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Local Trade Wars*

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Abstract

Modern protectionism has increasingly taken the form of decentralized trade coercion rather than multilateral escalation. What tariffs prevail in such *local trade wars*? How are welfare consequences shared between participants and bystanders? And can targeted economies credibly deter unilateralism? Using a multi-country, multi-sector Armington model that distinguishes the elasticity of substitution *between* domestic and imported goods from that *across* foreign varieties, we show that bilateral tariffs generate substantial third-market leakage. Applied to recent U.S. trade policy, this leakage magnifies U.S. losses and bystander gains under Trump 1.0, with bilateral Nash tariffs that are lower but more costly than those implied by standard models with a uniform trade elasticity. Trump 2.0's Liberation Day tariffs reverse these patterns by largely shutting down third-market leakage through broad-based tariff escalation. In a dynamic setting, no individual trading partner can credibly deter U.S. unilateralism: bilateral retaliation is either too weak or too costly. Only a near-universal coalition, broadly resembling the WTO membership, can flip U.S. incentives.

JEL classification: F10; F13; F14
Keywords: Local Trade Wars; Third-Market Leakage; Bilateral Tariffs; Unilateral Protectionism; Strategic Deterrence

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1 Introduction

The postwar trading system was built to replace bilateral power politics with multilateral rules. Yet recent trade conflicts have increasingly moved in the opposite direction. Under the Trump administrations, tariffs were imposed not through coordinated multilateral escalation, but through a sequence of localized bilateral or plurilateral confrontations—against China, Mexico, Canada, the European Union, and other trading partners individually. Rather than a global trade war, modern protectionism has taken the form of decentralized coercion embedded in a highly interconnected trade network.

While the quantitative properties of *global* trade wars have been well understood since the seminal work of Ossa (2011, 2014), much less is known about the properties of *local* trade wars. In particular, localized tariff conflicts generate substantial third-market reallocations. When the United States imposes tariffs on China, for example, import demand may shift not toward the United States itself, but toward untargeted suppliers such as Korea, Vietnam, or Mexico. These third-market leakages are well documented empirically (Fajgelbaum et al., 2024; Dang et al., 2023; Ito, 2022; Alfaro and Chor, 2023; Choi and Nguyen, 2023), yet much less is understood about how they reshape tariff incentives, welfare consequences, and strategic interactions across economies.[1] *What tariffs emerge in localized trade conflicts? How do third-market reallocations reshape the welfare consequences of local tariff wars? How do third-market leakages reshape the incentives for unilateralism, and how should other economies respond?* Understanding these questions is central to evaluating the economic and strategic consequences of modern trade conflicts.

This paper fills this gap by providing the first quantitative analysis of *local trade wars*. We use a multi-country, multi-sector Armington model with a nested CES structure that distinguishes the elasticity of substitution between domestic and imported goods (σ) from that among imported varieties (ρ). When $\rho > \sigma$, imported varieties are more substitutable with each other than with domestic goods, so bilateral tariff hikes divert expenditure primarily toward other foreign suppliers rather than toward domestic producers, generating a greater third-market leakage. An advantage of our framework is that it admits a tractable two-stage gravity-based estimation strategy that re-

[1] Economy names and codes follow the OECD Inter-Country Input-Output (ICIO) classification. Throughout the paper, "country", "economy", and "region" are used interchangeably and carry no implications as to the sovereignty or political status of any economy or territory.

covers both ρ and σ from changes in bilateral trade flows, tariffs, and domestic production shares, without requiring data on domestic prices.Our baseline estimates yield $\rho = 5.17$ and $\sigma = 1.55$, implying a large elasticity gap and, correspondingly, strong third-market leakages.

We then use the recent U.S. trade wars under Trump 1.0 and Trump 2.0 as a quantitative laboratory to evaluate the implications of third-market leakage for U.S. tariff incentives and global welfare, and to analyze the strategic interactions that rationalize the evolution of U.S. trade policy and examine whether partner economies can credibly deter U.S. unilateralism.

We obtain three main findings. *First*, third-market leakage under Trump 1.0 magnifies U.S. welfare losses under unilateral protectionism: the U.S. real income decreases by 0.054% in our baseline model, whereas the corresponding decline is merely 0.021% in standard models with uniform elasticity. Third-country gains are correspondingly large—Canada gains 0.116%, Mexico 0.395%, Korea 0.069%, Japan 0.055%—and are substantially underestimated by the standard model. The bilateral Nash tariffs in the U.S.-China conflict average 7.5% (U.S. on China) and 10.6% (China on U.S.) under our baseline—far below the actual trade-war tariffs of 23.6% and 21.5%, and below the Nash tariffs predicted by the standard model. Strong third-market effects thus yield *lower* Nash tariffs but *higher* welfare losses in local trade wars.

Second, Trump 2.0's Liberation Day tariff policy, which imposes broad-based tariffs simultaneously on all major trading partners, can be understood as an attempt to internalize third-market leakages. By closing off the leakage to third markets, it shifts demand more effectively toward domestic products. U.S. welfare rises by 0.149% under unilateral Liberation Day tariffs, a sharp reversal from the welfare loss under the China-focused tariff escalation of Trump 1.0. At the same time, third markets become substantially worse off: Mexico's welfare swings from a gain of +0.395% under Trump 1.0 to a loss of −0.618% under Trump 2.0, while Canada's welfare gain falls from +0.116% to +0.044%. Moreover, relative to the pre–Liberation Day benchmark, U.S. welfare remains positive even when China retaliates unilaterally (+0.081%) or when bilateral Nash tariffs are imposed by all trading partners (+0.198%).

The static results naturally raise a strategic question: can partner economies credibly deter U.S. unilateralism? Motivated by the observation that U.S. trade conflicts evolved through bilateral rather than multilateral negotiations—with some economies accommodating, others retaliating, and others negotiating—we model the United States as engaging separately with each trading partner in a bilateral sequential-move game, taking as given that the Liberation Day tariffs remain in place against all other partners. In each bilateral game, the United States moves first, choosing whether to maintain its tariff or back down, after which the partner decides whether to accommodate or retaliate. We consider both Nash and decoupling retaliation, in one-shot and infinitely repeated settings.

These strategic interactions yield our *third* finding. No individual trading partner can credibly deter U.S. unilateralism. In the one-shot game, Nash retaliation imposes too little cost on the United States, while decoupling is too costly for the partner to constitute a credible threat. Repetition does not rescue bilateral retaliation: trigger strategies prescribing Nash retaliation remain ineffective, and those prescribing decoupling require implausibly high levels of patience. Coordinated retaliation can reverse U.S. incentives, but only when the coalitionis near-universal in scope. Politically motivated coalitions of middle powers, including the one envisioned by Canadian Prime Minister Carney, fall short.[2] A deterrence-capable coalition instead combines major U.S. trading partners with a sufficiently broad group of smaller economies that have strong incentives to retaliate, approaching the breadth of WTO membership.

Related Literature. To the best of our knowledge, this paper is the first quantitative exploration of the implications of *local* trade wars. The surprising lack of comparable work perhaps stems from the long period of the "second golden age" of globalization (Baldwin, 2006), which made protectionism distant until recently.[3] Our work contributes to the growing literature on quantitative trade policy,[4] and is particularly relevant to the seminal work of Ossa (2011, 2014), which evaluated the trade and welfare effects of *global* trade wars, and Lashkaripour (2021), which takes a sufficient statistic approach. One key takeaway is that local trade wars can impose higher welfare costs than global trade wars, despite involving lower Nash tariffs, because

[2]Special address by Mark Carney, World Economic Forum Annual Meeting, Davos, 20 January 2026.

[3]There is a substantial body of theoretical and empirical research on preferential trade agreements, such as Aghion et al. (2007) and Mossay and Tabuchi (2015). However, the inherently cooperative nature of trade agreements makes the findings of this literature insufficient for understanding the properties of local trade wars (non-cooperative in nature).

[4]See Caliendo and Parro (2022) for a review. In addition to the papers mentioned in the main text, our research is remotely related to the works of Caliendo and Parro (2015), Aichele et al. (2016), Cheong and Takayama (2016), Dhingra et al. (2017), and Felbermayr et al. (2022), which quantitatively assess the trade and welfare effects of NAFTA, TTIP, TTP, Brexit, and a potential European disintegration. Since all these policies are regional, third-country effects are also present. However, the focus of these papers is on the assessment of a specific trade agreement or policy change. They do not consider endogenous strategic policy interactions, such as Nash tariffs, nor the role of varying elasticities.

of third-country effects. Policymakers who focus on tariff levels may therefore underestimate the welfare costs of regional trade conflicts.

We explore local trade wars in the context of the recent U.S.-China conflict, situating our work within the burgeoning literature on the economic impacts of the U.S.-China trade war, such as Amiti et al. (2019), Cavallo et al. (2019), Fajgelbaum et al. (2020), Flaaen et al. (2020), Grossman et al. (2024), Hu et al. (2025), and Ignatenko et al. (2025).[5] In spirit, our paper is most closely related to Fajgelbaum et al. (2024), which highlights that the U.S.-China trade war may benefit bystanders and the importance of tariff elasticities in evaluating welfare. Their reduced-form approach complements our equilibrium framework, which additionally permits Nash tariff computation, Trump 2.0 analysis, and game-theoretic analysis of strategic deterrence. Our findings also align with the empirical trade-diversion literature: Gorman (2022), Ito (2022), Alfaro and Chor (2023), Choi and Nguyen (2023), Dang et al. (2023), and Liu (2024).[6]

We also leverage theoretical insights from a diverse body of theoretical and quantitative work. Among others, the paper relates to the theoretical trade policy literature on individual motives for protection and Nash equilibrium tariffs (Johnson, 1953; Gorman, 1958; Venables, 1987; Grossman and Helpman, 1994), and to the analysis of third-country effects on trade policy synthesized by Bagwell and Staiger (2002). The emphasis on distinguishing ρ from σ follows Feenstra et al. (2018) and is embedded in Fajgelbaum et al. (2020). The game-theoretic analysis of bilateral and coalition-based deterrence is related to Maggi (1999), who highlights the role of multilateral enforcement in sustaining trade cooperation, and to Mei (2020), who provides a quantitative implementation of this insight. Our paper studies a different strategic environment, namely local trade wars and trade coercion by a major power, where coalition structures are explored as alternative strategic configurations rather than institutionally prescribed. Nevertheless, our findings convey a similar message: bilateral retaliation alone is generally insufficient; credible deterrence requires a sufficiently broad coalition. The calibration is standard in the quantitative trade and spatial literature based on Eaton and Kortum (2002).

[5] Other important works include Amiti et al. (2020), Handley et al. (2023), Huang et al. (2023), Jiang et al. (2023), Autor et al. (2024), Blanchard et al. (2024), Chor and Li (2024), and Du and Li (2024).

[6] An exception is Cigna et al. (2022), which found no evidence of trade diversion, possibly due to the relatively short time span examined. In a different but related context, recent empirical studies of sanctions also document substantial trade diversion and transshipment, with the latter constituting another form of third-market leakage; see, for example, Ferguson et al. (2023), Tyazhelnikov and Romalis (2024), and Egorov et al. (2025).

The rest of the paper is organized as follows. Section 2 presents the model. Section 3 parameterizes the model and estimates the trade elasticities. Section 4 evaluates the quantitative properties of local trade wars. Section 5 concludes.

2 The Model

In this section, we build a multi-country, multi-sector Armington model with nested CES preferences. The model also incorporates input-output linkages to capture trade in intermediate goods. We first present the model and then discuss how the two Armington elasticities shape the effects of tariffs.

2.1 Model Setup

There are N countries, indexed by i, n, k, and J sectors, indexed by s, j. Each country produces a distinct variety in each sector. Consumer preferences over sectoral composite goods are Cobb–Douglas, with expenditure shares α_i^j. Within each sector, preferences over domestic and foreign varieties take a nested-CES form:

$$Q_n^j = \left[\left(q_{nn}^j \right)^{\frac{\sigma-1}{\sigma}} + \left(\sum_{i \neq n} \left(q_{in}^j \right)^{\frac{\rho-1}{\rho}} \right)^{\frac{\rho}{\rho-1}\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}}, \tag{1}$$

where Q_n^j is the sector-j composite good in country n, and q_{in}^j is the quantity of the sector-j variety produced in country i and consumed in country n. The parameter σ governs the elasticity of substitution between domestic and foreign varieties, and ρ is the elasticity of substitution across foreign varieties.

Each country i has L_i units of inelastically-supplied labor, which is perfectly mobile across sectors. Production uses labor and composite goods from all sectors, with Cobb-Douglas technology:

$$q_i^j = \frac{1}{\iota_i^j} T_i^j L_i^{j\,\beta_i^{Lj}} \prod_{s=1}^{J} \left(Q_i^{sj} \right)^{\beta_i^{sj}} \tag{2}$$

where T_i^j denotes productivity, Q_i^{sj} is the sector-s composite good used as an input in sector j, ι_i^j is a normalization constant, and $\beta_i^{Lj} + \sum_{s=1}^{J} \beta_i^{sj} = 1$.[7] The unit input cost to produce variety j in country i is therefore:

$$c_i^j = w_i^{\beta_i^{Lj}} \prod_{s=1}^{J} \left(P_i^s\right)^{\beta_i^{sj}}, \tag{3}$$

where w_i is the wage rate and P_i^s is the price of the composite good s.

Bilateral trade is subject to iceberg trade costs τ_{in}^j and ad valorem tariffs t_{in}^j. Let $\kappa_{in}^j = \left(1 + t_{in}^j\right) \tau_{in}^j$, where $\kappa_{in}^j > 1$ for $i \neq n$ and $\kappa_{nn}^j = 1$. Tariff revenues are assumed to be redistributed equally to the workers of a country.

2.2 Equilibrium

Given the setup, let X_{in}^j be the value of good j exported from country i to n, and X_n^j be the total expenditure of country n on good j. Country n's expenditure share on the sector-j variety produced in country i is then given by

$$\lambda_{in}^j \equiv \frac{X_{in}^j}{X_n^j} = \frac{\left(\kappa_{in}^j c_i^j / T_i^j\right)^{1-\rho}}{\sum_{k \neq n} \left(\kappa_{kn}^j c_k^j / T_k^j\right)^{1-\rho}} \frac{\left[\sum_{k \neq n} \left(\kappa_{kn}^j c_k^j / T_k^j\right)^{1-\rho}\right]^{\frac{1-\sigma}{1-\rho}}}{\left[\sum_{k \neq n} \left(\kappa_{kn}^j c_k^j / T_k^j\right)^{1-\rho}\right]^{\frac{1-\sigma}{1-\rho}} + \left(c_n^j / T_n^j\right)^{1-\sigma}}, \quad i \neq n, \tag{4}$$

$$\lambda_{nn}^j \equiv \frac{X_{nn}^j}{X_n^j} = \frac{\left(c_n^j / T_n^j\right)^{1-\sigma}}{\left[\sum_{k \neq n} \left(\kappa_{kn}^j c_k^j / T_k^j\right)^{1-\rho}\right]^{\frac{1-\sigma}{1-\rho}} + \left(c_n^j / T_n^j\right)^{1-\sigma}}.$$

The price of the composite good j in country n is given by:

$$P_n^j = \left\{ \left[\sum_{k \neq n} \left(\kappa_{kn}^j c_k^j / T_k^j\right)^{1-\rho}\right]^{\frac{1-\sigma}{1-\rho}} + \left(c_n^j / T_n^j\right)^{1-\sigma} \right\}^{\frac{1}{1-\sigma}}. \tag{5}$$

[7]Specifically, $\iota_i^j = \beta_i^{Lj \beta_i^{Lj}} \prod_{s=1}^{J} \left(\beta_i^{sj}\right)^{\beta_i^{sj}}$.

Total expenditure on sector j consists of final consumption expenditure and expenditure on intermediate inputs:

$$X_i^j = \alpha_i^j Y_i + \sum_{s=1}^{J} \beta_i^{js} \sum_{n=1}^{N} \frac{\lambda_{in}^s X_n^s}{1 + t_{in}^s}, \tag{6}$$

where $Y_i = w_i L_i + \sum_{j=1}^{J} \sum_{n=1}^{N} \frac{t_{ni}^j}{1+t_{ni}^j} \lambda_{ni}^j X_i^j$ is the national income of country i. Finally, labor market clearing implies:

$$w_i L_i = \sum_{j=1}^{J} \beta_i^{Lj} \sum_{n=1}^{N} \frac{\lambda_{in}^j X_n^j}{1 + t_{in}^j}. \tag{7}$$

The equilibrium is summarized in the following definition:

Definition 1 (Equilibrium)**.** *Given $\{T_i^j\}$, $\{\tau_{in}^j\}$, and $\{t_{in}^j\}$, the equilibrium consists of wages $\{w_i\}_{i=1}^N$, sectoral expenditures $\{X_i^j\}_{i=1,...,N;\, j=1,...,J}$, and sectoral price indices $\{P_i^j\}_{i=1,...,N;\, j=1,...,J}$ satisfying* (7), (6), *and* (5) *for all i and j.*

In equilibrium, the welfare of the representative consumer in country i is given by

$$W_i = \frac{Y_i}{L_i P_i}. \tag{8}$$

where $P_i = \prod_{j=1}^{J} (P_i^j)^{\alpha_i^j}$ is the aggregate price index.

The equilibrium system in Definition 1 can be transformed to equilibrium in relative changes using the "exact-hat" algebra (Dekle et al., 2008). In particular, let z' be the level of variable z after the change and $\hat{z} = z'/z$. We can express changes in equilibrium outcomes $\left(\hat{w}_i, \hat{X}_i^j, \hat{L}_i^j\right)$ and welfare $\left(\hat{W}_i\right)$ as functions of the exogenous changes in, for example, tariff rates $(\hat{t}_{in}^j)$, the observables $(\lambda_{ni}^j, X_i^j, t_{in}^j)$ as well as model parameters $(\alpha, \beta, \rho, \sigma)$. This approach has been widely used to compute counterfactual changes in equilibrium outcomes, which is what we do in Section 4. The details of the equation system in relative changes are presented in Appendix A.1.

2.3 Local Trade Wars: An Illustrative Example

Before exploring the quantitative implications of local trade wars using the full model, it is useful to provide some qualitative discussion on how tariffs and their impacts depend on the two elasticities of substitution. We consider the following stylized version of our model presented in Section 2.1:

Example 1 (An Illustrative Example)**.** *Consider three regions, North ($i = 1$), South ($i = 2$), and the rest of the world ($i = 3$). We assume away multi-sectors, intermediates, and differences in productivity, labor endowment, and iceberg trade frictions,* i.e. $T_i = L_i = \tau_{in} = 1$ *for* $i, n = 1, 2, 3$. *Finally, we start from zero tariffs,* i.e., $t_{in} = 0$ *and hence* $\kappa_{in} = 1$ *for all* i *and* n.

Consider a unilateral tariff imposed by North on imports from South, *i.e.*, an increase in t_{21}. We obtain the following results:

Proposition 1 (Third-Country Effects of a Unilateral Protectionism Tariff)**.** *Suppose that* $\rho \geq \sigma > 1$. *In the three-country world described above, the first-order welfare effects of* t_{21} *are*

$$\begin{aligned} \frac{\partial \log W_1}{\partial \log (1 + t_{21})} &= \frac{1}{9}\left(1 - \frac{\rho - \sigma}{\rho + \sigma}\right) > 0 \\ \frac{\partial \log W_2}{\partial \log (1 + t_{21})} &= -\frac{2}{9} - \frac{1}{9}\frac{\rho - \sigma}{\rho + \sigma} < 0 \\ \frac{\partial \log W_3}{\partial \log (1 + t_{21})} &= \frac{1}{9} + \frac{2}{9}\frac{\rho - \sigma}{\rho + \sigma} > 0 \end{aligned} \tag{9}$$

Proposition 1 shows the somewhat unsurprising results from a unilateral increase in t_{21} when starting from a free-trade equilibrium: North gains, South loses, and the rest of the world benefits.

From equations (9), we can also see how the welfare of the three countries adjusts as ρ or σ increases, which is summarized in the following two propositions:

Proposition 2 (Unilateral Protectionism and Armington Elasticity)**.** *The welfare gain of the initiating country (country 1) decreases with* ρ *and increases with* σ*, whereas the welfare effect on the targeted country (country 2) moves in the opposite direction:*

$$\frac{\partial^2 \log W_1}{\partial \log (1 + t_{21})\, \partial \rho} < 0, \quad \frac{\partial^2 \log W_1}{\partial \log (1 + t_{21})\, \partial \sigma} > 0. \tag{10}$$

$$\frac{\partial^2 \log W_2}{\partial \log (1 + t_{21})\, \partial \rho} > 0, \quad \frac{\partial^2 \log W_2}{\partial \log (1 + t_{21})\, \partial \sigma} < 0. \tag{11}$$

Proposition 3 (Third-Country Effects and Armington Elasticity)**.** *The welfare gain of the third country increases with ρ and decreases with σ:*

$$\frac{\partial^2 \log W_3}{\partial \log(1+t_{21})\, \partial \rho} > 0, \frac{\partial^2 \log W_3}{\partial \log(1+t_{21})\, \partial \sigma} < 0. \tag{12}$$

Intuitively, as ρ increases, goods from the South and the rest of the world (RoW) become more similar in the eyes of Northern consumers. Therefore, an increase in t_{21} leads to greater trade diversion and thus a larger welfare gain for the rest of the world. This third-country effect tends to reduce the welfare gains the North derives from the increased tariffs. In other words, as ρ becomes larger, the North has less incentive to raise t_{21}, since trade protection mainly shifts demand to the rest of the world. On the other hand, when σ increases, goods from foreign markets become more similar to domestic varieties in the eyes of Northern consumers. Consequently, higher tariffs on Southern products will shift more consumption to domestic varieties, resulting in greater welfare gains for the North.

Another way to understand Propositions 2 and 3 is that the presence of the third-country effect limits Country 1's ability to manipulate terms of trade when it does not target all trading partners. Intuitively, the extent of this limitation depends on how easily goods from the targeted country can be substituted with those from non-targeted countries. In the limiting case $\rho \to \infty$, *i.e.*, when foreign varieties are perfect substitutes, the welfare gain from raising the bilateral tariff converges to zero, as shown by the first expression in (9).

How do Nash tariffs and welfare change in response to changes in σ and ρ? We illustrate this in Figure 1, where we numerically compute the Nash tariffs between the North and South. We fix $\sigma = 4$ and solve the Nash tariffs under different values of ρ. Intuitively, as ρ increases, the Nash tariff rate decreases. Because trade wars are more likely to shift demand to the rest of the world when ρ is high, this effectively reduces the incentives for the two countries to initiate local trade wars. On the other hand, the welfare loss increases as ρ increases due to amplified third-country effects. The opposite is true when σ increases. Because the two elasticities operate in opposite directions, a larger gap between them generates greater welfare losses for the countries involved in the trade war and larger gains for the third country.

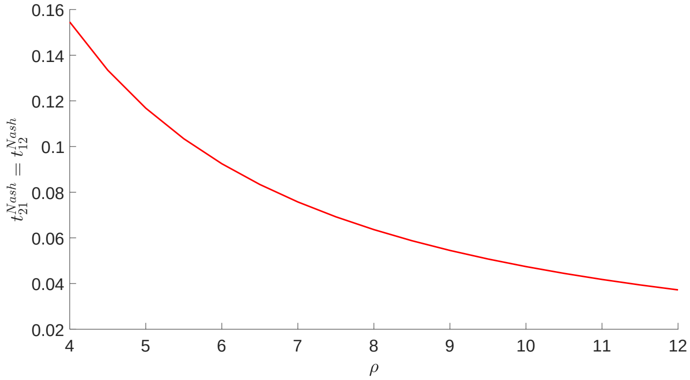

Figure 1: Nash Tariff Rates w.r.t. ρ: A Three-country Example

3 Calibration

This section describes how we calibrate the model and estimate the elasticity parameters ρ and σ.

3.1 Bring the Model to Data

To calibrate the model in relative changes, we require data on tariff changes $\hat{t}_{in}^j$, production and consumption shares β and α, initial trade flows X_{in}^j, and elasticities ρ and σ. All variables except ρ and σ are directly observed. To estimate the two elasticities, we use the Inter-Country Input-Output (ICIO) tables for domestic production, the BACI database for bilateral trade flows, and the UNCTAD TRAINS database for effective applied tariff rates.[8] After harmonizing the three datasets, we work with 77 countries or regions and 43 sectors, which define the units of analysis for our estimation. Beyond standard trade and tariff data, the estimation requires only total domestic production by sector and therefore does not rely on price data or estimated country-pair flows from input-output tables; we use the latter only for robustness checks.

3.2 Identify ρ and σ

We leverage the model's structure to estimate the key elasticities using a two-stage gravity-based framework. In the first stage, we estimate ρ from the relationship between changes in bilateral

[8]Following Caliendo et al. (2015), if initial-year tariff data are missing, we use the closest available value from the previous four years; if effective applied tariffs remain unavailable, we use most-favored-nation (MFN) rates. We use simple-average tariff rates to ensure consistency with the baseline estimation.

trade flows and changes in bilateral tariffs. In the second stage, we estimate σ from the relationship between changes in average import tariffs and changes in domestic production shares, using the fixed effects from the first stage.

3.2.1 Stage I: Identifying ρ

In relative changes, the expenditure share equation (4) can be written as

$$\begin{aligned}
\hat{\lambda}^j_{in} &= \frac{\left(\hat{\kappa}^j_{in}\hat{c}^j_i/\hat{T}^j_i\right)^{1-\rho}}{\sum_{k\neq n}\psi^j_{kn}\left(\hat{\kappa}^j_{kn}\hat{c}^j_k/\hat{T}^j_k\right)^{1-\rho}} \frac{\left[\sum_{k\neq n}\psi^j_{kn}\left(\hat{\kappa}^j_{kn}\hat{c}^j_k/\hat{T}^j_k\right)^{1-\rho}\right]^{\frac{1-\sigma}{1-\rho}}}{\left(1-\lambda^j_{nn}\right)\left[\sum_{k\neq n}\psi^j_{kn}\left(\hat{\kappa}^j_{kn}\hat{c}^j_k/\hat{T}^j_k\right)^{1-\rho}\right]^{\frac{1-\sigma}{1-\rho}}+\lambda^j_{nn}\left(\hat{c}^j_n/\hat{T}^j_n\right)^{1-\sigma}}, \quad i\neq n, \\
\hat{\lambda}^j_{nn} &= \frac{\left(\hat{c}^j_n/\hat{T}^j_n\right)^{1-\sigma}}{\left(1-\lambda^j_{nn}\right)\left[\sum_{k\neq n}\psi^j_{kn}\left(\hat{\kappa}^j_{kn}\hat{c}^j_k/\hat{T}^j_k\right)^{1-\rho}\right]^{\frac{1-\sigma}{1-\rho}}+\lambda^j_{nn}\left(\hat{c}^j_n/\hat{T}^j_n\right)^{1-\sigma}}.
\end{aligned} \tag{13}$$

where $\psi^j_{in} \equiv \frac{\left(\kappa^j_{in}c^j_i/T^j_i\right)^{1-\rho}}{\sum_{k\neq n}\left(\kappa^j_{kn}c^j_k/T^j_k\right)^{1-\rho}}$ is the import share of country n from i for sector j.

By rearranging terms and taking log differences of equation (13) for $i \neq n$, we obtain the estimating equation for ρ:

$$\Delta \log\left(X^j_{in}\right) = (1-\rho)\,\Delta\log\left(1+t^j_{in}\right) + D^j_i + \mathcal{D}^j_n + \epsilon^j_{in}. \tag{14}$$

where D^j_i and $\mathcal{D}^j_n$ capture the exporter-sector and importer-sector specific components of the equation, respectively. Following Fajgelbaum et al. (2020), we assume that changes in bilateral iceberg trade costs are orthogonal to changes in t^j_{in} and are therefore absorbed by ϵ^j_{in}.

3.2.2 Stage II: Identifying σ

The identification of σ relies on the information embedded in $\hat{\lambda}_{in}$ and the estimated fixed effects from the first stage. From equation (14):

$$\exp(D^j_i) = \left(\hat{c}^j_i/\hat{T}^j_i\right)^{1-\rho}, \tag{15}$$

$$\exp(\mathcal{D}_n^j) = \frac{\left[\sum_{k\neq n} \psi_{kn}^j \left(\hat{\kappa}_{kn}^j \hat{c}_k^j / \hat{T}_k^j\right)^{1-\rho}\right]^{\frac{\rho-\sigma}{1-\rho}}}{\left(1-\lambda_{nn}^j\right)\left[\sum_{k\neq n} \psi_{kn}^j \left(\hat{\kappa}_{kn}^j \hat{c}_k^j / \hat{T}_k^j\right)^{1-\rho}\right]^{\frac{1-\sigma}{1-\rho}} + \lambda_{nn}^j \left(\hat{c}_n^j / \hat{T}_n^j\right)^{1-\sigma}} \widehat{\sum_i X_{in}}. \tag{16}$$

Combining (15) with the expression for $\hat{\lambda}_{nn}^j$, we can rewrite (16) as

$$\exp(\mathcal{D}_n^j) = \frac{\hat{X}_{nn}^j \left[\sum_{k\neq n} \psi_{in}^j \left(\hat{\kappa}_{kn}^j\right)^{1-\rho} \exp\left(D_k^j\right)\right]^{\frac{\rho-\sigma}{1-\rho}}}{\exp(D_n^j)^{\frac{1-\sigma}{1-\rho}}}. \tag{17}$$

Taking logs of (16) and rearranging terms yields the estimating equation for σ:

$$\underbrace{(\rho-1)\Delta log X_{nn}^j - (\rho-1)\mathcal{D}_n^j - \rho \log\left[\sum_{k\neq n} \psi_{in}^j \left(\hat{\kappa}_{kn}^j\right)^{1-\rho} \exp\left(D_k^j\right)\right] + D_n^j}_{\text{Augmented Changes in Domestic Expenditure Share, } \mathcal{Y}_n^j} \tag{18}$$
$$= \sigma \underbrace{\left\{ D_n^j - \log\left[\sum_{k\neq n} \psi_{in}^j \left(\hat{\kappa}_{kn}^j\right)^{1-\rho} \exp\left(D_k^j\right)\right]\right\}}_{\Psi_n^j} + \varepsilon_n^j,$$

where ε_n^j is a measurement error, and $\mathcal{Y}_n^j$ and Ψ_n^j are functions of observables and fixed effects identified in the first stage.

The left-hand-side variable $\mathcal{Y}_n^j$ can be interpreted as an augmented change in the domestic expenditure share, while Ψ_n^j captures country n's level of protection. Intuitively, higher import tariffs make foreign goods relatively more expensive and shift expenditure toward domestic goods. A higher value of σ implies a stronger expenditure-switching response to a given increase in protection.

The novel part of our identification strategy is that we make full use of the structural gravity equation derived from our Armington model with nested-CES preferences. Building on Feenstra et al. (2018) and Fajgelbaum et al. (2020), this identification strategy offers an alternative that does not require data on domestic prices, which are unavailable for many countries.[9]

[9] Although we adopt a less data-intensive specification, the strategy can be extended to estimate sector-specific elasticities when sufficiently detailed production data and tariff variation are available.

3.2.3 Estimation Results

Table 1: Estimation of $1-\rho$

	Dependent variable: $\Delta \log \left(X_{in}^j\right)$					
BACI Data	Baseline (1)	2000-2010 (2)	Alt. Sample (3)	Wt.Avg Tariff (4)	PPML (5)	WIOT (6)
$\Delta \log \left(1+t_{in}^j\right)$	-4.17^{***}	-2.97^{***}	-3.47^{***}	-3.11^{***}	-3.71^{***}	
	(0.50)	(0.49)	(0.48)	(0.36)	(0.94)	
Observations	34,901	35,597	37,243	34,901	71,728	
R-squared	0.34	0.27	0.34	0.34	0.99	
Input-Output Data						
$\Delta \log \left(1+t_{in}^j\right)$	-2.63^{***}	-2.51^{***}	-2.26^{***}	-2.06^{***}	-4.24^{***}	-1.85^{*}
	(0.41)	(0.40)	(0.38)	(0.29)	(0.93)	(1.12)
Observations	36,593	37,205	38,979	36,593	74,136	12,373
R-squared	0.42	0.38	0.43	0.42	0.99	0.53
Importer-sector FEs	✓	✓	✓	✓	✓	✓
Exporter-sector FEs	✓	✓	✓	✓	✓	✓

Notes: The standard errors are clustered at the exporter-importer level. For PPML estimation, the Pseudo R-squared is reported. *** p<0.01, ** p<0.05, * p<0.1.

The estimation results of $1-\rho$ are presented in Table 1. The upper panel, Column (1), reports the baseline specification, where we estimate equation (14) using OLS with BACI trade data and TRAINS tariff data described in Section 3.1. We then use the estimated fixed effects to compute $\mathcal{Y}_n^j$ and Ψ_n^j, and estimate equation (18) to identify σ. This regression also includes country and sector fixed effects to account for potential country- or sector-specific demand or supply shocks. We report bootstrapped standard errors. The estimated σ is presented in Column (1) of the upper panel of Table 2. Since tariffs do not vary substantially in the short term, we employ long differences from 2000 to 2013 for estimation. Accordingly, the estimated (ρ, σ) should be interpreted as long-run Armington elasticities.[10]

Our baseline estimates are well within the range reported in the literature. As shown in Column (1) of the upper panel of Table 1, the estimated $1-\rho=-4.17$, significant at the 1% level, implies $\rho=5.17$. For comparison, the median estimates of ρ reported by Feenstra et al. (2018)

[10] Imbs and Mejean (2015) notes that trade elasticity estimates based on pooled or aggregated data tend to be biased toward zero due to the covariance between sectoral trade elasticities and sectoral tariff dispersion. To mitigate this bias, we exclude from the pooled regression the sectors with extreme tariff change dispersion: agriculture, forestry, fishing, food and tobacco, and motor vehicles.

Table 2: Estimation of σ

	Dependent variable: $\mathcal{Y}_n^j$				
BACI Data	Baseline (1)	2000-2010 (2)	Alt. Sample (3)	Wt.Avg Tariff (4)	WIOT (5)
Ψ_n^j	1.55***	1.36***	1.46***	1.41***	
	(0.14)	(0.08)	(0.11)	(0.10)	
Observations	801	817	856	801	
R-squared	0.50	0.41	0.51	0.53	
Input-Output Data					
Ψ_n^j	1.41***	1.37***	1.38***	1.32***	1.23***
	(0.09)	(0.06)	(0.08)	(0.07)	(0.27)
Observations	817	821	872	817	535
R-squared	0.50	0.51	0.55	0.57	0.06
Country FEs	✓	✓	✓	✓	✓
Sector FEs	✓	✓	✓	✓	✓

Notes: Bootstrapped standard errors are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

range from 3.22 to 4.05. The benchmark estimate of the trade elasticity in Simonovska and Waugh (2014) is -4.14, implying that $\rho = 5.14$. The estimate of the aggregate trade elasticity in Caliendo and Parro (2015) is 4.55, implying that $\rho = 5.55$.

As reported in Column (1) of the upper panel of Table 2, the baseline estimate of σ is 1.55, significant at the 1% level. The magnitude of σ is less than one-third of ρ, suggesting that the elasticity of substitution between domestic and foreign varieties is substantially lower than that between alternative foreign varieties. This is broadly consistent with the "rule of two" commonly adopted in the literature (Dixon and Jorgenson, 2013). It is also in line with Fajgelbaum et al. (2024), who estimate the import elasticity to be approximately 0.6 times the elasticity of substitution across imported varieties,[11] and Feenstra et al. (2018) fails to reject the hypothesis that ρ is twice as large as σ for about four-fifths of the goods in their sample.

The remainder of Tables 1 and 2 present robustness checks using alternative samples, data sources, and estimation methods. In the upper panel of Table 1, we re-estimate $1 - \rho$ using an alternative period (2000–2010 long difference), a sample including the motor vehicle sector, and aggregate tariffs weighted by trade flows rather than simple averages. The estimates remain robust and quantitatively similar to the baseline, as does σ from the second stage, reported in

[11] Fajgelbaum et al. (2024) employs a three-tier CES demand system, allowing the substitution between HS10 products within four-digit NAICS goods. Their estimated elasticities are lower, with ρ and σ (in our notation) being 2.53 and 1.53, respectively.

Columns (2)–(4) of the upper panel of Table 2. We also report PPML estimates of ρ in Column (5) of Table 1; these are statistically significant and quantitatively similar to the baseline OLS estimates.

The lower panel of each table reports robustness checks that replace BACI trade flows with ICIO data. The estimated value of $1-\rho$ ranges from -2.06 to -2.63, implying ρ values between 3.06 and 3.63. These estimates are lower than the BACI baseline, consistent with attenuation bias arising from measurement error in ICIO's estimated bilateral trade flows. The estimates of σ remain close to the BACI baseline, ranging from 1.23 to 1.41. Importantly, the qualitative result that $\rho > \sigma$ holds across all specifications. The final column of each lower panel reports estimates based on the WIOT database. Although WIOT covers fewer economies, the results remain broadly consistent, with the estimated ρ approximately 50% larger than σ.

4 Counterfactuals

Armed with the estimated elasticities $\rho = 5.17$ and $\sigma = 1.55$, we now quantify the welfare and strategic implications of U.S. trade policy under both Trump administrations. Throughout, we compare the baseline model ($\rho > \sigma$) with the standard model featuring a uniform elasticity ($\rho = \sigma = 5.17$) to highlight the role of third-market leakage. Sections 4.1 and 4.2 examine the trade policies of Trump 1.0 and Trump 2.0, respectively, while Sections 4.3 and 4.4 study strategic deterrence in one-shot and repeated bilateral interactions.

4.1 Trump 1.0: The U.S.-China Trade War

We calibrate the counterfactual model to the 2017 equilibrium using tariff rates from TRAINS and input-output data from ICIO. We aggregate the ICIO sample into 18 economies: 17 major countries or regions, and a rest-of-world (ROW). We also combine the non-tradable service sectors into a single sector. The lists of economies and sectors are reported in Tables B1 and B2 of Appendix B, respectively. Table B3 reports sectoral tariff rates before and after the trade war. The Trumpian tariffs are large—averaging 23.6% across the twenty active sectors, up from 2.2% pre-war—and China's retaliatory tariffs are of comparable magnitude, averaging 21.5% and concentrated in agriculture and food. We evaluate welfare under four counterfactual scenarios: (i)

U.S. unilateral tariff increases, (ii) the full bilateral trade war, (iii) U.S.-China decoupling, and (iv) the bilateral Nash tariff equilibrium, initialized at the 2017 pre-war tariff matrix. In each case, all other bilateral tariff rates remain at pre-war levels.

Table 3 reports the welfare results. Under unilateral U.S. protectionist tariffs, U.S. welfare falls by 0.054% in the baseline model—a counterintuitive finding that reflects two compounding forces. First, because $\rho > \sigma$ and the tariffs apply only to Chinese imports, they divert expenditure primarily toward other foreign suppliers rather than U.S. producers, dissipating the terms-of-trade gain through third-market leakage. Second, even setting leakage aside, the Trumpian tariffs are set far above the U.S. optimum: the Nash equilibrium implies U.S. tariffs on China of only 7.5%, roughly one-third of the 23.6% actually imposed, so the excess tariff generates additional deadweight losses. By comparison, the standard model with $\rho = \sigma$ understates the welfare loss as merely -0.021%. When China retaliates, U.S. losses roughly double to -0.102% under the baseline, versus -0.052% under the standard model. At the extreme of full decoupling, the U.S.

Table 3: Welfare Effects under Trump 1.0 (%)

	(1) U.S. unilateral tariff		(2) U.S.–China trade war		(3) U.S.–China decoupling		(4) U.S.–China Nash tariff	
ISO	$\rho > \sigma$	$\rho = \sigma$	$\rho > \sigma$	$\rho = \sigma$	$\rho > \sigma$	$\rho = \sigma$	$\rho > \sigma$	$\rho = \sigma$
USA	**-0.054**	**-0.021**	**-0.102**	**-0.052**	**-0.670**	**-0.435**	**0.0002**	**0.146**
CHN	**-0.320**	**-0.212**	**-0.331**	**-0.213**	**-0.845**	**-0.535**	**-0.111**	**0.021**
AUS	0.012	-0.032	0.040	-0.023	0.118	-0.030	0.008	-0.003
BRA	0.011	-0.005	0.033	-0.003	0.105	-0.002	0.006	-0.001
CAN	0.116	0.030	0.146	0.022	0.371	0.032	0.045	0.002
CHE	0.021	0.011	0.023	0.010	0.064	0.022	0.010	-0.000
EU	0.037	0.008	0.044	0.008	0.113	0.015	0.015	0.000
GBR	0.021	0.009	0.020	0.007	0.038	0.010	0.007	0.001
IDN	0.068	0.021	0.075	0.020	0.168	0.039	0.019	0.000
IND	0.092	0.053	0.085	0.043	0.176	0.070	0.027	0.003
JPN	0.055	0.009	0.064	0.009	0.148	0.017	0.022	-0.000
KOR	0.069	-0.022	0.103	-0.014	0.287	-0.004	0.036	-0.006
MEX	0.395	0.163	0.412	0.142	0.931	0.234	0.135	0.008
NOR	0.025	0.006	0.026	0.004	0.049	0.007	0.007	0.000
ROW	0.079	0.009	0.099	0.010	0.241	0.025	0.026	-0.001
RUS	0.048	0.016	0.052	0.013	0.105	0.018	0.017	0.001
TUR	0.025	0.021	0.020	0.018	0.036	0.030	0.005	0.001
TWN	0.047	-0.071	0.098	-0.051	0.330	-0.049	0.035	-0.013

Notes: The table reports welfare changes (in percent) relative to the 2017 pre-war baseline equilibrium. The four scenarios correspond to a U.S. unilateral tariff increase, a U.S.–China trade war, U.S.–China decoupling, and the Nash tariff equilibrium, respectively. The baseline model assumes $\rho = 5.17$ and $\sigma = 1.55$ ($\rho > \sigma$), while the standard model assumes $\rho = \sigma = 5.17$. The Nash equilibrium is initialized at the 2017 pre-war tariff matrix.

suffers a real income loss of −0.670% and China −0.845%, making it the most costly scenario for both countries.

The flip side of U.S. welfare losses is large third-country gains, shown in the remaining rows of Table 3. Under unilateral U.S. tariffs, Canada gains 0.116%, Mexico 0.395%, Korea 0.069%, and Japan 0.055% in real income—all well above what the standard model predicts. Under the bilateral trade war, third-country gains widen further: Mexico's gain rises to 0.412% and Canada's to 0.146%. These spillovers are a direct consequence of local trade war dynamics: U.S. and Chinese tariffs redirect import demand away from each other and toward third countries. This finding is consistent with the extensive empirical literature documenting trade diversion during the Trump 1.0 period (Ito, 2022; Alfaro and Chor, 2023; Dang et al., 2023), and the standard model substantially underestimates these gains.

Table 4 compares the bilateral Nash tariffs with the observed trade-war tariffs. The Nash tariffs are strikingly low relative to the observed conflict: the baseline model implies U.S. Nash tariffs on China averaging 7.5% and Chinese Nash tariffs on the U.S. averaging 10.6%—less than half of the corresponding trade-war levels of 23.6% and 21.5%. The standard model predicts higher Nash tariffs (9.9% and 12.7%), but these too fall well short of the actual conflict levels, suggesting that both administrations imposed tariffs substantially above the noncooperative equilibrium. The key is that, in local trade wars, each country's incentive to impose unilateral tariffs is dampened because higher tariffs primarily divert trade toward third countries rather than improve its terms of trade. Nash tariffs are therefore lower than in comparable global trade wars, even though welfare losses could be larger. This also implies that tariff levels can be a misleading gauge of the welfare costs of local trade wars. At the Nash equilibrium, U.S. welfare is essentially unchanged (+0.0002%) while China loses −0.111%, and third countries capture substantial gains. In contrast, the standard model predicts a positive U.S. Nash welfare gain of 0.146%, systematically overstating the benefits of protectionism.

4.2 Trump 2.0: Internalizing Third-Market Leakage

The Trump 1.0 results suggest a central limitation of bilateral trade wars: high tariffs on China diverted trade toward third markets rather than shifting expenditure toward U.S. production, benefiting bystanders at the expense of both the United States and China. The Liberation Day

Table 4: Nash and Trade-War Tariff Rates under Trump 1.0

Sector	$t_{\text{CHN,USA}}$			$t_{\text{USA,CHN}}$		
	Nash-*Bsl.*	Nash-*Std.*	War	Nash-*Bsl.*	Nash-*Std.*	War
Agriculture & forestry	5.8%	12.8%	17.5%	12.1%	14.5%	23.4%
Fishing & aquaculture	2.5%	3.7%	12.2%	10.4%	13.3%	15.4%
Energy mining	0.0%	0.4%	17.5%	4.9%	10.3%	24.2%
Non-energy mining	0.5%	1.4%	18.0%	4.4%	9.8%	19.6%
Mining support	0.6%	2.1%	17.8%	2.1%	3.6%	18.4%
Food, beverages & tobacco	24.4%	14.8%	23.1%	16.3%	14.2%	42.6%
Textiles, leather & footwear	12.2%	10.8%	34.1%	14.9%	16.4%	29.3%
Wood & cork products	6.9%	11.9%	24.7%	9.2%	13.4%	18.1%
Paper & printing	7.0%	13.1%	27.9%	9.7%	13.1%	20.9%
Coke & refined petroleum	4.3%	9.0%	25.6%	7.7%	11.6%	20.1%
Chemicals & pharmaceuticals	9.2%	12.2%	17.6%	10.1%	13.4%	17.9%
Rubber & plastics	9.1%	12.6%	27.9%	12.4%	14.1%	24.4%
Other non-metallic minerals	10.1%	13.2%	33.7%	13.4%	13.9%	23.4%
Basic metals	7.0%	10.3%	18.9%	8.7%	13.0%	13.2%
Fabricated metal products	9.0%	12.8%	27.7%	12.5%	13.3%	21.9%
Computers, electronics & optics	8.2%	10.9%	24.0%	9.9%	13.0%	15.1%
Electrical equipment & machinery, n.e.c.	8.5%	11.1%	27.3%	12.0%	13.4%	19.2%
Motor vehicles & trailers	6.9%	9.8%	29.5%	14.6%	13.2%	22.6%
Other transport equipment	8.5%	12.9%	22.2%	13.0%	12.8%	15.3%
Other manufacturing	9.0%	11.9%	24.8%	14.7%	14.1%	25.8%
Mean	**7.5%**	**9.9%**	**23.6%**	**10.6%**	**12.7%**	**21.5%**

Notes: The table reports sectoral Nash tariffs and observed tariff rates under the Trump 1.0 trade war. $t_{\text{CHN,USA}}$ denotes U.S. tariffs on imports from China and $t_{\text{USA,CHN}}$ denotes Chinese tariffs on imports from the United States. "Nash-*Bsl.*" and "Nash-*Std.*" report Nash tariffs under the baseline ($\rho = 5.17$, $\sigma = 1.55$) and standard ($\rho = \sigma = 5.17$) models, respectively, initialized at the 2017 pre-war tariff matrix. "War" reports observed tariff rates during the Trump 1.0 trade war. All rates are ad valorem and expressed in percent.

(LD) tariff of April 2025 can be understood as an attempt to resolve this tension. By imposing broad-based tariffs simultaneously on all major trading partners—ranging from 10% on Australia, Canada, and the U.K. to 34% on China—the U.S. sought to close the third-market leakage that had dissipated the gains from bilateral protection.[12]

In the second set of counterfactuals, we calibrate the model to the 2019 equilibrium, after the Trump 1.0 tariffs were already in place. For the Nash counterfactual, we compute the bilateral best-response fixed point using the Liberation Day tariffs as the initial tariff matrix. This reflects the idea that subsequent bilateral negotiations and strategic interactions begin from the announced tariff schedule, broadly consistent with how these negotiations have unfolded in prac-

[12]Table B4 in the Data Appendix documents the pre-war bilateral tariff levels and the Liberation Day tariff schedule; the average additional tariff across the seventeen partner economies is 26.9%.

Table 5: Welfare Effects under Trump 2.0 (%)

	(1) U.S. unilateral tariff		(2) China-only retaliation		(3) U.S.–China decoupling		(4) U.S.–partner Nash tariffs	
ISO	$\rho > \sigma$	$\rho = \sigma$	$\rho > \sigma$	$\rho = \sigma$	$\rho > \sigma$	$\rho = \sigma$	$\rho > \sigma$	$\rho = \sigma$
USA	**0.149**	**0.089**	**0.081**	**0.046**	**-0.399**	**-0.273**	**0.198**	**0.442**
CHN	**-0.189**	**-0.191**	**-0.233**	**-0.215**	**-0.590**	**-0.390**	**-0.077**	**-0.119**
AUS	-0.033	-0.100	-0.015	-0.093	0.022	-0.107	-0.021	-0.031
BRA	0.003	-0.094	0.029	-0.093	0.078	-0.094	0.028	0.136
CAN	0.044	-0.402	0.082	-0.414	0.313	-0.392	-0.174	-0.497
CHE	-0.232	-0.263	-0.227	-0.262	-0.216	-0.260	-0.021	-0.303
EU	-0.071	-0.120	-0.057	-0.121	0.003	-0.115	-0.070	-0.090
GBR	0.071	-0.010	0.068	-0.015	0.097	-0.006	-0.004	0.081
IDN	-0.063	-0.120	-0.058	-0.122	0.019	-0.110	0.134	0.394
IND	-0.051	-0.095	-0.057	-0.106	0.032	-0.078	0.127	0.256
JPN	-0.109	-0.162	-0.090	-0.161	-0.022	-0.158	-0.077	-0.006
KOR	-0.281	-0.373	-0.216	-0.358	-0.095	-0.369	-0.219	-0.345
MEX	-0.618	-0.890	-0.592	-0.914	-0.068	-0.836	-0.921	-1.068
NOR	-0.031	-0.128	-0.035	-0.132	-0.010	-0.126	-0.002	-0.097
ROW	-0.235	-0.255	-0.212	-0.251	-0.113	-0.248	-0.155	-0.151
RUS	0.078	-0.039	0.078	-0.044	0.127	-0.035	0.021	-0.028
TUR	0.097	-0.018	0.091	-0.022	0.148	-0.002	0.083	-0.029
TWN	-0.423	-0.523	-0.322	-0.492	-0.199	-0.523	-0.232	-0.491

Notes: The table reports welfare changes (in percent) relative to the 2019 pre-war baseline equilibrium. The four scenarios correspond to a global U.S. unilateral tariff increase, China-only retaliation, U.S.–China decoupling, and pairwise U.S.–partner Nash tariffs, respectively. The baseline model assumes $\rho = 5.17$ and $\sigma = 1.55$ ($\rho > \sigma$), while the standard model assumes $\rho = \sigma = 5.17$. Nash tariffs are initialized at the Liberation Day tariff matrix.

tice. We then evaluate welfare under the same four scenarios as in Section 4.1.

Table 5 reports the welfare results. Under unilateral Liberation Day tariffs with all partners accommodating, U.S. welfare rises by 0.149%—a sharp reversal from the -0.054% loss under Trump 1.0. Broad-based tariffs redirect expenditure toward domestic production rather than toward alternative foreign suppliers, so the terms-of-trade benefit is no longer dissipated through leakage. Even when China retaliates alone while all other partners accommodate, U.S. welfare remains positive at $+0.081\%$, and in the Nash equilibrium the U.S. gains $+0.198\%$. The standard model, in comparison, understates U.S. welfare gains under the first two scenarios ($+0.089\%$ and $+0.046\%$, respectively). In the decoupling scenario, U.S. welfare falls by -0.399%—still a significant loss, but considerably smaller than the -0.670% under Trump 1.0, partly reflecting the fact that bilateral tariffs on China were already elevated before any further escalation.

The welfare reversal for third markets is equally pronounced. Mexico, the single largest ben-

Table 6: Nash and Liberation Day Tariff Rates under Trump 2.0

	$t_{k,\text{USA}}$			$t_{\text{USA},k}$	
Partner k	Nash-*Bsl.*	Nash-*Std.*	LD tariff	Nash-*Bsl.*	Nash-*Std.*
AUS	10.0%	2.9%	10.0%	0.0%	2.3%
BRA	16.1%	18.0%	20.7%	14.5%	16.8%
CAN	10.0%	10.0%	10.0%	0.3%	0.3%
CHE	24.9%	60.7%	41.7%	0.0%	0.0%
CHN	28.1%	25.5%	44.7%	8.8%	9.4%
EU	21.9%	18.2%	25.0%	7.5%	10.8%
GBR	25.0%	14.1%	20.7%	5.4%	8.1%
IDN	16.2%	29.1%	42.8%	8.3%	11.8%
IND	20.5%	27.3%	37.7%	13.7%	15.2%
JPN	20.8%	7.6%	26.2%	5.7%	5.4%
KOR	22.4%	26.4%	26.4%	0.0%	0.0%
MEX	17.0%	17.0%	17.0%	0.0%	0.0%
NOR	15.6%	17.8%	17.8%	3.3%	0.5%
ROW	21.1%	19.5%	29.0%	10.3%	12.4%
RUS	19.2%	12.1%	12.1%	9.0%	6.0%
TUR	18.2%	45.7%	20.8%	10.1%	12.8%
TWN	23.9%	34.1%	34.1%	11.6%	4.4%
Mean	**19.5%**	**22.7%**	**25.7%**	**6.4%**	**6.8%**

Notes: The table reports sector-averaged Nash and Liberation Day tariff rates by partner economy under Trump 2.0. $t_{k,\text{USA}}$ denotes U.S. tariffs on imports from partner k and $t_{\text{USA},k}$ denotes partner k's tariffs on imports from the United States. "Nash-*Bsl.*" and "Nash-*Std.*" report Nash tariffs under the baseline ($\rho = 5.17$, $\sigma = 1.55$) and standard ($\rho = \sigma = 5.17$) models, respectively, initialized at the Liberation Day tariff matrix. "LD tariff" reports U.S. tariff levels under the Liberation Day schedule as a reference. All rates are ad valorem and expressed in percent.

eficiary of Trump 1.0 trade diversion (+0.395%), suffers a welfare loss of −0.618% under Trump 2.0 unilateral tariffs—a swing of more than one percentage point. Canada's gain collapses from +0.116% to +0.044%, Korea falls from +0.069% to −0.281%, and Chinese Taipei from +0.047% to −0.423%. Third-market welfare effects under Trump 2.0 are more nuanced. Each partner faces two offsetting forces: a direct cost from the Liberation Day tariff on its own exports to the U.S., and an indirect benefit from competing exporters facing similarly elevated tariffs. The net outcome depends on relative tariff exposure. Economies with modest Liberation Day tariff increases, such as Brazil (+10%), Turkey (+10%), and the United Kingdom (+10%), record small positive welfare changes. By contrast, economies facing the steepest Liberation Day tariffs, such as Mexico (+17%), Korea (+26%), Chinese Taipei (+32%), and Switzerland (+31%), suffer the largest welfare losses. The model with uniform elasticity again provides a misleading picture: for economies that benefit under $\rho > \sigma$, it predicts losses, because with $\rho = \sigma$ the indirect trade diversion channel is attenuated.

Table 6 reports bilateral Nash tariffs between the United States and each partner economy, computed starting from the Liberation Day tariff matrix. For presentational clarity, the table only reports simple averages across sectors. Several features stand out. First, U.S. Nash tariffs on most partners lie below the corresponding Liberation Day tariffs: for example, the U.S. Nash tariff on China averages 28.1%, compared with a Liberation Day tariff of 44.7%, while the cross-country average falls from 25.7% under Liberation Day tariffs to 19.5% at the Nash equilibrium. This suggests that the Liberation Day tariff overshoots the noncooperative equilibrium and may therefore be better interpreted as an opening bargaining position rather than a final tariff outcome.[13] Second, partner-economy Nash tariffs against the United States average only 6.4%, substantially below U.S. Nash tariffs. Several partners—including Australia, Canada, Korea, and Mexico—set Nash tariffs of zero or near zero on U.S. imports. The asymmetry between U.S. and partner-economy Nash tariffs, together with the U.S. welfare gain of 0.198% at the Nash equilibrium, illustrates why the Liberation Day tariff may constitute a strategically effective opening position: it raises the U.S. bargaining stake while leaving partner economies with limited credible retaliation options.

4.3 Strategic Deterrence I: One-Shot Bilateral Interactions

The welfare results of Section 4.2 suggest that Liberation Day tariffs generate substantial U.S. welfare gains that persist even under Chinese retaliation and at the Nash equilibrium. This naturally raises a strategic question: can individual trading partners credibly deter U.S. unilateralism through bilateral threats? To address this question, we begin with a one-shot sequential game between the United States and partner k, holding Liberation Day tariffs on all other partners fixed. The United States first chooses whether to maintain its tariff or back down; partner k then chooses whether to accommodate or retaliate. If it retaliates, the United States responds in kind. We consider two retaliation outcomes in separate games: bilateral Nash (Scenario 1) and bilateral decoupling (Scenario 2). Figure 2 illustrates the game structure.

Figure 3 summarizes the equilibrium outcome for each partner economy under the baseline

[13] Starting from the 2019 pre-war tariff schedule, the Nash equilibrium delivers substantially lower U.S. welfare gains than starting from the Liberation Day tariff matrix. In this sense, our findings are consistent with Hu et al. (2025), who argue that aggressive tariff increases in Trump 1.0 serve as bargaining devices that strengthen the U.S. negotiating position.

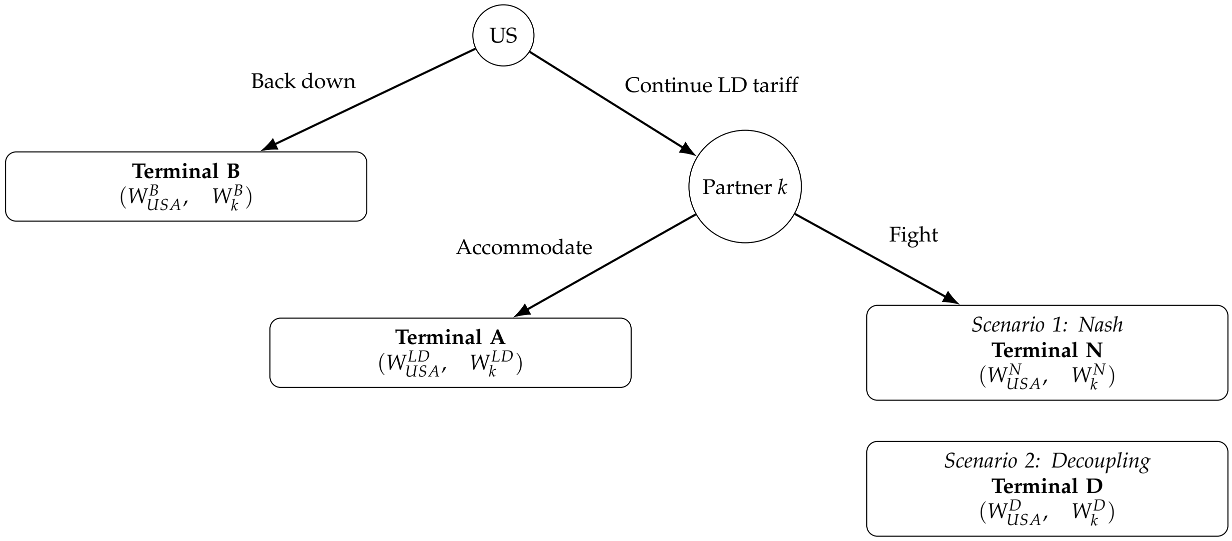

Figure 2: One-Shot Sequential Game post Liberation Day Tariffs

Notes: The figure depicts the one-shot sequential game between the United States and each partner k, taking the Liberation Day tariff on all other partners as given. We consider two scenarios separately, differing only in the continuation outcome from fighting: Nash retaliation (Terminal N, Scenario 1) and bilateral decoupling (Terminal D, Scenario 2).

model ($\rho > \sigma$). The horizontal axis, ΔW_k, measures partner k's welfare gain from fighting rather than accommodating. The vertical axis, ΔW_{US}, measures the U.S. welfare gain from maintaining the Liberation Day tariff rather than backing down, given partner k's optimal response. Each bilateral game's subgame-perfect Nash equilibrium is therefore determined by the quadrant in which the partner lies.[14]

Scenario 1: Nash retaliation. Panel A shows that most partners lie to the right of the vertical zero line and therefore prefer Nash retaliation to accommodation. At the same time, virtually all partners lie above the horizontal zero line, indicating that the United States still prefers to maintain the Liberation Day tariffs. Nash retaliation therefore fails to deter – the unique SPNE features the United States maintaining the Liberation Day tariffs, with most partners retaliating at their bilateral Nash tariffs. A few partners, including Australia, the United Kingdom, and Russia, instead accommodate because their bilateral Nash equilibrium entails U.S. tariffs at or above the Liberation Day level.

Scenario 2: Bilateral decoupling. Panel B shows that every partner lies to the left of the vertical zero line, indicating that decoupling is more costly than accommodation. The threat of

[14]Throughout this section, W denotes the percentage change in welfare relative to the 2019 pre-war baseline. Because this baseline is common across all payoffs, it cancels in pairwise comparisons such as $W_k^N - W_k^{LD}$.

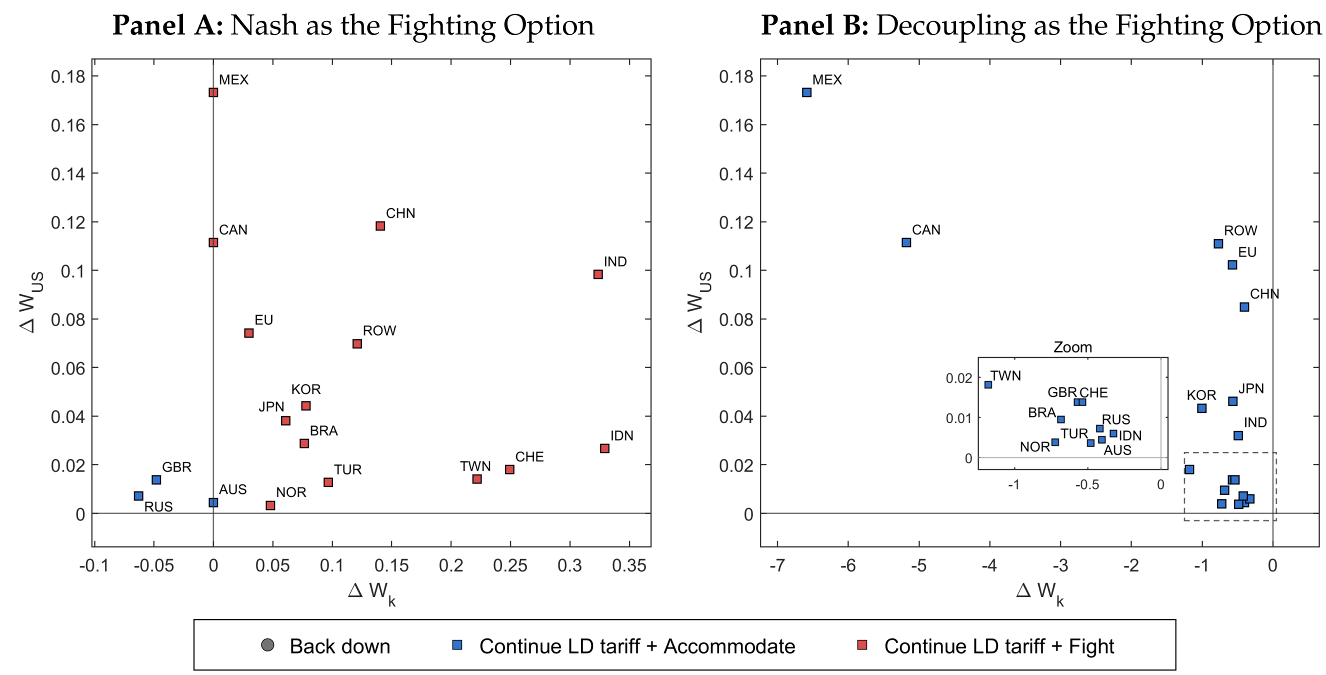

Figure 3: One-Shot Sequential Game: Decision Map ($\rho > \sigma$)

Notes: This figure presents the decisions of the U.S. and each trading partner in the one-shot bilateral sequential game following Liberation Day tariffs. The horizontal axis shows the partner's welfare difference between fighting and accommodating (i.e., $\Delta w_k = W_k^N - W_k^{LD}$ in Panel A; $\Delta w_k = W_k^D - W_k^{LD}$ in Panel B), given that the U.S. maintains Liberation Day tariffs on all other trading partners. The vertical axis measures the U.S. welfare gain from continuing the Liberation Day tariff versus backing down, conditional on partner k's optimal response.

decoupling is therefore not credible. Anticipating universal accommodation, the United States maintains the Liberation Day tariffs. The unique SPNE thus features continued U.S. tariffs and accommodation by every partner.

Taken together, the two scenarios reveal an interesting tension in bilateral deterrence. Nash retaliation is credible for most partners, but it imposes too little cost on the United States to induce it to back down. Bilateral decoupling would be more damaging to the United States,[15] but it is also too costly for the partner itself to constitute a credible threat. Thus, no individual trading partner can discipline U.S. unilateralism through bilateral threats alone. The failure of bilateral deterrence in the one-shot game raises the question of whether repeated interaction can sustain more effective threats. We turn to this possibility in the next subsection.

[15] Bilateral decoupling generates an average U.S. welfare loss of -0.049% across partners.

4.4 Strategic Deterrence II: Repeated Bilateral Interactions

Suppose the stage game described in Figure 2 is repeated infinitely between the U.S. and partner k, with all other bilateral relationships held fixed at Liberation Day tariffs. We probe the conditions under which the preferred equilibrium path—the U.S. backing down in every period—can be sustained through the threat of retaliation, and derive the associated discount factors. We consider a deterrence strategy profile in which partner k punishes any U.S. deviation by fighting for one period before returning to cooperation. This is the minimal credible threat consistent with subgame perfection, and the resulting patience threshold δ_k^* therefore represents an upper bound on the discount factor required for deterrence.

Strategies. The proposed strategy profile is as follows. Partner k plays:

$$\sigma_k(h^t) \;=\; \begin{cases} \text{Fight,} & \text{if the U.S. played LD in the previous period,} \\ \text{Accommodate,} & \text{otherwise,} \end{cases}$$

and the U.S. plays:

$$\sigma_{US}(h^t) \;=\; \begin{cases} \text{Back down,} & \text{if partner } k \text{ fought in the previous period,} \\ \text{LD,} & \text{otherwise.} \end{cases}$$

The proposed strategy profile sustains deterrence if and only if two conditions hold: partner k's threat to fight is credible, and the U.S. prefers backing down to facing retaliation. We study each condition in turn.

Partner k's incentive constraint (IC-k). Suppose the U.S. deviates and imposes Liberation Day tariffs. Partner k faces the following trade-off. By accommodating, k yields W_k^A in the current period and invites permanent Liberation Day exploitation thereafter, generating a continuation value of $W_k^A/(1-\delta_k)$ in total. By fighting, k incurs W_k^F today but—since the U.S.'s strategy prescribes backing down after being fought—restores the equilibrium path and earns W_k^B in every subsequent period. Fighting is therefore sequentially rational whenever:

$$W_k^F + \frac{\delta_k W_k^B}{1-\delta_k} \;\geq\; \frac{W_k^A}{1-\delta_k}, \tag{IC-k}$$

which rearranges to:

$$\delta_k \;\geq\; \delta_k^* \;=\; \frac{W_k^A - W_k^F}{W_k^B - W_k^F}.$$

The threshold δ_k^* lies in $(0, 1)$ whenever $W_k^F < W_k^A < W_k^B$: fighting is costly in the stage game ($W_k^F < W_k^A$), but the long-run benefit of restored peace outweighs the short-run cost ($W_k^A < W_k^B$) if the partner is patient enough. When $W_k^F \geq W_k^A$ (i.e.,$\delta_k^* < 0$), fighting is a dominant strategy and no patience condition is required.

U.S. incentive constraint (IC-US). On the equilibrium path, the U.S. considers a one-shot deviation to LD. Given partner k's strategy, this deviation triggers a fight in the current period, after which the U.S. returns to backing down. The U.S. therefore obtains W_{US}^{LD} net of partner k's retaliation today—equivalently W_{US}^F—and then W_{US}^B in every subsequent period, compared to W_{US}^B in every period on the equilibrium path. The no-deviation condition collapses to:

$$W_{US}^B \;\geq\; W_{US}^F. \tag{IC-US}$$

The US incentive constraint therefore depends purely on the stage-game payoff comparison W_{US}^B vs. W_{US}^F, and is independent of the U.S. discount factor.

Equilibrium conditions and deterrence. The proposed strategy profile constitutes a subgame perfect Nash equilibrium if and only if both incentive constraints are satisfied: (i) partner k is sufficiently patient ($\delta_k \geq \delta_k^*$) so that its threat to fight is credible, and (ii) the U.S. prefers backing down to provoking a fight ($W_{US}^B \geq W_{US}^F$). Condition (ii) is the binding constraint on the U.S. side: if it fails, keeping Liberation Day tariffs would be the dominant strategy of the U.S. We now compute δ_k^* across all trading partners and assess whether condition (i) is empirically plausible given condition (ii).

Table 7: Deterrence Strategy and Equilibrium Outcomes ($\rho > \sigma$)

	Panel A: Nash as the Fighting Option			*Panel B: Decoupling as the Fighting Option*		
Partner	$W^B_{US} - W^F_{US}$	δ^*_k	Equilibrium	$W^B_{US} - W^F_{US}$	δ^*_k	Deter. Cond.
AUS	-0.005	0.000	(LD, A)	0.021	0.865	$\delta_k \geq 0.865$
BRA	-0.029	-0.768	(LD, F)	0.052	0.796	$\delta_k \geq 0.796$
CAN	-0.111	0.000	(LD, A)	0.245	0.814	$\delta_k \geq 0.814$
CHE	-0.018	-0.448	(LD, F)	0.030	0.414	$\delta_k \geq 0.414$
CHN	-0.118	-0.453	(LD, F)	0.462	0.472	$\delta_k \geq 0.472$
EU	-0.074	-0.116	(LD, F)	0.490	0.663	$\delta_k \geq 0.663$
GBR	-0.017	0.258	(LD, A)	0.062	0.795	$\delta_k \geq 0.795$
IDN	-0.027	-6.208	(LD, F)	0.029	0.458	$\delta_k \geq 0.458$
IND	-0.098	-1.820	(LD, F)	0.081	0.494	$\delta_k \geq 0.494$
JPN	-0.038	-0.173	(LD, F)	0.159	0.579	$\delta_k \geq 0.579$
KOR	-0.044	-0.096	(LD, F)	0.079	0.530	$\delta_k \geq 0.530$
MEX	-0.173	0.000	(LD, A)	0.245	0.721	$\delta_k \geq 0.721$
NOR	-0.003	-0.156	(LD, F)	0.013	0.670	$\delta_k \geq 0.670$
ROW	-0.070	-0.306	(LD, F)	0.529	0.598	$\delta_k \geq 0.598$
RUS	-0.007	0.330	(LD, A)	0.026	0.765	$\delta_k \geq 0.765$
TUR	-0.013	-2.425	(LD, F)	0.016	0.779	$\delta_k \geq 0.779$
TWN	-0.014	-0.240	(LD, F)	0.039	0.507	$\delta_k \geq 0.507$

Notes: $W^B_{US} - W^F_{US}$ is the U.S. gain from backing down relative to absorbing one period of retaliation: negative in Panel A (IC-US fails; the U.S. imposes LD regardless) and positive in Panel B (IC-US holds). $\delta^*_k = (W^A_k - W^F_k)/(W^B_k - W^F_k)$ is the minimum patience for partner k's retaliatory threat to be credible; $\delta^*_k \leq 0$ means retaliation is statically dominant. In Panel A, the U.S. imposes LD throughout: (LD, F) when $\delta^*_k \leq 0$, (LD, A) otherwise. In Panel B, the U.S. backs down if and only if $\delta_k \geq \delta^*_k$; below the threshold, (LD, A) prevails. Welfare terms are percent changes relative to the 2019 pre-war benchmark; differences in percentage points.

Bilateral deterrence. Table 7 reports $W^B_{US} - W^F_{US}$, the critical discount factor δ^*_k, and the resulting equilibrium outcome for each partner under both fighting options. Under Nash retaliation, IC-US fails for every partner: in all seventeen bilateral interactions, the United States strictly prefers maintaining the Liberation Day tariffs under Nash retaliation to backing down, as in the one-shot game in Section 4.3. Partner patience is therefore irrelevant—the United States simply continues with the Liberation Day tariffs. Nash-based trigger strategies offer no deterrence.

Under bilateral decoupling, IC-US holds for every partner: the United States prefers backing down to maintaining the Liberation Day tariffs when facing decoupling. Deterrence is therefore feasible in principle, but only if the partner is sufficiently patient to carry out the threat. As shown in Table 7, the required discount factors are high for most partners, typically exceeding 0.70—thresholds that are difficult to reconcile with short electoral horizons and near-term adjustment costs in those economies. China is a notable exception, with $\delta^*_{CHN} = 0.472$, making a credible decoupling threat more plausible than for most other economies.

Table 8: Political Coalition Scenarios: Deterrence and Incentive Constraints

Panel A: Politically motivated coalitions

Coalition	Exp.share	$t^N_{C,US}$	$t^N_{US,C}$	$W^B_{US} - W^F_{US}$	δ^*_C	Equilibrium
Five Eyes (excl. US): CAN, GBR, AUS	18.9%	15.0%	7.5%	−0.112	0.020	(LD, A)
G7 (excl. US): CAN, EU, GBR, JPN	38.9%	23.7%	10.9%	−0.146	0.067	(LD, A)
Carney Coal.: CAN, EU, GBR, JPN, KOR, AUS	45.0%	23.2%	11.9%	−0.122	−0.001	(LD, F)
Carney + Emerging: +BRA, IND, IDN, TUR	51.3%	26.7%	13.6%	−0.170	0.054	(LD, A)
Carney + Emerging + CHN	59.9%	25.9%	13.9%	−0.139	−0.188	(LD, F)

Panel B: Market-power benchmarks

Coalition	Exp.share	$t^N_{C,US}$	$t^N_{US,C}$	$W^B_{US} - W^F_{US}$	δ^*_C	Equilibrium
Large Fight Partners: EU, CHN, JPN, BRA, IND, GBR, CAN, MEX, TWN, RUS, TUR	70.0%	31.1%	18.0%	−0.026	−0.007	(LD, F)
All Partners (excl. ROW)	78.3%	26.7%	14.5%	−0.111	−0.246	(LD, F)
ROW + EU + CAN + MEX + CHN	**73.6%**	**29.4%**	**20.4%**	**0.038**	**0.000**	**Back down**

Notes: Panel A reports deterrence outcomes for five politically motivated coalition scenarios, ordered by combined export share. Panel B reports three market-power benchmarks: the largest feasible political coalition (all large partners plus those with meaningful fight incentives), a near-universal coalition of all named partners excluding ROW, and the minimum effective coalition with ROW that achieves deterrence. Each coalition acts as a single player in a bilateral Nash game against the U.S., with all non-coalition routes fixed at the Liberation Day tariff matrix. "Exp. share" is the coalition's combined share in 2019 pre-war U.S. foreign exports. $t^N_{C,US}$ and $t^N_{US,C}$ are the Nash tariffs chosen by the U.S. and the coalition, respectively. $W^B_{US} - W^F_{US}$ is the U.S. incentive margin; positive means the U.S. prefers to back down. $\delta^*_C = (W^A_C - W^F_C)/(W^B_C - W^F_C)$ is the coalition's minimum patience for the trigger to be credible. "Equilibrium" reports "Back down" if the trigger is sustainable; otherwise (LD, F) if the coalition fights or (LD, A) if it accommodates. Welfare differences are in percentage points relative to the 2019 pre-war benchmark.

Multilateral deterrence. The bilateral analysis establishes a stark conclusion: individual trading partners can hardly deter U.S. unilateralism—either because Nash retaliation imposes insufficient costs on the U.S. or because decoupling, while sufficiently severe, requires patience levels that are difficult to reconcile with real-world political horizons. We now ask whether *coordinated* retaliation can succeed where bilateral threats fail. By coordinating their responses, a coalition of partners can pool market power, impose a larger collective Nash tariff on U.S. exports, and thereby raise the cost to the U.S. of maintaining Liberation Day tariffs.

We model the coalition as a unified player that jointly chooses a common Nash tariff against the United States, while the U.S. simultaneously chooses a common Nash tariff applied uniformly to all coalition members. Tariffs involving economies outside the coalition remain fixed at their Liberation Day levels. The trigger strategy is the same as in the bilateral case, with coalition welfare measured as the income-weighted sum of each member's welfare changes. We consider a coalition capable of sustaining deterrence if two conditions hold: (i) retaliation reverses the U.S. incentive constraint, so that $W_{\text{US}}^{B} \geq W_{\text{US}}^{F}$; and (ii) imposing the Nash tariff is in the coalition's own interest and therefore does not depend on its patience, so that

$$\delta_C^* = \frac{W_C^A - W_C^F}{W_C^B - W_C^F} \leq 0.$$

For coalitions, we restrict attention to Nash retaliation as the only fighting option. Coordinated decoupling would require an unprecedented degree of economic disengagement across multiple major economies and is therefore unlikely to be a relevant case in practice.

We consider eight coalition scenarios organized into two panels. Panel A examines five politically motivated coalitions, ordered by their combined share of U.S. exports.[16] Panel B presents three market-power benchmarks that move beyond political alignment to identify the collective retaliation capacity required for deterrence. Table 8 reports the results.

Panel A shows that none of the politically motivated coalitions satisfies IC-US. All five coalitions, ranging from the *Five Eyes* (18.9% of U.S. foreign exports) to *Carney + Emerging + CHN* (59.9%), yield a negative U.S. incentive margin. The relationship is not monotone: adding members with weak incentives to fight can lower the coalition's Nash tariff. For example, the Carney + Emerging coalition yields a more negative margin (−0.170) than both the smaller Carney Coalition (−0.122) and the larger coalition that also includes China (−0.139). Deterrence therefore depends not only on coalition size, but also on its composition and members' incentives to retaliate.

Panel B considers three market-power benchmarks. The first is a *Large Fight Partners* coalition, which includes countries and regions with either a U.S. export share of at least 3% and a positive bilateral Nash tariff, or a bilateral Nash tariff of at least 9%. It covers 70.0% of U.S. foreign exports and imposes the highest Nash tariff among the coalitions considered (a cross-sector average of 18.0%). Yet the U.S. incentive margin remains slightly negative at −0.026, indicating that the coalition's Nash retaliation is still insufficient to reverse U.S. incentives. The second benchmark includes *All Partners excluding ROW*. Although this coalition covers 78.3% of U.S. foreign exports, its incentive margin falls to −0.111. The reason is that, relative to the first coalition, the additional

[16] New Zealand is excluded from the Five Eyes coalition because it is included in the rest-of-world (ROW) aggregate; given its small size, this omission does not qualitatively affect the results.

members have weaker incentives to retaliate against the U.S. and therefore dilute the coalition's Nash tariff.

The third benchmark identifies an effective coalition: ROW + EU + CAN + MEX + CHN, covering 73.6% of U.S. foreign exports. This is a coalition that satisfies IC-US, with a U.S. incentive margin of $+0.038$ and a coalition patience threshold of $\delta_C^* = 0$, meaning the deterrence outcome is sustainable for any positive discount factor. The key to its success lies in the inclusion of ROW—the aggregate of all smaller economies outside our named economy list. ROW commands the largest single share of U.S. exports (21.7%) and, as shown in Table 7, has a strongly negative δ_k^* under bilateral Nash retaliation, meaning it fights as a dominant strategy. Paired with the large bilateral traders EU, CAN, MEX, and CHN, this coalition achieves both the coverage and the retaliation intensity needed to flip the U.S. incentive.

The coalition analysis yields two broader insights. First, effective deterrence requires a specific combination of market power and fight intensity: neither size alone nor intensity alone is sufficient. The winning coalition pairs large bilateral traders with the collective weight of the smaller economies, which is precisely the configuration that approximates a functioning multilateral trade regime. Second, the results speak directly to the vision articulated by Canadian Prime Minister Carney at Davos: middle powers should unite to resist U.S. unilateralism. Our analysis suggests this vision is only half right. Coordinated retaliation can deter unilateralism, but the coalition capable of doing so looks nothing like a club of middle powers. No politically motivated coalition of middle powers, however ambitious, comes close to satisfying the incentive constraints. What works is a near-universal coalition that combines large traders with the collective weight of smaller economies—precisely the membership structure of the WTO multilateral framework. The implication is clear: effective deterrence of great-power unilateralism may require not a new coalition of the willing, but rather a reinvigoration of the multilateral institutions that already exist.

5 Conclusion

This paper studies the quantitative implications of *local trade wars*—tariff conflicts involving a subset of trading relationships within an interconnected trade network. Central to our analysis is a nested-CES Armington structure that distinguishes the elasticity of substitution between domestic and foreign goods from that across foreign varieties, with the two elasticities recovered through a two-stage gravity estimation that does not require data on domestic prices. The estimated gap between the two elasticities implies substantial third-market leakage from bilateral tariffs, which reshapes the welfare implications and strategic logic of localized trade conflicts.

Three findings follow. First, under Trump 1.0, third-market leakage magnifies U.S. welfare losses and channels large gains to bystanders. The bilateral Nash equilibrium features lower tariffs than under a uniform-elasticity benchmark yet generates larger welfare losses, a paradox that can mislead policymakers who read tariff levels as a proxy for the cost of trade wars. The observed Trump 1.0 tariffs between the U.S. and China exceeded the bilateral Nash by a factor of three, leaving both participants worse off and third markets substantially better off.

Second, the Trump 2.0 Liberation Day schedule reverses these patterns by internalizing third-market leakage and extending tariffs to all major partners. Broad-based tariffs redirect demand toward domestic production, generating U.S. welfare gains and pronounced losses for the third markets that previously benefited from trade diversion. Our Nash analysis nonetheless suggests that the Liberation Day schedule overshoots the noncooperative equilibrium, consistent with its interpretation as an aggressive opening bargaining position rather than a final tariff outcome.

Third, no individual trading partner can credibly deter U.S. unilateralism: in the one-shot bilateral game, Nash retaliation imposes insufficient cost on the U.S., while decoupling is too costly for the partner to be credible. Coordinated retaliation in the repeated game can flip U.S. incentives, but only when the coalition is near-universal—politically motivated coalitions of middle powers, including the one envisioned by Canadian Prime Minister Carney, fall short. The deterrence-capable coalition combines major U.S. trading partners with a sufficiently broad group of smaller economies that have strong incentives to retaliate, broadly resembling the membership of the WTO.

Taken together, these findings suggest that the costs of localized trade conflicts are easily understated by standard models, and that their quantitative implications are more subtle than a simple extension of global-trade-war results would suggest. Because third-market leakages limit what partial coalitions can achieve, disciplining great-power unilateralism may require not a new coalition of the willing but a reinvigoration of the multilateral trading system.

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A Theory Appendix

A.1 "Exact-Hat" Algebra

We consider changes in κ^j_{in}. In relative changes, the expenditure share (4), the equilibrium equation system (7), (6), and (5) can be written as follows:

$$\hat{\lambda}^j_{in} = \frac{\left(\hat{\kappa}^j_{in}\hat{c}^j_i/\hat{T}^j_i\right)^{1-\rho}}{\sum_{k\neq n}\psi^j_{kn}\left(\hat{\kappa}^j_{kn}\hat{c}^j_k/\hat{T}^j_k\right)^{1-\rho}} \frac{\left[\sum_{k\neq n}\psi^j_{kn}\left(\hat{\kappa}^j_{kn}\hat{c}^j_k/\hat{T}^j_k\right)^{1-\rho}\right]^{\frac{1-\sigma}{1-\rho}}}{\left(1-\lambda^j_{nn}\right)\left[\sum_{k\neq n}\psi^j_{kn}\left(\hat{\kappa}^j_{kn}\hat{c}^j_k/\hat{T}^j_k\right)^{1-\rho}\right]^{\frac{1-\sigma}{1-\rho}} + \lambda^j_{nn}\left(\hat{c}^j_n/\hat{T}^j_n\right)^{1-\sigma}}, \quad i\neq n,$$

$$\hat{\lambda}^j_{nn} = \frac{\left(\hat{c}^j_n/\hat{T}^j_n\right)^{1-\sigma}}{\left(1-\lambda^j_{nn}\right)\left[\sum_{k\neq n}\psi^j_{kn}\left(\hat{\kappa}^j_{kn}\hat{c}^j_k/\hat{T}^j_k\right)^{1-\rho}\right]^{\frac{1-\sigma}{1-\rho}} + \lambda^j_{nn}\left(\hat{c}^j_n/\hat{T}^j_n\right)^{1-\sigma}}, \tag{A19}$$

$$\hat{P}^j_n = \left\{\left(1-\lambda^j_{nn}\right)\left[\sum_{k\neq n}\psi^j_{kn}\left(\hat{\kappa}^j_{kn}\hat{c}^j_k\right)^{1-\rho}\right]^{\frac{1-\sigma}{1-\rho}} + \lambda^j_{nn}\left(\hat{c}^j_n\right)^{1-\sigma}\right\}^{\frac{1}{1-\sigma}}; \tag{A20}$$

$$\hat{X}^j_i X^j_i = \alpha^j_i\hat{Y}_iY_i + \sum_{s=1}^{J}\beta^{js}_i\sum_{n=1}^{N}\frac{\hat{\lambda}^s_{in}\hat{X}^s_n\lambda^s_{in}X^s_n}{\widehat{1+t^s_{in}}\left(1+t^s_{in}\right)}; \tag{A21}$$

$$\hat{w}_iw_iL_i = \sum_{j=1}^{J}\beta^{Lj}_i\sum_{n=1}^{N}\frac{\hat{\lambda}^j_{in}\hat{X}^j_n\lambda^j_{in}X^j_n}{\widehat{1+t^j_{in}}\left(1+t^j_{in}\right)}, \tag{A22}$$

where $\psi^j_{in} \equiv \frac{\left(\kappa^j_{in}c^j_i/T^j_i\right)^{1-\rho}}{\sum_{k\neq n}\left(\kappa^j_{kn}c^j_k/T^j_k\right)^{1-\rho}}$ is the import share of country n from i for sector j. The change in input unit cost $\hat{c}^j_i \equiv \hat{w}_i^{\beta^{Lj}_i}\prod_{s=1}^{J}\left(\hat{P}^s_i\right)^{\beta^{sj}_i}$, and $\hat{Y}_iY_i = \hat{w}_iw_iL_i + \sum_{j=1}^{J}\sum_{k=1}^{N}\frac{\left(t^j_{ki}\right)'}{\widehat{1+t^j_{ki}}\left(1+t^j_{ki}\right)}\hat{\lambda}^j_{ki}\hat{X}^j_i\lambda^j_{ki}X^j_i$. The relative change in welfare of the representative consumer in country i is given by $\hat{W}_n = \frac{\hat{Y}_n}{\hat{P}_n}$.

A.2 Proofs to Proposition 1

In the simplified model described in Section 2.3. We normalize $w_1 = 1$ and consider changes in $1+t_{21}$. Denote $\tilde{Z} = \frac{dZ}{Z}$ for any variable z. The total differentiation of the price index and expenditure share equations are therefore given by:

$$\tilde{P}_n = \lambda_{nn}\tilde{w}_n + \sum_{k\neq n}\lambda_{kn}\left[\tilde{\kappa}_{kn} + \tilde{w}_k\right], \tag{A23}$$

and

$$\tilde{\lambda}_{in} = (1-\rho)\,\tilde{\kappa}_{in} + (1-\rho)\,\tilde{w}_i - (1-\sigma)\,\lambda_{nn}\tilde{w}_n - [(1-\rho) - (1-\sigma)\,\lambda_{nn}] \sum_{k\neq n} \psi_{kn}\left(\tilde{\kappa}_{kn} + \tilde{w}_k\right), i \neq n$$
$$\tilde{\lambda}_{nn} = (1-\sigma)\,(1-\lambda_{nn})\,\tilde{w}_n - (1-\sigma) \sum_{k\neq n} \lambda_{kn}\left(\tilde{\kappa}_{kn} + \tilde{w}_k\right). \tag{A24}$$

In the simplified model, there is only one sector and no intermediate inputs, so $\tilde{Y}_i = \tilde{X}_i$. In addition, there are no tariffs in the equilibrium, so it is easy to verify that

$$\tilde{X}_n = \tilde{w}_n + \sum_k \lambda_{kn} dt_{kn}. \tag{A25}$$

In other words, $\tilde{X}_1 = \tilde{w}_1 + \lambda_{21} dt_{21}$ and $\tilde{X}_n = \tilde{w}_n$ for $n = 2, 3$.

Finally, the total differentiation of the wage equations at the initial equilibrium gives the following:

$$\tilde{w}_i = \sum_n \frac{\lambda_{in} X_n}{w_i L_i} \left[\tilde{\lambda}_{in} + \tilde{X}_n - dt_{in}\right]. \tag{A26}$$

Since the three countries are identical and there is no initial trade friction, the initial consumption share, λ_{in}, is given by:

$$\lambda_{in} = \frac{1}{3} \quad \text{for } i, n = 1, 2, 3. \tag{A27}$$

and recall that initial wage and labor endowment all normalized to one, so $X_i = L_i = w_i$ for $i = 1, 2, 3$. Plug these initial conditions into equations (A23) to (A26) and take w_1 as the numeraire (i.e. $\tilde{w}_1 = 0$). After some algebra, we arrive at

$$\tilde{X}_1 = \frac{1}{3} dt_{21}, \quad \tilde{X}_2 = -\frac{1}{3} dt_{21}, \quad \tilde{X}_3 = \frac{1}{3}\left(\frac{\rho-\sigma}{\rho+\sigma}\right) dt_{21}. \tag{A28}$$

$$\tilde{P}_1 = \frac{1}{3}\left(dt_{21} + \tilde{w}_2 + \tilde{w}_3\right) = \frac{1}{9}\left(2 + \frac{\rho-\sigma}{\rho+\sigma}\right) dt_{21}; \tag{A29}$$

$$\tilde{P}_2 = \tilde{P}_3 = \frac{1}{3}\left(\tilde{w}_2 + \tilde{w}_3\right) = -\frac{1}{9}\left(1 - \frac{\rho-\sigma}{\rho+\sigma}\right) dt_{21}; \tag{A30}$$

Therefore the welfare change in each country equals

$$\tilde{W}_1 = \tilde{X}_1 - \tilde{P}_1 = \frac{1}{9}\left(1 - \frac{\rho-\sigma}{\rho+\sigma}\right) dt_{21}. \tag{A31}$$

$$\tilde{W}_2 = \tilde{X}_2 - \tilde{P}_2 = -\frac{1}{9}\left(2 + \frac{\rho - \sigma}{\rho + \sigma}\right) dt_{21}. \tag{A32}$$

$$\tilde{W}_3 = \tilde{X}_3 - \tilde{P}_3 = \frac{1}{9}\left(1 + 2\frac{\rho - \sigma}{\rho + \sigma}\right) dt_{21}. \tag{A33}$$

B Data Appendix

Table B1: List of Economies

Index	Code	Economy	Index	Code	Economy	Index	Code	Economy
1	AUS	Australia	7	GBR	United Kingdom	13	NOR	Norway
2	BRA	Brazil	8	IDN	Indonesia	14	ROW	Rest of world
3	CAN	Canada	9	IND	India	15	RUS	Russia
4	CHE	Switzerland	10	JPN	Japan	16	TUR	Turkey
5	CHN	China	11	KOR	Korea	17	TWN	Chinese Taipei
6	EU	European Union	12	MEX	Mexico	18	USA	United States

Notes: The table reports the economy classification used in the analysis. EU denotes the European Union, defined as the 27 EU member states: 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, and SWE. ROW denotes the residual group of ICIO-77 economies other than the 17 economies listed separately in the table.

Table B2: List of Sectors

Index	Code	Sector Description
1	01T02	Agriculture & forestry
2	03	Fishing & aquaculture
3	05T06	Energy mining
4	07T08	Non-energy mining
5	09	Mining support
6	10T12	Food, beverages & tobacco
7	13T15	Textiles, leather & footwear
8	16	Wood & cork products
9	17T18	Paper & printing
10	19	Coke & refined petroleum
11	20	Chemicals & pharmaceuticals
12	22	Rubber & plastics
13	23	Other non-metallic minerals
14	24	Basic metals
15	25	Fabricated metal products
16	26	Computers, electronics & optics
17	27	Electrical equipment & machinery, n.e.c.
18	29	Motor vehicles & trailers
19	30	Other transport equipment
20	31T33	Other manufacturing
21	S	Services

Notes: The table reports the sector classification used in the analysis. Sector codes are taken from the ICIO sector list. Sector *S* denotes all services listed after sector 31T33 in the ICIO database.

Table B3: Bilateral Tariff Rates under Trump 1.0

		$t_{CHN,USA}$		$t_{USA,CHN}$	
Index	Sector	Pre-war	Trumpian	Pre-war	Retaliation
1	Agriculture & forestry	1.9%	17.5%	11.3%	23.4%
2	Fishing & aquaculture	0.0%	12.2%	9.4%	15.4%
3	Energy mining	0.0%	17.5%	2.7%	24.2%
4	Non-energy mining	0.2%	18.0%	1.7%	19.6%
5	Mining support	0.0%	17.8%	0.0%	18.4%
6	Food, beverages & tobacco	4.9%	23.1%	26.2%	42.6%
7	Textiles, leather & footwear	8.4%	34.1%	13.8%	29.3%
8	Wood & cork products	1.9%	24.7%	5.4%	18.1%
9	Paper & printing	0.0%	27.9%	4.7%	20.9%
10	Coke & refined petroleum	0.2%	25.6%	5.6%	20.1%
11	Chemicals & pharmaceuticals	2.9%	17.6%	6.7%	17.9%
12	Rubber & plastics	3.1%	27.9%	9.9%	24.4%
13	Other non-metallic minerals	3.0%	33.7%	12.5%	23.4%
14	Basic metals	1.3%	18.9%	5.3%	13.2%
15	Fabricated metal products	1.7%	27.7%	10.0%	21.9%
16	Computers, electronics & optics	0.8%	24.0%	5.3%	15.1%
17	Electrical equipment & machinery, n.e.c.	2.0%	27.3%	9.2%	19.2%
18	Motor vehicles & trailers	2.5%	29.5%	14.1%	22.6%
19	Other transport equipment	1.9%	22.2%	6.6%	15.3%
20	Other manufacturing	2.6%	24.8%	15.0%	25.8%

Notes: The table reports sectoral ad valorem tariff rates before and after the U.S.-China trade war. $t_{CHN,USA}$ denotes U.S. tariffs on Chinese imports and $t_{USA,CHN}$ denotes Chinese tariffs on U.S. imports. Pre-war rates reflect the 2017 baseline; Trumpian and Retaliation rates reflect U.S. and Chinese tariffs, respectively, following the Section 301 escalation. All entries are in percent, rounded to one decimal place.

Table B4: Bilateral Tariff Rates under Trump 2.0

	$t_{k,\text{USA}}$			$t_{\text{USA},k}$
Partner k	Pre-war (2019)	$\Delta t_{k,\text{USA}}$	LD tariff	Pre-war (2019)
AUS	0.0%	10.0%	10.0%	0.0%
BRA	10.7%	10.0%	20.7%	11.0%
CAN	0.0%	10.0%	10.0%	0.3%
CHE	10.7%	31.0%	41.7%	0.0%
CHN	10.7%	34.0%	44.7%	6.5%
EU	5.0%	20.0%	25.0%	3.3%
GBR	10.7%	10.0%	20.7%	3.3%
IDN	10.8%	32.0%	42.8%	7.5%
IND	10.7%	27.0%	37.7%	13.3%
JPN	2.2%	24.0%	26.2%	1.9%
KOR	0.4%	26.0%	26.4%	0.0%
MEX	0.0%	17.0%	17.0%	0.0%
NOR	1.8%	16.0%	17.8%	0.5%
ROW	2.1%	26.9%	29.0%	4.2%
RUS	2.1%	10.0%	12.1%	6.0%
TUR	10.8%	10.0%	20.8%	6.5%
TWN	2.1%	32.0%	34.1%	4.4%

Notes: The table reports U.S. and partner-economy tariff rates before and after the Liberation Day tariffs. $t_{k,\text{USA}}$ denotes U.S. tariffs on imports from partner k and $t_{\text{USA},k}$ denotes partner k's tariffs on U.S. imports. Pre-war (2019) rates are from TRAINS. $\Delta t_{k,\text{USA}}$ denotes the Liberation Day tariff increases, sourced from Simonovska (2025). Liberation Day tariff is the sum of the two. All rates are ad valorem and expressed in percent, rounded to one decimal place. For presentational clarity, sector-level tariffs are aggregated to simple averages.