Trade Policy and Power Politics

Philip Economides — *Texas Tech University*

Carlos Góes — *World Bank Group*

Freddie Papazyan — *Texas Tech University*

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Abstract

Standard optimal tariff theory emphasizes terms-of-trade gains for large countries, but typically abstracts from geopolitical alignment and coercive power. We estimate foreign export supply elasticities for over 100 countries and provide empirical evidence that military power is positively associated with tariff protection, even conditional on standard measures of market power. Motivated by this fact, we develop a model of trade policy in which governments choose tariffs under the threat of military conflict, geopolitical alliances form endogenously, and can invest in power accumulation. Military strength shapes disagreement payoffs and the feasibility of peaceful cooperation. The model yields an augmented optimal tariff formula with three components: a standard terms-of-trade motive, a geopolitical wedge through endogenous bloc formation, and a dynamic wedge through the effect of tariffs on future power. Absent geopolitical motives and power accumulation, the model nests the standard static Nash optimal tariff equilibrium.

Keywords: Optimal tariffs; Geoeconomics; Military power.

JEL Classification: F11, F13, C73, F51, F52

1 Introduction

Over the past decade, governments have increased their use of trade policy, including tariffs, non-tariff barriers, and subsidies, among other instruments (Evenett et al. 2026). The use of tariffs by large countries to improve their welfare is present in standard trade theory. Countries can use their market power to improve their terms of trade beyond losses induced by production and consumption distortions. A classical result, summarized by Johnson (1953), is that the optimal tariff for a large country is positive and decreasing in the foreign export supply elasticity. However, that logic abstracts from the use of policy to achieve political objectives. Countries may reward political alignment, discipline rivals, and shape the broader distribution of international influence. Coercive and military capabilities affect what governments can credibly threaten when relations deteriorate and constrain the set of feasible equilibria. In such cases, bargaining happens under the "shadow of power" (Powell 1999).

This paper provides a theory for including strategic considerations and power dynamics into optimal tariff setting and evidence that these factors affect tariff setting beyond countries exploiting their market power. Following Feenstra (1994), Broda and Weinstein (2006) and Broda et al. (2008), we compute import-product measures of market power for over one hundred countries and thousands of products for 2001–2024, a period which features the US and China as two major leaders influencing trade policy setting. We show that countries that have relatively more military power maintain higher product-level tariff rates, even after controlling for the elasticity of foreign export supply – as suggested by standard theory. Controlling for product-level market power and product-level differences in the elasticities of demand across international varieties, we find that military capacity is positively associated with import protection. Moving from the 25th to the 75th percentile of proportionate military spending is associated with average HS4 tariff rates that are approximately $0.19 - 0.25$ percentage points higher, or about $4 - 5$ percent of the mean tariff rate.

We then develop a tractable dynamic general-equilibrium framework of tariff competition under the threat of conflict. We combine three ingredients that are usually studied separately: terms-of-trade manipulation by large countries, geopolitical competition for the alignment of smaller states, and endogenous accumulation of coercive power. Two large leaders opt for external tariffs, while a continuum of smaller countries sort endogenously into competing blocs. Tariff revenues can either be rebated to households or invested in coercive capacity, so current trade policy affects future military power. Military power, in turn, shapes disagreement payoffs because, when negotiations break down, leaders can escalate to conflict and the winner can impose its preferred trade regime. This feedback between trade policy and coercive capacity generates a dynamic strategic environment in which tariffs reflect not only current terms-of-trade motives, but also geopolitical alignment and continuation values. Our main theoretical result is an augmented optimal tariff formula that includes the optimal terms-of-trade motive with a geopolitical and a dynamic power accumulation wedge. Additionally, we show that the model remains tractable and we prove that the cross-sectional equilibrium exists and is unique even with endogenous bloc formation.

Our paper contributes to several strands of the literature. First, we contribute to the literature on optimal tariff setting. A classical result in trade theory is that large countries have incentives to impose positive tariffs when they face upward-sloping foreign export supply schedules (Johnson 1953). Ossa (2014) quantifies optimal tariffs in an uncooperative Nash equilibrium, while Lashkaripour (2021) and Ignatenko et al. (2025) derive sufficient-statistics formulas for the cost of global tariff escalation. Many other papers, including Grossman and Helpman (1994), Bagwell and Staiger (1999), Syropoulos (2002), Bagwell et al. (2021) developed optimal tariff formation with different theoretical perspectives. Closest to our paper, Becko and O'Connor (2025) study how forward-looking governments use peacetime trade and industrial policy to build future geopolitical leverage and Becko et al. (2025) write a model in which large countries can use trade policy to induce changes in geopolitical alignment in other countries. Our paper differs in two important aspects. We write a general equilibrium model that is close in spirit to modern quantitative trade models, in which bloc alliances emerge endogenously. The model remains tractable and preserves aggregation and equilibrium properties. Additionally, in our framework, tariff revenues can finance military capacity, so tariff choice affects not only current terms of trade but also future strategic conditions – power accumulation is itself an endogenous choice of trade policy. This yields an augmented optimal-tariff formula in which the standard market-power motive is supplemented by geopolitical-alignment and continuation-value wedges.

Second, we add to studies of geoeconomics, economic statecraft, and coercive bargaining (Hirschman 1945, Powell 1999, Clayton et al. 2026). This literature emphasizes that international economic relationships can shape the distribution of political leverage and the incentives for conflict. Martin et al. (2008) shows that trade openness has theoretically ambiguous effects on conflict. Their analysis highlights an important channel through which trade integration affects conflict incentives, but treats trade policy largely as part of the background environment rather than as an endogenous instrument chosen to alter geopolitical bargaining positions. More closely related to our focus on coercion, Cooley (2020) studies trade policy in the shadow of military power. Rather than focusing on how coercive power shapes openness, we study how governments choose tariffs when current policy affects both the composition of geopolitical blocs and the future balance of coercive power. Tariff policy is not only disciplined by power politics; it also helps produce future power. Thoenig (2024) provides a complementary quantitative framework for studying trade under the shadow of war, emphasizing how trade networks, sanctions, and strategic vulnerabilities affect the economic costs of geopolitical conflict. Our focus differs by endogenizing tariff choice within the bargaining environment rather than taking trade linkages or sanctions capacity as given. Tariffs influence follower alignment, the no-war bargaining set, and the accumulation of future military capacity through tariff-financed investment. This links conventional trade-policy instruments to the broader logic of power politics while retaining the optimal-tariff benchmark as a limiting case.

Third, we add to empirical analyses of tariff policy, market power, and non-market bargaining (Bagwell et al. 2021, Beshkar et al. 2015, Beshkar and Lee 2022). More directly related to our work, Broda et al. (2008) estimate foreign export supply and variety demand elasticities, and yields evidence suggesting that market power contributes positively to unilateral tariff rate setting across a sample of 15 non-WTO countries in the mid-1990's. We use the same methodological approach, as outlined in Feenstra (1994) and Broda and Weinstein (2006) and cover a much broader range of over one hundred countries for the modern, post-WTO period (2001-2024). Even after controlling for market power measures, we find a positive relationship between countries' relative military strength and HS4-importer tariff rates. Additionally, we find further supportive evidence of military spending enabling greater tariff rates to be scheduled when sampling for countries with relatively weaker WTO commitments. These facts suggest that the strategic use of trade policy extends beyond the static market-power channel emphasized in the standard optimal-tariff framework.

The remainder of the paper proceeds as follows. In Section 2, we describe our data and outline our main empirical findings. Section 3 details a dynamic trade model that incorporates mechanisms through which military power influences tariff-setting policies. Section 4 includes our quantification of the model. We provide concluding remarks in Section 5.

2 Data and Empirical Results

In the following section, we present our main empirical work and results. In short, we estimate metrics of importer market power for a large set of countries during the early 21st Century and show that applied tariffs are strongly associated with strategic variables (such as military expenditure) even after conditioning on these metrics of market power. We then show that these results persist even in cases in which countries are unconstrained by the international trade regime and, therefore, have relevant policy space to freely set their applied tariffs.

We start by explaining how each variable is sourced, harmonized, and prepared for the empirical analysis. We then present a series of quality checks on our elasticity estimates and detail our key empirical findings. Finally, we use the estimated elasticities to check the empirical association between effectively applied tariffs and strategic variables – net of market power.

2.1 Data

Tariff Rates. Our dependent variable is the applied tariff rate at the importer-product level. We construct this measure using the Global Tariff Database developed by Teti (2024). This source is particularly useful for our setting because standard tariff sources suffer from missing observations, incomplete reporting, and false interpolation. Teti (2024) shows that these data problems can generate substantial measurement error and selection bias, especially in empirical work that relies on cross-country tariff variation. The database corrects these issues using a new interpolation procedure and provides global tariff data at the HS6 bilateral level. The data are available in HS6 bilateral form and include both simple averages and current-year trade-weighted averages.[1]

Market Power and Tariff Revenue. Optimal tariffs are more attractive when foreign export supply is less elastic, while tariff revenue considerations are stronger when substitution across foreign varieties is more limited. The key objects we must estimate are, therefore, the inverse foreign export supply elasticity, ω_{ig} (which captures importer i's market power in HS4 product g) and the inverse of the elasticity of substitution across foreign varieties, $1/\sigma_{ig}$ (which proxies for the tariff-revenue motive).

In order to do so, we follow the methods pioneered by Feenstra (1994) and later outlined in Broda and Weinstein (2006) and Broda et al. (2008). We use disaggregated trade-flow data at the importer-exporter-period-product level to estimate market power via the inverse of the foreign export supply elasticity, as well as the fiscal motive for tariff-setting through the inverse of the elasticity of substitution across foreign varieties. We use BACI trade data, for 2001–2024, from the Centre for Prospective Studies and International Information (CEPII) (Gaulier and Zignago 2010).

In short, the method starts from a system of import (demand) and export (supply) equations derived from a CES utility function and, under the assumption that shocks to demand and supply are uncorrelated, uses variation across varieties within the same importer-product market to identify foreign export supply and import substitution elasticities. Empirically,

[1] A public version of the Global Tariff Database can be accessed at https://feodorateti.github.io/data.html. The HS6 version of the database was shared with the authors by Fiodora Teti.

we use import values and quantities at the HS6 level, we construct our elasticity pairs for importer-HS4 groups, the product level used in our empirical analysis. Within each importer-HS4 market, varieties are defined as exporter-HS6 pairs. This preserves the cross-variety variation needed for our adopted procedure. We describe the data work and method in detail, respectively, in Appendices E.1 and E.2[2].

Cells with insufficient support or variability are excluded. Our diagnostics indicate that the estimator produces a large usable sample: 130,176 importer-HS4 cells, or 90.1 percent of all estimated cells, yield feasible parameters. The median inverse foreign export supply elasticity is 1.82. As in BLW, the distribution of ω_{ig} is right-skewed, so we report diagnostics based on medians, and top-decile exclusions.

Military Expenditure. Our main variable of interest captures the non-market bargaining power aspect of tariff-setting measured using military expenditure data from the Stockholm International Peace Research Institute (SIPRI). We use a constant-dollar series to construct comparable measures of military capacity across countries and over time. Let M_{it} denote military expenditure for country i in year t. To account for the relative power of countries, our key variable is measured as log military spending relative to the United States, $\ln\left(\frac{M_{it}}{M_{US,t}}\right)$. This scaling follows the idea that the relevant strategic comparison is not absolute military spending alone, but rather a country's military position relative to the dominant military power. For robustness, we calculate military spending as a percentage of a country's own GDP as an alternative measure of military power. This accounts for how intensely military strength appears relative to a country's total productive capacity.

The SIPRI data require several harmonization steps before being merged into the trade and tariff panel. Country names are cleaned and mapped to ISO3 codes. We retain countries with valid military expenditure observations over the sample period used in the analysis. For successor states, we use consistent country definitions over time where appropriate.

The military variable is merged to the importer-year dimension. Since tariffs and market-power estimates are observed at the importer-product level, the military measure varies across importer-years and is common across products within an importer-year. In specifications with country or country-sector fixed effects, identification from military expenditure comes from the remaining cross-time or interaction variation allowed by the specification.

[2] Full details of the estimation procedure, including the moment equations, admissibility restrictions, and grid-search implementation, are provided in the Data Appendix. The quality of the recovered elasticities is central to their use as controls. Given that ω_{ig} is a nonlinear transformation of the recovered structural parameters, some estimates can become numerically fragile when the transformation denominator is close to zero.

Auxiliary Data. We use several auxiliary sources to construct controls and calibration moments. First, we measure tariff water as the difference between bound and applied MFN tariff rates, using WTO/WITS-TRAINS tariff schedules where bound rates are available. This measure captures the amount of policy space an importer has between its applied tariff and its WTO commitment, and is used to examine whether military-power effects are stronger when governments have more discretion over tariff setting. Second, for the calibration exercises, we use the Penn World Table to construct real consumption per capita, measured as household and government consumption relative to population and normalized by the world-year average (**?**). Third, we use UN General Assembly ideal-point estimates from **?** to measure geopolitical proximity. For each country-year, we compute the distance to an East benchmark and a West benchmark in UNGA voting space. The West benchmark is the United States. The East benchmark is Russia/USSR through 1991 and China thereafter. These distances are used only for the alignment calibration and diagnostic exercises, not for the main tariff regressions.

2.2 Stylized Facts

Estimating foreign export supply elasticities is a careful exercise that we approach with caution. Here, we report trends as diagnostic checks that examine whether (i) the estimates reproduce familiar patterns across product types; and (ii) whether they align with the elasticity structure in Broda et al. (2008). Using Rauch (1999) product classifications into commodities (goods traded on organized exchanges), reference goods (with quoted reference prices), and differentiated goods (those that cannot be priced by either of these mean), we find that the implied inverse export supply elasticities vary systematically product types.

Figure 1 summarizes the resulting estimates by product type and income group. We group the 111 importers in our sample into GDP per capita terciles over the 2001–2024 period. Differentiated goods exhibit the highest market power, followed by reference-priced goods and then commodities. This ranking is consistent with the intuition that more differentiated products are less substitutable across foreign suppliers, while commodities are more homogeneous and therefore face more elastic foreign export supply. To ensure that these patterns are not driven by countries with a larger number of matched HS4 products, panel (b) first computes median inverse export supply elasticities within each country–product-type cell and then reports medians across countries within each income tercile. The product-type ranking remains visible under this weighting.

In Figure 2 we compare our estimates to those in Broda et al. (2008) for their 15-country sample. Given that market power estimates are highly skewed, groups matched importer–HS4 observations into quantile bins of the BLW inverse elasticity. We plot the median modern

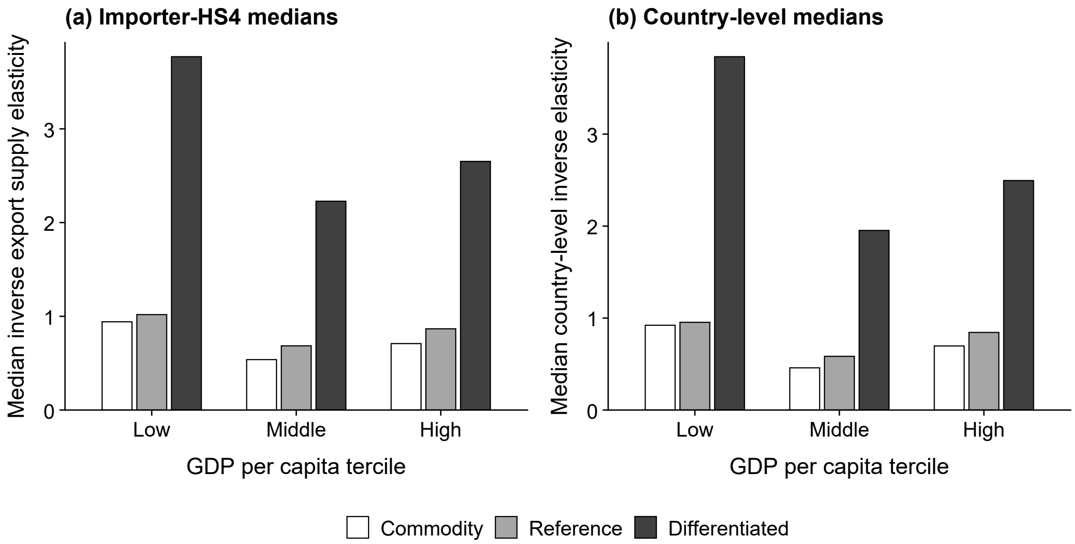

Figure 1: Inverse Export Supply Elasticities by Product Type and Income Group

Notes: Countries are grouped into terciles by average GDP per capita over 2001–2024. Panel (a) reports medians across importer-HS4 cells. Panel (b) first computes country-product-type medians across HS4 products, then reports medians across countries within each income tercile.

inverse elasticity within each bin. The relationship is positive, indicating that cells with higher inverse export supply elasticities in the BLW data also tend to have higher modern inverse elasticities. While we preserve the relative structure of the original BLW estimates, our estimates are considerably more compressed. This may be due to the use of different trade data and our coverage of a substantially later time period, during which trade integration, supplier composition, and product-level sourcing patterns changed markedly. We therefore interpret the figure as evidence of qualitative alignment rather than numerical equivalence.

Given that the elasticity estimates reproduce familiar product-type patterns, we next ask whether tariff protection is systematically related to military capacity in the modern data. This exercise uses the 2001–2024 sample, which combines importer–HS4 tariff measures, estimated inverse foreign export supply elasticities, inverse substitution elasticities, and country-level measures of military spending, GDP, and GDP per capita. This setting covers a much larger set of countries and is closer in time to the geopolitical environment motivating the model. For the subsample of countries with military spending data throughout the period, the 111 countries in our estimating sample account for approximately 94.4–95.1 percent of global GDP.

The sample is useful for documenting whether the relationship between military capacity and tariffs is visible in contemporary data. At the same time, we do not treat it as the cleanest identification environment. Post-2001 tariff schedules may reflect WTO bindings, preferential

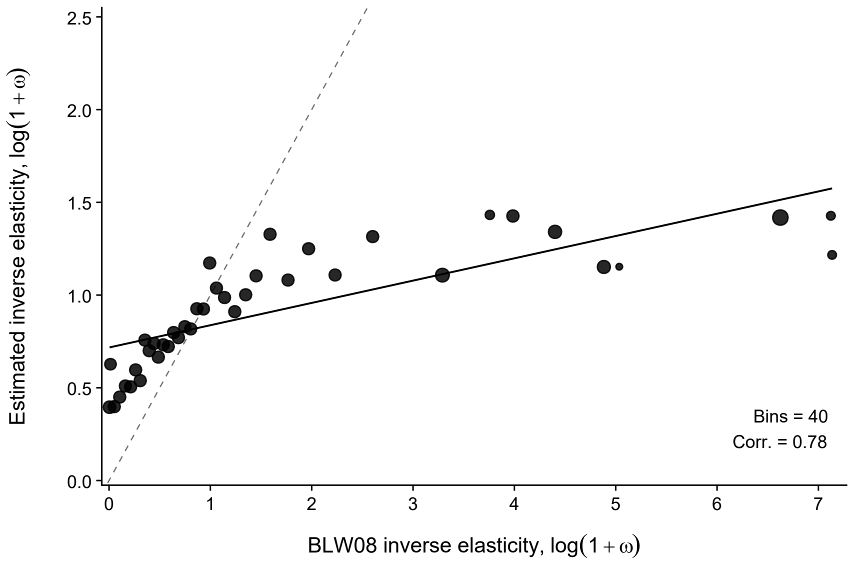

Figure 2: Comparison to BLW Inverse Export Supply Elasticities

Notes: The figure compares matched importer–HS4 inverse export supply elasticities from the BLW replication data to modern estimates constructed using 2001–2024 trade values. Points report medians within quantile bins of the BLW inverse elasticity. Both axes are in $\log(1+\omega)$. The dashed line is the 45-degree line. The fitted line is estimated using the binned medians. The displayed vertical axis is truncated at 2.5 to improve readability; the fitted line is estimated before this display truncation.

trade agreements, negotiated liberalization, and retaliatory episodes. Military expenditure may also proxy for broader state capacity, geopolitical influence, or exposure to security threats. We therefore interpret the modern estimates as broad descriptive evidence on the military spending–tariff relationship.

For the baseline specifications, the estimating equation is

$$\bar{\tau}_{ig} = \alpha + \beta_1 \omega_{ig} + \beta_2 \sigma_{ig}^{-1} + \gamma \text{Mil}_i + X_i' \delta + \eta_s + \varepsilon_{ig}, \tag{1}$$

where i indexes importers and g indexes HS4 products. The dependent variable $\bar{\tau}_{ig}$ is the average applied tariff imposed by importer i on HS4 product g. The term ω_{ig} denotes the inverse foreign export supply elasticity faced by importer i in product g, capturing the standard terms-of-trade motive for tariff protection. The term σ_{ig}^{-1} denotes the inverse elasticity of substitution across foreign varieties, following Broda et al. (2008) in capturing the tariff-revenue motive. The variable Mil_i denotes military capacity, which we measure as military spending as a share of GDP and military spending relative to U.S. military expenditure. The vector X_i includes country-level controls such as GDP and GDP per capita, and η_s denotes industry-section fixed effects.

A concern in the modern panel is that contemporaneous trade weights may themselves respond to tariff policy. For example, if a particular tariff rate is increased, the corresponding trade values for that given year may decline in such a manner that the average tariff rate falls. To reduce this source of endogeneity, our preferred aggregation uses fixed historical trade weights based on the 1995–1997 period. This holds the product-composition weights fixed prior to the sample and mitigates the concern that tariff-induced changes in trade shares mechanically affect the measured tariff aggregate. When instrumenting the elasticity controls, we use leave-one-importer-out same-HS4 averages as excluded instruments. The identifying assumption is that product-level elasticity conditions in other markets help predict the elasticity faced by importer i, while reducing mechanical correlation with importer-specific tariff choices.

Table 1 presents the baseline empirical relationship between military capacity and tariff protection. Across specifications, tariff rates are positively associated with military capacity after conditioning on the standard market-power controls emphasized by optimal tariff theory. This relationship is present whether military capacity is measured as military spending as a share of GDP or as military expenditure relative to the United States.

The magnitude is easiest to interpret over the observed cross-country distribution. Moving from the 25th to the 75th percentile of military spending as a share of GDP, from 2.6 to 6.3 percent of GDP, is associated with average HS4 tariff rates that are approximately 0.19 percentage points higher. The same estimate implies that a one percentage-point increase in military spending as a share of GDP is associated with tariff rates that are about 0.07 percentage points higher at the 25th percentile, 0.05 percentage points higher at the median, and 0.03 percentage points higher at the 75th percentile.[3] Using military spending relative to U.S. military expenditure yields a similar distributional implication: moving from the 25th to the 75th percentile of that measure is associated with tariffs about 0.25 percentage points higher. Relative to an average tariff rate of 5.14 percent, these estimates correspond to roughly 4–5 percent of the mean tariff.

The relationship also persists when we include inverse export supply and inverse substitution elasticity controls, suggesting that military capacity captures variation in tariff protection beyond the canonical terms-of-trade and tariff-revenue channels. We interpret these estimates as evidence of a robust moden correlation between military capacity and tariff protection.

[3] For a log-level specification, the effect of increasing military spending from s to $s + \Delta s$ is $\hat{\beta}\,[\log(s + \Delta s) - \log(s)]$, where s is measured in percentage points. The 25th percentile, median, and 75th percentile of military spending relative to GDP in the country sample are 2.6, 3.9, and 6.3 percent of GDP. A one percentage point increase from those starting values implies proportional increases of approximately 39, 25, and 16 percent, respectively.

Table 1: Military Spending and Import Tariffs: 2001-2024 sample

Dependent variable:	Average tariff at four-digit HS (%)					
	(1)	(2)	(3)	(4)	(5)	(6)
Dummy = mid or high inv. exp. elast.	5.693***	6.007***	6.007***			
	(0.1168)	(0.1392)	(0.1392)			
Mid and high inv. imp. elast.	-5.748***	-6.183***	-6.182***			
	(0.1799)	(0.2213)	(0.2213)			
Log inverse foreign export supply elasticity				1.040***	1.093***	1.093***
				(0.0233)	(0.0280)	(0.0280)
Log inverse import demand elasticity				-3.113***	-3.185***	-3.184***
				(0.1208)	(0.1432)	(0.1432)
Log military spending share of GDP		0.2091***			0.2036***	
		(0.0349)			(0.0341)	
Log military spending relative to US			0.0878**			0.0856**
			(0.0356)			(0.0348)
Country-Industry Section	Yes			Yes		
Industry Section		Yes	Yes		Yes	Yes
Observations	113,065	113,065	113,065	113,065	113,065	113,065
Average tariff rate	5.14	5.14	5.14	5.14	5.14	5.14
R^2	0.642	0.301	0.300	0.637	0.295	0.294
Within R^2	0.042	0.258	0.257	0.029	0.251	0.251
1st-stage F: export elasticity	9,047.6	8,974.4	8,974.4	8,795.5	8,080.5	8,080.7
1st-stage F: import elasticity	3,443.8	3,386.9	3,386.9	3,722.8	3,549.9	3,550.0

Notes: Standard errors robust to country and product clustering are reported in parentheses. The average tariff rate row reports the mean dependent variable in each estimation sample. Columns (2), (3), (5), and (6) include controls for country size and income per capita. Tariffs are aggregated using fixed 1995–1997 historical trade weights, reducing concerns that contemporaneous trade shares respond endogenously to tariff changes. Columns (2) and (5) measure military spending as a share of GDP. Columns (3) and (6) measure military spending relative to US military expenditure. Log inverse export elasticity corresponds to $\log(1/\varepsilon)$, and the inverse elasticity parameter corresponds to $\log(1/\sigma)$. Endogenous elasticity controls are instrumented using leave-one-importer-out same-HS4 averages. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

2.3 Policy Autonomy

Tariff water. So far we have shown that across all countries in our sample, for the post WTO period (2001-2024), those with more strategic power tended to apply higher tariffs, even after controlling for market power and revenue concerns. But this period is also characterized by a small policy space. Due to the expansion of the international trade regime through increased membership of the WTO and spread of preferential trade agreements, countries increasingly lacked policy space to freely set their tariffs in order to unilaterally maximize domestic welfare.

In order to evaluate if this relationship holds when countries have policy autonomy, we isolate the level of 'tariff water' that countries might have at any given time, defined as the difference between a country's bound MFN tariff rate and its applied MFN tariff rate (**??**). Bound tariffs represent WTO commitments that place legal ceilings on applied rates, while applied

MFN tariffs are the rates governments actually impose on non-preferential trading partners. A country with little tariff water applies tariffs close to its WTO bindings and therefore has relatively limited room to raise tariffs without violating its commitments. A country with greater tariff water applies tariffs further below its bindings and has more scope to adjust applied rates within the existing WTO schedule. If military or coercive capacity matters for tariff setting because it changes the feasible bargaining set, the ability to withstand foreign pressure, or the willingness to exploit available policy space, then its association with tariffs should be strongest where WTO commitments leave greater room for adjustment.

Table 2: High Tariff Water Relative to Medium and Low Tariff Water

Dependent variable:	Average tariff at four-digit HS (%)			
	Categorical elasticities		Log elasticities	
	Mil./GDP	Mil./US	Mil./GDP	Mil./US
High tariff water	1.047***	0.747***	0.993***	0.678***
	(0.066)	(0.065)	(0.064)	(0.063)
Log military spending share of GDP	0.397***		0.180***	
	(0.050)		(0.050)	
Log military spending share of GDP × High water	1.694***		2.126***	
	(0.072)		(0.071)	
Log military spending relative to US		0.940***		0.861***
		(0.047)		(0.046)
Log military spending relative to US × High water		-0.046		0.052*
		(0.032)		(0.031)
Observations	63,703	63,703	63,703	63,703
Average tariff rate	5.44	5.44	5.44	5.44
R^2	0.259	0.249	0.251	0.241
Within R^2	0.196	0.185	0.188	0.178

Notes: Standard errors robust to country and product clustering are reported in parentheses. Countries are assigned to tariff-water terciles using the average difference between simple-average bound MFN tariffs and simple-average applied MFN tariffs over 2001–2024. The table restricts to countries with at least ten years of tariff-water data and average binding coverage of at least 50 percent. All specifications use the modern 2001–2024 sample and historical 1995–1997 trade weights for tariff aggregation. The omitted tariff-water category is the medium-to-low group. Columns (1) and (2) use the categorical elasticity controls from Table 1; columns (3) and (4) use the log elasticity controls. All columns include industry-section fixed effects and controls for country size and income per capita. The corresponding inverse export supply elasticity and inverse import demand elasticity controls are included but omitted for compactness. Elasticity controls are instrumented using leave-one-importer-out same-HS4 averages. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 7 tests this prediction by splitting the 2001–2024 sample into terciles of average 'tariff water'. Given that tariff water is only defined for bound tariff lines, this introduces a restriction to the set of countries that can feasibly be included. We restricts attention to countries with at least ten years of tariff-water data and average binding coverage of at least 50 percent over the time span of 2001 to 2024.[4] The pattern is consistent with the policy-autonomy interpretation. The military-spending coefficients are largest in the high-water group, where applied tariffs sit furthest below WTO-bound ceilings. They are smaller in the low- and medium-water groups, where legal room for tariff adjustment is more limited or less clearly aligned with the mechanism. Thus, the broad modern correlation in Table 1 is concentrated among countries with greater formal tariff-policy discretion. Appendix Tables 7–9 report analogous splits using the unrestricted water classification, a stricter 75 percent binding-coverage threshold, and customs union coherent redefinition of water tariffs.

Pre-WTO Tariff Setting. We then follow Broda et al. (2008), who study average tariffs at the importer–HS4 level for a set of countries whose tariff schedules were not yet tightly constrained by WTO commitments. This environment is useful for our purposes because tariff variation is more likely to reflect unilateral tariff-setting incentives rather than negotiated bindings and preferential trade agreements. We therefore treat the BLW pre-WTO setting as the cleanest environment for studying whether non-market bargaining power is associated with tariff protection, after conditioning on market power.

The BLW regressions use average tariffs at the four-digit HS level over the 1990–1995 period. The sample includes 15 countries for which detailed product-level tariff schedules are available and whose tariff choices were not yet tightly constrained by WTO commitments.[5] We augment this framework by averaging military expenditure over the period, measured as a share of GDP and relative to U.S. spending. We retain Equation (1) as the regression specification, with the modern tariff and elasticity measures replaced by their BLW-sample counterparts.[6]

The elasticity controls vary at the importer–HS4 level and represent the standard BLW market-power and tariff-revenue channels. In contrast, military expenditure is measured at the country level. As a result, specifications with industry-section fixed effects preserve the cross-country variation needed to estimate the association between military capacity and tariff protection, while still comparing products within broad sectors. We also report specifications with country–industry-section fixed effects. These absorb all country-level differences within

[4]Binding coverage is the share of tariff lines for which a WTO bound rate is observed. When binding coverage is low, average tariff water is calculated over only a selected subset of the tariff schedule and may not represent the country's broader legal room to adjust applied tariffs. The 50 percent threshold is therefore used as a measurement-quality screen: it ensures that the water measure summarizes at least a majority of bound tariff lines on average. Appendix tables show that the qualitative pattern is similar under alternative classifications, including a stricter 75 percent binding-coverage threshold and a customs-union-collapsed tariff-policy-unit split.

[5]The sample includes Algeria, Belarus, Bolivia, China, Czech Republic, Ecuador, Latvia, Lebanon, Lithuania, Oman, Paraguay, Russia, Saudi Arabia, Taiwan, and Ukraine.

[6]We source these measures directly from the paper's associated replication package, which can be accessed at https://www.openicpsr.org/openicpsr/project/113273/version/V1/view

Table 3: Military Spending and Import Tariffs

Dependent variable:	Average tariff at four-digit HS (%)					
	(1)	(2)	(3)	(4)	(5)	(6)
Dummy = mid or high inv. exp. elast.	9.038***	7.282***	7.289***			
	(1.250)	(1.606)	(1.606)			
Mid and high inv. imp. elast.	-0.2563	0.6733	0.6770			
	(2.113)	(2.913)	(2.913)			
Log inverse foreign export supply elast.				1.779***	1.438***	1.440***
				(0.2376)	(0.2874)	(0.2875)
Log inverse import demand elast.				-0.8228	-0.4387	-0.4381
				(0.8220)	(1.084)	(1.085)
Log military spending share of GDP		0.1829**			0.2261*	
		(0.0866)			(0.1293)	
Log military spending relative to US			0.1476*			0.1925
			(0.0881)			(0.1314)
Fixed effects:						
Country-Industry Section	Yes			Yes		
Industry Section		Yes	Yes		Yes	Yes
Observations	12,254	12,254	12,254	12,254	12,254	12,254
Average tariff rate	13.38	13.38	13.38	13.38	13.38	13.38
R^2	0.531	0.096	0.096	0.531	0.096	0.096
Within R^2	0.008	0.018	0.018	0.008	0.018	0.018
1st-stage F: export elasticity	370.2	348.3	348.3	311.9	296.0	296.0
1st-stage F: import elasticity	101.5	91.3	91.3	144.1	124.5	124.5

Notes: Standard errors robust to country and product clustering are reported in parentheses. The average tariff rate row reports the mean dependent variable in each estimation sample. Columns (1) and (4) include Country–Industry Section fixed effects. Columns (2), (3), (5), and (6) include Industry Section fixed effects and controls for country size and income per capita; the coefficients on these controls are omitted from the table for readability. Columns (2) and (5) measure military spending as a share of GDP. Columns (3) and (6) measure military spending relative to US military expenditure. Log inverse export elasticity corresponds to log$(1/\varepsilon)$, and the inverse elasticity parameter corresponds to log$(1/\sigma)$. Endogenous elasticity controls are instrumented using leave-one-importer-out same-HS4 averages. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

broad sectors and therefore remove the variation needed to estimate the independent effect of military expenditure. Their role is instead diagnostic, as they show whether the BLW market-power relationship remains visible when identification comes from within-country, across-product variation. We therefore interpret the country–industry-section specifications as checks on the elasticity channel, and the industry-section specifications as the relevant estimates for assessing the military-capacity relationship.

This design does not by itself establish that military spending causally raises tariffs. Given that military expenditure varies at the country level, the coefficient may also capture omitted country characteristics that are correlated with both military capacity and tariff protection. These include broader state capacity, geopolitical influence, exposure to security threats, industrial-policy preferences, or the ability to withstand foreign retaliation. We therefore interpret the estimates as evidence that coercive or geopolitical capacity contains explanatory power for tariff protection after accounting for the canonical market-power and tariff-revenue motives, rather than as evidence of a direct causal effect of military spending.

Table 3 presents the BLW-sample results. Columns using indicator-based measures of inverse export elasticities reproduce the BLW-style market-power relationship, while the continuous log specifications provide an analogous check using the continuous elasticity measures. Across specifications, inverse export elasticities are positively associated with tariffs, consistent with the theoretical prediction that sectors facing less elastic foreign export supply admit higher optimal tariffs. When military spending relative to the United States is included, its coefficient is positive, indicating that countries with greater military capacity tend to impose higher tariffs even after conditioning on the market-power channel.

Taken together, indications from modern data and BLW exercises play complementary roles. The 2001–2024 sample shows that the positive association between military capacity and tariff protection is visible in broad contemporary data. This relationship intensifies for countries with relatively greater abilities to augment their tariffs while abiding by WTO commitments. The BLW pre-WTO sample provides a narrower setting in which tariffs are more plausibly interpreted as unilateral policy choices. The fact that the military-capacity relationship appears across all three settings suggests that geopolitical power may operate alongside the canonical market-power mechanism emphasized by optimal tariff theory.

3 Model and Analytical Results

In the previous section, we have documented a robust residual association between tariff protection and military capacity after conditioning on canonical market-power variables. Using these stylized facts documented as motivation, we develop a model of how military power and tariff choices interact. The model then provides a theoretical mechanism through which such a residual association can arise.

We consider a static environment consisting of two large leader countries and a continuum of small follower countries. Leaders simultaneously choose tariffs under the threat of military conflict. Military power is exogenous and affects each leader's conflict payoff, thereby shaping the set of tariff pairs compatible with peace. Given leaders' tariffs, followers select trade blocs to maximize consumption.

3.1 Setup

The world consists of two large, possibly heterogeneous *leader* countries, $\ell \in \{E, W\} =: \mathcal{L}$, called East (E) and West (W), and a continuum of small, ex ante identical *follower* countries, $f \in \mathcal{F} := [0, 1]$.

Households, Firms, and Trade Each country $i \in \mathcal{L} \cup \mathcal{F} =: \mathcal{C}$ is populated by a measure[7] $N_i \in \mathbb{R}_+$ of households that each inelastically supply a unit of labor at competitive wage w_i to domestic firms to produce the country's differentiated good. Aggregate household consumption in country i is a CES composite of each country's good,

$$C_i \equiv \left[\sum_{\ell \in \mathcal{L}} C_{i\ell}^{\frac{\sigma-1}{\sigma}} + \int_{\mathcal{F}} C_{if}^{\frac{\sigma-1}{\sigma}} df \right]^{\frac{\sigma}{\sigma-1}} \qquad (i \in \mathcal{C}), \tag{2}$$

where $\sigma > 1$ is the elasticity of substitution and C_{ij} is the consumption in i of the good produced in j. Households face budget constraint, $P_i C_i \leq w_i N_i + T_i$, where $T \geq 0$ denotes lump-sum transfers from the government and $P_i = \left[\sum_{\ell \in \mathcal{L}} P_{i\ell}^{-(\sigma-1)} + \int_{\mathcal{F}} P_{if}^{-(\sigma-1)} df \right]^{-\frac{1}{\sigma-1}}$ is the ideal price index. The demand in country i for country j's good is given by[8]

$$C_{ij} = \left(\frac{P_{ij}}{P_i} \right)^{-\sigma} \cdot C_i. \tag{3}$$

Production and Trade. Each country $i \in \mathcal{C}$ has a representative firm that produces output using a linear technology $Y_i = A_i n_i$. Markets are perfectly competitive, so factory-gate prices equal marginal costs ($p_i = w_i / A_i$) and wages adjust to clear labor markets ($n_i = N_i$). Since followers are ex ante identical, we have $N_f = N$ and $A_f = A$ for all $f \in \mathcal{F}$.

Goods can be consumed domestically or exported. Trade is subject to symmetric iceberg transport costs $\kappa_{ij} \geq 1$, so κ_{ij} units of country j's good must be shipped for each unit delivered to country i. Country i levies an *ad valorem* tariff $\tau_{ij} \geq 0$ on imports from abroad; domestic deliveries are subject to neither tariffs nor trade costs, so $\tau_{ii} = 0$ and $\kappa_{ii} = 1$. Tariff revenues are rebated lump-sum to households. Delivered prices are therefore given by $P_{ij} = (1 + \tau_{ij}) \kappa_{ij} p_j$

[7]Throughout this paper, "measure" specifically refers to the Lebesgue measure.

[8]Since individual followers are measure zero, a technical point is that C_{ij}, P_{ij} are well defined for every leader $i \in \mathcal{L}$ and for almost every follower $i \in \mathcal{F}$ except a subset of $\mathcal{F}$ that has measure zero; such null sets have no effect on Lebesgue integration, by construction.

and tariff revenues from imports satisfy

$$R_i = \sum_{j \in \mathcal{L}} \frac{\tau_{ij}}{1+\tau_{ij}} \times P_{ij} C_{ij} + \int_{\mathcal{F}} \frac{\tau_{if}}{1+\tau_{if}} \times P_{if} C_{if} df = T_i$$

Geopolitical blocs and geopolitical preferences. The world is partitioned into two blocs, East ($\mathcal{B}_E$) and West ($\mathcal{B}_W$). A bloc is a customs union led by $\ell \in \mathcal{L}$ which is formally defined as

$$\mathcal{B}_\ell := \{\ell\} \cup \{f \in \mathcal{F} : f \text{ follows } \ell\}.$$

Within a bloc tariffs are zero. Across blocs countries face uniform tariffs chosen by leaders; that is, each exporter producing in bloc of leader ℓ faces the tariff set by opposing leader $\ell' \neq \ell$. Thus, tariffs τ_{ij} can be compactly expressed as,

$$\tau_{ij} = \begin{cases} \tau_{\ell\ell'} & \text{if } i \in \mathcal{B}_\ell, j \in \mathcal{B}_{\ell'}, (\ell, \ell') \in \{E, W\}^2, \ell \neq \ell', \\ 0 & \text{otherwise}. \end{cases} \tag{4}$$

We assume that each leader values bloc membership to the extent that they are willing to give preferential access to their markets to followers. We assume that leaders' utility derived from geopolitical influence is given by

$$G_\ell = \bar{g}_\ell + \frac{\int_{\mathcal{B}_\ell \setminus \{\ell\}} Y_f \, df}{\int_{\mathcal{F}} Y_f \, df}.$$

The first term $\bar{g}_\ell \geq 0$ is an exogenous parameter corresponding to baseline geopolitical utility; the second term is the share of followers' GDP that falls within their coalition. This reduced form approach provides a natural baseline for analysis, but our framework may accommodate other functional forms.

Leaders. Each leader $\ell \in \mathcal{L}$ is represented by a government that maximizes social welfare through optimally choosing tariffs $\tau_{\ell j}$. Each leader is endowed with a stock of military power m_ℓ, which we take to be exogenous. The state of the world can be summarized by $\mathbf{s} = (m_E, m_W)$. The policymaker's utility is represented by:

$$U_\ell(\tau_{\ell\ell'}, \tau_{\ell'\ell}) = \omega_\ell \log C_\ell + (1 - \omega_\ell) \log G_\ell \tag{5}$$

where U_ℓ is Cobb–Douglas in consumption C_ℓ and geopolitical influence G_ℓ, with respective weights ω_ℓ and $1 - \omega_\ell$.

Followers. Follower governments want to maximize social welfare within their country. After observing the realization of their preferences regarding each bloc $\varepsilon_f(\ell)$ they choose which bloc to join. If follower f joins bloc ℓ, their social welfare is:

$$U_f(\ell) \;=\; \log C_f(\ell) + \mu \times \varepsilon_f(\ell) \qquad (\varepsilon_f(\ell) \overset{\text{iid}}{\sim} \text{Gumbel}(0,1)),$$

where $\varepsilon_f(\ell)$ are idiosyncratic shock denoting f's idiosyncratic preference for being in group ℓ; these shocks are drawn i.i.d. (across followers) from a Type-I Extreme Value (Gumbel) distribution with standard deviation scaled by μ. Taking expectations over the shocks yields expected utility for follower f:

$$\mathbb{E}\left[\max_{\ell} U_f(\ell)\right] = \mu \times \log\left(\sum_{j\in\mathcal{L}} \exp\left[\frac{\log C_f(j)}{\mu}\right]\right) + \mu\gamma$$

where $\gamma = 0.57721...$ is Euler's constant. This modeling approach allows us to analytically characterize the probability that a given follower f will choose to be in each bloc B_ℓ:

$$\pi_\ell = \int_{[0,1]} 1_{\{f\in\mathcal{B}_\ell\}}\, df = Pr\left(U_f(\ell) = \max_j\{U_f(j)\}\right) = \frac{\exp(\log C_f(\ell)/\mu)}{\sum_{j\in\mathcal{L}} \exp\left(\log C_f(j)/\mu\right)}$$

Each follower is small relative to the global market. Therefore, they take aggregate equilibrium prices and others' choices as given when deciding bloc membership. This assumption and the distribution of idiosyncratic shocks pin down bloc shares (π_E, π_W). Since there are infinitely many followers in the unit interval and followers are ex-ante identical, by the law of large numbers, the share of followers that will fall in each bloc will converge to the probability that any given f follows leader ℓ.

Tariff choice and conflict subgame. Leader governments choose tariffs as follows. After proposing their tariffs (τ_{EW}, τ_{WE}), they can each choose to unilaterally escalate from economic interaction to a military confrontation. Formally, each leader simultaneously chooses whether to declare war ($d_i = w$) or peace ($d_i = p$). If both sides declare peace (i.e., $(d_E, d_W) = (p,p)$), no war takes place. In peacetime, the proposed tariffs are enacted and each leader obtains $U_\ell(\tau_{\ell\ell'}, \tau_{\ell'\ell}, \mathbf{s})$. If peace is not jointly declared (i.e., $(d_E, d_W) \neq (p,p)$), a war takes place. In this case, each $i \in \mathcal{L}$ receives a flow expected payoff of

$$D_\ell(\mathbf{s}) \;=\; -\upsilon_\ell \;+\; q_\ell(\mathbf{s})\,\overline{U}_\ell \;+\; \big(1 - q_\ell(\mathbf{s})\big)\,\underline{U}_\ell, \tag{6}$$

where $\upsilon_\ell \geq 0$ is the cost of conflict, $q_\ell(\cdot)$ is the probability that i wins the war, and $\overline{U}_\ell(\cdot)$ and $\underline{U}_\ell(\cdot)$ denote flow welfare from winning and losing conflict, respectively. Victory probabilities follow a standard Tullock (2001) contest success function (CSF),[9]

$$q_\ell(\mathbf{s}) = \frac{m_\ell^\lambda}{m_\ell^\lambda + m_{\ell'}^\lambda} = \frac{1}{1 + (m_{\ell'}/m_\ell)^\lambda}, \qquad \lambda \in (0, \infty),$$

where λ governs the sensitivity of battlefield outcomes to relative coercive stocks. As $\lambda \to 0$, outcomes become uniformly random; as $\lambda \to \infty$, the stronger side wins with probability approaching one. We assume that the winner can impose its welfare-maximizing external tariff without retaliation, whereas the loser must concede to the winner's preferred tariff schedule. Formally,

$$\begin{aligned} \overline{U}_\ell &= U_\ell\big(\bar{\tau}_\ell, 0\big), & \underline{U}_\ell &= U_\ell\big(0, \bar{\tau}_{\ell'}\big), \\ \bar{\tau}_\ell &\in \arg\max_{\tau \geq 0} U_\ell(\tau, 0), & \bar{\tau}_{\ell'} &\in \arg\max_{\tau \geq 0} U_{\ell'}(\tau, 0). \end{aligned} \tag{7}$$

We assume that war occurs if either leader initiates, and that ties are resolved in favor of peace.[10] Under this timing, peace is the subgame outcome if and only if both leaders weakly prefer peace. The state-dependent peace-compatible set of feasible tariff pairs is, therefore:

$$\mathcal{P}(\mathbf{s}) := \{(\tau_{WE}, \tau_{WE}) \in \mathbb{R}_+ \mid U_W(\tau_{WE}, \tau_{EW}, \mathbf{s}) \geq D_W(\mathbf{s}), \quad U_E(\tau_{EW}, \tau_{WE}, \mathbf{s}) \geq D_E(\mathbf{s})\} \tag{8}$$

outside this set, at least one leader finds war profitable, and conflict occurs in the subgame, implementing the war value in (7). Figure 3 plots $\mathscr{P}(\mathbf{s})$the set of tariff pairs that can be sustained peacefully under two states: symmetric military power, ($m_E = m_W s = (1, 1)$), and an asymmetric state in which East is much stronger, ($m_E = 5 \times m_W$).

The figure illustrates the role of power in the model. Military power does not directly change peaceful prices or consumption allocations. Instead, it changes disagreement payoffs and therefore the set of tariff pairs that can be sustained without conflict. When power is symmetric, the peace region is relatively balanced across the two tariff dimensions. When East becomes stronger, the feasible set shifts in a way that allows East to sustain more aggressive tariff policies while restricting the set of West tariffs compatible with peace.

[9] This is also known as the "ratio-form" CSF, since the conflict outcome only directly depends on the ratio of contestants' powers.

[10] Formally, leader i initiates war if $D_i(\mathbf{s}) > U_i(\tau^*_{ij}, \tau^*_{ji}; \mathbf{s})$. If both weakly prefer peace, the outcome is peace.

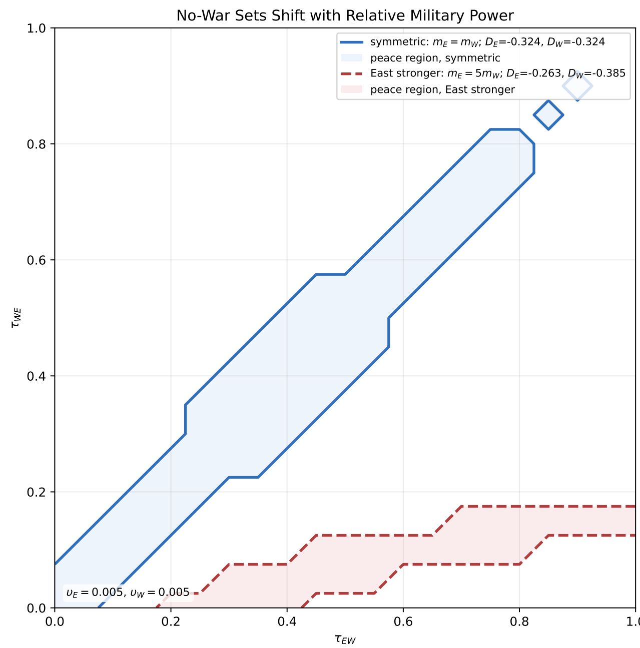

Figure 3: Peace-compatible feasible tariff sets sets under symmetric and asymmetric military power. Shaded regions regions denote tariff pairs that satisfy both leaders' peace-compatibility constraints.

Timing. The timing of the model proceeds as follows. (i) The state $\mathbf{s}$ is observed. (ii) Leaders simultaneously choose external tariffs (τ_{EW}, τ_{WE}). (iii) Leaders play the war subgame: conflict occurs if at least one initiates; otherwise peace. If war occurs, the implemented tariff regime is given by (7). (iv) Given implemented tariffs and realized idiosyncratic shocks, followers choose bloc membership. (v) Given tariffs and bloc shares, the cross-sectional equilibrium in $\mathcal{C}_t$ determines prices, allocations, tariff revenues, and transfers.

3.2 Equilibrium

Conditional Equilibrium. We now characterize the conditional equilibrium of this world economy. Since all followers are ex ante identical, conditional on bloc-membership, they will be ex-post identical. This allows us to aggregate them into two composite follower economies $\mathcal{F}_\ell := \mathcal{B}_\ell \setminus \{\ell\}$ with labor endowment $N_{\mathcal{F}_\ell} = \pi_\ell N$, and output $Y_{\mathcal{F}_\ell} = \pi_\ell AN$. As we prove in Lemma 1 of Appendix C, conditional on (π_E, π_W) and choices of tariffs (τ_{EW}, τ_{WE}), the static cross-sectional equilibrium can be represented as a four-economy general equilibrium among $\tilde{\mathcal{C}} := \{E, W, \mathcal{F}_E, \mathcal{F}_W\}$, subject to the customs-union tariff structure described above.

Definition 1 (Conditional cross-sectional equilibrium)**.** A conditional cross-sectional equilibrium given $(\boldsymbol{\tau}, \boldsymbol{\pi})$ is a collection of wages, factory-gate prices, delivered prices, price indices, consumption allocations, labor demand choices, tariff revenues, and transfers

$$\left\{w_i, p_i, P_i, C_i, n_i, R_i, T_i, \{P_{ij}, C_{ij}\}_{j\in\widetilde{\mathcal{C}}}\right\}_{i\in\widetilde{\mathcal{C}}},$$

such that:

(i) *Utility maximization.* Given goods and factor prices, households in every $i \in \mathcal{C}$ make earn their income and make consumption choices $\left\{C_i, \{C_{ij}\}_{j\in\widetilde{\mathcal{C}}}\right\}_{i\in\widetilde{\mathcal{C}}}$, to maximize their utility.

(ii) *Profit maximization.* Given goods and factor prices, firms in every $i \in \mathcal{C}$ choose factor demand $\{n_i\}_{i\in\mathcal{C}}$ to maximize profits.

(iii) *Government budget balance.* Given allocations and prices, government collect tariff revenue and rebates all of it lump-sum to households.

(iv) *Market clearing.* For every source economy $j \in \widetilde{\mathcal{C}}$, total production equals the quantity required to satisfy demand across all destinations: $A_j N_j = \nu_j \sum_{i\in\widetilde{\mathcal{C}}} \kappa_{ij} C_{ij}$, where $\nu_j = 1$ if $j \in \mathcal{L}$ and $\nu_j = \pi_j$ if $j \in \{\mathcal{F}_E, \mathcal{F}_W\}$ and for every economy $j \in \mathcal{C}$, labor supply equals labor demand $n_j = N_j$.

As a result, the demand for goods produced in $j \in \mathcal{F}_\ell$ at a given destination country i will be $C_{ij} = C_{i\mathcal{F}_\ell}$ for all $j \in \mathcal{F}_\ell$. National consumption in each country $i \in \mathcal{C}$ can then be rewritten as:

$$C_i = \left[\left(\sum_{\ell\in\mathcal{L}} C_{i\ell}^{\frac{\sigma-1}{\sigma}} + \int_{\mathcal{F}_\ell} C_{i\mathcal{F}_\ell}^{\frac{\sigma-1}{\sigma}} df\right)\right]^{\frac{\sigma}{\sigma-1}} = \left[\sum_{\ell\in\mathcal{L}} \left(C_{i\ell}^{\frac{\sigma-1}{\sigma}} + \pi_\ell C_{i\mathcal{F}_\ell}^{\frac{\sigma-1}{\sigma}}\right)\right]^{\frac{\sigma}{\sigma-1}} \tag{9}$$

which is identical to (2) since $(\mathcal{F}_E, \mathcal{F}_W)$ are disjoint partitions that fully cover $\mathcal{F}$. Since demands for follower produced varieties only depend on the bloc, not on any particular follower, we can take it out of the integral. Integrating over $\mathcal{F}_\ell$ results in its measure, i.e., the share of followers in said bloc π_ℓ.

Followers within each bloc will have an identical level of market access and exports, as controlled by tariffs τ_{ij}. As a result, factor and goods prices (both at the factory gate and delivery point) will also be identical. As such, we can rewrite ideal price indices analogously to (9):

$$P_i = \left[\sum_{\ell\in\mathcal{L}} \left(P_{i\ell}^{-(\sigma-1)} + \pi_\ell P_{i\mathcal{F}_\ell}^{-(\sigma-1)}\right)\right]^{-\frac{1}{\sigma-1}} \tag{10}$$

Because each follower has measure zero, its bloc choice does not affect aggregate outcomes. Hence, when selecting a bloc, a follower takes as given leaders' external tariffs and the associated equilibrium price system, including the equilibrium bloc shares (π_E, π_W) that summarize the mass of followers in each bloc. Nonetheless, in equilibrium these perceived bloc shares must be consistent with follower best responses: the realized shares equal the measure of followers who (given their idiosyncratic shocks) optimally select each bloc under the same price system.

Nash Equilibrium. We now characterize the equilibrium of the tariff choice game. The payoff-relevant state is $s = (m_E, m_W) \in \mathbb{R}^2_+$. For each leader $\ell \in \mathcal{L}$, a *tariff strategy* $\tau_\ell : \mathbb{R}^2_+ \to \mathbb{R}_+$ maps states to a proposed external tariff and a *diplomatic strategy* $d_\ell : \mathbb{R}^2_+ \times \mathbb{R}^2_+ \to \{w, p\}$ maps announced tariff pairs and states to a declaration of war (w) or peace (p). The Subgame Perfect Equilibrium is defined below.

Definition 2. A Subgame Perfect Equilibrium consists of strategies $(\tau^*_\ell, d^*_\ell)_{\ell\in\mathcal{L}}$ and values $(V_\ell)_{\ell\in\mathcal{L}}$ such that $\tau^*_\ell(s)$ attains the maximum of

$$V_\ell(\mathbf{s}) = \max_{\tau\in\mathbb{R}_+} \Big[\Phi(\mathbf{s})\, U_\ell\big(\tau, \tau^*_{\ell'\ell}(\mathbf{s})\big) + (1 - \Phi(\mathbf{s}))\, D_\ell(\mathbf{s}) \Big],$$

and

$$d^*_\ell(\tau_{\ell\ell'}, \tau_{\ell'\ell}, \mathbf{s}) = \begin{cases} p & \text{if } U_\ell(\tau_{\ell\ell'}, \tau_{\ell'\ell}) \geq D_\ell(\mathbf{s}), \\ w & \text{if } U_\ell(\tau_{\ell\ell'}, \tau_{\ell'\ell}) < D_\ell(\mathbf{s}) \end{cases}$$

for each $\ell \in \mathcal{L}$, $\ell' \in \mathcal{L} \setminus \{\ell\}$, and $s \in \mathbb{R}^2_+$, where $\Phi(\mathbf{s}) = \mathbb{1}\{(\tau, \tau^*_{\ell'\ell}(\mathbf{s})) \in \mathcal{P}(\mathbf{s})\}$.

Military power does not directly affect peaceful prices, consumption, or follower alignment. It affects equilibrium tariffs exclusively through the conflict payoffs $D_\ell(\mathbf{s})$, which determine the set $\mathcal{P}(s)$ of tariff pairs sustainable under peace.

3.3 Theoretical Results

We now derive two main results from the general equilibrium model described above. The first result establishes that, even though the model introduces endogenous bloc formation through followers $f \in \mathcal{F}$, the equilibrium in the aggregate economy $\tilde{\mathcal{C}}_t$ exists and is unique for a subset of the parameter space.

Proposition 1 (Existence and uniqueness of the conditional equilibrium). *Fix a state s and a tariff vector τ. Let $\tilde{\mathcal{C}} = \{E, W, F_E, F_W\}$ and suppose $\sigma > 1$ Then:*

*(i) (*Conditional uniqueness given π.*) For fixed bloc sizes π_E, π_W, if $\tau_{ij} < \bar{\tau} < \infty$ and $\kappa_{ij} < \bar{\kappa} < \infty$ for all pairs i, j, then the aggregate economy in (E, W, F_E, F_W) is unique up to a numéraire.*

*(ii) (*Uniqueness of π for large μ.*) $\exists \bar{\mu} > 0$ s.t. $\forall \mu \geq \bar{\mu}$, the fixed-point problem in π_ℓ has a unique solution $\pi_\ell^\star \in (0, 1)$; hence, the full conditional equilibrium is unique up to the choice of numéraire.*

Part (a) of Proposition 1 will be intuitive to those familiar with canonical general equilibrium trade models. It uses the fact that, for fixed bloc shares, bounded tariffs and trade costs, the aggregate economy satisfies gross substitutes property in wages (we show that in Lemma 2 of Appendix C). Aside from the bloc weights π_E, π_W, the proof follows the standard strategy and steps from Alvarez and Lucas (2007): it places restrictions on the parameter space for which the excess demand function satisfies the gross substitutes property for a given set of fixed π_E, π_W.

Naturally, π_E, π_W are not fixed: they are endogenous objects that emerge in equilibrium from the optimal choices of follower country governments. Part (b) tackles that question. It defines an operator over the bloc choice equation that defines π_ℓ and shows that, for a sufficient large dispersion of idiosyncratic bloc preferences (μ), that operator will be a contraction. Then, by the Contraction Mapping Theorem, there will be a unique fixed point that will result in the correct π_E, π_W.

Proposition 1 ensures that, for any primitives, current state, and tariff pair, the cross-sectional equilibrium is well defined. We can therefore treat prices, consumption, tariff revenues, bloc shares, and next-period power as functions of the current state and leaders' tariff choices. The next result differentiates a leader's peaceful payoff with respect to its external tariff. This yields an optimal-tariff formula that separates the standard terms-of-trade motive from two additional forces: the effect of tariffs on geopolitical alignment and the effect of tariffs on future military power.

Proposition 2. *Fix leader $\ell \in \{E, W\}$, rival $\ell' \neq \ell$, period t, and state $s_t = (m_\ell, m_{\ell'})$. Suppose conflict costs are sufficiently high, $\kappa_i \geq \sup_s \bar{U}_i(s)$ for each leader i, and the equilibrium tariff pair is locally interior to the no-war set. Assume that, to a first order, only the home wage w_ℓ and home bloc share π_ℓ respond to $\tau_{\ell\ell'}$, while foreign wages are fixed. Let*

$$\chi_\ell^w := \frac{d \log w_\ell}{d \log(1 + \tau_{\ell\ell'})}, \qquad \chi_\ell^\pi := \frac{d \log \pi_\ell}{d \log(1 + \tau_{\ell\ell'})}, \qquad \chi_\ell^V := \frac{d V_\ell(s_{t+1}^p)}{d \log(1 + \tau_{\ell\ell'})}.$$

Then any interior peaceful optimum satisfies

$$\tau^*_{\ell\ell'} = \frac{1}{\mathcal{E}^J_\ell - \mathcal{G}_\ell - \mathcal{D}_\ell},$$

where

$$\mathcal{E}^J_\ell = \frac{\lambda_{\ell\ell'} + \lambda_{\ell F_{\ell'}} - [\alpha^w_\ell + (1-\alpha^w_\ell)E^w_\ell - \lambda_{\ell\ell}]\,\chi^w_\ell}{1-\alpha^w_\ell},$$

$$\mathcal{G}_\ell = \frac{1}{1-\alpha^w_\ell}\left[\mathcal{B}_\ell + \frac{1-\omega_\ell}{\omega_\ell}\frac{\pi_\ell}{\bar{g}_\ell + \pi_\ell}\right]\chi^\pi_\ell,$$

$$\mathcal{D}_\ell = \frac{\beta}{\omega_\ell(1-\alpha^w_\ell)}\chi^V_\ell,$$

and

$$\mathcal{B}_\ell = (1-\alpha^w_\ell)E^\pi_\ell + \frac{1}{\sigma-1}\left(\lambda_{\ell F_\ell} - \frac{\pi_\ell}{1-\pi_\ell}\lambda_{\ell F_{\ell'}}\right).$$

Here α^w_ℓ is the wage-income share of leader ℓ's expenditure, $\lambda_{\ell k}$ is leader ℓ's expenditure share on source k, and E^w_ℓ and E^π_ℓ are the elasticities of the tariffed expenditure base

$$\widetilde{M}_\ell = P_{\ell\ell'}C_{\ell\ell'} + \pi_{\ell'}P_{\ell F_{\ell'}}C_{\ell F_{\ell'}}$$

with respect to w_ℓ and π_ℓ. If tariffs do not affect bloc shares or continuation values, then $\mathcal{G}_\ell = \mathcal{D}_\ell = 0$ and

$$\tau^*_{\ell\ell'} = \frac{1}{\mathcal{E}^J_\ell}.$$

Under the standard Johnson specialization, $\mathcal{E}^J_\ell$ is the foreign export-supply elasticity, so the textbook optimal-tariff formula is recovered.

The empirical results in Section 2 suggest that standard market power alone does not account for observed tariff protection. Proposition 2 shows how this remaining variation can arise when tariffs also affect geopolitical alignment and future coercive capacity through tariff-financed military investment. Moreover, this result provides a decomposition which clarifies how power politics modify the standard optimal-tariff logic. The term $\mathcal{E}^J_\ell$ is the generalized Johnson term, which captures the static terms-of-trade and tariff-revenue forces operating through the trade bloc. The term $\mathcal{G}_\ell$ is the geopolitical-alignment wedge, which captures the effect of tariffs on the share of followers aligned with leader ℓ. The term $\mathcal{D}_\ell$ is the dynamic-power wedge: it captures the effect of current tariffs on future coercive power through tariff-financed military investment.

Thus, the standard optimal-tariff formula is nested as a limiting case. When tariffs do not affect bloc alignment and do not change continuation values, the alignment and dynamic wedges vanish, and the optimal tariff reduces to the familiar static benchmark. In the full model, however, tariffs affect not only current prices and revenues, but also geopolitical alignment and future military capacity. Optimal trade policy therefore reflects power politics as well as market power.

4 Quantification

To quantify this model, we first explain our assumptions and approaches involved in identifying the set of key unknown model parameters. In this section, we outline these steps and then proceed to appraise the quality of our baseline quantification.

4.1 Calibration

Follower Alignment Dispersion μ. The model's follower-block assignment problem provides a natural way to discipline the dispersion parameter μ. Followers choose between two geopolitical blocs, East and West, indexed by $\ell \in \{E, W\}$. The utility of follower i from joining bloc ℓ is

$$U_i(\ell) = \log C_i(\ell) + \mu\epsilon_i(\ell), \tag{11}$$

where $C_i(\ell)$ is the consumption payoff associated with joining bloc ℓ, $\epsilon_i(\ell)$ is an idiosyncratic preference shock, and $\mu > 0$ controls the relative importance of non-economic alignment considerations. A smaller value of μ implies that bloc choices are more sensitive to consumption payoff differences, while a larger value implies that idiosyncratic or non-economic forces play a larger role.

Assuming that the shocks $\epsilon_i(E)$ and $\epsilon_i(W)$ are independently distributed Type-I extreme value, the probability that follower i joins bloc ℓ is given by the standard logit expression:

$$\pi_i(\ell) = \frac{\exp\left(\log C_i(\ell)/\mu\right)}{\sum_{\ell' \in \{E,W\}} \exp\left(\log C_i(\ell')/\mu\right)}. \tag{12}$$

For the two-bloc case, the probability of joining East is

$$\pi_i^E = \frac{\exp\left(\log C_i(E)/\mu\right)}{\exp\left(\log C_i(E)/\mu\right) + \exp\left(\log C_i(W)/\mu\right)}, \tag{13}$$

Taking the ratio of East and West probabilities gives

$$\frac{\pi_i^E}{\pi_i^W} = \frac{\exp\left(\log C_i(E)/\mu\right)}{\exp\left(\log C_i(W)/\mu\right)} = \exp\left(\frac{\log C_i(E) - \log C_i(W)}{\mu}\right).$$

Taking logs yields the alignment log-odds equation,

$$\log\left(\frac{\pi_i^E}{\pi_i^W}\right) = \frac{1}{\mu}\left[\log C_i(E) - \log C_i(W)\right]. \tag{14}$$

Equation (14) implies that the slope linking an East-versus-West payoff gap to East-versus-West alignment log odds is $1/\mu$. To bring this expression to the data, we need an empirical analogue of the probability that a country joins, or is aligned with, each bloc. We proxy these probabilities using geopolitical proximity in United Nations General Assembly voting space. A country whose voting behavior is closer to the East benchmark than to the West benchmark should be more likely to be aligned with East, and vice versa.

We use UNGA ideal-point distances to measure this proximity. For each country-year, let d_{it}^E denote the ideal-point distance between country i and the East benchmark in year t, and let d_{it}^W denote the corresponding distance between country i and the West benchmark. In the empirical implementation, these are pairwise ideal-point distances between the country and the relevant bloc benchmark. Smaller values indicate greater geopolitical proximity in UNGA voting space. For example, near the end of the Cold War, the Poland series shifts sharply toward the U.S. benchmark, consistent with Poland's Western realignment (Figure 4). Other Western bloc countries experience persistent breaks from the US following the Iraq war.

We convert these distances into soft bloc-assignment probabilities by assuming that the attractiveness of bloc ℓ is inversely related to its ideal-point distance, $A_{it}^\ell = \frac{1}{d_{it}^\ell}$. The implied probability that country i is aligned with East is then

$$\widetilde{\pi}_{it}^E = \frac{A_{it}^E}{A_{it}^E + A_{it}^W} = \frac{1/d_{it}^E}{1/d_{it}^E + 1/d_{it}^W} = \frac{d_{it}^W}{d_{it}^E + d_{it}^W}. \tag{15}$$

Similarly, the implied probability of West alignment is

$$\widetilde{\pi}_{it}^W = \frac{A_{it}^W}{A_{it}^E + A_{it}^W} = \frac{d_{it}^E}{d_{it}^E + d_{it}^W}. \tag{16}$$

This measurement equation has several useful properties. If country i is equidistant from the two bloc benchmarks, then $\widetilde{\pi}_{it}^E = \widetilde{\pi}_{it}^W = 1/2$. If country i is closer to East, so that $d_{it}^E < d_{it}^W$, then $\widetilde{\pi}_{it}^E > 1/2$. As d_{it}^E becomes small relative to d_{it}^W, the implied probability of East alignment

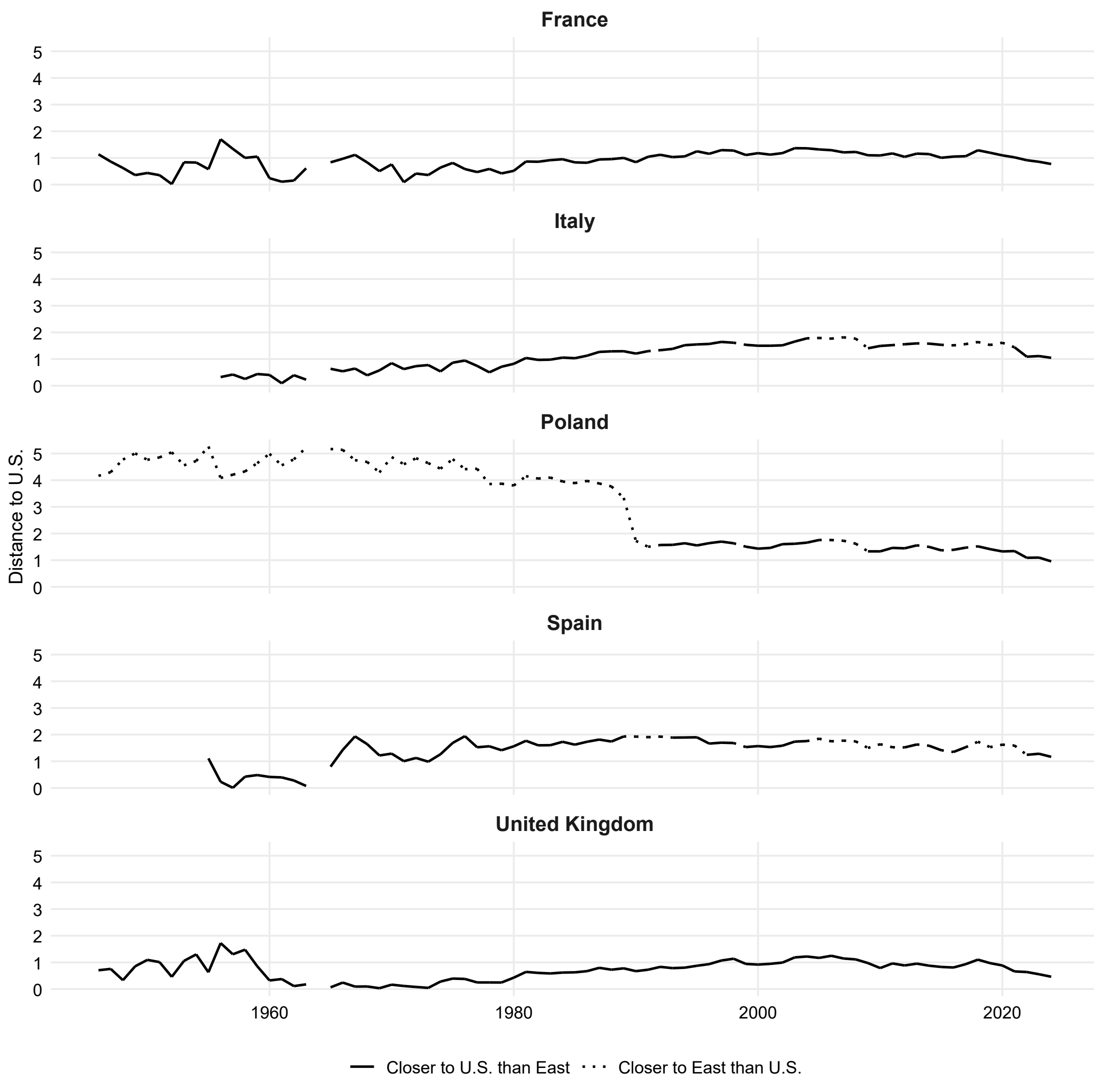

Figure 4: UNGA Ideal Point Distance by Country-Year.

Notes: Breaks in the early 1960s reflect years without usable UNGA roll-call ideal-point estimates, notably the 1964–1965 General Assembly voting disruption associated with the Article 19 financing crisis.

approaches one. The mapping is also invariant to the scale of the ideal-point metric, since multiplying both distances by a common constant leaves the implied probabilities unchanged.

Taking the ratio of the two implied probabilities gives

$$\frac{\widetilde{\pi}_{it}^{E}}{\widetilde{\pi}_{it}^{W}} = \frac{d_{it}^{W}/(d_{it}^{E} + d_{it}^{W})}{d_{it}^{E}/(d_{it}^{E} + d_{it}^{W})} = \frac{d_{it}^{W}}{d_{it}^{E}}.$$

Therefore, the empirical analogue of the model's alignment log odds is

$$a_{it} \equiv \log\left(\frac{\widetilde{\pi}_{it}^{E}}{\widetilde{\pi}_{it}^{W}}\right) = \log\left(\frac{d_{it}^{W}}{d_{it}^{E}}\right). \tag{17}$$

This object is positive when country i is closer to the East benchmark, negative when it is closer to the West benchmark, and equal to zero when the country is equidistant from the two blocs.

Combining the theoretical log-odds equation in (14) with the empirical alignment measure in (17) gives the conceptual estimating analogue

$$a_{it} = \frac{1}{\mu}\left[\log C_i(E) - \log C_i(W)\right] + \nu_{it}, \tag{18}$$

where ν_{it} captures measurement error in the UNGA-based alignment proxy and non-consumption determinants of geopolitical alignment. If the model's East-versus-West consumption payoff gap were observed, then a regression of empirical East-versus-West alignment log odds on this payoff gap would identify $1/\mu$.

In practice, the counterfactual payoff gap $\log C_i(E) - \log C_i(W)$ is not directly observed. Observed real consumption is an equilibrium outcome, not the difference between the consumption payoff country i would receive under East alignment and the payoff it would receive under West alignment. Therefore, we do not interpret the empirical exercise as a regression-based point estimate of μ. Instead, we use persistent bloc-switch events to discipline a conservative lower bound for μ. For each country-year, we construct real consumption per capita using Penn World Table consumption data and normalize it by the world benchmark.

$$\widetilde{c}_{it} = \log c_{it} - \log c_t^{World} \tag{19}$$

This variable measures country i's real-consumption position relative to the world in year t.

For each switch-window definition $k \in \{1, 2, 3\}$, we identify persistent bloc switches. A country is classified as switching in year t if it is assigned to the old bloc in each of the k years before the switch, assigned to the new bloc in year t, and remains assigned to the new bloc in each of the k years after the switch. The event year is therefore the first year of the new bloc. Figure 5 displays the number of switch events between 1970 and 2025 under the two-year window definition. Switches appear to cluster around major geopolitical episodes, including the late Cold War, the collapse of the USSR, and the post-Iraq War period, suggesting that the measure captures historically salient changes in relative UNGA voting proximity.

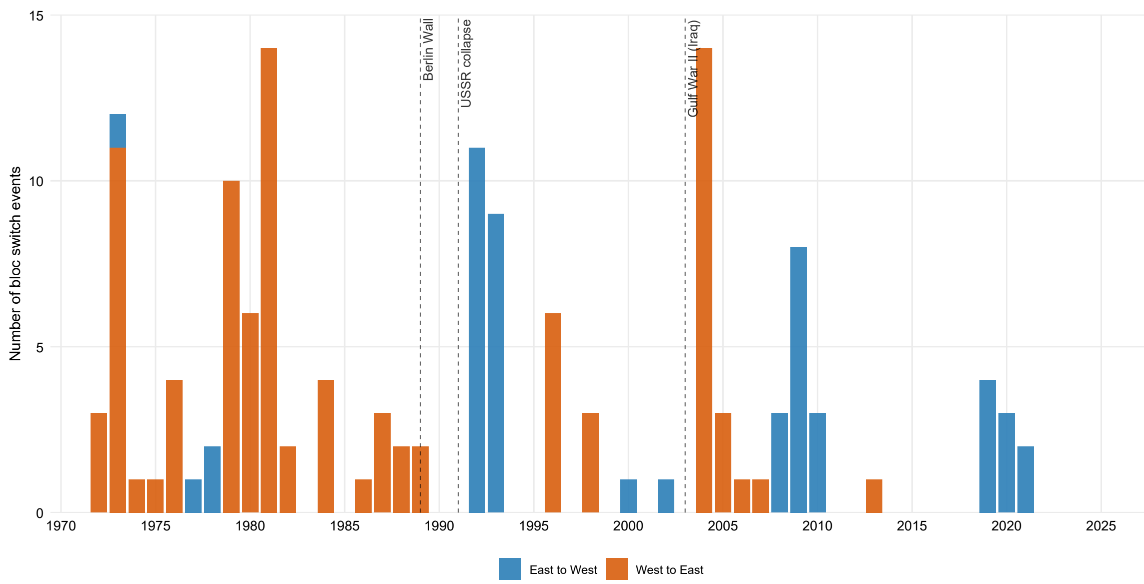

Figure 5: Number of Bloc Switch Events by Year (Two-Year Window)

Notes: The figure counts persistent switches in relative UNGA voting proximity. Under the two-year window, a switch in year t requires old-bloc assignment in years $t-2$ and $t-1$, new-bloc assignment in year t, and continued new-bloc assignment in years $t+1$ and $t+2$.

For each switch event, we compute the change in empirical alignment log odds using the post- and pre-switch windows, excluding the event year itself:

$$\Delta_k a_{it} = \frac{1}{k}\sum_{s=1}^{k} a_{i,t+s} - \frac{1}{k}\sum_{s=1}^{k} a_{i,t-s}. \tag{20}$$

We construct the corresponding change in relative real consumption as

$$\Delta_k \widetilde{c}_{it} = \frac{1}{k}\sum_{s=1}^{k} \widetilde{c}_{i,t+s} - \frac{1}{k}\sum_{s=1}^{k} \widetilde{c}_{i,t-s}. \tag{21}$$

The calibration values reported below are computed on this switch-event sample. They are not regression coefficients. For a given switch-window definition k, the full-pass-through benchmark asks what value of μ would rationalize the observed movement in alignment log odds if all of that movement were attributed to observed relative-consumption movement.

Under this benchmark,

$$\frac{1}{\mu} = \frac{|\Delta_k a_{it}|}{|\Delta_k \widetilde{c}_{it}|} \implies \mu = \frac{|\Delta_k \widetilde{c}_{it}|}{|\Delta_k a_{it}|}. \tag{22}$$

Given that observed alignment movements are also likely to reflect ideology, security relationships, diplomatic shocks, regime changes, and other non-economic forces, the full-pass-through calculation should be interpreted as a lower bound for μ. If some part of the observed movement in a_{it} is not caused by consumption-payoff differences, then the true consumption sensitivity of alignment is smaller than the full-pass-through sensitivity, and the corresponding value of μ is larger.

Let $\mathcal{S}_k$ denote the set of persistent switch events under window definition k, and let N_k denote the number of such events. We compute an average-based lower-bound statistic as

$$\widehat{\mu}_k^{avg} = \frac{\frac{1}{N_k}\sum_{(i,t)\in\mathcal{S}_k} |\Delta_k \widetilde{c}_{it}|}{\frac{1}{N_k}\sum_{(i,t)\in\mathcal{S}_k} |\Delta_k a_{it}|}, \tag{23}$$

The average-based statistic is our main lower-bound measure. The median-based statistic provides a robustness check that reduces the influence of large switch-event movements. Both statistics compare the magnitude of observed real-consumption movement to the magnitude of observed geopolitical realignment.

Table 4 reports these full-pass-through lower bounds across one-, two-, and three-year switch definitions. The reported standard errors are obtained using a country-cluster bootstrap applied to the switch-event sample. The bootstrap resamples countries with replacement, retains all switch events associated with sampled countries, and recomputes the lower-bound statistics. The table notes provide the full implementation details.

Table 4: Full-pass-through lower bounds for μ

			Average statistic			Median statistic		
Switch window	Events	Countries	$\widehat{\mu}$	SE	95% CI	$\widehat{\mu}$	SE	95% CI
1	302	123	0.172	(0.018)	[0.139, 0.211]	0.136	(0.008)	[0.117, 0.153]
2	145	89	0.139	(0.019)	[0.109, 0.18]	0.129	(0.021)	[0.098, 0.18]
3	94	65	0.114	(0.015)	[0.088, 0.149]	0.114	(0.014)	[0.086, 0.149]

The table reports full-pass-through lower bounds for μ, computed as the ratio of absolute changes in relative real consumption to absolute changes in UNGA alignment log-odds around persistent bloc-switch events. Standard errors are country-cluster bootstrap standard errors based on 1,000 replications. For each switch-window definition, countries are sampled with replacement, all switch events associated with sampled countries are retained, and the lower-bound statistic is recomputed. Confidence intervals are percentile intervals. The reported uncertainty refers to the empirical full-pass-through lower bound for μ, not to a structural point estimate.

Further details on the quantification of the model are forthcoming.

5 Concluding Remarks

This paper studies trade policy as an instrument of both market power and geopolitical power. Standard optimal-tariff theory explains protection through terms-of-trade incentives. We show that this channel is important but incomplete. Countries with greater military capacity set higher tariffs even after conditioning on standard measures of product-level market power. We recognize military power is correlated with state capacity, geopolitical exposure, alliance structure, and the ability to withstand retaliation. The point is narrower, but important: tariff protection is systematically related to coercive capacity in ways not captured by the canonical market-power channel alone.

To rationalize this pattern, we develop a dynamic model in which leaders choose tariffs while competing for geopolitical alignment and accumulating military power. Tariffs affect current prices and revenues, but they also shape bloc membership and future disagreement payoffs through tariff-financed investment in coercive capacity. The resulting optimal-tariff formula contains the standard terms-of-trade motive, but adds two wedges: one from geopolitical alignment and one from the effect of current tariffs on future power. When these forces are shut down, the familiar static optimal-tariff benchmark is recovered. Thus, our framework does not replace standard tariff theory. It embeds it in a setting where trade policy, alignment, and coercive power are jointly determined.

The analysis suggests that trade institutions discipline only part of the strategic problem. Binding tariffs can constrain the use of protection, but they do not remove the underlying incentives to use trade policy for geopolitical advantage. This distinction matters as governments increasingly treat economic policy as part of broader strategic competition. A complete account of tariff-setting should therefore allow market power and power politics to operate together, rather than treating geopolitical motives as outside the domain of trade policy.

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A Mathematical Appendix

B Aggregation

In this Appendix, we show that, conditional on bloc size (π_E, π_W), followers can be aggregated into two follower economies $\mathcal{F}_E$ and $\mathcal{F}_W$. We omit time subscripts since all objects are defined within a given period. By definition,

$$\int_{\mathcal{F}} \mathbf{1}\{f \text{ follows } \ell\}\, df = \int_{\mathcal{F}_\ell} 1\, df = \pi_\ell,$$

so the Lebesgue measure of $\mathcal{F}_\ell$ equals the share of followers in bloc ℓ.

Lemma 1 (Aggregation of follower economies). *Let the model be as described in the manuscript. Then:*

1. *followers in the same bloc will be ex-post identical, i.e.: output Y_f, labor supply N_f, demand functions C_{if}, delivery prices P_{if}, expenditure functions $P_{if}C_{if}$, factory gate prices p_f, wages w_f, and domestic consumption C_f will be the same for any $f', f \in \mathcal{F}_\ell$; and*
2. *given (1), we can aggregate followers blocs into representative economies, with consumption and production weights proportional to their shares π_ℓ.*

Ex-post identity within blocs. Without loss of generality, fix $\ell \in \{E, W\}$ and pick an arbitrary follower $f \in \mathcal{F}_\ell$. By assumption $Y_f = AN$ and $N_f = N$ for all $f \in \mathcal{F}$, which also holds for all $f \in \mathcal{F}_\ell$ since $\mathcal{F}_\ell$ is a subset of $\mathcal{F}$. Factory gate prices are $p_f = w_f/A$ for all f. Since $f \in \mathcal{F}_\ell$ is a customs union, delivered prices of goods produced in f and shipped to i are:

$$P_{if} = (1+\tau_{if})\kappa_{if}p_f = (1+\tau_{if})\kappa_{if}w_f/A = (1+\tau_{i\mathcal{F}_\ell})\kappa_{i\mathcal{F}_\ell}w_f/A$$

Similarly, expenditure at i on goods from f are:

$$P_{if}C_{if} = \left(\frac{P_{if}}{P_i}\right)^{-(\sigma-1)} \times P_iC_i = \left(\frac{(1+\tau_{i\mathcal{F}_\ell})\kappa_{i\mathcal{F}_\ell}w_f/A}{P_i}\right)^{-(\sigma-1)} \times P_iC_i = w_f^{-(\sigma-1)} \times \Lambda_{i\mathcal{F}_\ell} \times P_iC_i$$

where $\Lambda_{i\mathcal{F}_\ell} := \left(\frac{(1+\tau_{i\mathcal{F}_\ell})\kappa_{i\mathcal{F}_\ell}}{A\,P_i}\right)^{-(\sigma-1)}$. Therefore, expenditure functions, demand functions, delivered prices, and factory-gate prices at any i on goods from two different followers $f, f' \in \mathcal{F}_\ell$ only differ if the wages $w_f, w_{f'}$ are different. To show that we can aggregate each bloc with uniform expenditure functions, demand functions, delivered prices, and factory-gate prices, then, we must show that wages are the same for every $f \in \mathcal{F}_\ell$. By perfect competition, follower f's labor income equals its total sales revenue:

$$\begin{aligned} w_f &= \frac{1}{N}\left[\sum_{\ell' \in \mathcal{L}} P_{\ell' f} C_{\ell' f} + \int_{\mathcal{F}} P_{jf} C_{jf}\, dj\right] \\ &= \frac{1}{N}\left[\sum_{\ell' \in \mathcal{L}} P_{\ell' f} C_{\ell' f} + \sum_{k \in \{E,W\}} \int_{\mathcal{F}_k} P_{jf} C_{jf}\, dj\right] \\ &= w_f^{-(\sigma-1)} \frac{1}{N}\left[\sum_{\ell' \in \mathcal{L}} \Lambda_{\ell' \mathcal{F}_\ell}(P_{\ell'} C_{\ell'}) + \sum_{k \in \{E,W\}} \int_{\mathcal{F}_k} \Lambda_{j \mathcal{F}_\ell}(P_j C_j)\, dj\right]. \\ &= \left[\frac{1}{N}\left\{\sum_{\ell' \in \mathcal{L}} \Lambda_{\ell' \mathcal{F}_\ell}(P_{\ell'} C_{\ell'}) + \sum_{k \in \{E,W\}} \int_{\mathcal{F}_k} \Lambda_{j \mathcal{F}_\ell}(P_j C_j)\, dj\right\}\right]^{1/\sigma}. \end{aligned}$$

Since each follower has measure zero, the domestic case $j = f$ does not require separate treatment inside follower integrals; removing a single follower does not affect aggregate expressions [11]. Hence, the right-hand side depends on f only through the exporter bloc label ℓ. Therefore w_f is constant almost everywhere on $\mathcal{F}_\ell$, and we may write $w_f = w_{\mathcal{F}_\ell}$ for a.e. $f \in \mathcal{F}_\ell$. Therefore, output Y_f, labor supply N_f, demand functions C_{if}, delivery prices P_{if}, expenditure functions $P_{if}C_{if}$, factory gate prices p_f, wages w_f, and domestic consumption C_f will be the same for any $f', f \in \mathcal{F}_\ell$. Hence, any two followers $f, f' \in \mathcal{F}_\ell$ face identical equilibrium conditions and must receive identical allocations in equilibrium. This completes the first part of the proof.

Blocs. Fix some $\ell \in \{E, W\}$. By Part (1), for almost every $f \in \mathcal{F}_\ell$ the equilibrium objects $\{w_f, p_f, \{P_{if}\}_i, \{C_{if}\}_i, \{P_{if}C_{if}\}_i, C_f\}$ are constant in f. Hence, there exist representative-bloc objects
$\{w_{\mathcal{F}_\ell}, p_{\mathcal{F}_\ell}, P_{i\mathcal{F}_\ell}, C_{i\mathcal{F}_\ell}, P_{i\mathcal{F}_\ell}C_{i\mathcal{F}_\ell}\}$, such that for a.e. $f \in \mathcal{F}_\ell$,

$$w_f = w_{\mathcal{F}_\ell}, \qquad p_f = p_{\mathcal{F}_\ell}, \qquad P_{if} = P_{i\mathcal{F}_\ell}, \qquad C_{if} = C_{i\mathcal{F}_\ell}, \qquad P_{if}C_{if} = P_{i\mathcal{F}_\ell}C_{i\mathcal{F}_\ell}$$

[11]For any integrable function $g : \mathcal{F}_k \to \mathbb{R}$ and any $f \in \mathcal{F}_k$, $\int_{\mathcal{F}_k} g(j)\, dj = \int_{\mathcal{F}_k \setminus \{f\}} g(j)\, dj + \int_{\{f\}} g(j)\, dj$ Since $\{f\}$ is a singleton and has Lebesgue measure zero, $\int_{\{f\}} g(j)\, dj = 0$. Hence, $\int_{\mathcal{F}_k} g(j)\, dj = \int_{\mathcal{F}_k \setminus \{f\}} g(j)\, dj$. Applied to $g(j) = \Lambda_{j\mathcal{F}_\ell}(P_j C_j)$, this result implies that the domestic case $j = f$ does not require separate treatment inside follower integrals: removing a single follower does not affect aggregate expressions.

Let i be any importer (leader or follower). Total nominal expenditure by i on varieties produced by followers in bloc ℓ is

$$\int_{\mathcal{F}_\ell} P_{if} C_{if}\, df = \pi_\ell P_{i\mathcal{F}_\ell} C_{i\mathcal{F}_\ell} = \pi_\ell \left(\frac{P_{i\mathcal{F}_\ell}}{P_i}\right)^{-(\sigma-1)} P_i C_i$$

Let the importer i's CES price index be

$$P_i = \left(\sum_{\ell' \in \mathcal{L}} P_{i\ell'}^{-(\sigma-1)} + \int_{\mathcal{F}} P_{if}^{-(\sigma-1)}\, df\right)^{-\frac{1}{\sigma-1}}$$

Partition $\mathcal{F} = \mathcal{F}_E \cup \mathcal{F}_W$ and use Part (1) to write, for each $\ell \in \{E, W\}$, $P_{if} = P_{i\mathcal{F}_\ell}$ for a.e. $f \in \mathcal{F}_\ell$. Then

$$\int_{\mathcal{F}} P_{if}^{-(\sigma-1)}\, df = \sum_{\ell \in \mathcal{L}} \int_{\mathcal{F}_\ell} P_{if}^{-(\sigma-1)}\, df = \sum_{\ell \in \mathcal{L}} \int_{\mathcal{F}_\ell} P_{i\mathcal{F}_\ell}^{-(\sigma-1)}\, df = \sum_{\ell \in \mathcal{L}} \pi_\ell\, P_{i\mathcal{F}_\ell}^{-(\sigma-1)}$$

Hence, the price index can be written as if the follower continuum were replaced by two composite follower economies:

$$P_i = \left(\sum_{\ell' \in \mathcal{L}} P_{i\ell'}^{-(\sigma-1)} + \sum_{\ell \in \mathcal{L}} \pi_\ell\, P_{i\mathcal{F}_\ell}^{-(\sigma-1)}\right)^{-\frac{1}{\sigma-1}} \tag{B.1}$$

Similarly, the consumption index aggregator for a given country i is:

$$C_i = \left(\sum_{\ell \in \mathcal{L}} C_{i\ell}^{\frac{\sigma-1}{\sigma}} + \int_{\mathcal{F}} C_{if}^{\frac{\sigma-1}{\sigma}}\, df\right)^{\frac{\sigma}{\sigma-1}}$$

Partition $\mathcal{F} = \mathcal{F}_E \cup \mathcal{F}_W$ and use Part (1) to write, for each $\ell \in \{E, W\}$, $C_{if} = C_{i\mathcal{F}_\ell}$ for a.e. $f \in \mathcal{F}_\ell$. Then

$$\int_{\mathcal{F}} C_{if}^{\frac{\sigma-1}{\sigma}}\, df = \sum_{\ell \in \mathcal{L}} \int_{\mathcal{F}_\ell} C_{if}^{\frac{\sigma-1}{\sigma}}\, df = \sum_{\ell \in \mathcal{L}} \int_{\mathcal{F}_\ell} C_{i\mathcal{F}_\ell}^{\frac{\sigma-1}{\sigma}}\, df = \sum_{\ell \in \mathcal{L}} \pi_\ell C_{i\mathcal{F}_\ell}^{\frac{\sigma-1}{\sigma}}$$

Hence, the consumption aggregator and the ideal price index for i's can be written as

$$C_i = \left(\sum_{\ell \in \mathcal{L}} C_{i\ell}^{\frac{\sigma-1}{\sigma}} + \sum_{\ell \in \mathcal{L}} \pi_\ell\, C_{i\mathcal{F}_\ell}^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\sigma}{\sigma-1}}$$

Since $P_{if}C_{if} = P_{i\mathcal{F}_\ell}C_{i\mathcal{F}_\ell}$ is the same for almost every $f \in \mathcal{F}_\ell$, it follows, by the same logic that $\int_{\mathcal{F}_\ell} P_{if}C_{if}df = \pi_\ell P_{i\mathcal{F}_\ell}C_{i\mathcal{F}_\ell}$. Finally, output and labor forces for each bloc can be expressed as:

$$\begin{aligned} N_{\mathcal{F}_\ell} &= \textstyle\int_{\mathcal{F}_\ell} N_f df = \int_{\mathcal{F}_\ell} N df = \pi_\ell N \\ Y_{\mathcal{F}_\ell} &= \textstyle\int_{\mathcal{F}_\ell} Y_f df = \int_{\mathcal{F}_\ell} AN df = \pi_\ell AN \end{aligned}$$

Therefore, conditional on $\{\pi_\ell\}$, the continuum of followers can be replaced by two representative follower economies $\mathcal{F}_\ell$, without loss for the determination of $\{P_i, C_i\}$. $\square$

C Equilibrium

This Appendix lists the equations that characterize a Stationary Markov Perfect Bargaining Equilibrium (SMPBE). It is useful to separate (i) a *within-period* (static) trade equilibrium conditional on state $\mathbf{s} = (m_i, m_j)$ and tariff choices (τ_{ij}, τ_{ji}), from (ii) the *dynamic* equilibrium of the bargaining-and-power-accumulation game.

C.1 Cross-sectional Equilibrium

C.1.1 Existence and uniqueness

Lemma 2 (Gross-substitutes property in the aggregate economy)**.** *Let the aggregate economy be as in the manuscript. For fixed weights (π_E, π_W), if $\tau_{ij} < \bar{\tau} < \infty$ and $\kappa_{ij} < \bar{\kappa} < \infty$ for all pairs i, j, then there exists some $\bar{\phi} \in [0, 1)$, such that for all $\phi_i < \bar{\phi}$, the aggregate economy satisfies the gross-substitute property in the vector of wages.*

Proof. Proof. Fix $\boldsymbol{\pi} = (\pi_E, \pi_W)'$ and define the (endogenous vector of wages) as $\mathbf{w}$. Let:

$$\nu_i(\boldsymbol{\pi}) = \begin{cases} 1 & \text{if } i \in \{E, W\} \\ \pi_i & \text{if } i \in \{\mathcal{F}_E, \mathcal{F}_W\} \end{cases}$$

Expenditure shares then satisfy:

$$\lambda_{ij}(\boldsymbol{\pi}, \mathbf{w}) = \frac{P_{ij}C_{ij}}{P_iC_i} = \left(\frac{P_{ij}}{P_i}\right)^{-(\sigma-1)} = \frac{\nu_j(\boldsymbol{\pi})P_{ij}^{-(\sigma-1)}}{\sum_k \nu_k(\boldsymbol{\pi})P_{ik}^{-(\sigma-1)}} = \frac{\nu_j(\boldsymbol{\pi})[(1+\tau_{ij})\kappa_{ij}w_j/A_j]^{-(\sigma-1)}}{\sum_k \nu_k(\boldsymbol{\pi})[(1+\tau_{ik})\kappa_{ik}w_k/A_k]^{-(\sigma-1)}}$$

while total tariff revenue is:

$$R_i = \sum_{j \in \mathcal{C} \setminus \{i\}} \frac{\tau_{ij}}{1+\tau_{ij}} \times P_{ij} C_{ij} = \sum_{j \in \mathcal{C} \setminus \{i\}} \frac{\tau_{ij}}{1+\tau_{ij}} \lambda_{ij}(\boldsymbol{\pi}, \mathbf{w}) P_i C_i$$

Hence, we use the budget constraint to rewrite total expenditure in country i as a function of wages, tariffs, and trade shares:

$$P_i C_i = R_i + w_i N_i \iff P_i C_i = \frac{w_i N_i}{1 - \sum_{j \in \mathcal{C} \setminus \{i\}} \frac{\tau_{ij}}{1+\tau_{ij}} \lambda_{ij}(\boldsymbol{\pi}, \mathbf{w})} \equiv \frac{w_i N_i}{1 - \Theta_i(\boldsymbol{\pi}, \mathbf{w})}$$

where $\Theta_i(\boldsymbol{\pi}, \mathbf{w}) \equiv \sum_{j \in \mathcal{C} \setminus \{i\}} \frac{\tau_{ij}}{1+\tau_{ij}} \lambda_{ij}(\boldsymbol{\pi}, \mathbf{w})$ is the import-expenditure-weighted average of the tariff-revenue share $\frac{\tau_{ij}}{1+\tau_{ij}}$ and therefore equals tariff revenue as a fraction of total absorption: $\Theta_i = R_i / P_i C_i$. Since markets are perfectly competitive and labor is the only factor of production, labor income is equal to total expenditure on goods produced on a given country i, net of tariffs.

$$w_i N_i = \sum_j \frac{1}{1+\tau_{ji}} P_{ji} C_{ji} = \sum_j \frac{1}{1+\tau_{ji}} \lambda_{ji}(\boldsymbol{\pi}, \mathbf{w}) P_i C_i = \sum_j \frac{1}{1+\tau_{ji}} \lambda_{ji}(\boldsymbol{\pi}, \mathbf{w}) \frac{w_j N_j}{1 - \Theta_j(\boldsymbol{\pi}, \mathbf{w})}$$

Now define the excess demand function:

$$Z_i(\mathbf{w}, \boldsymbol{\pi}) = S_i(\boldsymbol{\pi}, \mathbf{w}) - w_i N_i$$

where $S_i \equiv \sum_j S_{ji} = \sum_j \frac{1}{1+\tau_{ji}} \lambda_{ji}(\boldsymbol{\pi}, \mathbf{w}) \frac{w_j N_j}{1-\Theta_j(\boldsymbol{\pi}, \mathbf{w})}$. What we need to show is that $\partial Z_i(\mathbf{w}, \boldsymbol{\pi}) / \partial w_m > 0$ for all $m \neq i$. Taking this derivative results in:

$$\frac{\partial Z_i(\mathbf{w}, \boldsymbol{\pi})}{\partial w_m} = \frac{\partial S_i(\mathbf{w}, \boldsymbol{\pi})}{\partial w_m}$$

We will now work out each of these derivatives independently. First, note:

$$\frac{\partial S_i(\mathbf{w}, \boldsymbol{\pi})}{\partial w_m} = \sum_j S_{ji}(\mathbf{w}, \boldsymbol{\pi}) \left[\frac{1}{\lambda_{ji}(\boldsymbol{\pi}, \mathbf{w})} \frac{\partial \lambda_{ji}(\mathbf{w}, \boldsymbol{\pi})}{\partial w_m} + \frac{1}{1 - \Theta_j(\boldsymbol{\pi}, \mathbf{w})} \frac{\partial \Theta_j(\mathbf{w}, \boldsymbol{\pi})}{\partial w_m} + \frac{1_{\{j=m\}}}{w_m} \right]$$

where for $m \neq i$:

$$\frac{\partial \lambda_{ji}(\mathbf{w}, \boldsymbol{\pi})}{\partial w_m} = \frac{\partial}{\partial w_m} \frac{\nu_i(\boldsymbol{\pi}) [(1+\tau_{ji}) \kappa_{ji} w_i / A_i]^{-(\sigma-1)}}{\sum_k \nu_k(\boldsymbol{\pi}) [(1+\tau_{jk}) \kappa_{jk} w_k / A_k]^{-(\sigma-1)}} = (\sigma - 1) \frac{\lambda_{ji} \lambda_{jm}}{w_m} > 0$$

and

$$\frac{\partial \Theta_i(\mathbf{w},\boldsymbol{\pi})}{\partial w_m} = \frac{\partial}{\partial w_m}\sum_{j\in\mathcal{C}\setminus\{i\}} \frac{\tau_{ij}}{1+\tau_{ij}}\lambda_{ij}(\boldsymbol{\pi},\mathbf{w}) = \sum_{j\in\mathcal{C}\setminus\{i\}} \frac{\tau_{ij}}{1+\tau_{ij}}\frac{\partial \lambda_{ij}(\boldsymbol{\pi},\mathbf{w})}{\partial w_m}.$$

using the fact that:

$$\frac{\partial \lambda_{ij}(\mathbf{w},\boldsymbol{\pi})}{\partial w_m} = \frac{\partial}{\partial w_m}\frac{\nu_j(\boldsymbol{\pi})[(1+\tau_{ij})\kappa_{ij}w_j/A_j]^{-(\sigma-1)}}{\sum_k \nu_k(\boldsymbol{\pi})[(1+\tau_{ik})\kappa_{ik}w_k/A_k]^{-(\sigma-1)}} = \begin{cases} (\sigma-1)\frac{\lambda_{ij}\lambda_{im}}{w_m} > 0 & \textbf{if } m\neq j \\ -(\sigma-1)\frac{\lambda_{im}(1-\lambda_{im})}{w_m} < 0 & \textbf{if } m = j \end{cases}$$

we can show:

$$\begin{aligned}
\frac{\partial \Theta_i}{\partial w_m} &= \frac{\tau_{im}}{1+\tau_{im}}\frac{\partial \lambda_{im}}{\partial w_m} + \sum_{\substack{j\neq i\\ j\neq m}} \frac{\tau_{ij}}{1+\tau_{ij}}\frac{\partial \lambda_{ij}}{\partial w_m} \\
&= \frac{1}{w_m}\frac{\tau_{im}}{1+\tau_{im}}\Big[-(\sigma-1)\lambda_{im}(1-\lambda_{im})\Big] + \frac{1}{w_m}\sum_{\substack{j\neq i\\ j\neq m}}\frac{\tau_{ij}}{1+\tau_{ij}}\Big[(\sigma-1)\lambda_{ij}\lambda_{im}\Big] \\
&= \frac{(\sigma-1)\lambda_{im}}{w_m}\left[-\frac{\tau_{im}}{1+\tau_{im}}(1-\lambda_{im}) + \sum_{\substack{j\neq i\\ j\neq m}}\frac{\tau_{ij}}{1+\tau_{ij}}\lambda_{ij}\right] \\
&= \frac{(\sigma-1)\lambda_{im}}{w_m}\left[\Theta_i - \frac{\tau_{im}}{1+\tau_{im}}\right]
\end{aligned}$$

Therefore:

$$\begin{aligned}
\frac{\partial S_i(\mathbf{w},\boldsymbol{\pi})}{\partial w_m} &= \sum_j S_{ji}(\mathbf{w},\boldsymbol{\pi})\left[\frac{1}{\lambda_{ji}}(\sigma-1)\frac{\lambda_{ji}\lambda_{jm}}{w_m} + \frac{1}{(1-\Theta_j)w_m}(\sigma-1)\lambda_{jm}\left(\Theta_j - \frac{\tau_{jm}}{1+\tau_{jm}}\right) + \frac{1_{\{j=m\}}}{w_m}\right] \\
&= \sum_j \frac{S_{ji}(\mathbf{w},\boldsymbol{\pi})}{w_m}\left\{(\sigma-1)\lambda_{jm}\left[1+\frac{1}{1-\Theta_j}\left(\Theta_j - \frac{\tau_{jm}}{1+\tau_{jm}}\right)\right] + 1_{\{j=m\}}\right\} \\
&= \sum_j \frac{S_{ji}(\mathbf{w},\boldsymbol{\pi})}{w_m}\left\{\frac{(\sigma-1)\lambda_{jm}}{1-\Theta_j}\left[1 - \frac{\tau_{jm}}{1+\tau_{jm}}\right] + 1_{\{j=m\}}\right\} > 0
\end{aligned}$$

since $\frac{\tau_{jm}}{1+\tau_{jm}} < 1$. This completes the proof. □

Lemma 3 (Derivative bound implies contraction). *Let $T : [a,b] \to \mathbb{R}$ be continuously differentiable with $\sup_{x\in[a,b]} |T'(x)| \leq q < 1$. Then T is a contraction.*

Proof. For any $x, y \in [a, b]$ with $x \neq y$, the Mean Value Theorem gives

$$|T(x) - T(y)| = |T'(\xi)| \cdot |x - y|$$

for some $\xi \in (x, y)$. Since $|T'(\xi)| \leq q < 1$, we have

$$|T(x) - T(y)| \leq q|x - y|.$$

Thus T is a contraction, and by the Contraction Mapping Theorem, T has a unique fixed point in $[a, b]$. □

Proof of Proposition 1

Proof. **Definitions. Part (i).** Fix $\pi \in (0, 1)$. Given π, the weights $\omega(\pi)$ are fixed, and the demand system induced by CES preferences satisfies gross substitutes when $\sigma > 1$. Market clearing is summarized by $Z(w, \pi) = 0$. By Lemma 2, the aggregate economy satisfies the gross substitutes property, which implies the cross-sectional equilibrium is unique. **Part (ii).** Define the composed operator $T(\pi) = \Pi_E(w(\pi), \pi)$, where

$$\Pi_E(w, \pi) = \frac{S_E(w, \pi)^{1/\mu}}{S_E(w, \pi)^{1/\mu} + S_W(w, \pi)^{1/\mu}},$$

and

$$S_E(w, \pi) = \frac{w_{F_E} N}{P_{F_E}(w, \pi) \left[1 - r_{F_E}(w, \pi)\right]}, \qquad S_W(w, \pi) = \frac{w_{F_W} N}{P_{F_W}(w, \pi) \left[1 - r_{F_W}(w, \pi)\right]}.$$

Fix $X = [\varepsilon, 1 - \varepsilon]$ such that $T(X) \subseteq X$. Write $\Delta V(\pi) = \frac{1}{\mu}\big(\ln S_W(\pi) - \ln S_E(\pi)\big)$ so $T(\pi) = (1 + \exp(\Delta V(\pi)))^{-1}$. Differentiating,

$$T'(\pi) = -T(\pi)(1 - T(\pi))\Delta V'(\pi), \qquad \Delta V'(\pi) = \frac{1}{\mu}\left(\frac{d \ln S_W(\pi)}{d\pi} - \frac{d \ln S_E(\pi)}{d\pi}\right).$$

Hence,

$$|T'(\pi)| = \frac{T(\pi)(1 - T(\pi))}{\mu}\left|\frac{d \ln S_W(\pi)}{d\pi} - \frac{d \ln S_E(\pi)}{d\pi}\right| \leq \frac{1}{4\mu}\left|\frac{d \ln S_W(\pi)}{d\pi} - \frac{d \ln S_E(\pi)}{d\pi}\right|.$$

Let $M = \sup_{\pi \in X}\left|\frac{d \ln S_W(\pi)}{d\pi} - \frac{d \ln S_E(\pi)}{d\pi}\right| < \infty$ and set $\bar{\mu} = M/4$. Then for $\mu > \bar{\mu}$, $\sup_{\pi \in X} |T'(\pi)| \leq M/(4\mu) < 1$. By Lemma 3, T is a contraction on X, so it has a unique fixed point $\pi^\star \in X$. By

Part (i), $w(\pi^\star)$ is unique up to numéraire, so the full equilibrium is unique up to numéraire. $\square$

C.2 Equilibrium conditions

Here we describe an equilibrium across a world with two leaders and two followers blocs: $\tilde{\mathcal{C}} := \{E,\, \mathcal{F}_E,\, W,\, \mathcal{F}_W\}$. Fix a period t, state $\mathbf{s} = (m_E, m_W)$ and a tariff pair (τ_{EW}, τ_{WE}). omit time subscripts since all objects are defined in the same time period. Let $b(i) \in \mathcal{L}$ denote the bloc of economy i, so that $b(E) = b(F_E) = E$ and $b(W) = b(F_W) = W$. For each $i \in \mathcal{C}$, define the source mass ν_i by $\nu_i = 1$ if $i \in \mathcal{L}$ and $\nu_{F_\ell} = \pi_\ell$ if $i = F_\ell \in \mathcal{F}$. Similarly, let $N_{\mathcal{F}_\ell} = \pi_\ell N$, $A_{\mathcal{F}_\ell} = A$ and $\phi_i = 0$ for all $i \in \mathcal{F}$.

The static equilibrium is a collection $\{w_i, p_i, P_i, C_i, R_i, T_i, \iota_i, \{P_{ij}, C_{ij}, \lambda_{ij}\}_{j\in\mathcal{C}}\}_{i\in\mathcal{C}}$ and bloc shares (π_E, π_W) satisfying

$$\tau_{ij} = \begin{cases} 0, & b(i) = b(j), \\ \tau_{b(i)b(j)}, & b(i) \neq b(j), \end{cases} \qquad i, j \in \mathcal{C}; \tag{C.1a}$$

$$p_i = \frac{w_i}{A_i}, \qquad i \in \mathcal{C}; \tag{C.1b}$$

$$P_{ij} = (1 + \tau_{ij})\kappa_{ij} p_j, \qquad i, j \in \mathcal{C}; \tag{C.1c}$$

$$P_i = \left[\sum_{j \in \mathcal{C}} \nu_j P_{ij}^{1-\sigma} \right]^{\frac{1}{1-\sigma}}, \qquad i \in \mathcal{C}; \tag{C.1d}$$

$$C_{ij} = \left(\frac{P_{ij}}{P_i} \right)^{-\sigma} C_i, \qquad i, j \in \mathcal{C}; \tag{C.1e}$$

$$\lambda_{ij} = \frac{\nu_j P_{ij} C_{ij}}{P_i C_i} = \nu_j \left(\frac{P_{ij}}{P_i} \right)^{1-\sigma}, \qquad i, j \in \mathcal{C}; \tag{C.1f}$$

$$\sum_{j \in \mathcal{C}} \lambda_{ij} = 1, \qquad i \in \mathcal{C}; \tag{C.1g}$$

$$P_i C_i = w_i N_i + T_i, \qquad i \in \mathcal{C}; \tag{C.1h}$$

$$R_i = \sum_{j \in \mathcal{C}} \nu_j \frac{\tau_{ij}}{1 + \tau_{ij}} P_{ij} C_{ij}, \qquad i \in \mathcal{C}; \tag{C.1i}$$

$$T_i = (1 - \phi_i) R_i, \qquad i \in \mathcal{C}; \tag{C.1j}$$

$$p_i \iota_i = \phi_i R_i, \qquad i \in \mathcal{C}; \tag{C.1k}$$

$$A_i N_i = \nu_i \sum_{j \in \mathcal{C}} \kappa_{ji} C_{ji} + \iota_i, \qquad i \in \mathcal{C}; \tag{C.1l}$$

$$\pi_\ell = \frac{(C_{F_\ell} / \pi_\ell)^{1/\mu}}{\sum_{k \in \mathcal{L}} (C_{F_k} / \pi_k)^{1/\mu}}, \qquad \ell \in \mathcal{L}; \tag{C.1m}$$

$$\sum_{\ell \in \mathcal{L}} \pi_\ell = 1. \tag{C.1n}$$

This system consists of 64 equations in 64 unknowns. Because the model is homogeneous of degree one in nominal prices, the static allocation is determined only up to a common scale normalization; we therefore impose a numéraire to pin down levels.

D Optimal tariff formula

The peaceful tariff problem. Fix a leader $\ell \in \mathcal{L}$, its rival $\ell' \neq \ell$, and the exogenous military-power vector $s = (m_\ell, m_{\ell'})$. Define leader k's no-war surplus by

$$H_k(\tau_{\ell\ell'}, \tau_{\ell'\ell}; s) \equiv U_k(\tau_{kk'}, \tau_{k'k}) - D_k(s), \qquad k \in \{\ell, \ell'\},$$

where the arguments of U_k are ordered so that the first argument is leader k's own tariff. Conditional on peace, leader ℓ solves

$$\max_{\tau_{\ell\ell'} \geq 0} U_\ell(\tau_{\ell\ell'}, \tau_{\ell'\ell}) \text{ subject to } U_\ell(\tau_{\ell\ell'}, \tau_{\ell'\ell}) - D_\ell(s) \geq 0, \text{ and } U_{\ell'}(\tau_{\ell'\ell}, \tau_{\ell\ell'}) - D_{\ell'}(s) \geq 0.$$

Let $\eta_\ell^{\text{own}} \geq 0$ and $\eta_\ell^{\text{rival}} \geq 0$ denote the multipliers on leader ℓ's and leader ℓ''s no-war constraints, respectively. The associated Lagrangian is

$$\mathscr{L}_\ell = U_\ell(\tau_{\ell\ell'}, \tau_{\ell'\ell}) + \eta_\ell^{\text{o}} \left[U_\ell(\tau_{\ell\ell'}, \tau_{\ell'\ell}) - D_\ell(s)\right] + \eta_\ell^{\text{r}} \left[U_{\ell'}(\tau_{\ell'\ell}, \tau_{\ell\ell'}) - D_{\ell'}(s)\right]. \tag{D.2}$$

Proof. We focus on an interior positive tariff, $\tau_{\ell\ell'}^* > 0$. The first-order of the Lagrangian condition with respect to $\log(1 + \tau_{\ell\ell'})$ is

$$\frac{dU_\ell}{d\log(1+\tau_{\ell\ell'})} + \eta_\ell^\ell \left[\frac{dU_\ell}{d\log(1+\tau_{\ell\ell'})} - \frac{dD_\ell(\mathbf{s})}{d\log(1+\tau_{\ell\ell'})}\right] + \eta_\ell^{\ell'} \left[\frac{dU_{\ell'}}{d\log(1+\tau_{\ell\ell'})} - \frac{dD_{\ell'}(\mathbf{s})}{d\log(1+\tau_{\ell\ell'})}\right] = 0. \tag{D.3}$$

Military power is exogenous. Moreover, the disagreement payoffs are evaluated under the war tariff regime and therefore do not depend on the proposed peaceful tariff $\tau_{\ell\ell'}$. Thus, $\frac{dD_\ell(\mathbf{s})}{d\log(1+\tau_{\ell\ell'})} = 0$ and $\frac{dD_{\ell'}(\mathbf{s})}{d\log(1+\tau_{\ell\ell'})} = 0$. Therefore, (D.3) reduces to

$$\left(1 + \eta_\ell^\ell\right) \frac{dU_\ell}{d\log(1+\tau_{\ell\ell'})} + \eta_\ell^{\ell'} \frac{dU_{\ell'}}{d\log(1+\tau_{\ell\ell'})} = 0 \tag{D.4}$$

We first derive the effect of $\tau_{\ell\ell'}$ on leader ℓ's own peaceful payoff. Define domestic expenditure by $E_\ell \equiv P_\ell C_\ell = w_\ell N_\ell + T_\ell$ and define the expenditure shares $\alpha_\ell^w \equiv \frac{w_\ell N_\ell}{E_\ell}$, $1 - \alpha_\ell^w \equiv \frac{T_\ell}{E_\ell}$. From the budget constraint, $\log C_\ell = \log(w_\ell N_\ell + T_\ell) - \log P_\ell$. Differentiating with respect to $\log(1 + \tau_{\ell\ell'})$ gives

$$\begin{aligned} \frac{d\log C_\ell}{d\log(1+\tau_{\ell\ell'})} &= \frac{w_\ell N_\ell}{w_\ell N_\ell + T_\ell} \frac{d\log w_\ell}{d\log(1+\tau_{\ell\ell'})} + \frac{T_\ell}{w_\ell N_\ell + T_\ell} \frac{d\log T_\ell}{d\log(1+\tau_{\ell\ell'})} - \frac{d\log P_\ell}{d\log(1+\tau_{\ell\ell'})} \\ &= \alpha_\ell^w \frac{d\log w_\ell}{d\log(1+\tau_{\ell\ell'})} + (1 - \alpha_\ell^w) \frac{d\log R_\ell}{d\log(1+\tau_{\ell\ell'})} - \frac{d\log P_\ell}{d\log(1+\tau_{\ell\ell'})} \end{aligned} \tag{D.5}$$

where in the second equation we used the fact that $T_\ell = R_\ell$ to replace transfers for tariff revenue. Define $\chi_\ell^w \equiv \frac{d\log w_\ell}{d\log(1+\tau_{\ell\ell'})}$ and $\chi_\ell^\pi \equiv \frac{d\log \pi_\ell}{d\log(1+\tau_{\ell\ell'})}$. We maintain the assumption that, to a first order, only the home wage w_ℓ and the home bloc share π_ℓ respond to $\tau_{\ell\ell'}$, while the other wages remain fixed. Leader ℓ's price index is $P_\ell = \left[\sum_{k\in\mathscr{L}}\left(P_{\ell k}^{-(\sigma-1)} + \pi_k P_{\ell\mathscr{F}_k}^{-(\sigma-1)}\right)\right]^{-1/(\sigma-1)}$ with expenditure shares $\lambda_{\ell k} \equiv \frac{P_{\ell k}C_{\ell k}}{P_\ell C_\ell} = \left(\frac{P_{\ell k}}{P_\ell}\right)^{-(\sigma-1)}$ and $\lambda_{\ell\mathscr{F}_k} \equiv \frac{\int_{\mathscr{F}_k} P_{\ell f}C_{\ell f}\,df}{P_\ell C_\ell} = \pi_k\left(\frac{P_{\ell\mathscr{F}_k}}{P_\ell}\right)^{-(\sigma-1)}$. Differentiating the price level wrt to $\log(1+\tau_{\ell\ell'})$ results in:

$$\begin{aligned}\frac{d\log P_\ell}{d\log(1+\tau_{\ell\ell'})} = \lambda_{\ell\ell}&\frac{d\log P_{\ell\ell}}{d\log(1+\tau_{\ell\ell'})} + \lambda_{\ell\ell'}\frac{d\log P_{\ell\ell'}}{d\log(1+\tau_{\ell\ell'})}\\ &+ \lambda_{\ell\mathscr{F}_\ell}\frac{d\log P_{\ell\mathscr{F}_\ell}}{d\log(1+\tau_{\ell\ell'})} + \lambda_{\ell\mathscr{F}_{\ell'}}\frac{d\log P_{\ell\mathscr{F}_{\ell'}}}{d\log(1+\tau_{\ell\ell'})}\\ &- \frac{1}{\sigma-1}\lambda_{\ell\mathscr{F}_\ell}\frac{d\log\pi_\ell}{d\log(1+\tau_{\ell\ell'})}\\ &- \frac{1}{\sigma-1}\lambda_{\ell\mathscr{F}_{\ell'}}\frac{d\log\pi_{\ell'}}{d\log(1+\tau_{\ell\ell'})}.\end{aligned} \tag{D.6}$$

Domestic prices satisfy $P_{\ell\ell} = p_\ell = \frac{w_\ell}{A_\ell}$, so $\frac{d\log P_{\ell\ell}}{d\log(1+\tau_{\ell\ell'})} = \chi_\ell^w$. The delivered price of the rival leader's good is $P_{\ell\ell'} = (1+\tau_{\ell\ell'})\kappa_{\ell\ell'}p_{\ell'}$, and the delivered price of a representative follower good from the rival bloc is $P_{\ell\mathscr{F}_{\ell'}} = (1+\tau_{\ell\ell'})\kappa_{\ell\mathscr{F}_{\ell'}}p_{\mathscr{F}_{\ell'}}$. Because the relevant foreign factory-gate prices are fixed to a first order and the home follower-bloc price is not directly affected by

$$\frac{d\log P_{\ell\ell'}}{d\log(1+\tau_{\ell\ell'})} = 1, \quad \frac{d\log P_{\ell\mathscr{F}_{\ell'}}}{d\log(1+\tau_{\ell\ell'})} = 1, \text{ and } \frac{d\log P_{\ell\mathscr{F}_\ell}}{d\log(1+\tau_{\ell\ell'})} = 0.$$

Because $\pi_{\ell'} = 1-\pi_\ell$, we have $d\pi_{\ell'} = -d\pi_\ell$. Hence, $\frac{d\log\pi_{\ell'}}{d\log(1+\tau_{\ell\ell'})} = -\frac{\pi_\ell}{1-\pi_\ell}\chi_\ell^\pi$. Substituting these expressions into (D.6) yields

$$\frac{d\log P_\ell}{d\log(1+\tau_{\ell\ell'})} = \lambda_{\ell\ell}\chi_\ell^w + \lambda_{\ell\ell'} + \lambda_{\ell\mathscr{F}_{\ell'}} - \frac{1}{\sigma-1}\left(\lambda_{\ell\mathscr{F}_\ell} - \frac{\pi_\ell}{1-\pi_\ell}\lambda_{\ell\mathscr{F}_{\ell'}}\right)\chi_\ell^\pi. \tag{D.7}$$

Leader ℓ's tariff revenue is $R_\ell = \frac{\tau_{\ell\ell'}}{1+\tau_{\ell\ell'}}(P_{\ell\ell'}C_{\ell\ell'} + \pi_{\ell'}P_{\ell\mathscr{F}_{\ell'}}C_{\ell\mathscr{F}_{\ell'}}) \equiv \frac{\tau_{\ell\ell'}}{1+\tau_{\ell\ell'}}\widetilde{M}_\ell$. Taking logs and derivating wrt to $\log(1+\tau_{\ell\ell'})$:

$$\begin{aligned}\frac{d\log R_\ell}{d\log(1+\tau_{\ell\ell'})} &= \frac{d\log\tau_{\ell\ell'}}{d\log(1+\tau_{\ell\ell'})} - \frac{d\log(1+\tau_{\ell\ell'})}{d\log(1+\tau_{\ell\ell'})} + \frac{d\log\widetilde{M}_\ell}{d\log(1+\tau_{\ell\ell'})}\\ &= \frac{1}{\tau_{\ell\ell'}} + \frac{d\log\widetilde{M}_\ell}{d\log(1+\tau_{\ell\ell'})}\\ &= \frac{1}{\tau_{\ell\ell'}} + \mathscr{E}_\ell^w\chi_\ell^w + \mathscr{E}_\ell^\pi\chi_\ell^\pi.\end{aligned} \tag{D.8}$$

where $\mathscr{E}_\ell^w \equiv \frac{\partial \log \widetilde{M}_\ell}{\partial \log w_\ell}$ and $\mathscr{E}_\ell^\pi \equiv \frac{\partial \log \widetilde{M}_\ell}{\partial \log \pi_\ell}$. Substituting (D.7) and (D.8) into (D.6) and rearranging terms results in:

$$\begin{aligned}\frac{d\log C_\ell}{d\log(1+\tau_{\ell\ell'})} = {} & \frac{1-\alpha_\ell^w}{\tau_{\ell\ell'}} - \left(\lambda_{\ell\ell'} + \lambda_{\ell\mathscr{F}_{\ell'}}\right) \\ & + \left[\alpha_\ell^w + (1-\alpha_\ell^w)\mathscr{E}_\ell^w - \lambda_{\ell\ell}\right]\chi_\ell^w \\ & + \left[(1-\alpha_\ell^w)\mathscr{E}_\ell^\pi + \frac{1}{\sigma-1}\left(\lambda_{\ell\mathscr{F}_\ell} - \frac{\pi_\ell}{1-\pi_\ell}\lambda_{\ell\mathscr{F}_{\ell'}}\right)\right]\chi_\ell^\pi. \end{aligned} \tag{D.9}$$

Since $G_\ell = \bar{g}_\ell + \pi_\ell$, we have:

$$\frac{d\log G_\ell}{d\log(1+\tau_{\ell\ell'})} = \frac{1}{\bar{g}_\ell + \pi_\ell}\frac{d\pi_\ell}{d\log(1+\tau_{\ell\ell'})} = \frac{\pi_\ell}{\bar{g}_\ell + \pi_\ell}\chi_\ell^\pi.$$

Using (5) and differentiating with respect to the choice variable:

$$\frac{dU_\ell}{d\log(1+\tau_{\ell\ell'})} = \omega_\ell \frac{d\log C_\ell}{d\log(1+\tau_{\ell\ell'})} + (1-\omega_\ell)\frac{d\log G_\ell}{d\log(1+\tau_{\ell\ell'})} \tag{D.10}$$

Define the generalized Johnson term by

$$\mathscr{E}_\ell^J \equiv \frac{\lambda_{\ell\ell'} + \lambda_{\ell\mathscr{F}_{\ell'}} - \left[\alpha_\ell^w + (1-\alpha_\ell^w)\mathscr{E}_\ell^w - \lambda_{\ell\ell}\right]\chi_\ell^w}{1-\alpha_\ell^w} \tag{D.11}$$

and define the geopolitical-alignment wedge by

$$\mathscr{G}_\ell \equiv \frac{1}{1-\alpha_\ell^w}\left[(1-\alpha_\ell^w)\mathscr{E}_\ell^\pi + \frac{1}{\sigma-1}\left(\lambda_{\ell\mathscr{F}_\ell} - \frac{\pi_\ell}{1-\pi_\ell}\lambda_{\ell\mathscr{F}_{\ell'}}\right) + \frac{1-\omega_\ell}{\omega_\ell}\frac{\pi_\ell}{\bar{g}_\ell + \pi_\ell}\right]\chi_\ell^\pi. \tag{D.12}$$

Using (D.10):

$$\frac{dU_\ell}{d\log(1+\tau_{\ell\ell'})} = \omega_\ell(1-\alpha_\ell^w)\left[\frac{1}{\tau_{\ell\ell'}} - \mathscr{E}_\ell^J + \mathscr{G}_\ell\right]$$

Therefore:

$$\omega_\ell(1-\alpha_\ell^w)\left[\frac{1}{\tau_{\ell\ell'}} - \mathscr{E}_\ell^J + \mathscr{G}_\ell\right] = -\frac{\eta_\ell^{\ell'}}{1+\eta_\ell^\ell}\frac{dU_{\ell'}}{d\log(1+\tau_{\ell\ell'})}$$

By (D.11),

$$-\omega_\ell(1-\alpha_\ell^w)\mathscr{E}_\ell^J = -\omega_\ell\left[\lambda_{\ell\ell'} + \lambda_{\ell\mathscr{F}_{\ell'}} - \mathscr{J}_\ell\right]. \tag{D.13}$$

We next derive the effect of leader ℓ's tariff on the rival's peaceful payoff. Applying the same consumption decomposition,

$$\frac{d\log C_{\ell'}}{d\log(1+\tau_{\ell\ell'})} = \alpha^w_{\ell'}\frac{d\log w_{\ell'}}{d\log(1+\tau_{\ell\ell'})} + (1-\alpha^w_{\ell'})\frac{d\log R_{\ell'}}{d\log(1+\tau_{\ell\ell'})} - \frac{d\log P_{\ell'}}{d\log(1+\tau_{\ell\ell'})}. \tag{D.14}$$

Under the maintained first-order restriction, $\frac{d\log w_{\ell'}}{d\log(1+\tau_{\ell\ell'})} = 0$. Hence,

$$\frac{d\log C_{\ell'}}{d\log(1+\tau_{\ell\ell'})} = (1-\alpha^w_{\ell'})\frac{d\log R_{\ell'}}{d\log(1+\tau_{\ell\ell'})} - \frac{d\log P_{\ell'}}{d\log(1+\tau_{\ell\ell'})}. \tag{D.15}$$

The rival's tariff revenue is $R_{\ell'} = \frac{\tau_{\ell'\ell}}{1+\tau_{\ell'\ell}}\widetilde{M}_{\ell'}$. Because $\tau_{\ell'\ell}$ is held fixed,

$$\frac{d\log R_{\ell'}}{d\log(1+\tau_{\ell\ell'})} = \frac{d\log \widetilde{M}_{\ell'}}{d\log(1+\tau_{\ell\ell'})}. \tag{D.16}$$

Define the cross elasticities

$$\mathscr{E}^w_{\ell'\leftarrow\ell} \equiv \frac{\partial\log\widetilde{M}_{\ell'}}{\partial\log w_\ell} \tag{D.17}$$

and

$$\mathscr{E}^\pi_{\ell'\leftarrow\ell} \equiv \frac{\partial\log\widetilde{M}_{\ell'}}{\partial\log \pi_\ell}, \tag{D.18}$$

where the latter derivative is evaluated along $\pi_{\ell'} = 1-\pi_\ell$. The chain rule gives

$$\frac{d\log R_{\ell'}}{d\log(1+\tau_{\ell\ell'})} = \mathscr{E}^w_{\ell'\leftarrow\ell}\chi^w_\ell + \mathscr{E}^\pi_{\ell'\leftarrow\ell}\chi^\pi_\ell. \tag{D.19}$$

The rival's price index is

$$P_{\ell'} = \left[\sum_{k\in\mathscr{L}}\left(P_{\ell'k}^{-(\sigma-1)} + \pi_k P_{\ell'\mathscr{F}_k}^{-(\sigma-1)}\right)\right]^{-1/(\sigma-1)}.$$

Leader ℓ's tariff does not directly enter the delivered prices paid by the rival. Under the maintained first-order restriction, it affects the rival's price index through w_ℓ and π_ℓ. Therefore,

$$\frac{d\log P_{\ell'}}{d\log(1+\tau_{\ell\ell'})} = \lambda_{\ell'\ell}\chi^w_\ell - \frac{1}{\sigma-1}\lambda_{\ell'\mathscr{F}_\ell}\chi^\pi_\ell - \frac{1}{\sigma-1}\lambda_{\ell'\mathscr{F}_{\ell'}}\frac{d\log\pi_{\ell'}}{d\log(1+\tau_{\ell\ell'})}. \tag{D.20}$$

Using (??),

$$\frac{d\log P_{\ell'}}{d\log(1+\tau_{\ell\ell'})} = \lambda_{\ell'\ell}\chi_\ell^w - \frac{1}{\sigma-1}\left(\lambda_{\ell'\mathscr{F}_\ell} - \frac{\pi_\ell}{1-\pi_\ell}\lambda_{\ell'\mathscr{F}_{\ell'}}\right)\chi_\ell^\pi. \tag{D.21}$$

Substituting (D.19) and (D.21) into (D.15) yields

$$\begin{aligned}\frac{d\log C_{\ell'}}{d\log(1+\tau_{\ell\ell'})} = & \left[(1-\alpha_{\ell'}^w)\mathscr{E}_{\ell'\leftarrow\ell}^w - \lambda_{\ell'\ell}\right]\chi_\ell^w \\ & + \left[(1-\alpha_{\ell'}^w)\mathscr{E}_{\ell'\leftarrow\ell}^\pi + \frac{1}{\sigma-1}\left(\lambda_{\ell'\mathscr{F}_\ell} - \frac{\pi_\ell}{1-\pi_\ell}\lambda_{\ell'\mathscr{F}_{\ell'}}\right)\right]\chi_\ell^\pi.\end{aligned} \tag{D.22}$$

Define

$$\mathscr{A}_{\ell'\leftarrow\ell}^w \equiv (1-\alpha_{\ell'}^w)\mathscr{E}_{\ell'\leftarrow\ell}^w - \lambda_{\ell'\ell} \tag{D.23}$$

and

$$\mathscr{A}_{\ell'\leftarrow\ell}^\pi \equiv (1-\alpha_{\ell'}^w)\mathscr{E}_{\ell'\leftarrow\ell}^\pi + \frac{1}{\sigma-1}\left(\lambda_{\ell'\mathscr{F}_\ell} - \frac{\pi_\ell}{1-\pi_\ell}\lambda_{\ell'\mathscr{F}_{\ell'}}\right). \tag{D.24}$$

Then

$$\frac{d\log C_{\ell'}}{d\log(1+\tau_{\ell\ell'})} = \mathscr{A}_{\ell'\leftarrow\ell}^w\chi_\ell^w + \mathscr{A}_{\ell'\leftarrow\ell}^\pi\chi_\ell^\pi. \tag{D.25}$$

Because

$$G_{\ell'} = \bar{g}_{\ell'} + \pi_{\ell'} = \bar{g}_{\ell'} + 1 - \pi_\ell,$$

we obtain

$$\begin{aligned}\frac{d\log G_{\ell'}}{d\log(1+\tau_{\ell\ell'})} &= \frac{1}{\bar{g}_{\ell'}+\pi_{\ell'}}\frac{d\pi_{\ell'}}{d\log(1+\tau_{\ell\ell'})} \\ &= -\frac{\pi_\ell}{\bar{g}_{\ell'}+\pi_{\ell'}}\chi_\ell^\pi.\end{aligned} \tag{D.26}$$

Using (??),

$$\begin{aligned}\frac{dU_{\ell'}}{d\log(1+\tau_{\ell\ell'})} &= \omega_{\ell'}\frac{d\log C_{\ell'}}{d\log(1+\tau_{\ell\ell'})} + (1-\omega_{\ell'})\frac{d\log G_{\ell'}}{d\log(1+\tau_{\ell\ell'})} \\ &= \omega_{\ell'}\mathscr{A}_{\ell'\leftarrow\ell}^w\chi_\ell^w \\ &\quad + \left[\omega_{\ell'}\mathscr{A}_{\ell'\leftarrow\ell}^\pi - (1-\omega_{\ell'})\frac{\pi_\ell}{\bar{g}_{\ell'}+\pi_{\ell'}}\right]\chi_\ell^\pi.\end{aligned} \tag{D.27}$$

Define the cross-payoff effect

$$\mathscr{X}_{\ell'\leftarrow\ell} \equiv \frac{dU_{\ell'}}{d\log(1+\tau_{\ell\ell'})}. \tag{D.28}$$

Thus,

$$\mathscr{X}_{\ell'\leftarrow\ell} = \omega_{\ell'}\mathscr{A}^{w}_{\ell'\leftarrow\ell}\chi^{w}_{\ell} + \left[\omega_{\ell'}\mathscr{A}^{\pi}_{\ell'\leftarrow\ell} - (1-\omega_{\ell'})\frac{\pi_\ell}{\bar{g}_{\ell'} + \pi_{\ell'}}\right]\chi^{\pi}_{\ell}. \tag{D.29}$$

Substituting (**??**) and (D.28) into (D.4) gives

$$0 = \left(1+\eta^{\ell}_{\ell}\right)\omega_\ell(1-\alpha^{w}_{\ell})\left[\frac{1}{\tau_{\ell\ell'}} - \mathscr{E}^{J}_{\ell} + \mathscr{G}_\ell\right] + \eta^{\ell'}_{\ell}\,\mathscr{X}_{\ell'\leftarrow\ell}. \tag{D.30}$$

Rearranging,

$$\left(1+\eta^{\ell}_{\ell}\right)\omega_\ell(1-\alpha^{w}_{\ell})\left[\frac{1}{\tau_{\ell\ell'}} - \mathscr{E}^{J}_{\ell} + \mathscr{G}_\ell\right] = -\eta^{\ell'}_{\ell}\,\mathscr{X}_{\ell'\leftarrow\ell}. \tag{D.31}$$

Since

$$\left(1+\eta^{\ell}_{\ell}\right)\omega_\ell(1-\alpha^{w}_{\ell}) > 0,$$

we may divide both sides to obtain

$$\frac{1}{\tau^{*}_{\ell\ell'}} - \mathscr{E}^{J}_{\ell} + \mathscr{G}_\ell = -\frac{\eta^{\ell'}_{\ell}}{\left(1+\eta^{\ell}_{\ell}\right)\omega_\ell(1-\alpha^{w}_{\ell})}\mathscr{X}_{\ell'\leftarrow\ell}. \tag{D.32}$$

Therefore,

$$\frac{1}{\tau^{*}_{\ell\ell'}} = \mathscr{E}^{J}_{\ell} - \mathscr{G}_\ell - \frac{\eta^{\ell'}_{\ell}}{\left(1+\eta^{\ell}_{\ell}\right)\omega_\ell(1-\alpha^{w}_{\ell})}\mathscr{X}_{\ell'\leftarrow\ell}. \tag{D.33}$$

Define the effective multiplier on the rival's no-war constraint by

$$\widehat{\eta}_\ell \equiv \frac{\eta^{\ell'}_{\ell}}{1+\eta^{\ell}_{\ell}} \geq 0 \tag{D.34}$$

and define the peace-constraint wedge by

$$\mathscr{M}_\ell \equiv -\frac{\widehat{\eta}_\ell}{\omega_\ell(1-\alpha^{w}_{\ell})}\mathscr{X}_{\ell'\leftarrow\ell}. \tag{D.35}$$

The general constrained optimal-tariff formula is therefore

$$\boxed{\frac{1}{\tau^{*}_{\ell\ell'}} = \mathscr{E}^{J}_{\ell} - \mathscr{G}_\ell + \mathscr{M}_\ell}. \tag{D.36}$$

Equation (D.36), together with the primal-feasibility, dual-feasibility, and complementary-slackness conditions (**??**)–(**??**), nests all possible configurations of the two no-war constraints.

If the rival's no-war constraint is slack, then complementary slackness implies $\eta_\ell^{\ell'} = 0$, so

$$\widehat{\eta}_\ell = 0 \qquad \text{and} \qquad \mathscr{M}_\ell = 0.$$

If the rival's constraint binds and leader ℓ's tariff lowers the rival's peaceful payoff, so that

$$\mathscr{X}_{\ell' \leftarrow \ell} < 0,$$

then

$$\mathscr{M}_\ell > 0.$$

The peace constraint then raises the inverse optimal tariff and lowers the tariff relative to the unconstrained static optimum.

Finally, if tariffs do not affect bloc shares, then

$$\chi_\ell^\pi = 0 \qquad \Longrightarrow \qquad \mathscr{G}_\ell = 0.$$

If the rival's no-war constraint is also slack, then

$$\mathscr{M}_\ell = 0$$

and

$$\tau_{\ell\ell'}^* = \frac{1}{\mathscr{E}_\ell^J}.$$

Under the standard Johnson specialization, $\mathscr{E}_\ell^J$ is the foreign export-supply elasticity, and the textbook optimal-tariff formula is recovered.

$\square$

E Data Appendix

E.1 Tariffs

Our tariff regressions use importer–HS4 average ad valorem tariff rates. We use two tariff sources. For the original BLW sample, we use the tariff measures from Broda et al. (2008), which report average tariff rates at the HS4 level for the non-WTO countries in their sample. These simple averages are constructed from TRAINS tariff data at the HS6 level. Some non-WTO countries report this data for only a small share of goods which led to the authors' decision to focus on 15 specific countries, where at least one-third of all HS6 goods include tariff rates.

For the modern extension, we construct an analogous importer–HS4 tariff measure for 2001–2024 using HS6-level tariff data. This is sourced from Feodora Teti's tariff microdata, and combined with bilateral HS6 trade flows from the CEPII/BACI data. Teti's tariff microdata is preferable to standard WITS/TRAINS extracts for the modern extension because it directly addresses two problems that are especially severe in cross-country tariff panels: false interpolation and selection. Standard WITS "effectively applied" tariffs can incorrectly replace missing preferential rates with MFN rates, generating artificial tariff spikes for country pairs covered by trade agreements, while also conditioning tariff availability on positive reported trade flows.

Teti corrects these problems by combining multiple raw tariff sources, detailed WTO phase-out schedules, and an imputation algorithm that accounts for trade-agreement timing, phase-ins, sequential deepening, overlapping preferences, and changing HS nomenclatures. The resulting dataset provides substantially broader and more internally consistent HS6 coverage across countries and years, making it better suited for our 2001–2024 importer–HS4 panel than raw WITS/TRAINS data. This is particularly important in our setting since we rely on cross-country and cross-product tariff variation, precisely the setting where missing preferential tariffs, false MFN interpolation, and trade-flow-based selection can introduce non-classical measurement error and selection bias.

The modern tariff measure is constructed in three steps. First, all HS product codes are mapped to bins of distinct HS4 level entries. Let i denote the importing country, j the exporting country, h an HS6 product, g the corresponding HS4 product group, and t the year. The underlying tariff data provide an HS6-level tariff rate τ_{ijht}, while the trade data provide bilateral import values v_{ijht}. Second, we construct fixed historical HS4 weights using pre-period trade flows from 1995–1997. For each importer–exporter–HS6 line, we sum import values over the base period, $v_{ijh} = \sum_{t=1995}^{1997} v_{ijht}$.

We then construct weights within each importer–HS4 cell using total base-period imports in that HS4 category:

$$w_{ijh} = \frac{v_{ijh}}{\sum_{j,h \in g} v_{ijh}}$$

These weights are defined using only positive base-period trade flows and are fixed throughout the 2001–2024 analysis period. The code implements this at the importer–exporter–HS6 level and normalizes the weights within importer–HS4 cells.

Third, for each year from 2001 to 2024, we attach the year-specific HS6 tariff to the fixed baseline-weighted HS6 lines and compute an importer–HS4 tariff average. Since tariff coverage may be incomplete for some HS6 lines in a given year, we track the covered baseline weight mass and normalize by the covered baseline weight.

$$\tau_{igt} = \frac{\sum_{j,h\in g} w_{ijh}\tau_{ijht}}{\sum_{j,h\in g} w_{ijh}\mathbf{1}\{\tau_{ijht} \text{ observed}\}}$$

The numerator is the weighted sum of observed tariffs using fixed 1995–1997 trade weights, and the denominator adjusts for the share of the baseline HS4 weight for which tariff data are observed in year t. Our final tariff variable is a time-invariant importer–HS4 measure equal to the simple average of these historically weighted annual tariff rates over 2001–2024:

$$\tau_{ig,2001-2024} = \frac{1}{T_{ig}} \sum_{t=2001}^{2024} \tau_{igt},$$

where the average is taken over years with non-missing tariff information.

We use the simple average across years rather than weighting years by contemporaneous trade volumes. This choice is intentional. A current-trade-weighted tariff average may be endogenous because the trade shares used to aggregate HS6 tariffs into HS4 tariff rates can themselves respond to tariff changes. If higher tariffs reduce imports in a product line, then contemporaneous import weights mechanically place less weight on high-tariff lines. Conversely, tariff reductions may increase trade shares and thereby affect the measured average tariff. Using fixed 1995–1997 trade weights mitigates this concern by holding the product composition of imports fixed at pre-period values. As a result, the modern tariff measure is closer to a predetermined tariff exposure measure and is less contaminated by contemporaneous trade reallocation induced by tariff policy.

For this reason, our preferred 2001–2024 tariff measure is the historically weighted HS4 tariff average. We also construct current-trade-weighted alternatives for diagnostics, but we emphasize the historical-weighted measure in the main robustness exercise since it better isolates tariff policy from endogenous changes in the composition of trade.

E.2 Elasticities

To adopt the BLW specification in a more modern setting, we also need to estimate the inverse elasticity of foreign export supply and the elasticity of import demand.

The unit of analysis mirrors tariff values at importer-HS4 market, indexed by i, g. The importer is i, the HS4 product category is g, and the time period is t. Within each importer-HS4 market, a variety is defined as an exporter-HS6 pair, $v = (j, h)$, where j is the exporter and h is the HS6 code nested inside HS4 good g. Thus, the estimating cell is importer-HS4, but the within-cell variation used for identification comes from exporter-HS6 varieties observed over time.

The trade value and quantity data are sourced from CEPII/BACI bilateral HS6 trade flows. BACI is built from UN Comtrade but reconciles mirror reports from exporters and importers into a single bilateral flow, improving consistency in both reported values and quantities relative to using raw Comtrade declarations directly. This is useful for our elasticity exercise because the Feenstra/BLW estimator is sensitive to unit values and expenditure shares: unit values require reliable value and quantity information, while expenditure shares require consistent measurement of total imports within each importer–HS4–year market. Using BACI also gives broad country coverage and harmonized HS6 product-level data, which is important for constructing exporter–HS6 varieties over a long modern panel.

For each importer-HS4-year-variety observation, the code constructs a unit value and an expenditure share. Let V_{igvt} denote import value and Q_{igvt} denote import quantity. The unit value is $p_{igvt} = \frac{V_{igvt}}{Q_{igvt}}$, and the expenditure share of variety v within importer-HS4-year market (i, g, t) is $s_{igvt} = \frac{V_{igvt}}{\sum_{v' \in \Omega_{igt}} V_{igv't}}$, where Ω_{igt} is the set of varieties observed in importer-HS4 market (i, g) in year t. The empirical implementation uses $\ln p_{igvt}$ and $\ln s_{igvt}$.

The first differencing step constructs adjacent-year log changes within each importer-HS4-variety panel:

$$\Delta \ln p_{igvt} = \ln p_{igvt} - \ln p_{igv,t-1}, \Delta \ln s_{igvt} = \ln s_{igvt} - \ln s_{igv,t-1}.$$

Only adjacent year-pairs are used, so an observation contributes to the estimating sample only when the same variety is observed in both $t-1$ and t.

The updated estimator then applies the BLW-style benchmark-variety double difference. For each importer-HS4 cell (i, g), we choose a benchmark variety k_{ig}. In our implementation, the benchmark is the variety with the greatest number of adjacent-year observations within the cell, with ties broken by total quantity and then total value. This choice is intended to select a stable, well-measured benchmark variety with broad time support.

For each non-benchmark variety v, adjacent-year changes are differenced relative to the benchmark variety in the same importer-HS4-year pair:

$$\Delta^k \ln p_{igvt} = \Delta \ln p_{igvt} - \Delta \ln p_{igk_{ig}t}, \Delta^k \ln s_{igvt} = \Delta \ln s_{igvt} - \Delta \ln s_{igk_{ig}t}.$$

This is the key change relative to a simple adjacent-year differencing procedure. The benchmark-relative transformation removes importer-good-year shocks common to all varieties in the same market and aligns the empirical moments more closely with the Feenstra/BLW estimating equation. The benchmark variety itself is dropped from the estimating sample after this transformation because its benchmark-relative price and share changes are mechanically zero:

$$\Delta^k \ln p_{igk_{ig}t} = 0, \qquad \Delta^k \ln s_{igk_{ig}t} = 0.$$

The estimating equation is based on the Feenstra/BLW relationship between benchmark-differenced price changes and benchmark-differenced share changes. For each importer-HS4 cell, define

$$y_{igvt} = \left(\Delta^k \ln p_{igvt}\right)^2, x_{1,igvt} = \left(\Delta^k \ln s_{igvt}\right)^2, x_{2,igvt} = \left(\Delta^k \ln p_{igvt}\right)\left(\Delta^k \ln s_{igvt}\right),$$

where squared terms in this relationship arise from the Feenstra/BLW moment condition. After solving the transformed demand and supply equations for their errors, the estimator multiplies those errors and uses the assumption that the demand and supply shocks are orthogonal. This produces a second-moment relationship in squared benchmark-relative price changes, squared benchmark-relative share changes, and their cross product.

The cell-level reduced-form relationship is

$$y_{igvt} = \theta_{1,ig} x_{1,igvt} + \theta_{2,ig} x_{2,igvt} + u_{igvt}.$$

Following the BLW "between" logic, we first average these moment terms over time within each variety. Let T_{igv} be the number of usable benchmark-differenced year-pairs for variety v. The variety-level moments are

$$\bar{y}_{igv} = \frac{1}{T_{igv}} \sum_t y_{igvt}, \quad \bar{x}_{1,igv} = \frac{1}{T_{igv}} \sum_t x_{1,igvt}, \quad , \bar{x}_{2,igv} = \frac{1}{T_{igv}} \sum_t x_{2,igvt}$$

The importer-HS4 cell is then estimated using the no-intercept between regression

$$\bar{y}_{igv} = \theta_{1,ig} \bar{x}_{1,igv} + \theta_{2,ig} \bar{x}_{2,igv} + \bar{u}_{igv}.$$

The regression is estimated separately for each importer-HS4 cell. The implementation weights each variety-level observation by $w_{igv} = \left(\sum_t Q_{igvt}\right) T_{igv}$, so that varieties with larger total quantities and more usable positive-import periods receive greater weight. This weighting is designed to give more influence to varieties with stronger measurement support, while preserving the BLW-style between-variety estimating structure.

The fitted coefficients from this regression are the reduced-form parameters $\theta_{1,ig}$ and $\theta_{2,ig}$. These coefficients are not themselves the elasticities of interest. They are mapped into structural parameters using prescribed Feenstra/BLW relationships. The structural parameters are σ_{ig}, the elasticity of substitution across varieties, and ω_{ig}, the inverse foreign export supply elasticity. We mirror the standard approach of using the intermediate supply-side parameter ρ_{ig}, which maps into ω_{ig} according to

$$\omega_{ig} = \frac{\rho_{ig}}{\sigma_{ig}(1-\rho_{ig})-1}.$$

Given (σ, ω), the reduced-form coefficients are

$$\theta_1 = \frac{\omega}{(1+\omega)(\sigma-1)}, \quad \theta_2 = \frac{\omega(\sigma-2)-1}{(1+\omega)(\sigma-1)}.$$

The direct recovery step uses these relationships to recover admissible (σ, ω), and then ρ, from the estimated (θ_1, θ_2).

A directly recovered cell is classified as `ok` if the recovered parameters satisfy the admissibility restrictions

$$\sigma > 1, \qquad 0 < \rho \leq 1, \qquad \omega > 0,$$

with finite values for all three parameters. If multiple admissible roots are available, the implementation selects the root that minimizes the weighted within-cell sum of squared residuals from the structural representation.

When direct inversion does not produce an admissible structural pair, the code uses a coarse BLW-style feasible-region grid search. The grid is defined over

$$\rho \in \{0.01, 0.02, \ldots, 1.00\},$$

and over a grid for σ beginning at 1.05 and increasing by 5 percentage points per step up to 131.5[12]:

$$\sigma_m = \{1.05, 1.10, \ldots, 131.5\}$$

For each candidate pair (σ, ρ), we compute the inverse elasticity of foreign export supply of a given HS4-importer

$$\omega(\sigma, \rho) = \frac{\rho}{\sigma(1-\rho)-1}.$$

[12]We defer to Broda, Greenfield and Weinstein (2006) for our decision to set a maximum σ of 131.5. While this potentially could bias our results because we do not allow for infinite elasticities of substitution, in practice the bias is likely to be quite small. If σ 3, a doubling in level of varieties corresponds to a 29 percent decline in the price index. If we shift to max σ at 131.5, a 0.5 percent decline occurs. Their exercise highlights that relaxing the maximum σ level beyond 131.5 would not lead to meaningful changes in variety gains or losses.

Candidate pairs are retained only if

$$\sigma > 1, \qquad 0 < \rho \leq 1, \qquad \omega(\sigma, \rho) > 0.$$

For each retained grid point, the implied reduced-form coefficients are computed as

$$\hat{\theta}_1(\hat{\sigma}, \hat{\omega}) = \frac{\hat{\omega}}{(1+\hat{\omega})(\hat{\sigma}-1)}, \quad \hat{\theta}_2(\hat{\sigma}, \hat{\omega}) = \frac{\hat{\omega}(\hat{\sigma}-2)-1}{(1+\hat{\omega})(\hat{\sigma}-1)}.$$

The grid search uses the same variety-level weights as the between regression. In our implementation, $w_{igv} = (\sum_t Q_{igvt})T_{igv}$, so that varieties with larger total quantities and more usable adjacent-year observations receive greater weight. This follows the BLW measurement-error logic that unit values are better measured when based on larger import volumes and longer positive-import histories, while preserving the between-variety structure of the estimator. The grid-search objective function is the weighted sum of squared residuals:

$$SSE(\hat{\sigma}, \hat{\rho}) = \sum_v w_{igv} \left[\bar{y}_{igv} - \hat{\theta}_1(\hat{\sigma}, \hat{\omega})\bar{x}_{1,igv} - \hat{\theta}_2(\hat{\sigma}, \hat{\omega})\bar{x}_{2,igv} \right]^2.$$

The selected grid-search estimate is the admissible grid point that minimizes this objective:

$$(\hat{\sigma}_{ig}, \hat{\rho}_{ig}) = \arg \min_{(\sigma,\rho) \in \mathcal{G}_{ig}} SSE(\hat{\sigma}, \hat{\rho}),$$

where $\mathcal{G}_{ig}$ is the feasible grid for importer-HS4 cell (i, g). The corresponding $\hat{\omega}_{ig}$ is then computed from the transformation above. These cells are classified as `grid_search_coarse`.

Cells are classified as `sparse` if they do not contain enough usable within-cell information to estimate the between regression credibly. We treat a cell as sparse if it has fewer than 20 usable benchmark-differenced observations or fewer than 4 usable non-benchmark varieties. These restrictions are practical support requirements designed to avoid attempting structural recovery in cells with too little cross-variety information.

The final output is therefore one recovered parameter tuple for each usable importer-HS4 cell:

$$(\hat{\sigma}_{ig}, \hat{\rho}_{ig}, \hat{\omega}_{ig}),$$

where, following the BLW measurement-error logic, we weight variety-level moments by observed support, using total quantity times the number of usable adjacent-year observations.

This allows use to generate an implied pass-through measure, $\hat{\zeta}_{ig} = \frac{1}{1+\hat{\omega}_{ig}}$ which is useful because extremely large ω values imply near-zero pass-through. For example, $\omega > 100$ corresponds to $\zeta < \frac{1}{101} \approx 0.01$. Since ω is obtained through a nonlinear transformation, we can track proximity to the transformation singularity. A cell is classified as near-singular if

$$\hat{\sigma}_{ig}(1 - \hat{\rho}_{ig}) - 1 < 0.01.$$

This threshold is not imposed during estimation. It is a post-estimation diagnostic flag. The purpose is to identify cells in which small changes in σ or ρ could generate very large changes in the transformed ω. Near-singular cells are therefore treated as numerically fragile transformed estimates, even when the underlying (σ, ρ) pair is formally admissible.

The recovery flags used throughout the report have the following interpretation:

- `ok`: the reduced-form coefficients imply an admissible structural pair directly;
- `grid_search_coarse`: direct inversion fails, but an admissible pair is recovered by minimizing the weighted objective over the coarse BLW-style feasible grid;
- `sparse`: the importer-HS4 cell does not contain enough usable benchmark-differenced variety-level information to estimate the elasticity pair credibly.

These labels are used throughout a set of diagnostics, included below, as indicators of recovery quality. Directly recovered cells are the cleanest cases. Grid-search cells remain usable, but they are harder cases and are more likely to be close to the transformation singularity. Sparse cells are excluded from the usable elasticity sample. The empirical diagnostics below therefore evaluate not only the distribution of recovered elasticities, but also how those distributions differ by recovery method, sample support, sector, and importer.

As an external scale check, we reproduce a BLW Table 3A-style summary for the countries used in Broda et al. (2008). In that restricted sample, the low- and medium-tercile medians of ω are 0.36 and 1.46, close to the corresponding BLW values of roughly 0.3 and 1.6. The high-tercile median is 42.97, compared with roughly 54 in BLW, and the mean excluding the top decile is 8.50, compared with roughly 13 in BLW. These comparisons suggest that the updated elasticity estimates are in the same broad range as the original BLW diagnostics.

Table 5: Inverse export supply elasticity statistics for the BLW 2008 country sample: full usable sample

Country	Observations	Median: low	Median: medium	Median: high	Mean: all	Mean: no top decile	SD: all	SD: no top decile
Algeria	1,024	0.29	1.36	33.61	56.98	6.65	218.61	14.65
Belarus	1,083	0.20	0.90	16.84	46.03	4.24	197.15	10.60
Bolivia	956	0.38	2.04	75.12	70.71	17.41	226.11	31.13
China	1,221	0.34	1.55	53.80	64.51	10.94	232.63	22.59
Czech Republic	1,205	0.37	1.70	49.25	56.51	10.34	208.70	20.98
Ecuador	1,034	0.43	1.81	67.40	76.57	16.14	246.19	30.04
Latvia	1,133	0.47	1.27	8.25	36.19	3.35	168.51	7.66
Lebanon	1,047	0.29	1.17	44.01	47.45	8.66	193.24	20.08
Lithuania	1,152	0.38	1.31	24.28	48.98	5.28	199.86	11.48
Oman	1,033	0.45	1.57	41.92	61.53	8.32	228.66	18.14
Paraguay	927	0.37	1.76	44.01	56.35	9.08	207.51	18.92
Russia	1,190	0.27	1.26	25.20	51.09	5.45	208.54	13.08
Saudi Arabia	1,130	0.33	1.61	50.18	55.74	10.57	207.74	21.23
Taiwan proxy	1,190	0.47	2.14	80.53	85.45	17.80	262.51	34.73
Ukraine	1,144	0.24	1.18	38.47	71.56	8.34	330.19	19.60
Median	1,130	0.37	1.55	44.01	56.51	8.66	208.70	19.60

Notes: The table follows the structure of BLW Table 3A but uses the 2001–2024 recovered elasticity estimates. The sample is restricted to the countries used in BLW 2008 where available in the current data. The unit of observation is an importer-HS4 cell. Low, medium, and high columns are importer-specific terciles of ω. The no-top-decile columns exclude the top decile of ω within importer.

F Empirical Appendix

F.1 Tariff Water and policy autonomy

Our tariff-water exercise in the main body of this paper asks whether the modern military-spending relationship is stronger where governments retain greater formal discretion over applied tariffs. Tariff water is defined as the difference between bound MFN tariffs and applied MFN tariffs. A larger gap indicates that a government applies tariffs below its WTO ceiling and therefore has more legal room to adjust applied rates without violating its commitments. This measure is useful for interpreting the modern 2001–2024 sample because, unlike the pre-WTO BLW setting, modern tariff schedules may be constrained by WTO bindings. If military capacity matters partly because it changes a government's willingness or ability to use available policy space, then the military-spending coefficient should be more visible among countries with greater tariff water.

In this portion of our empirical appendix we report our more detailed set of results for our main specification along with three alternative classifications to clarify how the tariff-water result should be interpreted. Appendix Table 7 uses the unrestricted water split, requiring only that countries have at least ten years of available tariff-water data. This version is useful as a raw benchmark, but it is not our preferred interpretation since average tariff water is only calculated over tariff lines for which bound rates are observed. When binding coverage is incomplete, a country's measured water may summarize only a selected subset of its tariff schedule rather than its broader legal room for adjustment. For this reason, the main text emphasizes a binding-coverage screen, and Appendix Table 8 shows that the exercise is similar under a stricter threshold requiring average binding coverage of at least 75 percent. Appendix Table 9 addresses a separate concern that the relevant unit of tariff discretion is not always the country. Members of customs unions may share a common external tariff, so the customs-union specification collapses member countries into tariff-policy units before assigning tariff-water terciles and then maps the resulting classification back to countries for estimation. Taken together, these tables show that the tariff-water exercise should be read as a measurement-guided heterogeneity check rather than as a separate identification design. The preferred interpretation comes from classifications where tariff water more plausibly captures meaningful policy space, i.e., samples with broader binding coverage and specifications that account for shared tariff schedules within customs unions.

Table 6: Military Spending and Import Tariffs by Tariff Water

Dependent variable:	Average tariff at four-digit HS (%)			
	Categorical elasticities		Log elasticities	
	Mil./GDP	Mil./US	Mil./GDP	Mil./US
Panel A: High tariff water				
Log military spending share of GDP	1.824***		1.867***	
	(0.089)		(0.083)	
Log military spending relative to US		1.973***		2.023***
		(0.097)		(0.090)
Observations	19,079	19,079	19,079	19,079
Average tariff rate	6.65	6.65	6.65	6.65
R^2	0.202	0.202	0.192	0.193
Within R^2	0.123	0.123	0.112	0.113
Panel B: Medium tariff water				
Log military spending share of GDP	0.305***		0.038	
	(0.079)		(0.081)	
Log military spending relative to US		0.182**		-0.089
		(0.079)		(0.081)
Observations	21,291	21,291	21,291	21,291
Average tariff rate	6.13	6.13	6.13	6.13
R^2	0.263	0.262	0.255	0.254
Within R^2	0.182	0.181	0.173	0.172
Panel C: Low tariff water				
Log military spending share of GDP	0.989***		1.068***	
	(0.061)		(0.060)	
Log military spending relative to US		0.922***		1.034***
		(0.062)		(0.061)
Observations	23,333	23,333	23,333	23,333
Average tariff rate	3.83	3.83	3.83	3.83
R^2	0.303	0.302	0.298	0.296
Within R^2	0.252	0.250	0.246	0.244

Notes: Standard errors robust to country and product clustering are reported in parentheses. Countries are assigned to tariff-water terciles using the average difference between simple-average bound MFN tariffs and simple-average applied MFN tariffs over 2001–2024. The table restricts to countries with at least ten years of tariff-water data and average binding coverage of at least 50 percent. All specifications use the modern 2001–2024 sample and historical 1995–1997 trade weights for tariff aggregation. Columns (1) and (2) use the categorical elasticity controls from Table 1; columns (3) and (4) use the log elasticity controls. All columns include industry-section fixed effects and controls for country size and income per capita. The corresponding inverse export supply elasticity and inverse import demand elasticity controls are included but omitted for compactness. Elasticity controls are instrumented using leave-one-importer-out same-HS4 averages. Countries without an assigned tariff-water group are excluded from the corresponding panel. Appendix tables report analogous results using the unrestricted water split, a 75 percent binding-coverage threshold, and a customs-union-collapsed classification. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 7: Military Spending and Import Tariffs by Tariff Water: Unrestricted Split

Dependent variable:	Average tariff at four-digit HS (%)			
	Categorical elasticities		Log elasticities	
	Mil./GDP	Mil./US	Mil./GDP	Mil./US
Panel A: High tariff water				
Log military spending share of GDP	0.305***		0.233***	
	(0.090)		(0.083)	
Log military spending relative to US		0.312***		0.228***
		(0.092)		(0.084)
Observations	21,317	21,317	21,317	21,317
Average tariff rate	9.56	9.56	9.56	9.56
Panel B: Medium tariff water				
Log military spending share of GDP	1.329***		1.117***	
	(0.074)		(0.078)	
Log military spending relative to US		1.128***		0.902***
		(0.075)		(0.080)
Observations	27,233	27,233	27,233	27,233
Average tariff rate	6.32	6.32	6.32	6.32
Panel C: Low tariff water				
Log military spending share of GDP	0.696***		0.777***	
	(0.054)		(0.053)	
Log military spending relative to US		0.622***		0.727***
		(0.055)		(0.054)
Observations	26,664	26,664	26,664	26,664
Average tariff rate	3.92	3.92	3.92	3.92

Notes: Standard errors robust to country and product clustering are reported in parentheses. Countries are assigned to tariff-water terciles using the average difference between simple-average bound MFN tariffs and simple-average applied MFN tariffs over 2001–2024. The unrestricted split requires at least ten years of tariff-water data but imposes no minimum binding-coverage threshold. All specifications use the modern 2001–2024 sample and historical 1995–1997 trade weights for tariff aggregation. Columns (1) and (2) use the categorical elasticity controls from Table 1; columns (3) and (4) use the log elasticity controls. All columns include industry-section fixed effects and controls for country size and income per capita. The corresponding inverse export supply elasticity and inverse import demand elasticity controls are included but omitted for compactness. Elasticity controls are instrumented using leave-one-importer-out same-HS4 averages. Countries without an assigned tariff-water group are excluded from the corresponding panel. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 8: Military Spending and Import Tariffs by Tariff Water: Binding Coverage $\geq 75\%$

Dependent variable:	Average tariff at four-digit HS (%)			
	Categorical elasticities		Log elasticities	
	Mil./GDP	Mil./US	Mil./GDP	Mil./US
Panel A: High tariff water				
Log military spending share of GDP	1.323***		1.357***	
	(0.107)		(0.097)	
Log military spending relative to US		1.429***		1.459***
		(0.115)		(0.105)
Observations	15,104	15,104	15,104	15,104
Average tariff rate	6.56	6.56	6.56	6.56
Panel B: Medium tariff water				
Log military spending share of GDP	1.060***		0.834***	
	(0.089)		(0.098)	
Log military spending relative to US		0.867***		0.601***
		(0.089)		(0.098)
Observations	17,302	17,302	17,302	17,302
Average tariff rate	6.07	6.07	6.07	6.07
Panel C: Low tariff water				
Log military spending share of GDP	1.026***		1.149***	
	(0.053)		(0.052)	
Log military spending relative to US		0.968***		1.120***
		(0.054)		(0.053)
Observations	22,450	22,450	22,450	22,450
Average tariff rate	3.78	3.78	3.78	3.78

Notes: Standard errors robust to country and product clustering are reported in parentheses. Countries are assigned to tariff-water terciles using the average difference between simple-average bound MFN tariffs and simple-average applied MFN tariffs over 2001–2024. The table restricts to countries with at least ten years of tariff-water data and average binding coverage of at least 75 percent. All specifications use the modern 2001–2024 sample and historical 1995–1997 trade weights for tariff aggregation. Columns (1) and (2) use the categorical elasticity controls from Table 1; columns (3) and (4) use the log elasticity controls. All columns include industry-section fixed effects and controls for country size and income per capita. The corresponding inverse export supply elasticity and inverse import demand elasticity controls are included but omitted for compactness. Elasticity controls are instrumented using leave-one-importer-out same-HS4 averages. Countries without an assigned tariff-water group are excluded from the corresponding panel. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 9: Military Spending and Import Tariffs by Tariff Water: Customs-Union-Collapsed Split

Dependent variable:	Average tariff at four-digit HS (%)			
	Categorical elasticities		Log elasticities	
	Mil./GDP	Mil./US	Mil./GDP	Mil./US
Panel A: High tariff water				
Log military spending share of GDP	1.334***		1.047***	
	(0.118)		(0.112)	
Log military spending relative to US		1.408***		1.071***
		(0.124)		(0.119)
Observations	20,444	20,444	20,444	20,444
Average tariff rate	9.84	9.84	9.84	9.84
Panel B: Medium tariff water				
Log military spending share of GDP	1.141***		1.015***	
	(0.057)		(0.057)	
Log military spending relative to US		1.007***		0.872***
		(0.059)		(0.059)
Observations	31,125	31,125	31,125	31,125
Average tariff rate	5.92	5.92	5.92	5.92
Panel C: Low tariff water				
Log military spending share of GDP	0.281***		0.293***	
	(0.080)		(0.078)	
Log military spending relative to US		0.183**		0.242***
		(0.078)		(0.077)
Observations	23,645	23,645	23,645	23,645
Average tariff rate	4.01	4.01	4.01	4.01

Notes: Standard errors robust to country and product clustering are reported in parentheses. Countries are assigned to tariff-water terciles after collapsing customs-union members into tariff-policy units. The resulting tariff-policy-unit classification is then mapped back to countries for estimation. All specifications use the modern 2001–2024 sample and historical 1995–1997 trade weights for tariff aggregation. Columns (1) and (2) use the categorical elasticity controls from Table 1; columns (3) and (4) use the log elasticity controls. All columns include industry-section fixed effects and controls for country size and income per capita. The corresponding inverse export supply elasticity and inverse import demand elasticity controls are included but omitted for compactness. Elasticity controls are instrumented using leave-one-importer-out same-HS4 averages. Countries without an assigned tariff-water group are excluded from the corresponding panel. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.