Optimal Tariffs with Geopolitical Alignment

John Sturm Becko
Princeton University

Gene M. Grossman
Princeton University

Elhanan Helpman
Harvard University

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Abstract

As global tensions have intensified, the great powers have increasingly turned to *economic* statecraft as a means to achieve their foreign policy goals. Among its key instruments, trade policy—including both the imposition or threat of tariffs and the offer of preferential trade arrangements—have been designed as sticks and carrots to foster political alignment. In this paper, we revisit the question of optimal tariffs in a setting where large countries care not only about their economic welfare, but also about the political alignments of smaller countries. We consider two geopolitical scenarios. In the first, there is a single large country – a "hegemon" – and a continuum of small countries. The large country offers a preferential trade agreement to all small countries that choose to align with it. All non-aligned countries face MFN tariffs. In the second scenario, there are two "great powers" in a bipolar world. Each large country offers a free trade agreement to those that align exclusively with it and sets an MFN tariff for those that do not. The small countries sort into three groups, those that align with Home, those that align with Foreign, and those that remain unaligned.

We characterize the optimal tariffs for the hegemon and the optimal best responses for the two great powers. We discuss how the hegemon's tariffs vary with geopolitical conditions, including its size. In the bipolar case, we also consider whether the two powers' tariffs are strategic substitutes or strategic complements. When analytical expressions are ambiguous, we resort to calibration to get a sense of the relative magnitudes of the conflicting forces.

1 Introduction

Statecraft involves the strategic use of the various levers of national power to advance geopolitical objectives. As global tensions have intensified, the great powers have increasingly turned to *economic* statecraft as a means to achieve their foreign policy goals. Among its key instruments, trade policies—including both the imposition or threat of tariffs and the offer of preferential trade arrangements—serve as both sticks and carrots to foster political alignment.

In his seminal paper, Krasner (1976) examined the interplay between state power and the international trading system. He challenged the prevailing notion that trade structures are shaped primarily by material economic factors, such as aggregate welfare and distributional effects. While not denying the importance of these considerations, he argued that a large country's trade policies are heavily influenced by strategic objectives, particularly the pursuit of international influence.

Geopolitical alignments enhance a great power's international standing and security in several ways. Small allies may offer strategic geographic positions that serve as a buffer against external threats (Morrow, 1991). They may provide access to scarce natural resources or specialized technological expertise (Keohane, 1969, 1971). More abstractly, their alignment can lend political legitimacy and amplify a larger partner's ideological influence. For example, small states can provide multilateral support for actions that might otherwise appear to be unilateral. Historically, states that lack military strength have been able to leverage their strategic positioning, diplomatic agility, and specialized capabilities to extract trade concessions from the world's most powerful countries.

Whereas large powers gain clear benefits from the geopolitical alignments they cultivate, smaller states face both opportunities and risks in aligning with a dominant economic power (Keohane, 1969, 1971). The potential rewards from alliances may include security guarantees through defense agreements and military assistance, or financial support on favorable terms for important infrastructure projects. They may also gain from knowledge transfers, regulatory harmonization, and improved governance structures. Their citizens may take pride in associating with a successful regime or a country whose values and norms they admire. However, alignment often comes at the expense of policy autonomy. Smaller states may be pressured to conform to their partner's strategic interests and ideological perspectives, even when these conflict with their own. They could face new security risks or economic retaliation from their partner's adversaries or heightened economic coercion by their more powerful ally. For some small countries, alignment with a great power yields net benefits; for others, the costs outweigh the gains. The balance depends on factors unique to each country, such as its geography, economic structure, ideological leanings, and political regime.

Extensive research supports Krasner's argument that geopolitical alignments shape trading patterns. Several studies extend the gravity model that explains bilateral trade flows or changes in trade volumes, by incorporating alongside the usual variables like size and distance measures of geopolitical alignment. In an early example, Gowa and Mansfield (1993) included dummy variables for the existence of a bilateral military alliance, for common membership in a broader military alliance, and for countries at war. They found that alliances increase bilateral trade, especially in bipolar systems, while wars depress trade volumes. More recently, it has become common to

proxy geopolitical alignment with similarity in voting behavior in international organizations, and especially in the U.N. General Assembly, using methods proposed by Voeten (2013) and Bailey et al. (2017). Recent studies (Hakobyan et al., 2023; Bonadio et al., 2024; Cevik, 2024; Gopinath et al., 2023; Qiu et al., 2024) consistently find either that geopolitical alignment boosts trade flows, after controlling for gravity variables, or conversely that increasing geopolitical distance impedes bilateral trade. Gopinath et al. (2024) focus on the decline in inter-bloc trade in the wake of the Russia- Ukraine war, whereas Bonadio et al. (2024) examine the decoupling that ensued from the U.S.-China trade war. Meanwhile, Redding et al. (2024) explore the causal link between economic interdependence and political alignment, leveraging China's economic rise as a natural experiment and using declines in air travel costs as an instrumental variable.[1] All of these authors conclude that similarity of political and strategic interests facilitates a closer trade relationship and, in some cases, that rising geopolitical tensions are contributing to fragmentation of the world trading system.

Trade policy plays a key role in forging a link between geopolitical alignments and trade patterns. Mansfield et al. (2002) investigated how political regime type influences the formation of international trade agreements. Analyzing the creation of preferential trade agreements (PTAs) in the latter half of the 20th century, they found that democratic countries were about twice as likely as autocratic ones to form PTAs, and that democratic dyads were roughly four times as likely to do so as autocratic dyads. Bonadio et al. (2024) measured shifts in bilateral trade costs by examining the residuals from a gravity model. They showed that between 2015 and 2023, trade costs declined for country pairs within the same geopolitical bloc (aligned with either the United States or China) but increased for those in opposing blocs. They attribute these shifts in trade costs to specific trade policy actions taken by the United States and China in response to geopolitical tensions. Finally, and most relevant for our purposes, Sokolova and DiCaprio (2018) considered the relationship between geopolitical alignment and the formation of trade agreements. Using similarity in U.N. voting as a proxy for alignment, they demonstrated that countries participating in a common PTA are 4% more likely to vote alike on General Assembly resolutions than other country pairs, with an even stronger effect for votes on divisive issues.

Perhaps the most compelling evidence of geopolitics shaping trade policy comes from recent events: escalating U.S.-China tensions have triggered multiple rounds of tariff hikes, deepening a trade war and accelerating the decoupling of their economies and those of their allies.

In this paper, we examine the relationship between trade policy and geopolitical alignment from a theoretical perspective. Our starting point is the familiar analysis of optimum tariffs for a large country pioneered by Mill (1844) and Bickerdike (1906), and extended to a world with two-large countries by Johnson (1953). In a simple setting where large countries enjoy market power that motivate their use of tariffs to improve their terms of trade, we introduce political alignment as an additional objective of government policy. We consider two distinct geopolitical scenarios. In the first, there is a single large country – a "hegemon" – and a continuum of small countries. The

[1] In an earlier paper, Flores-Macías and Kreps (2013) find that increased trade with China led to to greater voting alignment with China in the UN General Assembly, without addressing the issue of causality.

hegemon can offer a preferential trade agreement to small countries that choose to align with it (the carrot), while imposing an MFN tariff (the stick) on imports from countries that retain their independence. In the second scenario, there are two "great powers" in a bipolar world. Each great power can offer a free trade agreement to those that align with it while imposing an MFN tariff on those that remain unaligned or align with its rival. The small countries sort into three groups, those that align with H (Home), those that align with F (Foreign), and those that remain unaligned.

We employ a standard economic model to analyze these dynamics. Each small country has an endowment of a homogenous good that is perfectly substitutable with respect to source. Each such country also has an endowment of a unique differentiated product à la Armington (1969). The large country (or countries) also have an endowment of the homogeneous good, plus endowments of a finite range of differentiated products. The number of differentiated products exported by a large country is proportional to its population. All countries import the differentiated products produced elsewhere, export their own unique varieties, and import or export the homogeneous good to balance their trade. Product markets are perfectly competitive.

We assume that demands are quasi-linear and that utilities derived from consumption of the differentiated products are additively separable. Small countries can impose tariffs on imports from non-FTA partners, but we show that they have no incentive to do so. The large country may offer an FTA to allies or not. If it does, the countries that align with it face zero tariffs, whereas the non-aligned (or those that align with the second large country, if there is one) face an MFN tariff of its choosing. We rule out export subsidies based on prevailing WTO rules and disregard export taxes with reference to the U.S. Constitution and to the WTO accession agreements by China. So the optimal policy problem facing a large country becomes one of choosing the MFN tariff rate on imported differentiated products for countries that opt not to align.

We treat the geopolitics in reduced form. A hegemon derives a non-economic benefit in proportion to the number of small countries that choose to align with it. Each great power in a bipolar world derives non-economic benefits from the number of small countries that align with it and incurs non-economic costs from those that align with its rival. Small country experience "valence shocks" that reflects their net utility gains or losses from aligning with the hegemon or one of the two great powers. The shocks vary by country and can be positive or negative, in keeping with the discussion in Keohane (1969, 1971).

In Section 3, we examine the optimal trade policies of a single large hegemon, balancing incentives for exploitation of market power and geopolitical influence. Conditional on its offering an FTA to allies, the hegemon sets an MFN tariff that reflects both economic and geopolitical considerations. The economic component of the optimal tariff formula exhibits the usual tradeoff between the terms-of-trade improvement generated by a marginally larger tariff and the reduction in trade volume. The geopolitical component captures the direct political benefit from additional allies, but also a cost that arises from sacrificing available terms-of-trade gains in the service of state power. We show that the hegemon opts to offer an FTA to encourage alignment whenever the direct marginal benefit of allies exceeds a critical threshold. When this condition holds, the direct benefit of securing

an additional ally outweighs the indirect cost of lost tariff revenues. It follows that a hegemon's optimal MFN tariff in a world with endogenous alignment exceeds the Mill-Bickerdike tariff for a country that takes the number of its allies as given.

We also analyze the determinants of the size of the optimal MFN tariff. When the hegemon offers an FTA to induce alignment, its tariff on non-aligned countries rises with the weight that it places on geopolitical allies and increases with any factor that increases the hazard rate of the alignment cost distribution for small countries. However, the effect of an increase in the hegemon's size is ambiguous, as it involves countervailing forces. As a result, a growing hegemon may pursue a more open trade regime or a more fragmented one, depending on the balance of these effects. We revisit this issue in Section 5, where we develop a calibrated version of our model.

In Section 4, we turn to the case of competing great powers. Here, we study Nash equilibria in which each large country sets its MFN tariff taking the other large country's tariff as given, but accounting for its own tariff's effects on the alignment decisions of small countries. Despite several additional complexities, we derive a formula for each large country's tariff that captures generalized versions of the same forces that appear in the case of a single hegemon. The optimal tariff's economic component reflects standard terms-of-trade considerations, but now accounts for the effects of a large country's imports on two different world prices: those of non-aligned countries and those of countries aligned with the competing power. The tariff's geopolitical component reflects alignment considerations, but now accounts for small countries' alignment transitions between each of the large countries and non-alignment, as well as between the two large countries.

Section 5 conducts a preliminary quantification of the model geared toward geopolitical competition between the United States and China. Following an extensive literature in intenational relations, we identify geopolitical alignment with voting patterns in the United Nations General Assembly and use data on voting histories to infer countries' costs of aligning with either great power. We combine this geopolitical approach with a more conventional economic calibration as well as inferences about the US and China's preferences for alignment based on their military spending.

We then revisit our theoretical results on trade policy through the lens of the calibrated model. We draw two main conclusions. First, the geopolitical rationale for tariffs is strong, particularly for the United States. The US's optimal tariff accounting for alignment is roughly 50% larger than its economically optimal tariff. Second, this both the economic and geopolitical components of each large country's tariff are increasing in its share of world GDP. In this sense, our results suggest that as China grows, it may become more protectionist—for both economic and geopolitical reasons—at the same time as the US's relative decline promotes liberalization.

2 The Setting

In this section, we describe the economic and political environments for which we will derive optimal trade policies. The following two sections consider distinct geopolitical scenarios. In the first, a single large country—labeled H—interacts with a continuum of small countries. The large country

(or "hegemon" in this scenario) can offer a free trade agreement (FTA) to those that align with it, leaving those that do not align to face its chosen MFN tariff, τ_H.[2] In the second scenario, two "great powers" compete to attract allies among the continuum of small countries in a bipolar world. Each large country, H or F, can offer preferential market access to small countries that align exclusively with it. Meanwhile, each imposes an MFN tariff τ_J, $J \in \{H, F\}$, on imports from the rival power, from countries that align with the rival, and from non-aligned countries. The small countries sort into three groups, those that align with H, those that align with F, and those that remain geopolitically independent.

In both geopolitical settings, there is a measure m_S of symmetric small countries indexed by $i \in [1 - m_S, 1]$, with a combined population of m_S. We endow each small country with x units per capita of a freely-traded homogeneous good, which serves as numeraire, and y units of a unique differentiated product, also indexed by i. In the unipolar world of Section 3, a single hegemon has population m_H, an aggregate endowment of $m_H x$ units of the homogeneous good, and an aggregate endowment of y units of each of a measure m_H of differentiated products indexed by $i \in [0, m_H]$. In the bipolar world of Section 4, large country J, $J \in \{H, F\}$, has population m_J, an aggregate endowment of $m_J x$ units of the homogeneous good, and an aggregate endowment of y units of each of a measure m_J of differentiated products. The differentiated products originating in H are indexed by $i \in [0, m_H]$, while those from F are indexed by $i \in [m_H, m_H + m_F]$. In this scenario, $m_H + m_F = 1 - m_S$.

Consumers worldwide derive their demands from a quasi-linear utility function that has additively separable sub-utility components, namely

$$U = c^x + \int_0^1 u\left[c\left(i\right)\right] di,$$

where c^x denotes consumption of the homogeneous good and $c\left(i\right)$ denotes consumption of differentiated product i. All consumers have sufficient income to purchase their desired quantities of the differentiated products and allocate their strictly-positive residual spending to the homogeneous good. Let $p_k\left(j\right)$ represent the consumer price of a differentiated product j when purchased in country k (where k might index a large country or one of the small countries) and let $c_k\left(j\right)$ be the per-capita consumption in k of a good j. Then consumer optimization implies

$$u'\left[c_k\left(j\right)\right] = p_k\left(j\right), \quad \text{for all } j \text{ and } k, \tag{1}$$

and $c_k^x = I_k - S_k$, where I_k is per-capita income in country k, S_k is per-capita spending on all available differentiated products in country k, and c_k^x is per-capita consumption of the homogeneous good.

The relationship between the prices of a given variety in different countries reflects their respective trade policies. In this paper, we exclude export subsidies, in line with Article XVI of the GATT, which prohibits their use. We also rule out export taxes in powerful countries, inasmuch as the U.S.

[2] We use τ to refer to one plus the *ad valorem* tariff rate.

Constitution and China's WTO Accession Agreement prohibit such levies.[3] Later, we will argue that, in our setting, small countries have no unilateral incentive to impose tariffs on their imports of differentiated products or to tax exports of their unique varieties. Anticipating this result, we do not introduce notation for trade policies in the small countries. We also rule out taxes or subsidies on imports of the homogeneous product.[4] This leaves only the MFN tariffs imposed by the large countries that create price wedges between origin and destination markets. Accordingly, we will distinguish the domestic prices of imported varieties in large-country markets from the prices paid for those goods in the rest of the world.

An additive political component of utility captures geopolitical motivations in reduced form. We assume that a small country can align with at most one large country and that country i bears a cost $\eta_{J,i}$ from aligning with large country J, where $J = H$ in the unipolar scenario and $J \in \{H, F\}$ in the bipolar world. This cost reflects domestic policy concessions required to secure alignment, compromises in international positions, and psychological costs associated with aligning with a country that has different values, culture, or religious composition or a different political regime. However, $\eta_{J,i}$ need not be positive, if country i actually benefits, on net, from an alignment with J. A small country might benefit geopolitically if J provides military protection from external threats or if i derives status or satisfaction from associating itself with an admired large country or one with similar values or political regime.

In the unipolar scenario, we take $\eta_{H,i}$ to be an independent draw from a continuous cumulative distribution function $G(\eta)$, with a range that includes positive and negative values and either a large finite or infinite support. In the bipolar scenario, the pair $(\eta_{H,i}, \eta_{F,i})$ is an independent draw from the joint cumulative distribution function $\Gamma(\eta_H, \eta_F)$. We allow for correlation, either positive or negative, between $\eta_{H,i}$ and $\eta_{F,i}$. In all cases, the geopolitical utility from non-alignment is normalized to zero.

A large country enjoys strictly positive geopolitical benefits when small countries align with it. These benefits may arise from aggregating military power against a common adversary, gaining policy concessions, or enhancing support in international organizations. We introduce the parameter $\beta_J > 0$ to capture the intensity of a large country's preference for each ally. The per-capita utility benefit from having a fraction α_J of the measure m_S of small countries align with it is $\beta_J \alpha_J m_S$, where $J = H$ in the hegemonic scenario and $J \in \{H, F\}$ in the bipolar scenario. In the latter case, we also assume that a large country incurs a welfare loss of $\delta_J \alpha_{-J} m_S$ when a fraction α_{-J} of the measure m_S of small countries align with its rival.

The political dynamics unfold as follows. First, the large countries decide whether to offer duty-free access to imports from geopolitical allies, while simultaneously setting an MFN tariff that applies to imports from countries that are not aligned with, including any rival power. In the bipolar

[3] In the European Union (EU), member states are generally not prohibited from imposing export taxes, though such policies are rarely used in practice. While we could incorporate export taxes into our analysis, we choose to focus on a case without them.

[4] If the large countries were to tax imports of the homogeneous goods from countries that do not align, then consumers in that country would source their imports duty-free from aligned countries, and consumers in the aligned countries would import instead from the non-aligned countries, with no effect on equilibrium quantities or prices.

scenario, the large countries choose their MFN tariffs simultaneously, taking the other's choices as given. Once the large countries have announced their trade policies, the small countries decide whether to align. In the hegemonic scenario, if an FTA is on offer, a small country compares its combined economic and geopolitical utility under free trade with the utility it would achieve under the MFN tariff τ_H and no alignment. In the bipolar scenario, a small country compares combined economic and geopolitical welfare under three options: alignment with H (implying that its firms face a tariff of τ_F when exporting to F); alignment with F (implying that its firms face a tariff of τ_H when exporting to H); and non-alignment.

3 Optimal Tariffs for a Single Hegemon

In this section, we analyze the optimal stick-and-carrot trade policies for a single large hegemon. To simplify notation, we omit the superscript H on variables relating to the hegemon except when needed for clarity.

Anticipating that small countries impose no import tariffs or export taxes, consider the case in which the hegemon offers an FTA to encourage alignment. Countries that accept the proposal realize a uniform price q_h for their exports of differentiated products to all markets. By symmetry, $q_h = q$, the price that firms in the hegemon obtain for their differentiated outputs, both domestically and abroad. In contrast, countries that choose to remain geopolitically independent face the hegemon's tariff when exporting there. Letting q_n denote the f.o.b. price of a differentiated product exported by a non-aligned country, the c.i.f. price in H for a good imported from a non-aligned country becomes $p_n = \tau q_n$.

These pricing relationships imply the following market-clearing conditions for goods produced by non-aligned and aligned countries, respectively, when allies can join an FTA:

$$mc\left(\tau q_n\right) + m_S c\left(q_n\right) = y \tag{2}$$

and

$$mc\left(q\right) + m_S c\left(q\right) = y, \tag{3}$$

where $c\left(\cdot\right)$ represents the per-capita demand function derived by inverting (1). In (2), the first term captures demand for a non-aligned country's exports by the measure m of consumers in the hegemon, who face the tariff-augmented price τq_n. The second term represents demand by the measure $m_S = 1 - m$ of consumers in small countries, who purchase the good at the world price q_n. Together, these demands exhaust the supply y. In (3), the terms capture the demand by consumers in the hegemon and in the measure m_S of small countries for goods produced in aligned countries, considering that all these sales take place at price q. Again, these demands sum to the inelastic supply y of each good. This equation also applies to goods produced in the hegemon itself, which face no tariffs domestically or in any export market.

These market-clearing conditions clarify why small countries gain nothing from imposing import tariffs or export taxes. A small country that levies a tariff on an imported differentiated product would slightly reduce aggregate world demand for that good, but the resulting loss in consumer-surplus would outweigh the negligible terms-of-trade gain. An export tax would increase the cost of a country's goods in foreign markets, but with a perfectly inelastic export supply, producers in the exporting country would bear the entire burden of the tax. The price q_n paid to these firms would fall in proportion to one plus the export levy, leaving the country's total revenue—combining both private and government proceeds—unchanged.[5]

The hegemon selects its tariff τ and decides whether to offer an FTA to allies to maximize per-capita welfare, including both economic and geopolitical components. To formalize the policy calculus, we define $S(q,\tau)$ as the sum of per-capita consumer surplus and tariff revenue when local consumers buy $c(p)$ units of a differentiated product and pay $p=\tau q$ per unit, with q going to the seller and $(\tau-1)q$ accruing as tariff revenue. Specifically,

$$\begin{aligned} S(q,\tau) &= u[c(\tau q)] - \tau q c(\tau q) + (\tau-1) q c(\tau q) \\ &= u[c(\tau q)] - q c(\tau q). \end{aligned}$$

Using this notation, a good imported by the hegemon from a non-aligned country generates consumer surplus plus revenue of $S(q_n,\tau) = u[c(\tau q_n)] - q_n c(\tau q_n)$, while an import from an ally under an FTA yields $S(q_h,1) = S(q,1)$, which matches the per-capita consumer surplus enjoyed by the hegemon for consumption of domestically-produced goods.

In equilibrium, the economic component of utility v amounts to the sum of per-capita income from sales of local goods, per-capita consumer surplus from all differentiated products, and per-capita tariff revenue. A tariff of τ with an exception for allies generates economic utility of

$$v = x + qy + (1-\alpha) m_S S(q_n,\tau) + [m + \alpha m_S] S(q,1), \tag{4}$$

considering that $(1-\alpha)m_S$ goods are imported subject to the tariff and $m+\alpha m_S$ goods are either produced locally or imported duty-free.

Adding the geopolitical benefits from alignment gives total per capita welfare W under an FTA,

$$W = x + qy + (1-\alpha) m_S S(q_n,\tau) + [m + \alpha m_S] S(q,1) + \beta\alpha m_S. \tag{5}$$

The hegemon chooses a tariff τ to maximize W, accounting for its effect on the equilibrium prices (q and q_n) and the fraction of countries that align (α). It then compares the maximal welfare level achievable under an FTA with the welfare it could obtain without one, where a uniform tariff would apply to all small countries but would not influence alignment decisions.

An individual residing in a small country derives utility as a consumer from the sum of per-

[5] If the demand function $c(\cdot)$ were inelastic, a small country could benefit from an export quota that limits export sales to the monopoly level. However, such quotas are prohibited under WTO rules.

capita income and consumer surplus on differentiated products. Since $q_h = q$ under an FTA, the indirect utility of a resident of a small country is

$$v_z = x + q_z y + [m + \alpha m_S] S(q) + (1 - \alpha) m_S S(q_n), \text{ for } z \in \{h, n\},$$

where v_h and v_n represent economic utility with and without preferential market access. The economic incentive to align with the hegemon—assuming that an FTA is on offer and the MFN tariff is positive—is given by

$$v_h - v_n = y(q - q_n) > 0,$$

reflecting the income gain from the higher export price received by an aligned country.

Beyond economic considerations, individuals in small country i experience a cost of alignment, denoted by $\eta_{H,i}$. This captures the disutility associated alignment with the hegemon. This "cost" may be negative if, for example, the small country benefits from a military alliance with the hegemon.[6]

Country i aligns with the hegemon if and only if the benefit from alignment exceeds the cost, i.e.,

$$\eta_{H,i} < v_h - v_n = y(q - q_n) \ .$$

Since $\eta_{H,i}$ follows the cumulative distribution function $G(\cdot)$, the fraction of small countries that choose to align with the hegemon is

$$\alpha = G[y(q - q_n)]. \tag{6}$$

This fraction increases with $q - q_n$, the price premium that an aligned country receives for its exports relative to a non-aligned country.

3.1 Optimal MFN Tariff Conditional on Offering an FTA to Allies

We now examine the optimal tariff problem facing the hegemon. To begin, we assume that the hegemon offers an FTA to countries that align with it and characterize the tariff it would then impose on non-aligned countries. Later, we consider whether offering an FTA is optimal in the first place.

The hegemon's objective is to maximize total welfare, W, as given in (5), subject to market-clearing conditions (2) and (3), which jointly determine equilibrium prices and hence alignment via (6).

Notice first that the market-clearing condition (3) for goods produced in an aligned country or in the hegemon fully determines the price q, independently of the tariff τ. In contrast, the price of non-aligned exports, q_n, is determined by (2), which reveals the usual inverse relationship between q_n and τ. As in standard trade theory, the prospect of a terms-of-trade improvement incentivizes

[6] If military alliance provides a motivation for alliance, the cost or benefit of joining may depend on the size of the hegemon, m. We could easily incorporate a geopolitical valence shock that varies with m; this will only matter when considering comparative statics with respect to m.

the hegemon to set $\tau > 1$. However, unlike in a pure terms-of-trade context, the hegemon must also consider the impact of a tariff on alignment. A higher tariff τ increases the price gap $q - q_n$, enhancing the attractiveness of FTA membership to small countries. The optimal tariff balances the marginal economic and geopolitical effects of the tariff.

The first-order condition for the optimal MFN tariff can be written as[7]

$$\frac{W'(\tau)}{m_S} = (1-\alpha)\left[-c(p_n)\frac{dq_n}{d\tau} + (\tau-1)\,q_n c'(p_n)\frac{dp_n}{d\tau}\right] + [\beta + S(q,1)) - S(q_n,\tau)]\frac{d\alpha}{d\tau} = 0, \quad (7)$$

where we recall that $p_n = \tau q_n$ is the domestic price in the hegemon for a good imported from a non-aligned country.

The first term in (7) is familiar from the standard, optimal-tariff analysis. In the square brackets, the first term represents the *terms-of-trade effect*: since $dq_n/d\tau < 0$, an MFN tariff generates a welfare benefit by depressing the price of imports from non-aligned countries. The second term captures a *volume-of-trade effect*: since $c'(p_n) < 0$, a higher MFN tariff, which dampens demand for imports from non-aligned countries, reduces welfare due to the gap between marginal utility from consumption and the opportunity cost of imports whenever $\tau > 1$. The two effects can be combined to yield

$$-c(p_n)\frac{dq_n}{d\tau} + (\tau-1)\,q_n c'(p_n)\frac{dp_n}{d\tau} = c(p_n)\frac{dq_n}{d\tau}\left[(\tau-1)\,\varepsilon_{e(q_n)} - 1\right],$$

where $e(q_n) = y - (1-m)\,c(q_n)$ is the net supply of exports by a non-aligned country to the hegemon after allowing for exports to the other small markets, and $\varepsilon_{e(q_n)} > 0$ is the elasticity of net exports with respect to their price. If geopolitical considerations were absent (e.g., if $d\alpha/d\tau = 0$), then the first-order condition would reduce to[8]

$$\tau^\circ - 1 = \frac{1}{\varepsilon_{e(q_n)}},$$

which is the familiar Mill-Bickerdike formula equating the *ad valorem* tariff rate to the inverse of the export supply elasticity.

The second term in (7) represents the marginal welfare effect of induced changes in alignment. From (6), $d\alpha/d\tau > 0$; a higher tariff reduces the export price q_n (see (2)) and so expands the gap between a small country's income with and without alignment. The direct effect on welfare

[7] We assume that $W(\tau)$ is strictly concave in the relevant range, in which case the value of τ that satisfies (7) provides a unique solution for the optimal MFN tariff rate when the hegemon offers an FTA to allies.

[8] In equilibrium,

$$e(q_n) = mc[\tau q_n].$$

Differentiating with respect to τ implies

$$\varepsilon_{c(\tau q_n)}(1+\varepsilon_{q_n}) = \varepsilon_{e(q_n)}\varepsilon_{q_n},$$

from which it follows that

$$\tau^\circ - 1 = \frac{1}{\varepsilon_{e(q_n)}}.$$

is positive, as reflected by the preference parameter β. But there is a second, more subtle effect, captured by $S(q,1) - S(q_n,\tau)$, which is negative at $\tau = \tau^\circ$. When a small country switches its status from being non-aligned to aligned, the hegemon realizes consumer surplus on imports from that country of $S(q,1)$ plus zero tariff revenue, instead of consumer surplus plus tariff revenue of $S(q_n,\tau)$. Inasmuch as the Mill-Bickerdike tariff τ° maximizes the sum of consumer surplus and tariff revenue, the marginal welfare effect of this swap must be negative at τ°. In other words, the induced change in alignment provides a direct geopolitical benefit to the hegemon, but also imposes a cost, because it sacrifices surplus attainable via strategic manipulation of the terms of trade.

Letting τ^* be the solution to (7), it is easy to see that $\tau^* > 1$, because $W'(1) = -m_S(1-\alpha)c(p_n)(dq_n/d\tau) + \beta m_S(d\alpha/d\tau) > 0$. At $\tau = 1$, the volume-of-trade effect and the cost of inducing alliance vanish. What remains are the terms-of-trade effect and the direct geopolitical effect, both of which point to a positive tariff.

3.2 To Offer an FTA to Allies or Not?

If the hegemon does not offer preferential trade to countries that align, then a fixed fraction $G(0)$ of small countries align based solely on their political affinities. In this case, the hegemon sets a universally-applicable tariff of τ°. The hegemon offers an FTA to encourage alignment if and only if

$$\beta\left[\alpha^* - G(0)\right] > S(q_n^\circ,\tau^\circ) - \alpha^* S(q,1) - (1-\alpha^*)S(q_n^*,\tau^*), \tag{8}$$

where the superscripts on q_n and α distinguish whether these variables are evaluated with $\tau = \tau^*$ or $\tau = \tau^\circ$. Since $S(q_n^\circ,\tau^\circ) > \max\{S(q,1), S(q_n^*,\tau^*)\}$ and $\alpha^* > G(0)$, (8) captures a trade-off between economic and geopolitical objectives.

Clearly, the decision to offer an FTA hinges on the importance the hegemon attaches to geopolitical allies. We define β^* as the smallest value of β for which the hegemon prefers to offer duty-free access in exchange for alignment. Then,

$$\beta^* = \frac{S(q_n^\circ,\tau^\circ) - [\alpha^* S(q,1) + (1-\alpha^*)S(q_n^*,\tau^*)]}{\alpha^* - G(0)}$$

3.3 Characterizing the Optimal Tariffs

We now characterize the optimal trade policies and examine how they vary with geopolitical circumstances. If the hegemon benefits little from attracting allies ($\beta < \beta^*$), it imposes a uniform tariff $\tau = \tau^\circ$ on imports from all sources. Conversely, if the benefit from securing allies proves substantial ($\beta > \beta^*$), the hegemon grants duty-free market access to aligned countries while imposing a tariff of $\tau = \tau^*$ on imports from non-aligned countries.

Do geopolitical considerations—when active—lead to higher tariffs? To answer this question, we evaluate the second line of (7) at $\tau = \tau^*$. We see that the hegemon benefits from the marginal ally if and only if $\beta > S(q_n^*,\tau^*) - S(q,1)$. But $\beta > \beta^*$ implies $\beta > S(q_n^*,\tau^*) - S(q,1)$; anytime the

hegemon offers an FTA to induce alignment, it must benefit from its marginal ally.[9] This in turn implies that $\tau^* > \tau^\circ$; whenever geopolitical concerns lead the hegemon to offer preferential access to allies, it sets a higher tariff on non-allied imports than the Mill-Bickerdike tariff. We summarize as follows:

Proposition 1. *If $\beta < \beta^*$, the hegemon does not offer an FTA and imposes a uniform tariff of $\tau^\circ > 1$ on all imports. If $\beta > \beta^*$, the hegemon offers an FTA to induce alignment and sets a tariff on non-allied imports of $\tau^* > \tau^\circ$.*

Assuming now that $\beta > \beta^*$, we examine three key aspects of the geopolitical environment: the hegemon's preference intensity for allies β, the hazard rate $\lambda(\eta^*)$ of the distribution of alignment costs among small countries, and the hegemon's share m of the world population.

Using (7), we can express the optimal tariff as[10]

$$\tau^* - 1 = \frac{1}{\varepsilon_{e(q_n^*)}} \left\{ 1 + \left[\beta + S(q,1) - S(q_n^*, \tau^*) \right] \frac{y}{c^n(\tau^* q_n^*)} \lambda(\eta^*) \right\} := T(\tau^*). \tag{9}$$

Now we can ascertain how any parameter ζ affects the optimal tariff by considering how it affects $T(\tau^*)$ at constant τ^*.[11]

Consider first the preference parameter β. We have

$$\frac{\partial T^*(\tau^*)}{\partial \beta} = \frac{1}{\varepsilon_{e(q_n^*)}} \frac{y}{c^n(\tau^* q_n^*)} \lambda(\eta^*) > 0.$$

Therefore, a hegemon that values allies more highly will set a larger MFN tariff. The reasoning is straightforward: when $\beta > \beta^*$, each additional ally brings a net benefit to the hegemon. A higher β strengthens the incentive to attract allies, prompting the hegemon to impose harsher penalties on non-alignment through increased tariffs.

Now suppose we introduce a parameter θ in the distribution function, $G(\eta; \theta)$ hazard-rate function in the hazard-rate function $\lambda(\eta^*; b)$ such that $\partial \lambda(\eta^*; \theta) / \partial \theta > 0$; i.e., an increase in θ raises the hazard rate at the initial η^*. Taking the partial derivative of $T(\tau^*)$ at constant τ^*, we find

$$\frac{\partial T^*(\tau^*)}{\partial \theta} = \frac{1}{\varepsilon_{e(q_n^*)}} \left[\beta + S(q,1) - S(q_n^*, \tau^*) \right] \frac{y}{c^n(\tau^* q_n^*)} \frac{\partial \lambda(\eta^*; \theta)}{\partial \theta}.$$

[9] Using the definition of β^*, if $\beta > \beta^*$,

$$\begin{aligned} \beta &> \frac{S(q_n^*, \tau^*) - \left[\alpha^* S(q,1) + (1-\alpha^*) S(q_n^*, \tau^*) \right]}{\alpha^* - G(0)} \\ &= \frac{S(q_n^*, \tau^*) - S(q,1)}{1 - G(0)/\alpha^*} \\ &> S(q_n^*, \tau^*) - S(q,1) \end{aligned}$$

where the last inequality follows from the fact that $\alpha^* > G(0)$.

[10] See the online appendix for a derivation of this expression, along with proofs of the qualitative statements in the following paragraphs.

[11] For any parameter ζ and any τ^* that satisfies the second-order condition for maximizing W, $d\tau^*/d\zeta > 0$ if and only if $\partial W'(\tau^*)/\partial \zeta > 0$. But, as we show in the appendix, $sgn\left[\partial T(\tau^*)/\partial \zeta\right] = sgn\left[\partial W'(\tau^*)/\partial \zeta\right]$.

For all $\beta > \beta^*$, the term in square brackets is positive. So a change the parameter θ raises the tariff if and only if it raises the hazard rate $\lambda(\eta^*)$ at the initial value of η^*.

To illustrate, suppose that θ represents a *bias* in the distribution of costs, so that we can express $G(\eta;\theta)$ as $G(\eta+b)$, with an (arbitrary) initial value of $b=0$. In this case, the hazard rate rises with b if and only if $\lambda'(\eta^*) > 0$. To understand the forces at play, consider again the two terms on the right-hand side of (7). The first term captures the marginal economic disincentive to raise the tariff, which stems from τ^* exceeding the Mill-Bickerdike level. A higher bias reduces the number of non-aligned countries, thereby lowering the marginal cost of increasing the tariff. This effect is proportional to the density of countries initially on the margin of indifference relative to the initial number of non-aligned countries, i.e., $g(\eta^*)/[1-G(\eta^*)]$. The second term captures the marginal geopolitical incentive to raise the tariff in order to attract more allies, which depends on the responsiveness of alignment to a tariff change. From (6), $d\alpha/d\tau$ grows with b at $b=0$ if and only if $g'(\eta^*) > 0$. If the density is rising at η^*, the geopolitical incentive to raise the tariff strengthens, reinforcing the reduced marginal cost and leading to a higher optimal tariff. However, if the density if falling at the initial η^*, the economic and geopolitical forces work against one another. The decline in alignment responsiveness is proportional to $g'(\eta^*)/g(\eta^*)$. Since two terms in (7) balance at the initial τ^*, the positive force dominates whenever $g(\eta^*)/[1-G(\eta^*)] > -g'(\eta^*)/g(\eta^*)$, a condition that holds if and only if the hazard rate is rising at η^*.[12]

Finally, we examine how the optimal tariff varies with the hegemon's population share, m. There right-hand side of (9) includes four key components: (i) the inverse of the foreign supply elasticity, $1/\varepsilon_{e(q_n^*)}$; (ii) the marginal value of an additional ally, $\beta + S(q,1) - S(q_n^*,\tau^*)$; (iii) the ratio of a non-aligned country's endowment of its differentiated product to the per capita demand for that good in the hegemon; and (iv) the hazard rate of the valence shock, $\lambda(\eta^*)$. We now discuss how each of these components responds to a change in the m, holding τ^* constant.

The inverse supply elasticity may rise or fall as the population share of the hegemon grows, although an increase seems more likely based on standard trade-theoretic considerations. For example, Syropoulos (2002) provides sufficient conditions under which an increase in country size implies a higher inverse supply elasticity in a fairly general, two-country, two-sector neoclassical trade model. In our setting, a sufficient condition for the inverse supply elasticity to rise with m is that demand for a differentiated product exhibits a constant elasticity or one that rises with price (i.e., satisfies Marshall's second law of demand).

In the term expressing the marginal net benefit from an additional ally, only $S(q_n^*,\tau^*)$ varies with m. As the hegemon's population share increases, its terms of trade improve for a given tariff, allowing it to extract more surplus from non-aligned suppliers. This raises the opportunity cost of attracting allies, contributing to a lower tariff.

At a constant tariff, the per capita demand for non-aligned imports grows as the hegemon's terms

[12] Note that

$$\frac{d\log\lambda(\eta)}{d\eta} = \frac{g(\eta)}{1-G(\eta)} + \frac{g'(\eta)}{g(\eta)},$$

so $\lambda'(\eta^*) > 0 \Leftrightarrow \frac{g(\eta)}{1-G(\eta)} > -\frac{g'(\eta)}{g(\eta)}$.

of trade improve, while the supply of any given differentiated product remains fixed. Consequently, the inverse demand share declines with m, further contributing to a smaller optimal tariff.

A larger m also implies a greater number of allies, as the relative benefit of alignment increases when q_n falls. This has two effects on the last term in (9). First, the greater alignment may increase or decrease the density of countries on the margin of indifference, depending on whether, $g(\eta)$ is increasing or decreasing at $\eta = \eta^*$. As the density on the margin changes, so does the responsiveness of alignment to the MFN tariff. Second, greater alignment means that the MFN tariff applies to fewer countries, and so the marginal cost of raising the tariff further beyond the Mill-Bickerdike level is reduced. No matter whether the density is rising or falling at η^*, the second effect dominates when the valence shock has a rising hazard rate. In this case, a larger relative size of the hegemon contributes to a higher optimal tariff rate.

The comparative statics with respect to m thus reflect the combined influence of these four effects.[13] Unlike a purely economic analysis, these geopolitical considerations mean that theory does not guarantee that larger hegemons impose higher tariffs. To explore the relationship between country size and optimal tariffs further, we turn to model calibration in Section 5.

We can summarize the comparative statics for the hegemon's optimal tariff in the following proposition:

Proposition 2. *If $\beta > \beta^*$, the optimal MFN tariff (i) increases with the weight β that the hegemon places on geopolitical allies; (ii) increases with any parameter that raises the hazard rate of the alignment cost distribution for small countries at the initial value of η; (iii) may increase or decrease with the hegemon's population share m, depending on the balance of economic and geopolitical forces.*[14]

4 Nash Tariffs in a Bipolar World

The emergence of China as an economic power has diluted the hegemonic influence of the United States. After decades of steady global integration, the "decoupling" of trading blocs now appears to be the dominant trend in international relations. In this section, we revisit the question of unilaterally optimal trade policies in a world with two competing powers. The two large countries, labeled H and F, can offer preferential trade agreements to small countries to encourage their geopolitical alignment. Meanwhile, they set MFN tariffs τ_J, $J \in \{H, F\}$, that apply to imports from the other large country and to imports from countries that do not align–either because they choose to remain independent or because they align with the rival power.

As before, each small country produces y units of a unique variety of a differentiated product, while large country $J \in \{H, F\}$ produces y units of a measure m_J of varieties, $m_H + m_F = 1 - m_S$. We use α_J to denote the fraction of small countries that align with country J, with h indicating a country that aligns with H and f indicating a country that aligns with F.

[13] See the online appendix for the technical details.

[14] In the appendix, we provide a necessary and sufficient condition for an increase in m to raise the optimal tariff.

We begin with the market-clearing conditions that determine world prices. For the small countries that align with a major power, we have

$$m_H c(q_h) + m_F c(\tau_F q_h) + m_S c(q_h) = y \tag{10}$$

and

$$m_H c(\tau_H q_f) + m_F c(q_f) + m_S c(q_f) = y, \tag{11}$$

where the MFN tariff imposed by H applies to imports from small countries labeled f and that imposed by F applies to imports from those labeled h. Goods produced in non-aligned countries, labeled n, face MFN tariffs in both large markets. Thus,

$$m_H c(\tau_H q_n) + m_F c(\tau_F q_n) + m_S c(q_n) = y. \tag{12}$$

The market-clearing conditions for the two large countries can be written as

$$m_J c(q_J) + m_{-J} c(\tau_{-J} q_J) + m_S c(q_J) = y, \;\; J \in \{H, F\}, \tag{13}$$

since exports from each large power face tariffs only in the rival's market.

A small country of type z achieves economic utility of

$$\begin{aligned} v_z &= x + q_z y + \sum_J m_J S(q_J, 1) \\ &\quad + m_S \left[\alpha_H S(q_h, 1) + \alpha_F S(q_f, 1) + (1 - \alpha_H - \alpha_F) S(q_n, 1)\right], \end{aligned}$$

where $z = h$ if it aligns with H, $z = f$ if it aligns with F, and $z = n$ if it remains independent. A small country's income depends on its alignment choice, as world prices vary with z. Meanwhile, it earns consumer surplus on all imported varieties, whose prices are beyond its control. A country i that aligns with $J \in \{H, F\}$ incurs a geopolitical utility cost of $\eta_{J,i}$, while a non-aligned country bears no such cost. Consequently, country i aligns with H if and only if

$$\eta_{H,i} < \min\left\{(q_h - q_n) y, (q_h - q_f) y + \eta_{F,i}\right\}$$

and aligns with F if and only if

$$\eta_{F,i} < \min\left\{(q_f - q_n) y, (q_f - q_h) y + \eta_{H,i}\right\}.$$

Figure 1 illustrates the combinations of $\eta_{H,i}$ and $\eta_{F,i}$ that lead a small country to align with H, align with F, and remain geopolitically independent. Given that η_i is drawn from the joint cumulative distribution function $\Gamma(\eta_H, \eta_F)$, we integrate over the densities in each region to calculate

the alignment fractions:

$$\alpha_H = \int \int^{\min\left\{(q_h - q_n)y, (q_h - q_f)y + \eta_{F,i}\right\}} \gamma\left(\eta_{H,i}, \eta_{F,i}\right) d\eta_{H,i} d\eta_{F,i} \tag{14}$$

and

$$\alpha_F = \int \int^{\min\left\{(q_f - q_n)y, (q_f - q_h)y + \eta_{H,i}\right\}} \gamma\left(\eta_{H,i}, \eta_{F,i}\right) d\eta_{F,i} d\eta_{H,i}, \tag{15}$$

where $\gamma\left(\eta_H, \eta_F\right)$ is the joint density function. Henceforth, we use $m_h := \alpha_H m_S$, $m_f := \alpha_F m_S$, and $m_n := \left(1 - \alpha_H - \alpha_F\right) m_S$ to denote the number of small countries that align with H, with F, and with neither large country, respectively.

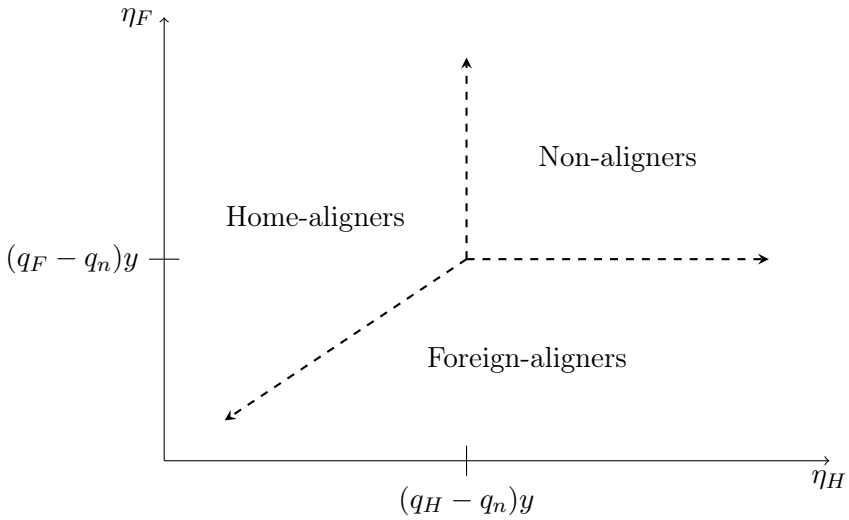


Figure 1: Regions of Home-alignment, Foreign-alignment, and non-alignment in the space of alignment costs.

When a country J offers an FTA to encourage alignment, it chooses its MFN tariff τ_J to maximize the sum of the economic and geopolitical components of utility, where the latter incorporates both the perceived benefit from having allies and the perceived cost from seeing countries align with its rival. Country H maximizes

$$\begin{aligned} W_H\left(\tau_H, \tau_F\right) = {} & x + q_H y + m_H S\left(q_H, 1\right) + m_F S\left(q_F, \tau_H\right) \\ & + m_h S\left(q_h, 1\right) + m_f S\left(q_f, \tau_H\right) + m_n S\left(q_n, \tau_H\right) \\ & + \beta_H m_h - \delta_H m_f. \end{aligned} \tag{16}$$

In (16), the first line represents the country's factor income plus the sum of consumer surplus and tariff revenues from purchases of its own differentiated products and those imported from its rival. The second line represents the sum of consumer surplus and tariff revenues from imports from the three types of small countries. The final line represents the geopolitical benefits and costs to country H of equilibrium alignments. The expression for W_F, the combined economic and geopolitical per

capita welfare in country F, is analogous.[15]

Equations (10) and (13) imply $q_f = q_F$, with both prices inversely related to τ_H but independent of τ_F. Likewise, (11) and (13) imply $q_h = q_H$, with both prices inversely related to τ_F but independent of τ_H. Moreover, (12) shows that an increase in either tariff lowers the price of goods exported by non-aligned countries, ensuring that $q_n < \min\{q_h, q_f\}$.

In a Nash setting, the government of country H chooses τ_H to maximize W_H subject to the market-clearing conditions (10)-(13) and the alignment conditions (14) and (15). The first-order condition can be written as

$$\begin{aligned}\frac{1}{m_S}\frac{\partial W_H}{\partial \tau_H} = &\left(\frac{m_F}{m_S} + \alpha_F\right)\left[-c\left(p_F\right)\frac{dq_F}{d\tau_H} + \left(\tau_H - 1\right)q_F c'\left(p_F\right)\frac{dp_F}{d\tau_H}\right] \\ &+ \left(1 - \alpha_H - \alpha_F\right)\left[-c\left(p_n\right)\frac{dq_n}{d\tau_H} + \left(\tau_H - 1\right)q_n c'\left(p_n\right)\frac{dp_n}{d\tau_H}\right] \\ &+ \left[\beta_H + S\left(q_H, 1\right) - S\left(q_n, \tau_H\right)\right]\frac{d\alpha_H}{d\tau_H} + \left[S\left(q_F, \tau_H\right) - S\left(q_n, \tau_H\right) - \delta_H\right]\frac{d\alpha_F}{d\tau_H} = 0\end{aligned} \tag{17}$$

The first term on the right-hand side of (17) captures the marginal economic impact of increasing the MFN tariff on imports from country F and its allies while the second captures the welfare implications of changing the terms and quantity of imports from non-aligned countries. Combined, these terms will be negative or positive according to whether the MFN tariff exceeds or falls short of the Mill-Bickerdike levels for imports from these respective sources. The third term in (17) represents the marginal welfare effect of the induced changes in alignment with H. Inasmuch as an increase in τ_H, holding τ_F constant, lowers both q_f and q_n, it makes both aligning with F and remaining independent less attractive. Consequently, a higher MFN tariff induces more countries to align with H. The fourth and final term reflects the effect of a tariff hike on the number of countries aligning with H's large rival. This sign of this term is ambiguous: as the tariff increases, some countries switch allegiance from F to H, but others may switch their allegiance to F rather than remain unaligned. The net effect on α_F depends on the shape of demands and the distribution of the valence shocks.[16] Thus, the best response by H to a given τ_F need not rise with δ_H, the welfare penalty H that incurs when more countries align with its rival.

In the appendix, we derive the following formula for the best-response tariff that can be compared to (9), the optimal tariff in the unipolar case:

$$\tau_H^* - 1 = \frac{1}{\omega_n \varepsilon_{e(q_n^*)} + \left(1 - \omega_n\right)\varepsilon_{e(q_f^*)}}\left\{1 + \left(1 - \omega_n\right)\frac{y}{c\left(p_f\right)}\Omega_f + \omega_n \frac{y}{c\left(p_n\right)}\Omega_n\right\},$$

[15] That is,

$$\begin{aligned}W_F = &\, x + q_F y + m_H S\left(q_H, \tau_F\right) + m_F S\left(q_F, 1\right) \\ &+ m_h S\left(q_h, \tau_F\right) + m_f S\left(q_f, 1\right) + m_n S\left(q_n, \tau_F\right) \\ &+ \beta_F m_f - \delta_F m_h.\end{aligned}$$

[16] In the online appendix, we provide examples of functional forms and parameters for which $d\alpha_F/d\tau_H > 0$ and $d\alpha_F/d\tau_H < 0$.

where Ω_n and Ω_f describe the total welfare effects on H of changes in alignment induced by a decline in q_f and q_n, respectively (as discussed further below), and ω_n is the share of the total terms-of-trade effect of a change in the MFN tariff that reflects imports from non-aligned countries.[17]

The term that precedes the curly bracket is the Mill-Bickerdike tariff, considering that the MFN tariff applies now to two sets of imports with different prices and different export supply elasticities. The term plays the same role as the inverse supply elasticity in (9); it balances the terms-of-trade effect and the volume-of-trade effect at a fixed alignment.

The term in the curly brackets is equal to one when alignments are fixed, which means of course that the best response by H in the absence of geopolitical realignments is a Mill-Bickerdike tariff (that varies with τ_F), as in Johnson (1956). When realignment does occur, the term that incorporates Ω_f reflects the welfare effects of the changes in alignment induced by the fall in q_f; this includes both the shifts in alignment from F to H and the shifts from alignment with F to non-alignment. Meanwhile, the term that incorporates Ω_n reflects the welfare effects of the changes in alignment induced by the fall in q_n; this includes both the shifts from non-alignment to alignment with H and the shifts from non-alignment to alignment with F. The magnitude of these realignments depends on the size of the price movements, which are captured by $(1-\omega_n)\, y/c\,(p_f)$ and $\omega_n y/c\,(p_n)$.

Specifically, we define

$$\begin{aligned}\Omega_f &= \frac{\mu_{HF}}{m_F+m_f}\left\{\beta_H+\delta_H-\left[S\left(q_f,\tau_H\right)-S\left(q_h,1\right)\right]\right\}\\ &\quad+\frac{\mu_{nF}}{m_F+m_f}\left\{\delta_H-\left[S\left(q_n,\tau_H\right)-S\left(q_f,\tau_H\right)\right]\right\},\end{aligned}$$

where μ_{HF} is the density of small countries that are indifferent between aligning with H or with F and μ_{nF} is the density of small countries that are indifferent between aligning with F and remaining unaligned.[18] These densities play the same role as $g\left(\eta^*\right)$ in the unipolar scenario. They determine

[17] More formally, $\omega_n = \frac{m_n c(p_n)\frac{dq_n}{d\tau_H}}{\left(m_F+m_f\right)c\left(p_f\right)\frac{dq_f}{d\tau_H}+m_n c(p_n)\frac{dq_n}{d\tau_H}}$.
The numerator of ω_n is the product of the total quantity of imports from non-aligned countries and the marginal impact of the tariff on the world price of these goods. The denominator is the sum of these marginal terms-of trade-effects across all imports subject to the tariff, considering that some of these imports originate in non-aligned countries and the rest originate in the rival large country and its allies.Also, $\epsilon_{e_n\left(q_n^*\right)}$ and $\varepsilon_{e_f\left(q_f^*\right)}$ are the elasticities of export supply facing country H from non-aligned countries and from country F and its allies, respectively, where

$$e_n\left(q_n\right)=y-m_F c\left(\tau_F q_n\right)-m_S c\left(q_n\right)$$

and

$$e_f\left(q_f\right)=y-\left(1-m_H\right)c\left(q_f\right).$$

[18] Using Figure 1, μ_{HF} is the total density of countries on the boundary AB and μ_{nF} is the totally density on the boundary BC. These are calculated as:

$$\mu_{HF}=m_S\int^{\left(q_f-q_n\right)y}\gamma\left[\left(q_h-q_f\right)y+\eta_{F,i},\eta_{F,i}\right]d\eta_{F,i}$$

and

$$\mu_{nF}=m_S\int_{\left(q_h-q_n\right)y}\gamma\left[\eta_{H,i}\left(q_f-q_n\right)y\right]d\eta_{H,i}\ .$$

the number of small countries that realign as q_f falls. The ones that switch from alignment with F to alignment with H generate a direct geopolitical gain of $\beta_H + \delta_H$ and an indirect "loss" of $S(q_f, \tau_H) - S(q_h, 1)$.[19] The ones that switch from alignment to F to non-alignment generate a direct gain of δ_H and an indirect "loss" of $S(q_n, \tau_H) - S(q_f, \tau_H)$.

Similarly,

$$\begin{aligned}\Omega_n &= \frac{\mu_{Hn}}{m_n}\left\{\beta_H - \left[S(q_n, \tau_H) - S(q_h, 1)\right]\right\} \\ &\quad + \frac{\mu_{nF}}{m_n}\left\{-\delta_H - \left[S(q_n, \tau_H) - S(q_f, \tau_H)\right]\right\},\end{aligned}$$

where μ_{Hn} is the density of small countries that are indifferent between aligning with H and remaining unaligned.[20]As q_n falls, the switches from non-alignment to alignment with H generate a direct gain of β_H and a "loss" of $S(q_n, \tau_H) - S(q_h, 1)$. The switches from non-alignment to alignment with F generate a direct loss of δ_H and a further "loss" of $S(q_n, \tau_H) - S(q_f, \tau_H)$.

To summarize, we find similar forces at play in the bipolar and unipolar worlds, but with two essential differences. First, when a large country applies tariffs on an MFN basis except for exceptions granted under an FTA, it must consider how its tariff affects two sets of world prices. On the economic side, the government must consider a weighted average of residual export supply elasticities for non-aligned and foreign-aligned goods. On the geopolitical side, it must consider a weighted average of the alignment effects induced by lower export prices for countries that align with its rival and those that choose not to align at all. Second, in the bipolar case, there are more margins along which small countries can adjust their alignment in response to higher tariffs. Not only can non-aligned countries switch to alignment with a country that raises its MFN tariffs—just as in the unipolar case—but countries that already are aligned can switch their allegiance while those that are non-aligned countries can opt to align with a rival. Tariff-induced declines in prices of goods produced in the rival bloc affect the first and third of these margins, while tariff-induced declines in non-aligned prices affect the second and third of these margins.

We are interested in whether the Nash tariffs are strategic complments or substitutes. If complements, the best-response curves in (τ_H, τ_F) space slope upward, as illustrated in Figure 2. In this case, a shift in the geopolitical environment–such as an increase in β_H–that causes country H to raise its tariff at a given τ_F in an effort to attract more allies (as depicted in the figure) induces the foreign country to escalate the tariff war in response. In contrast, if the two tariffs are strategic substitutes, the rival power will respond to an attempt by H to attract more allies by lowering its own tariff, thereby tempering the trade conflict.

As a baseline for comparison, consider a world without geopolitical considerations; i.e., α_H

[19]The quotation marks in "loss" are meant to remind the reader that this loss might be negative.

[20]In Figure 1, μ_{Hn} is the total density of countries on the boundary CD. This is calculated as:

$$\mu_{Hn} = m_S \int_{(q_f - q_n)y} \gamma\left[(q_h - q_n)\, y, \eta_{F,i}\right] d\eta_{F,i}$$

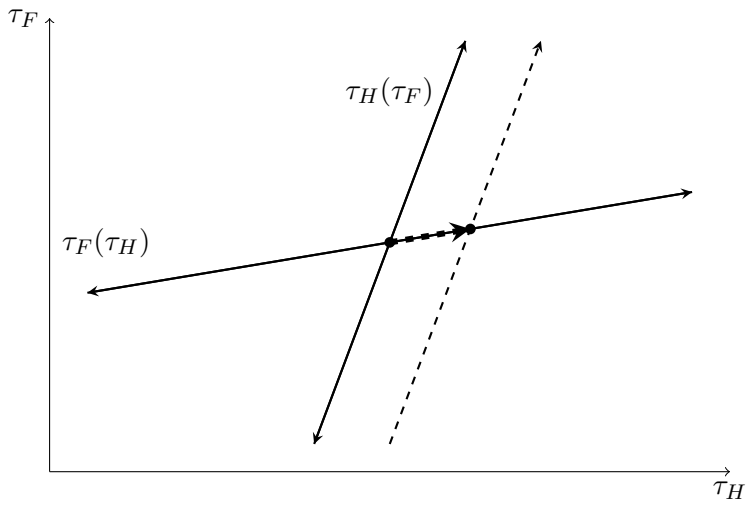


Figure 2: Best response curves in the case of complementarities. A shift in Home's best-response curve $\tau_H(\tau_F)$ results in higher equilibrium tariffs for both countries.

and α_F are fixed and exogenous. In this case we can show that the two tariffs must be strategic complements provided that each tariff rate is positive and that the demand function $c(\cdot)$ has a constant elasticity greater than one; see the online appendix.[21] However, in a tariff war with geopolitical stakes, the situation becomes considerably more complex. Analytical results are difficult to come by, so we postpone this question until Section 5, where we introduce realistic parameter values.

We are also interested in how the Nash equilibrium tariffs depend on the relative size of the two great powers. Can the growth in China's relative importance help to explain the retreat from globalization in a world of increasing geopolitical rivalry? Once again, we turn to simulation to explore this question in the next section.

5 Quantifying optimal tariffs with geopolitical alignment

We now turn to a quantitative simulation of our model. We begin by studying the US as a single hegemon and then consider the rise of China as a second, competing power. Given the stylized nature of our model, we do not attempt to precisely quantify countries' optimal tariffs. Rather, we aim to shed light on which qualitative mechanisms are and are not quantitatively important.

5.1 Calibration

To quantify optimal tariffs, we must first calibrate our model's economic and geopolitical parameters. We do focusing on the model with two competing powers and then explain how we interpret the calibration to study a single hegemon.

[21] Chattopadhyay and Mitka (2019) prove a similar result in an endowment model with two goods and many countries. Dixit (1987) points out that tariffs may be strategic complements or strategic subsitutes in a two-country, two-good tariff game with neoclassical production technologies.

We begin with the model's economic parameters, i.e. m_H, m_F, m_S, $u(\cdot)$, y, and x. We set $m_H = 26.5\%$ and $m_F = 17.0\%$ to the US and Chinese shares of world GDP in 2023, and set $m_S = 1 - m_H - m_F$. We set

$$u(c) = c^{(\sigma-1)/\sigma}$$

with $\sigma = 4$ following Simonovska & Waugh (2014); the overall scale of utility is a normalization of the size of util. Noting that y is simply a normalization of units, we set it to one. Finally, we set $x = 10/3$ so that the gains from free trade relative to autarky, $u(y)/x$, are 30% (see Costinot & Rodriguez-Clare, 2014).

To calibrate the model's geopolitical parameters—i.e. $\Gamma(\cdot,\cdot)$, β_H, β_F, δ_H and δ_F—we must first decide what constitutes geopolitical alignment. Drawing on literatures in international relations and, more recently, economics, we identify geopolitical alignment with voting similarity in the United Nations General Assembly (see, e.g., Voeten, 2000; Bailey et al, 2017; Kleinman et al, 2024). The UNGA is a deliberative body in which all member states of the United Nations cast non-binding votes on a wide range of global policy issues. Following Gopinath et al (2025), we say that a country is aligned with the US or China if it is in the top quartile of UNGA voting similiarity with the US or China, respectively.[22] According to this definition, countries comprising 28.5% of world GDP align with the US, including Canada, Australia, and most of Europe. The marginal aligner with the US, San Marino, votes with it $\bar{f}_H = 45.3\%$ of the time. Meanwhile, countries comprising 5.7% of world GDP align with China, including Indonesia, Iran, and North Korea. The marginal aligner with China, Malaysia, votes with it $\bar{f}_F = 76.5\%$ of the time. Non-aligned countries include Japan, India, Brazil, and Russia.

To quantify countries' perceived costs of *changing* these alignments, we turn to the literature on vote-buying at the United Nations. Numerous papers document that large countries, especially the US, use geopolitically-conditional foreign aid and other economic "carrots" as coercive tools to influence UN votes (see, e.g., Alesina & Dollar, 2000; Kuziemko & Weber, 2006; Davis & Pratt, 2021). Dreher et al (2008) estimate that each percentage point increase in US program aid as a share of a country's GDP results in a two percentage point increase in share of UNGA votes where the country votes with the US. We assume that the implied "cost of a vote" is constant across countries and votes. Thus, for a country i whose UN votes coincide with those of large country J in a fraction $f_{J,i}$ of votes, the country's perceived cost of alignment with J is

$$\kappa \text{GDP}_i(\bar{f}_J - f_{J,i}),$$

where $\kappa = 1/2$. In the model a small country's GDP under free trade (which is close to the observed equilibrium) is proportional to its mass with a constant of proportionality $x + u'(y)y$. We therefore

[22] Gopinath et al (2025) measure voting similarity using the ideal point estimation method of Bailey et al (2017). We instead measure the share of resolutions (from 2021 through 2024) on which two countries have the same votes—either yea, nay, or abstain—among votes for which both are present. We choose this measure because it aligns with the vote-buying estimates of Dreher et al (2008).

infer that i's cost of alignment per mass is

$$\eta_{J,i} = \kappa \left(x + u'(y)y\right)(\bar{f}_J - f_{J,i}). \tag{18}$$

We use Equation 18 to compute $\eta_{H,i}$ and $\eta_{F,i}$ for all countries i other than the US and China. We then estimate $\Gamma(\cdot,\cdot)$ by fitting a two-component Gaussian mixture model that weights each country proportionally to its GDP. Figure 3 shows our estimates of $\eta_{J,i}$ and $\Gamma(\cdot,\cdot)$.

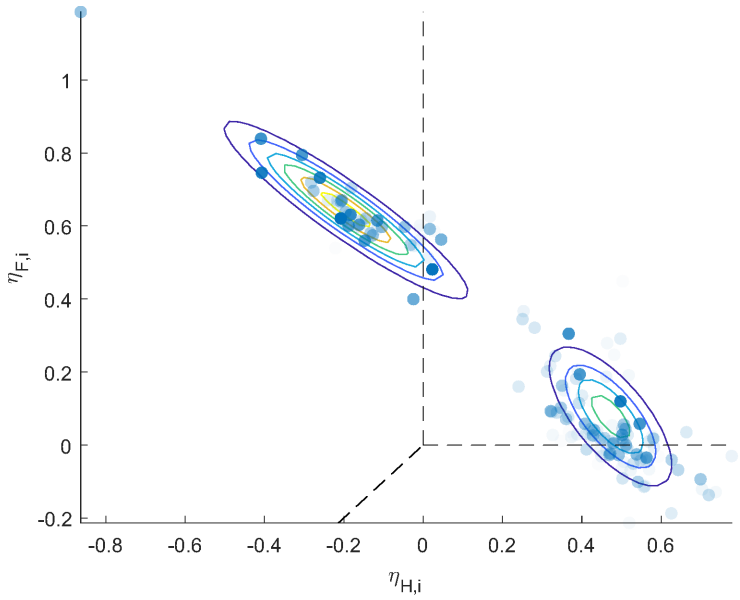


Figure 3: Points correspond to our estimates of $(\eta_{H,i}, \eta_{F,i})$ for all countries i in the UN excluding the US and China. Darker points represent countries with larger GDP. Contour lines correspond to our estimated distribution of alignment costs $\Gamma(\cdot)$.

To calibrate the value large powers place on alignment, we conjecture that their military spending reflects the need to deter threats from non-aligned countries and especially countries aligned with opposing powers. Concretely, we assume that each large country J must engage in military spending (of the numeraire) equal to

$$S_J = \phi_J m_J \left(m_n + 2(m_{-j} + m_{-J})\right) \tag{19}$$

for some constant ϕ_J. Assuming military spending delivers no direct utility, this implies $\beta_J = \delta_J = \phi_J$. The US and China spent 3.4% and 1.7% of their respective GDPs on military spending in 2023. This implies $\beta_H = \delta_H = 0.205$ and $\beta_F = \delta_F = 0.052$.[23]

To calibrate the model with a single hegemon, we maintain the calibration above but remove the possibility of alignment with China and interpret China itself as a mass of small countries with

[23] Inverting Equation 19 implies

$$\phi_J = \frac{S_J}{\text{GDP}_J} \frac{\text{GDP}_J}{m_J} \frac{1}{m_n + 2(m_{-j} + m_{-J})}.$$

We approximate GDP_J by its free-trade value in the model, $(x + u'(y)y)m_J$, and then substitute in military spending shares and the shares of non-aligned and other-aligned world GDP.

high cost of aligning with the US. Formally, we maintain the value of m_H but set $m_S = 1 - m_H$. We define the distribution of alignment costs with the US, $G(\cdot)$, by assuming there is a $m_F/(1 - m_H)$ probability a small country has China's cost of alignment, $\eta_{H,F}$, and a complementary probability it draws its cost from the marginal distribution of $\eta_{H,i}$ under $\Gamma(\cdot, \cdot)$. As with all other countries, we use Equation 18 to set China's cost of alignment based on the (low) fraction $f_{H,F} = 15.1\%$ of its UN votes that coincide with those of the US.

5.2 Trade policies for a United States hegemon

The United States has been a dominant economic and geopolitical power for the last many decades. What implications does this dominance have for trade policy? We now address this question quantitatively through the lens of our calibrated model. To start, we treat the US as a lone hegemon before turning to the case of competing great powers in Section 5.3.

Figure 4 displays the US's optimal tariff, both under our calibration (the dotted line) and over a range of values of m_H, the US's share of world GDP. It also compares the US's optimal tariff to its purely economic component, given by the inverse export elasticity $1/\varepsilon_{e(q_n)}$. Importantly, the geopolitical component of the US's tariff is substantial, causing tariffs to be 30% larger than their pure economic component. In this sense, our calibration validates the idea that tariffs are a relevant tool for acheiving geopolitical alignment. Home's optimal tariff results in a modest geopolitical realignment relative to free trade, as countries comprising 42.3% of non-US GDP align with the US, compared to 41.3% under free trade.

The figure also shows that the US's optimal tariff is increasing in its size. This is unsurprising, since the US gains market power as an importer as it grows, resulting in a larger economic rationale for tariffs. What is more surprising is that the *ratio of optimal tariffs to their purely economic component* is also increasing in world GDP. This provides a resolution to the discussion in Section 3.3 of the competing effects of country size. There, we identified two mechanisms—the economic value of a marginal aligner and the quantity of US imports from non-aligners—that encourage larger hegemons to use lower tariffs and two mechanisms—the economic rationale already discussed and changes in the hazard rate of alignment costs— that encourage larger hegemons to use higher tariffs. The fact that optimal tariffs increase relative to their purely economic component implies that the hazard rate mechanism dominates the two effects pushing in the opposite direction.

Stepping back, these results suggest that a future in which the US is less economically dominant may also be one in which trade is freer. Our results demonstrate that this liberalization reflects changes in *both* the US's economic and geopolitical incentives to impose tariffs as it shrinks.

5.3 Trade policies in a bipolar world

Our quantitative analysis has so far assumed that, as the US's share of world GDP falls, that of small, non-hegemonic countries grows. In reality, this trend has in the past and likely will in the future be driven by the growth of another great power: China. How do the interactions of these

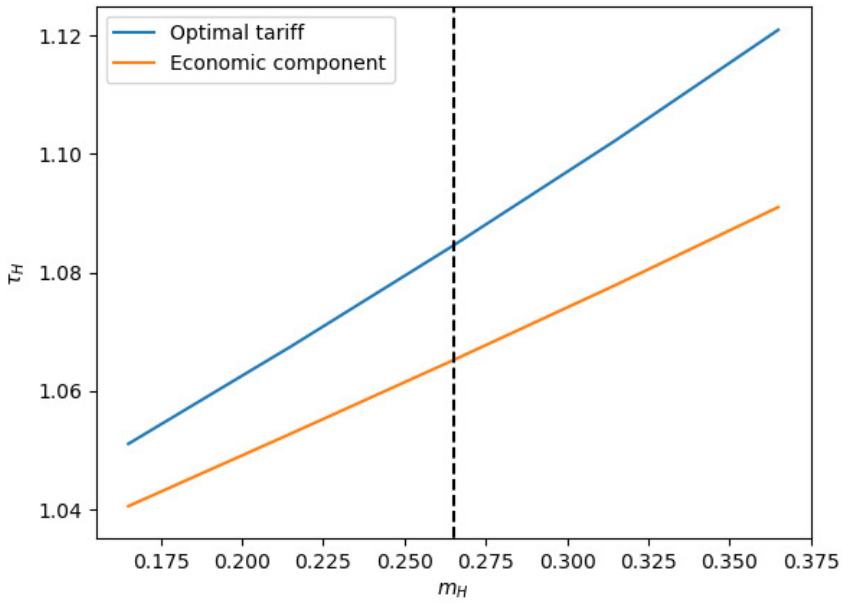


Figure 4: Optimal tariffs for a US hegemon as a function of country size. "Economic component" refers to the Bickerdike-Mill inverse elasticity, $1/\varepsilon_{e(q_n)}$, evaluated at the optimal tariff.

two great powers affect global trade policy, and how will they mediate changes in relative country size? We now address these questions by turning to the bipolar version of our calibrated model.

We begin by considering current Nash-equilibrium tariffs in our model. We estimate that the US's optimal tariff is 9.0% percent (slightly higher than the hegemon case), while China's is 4.7%. China's somewhat smaller tariff is consistent with its weaker preferences for alignment in our calibration. These relatively modest tariffs result in relatively modest changes in alignment. Countries comprising 54.7% of non-US, non-China GDP align with the US, compared to 53.7% under free trade. Interestingly, the US's larger gains in alignment while countries comprising 10.0% of non-US, non-China GDP align with China, compared to 9.3% under free trade. Inuitively, more countries align with a hegemon in the presence of trade threats. Figure 5 visualizes this change in alignment by diving the space of alignment costs $(\eta_{H,i}, \eta_{F,i})$ in three regions—US-aligners, China-aligners, and non-aligners—both under free trade (black lines) and under Nash tariffs (red lines).

We also consider how each country's optimal tariffs change as their relative sizes change, holding fixed the mass of small countries. Figure 6 shows this comparative static. As expected, each country's optimal tariff grows in its size. More interestingly, we see that—as in the hegemon case—not only the economic component of tariffs, but also the ratio between each country's optimal tariff and the economic component grows in its size. In this sense, our results suggest that as China grows, it may become more protectionist—for both economic and geopolitical reasons—at the same time as the US's decline promotes liberalization.

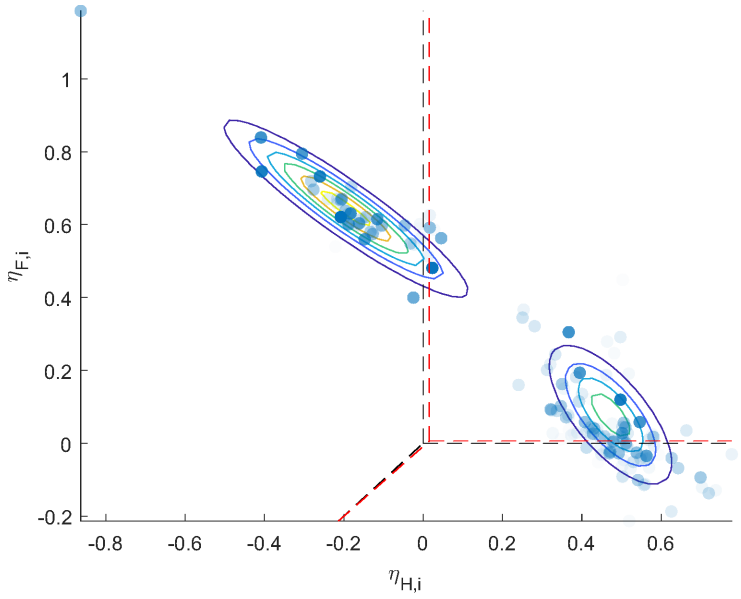


Figure 5: Empirical and calibrated distribution of alignment costs, and regions of alignment with US (left region), China (bottom region), and neither (top-right region).

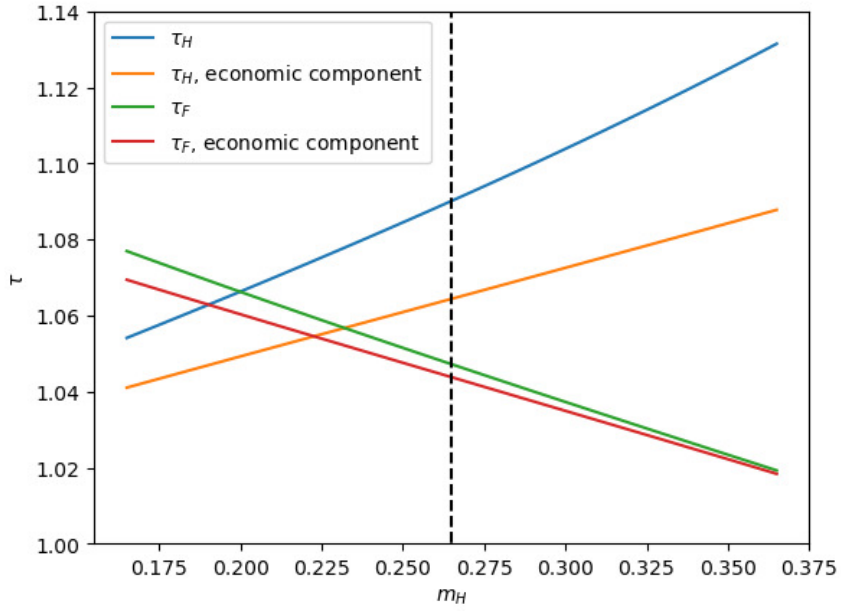


Figure 6: Nash tariffs for US and China the US's share of world GDP, holding fixed the GDP share of small countries. "Economic component" refers to Bickerdike-Mill inverse elasticities evaluated at equilibrium tariffs.

6 Conclusion

This paper studies the relationship between trade policy and geopolitical alignment through the lens of optimal trade policy. We characterize optimal trade policies—both for lone hegemons and

competing great powers—when tariffs and free trade agreements operate as sticks and carrots used to induce geopolitical alignment. Our theoretical results identify new mechanisms that underlie this geopolitical rationale for trade policy and point to potential interactions between the policies of competing powers. Our quantitative results calibrate the model using voting data from the United Nations and then use it to assess the strength of the geopolitical motive for tariffs, as well as its dependence on the relative sizes of the US and China.

This draft is highly preliminary and incomplete. On the theoretical side, future versions will provide further analytical results in the bipolar case that (a) decompose the effects of country size on tariffs and (b) characterize strategic complementarities in geopolitical tariff setting. On the quantitative side, future versions will provide a more detailed calibration and use future theoretical results to (a) identify which qualitative mechanisms drive our comparative statics quantitatively and (b) assess the extent of strategic complementarity. Finally, we will use our model to interpret recent empirical trends related to declining trade across geopolitical blocs and rising trade within them.