and quarterly recent data, to evaluate policy persistence versus

*All code and data used in this paper are available at https://github.com/nicolasdemoura/trade_project_2025.

†FGV/Sao Paulo School of Economics. mailto:nicolasgoulartdemoura@gmail.com

temporary adjustments. The analysis covers 10 economies and 12 sectors, providing comprehensive coverage of major trading relationships and economic activities.

2 Theoretical Framework

We adopt the multi-sector Ricardian trade model developed by Costinot et al. (2012), which extends the Eaton and Kortum (2002) framework to incorporate multiple sectors and intermediate input linkages. The model features N countries and K sectors, where each country-sector pair is characterized by specific productivity parameters, production costs, and trade linkages.

2.1 Production and Technology

Production in country i, sector k is governed by a Cobb-Douglas technology that combines labor and intermediate inputs from all sectors. The unit cost of production is given by:

$$c_{ik} = (w_{ik})^{\beta_{ik}} \left(\prod_{k'=1}^{K} {p_{ik'}}^{\gamma_{ikk'}} \right)^{1-\beta_{ik}}$$

where $w_{ik} > 0$ represents the wage rate in country i, sector k, $p_{ik'} > 0$ denotes the price of intermediate input from sector k' in country i, $\beta_{ik} \in (0, 1)$ is the labor share parameter, and $\gamma_{ikk'} \geqslant 0$ represents the share of intermediate input k' in the production of sector k with the restriction $\sum_{k'=1}^{K} \gamma_{ikk'} = 1$.

Each country i in sector k is characterized by a productivity parameter $T_{ik} > 0$ that determines the country's comparative advantage in that sector. Higher values of T_{ik} indicate greater productivity and lower production costs, making the country more competitive in international markets for sector k goods.

2.2 Trade Structure and Market Clearing

Countries trade goods subject to iceberg trade costs $d_{nik} \geqslant 1$ and ad valorem tariffs $\tau_{nik} \geqslant 0$, where d_{nik} represents the units of good that must be shipped from country i to country n in sector k for one unit to arrive, and τ_{nik} is the tariff rate imposed by country n on imports from country i in sector k. By convention, $d_{iik} = 1$ and $\tau_{iik} = 0$ for domestic transactions.

Given perfect competition and consumers' preference for variety, the share of country n's expenditure on sector k goods that comes from country i is:

$$\pi_{nik} = \frac{T_{ik} \left(c_{ik} d_{nik} (1 + \tau_{nik}) \right)^{-\theta}}{\sum_{i'=1}^{N} T_{i'k} \left(c_{i'k} d_{ni'k} (1 + \tau_{ni'k}) \right)^{-\theta}}$$

where $\theta > 1$ is the trade elasticity parameter that governs the substitutability between varieties from different countries. The trade shares satisfy $\pi_{nik} \in (0,1)$ and $\sum_{i=1}^{N} \pi_{nik} = 1$ for all n, k.

The price index for sector k goods in country n is determined by:

$$p_{nk} = \left[\sum_{i=1}^{N} T_{ik} \left(c_{ik} d_{nik} (1 + \tau_{nik}) \right)^{-\theta} \right]^{-\frac{1}{\theta}}$$

where $p_{nk} > 0$ represents the minimum cost of purchasing one unit of sector k goods in country n.

2.3 Income and Expenditure

Total income for country n is given by:

$$Y_n = \sum_{k=1}^{K} w_{nk} L_{nk} + \sum_{k=1}^{K} \sum_{i=1}^{N} \tau_{nik} \pi_{nik} X_{nk}$$

where $Y_n > 0$ represents the total income available for expenditure across all sectors.

Total expenditure by country n on sector k goods is determined by Cobb-Douglas preferences with expenditure shares α_{nk}:

$$X_{nk} = \alpha_{nk} \left(\sum_{k'=1}^{K} w_{nk'} L_{nk'} + \sum_{k'=1}^{K} \sum_{i=1}^{N} \tau_{nik'} \pi_{nik'} X_{nk'} \right)$$

where $\alpha_{nk} \in (0,1)$ with $\sum_{k=1}^{K} \alpha_{nk} = 1$, $L_{nk} > 0$ represents labor allocation, and $X_{nk} > 0$ denotes total expenditure. The term in parentheses represents total income, comprising labor income and tariff revenue.

2.4 Labor Mobility and Trade Balance

We consider two scenarios for labor mobility that correspond to different time horizons for adjustment. The choice between these scenarios determines both the wage structure and the trade balance conditions.

Mobile Labor (Long-Run Equilibrium). Under perfect labor mobility within countries, wages equalize across sectors: $w_{ik} = w_i$ for all k. The trade balance condition requires that total export revenues equal total income:

$$\sum_{k=1}^{K} \sum_{n=1}^{N} \pi_{ink} \alpha_{nk} Y_n = \sum_{k=1}^{K} w_i L_{ik} + \sum_{k=1}^{K} \sum_{n=1}^{N} \tau_{nik} \pi_{nik} \alpha_{nk} Y_n \quad \forall i$$

This scenario represents long-run equilibrium where labor can move between sectors in response to wage differentials.

Immobile Labor (Short-Run Equilibrium). Under sector-specific labor, wages can differ across sectors within a country: w_{ik} varies with both i and k. The trade balance condition must hold at the sector level:

$$\sum_{n=1}^{N} \pi_{ink} \alpha_{nk} Y_n = w_{ik} L_{ik} + \sum_{n=1}^{N} \tau_{nik} \pi_{nik} \alpha_{nk} Y_n \quad \forall i, k$$

This scenario represents short-run equilibrium where sector-specific factors prevent immediate labor reallocation.

2.5 Welfare Measurement

Real welfare for country n is measured as total real income, comprising both labor income and tariff revenue:

$$W_n = \frac{\sum_{k=1}^{K} w_{nk} L_{nk} + \sum_{k=1}^{K} \sum_{i=1}^{N} \tau_{nik} \pi_{nik} X_{nk}}{P_n}$$

where the aggregate price index is:

$$P_n = \prod_{k=1}^{K} {p_{nk}}^{\alpha_{nk}}$$

with $P_n > 0$ and $W_n > 0$.

2.6 Equilibrium Definition

A general equilibrium consists of wages $\{w_{ik}\}$, prices $\{p_{nk}\}$, trade shares $\{\pi_{nik}\}$, expenditures $\{X_{nk}\}$, and incomes $\{Y_n\}$ such that: (i) firms minimize costs taking prices as given, (ii) trade shares follow from consumer optimization, (iii) price indices clear markets, (iv) expenditure patterns reflect consumer preferences, (v) income identities hold, and (vi) trade balances are satisfied under the specified labor mobility regime.

Variable Definitions and Data Sources. The complete set of variables and their empirical counterparts is summarized in Table 1:

Table 1: Model Variables and Parameters

Variable	Description	Source
Primary Outcomes of Interest		
W_n^{income}	Real income from labor: $\frac{\sum_k w_{nk} L_{nk}}{P_n}$	Structural model solution
W_n^{tariff}	Real tariff revenue: $\frac{\sum_k \sum_i \tau_{nik} \pi_{nik} X_{nk}}{P_n}$	Structural model solution
W_n	Total real welfare: $W_n^{income} + W_n^{tariff}$	Structural model solution
P_n	Aggregate price index	Structural model solution
Structural Parameters		
T_{ik}	Productivity parameter, country i, sector k	Reduced form regression
θ	Trade elasticity	External calibration
β_{ik}	Labor share, country i, sector k	Input-output tables
$\gamma_{ikk'}$	Intermediate input share, k' in k, country i	Input-output tables
α_{nk}	Expenditure share, country n, sector k	Input-output tables
d_{nik}	Iceberg trade cost, i to n, sector k	Structural estimation
Policy Variables		
τ_{nik}	Ad valorem tariff, n imports from i, sector k	Trade policy data
Endogenous Variables		
p_{nk}	Sectoral price index, country n, sector k	Structural equilibrium
c_{ik}	Unit cost of production, country i, sector k	Structural equilibrium
w_{ik}	Wage rate, country i, sector k	Structural equilibrium
π_{nik}	Bilateral trade share, n imports from i, sector k	Structural equilibrium
X_{nk}	Sectoral expenditure, country n, sector k	Structural equilibrium
Y_n	Total income, country n	Structural equilibrium
L_{nk}	Labor allocation, country n, sector k	Structural equilibrium

3 Data Construction

This section describes the data construction process for our multi-sector Ricardian analysis. We integrate multiple databases covering 10 countries and 12 sectors, combining 2009 WIOD structural data with contemporary 2024-2025 U.S. tariff information for counterfactual analysis. Table 2 details the country grouping structure, while Tables 3 and 4 present our sector aggregation scheme linking WIOD classifications to HS codes.

3.1 World Input-Output Database (WIOD)

Our analysis builds on the World Input-Output Database (WIOD) 2013 Release (Timmer et al., 2015), providing comprehensive input-output tables for 27 EU

countries and 13 other major economies from 1995 to 2011. We focus on 2009 as it provides complete trade flow information across our country sample, essential for structural parameter estimation. This dataset includes detailed information on bilateral intermediate input flows Z_{nikl} representing imports by sector k in country n from sector l in country i. This data allow us to compute three critical data components that form the foundation of our calibration: bilateral trade flows $X_{nik} = \sum_l Z_{nikl}$ used to compute trade shares π_{nik}, sectoral intermediate input coefficients $\gamma_{ikk'}$, and final expenditure patterns used to derive consumption shares α_{nk}.

We implement a structured aggregation scheme to balance tractability with economic realism. Our 10-country framework includes 8 focus economies (USA, Brazil, China, Japan, Mexico, India, Canada, United Kingdom), the European Union as an integrated bloc (27 member countries), and Rest of World capturing remaining economies. This aggregation captures the primary trade relationships while maintaining computational feasibility, as detailed in Table 2.

The 35 original WIOD sectors are aggregated into 12 economically meaningful categories following the mapping scheme presented in Tables 3 and 4: Food, Textiles, Paper, Chemical, Metal, Manufacture, Mining, Energy, Construction, Retail/Wholesale, Transport, and Services. This aggregation scheme is designed to capture key sectoral distinctions while maintaining sufficient observations within each category to ensure robust parameter estimation. We also match these sectors to corresponding HS codes to facilitate integration with tariff data from TRAINS and USITC, as detailed in the sector mapping tables.

Table 2: Country Aggregation Scheme

Model Region	Constituent Countries/Economies	WIOD Codes
Focus Economies	United States	USA
	Brazil	BRA
	China	CHN
	Japan	JPN
	Mexico	MEX
	India	IND
	Canada	CAN
	United Kingdom	GBR
European Union	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden	AUT, BEL, BGR, HRV, CYP, CZE, DNK, EST, FIN, FRA, DEU, GRC, HUN, IRL, ITA, LVA, LTU, LUX, MLT, NLD, POL, PRT, ROU, SVK, SVN, ESP, SWE
Rest of World	Australia, Indonesia, Korea, Russia, Turkey, Taiwan, Other economies	AUS, IDN, KOR, RUS, TUR, TWN, RoW

Notes: The aggregation scheme balances analytical tractability with economic realism. Focus economies represent the 8 largest trading partners and policy-relevant countries for our analysis. The European Union is treated as an integrated economic area reflecting deep trade and regulatory integration among member states. Rest of World captures remaining economies in the WIOD database. Country codes follow ISO 3166-1 alpha-3 standard as implemented in Timmer et al. (2015).

Table 3: Sector Mapping: Model Sectors to WIOD and HS Classifications (Part 1)

Model Sector	WIOD Sectors	HS Codes (Chapters)
Chemical	Chemicals and Chemical Products (24, c9); Rubber and Plastics (25, c10)	28: Inorganic chemicals; 29: Organic chemicals; 30: Pharmaceutical products; 31: Fertilizers; 32: Tanning/dyeing extracts; 33: Essential oils/perfumery; 34: Soap/surface-active agents; 35: Albuminoidal substances; 36: Explosives/pyrotechnics; 38: Miscellaneous chemicals; 39: Plastics
Construction	Construction (F, c18); Real Estate Activities (70, c29)	25: Salt/sulphur/earths and stone; 68: Articles of stone/plaster/cement
Energy	Coke, Refined Petroleum and Nuclear Fuel (23, c8); Electricity, Gas and Water Supply (E, c17)	27: Mineral fuels/oils; 84: Nuclear reactors/boilers/machinery
Food	Agriculture, Hunting, Forestry and Fishing (AtB, c1); Food, Beverages and Tobacco (15t16, c3)	1: Live animals; 2: Meat; 3: Fish/crustaceans; 4: Dairy produce; 5: Animal products; 6: Live trees/plants; 7: Vegetables; 8: Fruit/nuts; 9: Coffee/tea/spices; 10: Cereals; 11: Milling products; 12: Oil seeds; 15: Fats/oils; 16: Meat preparations; 17: Sugars; 18: Cocoa; 19: Cereal preparations; 20: Vegetable preparations; 21: Miscellaneous edible; 22: Beverages; 23: Food waste/animal feed; 24: Tobacco
Manufacture	Electrical and Optical Equipment (30t33, c14); Machinery, Nec (29, c13); Manufacturing, Nec; Recycling (36t37, c16); Transport Equipment (34t35, c15)	37: Photographic goods; 40: Rubber articles; 41: Raw hides/skins; 42: Leather articles; 43: Furskins; 45: Cork articles; 46: Straw manufactures; 64: Footwear; 65: Headgear; 66: Umbrellas; 67: Feathers; 69: Ceramics; 70: Glass; 71: Precious stones; 82: Tools/cutlery; 83: Miscellaneous base metal; 85: Electrical machinery; 86: Railway vehicles; 87: Motor vehicles; 88: Aircraft; 89: Ships; 90: Optical instruments; 91: Clocks/watches; 92: Musical instruments; 93: Arms/ammunition; 94: Furniture; 95: Toys/games; 96: Miscellaneous manufactures; 97: Art/antiques

Notes: WIOD sector codes in parentheses show both the alphanumeric (first) and numeric (second) identifiers from Timmer et al. (2015). HS codes refer to 2-digit Harmonized System chapters. Table continues on next page.

Table 4: Sector Mapping: Model Sectors to WIOD and HS Classifications (Part 2)

Model Sector	WIOD Sectors	HS Codes (Chapters)
Metal	Basic Metals and Fabricated Metal (27t28, c12); Other Non-Metallic Mineral (26, c11)	72: Iron/steel; 73: Iron/steel articles; 74: Copper; 75: Nickel; 76: Aluminium; 78: Lead; 80: Tin; 81: Other base metals; 79: Zinc
Mining	Mining and Quarrying (C, c2)	26: Ores/slag/ash; 13: Lac/gums/resins; 14: Vegetable plaiting materials
Paper	Pulp, Paper, Printing and Publishing (21t22, c7); Wood and Products of Wood and Cork (20, c6)	44: Wood/wood articles; 47: Wood pulp; 48: Paper/paperboard
Retail and Wholesale	Retail Trade, Except Motor Vehicles (52, c21); Sale/Maintenance of Motor Vehicles (50, c19); Wholesale Trade (51, c20)	*Non-tradable services sector*
Services	Education (M, c32); Financial Intermediation (J, c28); Health and Social Work (N, c33); Hotels and Restaurants (H, c22); Other Community/Social/Personal Services (O, c34); Post and Telecommunications (64, c27); Private Households with Employed Persons (P, c35); Public Admin and Defence (L, c31); Renting of M&Eq and Other Business Activities (71t74, c30)	*Non-tradable services sector*
Textiles	Leather, Leather and Footwear (19, c5); Textiles and Textile Products (17t18, c4)	50: Silk; 51: Wool/animal hair; 52: Cotton; 53: Other vegetable fibers; 54: Man-made filaments; 55: Man-made staple fibers; 56: Wadding/felt; 57: Carpets; 58: Special woven fabrics; 59: Impregnated textiles; 60: Knitted fabrics; 61: Knitted apparel; 62: Woven apparel; 63: Other textiles
Transport	Air Transport (62, c25); Inland Transport (60, c23); Other Supporting Transport Activities (63, c26); Water Transport (61, c24)	*Non-tradable services sector*

Notes: WIOD sector codes in parentheses show both the alphanumeric (first) and numeric (second) identifiers from Timmer et al. (2015). HS codes refer to 2-digit Harmonized System chapters. Non-tradable services sectors do not have corresponding HS classifications as they represent domestic activities.

3.2 Socioeconomic Accounts and Labor Data

Labor market data comes from the WIOD Socioeconomic Accounts (SEA) July 2014 release (Timmer et al., 2015), providing employment and compensation data by country and sector for 2009.

All monetary values are converted to 2009 US dollars using annual average exchange rates from the IMF International Financial Statistics, ensuring cross-country comparability. The WIOD input-output framework enables direct computation of key structural parameters: labor shares $\beta_{ik} = \frac{\text{Labor Compensation}_{ik}}{\text{Gross Output}_{ik}}$ capture the factor intensity of production consistent with our Cobb-Douglas specification. Together with intermediate input coefficients $\gamma_{ikk'} = \frac{\text{Intermediate Purchases}_{ikk'}}{\text{Gross Output}_{ik}}$ and final expenditure shares $\alpha_{nk} = \frac{\text{Final Consumption}_{nk}}{\text{Total Final Consumption}_{n}}$, these parameters form the technological and preference foundations of our structural model.

3.3 Tariff Data Architecture

We use tariff data from two sources: TRAINS database for international tariffs and USITC customs data for detailed US policy analysis, enabling evaluation of recent policy changes across our multi-country framework.

The TRAINS database, accessed through the World Bank's WITS platform (WITS, 2025), provides our baseline tariff structure for all non-US economies in the sample. We utilize 2023 data as the most recent year with complete coverage across our 9 international partners (Brazil, China, Japan, Mexico, India, Canada, United Kingdom, European Union, and Rest of World). The TRAINS system offers ad valorem equivalent rates at the HS 6-digit level, which we aggregate to match our 12-sector classification scheme. This database ensures consistent measurement methodology across countries and provides the structural foundation for calibrating bilateral trade costs in our baseline equilibrium.

For the United States, we employ detailed HTS-level data from USITC DataWeb covering 2024-2025 (UISTC, 2025). This high-frequency dataset contains monthly observations of General Customs Value and General Import Charges at the 10-digit HTS level, enabling precise calculation of effective tariff rates as $\tau_{ikt} = \frac{\text{Import Charges}_{ikt}}{\text{Customs Value}_{ikt}}$ for each trading partner and product category. In order to simplify, we consider this implied tariff as the total tariff faced by US importers, ignoring potential interactions with other trade barriers or specific tariffs. We aggregate these HTS-level tariffs to our 12-sector classification and the 10-country framework by summing import values and charges across relevant codes.

We calibrate the structural model using 2023 tariff data as our baseline equilibrium for international partners, combined with 2024 US rates as the initial state for counterfactual analysis. For policy evaluation, we construct three temporal aggregations of 2025 US tariff policies: a rolling 12-month window to capture medium-term

policy trends, year-to-date averages through the most recent available month, and the latest quarterly period to identify short-term policy shifts. While the quarterly (3-month) aggregation provides the most accurate representation of current policy stance, it suffers from seasonal fluctuations in trade patterns that can distort effective tariff calculations. Extending to a 12-month rolling window mitigates these seasonal effects but incorporates pre-2025 tariff policies that may not reflect the current administration's trade stance. This approach maintains international comparability through TRAINS while leveraging USITC's superior temporal resolution for US policy analysis, with the quarterly measure serving as our primary specification despite its seasonal limitations.

4 Calibration

This section presents the parameter estimation results and evaluates the model's ability to replicate observed trade and production patterns. Our estimation strategy follows the method of moments approach, targeting key structural relationships while ensuring computational stability through exponential parameter transformations.

4.1 Parameter Calibration Strategy

Our calibration follows a four-stage approach separating parameters by identification source. Each parameter group uses the most appropriate econometric method given the underlying economic structure.

4.1.1 Preference and Technology Parameters from Input-Output Data

We extract structural parameters directly from WIOD input-output tables following Costinot et al. (2012). Expenditure shares are computed as:

$$\alpha_{nk} = \frac{\sum_i X_{nik}}{\sum_k \sum_i X_{nik}}$$

where X_{nik} represents country n's total expenditure on sector k products from all origins i, ensuring that $\sum_k \alpha_{nk} = 1$ for each country. Labor shares in production are calculated as:

$$\beta_{ik} = \frac{\text{Labor Compensation}_{ik}}{\text{Gross Output}_{ik}}$$

Again, this satisfies the resource constraint $\beta_{ik} \in [0, 1]$ Intermediate input coefficients are derived as sectoral input requirements:

$$\gamma_{ikk'} = \frac{\sum_j Z_{ijkk'}}{\sum_l \sum_j Z_{ijkl}}$$

where purchases of sector k' inputs by sector k in country i are normalized by gross output. These parameters satisfy the resource constraint $\sum_{k'} \gamma_{ikk'} = 1$ by construction. Tables 7 through 18 in the appendix present the complete parameter matrices.

In the Appendix, we present the full set of estimated parameters derived from the WIOD data, including preference parameters α_{nk} (Table 7), labor share parameters β_{ik} (Table 8), and intermediate input coefficients $\gamma_{ikk'}$ (Tables 9 through 18).

We can see some standard patterns, which we highlight below.

Preference Parameters The expenditure shares (Table 7) reveal expected consumption patterns. Services represent the largest expenditure category across all countries, consistent with the service economy dominance in modern economies. Developing countries (China, Brazil, India, Mexico) allocate higher expenditure shares to Food compared to developed economies, reflecting lower per capita incomes and Engel's law. Developed countries show higher relative spending on Construction, indicating greater infrastructure investment and housing consumption.

Labor Share Parameters Labor shares (Table 8) display clear sectoral patterns. Service-oriented sectors (Services, Retail/Wholesale, Transport) exhibit high labor intensity, reflecting their people-intensive nature. Capital-intensive sectors (Energy, Manufacture, Metal) show low labor shares, consistent with their reliance on physical capital and technology. These patterns are consistent across countries, suggesting similar production technologies worldwide.

Intermediate Input Shares The intermediate input matrices (Tables 9 through 18) display strong diagonal elements, indicating substantial within-sector input usage. Services and Retail/Wholesale sectors serve as important input suppliers to most other sectors, reflecting their role as business services and distribution channels. These patterns remain consistent across countries, supporting the assumption of similar production technologies in our structural model.

4.1.2 Trade Elasticity from Literature

The trade elasticity θ is set to 6.53 following Costinot et al. (2012), which represents the central estimate from their analysis of bilateral trade patterns. This value lies within the consensus range of 2.84 and 12.86 established by the broader literature (Eaton and Kortum, 2002) and provides appropriate substitution elasticity for our multi-sector framework.

4.1.3 Productivity Parameters via CDK Regression

Productivity parameters T_{ik} are estimated using the two-step procedure developed by Costinot et al. (2012). We first run the reduced-form regression:

$$\log \pi_{nik} = \alpha_{ik} + \gamma_{nk} + \varepsilon_{nik} \tag{1}$$

where π_{nik} represents observed bilateral trade shares, α_{ik} are origin-sector fixed effects capturing comparative advantage, and γ_{nk} are destination-sector fixed effects reflecting market access. Following CDK methodology, productivity parameters are recovered as:

$$\hat{T}_{ik} = \exp\left(\frac{\hat{\alpha}_{ik}}{\theta}\right) \tag{2}$$

This approach exploits the restriction that comparative advantage patterns must match observed trade flows, identifying country-sector productivity levels. We also have some issues with multicollinearity in the regression, which we address by using matrix completion via low-rank matrix approximation with nuclear norm regularization (Mazumder et al., 2010). Table 19 presents the estimated productivity matrix.

4.1.4 Structural Estimation of Trade Costs

The final stage estimates iceberg trade costs through structural method of moments, targeting exact replication of observed bilateral trade shares while satisfying general equilibrium constraints. We parameterize trade costs using an additive decomposition in log space:

$$\log d_{nik} = \log d_{ni} + \log d_{nk}^{\text{importer}} + \log d_{ik}^{\text{exporter}} \tag{3}$$

where d_{ni} captures bilateral geographic and institutional barriers, d_{nk}^{importer} reflects destination-sector import barriers, and d_{ik}^{exporter} represents origin-sector export facilitation. This decomposition reduces the parameter space from $N^2 \times K$ to $N(N-1) + 2NK$ while maintaining sufficient flexibility to match observed trade patterns. Without this our model would be underidentified given the limited number of observations.

We solve the method of moments system:

$$\begin{aligned} \min_{\boldsymbol{\theta}} \quad & \sum_{n,i,k} \left(\pi_{nik}^{\text{data}} - \pi_{nik}^{\text{model}}(\boldsymbol{\theta})\right)^2 \\ \text{s.t.} \quad & \text{Trade Balance Constraint} \\ & \text{Price Consistency Constraint} \end{aligned}$$

where $\boldsymbol{\theta}$ contains trade cost components $\{d_{ni}\}$, $\{d_{ik}^{\text{importer}}\}$, $\{d_{jk}^{\text{exporter}}\}$, along with

wages $\{w_{ik}\}$ and prices $\{p_{ik}\}$ as endogenous variables. Tables 37 through 59 present the final estimated iceberg trade costs for each sector.

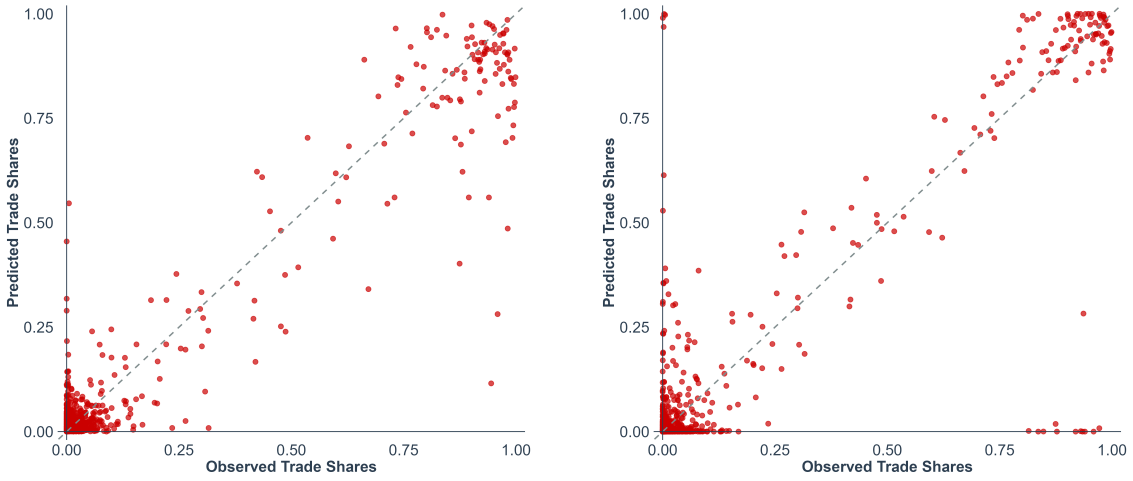
4.2 Calibration Performance and Parameter Estimates

Productivity Parameters Productivity estimates (Table 19) confirm expected comparative advantage patterns. Developed countries (USA, EU, UK) exhibit high productivity in Services and Chemicals, reflecting their technological sophistication and human capital endowments. China demonstrates strong productivity in Textiles and Manufacture, consistent with its manufacturing specialization. Brazil shows high productivity in Food production, aligning with its agricultural comparative advantage. These patterns validate the CDK regression approach for identifying productivity differences.

Tariff Structure Baseline tariff data (Tables 20 through 29) reveal expected patterns. Non-tradable sectors (Services, Retail/Wholesale, Transport) have zero tariffs by construction. USMCA members (USA, Canada, Mexico) maintain low bilateral tariffs, reflecting their trade agreement. Canada also has preferential access to UK and EU markets. China exhibits relatively high protection levels across sectors, while India maintains low tariffs with the UK, possibly reflecting historical trade ties.

Trade Cost Decomposition Bilateral trade costs (Tables 31, 33, 35) show geographic proximity effects. Neighboring countries (USA-Canada-Mexico, EU-UK) have lower bilateral costs. Notable exceptions include high costs between India and China, suggesting significant institutional or logistical barriers. Labor mobility assumptions do not substantially affect these estimates, indicating that trade cost identification is separate from labor market adjustments.

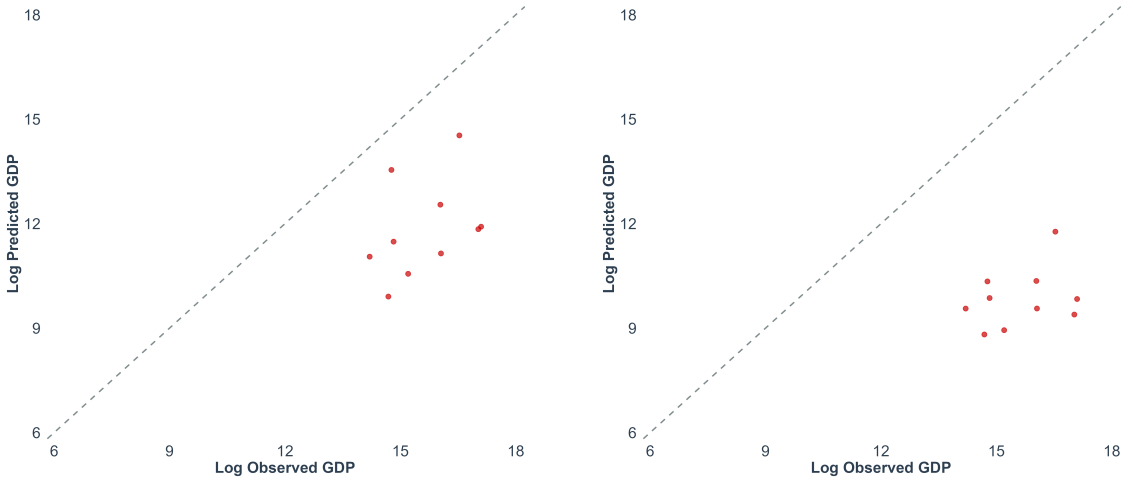
The structural estimation achieves excellent fit to observed trade patterns ($R^2 = 0.9331$). Figure 1 demonstrates strong correlation between predicted and observed bilateral trade shares across both mobile and immobile sectors, validating our decomposed trade cost specification. The model replicates key stylized facts: the gravity relationship between trade flows and economic size, the home bias in consumption patterns, and the sectoral variation in trade intensities. Moment matching performance indicates that our four-stage calibration strategy successfully identifies the structural parameters while maintaining computational efficiency.



(a) Mobile Sectors **(b)** Immobile Sectors

Figure 1: Model Fit: Predicted vs. Observed Bilateral Trade Shares

However, when we look at GDP shares, the fit is very poor, as shown in Figure 2. This is likely due to the fact that we are not targeting GDP shares in our calibration, and the model is not flexible enough to match both trade shares and GDP shares simultaneously given the limited number of parameters. This suggests that future work could explore alternative parameterizations or additional data sources to improve the model's ability to replicate observed production patterns while maintaining trade flow accuracy.



(a) Mobile Sectors **(b)** Immobile Sectors

Figure 2: Model Fit: Predicted vs. Observed GDP Shares

5 Counterfactual Analysis

This section evaluates the economic effects of alternative tariff policies using our calibrated multi-sector model. We analyze three contemporary scenarios based on 2025 US trade data: Last Twelve Months (LTM), Year-to-Date (YTD), and Most Recent Quarter (3M) tariff rates. Each scenario is evaluated under both mobile and immobile labor assumptions to capture short-run versus long-run adjustment mechanisms.

5.1 Policy Scenarios

Our counterfactual experiments replace the baseline 2024 tariff structure with contemporary rates derived from HTS-level US import data. The three scenarios capture different temporal perspectives on recent trade policy: **LTM Scenario (Last Twelve Months):** Uses contemporary tariff rates based on recent US trade policy implementation. This scenario captures the current protective stance across sectors.

YTD Scenario (Year-to-Date): Employs tariff rates reflecting policy changes implemented during 2025. This scenario provides the baseline for our main counterfactual analysis.

3M Scenario (Recent Quarter): Focuses on the most recent policy adjustments, highlighting short-term trade impacts and immediate policy effects.

These scenarios are compared against the 2024 baseline to quantify the welfare and structural adjustment effects of contemporary trade policy. The temporal variation allows analysis of policy evolution and helps identify which time horizon best captures steady-state effects.

Under the mobile labor assumption, workers can reallocate across sectors within each country in response to tariff changes. This represents the long-run equilibrium where factor markets have fully adjusted to policy changes.

The YTD tariff scenario results (Table 5) show welfare effects that appear implausibly large in magnitude, similar to the immobile labor case. The EU shows gains of 19.58%, USA 14.37%, China 7.50%, Brazil 5.21%, and Japan 4.76%, while Mexico faces losses of -4.91% and Canada -1.28%.

While the absolute magnitudes are unrealistic and suggest model specification or computational issues, the relative ordering of countries provides meaningful insights. The results indicate that Canada and Mexico are the countries most vulnerable to contemporary US tariff policies, consistent with their deep integration with US supply chains and NAFTA/USMCA trade relationships. Similarly, the model identifies India, China, and Brazil as potentially significant losers from protectionist policies, reflecting their substantial trade exposure to developed markets.

Table 5: Welfare Effects by Country - 2025 YTD Tariffs: with Labor Mobility

	Baseline Tariff (p.p.)	Counterfactual Tariff (p.p.)	Welfare Change (%)	Income Change (%)	Tariff Revenue Change (%)
BRA	2.870	3.080	5.210	5.270	-5.490
CAN	2.260	2.110	-1.280	-1.300	4.290
CHN	0.540	0.490	7.500	7.450	42.660
EU	1.630	1.800	19.580	19.580	44.660
GBR	1.830	1.770	2.730	2.720	14.690
IND	0.290	0.290	2.650	2.600	9.150
JPN	2.810	2.940	4.760	4.770	-5.860
MEX	1.430	1.340	-4.910	-4.940	0.730
RoW	4.990	3.680	1.760	1.780	-6.140
USA	0.000	0.000	14.370	14.410	3.770

The pattern where North American trading partners (Canada, Mexico) show the largest relative welfare losses aligns with expectations that geographically proximate and economically integrated countries face the greatest adjustment costs from trade disruptions. This ordering effect, rather than the specific numerical values, represents the most reliable insight from this counterfactual exercise.

Tariff revenue changes also show implausibly large magnitudes, with EU increasing 44.66% and China 42.66%, while Brazil (-5.49%), Japan (-5.86%), and Rest of World (-6.14%) experience decreases. Again, the levels are unrealistic, but the pattern suggests differential impacts across trading partners that merit further investigation with improved model specifications. We don't believe that these are just general equilibrium effects, but rather numerical issues with the immobile labor specification.

The immobile labor specification assumes workers cannot move between sectors, representing short-run adjustment where sectoral employment remains fixed at baseline levels. This scenario captures immediate policy impacts before factor reallocation occurs.

The immobile labor results (Table 6) exhibit extremely large welfare effects that appear unrealistic. Canada shows welfare gains of 14,773%, GBR 7,030%, and Japan 5,839%, while even the smallest effects (USA: 112.76%, China: 94.82%) are implausibly large. These results suggest numerical instability or specification issues in the immobile labor model.

The magnitude of these welfare changes indicates that the immobile labor constraint may be creating artificial rigidities that generate unrealistic general equilibrium responses. When labor cannot reallocate across sectors, the model appears to compensate through extreme price and wage adjustments that violate economic intuition.

Tariff revenue changes under immobile labor are similarly extreme, with most countries showing increases in the thousands of percent. These results suggest fundamental problems with the immobile labor specification, making the mobile labor scenario more credible for policy analysis.

The implausible welfare effects under labor immobility highlight the importance of factor mobility assumptions in quantitative trade models. The excessive gains may reflect computational difficulties in solving the general equilibrium system under binding employment constraints, indicating that the mobile labor specification provides more reliable counterfactual predictions.

Table 6: Welfare Effects by Country - 2025 YTD Tariffs: without Labor Mobility

	Baseline Tariff (p.p.)	Counterfactual Tariff (p.p.)	Welfare Change (%)	Income Change (%)	Tariff Revenue Change (%)
BRA	2.840	8.400	4359.050	4268.170	9960.980
CAN	2.110	3.530	14773.460	14731.570	24494.880
CHN	8.780	13.790	94.820	94.780	230.300
EU	5.280	3.040	28.300	28.300	206.330
GBR	0.540	4.670	7030.070	7042.520	3122.370
IND	0.030	2.430	2669.430	2595.920	4433.030
JPN	0.680	8.000	5838.970	5865.050	1632.200
MEX	0.430	2.590	1631.290	1646.680	619.100
RoW	4.290	1.190	209.960	205.550	2374.150
USA	0.000	0.000	112.760	109.150	418.400

5.2 Policy Implications

The YTD scenario analysis reveals several key policy insights. The asymmetric welfare distribution suggests that contemporary trade policies generate significant redistributive effects across countries. The main source of welfare gains appears to be trade diversion, where protected domestic industries benefit at the expense of foreign competitors. By imposing tariffs, the US may be redirecting trade flows towards its own producers, thereby improving its terms of trade. However, this comes at the cost of efficiency losses in global supply chains, particularly affecting countries like Canada and Mexico that are closely integrated with the US economy.

The contrast between mobile and immobile labor scenarios highlights the critical importance of labor market flexibility in determining adjustment costs. While the mobile labor results suggest manageable welfare effects ranging from -4.91% to +19.58%, the implausible immobile labor results indicate that rigid labor markets could generate severe adjustment problems.

6 Conclusion

This study applies the Costinot et al. (2012) multi-sector Ricardian trade model to examine U.S. tariff policies using WIOD input-output data and U.S. tariff information. The analysis covers 10 countries and 12 sectors, revealing asymmetric welfare effects under the 2025 YTD tariff scenario. With mobile labor, the model predicts welfare gains of 19.58% for the European Union and 14.37% for the United States, while showing losses of 4.91% for Mexico and 1.28% for Canada. These results suggest that trade policies redistribute welfare across countries, with larger economies potentially benefiting at the expense of smaller, trade-dependent partners.

The calibration strategy combines input-output data with trade policy information, achieving reasonable fit to bilateral trade patterns ($R^2 = 0.933$). However, the model struggles to match GDP shares simultaneously, indicating trade-offs between trade flow accuracy and production pattern replication. The immobile labor specification produces implausibly large welfare changes, suggesting numerical issues and highlighting the importance of labor mobility assumptions in these models.

The results indicate that the examined tariff policies function more as redistributive mechanisms than efficiency improvements. While the welfare effects are substantial, ranging from losses of nearly 5% to gains exceeding 19%, these findings should be interpreted cautiously given the model's limitations. The contrast between mobile and immobile labor results emphasizes the role of labor market assumptions in determining policy impacts. Future work could address computational challenges in solving constrained equilibrium models and estimate more precisely what are the policy shocks driving these welfare changes.

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Appendix

This appendix contains the estimated parameters and data tables used in the analysis.

Estimated Parameters Tables 7 and 8 present the estimated preference parameters and labor share parameters for each country and sector.

Technology Parameters Tables 9 through 18 show the intermediate input coefficients for each country.

Productivity Parameters Table 19 presents the productivity parameters used in the model calibration.

Tariff Data Tables 20 through 29 contain the tariff rates applied by each country across different sectors.

Trade Cost Decomposition Tables 31, 33, and 35 provide the decomposition of iceberg trade costs into bilateral, exporter, and importer components. Tables 37 through 59 present the final estimated iceberg trade costs for each sector.

Welfare Effects Tables 60 through **??** summarize the welfare effects of other tariff scenarios under both mobile and immobile labor assumptions.

Table 7: Expenditure Shares (α)

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.082	0.047	0.096	0.117	0.075	0.079	0.046	0.030	0.105	0.245	0.015	0.063
CAN	0.055	0.059	0.047	0.059	0.086	0.077	0.078	0.052	0.137	0.289	0.006	0.056
CHN	0.112	0.014	0.072	0.107	0.172	0.166	0.061	0.041	0.042	0.123	0.049	0.043
EU	0.050	0.097	0.063	0.055	0.090	0.078	0.028	0.031	0.109	0.318	0.008	0.073
GBR	0.034	0.105	0.043	0.037	0.057	0.038	0.036	0.030	0.100	0.451	0.003	0.066
IND	0.073	0.041	0.114	0.109	0.108	0.146	0.052	0.021	0.101	0.116	0.025	0.096
JPN	0.080	0.042	0.069	0.060	0.109	0.109	0.039	0.037	0.092	0.303	0.007	0.053
MEX	0.095	0.042	0.073	0.088	0.122	0.096	0.073	0.034	0.116	0.204	0.016	0.042
RoW	0.053	0.044	0.077	0.092	0.098	0.086	0.135	0.036	0.099	0.187	0.012	0.082
USA	0.053	0.082	0.047	0.052	0.068	0.055	0.041	0.034	0.060	0.464	0.004	0.040

Table 8: Labor Shares (β)

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.166	0.220	0.093	0.170	0.206	0.213	0.153	0.258	0.443	0.447	0.276	0.366
CAN	0.184	0.174	0.096	0.133	0.203	0.192	0.112	0.267	0.418	0.440	0.391	0.329
CHN	0.060	0.113	0.065	0.329	0.067	0.065	0.164	0.081	0.145	0.239	0.085	0.123
EU	0.166	0.172	0.085	0.250	0.229	0.224	0.211	0.220	0.402	0.451	0.240	0.276
GBR	0.296	0.344	0.100	0.310	0.323	0.363	0.106	0.376	0.407	0.377	0.382	0.398
IND	0.062	0.248	0.059	0.313	0.079	0.069	0.217	0.199	0.555	0.407	0.175	0.155
JPN	0.145	0.204	0.063	0.195	0.169	0.148	0.102	0.267	0.411	0.405	0.458	0.443
MEX	0.096	0.121	0.061	0.121	0.094	0.084	0.039	0.131	0.195	0.380	0.166	0.211
RoW	0.123	0.173	0.068	0.255	0.155	0.119	0.206	0.217	0.378	0.432	0.144	0.230
USA	0.152	0.173	0.102	0.151	0.250	0.224	0.195	0.221	0.448	0.422	0.338	0.393

Table 9: Intermediate Input Shares (γ) - BRA

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
Chemical	0.362	0.012	0.126	0.027	0.023	0.033	0.036	0.025	0.138	0.173	0.006	0.039
Construction	0.087	0.110	0.033	0.002	0.058	0.362	0.029	0.042	0.123	0.121	0.002	0.031
Energy	0.017	0.007	0.311	0.051	0.031	0.008	0.382	0.002	0.060	0.096	0.000	0.034
Food	0.097	0.007	0.045	0.537	0.010	0.017	0.005	0.009	0.141	0.102	0.002	0.029
Manufacture	0.084	0.010	0.038	0.002	0.331	0.216	0.002	0.024	0.110	0.146	0.004	0.032
Metal	0.078	0.010	0.101	0.003	0.039	0.339	0.120	0.016	0.109	0.150	0.003	0.033
Mining	0.034	0.168	0.077	0.002	0.071	0.078	0.095	0.006	0.062	0.303	0.006	0.099
Paper	0.121	0.015	0.064	0.136	0.024	0.028	0.004	0.304	0.101	0.158	0.007	0.038
Retail	0.021	0.103	0.125	0.004	0.059	0.007	0.001	0.023	0.107	0.420	0.006	0.123
Services	0.044	0.082	0.088	0.072	0.043	0.008	0.001	0.034	0.084	0.435	0.006	0.102
Textiles	0.088	0.013	0.055	0.072	0.019	0.007	0.001	0.013	0.161	0.109	0.436	0.026
Transport	0.040	0.051	0.134	0.015	0.081	0.006	0.001	0.052	0.105	0.385	0.011	0.120

Table 10: Intermediate Input Shares (γ) - CAN

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
Chemical	0.407	0.020	0.123	0.013	0.014	0.021	0.058	0.020	0.157	0.128	0.007	0.032
Construction	0.043	0.117	0.036	0.010	0.071	0.188	0.079	0.106	0.104	0.221	0.006	0.019
Energy	0.023	0.033	0.046	0.003	0.011	0.009	0.670	0.005	0.087	0.060	0.000	0.054
Food	0.058	0.028	0.040	0.430	0.014	0.017	0.014	0.030	0.182	0.136	0.003	0.048
Manufacture	0.045	0.019	0.011	0.004	0.443	0.156	0.009	0.026	0.143	0.115	0.007	0.021
Metal	0.023	0.017	0.046	0.003	0.018	0.451	0.179	0.010	0.151	0.075	0.001	0.027
Mining	0.020	0.071	0.074	0.006	0.050	0.029	0.253	0.010	0.214	0.238	0.001	0.033
Paper	0.051	0.024	0.053	0.191	0.021	0.008	0.017	0.296	0.166	0.153	0.002	0.017
Retail	0.066	0.080	0.047	0.016	0.087	0.036	0.013	0.073	0.093	0.450	0.007	0.032
Services	0.031	0.076	0.039	0.036	0.035	0.005	0.012	0.038	0.140	0.523	0.003	0.063
Textiles	0.095	0.023	0.028	0.008	0.016	0.004	0.009	0.023	0.178	0.121	0.472	0.023
Transport	0.013	0.049	0.140	0.004	0.028	0.004	0.027	0.006	0.129	0.202	0.001	0.398

Table 11: Intermediate Input Shares (γ) - CHN

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
Chemical	0.508	0.004	0.113	0.061	0.036	0.032	0.074	0.021	0.033	0.071	0.018	0.030
Construction	0.057	0.021	0.037	0.013	0.111	0.451	0.020	0.038	0.048	0.106	0.009	0.087
Energy	0.018	0.001	0.313	0.007	0.091	0.013	0.403	0.004	0.026	0.091	0.006	0.026
Food	0.081	0.002	0.021	0.701	0.015	0.012	0.004	0.017	0.045	0.071	0.003	0.029
Manufacture	0.081	0.004	0.022	0.008	0.495	0.209	0.006	0.019	0.050	0.073	0.012	0.021
Metal	0.048	0.003	0.097	0.007	0.072	0.431	0.175	0.021	0.038	0.069	0.007	0.033
Mining	0.080	0.004	0.185	0.011	0.177	0.118	0.145	0.016	0.034	0.141	0.013	0.076
Paper	0.128	0.006	0.036	0.125	0.043	0.022	0.010	0.486	0.040	0.059	0.016	0.030
Retail	0.027	0.079	0.037	0.019	0.079	0.004	0.001	0.036	0.023	0.480	0.034	0.183
Services	0.101	0.049	0.046	0.124	0.149	0.018	0.005	0.066	0.053	0.320	0.030	0.039
Textiles	0.097	0.007	0.020	0.159	0.018	0.008	0.005	0.013	0.025	0.048	0.581	0.018
Transport	0.048	0.014	0.244	0.042	0.157	0.020	0.015	0.012	0.033	0.262	0.018	0.135

Table 12: Intermediate Input Shares (γ) - EU

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
Chemical	0.327	0.021	0.089	0.019	0.035	0.037	0.015	0.021	0.161	0.220	0.006	0.049
Construction	0.032	0.356	0.030	0.005	0.057	0.147	0.010	0.029	0.084	0.227	0.002	0.022
Energy	0.025	0.038	0.271	0.003	0.032	0.017	0.322	0.005	0.094	0.130	0.001	0.062
Food	0.046	0.020	0.052	0.434	0.022	0.024	0.003	0.021	0.177	0.150	0.002	0.048
Manufacture	0.055	0.023	0.023	0.003	0.364	0.166	0.002	0.023	0.138	0.159	0.006	0.037
Metal	0.039	0.026	0.063	0.003	0.074	0.418	0.052	0.013	0.128	0.130	0.002	0.051
Mining	0.042	0.049	0.158	0.006	0.094	0.088	0.122	0.013	0.108	0.195	0.002	0.123
Paper	0.059	0.030	0.052	0.067	0.030	0.023	0.005	0.306	0.144	0.217	0.004	0.063
Retail	0.024	0.131	0.054	0.023	0.055	0.018	0.002	0.029	0.126	0.390	0.007	0.140
Services	0.026	0.097	0.042	0.044	0.045	0.010	0.001	0.030	0.067	0.603	0.003	0.031
Textiles	0.085	0.031	0.046	0.036	0.028	0.016	0.002	0.015	0.218	0.146	0.323	0.054
Transport	0.013	0.048	0.103	0.005	0.051	0.010	0.001	0.010	0.079	0.244	0.001	0.434

Table 13: Intermediate Input Shares (γ) - GBR

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
Chemical	0.277	0.012	0.067	0.014	0.029	0.042	0.010	0.031	0.269	0.195	0.004	0.051
Construction	0.024	0.411	0.007	0.003	0.022	0.062	0.013	0.023	0.048	0.375	0.001	0.011
Energy	0.002	0.015	0.307	0.001	0.012	0.009	0.526	0.003	0.035	0.071	0.000	0.018
Food	0.049	0.020	0.054	0.375	0.022	0.028	0.002	0.032	0.191	0.182	0.002	0.044
Manufacture	0.054	0.014	0.030	0.003	0.297	0.187	0.002	0.026	0.197	0.152	0.005	0.032
Metal	0.029	0.014	0.086	0.004	0.066	0.350	0.038	0.017	0.204	0.122	0.001	0.070
Mining	0.011	0.052	0.075	0.003	0.048	0.064	0.306	0.006	0.067	0.288	0.001	0.079
Paper	0.041	0.025	0.049	0.012	0.025	0.015	0.002	0.364	0.164	0.234	0.002	0.066
Retail	0.018	0.167	0.031	0.032	0.043	0.011	0.002	0.018	0.084	0.405	0.004	0.183
Services	0.024	0.055	0.022	0.037	0.047	0.004	0.001	0.025	0.086	0.656	0.002	0.040
Textiles	0.059	0.020	0.047	0.013	0.033	0.017	0.002	0.029	0.295	0.206	0.210	0.069
Transport	0.016	0.048	0.047	0.005	0.039	0.005	0.002	0.012	0.070	0.391	0.001	0.362

Table 14: Intermediate Input Shares (γ) - IND

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
Chemical	0.454	0.009	0.099	0.059	0.037	0.018	0.013	0.021	0.118	0.054	0.018	0.100
Construction	0.020	0.099	0.080	0.032	0.063	0.402	0.025	0.024	0.098	0.057	0.003	0.097
Energy	0.022	0.025	0.210	0.002	0.040	0.006	0.320	0.003	0.173	0.065	0.002	0.133
Food	0.063	0.022	0.052	0.545	0.017	0.004	0.001	0.016	0.120	0.045	0.008	0.107
Manufacture	0.053	0.018	0.029	0.004	0.357	0.217	0.007	0.013	0.077	0.150	0.010	0.065
Metal	0.030	0.026	0.127	0.003	0.039	0.421	0.102	0.009	0.099	0.050	0.003	0.092
Mining	0.123	0.142	0.151	0.008	0.160	0.097	0.008	0.017	0.070	0.136	0.003	0.084
Paper	0.096	0.013	0.066	0.171	0.027	0.015	0.009	0.297	0.108	0.075	0.008	0.114
Retail	0.007	0.045	0.065	0.000	0.067	0.009	0.000	0.066	0.022	0.420	0.010	0.289
Services	0.050	0.081	0.044	0.169	0.110	0.007	0.000	0.021	0.063	0.382	0.005	0.068
Textiles	0.086	0.021	0.060	0.123	0.075	0.011	0.002	0.013	0.091	0.094	0.325	0.100
Transport	0.062	0.047	0.368	0.024	0.156	0.016	0.000	0.016	0.080	0.150	0.007	0.072

Table 15: Intermediate Input Shares (γ) - JPN

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
Chemical	0.500	0.016	0.127	0.017	0.012	0.031	0.007	0.023	0.082	0.146	0.004	0.034
Construction	0.031	0.085	0.039	0.004	0.034	0.234	0.022	0.055	0.107	0.341	0.005	0.044
Energy	0.012	0.072	0.135	0.001	0.008	0.014	0.455	0.007	0.080	0.143	0.001	0.071
Food	0.060	0.007	0.045	0.544	0.009	0.027	0.000	0.035	0.127	0.101	0.004	0.040
Manufacture	0.071	0.009	0.026	0.003	0.490	0.147	0.001	0.015	0.084	0.123	0.004	0.027
Metal	0.025	0.018	0.057	0.002	0.029	0.539	0.074	0.010	0.087	0.104	0.002	0.052
Mining	0.022	0.017	0.147	0.003	0.013	0.029	0.395	0.003	0.130	0.142	0.006	0.092
Paper	0.106	0.018	0.065	0.069	0.015	0.035	0.005	0.346	0.132	0.143	0.009	0.055
Retail	0.027	0.088	0.076	0.004	0.117	0.028	0.000	0.031	0.082	0.476	0.008	0.062
Services	0.061	0.048	0.072	0.059	0.033	0.009	0.000	0.043	0.090	0.538	0.007	0.039
Textiles	0.147	0.013	0.050	0.028	0.025	0.009	0.000	0.021	0.124	0.168	0.384	0.031
Transport	0.014	0.077	0.148	0.003	0.046	0.009	0.000	0.025	0.070	0.316	0.005	0.286

Table 16: Intermediate Input Shares (γ) - MEX

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
Chemical	0.318	0.012	0.050	0.013	0.016	0.018	0.281	0.029	0.103	0.114	0.006	0.040
Construction	0.068	0.129	0.044	0.005	0.053	0.297	0.026	0.024	0.141	0.165	0.001	0.048
Energy	0.133	0.004	0.151	0.002	0.011	0.011	0.500	0.003	0.073	0.090	0.001	0.022
Food	0.073	0.011	0.055	0.516	0.010	0.016	0.002	0.021	0.149	0.095	0.003	0.050
Manufacture	0.095	0.010	0.018	0.002	0.479	0.133	0.002	0.030	0.100	0.076	0.022	0.032
Metal	0.045	0.011	0.104	0.004	0.042	0.390	0.111	0.018	0.147	0.086	0.005	0.038
Mining	0.225	0.006	0.097	0.004	0.020	0.068	0.078	0.006	0.148	0.294	0.001	0.052
Paper	0.096	0.021	0.060	0.084	0.022	0.025	0.001	0.326	0.141	0.140	0.023	0.061
Retail	0.043	0.107	0.054	0.032	0.133	0.043	0.001	0.057	0.111	0.366	0.016	0.036
Services	0.071	0.075	0.071	0.010	0.051	0.021	0.000	0.051	0.080	0.525	0.006	0.039
Textiles	0.070	0.017	0.039	0.110	0.048	0.013	0.001	0.025	0.115	0.102	0.420	0.039
Transport	0.037	0.023	0.290	0.004	0.066	0.015	0.002	0.017	0.153	0.305	0.005	0.083

Table 17: Intermediate Input Shares (γ) - RoW

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
Chemical	0.378	0.005	0.120	0.027	0.024	0.026	0.159	0.019	0.094	0.082	0.009	0.058
Construction	0.032	0.098	0.046	0.011	0.065	0.242	0.136	0.035	0.105	0.137	0.002	0.091
Energy	0.017	0.010	0.203	0.002	0.033	0.010	0.510	0.003	0.096	0.053	0.001	0.061
Food	0.044	0.010	0.039	0.553	0.013	0.011	0.019	0.019	0.141	0.084	0.002	0.065
Manufacture	0.071	0.008	0.025	0.005	0.466	0.160	0.015	0.022	0.090	0.088	0.007	0.042
Metal	0.026	0.007	0.070	0.002	0.036	0.393	0.266	0.011	0.079	0.055	0.002	0.053
Mining	0.021	0.021	0.105	0.003	0.041	0.038	0.527	0.006	0.050	0.111	0.001	0.074
Paper	0.067	0.011	0.053	0.092	0.027	0.018	0.044	0.413	0.108	0.093	0.006	0.070
Retail	0.019	0.097	0.068	0.038	0.056	0.011	0.012	0.039	0.100	0.374	0.006	0.180
Services	0.036	0.080	0.064	0.078	0.072	0.012	0.027	0.050	0.095	0.412	0.006	0.070
Textiles	0.092	0.011	0.042	0.117	0.022	0.010	0.025	0.018	0.121	0.091	0.388	0.064
Transport	0.027	0.042	0.187	0.014	0.104	0.017	0.046	0.016	0.109	0.242	0.004	0.190

Table 18: Intermediate Input Shares (γ) - USA

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
Chemical	0.465	0.012	0.088	0.017	0.029	0.028	0.023	0.023	0.071	0.210	0.006	0.028
Construction	0.027	0.145	0.047	0.001	0.060	0.102	0.010	0.036	0.080	0.476	0.001	0.015
Energy	0.009	0.022	0.065	0.000	0.004	0.005	0.715	0.002	0.048	0.058	0.000	0.070
Food	0.057	0.020	0.050	0.520	0.015	0.027	0.004	0.037	0.086	0.143	0.001	0.040
Manufacture	0.064	0.013	0.016	0.001	0.347	0.202	0.004	0.027	0.084	0.210	0.009	0.023
Metal	0.039	0.023	0.049	0.001	0.055	0.442	0.045	0.020	0.064	0.210	0.001	0.052
Mining	0.056	0.079	0.057	0.001	0.053	0.091	0.197	0.015	0.039	0.348	0.000	0.063
Paper	0.068	0.035	0.047	0.046	0.034	0.032	0.005	0.253	0.077	0.336	0.013	0.055
Retail	0.024	0.122	0.030	0.002	0.076	0.015	0.001	0.027	0.090	0.518	0.006	0.088
Services	0.024	0.106	0.037	0.025	0.043	0.011	0.005	0.028	0.043	0.648	0.002	0.029
Textiles	0.277	0.013	0.044	0.045	0.024	0.018	0.002	0.021	0.089	0.131	0.303	0.033
Transport	0.013	0.049	0.226	0.000	0.050	0.024	0.012	0.010	0.047	0.379	0.000	0.190

Table 19: Technology Parameters

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.431	0.111	0.372	0.526	0.411	0.477	0.446	0.472	0.277	0.282	0.454	0.267
CAN	0.461	0.300	0.432	0.468	0.481	0.480	0.540	0.530	0.435	0.412	0.392	0.407
CHN	0.623	0.447	0.460	0.462	0.721	0.621	0.361	0.526	0.577	0.413	0.780	0.563
EU	0.697	0.427	0.641	0.539	0.711	0.667	0.390	0.646	0.626	0.606	0.623	0.668
GBR	0.511	0.250	0.452	0.372	0.512	0.491	0.354	0.450	0.427	0.512	0.426	0.478
IND	0.451	1.407	0.397	0.436	0.479	0.452	0.304	0.348	0.297	0.422	0.508	0.422
JPN	0.548	0.106	0.454	0.321	0.624	0.583	0.289	0.419	0.371	0.398	0.459	0.524
MEX	0.405	0.105	0.337	0.340	0.451	0.429	0.332	0.308	0.422	0.230	0.374	0.291
RoW	0.714	0.415	0.751	0.688	0.723	0.720	0.751	0.633	0.662	0.536	0.652	0.670
USA	0.662	0.138	0.597	0.574	0.707	0.605	0.437	0.632	0.377	0.594	0.561	0.675

Table 20: Tariff Rates - BRA

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAN	0.001	0.016	0.000	0.057	0.003	0.000	0.000	0.001	0.000	0.000	0.068	0.000
CHN	0.069	0.031	0.002	0.074	0.055	0.021	0.000	0.000	0.000	0.000	0.134	0.000
EU	0.038	0.004	0.003	0.082	0.033	0.009	0.000	0.006	0.000	0.000	0.048	0.000
GBR	0.007	0.000	0.007	0.180	0.004	0.002	0.000	0.013	0.000	0.000	0.075	0.000
IND	0.088	0.104	0.007	0.448	0.114	0.025	0.025	0.070	0.000	0.000	0.059	0.000
JPN	0.017	0.001	0.000	0.068	0.014	0.001	0.000	0.001	0.000	0.000	0.134	0.000
MEX	0.040	0.021	0.015	0.178	0.152	0.042	0.000	0.016	0.000	0.000	0.092	0.000
RoW	0.038	0.045	0.030	0.585	0.043	0.033	0.000	0.004	0.000	0.000	0.002	0.000
USA	0.038	0.103	0.037	0.052	0.033	0.058	0.082	0.063	0.000	0.000	0.058	0.000

Table 21: Tariff Rates - CAN

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.014	0.047	0.055	0.081	0.067	0.077	0.020	0.114	0.000	0.000	0.254	0.000
CAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CHN	0.038	0.029	0.019	0.079	0.003	0.026	0.000	0.001	0.000	0.000	0.081	0.000
EU	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GBR	0.000	0.000	0.000	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IND	0.080	0.094	0.014	0.010	0.093	0.014	0.025	0.068	0.000	0.000	0.175	0.000
JPN	0.001	0.000	0.000	0.191	0.001	0.000	0.000	0.002	0.000	0.000	0.008	0.000
MEX	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RoW	0.011	0.002	0.004	0.110	0.009	0.007	0.000	0.001	0.000	0.000	0.030	0.000
USA	0.017	0.067	0.040	0.010	0.007	0.010	0.046	0.037	0.000	0.000	0.015	0.000

Table 22: Tariff Rates - CHN

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.072	0.068	0.113	0.096	0.133	0.123	0.020	0.128	0.000	0.000	0.262	0.000
CAN	0.027	0.036	0.002	0.038	0.026	0.012	0.000	0.009	0.000	0.000	0.148	0.000
CHN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EU	0.045	0.008	0.011	0.110	0.024	0.029	0.000	0.008	0.000	0.000	0.104	0.000
GBR	0.042	0.000	0.004	0.098	0.022	0.017	0.000	0.011	0.000	0.000	0.105	0.000
IND	0.074	0.088	0.052	0.260	0.106	0.080	0.015	0.080	0.000	0.000	0.123	0.000
JPN	0.014	0.001	0.000	0.101	0.007	0.007	0.000	0.016	0.000	0.000	0.063	0.000
MEX	0.052	0.044	0.018	0.153	0.053	0.038	0.000	0.032	0.000	0.000	0.173	0.000
RoW	0.030	0.035	0.016	0.261	0.025	0.029	0.002	0.021	0.000	0.000	0.069	0.000
USA	0.077	0.140	0.038	0.088	0.050	0.088	0.512	0.128	0.000	0.000	0.071	0.000

Table 23: Tariff Rates - EU

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.069	0.066	0.108	0.133	0.143	0.126	0.020	0.121	0.000	0.000	0.230	0.000
CAN	0.000	0.000	0.000	0.120	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CHN	0.036	0.065	0.045	0.113	0.061	0.046	0.000	0.012	0.000	0.000	0.066	0.000
EU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GBR	0.001	0.000	0.000	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IND	0.093	0.187	0.074	0.630	0.112	0.050	0.041	0.071	0.000	0.000	0.114	0.000
JPN	0.000	0.001	0.000	0.078	0.008	0.000	0.000	0.004	0.000	0.000	0.000	0.000
MEX	0.000	0.000	0.000	0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RoW	0.021	0.041	0.013	0.103	0.026	0.022	0.000	0.023	0.000	0.000	0.032	0.000
USA	0.009	0.087	0.025	0.053	0.019	0.044	0.111	0.075	0.000	0.000	0.037	0.000

Table 24: Tariff Rates - GBR

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.084	0.081	0.114	0.165	0.165	0.117	0.020	0.123	0.000	0.000	0.166	0.000
CAN	0.010	0.016	0.000	0.145	0.020	0.005	0.000	0.001	0.000	0.000	0.089	0.000
CHN	0.033	0.099	0.027	0.103	0.087	0.030	0.000	0.050	0.000	0.000	0.066	0.000
EU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GBR	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IND	0.139	0.079	0.086	1.411	0.175	0.024	0.047	0.038	0.000	0.000	0.117	0.000
JPN	0.005	0.003	0.000	0.053	0.008	0.010	0.000	0.004	0.000	0.000	0.071	0.000
MEX	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RoW	0.037	0.030	0.040	0.077	0.047	0.042	0.000	0.027	0.000	0.000	0.083	0.000
USA	0.012	0.051	0.021	0.047	0.014	0.040	0.113	0.051	0.000	0.000	0.033	0.000

Table 25: Tariff Rates - IND

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.076	0.068	0.115	0.102	0.143	0.112	0.020	0.141	0.000	0.000	0.238	0.000
CAN	0.004	0.037	0.000	0.025	0.030	0.007	0.000	0.013	0.000	0.000	0.133	0.000
CHN	0.056	0.016	0.048	0.075	0.026	0.027	0.000	0.034	0.000	0.000	0.050	0.000
EU	0.005	0.000	0.000	0.053	0.005	0.008	0.000	0.001	0.000	0.000	0.082	0.000
GBR	0.000	0.000	0.000	0.030	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000
IND	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
JPN	0.001	0.001	0.000	0.021	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MEX	0.027	0.018	0.023	0.158	0.123	0.022	0.000	0.053	0.000	0.000	0.212	0.000
RoW	0.034	0.029	0.028	0.151	0.047	0.021	0.001	0.023	0.000	0.000	0.064	0.000
USA	0.031	0.134	0.051	0.061	0.036	0.077	0.045	0.101	0.000	0.000	0.058	0.000

Table 26: Tariff Rates - JPN

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.061	0.075	0.112	0.118	0.126	0.118	0.020	0.126	0.000	0.000	0.181	0.000
CAN	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CHN	0.044	0.095	0.030	0.113	0.035	0.032	0.000	0.035	0.000	0.000	0.066	0.000
EU	0.001	0.000	0.001	0.005	0.017	0.001	0.000	0.000	0.000	0.000	0.000	0.000
GBR	0.002	0.000	0.000	0.016	0.020	0.002	0.000	0.000	0.000	0.000	0.000	0.000
IND	0.006	0.039	0.018	0.604	0.037	0.003	0.000	0.026	0.000	0.000	0.000	0.000
JPN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MEX	0.000	0.000	0.000	0.014	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RoW	0.029	0.035	0.021	0.142	0.027	0.028	0.005	0.002	0.000	0.000	0.052	0.000
USA	0.022	0.055	0.026	0.070	0.025	0.058	0.169	0.081	0.000	0.000	0.034	0.000

Table 27: Tariff Rates - MEX

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.056	0.034	0.043	0.046	0.021	0.040	0.016	0.107	0.000	0.000	0.119	0.000
CAN	0.000	0.000	0.000	0.024	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CHN	0.073	0.054	0.020	0.068	0.030	0.022	0.000	0.030	0.000	0.000	0.111	0.000
EU	0.000	0.000	0.000	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GBR	0.000	0.000	0.000	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
IND	0.089	0.096	0.007	0.990	0.078	0.026	0.028	0.069	0.000	0.000	0.092	0.000
JPN	0.000	0.007	0.000	0.182	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MEX	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RoW	0.059	0.025	0.035	0.114	0.036	0.012	0.000	0.023	0.000	0.000	0.034	0.000
USA	0.015	0.060	0.008	0.020	0.005	0.016	0.012	0.015	0.000	0.000	0.007	0.000

Table 28: Tariff Rates - RoW

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.029	0.040	0.043	0.103	0.088	0.110	0.020	0.098	0.000	0.000	0.213	0.000
CAN	0.006	0.009	0.001	0.056	0.010	0.001	0.000	0.004	0.000	0.000	0.117	0.000
CHN	0.031	0.005	0.007	0.076	0.005	0.013	0.000	0.012	0.000	0.000	0.091	0.000
EU	0.006	0.000	0.001	0.040	0.005	0.007	0.000	0.002	0.000	0.000	0.008	0.000
GBR	0.007	0.000	0.001	0.071	0.002	0.002	0.000	0.000	0.000	0.000	0.001	0.000
IND	0.044	0.202	0.005	0.142	0.055	0.018	0.011	0.032	0.000	0.000	0.076	0.000
JPN	0.013	0.011	0.000	0.148	0.002	0.003	0.000	0.016	0.000	0.000	0.024	0.000
MEX	0.040	0.058	0.012	0.078	0.033	0.073	0.000	0.028	0.000	0.000	0.185	0.000
RoW	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
USA	0.059	0.201	0.017	0.074	0.023	0.064	0.342	0.094	0.000	0.000	0.056	0.000

Table 29: Tariff Rates - USA

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.084	0.035	0.039	0.099	0.102	0.119	0.020	0.112	0.000	0.000	0.169	0.000
CAN	0.017	0.020	0.002	0.135	0.032	0.006	0.000	0.002	0.000	0.000	0.062	0.000
CHN	0.046	0.051	0.026	0.083	0.053	0.040	0.000	0.010	0.000	0.000	0.120	0.000
EU	0.014	0.006	0.008	0.052	0.022	0.028	0.000	0.001	0.000	0.000	0.070	0.000
GBR	0.014	0.000	0.001	0.082	0.006	0.019	0.000	0.000	0.000	0.000	0.070	0.000
IND	0.085	0.077	0.032	0.221	0.099	0.031	0.038	0.052	0.000	0.000	0.076	0.000
JPN	0.008	0.003	0.000	0.198	0.006	0.016	0.000	0.001	0.000	0.000	0.046	0.000
MEX	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RoW	0.021	0.024	0.009	0.186	0.018	0.014	0.000	0.008	0.000	0.000	0.021	0.000
USA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 30: Bilateral Trade Costs (d_{ni}): with Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	1.000	1.658	2.327	2.014	1.645	1.988	1.844	1.700	1.922	1.951
CAN	1.839	1.000	2.327	1.952	1.524	1.899	1.682	1.681	2.118	1.861
CHN	2.269	2.000	1.000	2.210	1.987	2.106	2.247	1.767	1.801	1.582
EU	1.921	1.851	2.935	1.000	1.517	2.121	2.085	1.946	1.713	2.009
GBR	1.683	1.486	2.074	1.787	1.000	1.779	1.679	1.656	1.866	1.796
IND	1.659	1.795	1.582	2.229	1.883	1.000	2.012	1.539	1.691	1.931
JPN	1.769	1.645	2.103	1.985	1.664	2.000	1.000	1.749	2.033	1.933
MEX	1.744	1.586	1.926	1.843	1.604	1.689	1.738	1.000	1.910	1.835
RoW	2.000	1.941	2.535	1.546	1.665	1.822	1.675	2.124	1.000	1.754
USA	1.970	1.597	2.487	2.053	1.748	1.780	1.946	1.529	1.715	1.000

Table 31: Bilateral Trade Costs (d_{ni}): without Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	1.000	2.564	2.811	4.966	2.870	5.358	2.842	2.879	2.054	3.982
CAN	1.826	1.000	4.121	2.211	2.073	3.870	3.290	2.597	1.857	2.087
CHN	2.738	2.806	1.000	9.194	3.502	10.757	2.290	2.576	8.986	6.188
EU	3.306	3.797	4.563	1.000	1.797	4.256	2.777	2.178	3.150	4.085
GBR	1.535	1.921	4.102	2.311	1.000	1.819	2.057	2.108	1.688	2.430
IND	8.215	3.401	372.165	4.421	2.890	1.000	3.035	4.877	10.040	2.074
JPN	1.823	3.246	3.144	2.361	2.207	3.670	1.000	3.047	1.441	1.108
MEX	1.978	1.911	2.803	1.995	2.079	3.451	3.100	1.000	2.569	2.377
RoW	1.739	2.290	5.618	2.425	1.986	2.721	2.752	3.842	1.000	1.328
USA	2.788	2.021	2.994	2.517	2.416	3.264	2.799	2.290	1.842	1.000

Table 32: Exporter Fixed Effects ($d_{jk}^{exporter}$): with Labor Mobility

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.931	0.812	0.907	0.947	0.961	0.924	0.933	1.012	0.897	1.018	0.979	0.857
CAN	1.178	0.811	1.002	0.952	1.202	1.132	1.052	0.905	0.909	1.062	0.951	0.906
CHN	0.913	0.949	0.911	0.788	0.719	0.926	0.759	0.906	1.047	0.582	0.945	0.936
EU	0.849	0.966	0.983	0.981	0.890	0.932	1.187	0.983	1.038	1.111	0.903	1.032
GBR	1.142	0.797	0.954	0.859	1.128	1.003	1.034	0.884	0.900	1.002	1.089	0.896
IND	0.949	1.224	0.927	0.804	1.152	0.923	0.919	0.847	0.686	0.616	0.875	0.858
JPN	0.906	0.757	0.911	0.881	0.913	0.920	1.184	0.865	0.895	1.110	0.793	0.905
MEX	1.052	0.763	0.916	0.922	1.150	1.006	0.812	0.937	0.933	1.151	0.952	0.863
RoW	0.985	0.994	1.074	0.990	1.024	1.028	0.775	0.964	1.008	0.851	0.976	1.052
USA	0.847	0.807	0.920	0.971	0.794	0.876	1.161	1.022	0.897	1.242	0.938	1.022

Table 33: Exporter Fixed Effects ($d_{jk}^{exporter}$): without Labor Mobility

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	1.143	0.796	1.166	1.105	1.009	0.968	0.969	1.101	0.828	186.208	1.184	1.058
CAN	1.308	0.836	1.146	1.423	1.215	1.178	1.121	1.272	0.657	0.992	1.260	1.033
CHN	0.885	1.584	1.270	0.327	0.788	1.074	1.674	1.618	1.502	0.251	1.002	1.646
EU	0.946	0.989	0.925	0.384	1.158	0.990	1.235	1.106	1.418	26.437	1.205	1.313
GBR	1.328	1.137	0.930	1.093	1.409	1.175	1.172	1.012	0.849	0.564	1.588	1.275
IND	1.462	1.889	0.898	325.116	2.164	1.423	1.354	1.132	1.710	0.201	1.114	1.050
JPN	0.989	1.075	1.322	0.948	0.851	1.041	1.521	1.233	1.173	0.452	0.952	1.609
MEX	1.316	0.713	1.091	1.010	1.234	1.235	0.972	1.278	0.902	0.433	1.323	1.120
RoW	1.147	1.027	1.260	1.626	1.061	0.928	0.576	1.133	13.629	0.311	1.264	1.675
USA	0.914	1.008	1.038	0.776	1.058	0.968	1.122	1.041	1.572	43.124	0.876	1.359

Table 34: Importer Fixed Effects ($d_{ik}^{importer}$): with Labor Mobility

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	0.943	0.849	0.933	0.944	0.924	0.921	0.938	0.917	0.910	0.933	0.923	0.938
CAN	0.970	0.918	0.940	0.911	0.978	0.957	0.997	0.926	0.955	0.938	0.890	0.918
CHN	0.954	0.905	0.951	0.855	1.004	0.960	0.928	0.914	0.834	1.042	0.951	0.904
EU	1.028	0.918	0.977	0.963	1.046	1.001	0.940	0.972	0.930	0.941	0.984	0.966
GBR	0.967	0.884	0.966	0.918	0.980	0.960	0.980	0.939	0.942	0.914	0.923	0.935
IND	0.935	0.809	0.921	0.843	0.905	1.007	0.930	0.909	0.960	1.002	0.932	0.918
JPN	0.950	0.844	0.945	0.873	0.966	0.945	0.972	0.918	0.871	0.859	0.927	0.905
MEX	0.955	0.868	0.947	0.925	0.983	0.944	0.997	0.929	0.916	0.937	0.928	0.930
RoW	0.986	0.909	0.967	0.878	0.996	0.983	1.156	0.939	0.914	1.009	0.946	0.933
USA	1.010	0.883	0.945	0.966	1.030	0.970	0.873	0.947	0.929	0.910	0.970	0.952

Table 35: Importer Fixed Effects ($d_{ik}^{importer}$): without Labor Mobility

	Chemical	Construction	Energy	Food	Manufacture	Metal	Mining	Paper	Retail	Services	Textiles	Transport
BRA	1.117	0.913	1.172	1.766	1.185	1.085	1.244	1.224	1.966	1.675	1.166	1.469
CAN	1.018	0.750	0.933	1.535	1.068	0.992	1.261	1.131	1.525	1.304	0.957	1.136
CHN	1.205	0.847	0.979	1.694	1.088	1.086	0.912	1.049	1.498	2.157	1.479	1.241
EU	1.305	1.365	1.215	1.771	1.249	1.247	0.892	1.270	1.527	1.709	1.146	1.326
GBR	1.107	1.043	1.141	1.406	1.069	1.070	1.173	1.170	1.569	1.464	0.938	1.227
IND	0.973	1.176	1.318	1.446	0.859	0.911	0.914	1.234	0.794	2.086	1.384	1.643
JPN	1.115	0.958	0.919	1.672	1.239	1.058	1.033	1.062	1.480	2.084	1.149	1.100
MEX	1.008	0.857	1.010	1.626	1.091	0.988	1.333	1.052	1.222	1.435	1.063	1.141
RoW	1.165	1.416	1.163	1.446	1.250	1.230	1.469	1.268	1.559	2.060	1.186	1.391
USA	1.315	1.572	1.168	1.303	1.504	1.281	1.228	1.416	1.582	2.405	1.249	1.341

Table 36: Iceberg Trade Costs (d_{nik}) - Chemical: with Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	0.878	1.497	2.067	1.927	1.481	1.730	1.630	1.511	1.764	1.834
CAN	2.043	1.143	2.616	2.363	1.736	2.092	1.882	1.890	2.460	2.215
CHN	1.953	1.772	0.872	2.075	1.756	1.798	1.950	1.541	1.622	1.459
EU	1.538	1.525	2.378	0.873	1.246	1.684	1.682	1.577	1.434	1.723
GBR	1.811	1.646	2.260	2.097	1.104	1.899	1.821	1.805	2.100	2.071
IND	1.484	1.652	1.433	2.174	1.729	0.887	1.814	1.394	1.582	1.851
JPN	1.512	1.446	1.819	1.850	1.459	1.695	0.861	1.513	1.817	1.770
MEX	1.730	1.619	1.935	1.994	1.633	1.661	1.737	1.004	1.981	1.950
RoW	1.858	1.856	2.384	1.566	1.587	1.678	1.569	1.998	0.971	1.746
USA	1.573	1.312	2.010	1.786	1.432	1.409	1.566	1.236	1.431	0.855

Table 37: Iceberg Trade Costs (d_{nik}) - Chemical: without Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	1.277	2.981	3.871	7.405	3.631	5.959	3.624	3.315	2.735	5.985
CAN	2.669	1.331	6.496	3.774	3.002	4.927	4.801	3.424	2.831	3.589
CHN	2.708	2.527	1.067	10.617	3.431	9.265	2.261	2.297	9.267	7.202
EU	3.496	3.657	5.204	1.235	1.883	3.920	2.931	2.077	3.474	5.084
GBR	2.278	2.596	6.564	4.003	1.470	2.350	3.047	2.821	2.611	4.242
IND	13.416	5.058	655.444	8.430	4.676	1.422	4.949	7.183	17.098	3.986
JPN	2.013	3.265	3.745	3.045	2.415	3.530	1.103	3.035	1.660	1.440
MEX	2.909	2.560	4.446	3.426	3.029	4.421	4.551	1.326	3.941	4.114
RoW	2.229	2.673	7.765	3.628	2.522	3.037	3.521	4.441	1.337	2.003
USA	2.848	1.880	3.298	3.003	2.446	2.904	2.855	2.110	1.963	1.202

Table 38: Iceberg Trade Costs (d_{nik}) - Construction: with Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	0.690	1.236	1.710	1.501	1.181	1.307	1.264	1.199	1.419	1.399
CAN	1.267	0.744	1.708	1.453	1.092	1.246	1.151	1.183	1.562	1.333
CHN	1.829	1.742	0.859	1.926	1.667	1.617	1.801	1.456	1.554	1.325
EU	1.577	1.642	2.567	0.887	1.296	1.659	1.702	1.633	1.505	1.714
GBR	1.139	1.087	1.496	1.307	0.704	1.147	1.130	1.146	1.352	1.264
IND	1.725	2.017	1.753	2.506	2.039	0.991	2.080	1.636	1.882	2.088
JPN	1.137	1.143	1.441	1.380	1.113	1.225	0.639	1.149	1.399	1.292
MEX	1.130	1.110	1.330	1.291	1.082	1.043	1.119	0.662	1.324	1.236
RoW	1.688	1.770	2.280	1.410	1.462	1.465	1.406	1.832	0.903	1.539
USA	1.350	1.182	1.816	1.520	1.246	1.162	1.325	1.071	1.257	0.712

Table 39: Iceberg Trade Costs (d_{nik}) - Construction: without Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	0.726	1.530	1.896	5.396	2.383	5.015	2.166	1.963	2.315	4.984
CAN	1.392	0.627	2.918	2.522	1.807	3.804	2.632	1.860	2.197	2.742
CHN	3.959	3.332	1.342	19.881	5.788	20.042	3.474	3.496	20.154	15.413
EU	2.986	2.817	3.826	1.351	1.855	4.953	2.631	1.847	4.413	6.356
GBR	1.593	1.638	3.952	3.585	1.186	2.432	2.239	2.054	2.716	4.343
IND	14.166	4.817	595.774	11.400	5.696	2.222	5.490	7.895	26.853	6.161
JPN	1.788	2.616	2.864	3.464	2.475	4.639	1.029	2.807	2.193	1.872
MEX	1.287	1.021	1.693	1.941	1.545	2.893	2.115	0.611	2.592	2.664
RoW	1.631	1.764	4.892	3.401	2.129	3.288	2.708	3.383	1.455	2.146
USA	2.565	1.527	2.557	3.464	2.542	3.870	2.702	1.978	2.629	1.585

Table 40: Iceberg Trade Costs (d_{nik}) - Energy: with Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	0.846	1.413	2.005	1.784	1.442	1.661	1.579	1.460	1.685	1.671
CAN	1.719	0.942	2.215	1.910	1.475	1.753	1.591	1.594	2.051	1.761
CHN	1.928	1.713	0.866	1.967	1.749	1.768	1.934	1.524	1.587	1.361
EU	1.761	1.709	2.741	0.960	1.440	1.920	1.935	1.810	1.628	1.865
GBR	1.497	1.332	1.880	1.665	0.921	1.563	1.512	1.495	1.720	1.618
IND	1.435	1.565	1.394	2.019	1.687	0.855	1.762	1.351	1.516	1.692
JPN	1.504	1.409	1.821	1.767	1.465	1.679	0.861	1.509	1.791	1.664
MEX	1.492	1.367	1.678	1.651	1.421	1.426	1.505	0.868	1.692	1.589
RoW	2.005	1.960	2.588	1.622	1.728	1.803	1.700	2.161	1.038	1.780
USA	1.692	1.381	2.176	1.845	1.554	1.510	1.692	1.332	1.525	0.869

Table 41: Iceberg Trade Costs (d_{nik}) - Energy: without Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	1.367	2.788	3.209	7.033	3.819	8.229	3.045	3.391	2.786	5.421
CAN	2.452	1.069	4.625	3.078	2.712	5.843	3.465	3.008	2.475	2.792
CHN	4.076	3.324	1.244	14.182	5.075	17.997	2.673	3.305	13.274	9.176
EU	3.583	3.275	4.131	1.123	1.896	5.184	2.359	2.035	3.388	4.410
GBR	1.674	1.667	3.735	2.610	1.061	2.228	1.758	1.981	1.825	2.638
IND	8.650	2.850	327.373	4.824	2.963	1.183	2.506	4.427	10.491	2.176
JPN	2.825	4.004	4.071	3.792	3.331	6.392	1.215	4.071	2.216	1.710
MEX	2.530	1.946	2.995	2.644	2.588	4.961	3.108	1.102	3.261	3.029
RoW	2.569	2.692	6.933	3.711	2.857	4.517	3.187	4.892	1.466	1.954
USA	3.391	1.956	3.042	3.173	2.862	4.462	2.670	2.401	2.223	1.212

Table 42: Iceberg Trade Costs (d_{nik}) - Food: with Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	0.893	1.431	1.883	1.836	1.430	1.587	1.523	1.488	1.598	1.784
CAN	1.652	0.867	1.893	1.789	1.332	1.525	1.397	1.479	1.771	1.711
CHN	1.686	1.435	0.673	1.676	1.437	1.399	1.545	1.287	1.246	1.203
EU	1.777	1.654	2.460	0.944	1.366	1.754	1.785	1.764	1.476	1.903
GBR	1.364	1.164	1.523	1.479	0.789	1.289	1.259	1.316	1.408	1.491
IND	1.259	1.316	1.087	1.726	1.391	0.678	1.412	1.145	1.194	1.500
JPN	1.471	1.321	1.583	1.684	1.346	1.486	0.769	1.425	1.573	1.645
MEX	1.517	1.333	1.518	1.636	1.358	1.313	1.398	0.852	1.546	1.634
RoW	1.868	1.751	2.144	1.473	1.513	1.521	1.447	1.944	0.869	1.677
USA	1.806	1.414	2.064	1.920	1.559	1.459	1.650	1.373	1.463	0.938

Table 43: Iceberg Trade Costs (d_{nik}) - Food: without Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	1.951	4.346	5.261	9.714	4.459	8.559	5.251	5.172	3.281	5.731
CAN	4.587	2.184	9.935	5.571	4.149	7.964	7.830	6.012	3.821	3.868
CHN	1.579	1.406	0.553	5.316	1.608	5.080	1.251	1.368	4.243	2.632
EU	2.240	2.236	2.967	0.680	0.970	2.362	1.782	1.360	1.748	2.043
GBR	2.964	3.224	7.599	4.473	1.538	2.876	3.762	3.749	2.668	3.461
IND	4715.767	1696.646	204984.104	2544.679	1321.161	470.152	1650.304	2578.875	4719.838	878.481
JPN	3.052	4.724	5.051	3.965	2.943	5.033	1.586	4.700	1.976	1.369
MEX	3.528	2.962	4.796	3.567	2.952	5.040	5.235	1.642	3.752	3.128
RoW	4.993	5.714	15.475	6.980	4.541	6.397	7.483	10.160	2.351	2.813
USA	3.822	2.408	3.938	3.461	2.638	3.665	3.635	2.892	2.068	1.011

Table 44: Iceberg Trade Costs (d_{nik}) - Manufacture: with Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	0.887	1.558	2.243	2.023	1.549	1.728	1.711	1.605	1.839	1.931
CAN	2.043	1.176	2.808	2.454	1.796	2.067	1.954	1.986	2.537	2.306
CHN	1.507	1.406	0.722	1.662	1.400	1.370	1.561	1.248	1.290	1.172
EU	1.580	1.611	2.622	0.931	1.324	1.709	1.794	1.702	1.519	1.842
GBR	1.753	1.639	2.348	2.108	1.105	1.816	1.830	1.835	2.096	2.087
IND	1.766	2.022	1.829	2.685	2.126	1.043	2.239	1.742	1.940	2.292
JPN	1.492	1.468	1.926	1.895	1.488	1.652	0.882	1.568	1.848	1.818
MEX	1.853	1.784	2.223	2.217	1.808	1.758	1.931	1.130	2.187	2.174
RoW	1.893	1.944	2.606	1.655	1.671	1.689	1.658	2.138	1.020	1.851
USA	1.445	1.240	1.982	1.704	1.360	1.279	1.493	1.193	1.356	0.818

Table 45: Iceberg Trade Costs (d_{nik}) - Manufacture: without Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	1.196	2.763	3.087	6.259	3.096	4.646	3.553	3.171	2.591	6.046
CAN	2.629	1.297	5.448	3.354	2.692	4.040	4.950	3.443	2.819	3.813
CHN	2.556	2.360	0.857	9.043	2.949	7.281	2.234	2.214	8.845	7.332
EU	4.537	4.696	5.750	1.446	2.224	4.235	3.983	2.753	4.559	7.116
GBR	2.564	2.891	6.290	4.065	1.506	2.202	3.590	3.242	2.971	5.149
IND	21.074	7.860	876.535	11.948	6.686	1.860	8.137	11.520	27.152	6.752
JPN	1.838	2.950	2.911	2.509	2.008	2.683	1.054	2.830	1.532	1.418
MEX	2.894	2.519	3.765	3.074	2.742	3.660	4.738	1.347	3.962	4.413
RoW	2.188	2.595	6.488	3.213	2.253	2.481	3.617	4.450	1.326	2.120
USA	3.498	2.284	3.448	3.327	2.734	2.969	3.670	2.646	2.436	1.592

Table 46: Iceberg Trade Costs (d_{nik}) - Metal: with Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	0.851	1.466	2.065	1.862	1.459	1.850	1.610	1.482	1.747	1.749
CAN	1.919	1.083	2.530	2.210	1.656	2.165	1.799	1.796	2.358	2.044
CHN	1.935	1.771	0.889	2.048	1.766	1.964	1.967	1.544	1.641	1.421
EU	1.650	1.651	2.628	0.933	1.358	1.992	1.838	1.712	1.571	1.817
GBR	1.555	1.425	1.998	1.793	0.963	1.797	1.591	1.567	1.840	1.747
IND	1.411	1.585	1.403	2.059	1.669	0.930	1.755	1.341	1.535	1.729
JPN	1.499	1.447	1.857	1.826	1.469	1.852	0.869	1.517	1.839	1.724
MEX	1.617	1.527	1.862	1.856	1.550	1.712	1.653	0.950	1.890	1.791
RoW	1.895	1.909	2.503	1.590	1.643	1.886	1.628	2.061	1.011	1.749
USA	1.591	1.338	2.093	1.799	1.470	1.571	1.612	1.264	1.478	0.850

Table 47: Iceberg Trade Costs (d_{nik}) - Metal: without Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	1.050	2.461	2.955	5.996	2.972	4.723	2.911	2.752	2.445	4.937
CAN	2.332	1.168	5.273	3.248	2.612	4.152	4.100	3.021	2.690	3.148
CHN	3.190	2.990	1.167	12.321	4.025	10.526	2.604	2.733	11.875	8.516
EU	3.548	3.727	4.905	1.234	1.902	3.836	2.907	2.129	3.834	5.178
GBR	1.957	2.240	5.237	3.387	1.257	1.947	2.558	2.447	2.439	3.657
IND	12.679	4.800	575.272	7.846	4.399	1.296	4.570	6.854	17.572	3.780
JPN	2.058	3.352	3.556	3.066	2.458	3.479	1.102	3.133	1.845	1.477
MEX	2.650	2.342	3.761	3.073	2.746	3.882	4.051	1.220	3.903	3.760
RoW	1.750	2.107	5.660	2.805	1.971	2.298	2.701	3.519	1.141	1.578
USA	2.926	1.940	3.147	3.038	2.501	2.877	2.867	2.189	2.193	1.239

Table 48: Iceberg Trade Costs (d_{nik}) - Mining: with Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	0.875	1.543	2.015	1.766	1.505	1.725	1.673	1.582	2.074	1.589
CAN	1.814	1.049	2.271	1.928	1.570	1.857	1.720	1.763	2.575	1.708
CHN	1.615	1.514	0.705	1.577	1.478	1.487	1.659	1.338	1.581	1.048
EU	2.138	2.191	3.233	1.115	1.764	2.341	2.407	2.302	2.351	2.080
GBR	1.631	1.532	1.990	1.735	1.013	1.710	1.688	1.706	2.229	1.620
IND	1.430	1.645	1.350	1.925	1.696	0.855	1.798	1.410	1.797	1.549
JPN	1.963	1.942	2.310	2.208	1.930	2.201	1.151	2.063	2.782	1.996
MEX	1.328	1.284	1.452	1.406	1.276	1.275	1.372	0.809	1.792	1.300
RoW	1.454	1.501	1.824	1.126	1.265	1.313	1.263	1.642	0.896	1.186
USA	2.146	1.850	2.681	2.240	1.990	1.923	2.198	1.770	2.302	1.013

Table 49: Iceberg Trade Costs (d_{nik}) - Mining: without Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	1.205	3.131	2.484	4.293	3.261	4.746	2.845	3.716	2.922	4.737
CAN	2.544	1.413	4.213	2.211	2.725	3.966	3.809	3.879	3.056	2.871
CHN	5.701	5.923	1.528	13.738	6.878	16.471	3.963	5.748	22.098	12.722
EU	5.078	5.913	5.142	1.102	2.603	4.807	3.544	3.585	5.714	6.196
GBR	2.237	2.838	4.385	2.416	1.374	1.949	2.490	3.292	2.904	3.495
IND	13.836	5.807	459.855	5.343	4.591	1.238	4.248	8.803	19.969	3.449
JPN	3.448	6.226	4.364	3.206	3.938	5.105	1.572	6.178	3.219	2.069
MEX	2.391	2.342	2.486	1.731	2.370	3.068	3.113	1.295	3.668	2.837
RoW	1.247	1.664	2.954	1.247	1.343	1.434	1.639	2.951	0.846	0.940
USA	3.889	2.858	3.063	2.520	3.179	3.348	3.245	3.424	3.034	1.377

Table 50: Iceberg Trade Costs (d_{nik}) - Paper: with Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	0.928	1.554	2.153	1.980	1.564	1.827	1.713	1.598	1.827	1.869
CAN	1.527	0.838	1.926	1.716	1.295	1.562	1.397	1.413	1.801	1.595
CHN	1.884	1.677	0.828	1.945	1.690	1.733	1.869	1.487	1.532	1.356
EU	1.732	1.685	2.639	0.955	1.400	1.895	1.883	1.777	1.582	1.870
GBR	1.364	1.216	1.677	1.535	0.830	1.429	1.363	1.360	1.549	1.503
IND	1.289	1.408	1.225	1.834	1.498	0.770	1.565	1.211	1.345	1.549
JPN	1.404	1.318	1.664	1.669	1.352	1.572	0.795	1.406	1.653	1.584
MEX	1.498	1.376	1.650	1.678	1.411	1.437	1.495	0.870	1.680	1.627
RoW	1.767	1.732	2.234	1.447	1.506	1.595	1.482	1.901	0.905	1.600
USA	1.846	1.511	2.324	2.038	1.678	1.653	1.827	1.452	1.646	0.968

Table 51: Iceberg Trade Costs (d_{nik}) - Paper: without Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	1.347	3.191	3.245	6.939	3.695	7.277	3.321	3.331	2.867	6.205
CAN	2.842	1.439	5.500	3.571	3.085	6.076	4.444	3.475	2.996	3.758
CHN	5.422	5.135	1.698	18.889	6.629	21.486	3.935	4.383	18.445	14.178
EU	4.474	4.749	5.294	1.404	2.325	5.809	3.260	2.533	4.419	6.396
GBR	1.902	2.200	4.357	2.970	1.184	2.273	2.211	2.244	2.167	3.483
IND	11.381	4.354	442.002	6.354	3.827	1.397	3.648	5.806	14.416	3.325
JPN	2.750	4.526	4.067	3.696	3.183	5.585	1.309	3.951	2.253	1.934
MEX	3.095	2.764	3.760	3.238	3.108	5.445	4.207	1.344	4.166	4.303
RoW	2.413	2.936	6.681	3.489	2.634	3.806	3.312	4.580	1.438	2.132
USA	3.552	2.379	3.269	3.327	2.943	4.193	3.094	2.507	2.432	1.474

Table 52: Iceberg Trade Costs (d_{nik}) - Retail: with Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	0.816	1.421	1.740	1.680	1.392	1.713	1.441	1.398	1.577	1.626
CAN	1.522	0.868	1.763	1.649	1.306	1.658	1.331	1.400	1.761	1.571
CHN	2.161	2.000	0.873	2.151	1.960	2.117	2.048	1.695	1.724	1.537
EU	1.814	1.835	2.539	0.965	1.484	2.114	1.885	1.850	1.626	1.936
GBR	1.378	1.277	1.556	1.495	0.848	1.538	1.316	1.365	1.535	1.501
IND	1.036	1.176	0.905	1.421	1.218	0.659	1.202	0.967	1.061	1.230
JPN	1.441	1.406	1.569	1.651	1.403	1.719	0.779	1.434	1.664	1.606
MEX	1.481	1.414	1.498	1.599	1.411	1.513	1.412	0.855	1.629	1.590
RoW	1.835	1.870	2.131	1.449	1.582	1.764	1.471	1.962	0.922	1.642
USA	1.608	1.368	1.859	1.711	1.478	1.534	1.520	1.256	1.406	0.833

Table 53: Iceberg Trade Costs (d_{nik}) - Retail: without Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	1.627	3.236	3.485	6.278	3.728	3.519	3.481	2.910	2.651	5.213
CAN	2.359	1.003	4.058	2.220	2.139	2.019	3.200	2.086	1.903	2.169
CHN	8.084	6.428	2.250	21.091	8.255	12.824	5.090	4.726	21.046	14.701
EU	9.218	8.215	9.697	2.166	4.000	4.791	5.827	3.774	6.968	9.165
GBR	2.562	2.487	5.217	2.995	1.332	1.225	2.583	2.186	2.234	3.262
IND	27.608	8.868	953.216	11.543	7.754	1.357	7.678	10.185	26.764	5.609
JPN	4.201	5.806	5.524	4.229	4.062	3.416	1.735	4.365	2.635	2.055
MEX	3.506	2.629	3.787	2.747	2.942	2.470	4.135	1.101	3.612	3.390
RoW	46.598	47.607	114.719	50.472	42.488	29.431	55.493	63.968	21.252	28.634
USA	8.617	4.846	7.051	6.045	5.963	4.073	6.512	4.398	4.516	2.487

Table 54: Iceberg Trade Costs (d_{nik}) - Services: with Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	0.949	1.582	2.467	1.928	1.530	2.027	1.611	1.622	1.974	1.807
CAN	1.822	0.996	2.575	1.950	1.479	2.021	1.533	1.673	2.270	1.799
CHN	1.232	1.092	0.607	1.212	1.058	1.229	1.124	0.965	1.059	0.839
EU	1.990	1.928	3.397	1.045	1.540	2.362	1.989	2.026	1.921	2.031
GBR	1.573	1.396	2.166	1.685	0.916	1.787	1.445	1.556	1.887	1.639
IND	0.953	1.037	1.016	1.293	1.061	0.618	1.065	0.889	1.051	1.083
JPN	1.832	1.713	2.433	2.074	1.689	2.225	0.954	1.820	2.278	1.954
MEX	1.873	1.712	2.311	1.997	1.688	1.949	1.718	1.079	2.218	1.923
RoW	1.588	1.549	2.249	1.238	1.295	1.554	1.225	1.695	0.859	1.359
USA	2.282	1.859	3.218	2.398	1.984	2.216	2.075	1.780	2.148	1.130

Table 55: Iceberg Trade Costs (d_{nik}) - Services: without Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	311.961	622.739	1129.093	1580.914	782.513	2080.893	1102.960	769.254	788.100	1783.098
CAN	3.033	1.294	8.816	3.748	3.010	8.005	6.799	3.697	3.794	4.976
CHN	1.152	0.919	0.542	3.947	1.288	5.635	1.199	0.928	4.650	3.737
EU	146.422	130.944	260.235	45.193	69.556	234.682	152.973	82.643	171.601	259.688
GBR	1.451	1.413	4.990	2.227	0.826	2.139	2.417	1.706	1.961	3.295
IND	2.767	0.892	161.432	1.519	0.851	0.419	1.272	1.407	4.159	1.003
JPN	1.381	1.915	3.068	1.826	1.462	3.463	0.943	1.978	1.343	1.205
MEX	1.437	1.081	2.622	1.479	1.319	3.121	2.800	0.622	2.295	2.478
RoW	0.905	0.928	3.765	1.288	0.903	1.763	1.782	1.713	0.640	0.992
USA	201.431	113.680	278.486	185.575	152.577	293.592	251.582	141.738	163.675	103.695

Table 56: Iceberg Trade Costs (d_{nik}) - Textiles: with Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	0.903	1.444	2.166	1.939	1.487	1.814	1.672	1.545	1.780	1.853
CAN	1.614	0.846	2.104	1.826	1.338	1.684	1.482	1.484	1.906	1.718
CHN	1.978	1.681	0.899	2.054	1.733	1.855	1.967	1.550	1.611	1.450
EU	1.601	1.487	2.521	0.888	1.265	1.786	1.745	1.631	1.464	1.760
GBR	1.692	1.440	2.149	1.915	1.006	1.807	1.695	1.675	1.923	1.899
IND	1.339	1.397	1.316	1.918	1.521	0.816	1.631	1.250	1.400	1.639
JPN	1.296	1.162	1.587	1.550	1.219	1.480	0.735	1.288	1.527	1.488
MEX	1.533	1.344	1.744	1.726	1.410	1.499	1.533	0.884	1.721	1.695
RoW	1.802	1.686	2.353	1.484	1.500	1.658	1.515	1.925	0.924	1.661
USA	1.706	1.333	2.219	1.894	1.514	1.557	1.692	1.331	1.522	0.910

Table 57: Iceberg Trade Costs (d_{nik}) - Textiles: without Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	1.380	2.905	4.922	6.740	3.187	8.779	3.866	3.622	2.885	5.886
CAN	2.682	1.206	7.683	3.194	2.451	6.751	4.764	3.479	2.776	3.283
CHN	3.199	2.692	1.482	10.562	3.292	14.921	2.637	2.743	10.682	7.742
EU	4.646	4.382	8.137	1.382	2.032	7.101	3.846	2.791	4.505	6.148
GBR	2.843	2.921	9.637	4.206	1.490	3.998	3.754	3.558	3.179	4.817
IND	10.674	3.628	613.557	5.648	3.021	1.543	3.887	5.777	13.273	2.886
JPN	2.023	2.959	4.429	2.578	1.972	4.837	1.094	3.084	1.628	1.317
MEX	3.051	2.421	5.486	3.026	2.580	6.320	4.712	1.406	4.032	3.927
RoW	2.564	2.772	10.508	3.514	2.356	4.762	3.998	5.163	1.500	2.097
USA	2.848	1.695	3.880	2.528	1.986	3.958	2.818	2.133	1.915	1.094

Table 58: Iceberg Trade Costs (d_{nik}) - Transport: with Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	0.804	1.303	1.802	1.666	1.318	1.564	1.430	1.354	1.536	1.592
CAN	1.564	0.831	1.907	1.708	1.291	1.580	1.379	1.417	1.791	1.606
CHN	1.993	1.718	0.847	1.999	1.740	1.811	1.905	1.539	1.574	1.411
EU	1.861	1.753	2.740	0.997	1.464	2.011	1.949	1.868	1.651	1.975
GBR	1.415	1.221	1.681	1.546	0.838	1.464	1.362	1.380	1.560	1.533
IND	1.336	1.413	1.227	1.847	1.511	0.788	1.562	1.228	1.354	1.578
JPN	1.503	1.366	1.722	1.736	1.409	1.663	0.819	1.472	1.718	1.667
MEX	1.412	1.256	1.503	1.536	1.294	1.338	1.357	0.802	1.537	1.508
RoW	1.974	1.873	2.411	1.570	1.637	1.760	1.595	2.078	0.981	1.757
USA	1.889	1.497	2.298	2.025	1.670	1.671	1.800	1.453	1.635	0.973

Table 59: Iceberg Trade Costs (d_{nik}) - Transport: without Labor Mobility

	BRA	CAN	CHN	EU	GBR	IND	JPN	MEX	RoW	USA
BRA	1.554	3.082	3.689	6.967	3.725	9.313	3.308	3.475	3.022	5.648
CAN	2.770	1.174	5.281	3.028	2.627	6.568	3.739	3.061	2.668	2.889
CHN	6.620	5.248	2.042	20.067	7.071	29.095	4.148	4.837	20.574	13.656
EU	6.375	5.665	7.433	1.741	2.894	9.181	4.011	3.263	5.753	7.190
GBR	2.875	2.784	6.489	3.906	1.564	3.810	2.885	3.067	2.993	4.153
IND	12.670	4.057	484.827	6.155	3.722	1.725	3.506	5.842	14.661	2.920
JPN	4.309	5.937	6.279	5.039	4.358	9.706	1.771	5.596	3.226	2.391
MEX	3.256	2.433	3.897	2.964	2.857	6.353	3.821	1.278	4.004	3.571
RoW	4.280	4.359	11.677	5.386	4.081	7.489	5.072	7.344	2.330	2.983
USA	5.567	3.122	5.049	4.538	4.029	7.291	4.187	3.552	3.483	1.822

Table 60: Welfare Effects by Country - 2025 3M Tariffs: with Labor Mobility

	Baseline Tariff (p.p.)	Counterfactual Tariff (p.p.)	Welfare Change (%)	Income Change (%)	Tariff Revenue Change (%)
BRA	2.870	3.000	5.210	5.270	-5.620
CAN	2.260	2.170	-1.250	-1.270	4.310
CHN	0.540	0.470	7.150	7.100	42.580
EU	1.630	1.860	19.530	19.520	44.740
GBR	1.830	1.720	2.760	2.750	14.720
IND	0.290	0.300	2.560	2.500	8.850
JPN	2.810	2.720	4.760	4.770	-6.110
MEX	1.430	1.310	-5.190	-5.220	0.360
RoW	4.990	3.280	1.790	1.820	-5.820
USA	0.000	0.000	14.340	14.400	0.470

Table 61: Welfare Effects by Country - 2025 3M Tariffs: without Labor Mobility

	Baseline Tariff (p.p.)	Counterfactual Tariff (p.p.)	Welfare Change (%)	Income Change (%)	Tariff Revenue Change (%)
BRA	2.840	7.600	4611.970	4512.460	10746.030
CAN	2.110	4.330	16090.290	16040.020	27756.860
CHN	8.780	14.130	122.340	122.320	198.310
EU	5.280	2.980	29.000	29.000	208.660
GBR	0.540	3.910	7537.330	7550.890	3281.900
IND	0.030	2.090	2909.610	2831.040	4794.590
JPN	0.680	12.950	6535.700	6564.200	1937.360
MEX	0.430	2.020	1699.040	1713.360	757.750
RoW	4.290	1.140	269.390	264.110	2860.890
USA	0.000	0.000	138.210	131.640	695.520

Table 62: Welfare Effects by Country - 2025 LTM Tariffs: with Labor Mobility

	Baseline Tariff (p.p.)	Counterfactual Tariff (p.p.)	Welfare Change (%)	Income Change (%)	Tariff Revenue Change (%)
BRA	2.870	3.080	5.210	5.270	-5.450
CAN	2.260	2.060	-1.300	-1.320	4.230
CHN	0.540	0.520	7.400	7.350	42.260
EU	1.630	1.820	19.590	19.580	44.590
GBR	1.830	1.880	2.740	2.720	14.620
IND	0.290	0.290	2.730	2.680	9.060
JPN	2.810	3.010	4.770	4.780	-5.850
MEX	1.430	1.440	-4.980	-5.010	0.620
RoW	4.990	3.550	1.680	1.700	-6.360
USA	0.000	0.000	14.190	14.230	4.500

Table 63: Welfare Effects by Country - 2025 LTM Tariffs: without Labor Mobility

	Baseline Tariff (p.p.)	Counterfactual Tariff (p.p.)	Welfare Change (%)	Income Change (%)	Tariff Revenue Change (%)
BRA	2.840	8.660	3879.160	3800.440	8731.560
CAN	2.110	3.350	12907.060	12874.940	20362.880
CHN	8.780	13.500	56.780	56.600	708.480
EU	5.280	3.330	22.800	22.800	188.790
GBR	0.540	5.110	6181.390	6192.370	2733.870
IND	0.030	2.930	2395.650	2327.060	4041.510
JPN	0.680	8.030	4930.710	4953.700	1221.840
MEX	0.430	2.680	1506.850	1522.450	481.160
RoW	4.290	1.220	176.030	172.100	2106.480
USA	0.000	0.000	78.470	75.190	356.440