Trade Policy in the Shadow of Power

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Abstract

Does military coercion affect the trade policies governments adopt in times of peace? Here, I marry a simple domestic political economy of trade, inspired by Grossman and Helpman (1994, 1995), with an international model of bargaining and war (Fearon 1995). I then explore how changes in economic and political primitives affect the bargaining environment when governments have both militarized and non-militarized tools to pursue their policy objectives. The model demonstrates that the magnitude of bilateral conflicts of interest and governments' optimal level of military investment vary dramatically as a function of whose welfare the governments maximize. Those that value social welfare generate smaller externalities, yielding largely harmonious and unmilitarized international relations, while those that maximize rents seek to impose large externalities on their neighbors and maintain large militaries. The model provides firm political-economic foundations for other studies linking government bias to patterns of international conflict (Lake 1992, Jackson and Morelli 2007).

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Introduction

Conflicts of interest are a fact of international politics. Governments often have incompatible policy objectives that require them to bargain with one another over who gets what and which policies are implemented. In the anarchy of international politics, such bargaining occurs "in the shadow of power" (Powell 1999) – military force can, in principle, always be employed in an attempt to impose a favorable settlement. Workhorse models of international conflict take the conflicts of interest underlying this coercive bargaining as given, endow governments with military power, and analyze the distributional outcomes that emerge from their interaction and the likelihood that costly conflict occurs (Fearon 1995). These models ask: *given a conflict of interest*, what prevents governments from resolving disputes peacefully?

In abstracting away from the exact nature of the dispute at hand, these models direct our attention away from the question of why international disputes emerge in the first place.[1] What do governments want, and why do their objectives bring them into conflict with one another? To explain salient patterns of international conflict, this question must be answered first (Moravcsik 1997). This question addressed by assumption in the crisis bargaining model. Governments are assumed to have homogenous preferences over the consumption of some private good, such as territory.

Much of the bargaining that takes place in international politics is not over private goods, but over which domestic policies will be adopted and who will bear the costs of adjustment induced by changes from the status quo. International trade policy formation is one such bargaining arena. Domestic trade policies affect the welfare of sub-state groups, but also impose externalities (positive or negative) on foreigners. Governments therefore come to international trade negotiations with preferences over their own policy and the policies of others. These preferences will vary depending whose interests the government represents (Gawande, Krishna, and Olarreaga 2009).

When the externalities generated by trade policies are large enough, affected gov-

[1] This family of models is frequently referred to as the "crisis bargaining model," terminology I adopt here.

ernments may have incentives to seek influence over the policy choices of others. In the anarchy of world politics, "influence" can always – in principle – take the form of threats, displays, or uses of military force (Fearon 1997). To avoid conflict, governments must make concessions that leave threatening countries at least as well off as they would be in a war. This setting raises an inference problem. Namely, are trade policies chosen for their desirable domestic effects, or are they chosen to prevent war with affected foreign governments?

In the model I develop here, governments have militarized and non-militarized tools to pursue their policy objectives. Governments' preferences are defined by a simple domestic political economy of trade, inspired by Grossman and Helpman (1995). Governments are differentiated by the extent to which they value rents from special interests versus social welfare. While this model was built to explain commercial policy formation in democracies (Grossman and Helpman 1996), it adheres closely to the way in which theories of domestic distributional conflict conceptualize regime type in a broader sense (Bueno De Mesquita et al. 2003; Acemoglu and Robinson 2005). A government's type determines the trade policy it adopts in a noncooperative equilibrium. I then embed this model inside a international bargaining model and analyze how the bargaining environment changes as a function of economic and political primitives. When governments exercise their military option, they do so in order to replace the foreign government with a 'puppet' that imposes smaller negative externalities in a noncooperative equilibrium. This in turn allows the victorious government to secure distributional outcomes closer to its ideal in a setting in which it negotiates with the puppet.

This sort of *gunboat diplomacy* has historical precedent. The United States coerced trade policy concessions out of Japan in the 1850s through the Perry Expeditions, an instance in which its policy demands were clearly paired with a threat of military force. In the same period, Britain and France succeeded in forcing a recalcitrant Chinese government to open its markets in the Opium Wars (1839-1842; 1856-1860). In both cases, the target government held protectionist preferences and was forced to deviate from its ideal policies in order to appease a more militarily powerful adversary. Arguably, this form of coercive diplomacy has been less conspicuos in the post-World War II era. I take this "modern economic peace" (Coe, n.d.) as a puzzle to be explained, rather than a structural condition of contemporary world

politics.

As Carroll (2017) convincingly argues, 'contentious' economies featuring both exchange and predation are not reducible to their economic and military components. Rather, military capacity influences the pattern of exchange, and expectations about exchange influence how governments choose to employ their military capacity. The model integrates exchange and conflict while 'taking preferences seriously' (Moravcsik 1997) and connecting governments' objectives to their international relations. Developing such a model in the context of trade policy sheds light on ongoing debates in international political economy and international security. Why are democratic dyads less likely to engage in militarized interstate disputes (Russett and Oneal 2001)? Does international economic integration promote peace (Gartzke 2007)? Are commercial policies determined primarily by domestic political characteristics or international structural factors?

In addressing these questions, the literature on bargaining and war has focused primarily on how domestic political characteristics or economic flows affect the information or commitment problems underlying conflict. Schultz (1998), for example, shows that domestic institutions such as legislatures can convey information about a leader's resolve to foreign audiences, mitigating information problems. Gartzke, Li, and Boehmer (2001) show that trade flows can provide states with non-militarized tools to signal interest and resolve. The model here focuses on another mechanism through which domestic political institutions can affect international conflict. Poliltical institutions also mediate the access of sub-state groups to the policymaking process, affecting the policy preferences of political leaders. If institutions affect governments' ideal policies, they will also affect the magnitude of externalities these governments impose on one another when they do not coordinate their policies. This in turn affects the magnitude of their conflict of interest, and the likelihood that unmilitarized 'trade talks' will be insufficient to determine bargaining outcomes, requiring militarized bargaining.

There is also a large literature at the intersection of international security and international political economy examining the consequences of globalization and democratization for the prevalence of international conflict. Adherents of a theory of 'commercial peace' have argued that economic integration increases the opportunity

costs of conflict, driving states toward more pacific international relations (Angell 1911; Oneal and Russet 1997; Morrow, Siverson, and Tabares 1998; Mansfield and Pevehouse 2000; Gartzke 2007; Hegre, Oneal, and Russett 2010). These theories generally rest on two fundamental premises. First, exogenous reductions in *trade costs* (often referred to as 'globalization') stimulate increased trade between countries. Second, governments value the potential gains from such trade. Therefore, because conflict is trade-disrupting (Pollins 1989; Kastner 2007; Brutger and Wright 2014),[2] globalization promotes peace.

Trade costs reductions should not be taken as exogenous. Governments that maintain trade policy autonomy can always choose the extent to which they participate in the global economy, and this 'endogenous' component of trade costs generates substantial trade frictions, even in today's 'globalized' era (Anderson and Van Wincoop 2004). It is also not clear that all governments value the gains from trade in the first place. As Gawande, Krishna, and Olarreaga (2009) show, many governments' observed trade policy behavior is consistent with mercantilist preferences, in which market access abroad is valued but domestic liberalization may not be. Why, then, should these governments view conflict as inducing opportunity costs? If they are sufficiently mercantilist, trade-disrupting conflict might improve their welfare, as it decreases the amount of competition facing domestic industries (Chatagnier and Kavakli 2015).

Trade is endogenous to the model presented here. Governments can always choose to close their markets to foreign competition. When they are sufficiently social welfare-conscious, they will endeavor to implement smaller price distortions, valuing the gains from trade more highly than the rents accrued from protectionist special interests. This provides a mechanism through which domestic political institutions can affect the magnitude of conflicts of interest between governments.[3] Because social welfare-conscious dyads prefer to adopt lower degrees of distortionary trade policy, they both trade more and have more common interests than rent-maximizing dyads. In this sense, trade is not causing peace. Peace emerges because these governments have nothing worth fighting over. To the extent that

[2] See Davis and Meunier (2011) for empirical results that contradict this assertion.

[3] Milner and Kubota (2005) provide evidence that when setting trade policy, democracies better approximate the social welfare maximizing ideal than their autocratic counterparts.

advanced democracies better approximate the social welfare maximizing ideal than their autocratic counterparts, the model provides a novel explanation for the comity between them, a phenomenon Coe (n.d.) terms the "modern economic peace."

Several other studies have sought to connect governments' biases to international conflict behavior. Putnam (1988) and Milner (1997) both develop international bargaining games in which preferences are determined by domestic political characteristics. Lake (1992) argues that rent-seeking states demonstrate an 'imperialist bias,' because international expansionism delivers increased rents to the ruling coalition. As Fearon (2008) notes, incentives for predation disappear rapidly as governments internalize the interests of the average citizen. Jackson and Morelli (2007) show that leaders that accrue disproportionate gains from foreign wars are more belligerent and secure more advantageous bargaining outcomes on behalf of their citizens. This paper provides firm political-economic foundations for these findings. Rather than exploring the impact of government bias in some arbitrary bargaining space, the model developed here is built on top of a general equilibrium model of trade, in which governments' policy choices directly affect the welfare of sub-state agents, whose preferences serve as primitives.

The paper's closest cousins are Coe (n.d.) and Carroll (2017). Unlike Coe (n.d.), comity of interest in my model is generated not from the long-run growth prospects of welfare-concious governments, but from the short term externalities they impose on one another through trade policy. Like the model developed here, Carroll (2017) unifies militarized bargaining and economic exchange and does so in a more general setting. My more stylized model incoporates domestic political processes, however, which allows me to investigate how regime type and trade policy relate in a contentious world economy.

The paper proceeds as follows. The next section lays out the model and its political economic foundations. It shows how the domestic political economy shapes government preferences and describes how governments interact within the model. Section 3 derives the model's key results, showing the conflicts of interest between the governments, and the types of international relations they induce, vary systematically based on the degree to which governments maximize social welfare versus rents. Section 4 discusses a formal extension to the model, in which gov-

ernments can invest in military capacity before bargaining. Section 5 concludes by discussing the model's implications for existing explanations of the commercial peace and democratic peace. Proofs accompanying the main results are included in the Appendix.

Model

The model is built on top of a two-country, two-sector international economy. The domestic economies are composed of the producers that make each good and a representative consumer. One sector is endowed with a specific factor of production, and seeks to influence the goverment's choice of trade policy through political contributions.[4] I first define the primitives of this economy and an international economic equilibrium. I then proceed to introduce government and producer preferences, and allow for lobbying by owners of the specific factor. This domestic influence game defines each government's ideal trade policy, and pins down an international political-economic equilibrium (trade wars) in which each government optimally responds to the other's trade policy. I then introduce the governments' military instruments and define the bargaining range induced by this alternative outside option. The next section discusses the theoretical results that emerge from this analysis.

Before elucidating the model, I briefly discuss its core assumptions so that readers can later consider the sensitivity of the results to alternative model specifications. First, the international economy is based on a Ricardo-Viner trade model in which production in non-numeraire sector is undertaken by a combination of labor and some immobile specific factor. The presence of the immobile factor allows its owners to obtain positive profits in a competitive equilibrium and induces producers to prefer higher prices for the non-numeraire good. The owners of the specific factor are assumed to constitute a vanishingly small proportion of the overall population, and therefore care only about these profits.[5] Importers will have a preference for a

[4]The other 'numeraire' sector employs only labor, makes no profit, and serves only to pin down the competitive wage and distribution of labor across sectors. The actors in the model are the governments and the non-numeraire sectors.

[5]They consume a negligible amount, meaning they do not internalize distortions to their con-

protective tariff, and exporters will seek export subsidies. These stark preferences emerge from the simplicity of the economy. There are no intermediate goods, firms produce with a simple, constant-returns-to-scale technology, and there is no firm heterogeneity. These features are central to contemporary research on trade and trade policy (Krugman 1980, Melitz (2003), Kim (2017)), but I abstract from them to demonstrate how the results of a canonical model of trade policy formation (Grossman and Helpman 1995) change when governments bargain in the shadow of power.

Second, industries seek to influence the government's policies through 'political contributions,' simply defined as monetary transfers from the industry to the government. The framework assumes that 1) lobbying is directed at a single agent, 2) it is composed merely of 'contributions' and 3) that it is undertaken by a unitary actor representing the interests of the sector. Consumers are assumed to be unorganized politically. This assumption captures the difference in the magnitude of the collective action problem facing producers and consumers, respectively (Olson 1965).

Finally, I conceptualize governments as lying on a spectrum from pure 'kleptocracies' to pure 'technocracies'. When setting trade policy, kleptocrats seek to maximize rents, while technocrats seek to maximize social welfare. This conceputalization of regime type is admitedly crude, and should not be confused with a autocracy-democracy spectrum.[6] Real world governments should be thought of as living somewhere in this single dimensional space, depending on the extent to which their political institutions allow special interests privileged access to the policy making process. The model has the advantage of capturing the possible preferences of a wide variety of types of governments.

sumption patterns from trade policy.

[6]Existing structural estimations of the parameter underlying this specification often find that autocratic Singapore is the world's most welfare-conscious government (Gawande, Krishna, and Olarreaga (2009); Gawande, Krishna, and Olarreaga (2015)).

Production and Exchange

Countries produce two goods, labeled 0 and 1. For expositional purposes, I focus on the 'home' country, indexed with i. Primitives in the 'foreign' country – indexed with j – are defined analagously. Good 0 serves as the numeraire ($p_{i0} = 1$). I therefore use p_i to denote the price of the nonnumeraire good in country i.

Consumption

Each country hosts a representative consumer, which holds quasilinear utility U_i over the consumption of two goods, where q_{i0} denotes country i's consumer's consumption of good 0 and u_i is some increasing and concave function with $u_i(0) = 0$.

$$U_i(\boldsymbol{q}_i) = q_{i0} + u_i(q_{i1}) \tag{1}$$

The consumer is endowed with L_i units of labor which it can devote to the production of either good 0 or good 1, earning wages w_{i0} and w_{i1} respectively. On the production side of the economy, I normalize the competitive wage by assuming the marginal product of labor in the numeraire sector is 1, giving $w_{i0} = w_{i1} = 1$.

Maximization of the consumer's utility subject to her budget constraint yields a demand function for the nonnumeraire good:[7]

$$d_i(p_i) = u_i'^{-1}(p_i) \tag{2}$$

We can then substitute this into the indirect utility function, giving consumer welfare as a function of income and prices:

[7] The consumer solves

$$\begin{aligned} \max_{\boldsymbol{q_i}} \quad & U_i(\boldsymbol{q_i}) \\ \text{subject to} \quad & q_0 + p_i q_{i1} \leq L_i \end{aligned}$$

$$v_i(p_i, L_i) = L_i + [u_i(d_i(p_i)) - p_i d_i(p_i)] \tag{3}$$

Consumer surplus is simply the utility consumers derive in excess of their income L_i:

$$S_i(p_i) = u_i(d_i(p_i)) - p_i d_i(p_i) \tag{4}$$

Production

Producers of the numeraire good require only labor to produce. They employ technology $f_{i0}(L_{i0})$ which exibits constant returns to scale with marginal product equal to 1. This ensures that the competitive wage rate is also 1. In the nonnumeraire sector, producers employ both labor and some inelastically supplied sector-specific factor. Their technology, $f_{i1}(L_{i1}, K_i)$, exhibits constant returns to scale and diminishing returns to labor. In a competitive equilibrium, producers maximize profits taking prices as given.[8] Further, assume L_i is large enough such that both goods are produced in equilibrium.

This yields a supply curve for the nonnumeraire sector $y_i(p_i)$ which is naturally increasing in the price of the nonnumeraire good. Equilibrium profits in this sector are

$$\Pi_i(p_i) = p_i f_{i1}(L^\star_{i1}(p_i), K_{i1}) - L^\star_{i1}(p_i) \tag{5}$$

where $L^\star_{i1}(p_i)$ is equilibrium labor demand in the sector.

[8] The nonnumeraire producers problem is

$$\max_{L_i} \quad p_i f_{i1}(L_{i1}, K_i) - L_{i1}$$

Effective Prices and International Markets

The international price of the nonnumeraire good is denoted with π. Governments can implement tariffs or subsidies that results in a wedge between the international price and domestic price. Trade policies are denoted with τ_i and act as scalars on international prices:

$$p_i = \tau_i \pi \tag{6}$$

Free trade prevails when domestic prices are equivalent to world prices ($\tau_i = 1$). Producer-biased interventions such as import tariffs or export subsidies result in higher domestic prices than world prices ($\tau_i > 1$). Export taxes and import subsidies result in reductions in domestic prices and benefit consumers ($\tau_i < 1$).

In an international economic equilibrium, labor markets clear in both countries and international good markets clear. These conditions can be written as follows:

$$L_{i0}^{\star} + L_{i1}^{\star} = L_i \quad \forall \quad i \tag{7}$$

$$\sum_i q_{i0}^{\star} = \sum_i f_{i0}(L_{i0}^{\star}) \tag{8}$$

$$\sum_i q_{i1}^{\star} = \sum_i f_{i1}(L_{i1}^{\star}, K_i) \tag{9}$$

Lemma 1 states that for any feasible pair of trade policies, a unique international economic equilibrium exists.

Lemma 1: *For any $\tau_i, \tau_j > 0$, there exists a unique $\pi(\tau_i, \tau_j)$ such that Equations 7, 8, and 9 are satisfied.*

Given the international price, it is straightforward to calculate international economic flows and the tariff revenues (or subsidy expenditures) accruing to governments. Net imports of the nonnumeraire good is simply the difference between domestic supply and demand evaluated at equilibrium domestic prices:

$$m_i(p_i) = d_i(p_i) - y_i(p_i) \tag{10}$$

Tariff revenue is the product of the ad valorem tariff and net imports:

$$r(\tau_i, \pi) = (\tau_i - 1) \cdot \pi \cdot m_i(\tau_i * \pi) \tag{11}$$

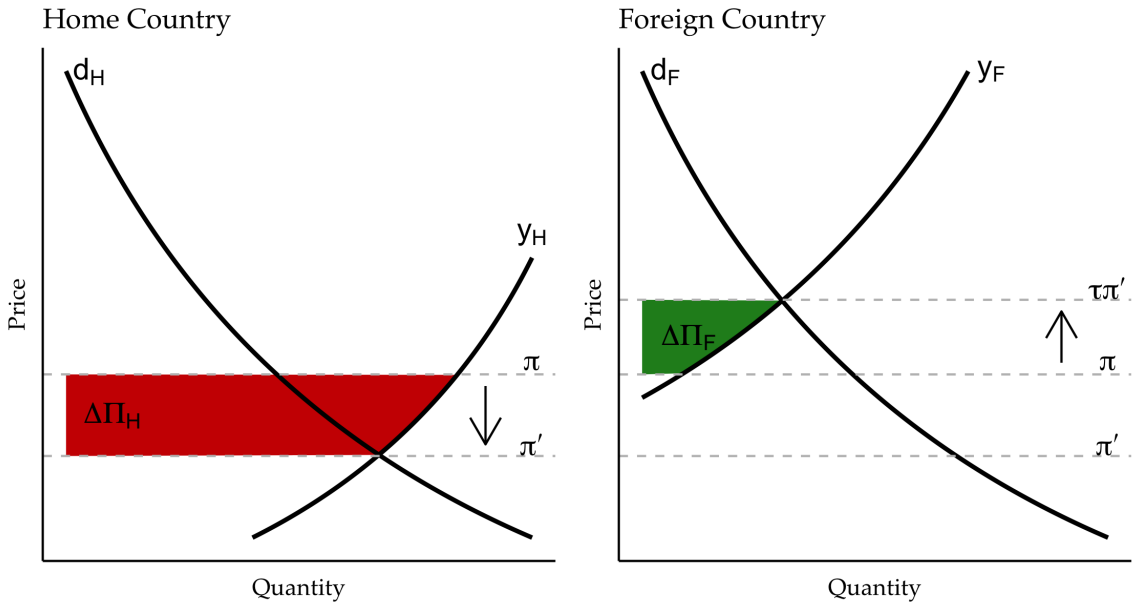

Figure 1: Effect of a foreign tariff on trade flows and producer welfare. The plot shows supply (y_i) and demand (d_i) curves in notional home and foreign economies and the international price (π) that prevails in free trade. The home country produces the nonnumeraire good more efficiently that the foreign country and exports the good in a free trade equilibrium. When a trade-eliminating tariff is imposed, the foreign price ($\tau\pi$) increases but the world price (π') decreases. The shaded regions show the effect on producer profits. The tariff shifts profits from home to foreign firms.

Import tariffs (or export subsidies) raise prices in local markets, shifting income from domestic consumers into the pockets of domestic producers. In this two-country, "large" country setting, the effects of these policies are not nationally bounded, however. Producer-biased policies flood international markets, resulting in a decrease in international prices. Therefore, they also affect foreign markets, shifting income from the pockets of producers into the pockets of consumers.

Attempts to protect producers at home necessarily come at the expense of producers abroad. Similarly, domestic consumer-biased policies (export taxes and import subsidies) harm consumers elsewhere. Figure 1 depicts the effect of producer-biased policies on producer welfare in both countries.

Political Economy of Protection

Given these distributional effects, how are trade policies determined? Here a develop a simple influence game in which nonnumeraire producers seek to distort governments' policy choices through political contributions. Governments set policy noncooperatively – no international bargaining (coercive or noncoercive) occurs. This 'trade wars' (Grossman and Helpman 1995) equilibrium establishes a baseline set of policies $(\tau_i^\star, \tau_j^\star)$ that I later compare to the policies that emerge when governments bargain in the shadow of power.

The domestic influence game proceeds as follows:

1. Producers present contribution schedules to their governments, specifying the amount they will contribute for any trade policy τ_i, given any foreign trade policy τ_j.
2. Governments each choose trade policies unilaterally.
3. Policies $(\tau_i^\star, \tau_j^\star)$ are implemented. Production, consumption, and trade occur at the international price $\pi(\tau_i^\star, \tau_j^\star)$ and contributions accrue to the governments.

When setting contribution schedules, producers naturally seek to maximize their net welfare (profits less contributions). Letting $C_i(\tau_i|\tau_j)$ denote the contribution schedule of producers in country i, net producer welfare can be written

$$W_i(\tau_i, \tau_j) = \Pi_i(\tau_i, \tau_j) - C_i(\tau_i|\tau_j) \tag{12}$$

As discussed above, governments seek to maximize a weighted average of government revenues and social welfare. Governments are differentiated by an exogenous parameter $a_i \in [0, 1]$ which represents the weight they place on ex post societal

income – consumer surplus and producer profits – relative to political contributions. Governments also collect tariff revenue, which I assume is valued equally by all types of government.[9] Government welfare can therefore be written:

$$G_i(\tau_i, \tau_j) = (1 - a_i)C_i(\tau_i|\tau_j) + a_i \left[\Pi_i(\tau_i, \tau_j) + S_i(\tau_i, \tau_j)\right] + r(\tau_i, \tau_j) \tag{13}$$

I refer to a_i parameter alternatively as the government's welfare conciousness or its bias type. Pure kleptocrats ($a_i \to 0$) care only income that accrues to the government – political contributions and tariff revenues (or subsidy costs). Pure technocrats ($a_i \to 1$) act to maximize social welfare as defined by Grossman and Helpman, where social welfare is composed of consumer surplus, producer profits, and tariff revenues.

An equilibrium of the domestic influence game consists of a contribution schedule by the producers in each country ($C_i(\tau_i|\tau_j)$) and a trade policy choice by each government ($\tau_i(C_i)$) that constitute mutual best responses. Proucers must have no incentive to change their contribution schedules, given the government's policy choice, and the government must have no incentive to change its policy choice, given the contribution schedule. Lemma 2 demonstrates that in any equilibrium of this domestic influence game, contributions induce the government to act as if it were maximizing the (weighted) *joint* welfare of the producers and itself.[10]

Lemma 2: *In any equilibrium of the domestic influence game, the government chooses its trade policy such that*

$$\tau_i^\star = \underset{\tau_i}{\text{argmax}}\, \Pi_i(\tau_i, \tau_j) + a_i S_i(\tau_i, \tau_j) + r(\tau_i, \tau_j)$$

[9]Theories of optimal taxation in public economics (see Dixit (1985)) generally treat tariff revenue as a component of social welfare, a convention adopted by Grossman and Helpman (1994). In their model, contributions are retained by the unitary government but tariff revenues are redistributed to the population. Less welfare-concious governments value tariff revenue less for this reason. However, tariff revenue can in principle be devoted to any government expenditure. Technocrats might redistribute it to the population, while kleptocrats might spend it on rennovations to presidential palaces. For this reason, I put tariff revenue in the government's objective but not society's.

[10]Lemma 2 is a special case of Proposition 1 in Grossman and Helpman (1994), which itself was an application of Bernheim and Whinston (1986).

Lemma 2 allows me to 'black box' the domestic influence game for the remainder of the analysis. I denote with the objective function induced by this game with $G_i^\star(\tau_i, \tau_j)$:

$$G_i^\star(\tau_i, \tau_j) = \Pi_i(\tau_i, \tau_j) + a_i S_i(\tau_i, \tau_j) + r(\tau_i, \tau_j) \tag{14}$$

Given the sparse assumptions I've placed on preferences and technologies until this point, the shape of $G_i^\star(\tau_i, \tau_j)$ is relatively unrestricted.[11] For some sets of economic primitives, the government may have incentives to adopt unrealistic and highly distortionary trade policies. To preclude the existence of these corner solutions, I make the following assumption.

Assumption 1: *For all $a_i \in [0, 1]$, international economic primitives are such that $G_i^\star(\tau_i, \tau_j)$ is concave in τ_i and τ_j.*

This simply requires that the slopes of the consumer surplus and profit functions not be too extreme. The assumption bites hardest when $a_i = 0$. In this case, I require that the sum of tariff revenue and producer profits be a concave function. As τ_i gets large, the marginal cost to the government of subsidizing producers must outweigh the marginal profit of those producers. The same requirements apply to $G_j^\star(\tau_j, \tau_i)$.

I also assume that governments trade policy choices are strategic complements. When one government increases import tariffs, its trade partner also prefers to increase protection. This comports with the stylized facts of contemporary trade negotiations – governments frequently threaten to levy "countervailing duties" on partners found to be in violation of trade policy commitments. In a world in which trade policy choices were not strategic complements, governments would not engage in such behavior. In contrast with Assumption 1, this criteria becomes easier to satisfy as a_i gets small. As the government places a larger weight on producer profits, it is more likely to respond to foreign tariff hikes with hikes of its own. This ensures that governments' best response curves are increasing functions of one another's trade policies.

[11] Dixit (1996) discusses this issue in more depth.

Assumption 2: *For all $a_i \in [0,1]$, International economic primitives are such that*

$$\frac{\partial^2 G_i^\star(\tau_i, \tau_j)}{\partial \tau_i \partial \tau_j} > 0 \quad \forall \quad \tau_j \in \mathbb{R}_+$$

When governments set trade policy noncooperatively, they each seek to maximize their objective functions, $G_i^\star(\tau_i, \tau_j)$. This results in an international 'trade wars' equilibrium, in which the governments' optimally respond to one anothers' trade policy choice, given preferences induced by the domestic influence game.

Lemma 3 (Trade Wars): *In any noncooperative international equilibrium, government trade policies maximize their contribution-induced utility and constitute best responses to one another*

$$\tau_i^\star = \underset{\tau_i}{\text{argmax}}\ G_i^\star(\tau_i, \tau_j^\star)$$

$$\tau_j^\star = \underset{\tau_j}{\text{argmax}}\ G_j^\star(\tau_j, \tau_i^\star)$$

Let $\tau_i^\star(a_i)$ denote the policy chosen by i in a trade wars equilibrium, given as a function of its bias type. As governments become more kleptocratic, they value the welfare of consumers less and less. In equilibrium, how do such changes in welfare-conciousness affect governments' policy choices? Lemma 3 confirms the intuition that equilibrium trade policy becomes more consumer-biased as welfare-conciousness increases.

Lemma 3: *$\tau_i^\star(a_i)$ is a strictly decreasing function.*

Consider an exogenous decrease in the welfare-conciousness of the foreign country. In equilibrium, such a shift causes increases in protection both at abroad and at home, due to the strategic complementarity of governments' policy choices. Because the bias type of the foreign government determines the type of trade policies and world prices that emerge in equilibrium, it also indirectly affects the welfare of the home government. If governments had the power to change the bias type of their trading partner, they might be able to realize more advantageous international trade policy regimes.[12] This possibility is realized when governments can bargain

[12] Advantageous from the perspective of their preferences, given by the underlying lobbying

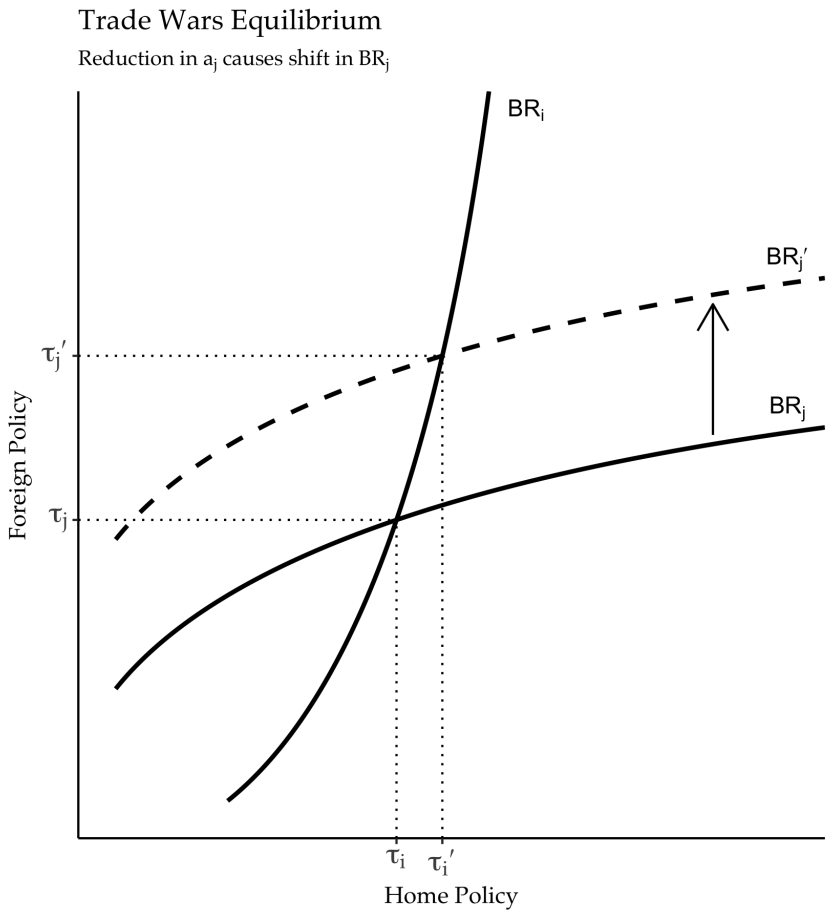

Figure 2: Best response functions for the home and foreign countries. The arrow shows the effect of a decrease in a_j on Foreign's policy best response function. A decrease in a_j tilts Foreign's preferences to be more in line with producer interests. In equilibrium, this results in higher import tariffs (export subsidies) in both countries.

with military force.

International Bargaining and Militarized Force

In the 'trade talks' model of Grossman and Helpman (1995), governments can do no worse in trade negotiations than they fare in 'trade wars.' Governments derive bargaining power from their ability to revert to the trade wars equilibrium if trade talks are insufficiently attractive. In reality, governments dissatisfied with market

game.

access conditions abroad have numerous tools at their disposal to seek changes in the trade policies of foreign governments. If trade threats do not generate sufficient bargaining power, these governments might prefer to tie non-trade inducements to trade negotiations. In particular, governments might threaten invasion and forcible removal of other governments if their trade policy demands are not met. Under what circumstances will unmilitarized trade negotiations be sufficient to achieve governments' policy objectives? And when will they consider the use of military force?

Here, I assume that war can be employed to replace a militarily defeated government with a type of the victor's choosing. In the context of the moel presented above, this means imposing a new a_i parameter that conditions the government's choice of trade policy. Such changes could be implemented by imposing new political leadership, whose preferences differ from those that were deposed, or imposing new political institutions (Owen IV (2002), Lo, Hashimoto, and Reiter (2008)). This victorious government then negotiates a new set of bilateral trade policies with this 'puppet' government. When contemplating a war, therefore, governments consider both the costs of war and the magnitude of the benefits they would accrue if they were able to bargain with a partner holding more 'dovish' trade policy preferences. On the other hand, they consider the outcome in which they lose a war and are replaced by a puppet themselves. Here, governments continue to value social welfare, but lose access to their rent streams (contributions and tariff revenue).

The value of the government's military option is determined, in part, by its exogenously given military capacity $\omega_i \in \mathbb{R}_+$. A contest function $q : \{\omega_i, \omega_j\} \to [0, 1]$ determines the probability that government i prevails in war for control of the type of j's government. This contest function is assumed to be increasing and weakly concave in ω_i, to be decreasing and weakly convex in ω_j and to satisfy the law of total probability $q(\omega_i, \omega_j) + q(\omega_j, \omega_i) = 1$.[13] If either state chooses to engage in a war, both governments pay fixed proportion of their post-war welfare, denoted $c_i \in [0, 1]$. Country i wins the war with probability $q(\omega_i, \omega_j)$ and can then replace

[13]The commonly used 'additive' contest function (Jia, Skaperdas, and Vaidya 2013) satisfies these conditions for $\omega \in \mathbb{R}_{++}$ with

$$q(\omega_i, \omega_j) = \frac{\omega_i}{\omega_i + \omega_j}$$

j's government with an alternative government of its choosing ($a_j \in [0,1]$. Denote with $\overline{G}_i$ government i's utility when it wins a war and $\underline{G}_i$ its utility when it loses a war. These values depend on the type of the imposed puppet government and I characterize them below.[See Definition 1.]

In the bargaining game, government j offers a trade policy pair $\left\{\tau_i^j, \tau_j^j\right\}$ and some side payment R^j to country i.[14] Governments' utilities are under the offer are therefore given by

$$G_i^t(\tau_i^j, \tau_j^j, R^j) = G_i^\star(\tau_i^j, \tau_j^j) + R^j \tag{15}$$

$$G_j^t(\tau_j^j, \tau_i^j, R^j) = G_j^\star(\tau_j^j, \tau_i^j) - R^j \tag{16}$$

where $G_i^\star(\tau_i^j, \tau_j^j)$ and $G_j^\star(\tau_j^j, \tau_i^j)$ are as in Equation 14.

After observing j's offer, i takes one of three actions.

1. Accept j's offer, in which case $\left\{\tau_i^j, \tau_j^j, R^j\right\}$ is implemented and i receives utility $G_i^t(\tau_i^j, \tau_j^j, R^j)$ as defined in Equation 15.
2. **Trade Wars**: Implement noncooperative trade policy, yielding $G_i^\star(\tau_i^\star, \tau_j^\star)$ where $\tau_i^\star$ and $\tau_j^\star$ are given in Lemma 3.
3. **Regime Change Bid:** Declare war in a bid to replace j's government. The victor of the war then replaces the losing government with one of its choosing ($a_{i/j} \in [0,1]$). j then makes a new offer, $\left\{\tau_i, \tau_j, R^j\right\}$ that i must either accept or reject, where rejection results automatically in trade wars.[15] Regime change bids yield expected utility

[14] Grossman and Helpman (1995) prove the distributional equivalence between 1) a fixed trade policy pair $\left\{\tau_i^j, \tau_j^j\right\}$ and a side payment and 2) a fixed trade policy ratio (τ_i/τ_j) and a trade policy 'level' τ_j. Essentially, they show that governments can use trade policy to implement an arbitrary division of utility through its effect on tariff revenues (or subsidy costs). I introduce a side payment here to distinguish between efficiency and distributional considerations, but the analysis holds if governments are prohibited from using side payments. Unlike in Grossman and Helpman (1995), the side payment is assumed to contribute directly to governments' utilities.

[15] I assume away the possibility of war after a regime change bid. The war victor will have no incentive to initiate a war because it has already installed its preferred puppet. I prohibit puppets from declaring war on the government that put them into power. Such restrictions might be enforced by military occupation and forced demilitarization by the victorious government.

$$\tilde{G}_i = \left(q(\omega_i, \omega_j)\overline{G}_i + (1 - q(\omega_i, \omega_j))\underline{G}_i\right)(1 - c_i) \tag{17}$$

I assume that j has all the bargaining power both before and after regime change bids. This assumption is made to simplify analysis and highlight the incentives facing i. Because i makes no proposals, its pre-war decision is relatively straightforward. If it is not satisfied with j's offer, it can either walk away from the negotiating table or try to replace j's government. A subgame perfect equilibrium of this game will always be efficient. Government j will make the minimal concession that prevents both trade wars and regime change bids.

Finding this minimal concession requires reasoning backward from the expected outcome of a regime change bid. After such a bid, trade wars is the only available outside option, and j will make an offer that leaves i indifferent between accepting it and initiating trade wars.

Lemma 4: *In any take-it-or-leave-it bargaining game in which trade wars* $\left\{\tau_i^\star, \tau_j^\star\right\}$ *(Lemma 3) serves as the reversion point and j holds proposer power, governments will implement* $\left\{\tau_i^t, \tau_j^t\right\}$ *where*

$$\left\{\tau_i^t, \tau_j^t\right\} \in \underset{\{\tau_i, \tau_j\}}{\text{argmax}}\, G_i^\star(\tau_i, \tau_j) + G_j^\star(\tau_j, \tau_i)$$

Government j's side payment to i satisfies

$$R^j = G_i^\star(\tau_i^t, \tau_j^t) - G_i^\star\left(\tau_i^\star(a_i), \tau_j^\star(a_j)\right)$$

yielding i's utility

$$G_i^t\left(\tau_i^t, \tau_j^t, R^j\right) = G_i^\star(\tau_i^t, \tau_j^t) + R^j = G_i^\star\left(\tau_i^\star(a_i), \tau_j^\star(a_j)\right)$$

In this nonmilitarized bargaining game, governments choose the pareto efficient trade policy, and then redistribute income amongst themselves such that i is indifferent between the realized bargain and the trade wars outcome. i's utility in this bargaining game is therefore equivalent to what it obtains in trade wars, and, by the arguments advanced in the previous section, dependent on the bias types of

itself and the foreign government.

Taking this bargain as given, what type of government would i most like to bargain with? Because of the equivalence between trade talks and trade wars utility, i will choose a_j to maximize its trade wars utility. Definition 1 describes this ideal negotiating partner.

Definition 1 (War Outcomes): *If country i wins a war with country j, it will install a puppet government of type $k(a_i)$ where*

$$k(a_i) = \underset{a_j \in [0,1]}{\operatorname{argmax}} \, G_i^\star \left(\tau_i^\star(a_i), \tau_j^\star(a_j) \right)$$

This yields utility

$$\overline{G}_i(a_i) = G_i^\star \left(\tau_i^\star(a_i), \tau_j^\star(k(a_i)) \right)$$

If i loses the war, it is replaced by a bias type $k(a_j)$ giving utility

$$\underline{G}_i \left(a_i, a_j \right) = a_i \left[\Pi_i \left(\tau_i^\star \left(k(a_j) \right), \tau_j^\star(a_j) \right) + S_i \left(\tau_i^\star \left(k(a_j) \right), \tau_j^\star(a_j) \right) \right]$$

The utility i receives when it wins the war, $\overline{G}_i(a_i)$, is simply its utility under the bargaining game in which it optimally chooses the type of its trading partner. When i loses the war, it loses access to its rent streams $r(\tau_i, \tau_j)$ and $C_i(\tau_i|\tau_j)$. This leaves the (weighted) welfare of private actors ($\Pi_i + S_i$) under the trade policy regime negotiated by the j and its puppet, $\left(\tau_i^\star \left(k(a_j) \right), \tau_j^\star(a_j) \right)$.

The function $k(a_i) : [0,1] \to [0,1]$ is a mapping between the home government's type and its preference over the bias type of the foreign government. It answers the question – what type of government would the home country like to see in power abroad?

Governments' bias types affect their choice of trade policy at home, but also determine the types of policies they would like to see implemented abroad. When governments are biased toward producers, they desire consumer-biased policies abroad, which increase demand for their exports. Conversely, when governments are biased toward consumers, they prefer foreign governments to adopt producer-biased policies, which flood international markets and drive prices down. Let

$\{\bar{a}_i, \bar{a}_j\}$ denote the pair of governments that are "satisfied" by the policy regime that emerges in a trade war and desire no change in trade policy abroad.[16] Formally,

$$\{\bar{a}_i, \bar{a}_j\} = \left\{ a_i, a_j \left| \frac{\partial G_i^\star}{\partial \tau_j} = \frac{\partial G_j^\star}{\partial \tau_i} = 0 \right|_{(\tau_i^\star(a_i), \tau_j^\star(a_j))} \right\} \tag{18}$$

While they would benefit domestic consumers, it is rare to observe governments lobbying for export subsidies abroad. Trade negotiations focus primarily on gaining market access abroad – changes that would help producers. For this reason, it is natural to assume that governments of interest all display some degree of bias toward producers and desire tariff decreases abroad. I focus on these governments for the remainder of the analysis.

Assumption 3: $\{a_i, a_j\} \ll \{\bar{a}_i, \bar{a}_j\}$

When Assumption 3 is satisfied, governments use military force to pry open international markets by installing more welfare-conscious puppets abroad. These foreign puppets will implement more consumer-biased trade policies, resulting in better market access for producers at home. Because of the strategic complementarity between trade policy choices, the global level of protection will also fall.

Lemma 5: $k(a_i) > a_j$ *and* $\left\{\tau_i^\star(a_i), \tau_j^\star(k(a_i))\right\} \ll \left\{\tau_i^\star(a_i), \tau_j^\star(a_j)\right\}$

Regime change bids are therefore used instrumentally to open international markets. Because of the efficiency of the bargaining game laid out here, regime change bids will never occur in equilibrium. Governments will make trade policy concessions that leave potential aggressors indifferent between initiating a regime change bid and accepting the concessions. In this sense, the possibility of regime change constrains the set of policies that governments can feasibly offer. Under certain military power configurations, this may result in very different distributional implications than the pure 'trade talks' model of Grossman and Helpman (1995). The next section analyzes the sensitivity of bargaining outcomes to the shadow of military power.

[16] When either of the (a_i, a_j) that solve Equation 18 with equality are greater than 1, set $\bar{a}_{i,j} = 1$.

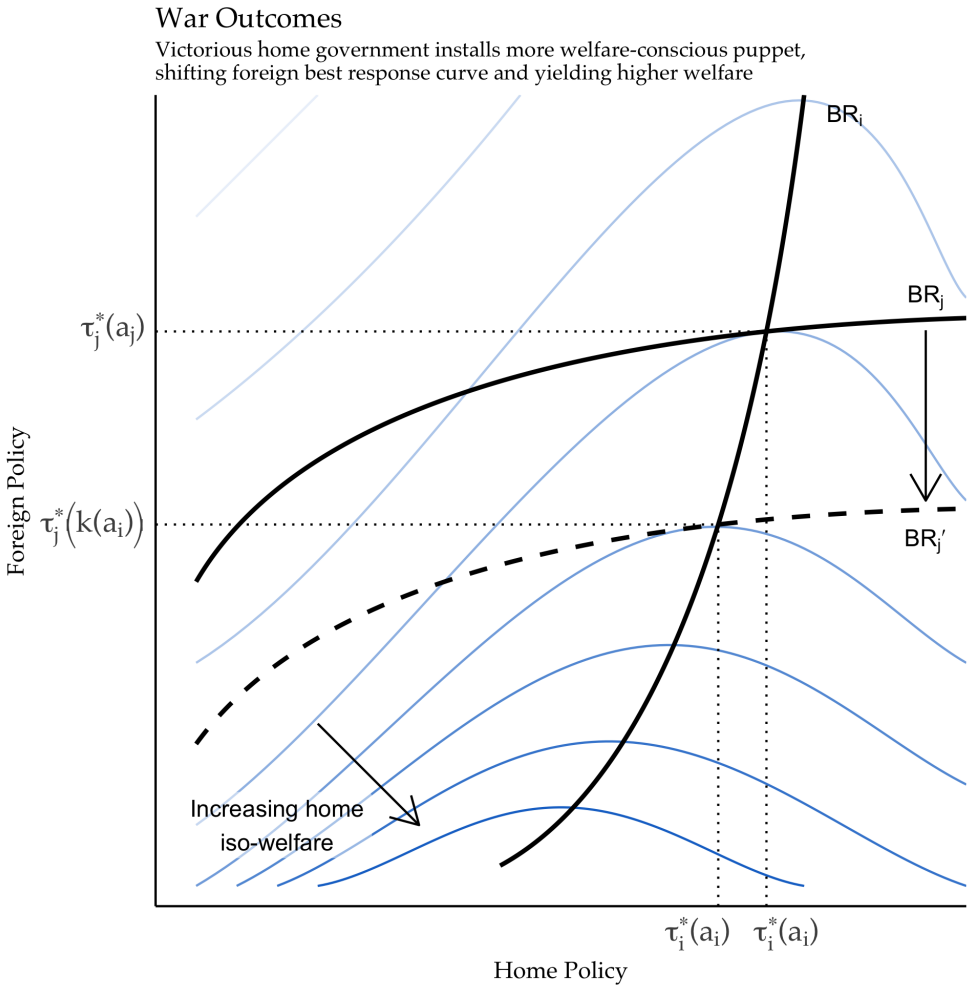

Figure 3: Best response functions and home iso-welfare curves. Because home welfare is decreasing in τ_j, the ability to impose a more welfare-concsious puppet allows the home government to realize higher welfare in a trade wars equilibirum. The figure depicts the shift from $(\tau_i^\star(a_i), \tau_j^\star(a_j))$ to $(\tau_i^\star(a_i), \tau_j^\star(k(a_i)))$ and the welfare implications for the home country.

Results

The bargaining game presented above has two outside options – trade wars and regime change bids. Whether or not a latent threat of regime change affects bargaining outcomes hinges on the governments trade policy preferences – determined by their bias type (a_i) – as well as the distribution of military power $q(\omega_i, \omega_j)$. Here, I show that when Assumption 3 is satisfied, conflicts of interest between governments

grow larger as governments become more kleptocratic ($a_i \to 0$). As a result, when relative power is variable, more powerful governments are more likely to lean on the threat of regime change to achieve their objectives.

The logic underlying this result is straightforward. Relatively technocratic governments have more nuanced views of international price changes because they weigh more equally the interests of producers (that want higher prices) and consumers (that want lower prices). These countervailing forces mollify conflicts of interest between relatively technocratic governments and make it more likely that such governments will be able to realize efficient outcomes through pure 'trade talks.' Conversely, strong kleptocrats desire increased market access abroad – policy changes that come at the expense of foreign producers. When the foreign government strongly internalizes these producers' interests, it will resist such policy changes. These incompatible policy interests make it more likely that governments will resort to the threat of force to achieve their objectives.

Conflicts of Interest

How severe are the distributional outcomes of a regime change bid? Are governments largely indifferent between the policies they and their puppet would implement, or does their welfare depend strongly on who is in power at home and abroad? These questions define the stakes of the international negotiation and the strategic means governments will employ to pursue their objectives.

I define government i's conflict of j to be the difference in i's welfare under each possible outcome of a regime change bid. When i wins the war, it installs a puppet in j. When i loses, it is replaced by a puppet that implements policies closer to j's preferences in a trade war. The welfare difference for i between these two scenarios is taken to be the conflict of interest. Note that this conflict of interest, unlike standard models of bargaining and war, is not symmetric. The 'pie' at stake in the negotiation over trade policies may be valued differently by each government – i's preference intensity may be stronger than j's or vice versa. This variation in preference intensity, combined with variable military power, determines bargaining outcomes.

Definition 3: *Government i's conflict of interest with j is:*

$$\Gamma_i(a_i, a_j) = \overline{G}_i(a_i) - \underline{G}_i(a_i, a_j)$$

where $\overline{G}_i$ *and* $\underline{G}_j$ *are as given in Definition 1.*

As governments become more kleptocratic ($a_i \to 0$), conflicts of interest are influenced in two ways. First, $\underline{G}_i(a_i, a_j)$ strictly decreases. If i loses a war, the policy regime that will be imposed by j's puppet, $k(a_j)$, is independent of i's bias type. A pure kleptocrat loses access to its rent streams and places no value on the social welfare that emerges from the policy regime implemented by the puppet, implying $\underline{G}_i(0, a_j) = 0 \quad \forall \quad a_j$. As a_i increases, the policy regime doesn't change, but the deposed government places value on the social welfare accrued under the policy regime. The effect on $\overline{G}_i(a_i)$ is ambiguous. On the one hand, decreases in a_j have the same effect on $\overline{G}_i(a_i)$ as they do on $\underline{G}_i(a_i, a_j)$ by reducing the weight placed on social welfare. Here, however, this is compensated by an increasing weight on contributions $C_i(\tau_i|\tau_j)$. Moreover, decreases in a_i reduce the ambiguity in i's price incentives and increase the returns to being able to exert influence over j's policies. Proposition 1 shows that when combined, these effects serve to increase conflicts of interest as i becomes more kleptocratic.

Proposition 1: *For all* $(a_i, a_j) \ll (\bar{a}_i, \bar{a}_j)$, $\Gamma_i(a_i, a_j)$ *is decreasing in* a_i.

Relatively technocratic governments have less at stake in militarized trade negotiations than their kleptocratic counterparts. Regime change bids are less consequential for technocrats, causing them to have smaller conflicts of interest with their trade partners. Governments with higher welfare-consciousness have less reason to fight one another.

Militarized and Non-Militarized Bargaining

In the model of Grossman and Helpman (1995), my measure of conflict of interest has no effect on the policies governments adopt in a 'trade talks' equilibrium. 'Trade wars' serves as the reversion point, and governments always secure at least as much utility as they do under this outcome. When the governments negotiate in the

shadow of military power, this need not hold. This raises the possibility that the magnitude of conflicts of interest will affect bargaining outcomes. Whether or not the militarized option binds depends on whether it delivers substantially different distributional outcomes than pure trade wars. When military and economic power are in alignment, militarized bargaining is unnecessary and governments can engage in nonmilitarized trade negotiations. When these measures of power diverge from one another, counterfactual regime change bids affect the policies that are agreed to in trade negotiations.

International relations between countries that rely on only trade policy threats to determine bargaining outcomes are likely to differ substantially from those that require some latent militarized threat. Countries that engage in pure 'trade talks' need only to make trade sanctions credible. By contrast, countries that use implicit threats of force to deliver favorable bargaining outcomes may have incentives to maintain competent and ready militaries to ensure that such threats are taken seriously, particularly when information about capabilities is private or mobilizations increase military effectiveness (Fearon 1997). This subsection analyzes the conditions under which different patterns of international relations are likely to materialize. In particular, it analyzes the likelihood that regime change bids will bind in determining bargaining outcomes, when its trading partner's military capabilities (ω_i) are drawn from some probability distribution. This mirrors the international security environment states face in a real, N-country international system. They face multiple prospective adversaries (or trade partners), each with varying military capabilities. The probability of regime change bids binding can therefore alternatively be thought of as the percentage of countries for which military relations (rather than pure trade talks) determines bargaining outcomes.[17]

Recall that the foreign country, j, retains proposal power both before and after hot wars. This makes it relatively straightforward to determine under what conditions country i will prefer to initiate a regime change bid and when this option will bind in determining bargaining outcomes. In any regime change bid, the victor will replace the loser's government with its ideal type ($k(a_{i,j})$) and j will push i to its reversion point, making i indifferent between the trade wars outcome and its offer.

[17] Of course, this abstracts from the more complicated international economy that would emerge in such a setting.

This yields the $\tilde{G}_i$ expected utility for i, given in Equation 17 and rewritten here

$$\tilde{G}_i = \left(q(\omega_i, \omega_j)\overline{G}_i + (1 - q(\omega_i, \omega_j))\underline{G}_i\right)(1 - c_i)$$

In the absence of a regime change bid, government i simply receives its trade wars utility, $G_i^\star(\tau_i^\star(a_i), \tau_j^\star(a_j))$. Note that Equation 17 can be written as a function of i's conflict of interest with j:

$$\tilde{G}_i = \left[\underline{G}_i(a_i, a_j) + q(\omega_i, \omega_j)\Gamma_i(a_i, a_j)\right](1 - c_i)$$

Government i will reject any offer and declare war whenever such an offer leaves it worse off than $\tilde{G}_i$. Therefore, regime change bids will bind in determining bargaining outcomes, whenever[18]

$$\left[\underline{G}_i(a_i, a_j) + q(\omega_i, \omega_j)\Gamma_i(a_i, a_j)\right](1 - c_i) > G_i^\star(\tau_i^\star(a_i), \tau_j^\star(a_j)) \tag{19}$$

Figure 4 depicts the bargaining space induced by this outside option. Whether or not regime change bids are relevant in bargaining hinges on whether or not the distributional outcome of a trade war is in line with the distributional outcome of a regime change bid. When these outcomes are sufficiently different, counterfactual regime change bids will pin down bargaining outcomes.

Clearly, the likelihood of regime change bids binding depends on both the distribution of military capabilities (ω_i, ω_j) *and* the governments' representativeness parameters (a_i, a_j). Now consider a disribution of foreign country military capabilities, $F_j : [\underline{\omega}_j, \overline{\omega}_j] \to [0, 1]$ where $q(\omega_i, \underline{\omega}_j) = 1$ and $q(\omega_i, \overline{\omega}_j) = 0$ and F_j is some strictly increasing cdf. For a random foreign capability draw from this distribution, what is the probability that Equation 19 will hold and counterfactual regime change bids will be relevant for pre-war bargaining outcomes?

Proposition 2: *There exists a* $c_i^\star \in [0, 1]$ *such that for all* $c_i > c^\star$*, the probability that Equation 19 holds is decreasing in* a_i*.*

[18] An analagous condition can be derived for j. I focus on i's condition for ease of exposition.

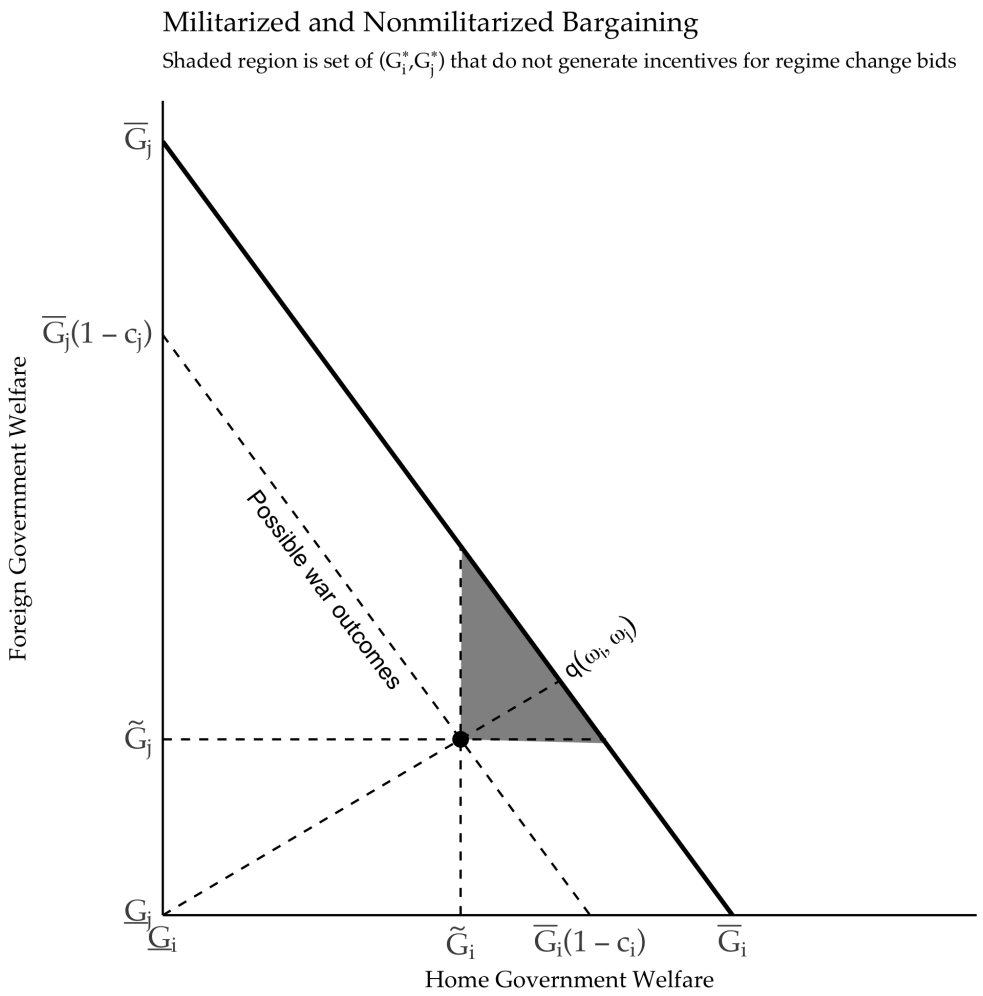

Figure 4: Welfare pairs (G_i, G_j) and induced bargaining space. The solid line connecting $\overline{G}_i$ and $\underline{G}_i$ is the pareto frontier. $q(\omega_i, \omega_j)$ determines the governments expected value for war $(\tilde{G}_i, \tilde{G}_j)$ When $(G_i^\star, G_j^\star)$ is in the shaded region, Inequality 19 is satisfied for i and j, and trade wars is sufficient to pin down bargaining outcomes. Otherwise, counterfactual regime change bids determine the equilibrium trade policies.

So long as regime change bids are sufficiently costly for government i, kleptocrats will be more inclined to undertake them. This follows logically from the incentives discussed in this section. As i's conflict of interest with j increases, it has more at stake in the negotiation. As established by Proposition 1, kleptocrats face larger conflicts of interest than their technocratic counterparts. While their may be cases in which trade wars and regime change bids deliver similar distributional outcomes,

this becomes less likely as conflicts of interest grow larger. The bargains made feasible by each outside option become less and less likely to overlap.

While Proposition 2 considers only the circumstances under which i has incentives to launch regime change bids, the same logic holds for j. Since j holds proposal power, it is able to obtain more favorable outcomes from the negotiation. But similarly to i, if conflicts of interest are large and the military balance is favorable enough, there will be cases in which j has the same incentives to launch regime change bids. As a result, j will offer i its expected utility under a regime change bid and extract the remainder of the bargaining surplus.

Discussion

The model presented here derives government preferences over a two country Ricardo-Viner trade model, in order to ground the discussion in a substantive policy area and contribute to theoretical debates about the origins of the commercial peace. Propositions 1 and 2 would likely obtain in a more general setting, however. These results rest on three key assumptions:

1. Governments choose an externality-generating policy.
2. The magnitude of the externality varies as a function of the governments' types.
3. When bargaining, governments' threat points include both noncooperative policy choice and militarized conflict, which results in replacement of the losing government.

In the realm of trade, assumption 1 and 2 obtain for 'large' countries. Small countries, having no ability to influence world prices, inflict no externalities on their trading partners and therefore have no need to bargain over trade policy, coercively or noncoercively. Most policies of interest to international relations researchers and policymakers display these features to some extent. Governments that better internalize the interests of average citizens appear to adopt more effective environmental regulations, meaning that such governments generate few externalities than their less welfare-conscious counterparts (Cao and Ward 2015). Exchange rate

regimes are a product of governments' proclivity to manipulate the price of imports and exports, which also appears to vary systematically as a function of domestic political characteristics (Bearce and Hallerberg 2011, Steinberg and Malhotra (2014)). Finally, investment protections vary as a function of regime type, meaning that different types of governments impose different levels of externalities on foreign investors (Li 2009).

What empirical regularities does the model predict? Returning to the model of trade and conflict presented here, the model yields predictions about trade policy, trade flows, international political relations, *and their correlations*. In a model where conflict occured in equilibrium, a necessary condition for its emergence would be that incentives for regime change bids existed for one country or the other. Therefore, the model also may have something to say about the relationship between trade policy and international conflict. In the model, kleptocratic governments prefer to adopt trade policies that impose large externalities on other kleptocrats. By setting high tariffs, these governments cut into the profits of firms abroad, whose welfare becomes more important as the foreign government becomes more kleptocratic. This behavior both increases the returns to being able to replace foreign governments with puppets with more dovish preferences, and increases the costs of being forced to adopt the policies of a foreign-installed puppet. These counterfactual scenarios determine the magnitude of the conflict of interest governments face when interacting with one another, and the likelihood that governments will appeal to their militarized outside option when bargaining over trade policy.

This also suggests that foreign policy hostility and protectionist trade policy should, under some circumstances, be correlated. Kleptocratic dyads should endeavor to provide each other with minimal market access, which would reduce the amount of trade that occurs between them. When the militarized relations determine trade policy, however, kleptocrats suffering from military disadvantage may adopt lower levels of protection than they would under pure trade talks, in order to forestall military conflict. Because these governments are more likely to lean on the militarized outside option in determining trade policy, their political relations are more likely to be more hostile and antagonistic. If hostile political relations are a precondition for militarized conflict, then these dyads should also see more militarized disputes. By contrast, relatively technocratic regimes should adopt more

open trade policies, increasing trade and mollifying conflicts of interest, making harmonious political relations more likely.

The post-World War II era has been marked by 1) a large increase in international trade flows, 2) an increase in the number of democracies in the international system and 3) a relative dearth of interstate conflict. The democratic and commercial peace literatures largely see 1) and 2) as mollifying existing conflicts of interests between states - territorial, ideological, or otherwise - and in turn causing 3). The theory presented here takes a governments' representativeness as exogenous. After imposing simple structure on the nature of governments' interaction, it then generates trade policy, trade flows, and conflicts of interest endogeously from the same framework. Here, the same forces that drive the formation of trade policy drive governments' conflict propensity.

The theory therefore sees 1) and 3) as endogenously emerging from 2). As governments have become more welfare-conscious they both adopt lower levels of trade protection and impose smaller negative externalities on one another. Rather than providing incentives for governments to resolve preexisting conflicts of interest, this behavior obviates conflicts of interest altogether. While the incidence of interstate conflict has declined dramatically since World War II, there remains substantial variation in both the rhetorical tenor and degree of militarization of contemporary international relations that is not captured by the 'MID-or-not'[19] classification often used by empirical conflict scholars. Some contemporary international relations are highly militarized and conflict-prone, with governments perceiving one another as national security threats, engaging in various forms of coercive diplomacy, and forgoing cooperation for fear of losing strategic avantage. In other cases, particularly relations amongst advanced industrial democracies, governments enjoy overwhelmingly warm relations. Their militaries make no preparations for war with one another, actively assisting one another in combating external security threats and resolving conflicts of interest through bilateral, noncoercive negotiations. To the extent that conflicts in security relations exist, they revolve around who will bear the burdens of collective self-defense, rather than any fundamental conflicts over 'national interests.' Coe (n.d.) terms this lack of antagonism "the modern economic peace," and argues convincingly that existing theories struggle

[19] MID: Militarized Interstate Dispute

to explain it.

These countries also spend relatively small amounts of their national income on their militaries, relative to their autocratic counterparts and historical levels of military spending. In the model, military power is gratuitous when conflicts of interest are small and delivers no added effective bargaining power. These countries can therefore have common interests sufficient to demobilize their militaries and enjoy amicable, noncoercive political relations. While the same scenario can materialize for dyads with large countries of interest, it becomes much less likely. With sufficient military power, governments can guarantee themselves better distributional outcomes than pure trade talks would deliver, providing strong incentives to mobilize for war, demonstrate military capacity, and send costly signals of resolve to fight. The next section briefly explores armament incentives as an extension to the model.

Extension: Endogenous Military Investment

Consider the decision problem of a home government entering trade negotiations with a partner that has fixed military capacity ω_j. Assume investments in military capacity cost $z_i(\omega_i)$ where z_i is some increasing and weakly convex function with $z_i(0) = 0$. Again, assume the foreign government has proposal power. Recall from Equation 17 that the home government's war utility is given by

$$\tilde{G}_i(\omega_i, \omega_j) = \left(q(\omega_i, \omega_j)\overline{G}_i + (1 - q(\omega_i, \omega_j))\underline{G}_i\right)(1 - c_i)$$

where we have written $\tilde{G}$ as a function of capabilities instead of bias types. In trade wars, the home government will receive $G_i^\star(\tau_i^\star(a_i), \tau_j^\star(a_j))$.

If the government sets $\omega_i = 0$, it will receive either $G_i^\star(\tau_i^\star(a_i), \tau_j^\star(a_j))$ or $\tilde{G}_i(0, \omega_j)$, depending on whether Inequality 19 holds for the foreign government. It could also consider investing just enough to make the foreign government indifferent between trade wars and hot wars, ensuring that it receives its trade wars utility. Denote this level of investment with $\omega_i^\star$, where $\omega_i^\star$ solves:

$$\left(\underline{G}_j + q(\omega_i^\star, \omega_j)\Gamma_j(a_j, a_i)\right)(1 - c_j) = G_j^\star(\tau_j^\star(a_j), \tau_i^\star(a_i)) \tag{20}$$

This would yield utility $G_i^\star(\tau_i^\star(a_i), \tau_j^\star(a_j)) - z(\omega_i^\star)$. Finally, the government could consider investing enough such that Inequality 19 holds and it prefers to initiate a regime change bid absent sufficient concessions. Here, it would invest optimally for this contingency, equating the marginal benefits from investing with marginal cost

$$\frac{d\tilde{G}_i(\omega_i, \omega_j)}{d\omega_i} = \frac{\partial q(\omega_i, \omega_j)}{\partial \omega_i}\Gamma_i(a_i, a_j)(1 - c_i) - \frac{\partial z_i(\omega_i)}{\partial \omega_i} = 0 \tag{21}$$

Of these three options, the government will then choose the amount of investment that maximizes its utility. The first option, investing zero, is naturally independent of the magnitude of i's conflict of interest with j. For the second and third options, deterring foreign regime change bids and investing optimally for a regime change bid, optimal investment is higher for kleptocrats.

Proposition 3: *There exists a $c_i^\star \in [0, 1]$ such that for all $c_i > c^\star$, optimal military investment $\omega_i^\star(a_i)$ is weakly decreasing in a_i.*

Because kleptocrats have more at stake when both engaging in and fending off regime change bids, they invest more for these contingencies. Lake (1992) argues that autocracies display an imperialist bias owing to rent-seeking incentives in a semi-competitive global market for protection. Here, more kleptocratic governments face larger policy conflicts of interest with their trading partners. As a result, they invest more to secure better distributional outcomes in these conflicts. Even when one's own conflicts of interest are small, governments can be induced to invest in military capacity to prevent others with more at stake from extorting them. Empirically, this suggests that governments whose international relations are characterized by larger conflicts of interest should maintain larger militaries. Kleptocrats who expect to interact mostly with other kleptocrats should maintain the largest militaries.

Conclusion

This paper began by asking: what do governments want, and why do their objectives bring them into conflict with one another? If strong conflicts of interest were endemic to international relations and plagued all dyads equally, then this question would be of little consequence. Yet, there are many reasons to suspect that governments of different stripes have very different objectives. Here, I have shown that this variation affects governments' conflict propensity. In equilibrium, low bias governments impose relatively small externalities on one another, meaning that the bilateral trade policies they would adopt if they controlled the foreign government differ little from the 'trade wars' pattern of protection. By contrast, highly unrepresentative states not only desire higher levels of protection at home, they also more highly prize market access abroad. This means that their returns to foreign liberalization are large, increasing the size of their dyadic conflicts of interest. Consistent with Jackson and Morelli (2007), this study shows that conflicts of interest vary dramatically as a function of governments' 'bias' toward particularistic interests. Unbiased governments have little reason to fight other unbiased governments because their optimal policy choices are largely harmonious in the realm of trade. Biased, rent-seeking governments, exhibit more conflictual preferences. The likelihood that military power becomes relevant in determining bargaining outcomes increases as conflicts of interest grow larger. This helps explain not just the dearth of armed conflict between highly representative governments, but their general lack of foreign policy antagonism toward one another.

In addition to providing a self-contained account of the stylized facts of Coe's 'modern economic peace,' the model has implications for empirical IPE scholars studying the relationship between democracy and trade liberalization. Several studies have employed the Grossman-Helpman model to structurally estimate governments' welfare-consciousness cross-nationally (Goldberg and Maggi 1999; Mitra, Thomakos, and Ulubasoglu 2006; Gawande, Krishna, and Olarreaga 2009; Gawande, Krishna, and Olarreaga 2012; Gawande, Krishna, and Olarreaga 2015). All use as estimating equations the predicted equilibrium protection of a small country taking an international price as given (Grossman and Helpman 1994) or a large country engaged in efficient 'trade talks' (Grossman and Helpman 1995). If

governments are indeed all engaged in pure 'trade talks' when negotiating trade regimes, then these models should produce accurate estimates of governments' underlying welfare-consciousness. If, however, governments set trade policy under the shadow of militarized coercion, these estimates will be biased. This estimation procedure, when seeing low levels of protection, infers that governments must place a relatively small weight on political contributions. In this model, governments can adopt low levels of protection either because they are not rent seekers *or* because they face a threat of force from a trading partner that seeks market access. Kleptocrats whose markets are pried open by threats of force adopt the same trade policies as technocrats who adopt such policies because they benefit consumers.

Finally, the theory highlights a prerequisite for international conflict that is underappreciated in the existing literature. For governments to initiate war with one another, they must both 1) possess conflicts of interest large enough to justify the costs of conflict and 2) be unable to resolve these conflicts peacefully. Theoretical research on international conflict has focused principally on identifying conditions under which 2) does not obtain. But understanding the emergence of conflicts of interest is arguably as or more important than understanding bargaining failures for identifying what types of governments are most likely to experience hostile international relations. Interstate war is incredibly rare in contemporary international politics, but many dyads still experience antagonistic and militarized political relations. Focusing attention on the conflicts of interest underlying these antagonisms, rather than realized conflict, might help explain their emergence and termination.

Appendix

Lemma 1: *For any $\tau_i, \tau_j > 0$, there exists a unique $\pi(\tau_i, \tau_j)$ such that Equations 7, 8, and 9 are satisfied.*

Proof: Start by showing there exists a π such that Equation 9 is satisfied. Given our assumptions on the economy, we can prove this by showing that demand is monotonically decreasing in p_i and supply is monotonically increasing in p_i. Aggregate demand in the nonnumeraire sector and aggregate supply can be written as functions of the international price, because domestic prices are transformations of the international price ($p_i = \tau_i \pi$).

$$D(\pi) = d_i(p_i(\pi)) + d_j(p_j(\pi))$$

$$Y(\pi) = y_i(p_i(\pi)) + y_j(p_j(\pi))$$

Since u_i is concave, u_i' is a decreasing function, so $u_i'^{-1}$ is also decreasing. Since $d_i(p_i) = u_i'^{-1}$ and $p_i(\pi)$ is an increasing function of π, $D_i(\pi)$ is monotonically decreasing.

The countries supply functions are given by $y_i(p_i(\pi)) = f_{i1}(L_{i1}^\star(p_i), K_i)$ and f_{i1} is increasing in both inputs. To show $y_i(p_i(\pi))$ is increasing in π, it suffices to show that $L_{i1}^\star(p_i(\pi))$ is also increasing in π. By profit maximization, we must have

$$p_i f_{i1}'(L_{i1}, K_i) = 1 \implies L_{i1}^\star(p_i) = f_{i1}'^{-1}(1/p_i)$$

Since f_{i1} exhibits the same properties as a u_i, $f_{i1}'^{-1}$ is decreasing in its argument, implying it is increasing in p_i (π). Therefore, $Y(\pi)$ is a monotonically increasing function.

Equation 9 can be written $D(\pi) = Y(\pi)$. Since $D(\pi)$ is monotonically increasing and $Y(\pi)$ is monotonically decreasing, this equation has a unique solution, $\pi^\star$. By Walras' Law, Equation 8 must hold with equality as well.

We have already shown that $L_{i1}^\star(p_i) = f_{i1}'^{-1}(1/p_i)$ is a monotonically decreasing function of p_i. Labor demand in the nonnumeraire sector is independent of p_i. By

assumption, both goods are produced ($L_{i0}, L_{i1} > 0$) implying that a factor market equilibrium exists and satisfies Equation 7.

Lemma 2: *In any equilibrium of the domestic influence game, the government chooses its trade policy such that*

$$\tau_i^\star = \underset{\tau_i}{\text{argmax}}\, \Pi_i(\tau_i, \tau_j) + aS_i(\tau_i, \tau_j) + r(\tau_i, \tau_j)$$

Proof: For any interior solution, government welfare maximization requires

$$(1 - a_i)\frac{\partial C_i(\tau_i)}{\partial \tau_i} + a_i\left[\frac{\partial \Pi(\tau_i)}{\partial \tau_i} + \frac{\partial S(\tau_i)}{\partial \tau_i}\right] + \frac{\partial r(\tau_i)}{\partial \tau_i} = 0$$

Producer net welfare maximization requires

$$\frac{\partial \Pi(\tau_i)}{\partial \tau_i} = \frac{\partial C_i(\tau_i)}{\partial \tau_i}$$

Subsituting these conditions in for one another, we obtain

$$\frac{\partial \Pi(\tau_i)}{\partial \tau_i} + a_i\left[\frac{\partial \Pi(\tau_i)}{\partial \tau_i} + \frac{\partial S(\tau_i)}{\partial \tau_i}\right] + \frac{\partial r(\tau_i)}{\partial \tau_i} = 0$$

which is the first order condition for joint welfare maximization. Assumption 1 guarantees that this function is concave, meaning the first order condition is sufficient.

Lemma 3: $\tau_i^\star(a_i)$ *is a strictly decreasing function.*

Proof: In any noncooperative international equilibrium, $\frac{\partial G_i}{\partial \tau_i} = \frac{\partial G_j}{\partial \tau_j} = 0$. Equilibrium trade policies can be written as implicit functions of i's bias type, $\tau_i^\star(a_i)$ and $\tau_j^\star(a_i)$. By the implicit function theorem, their derivatives satisfy

$$\begin{bmatrix} \frac{\partial \tau_i(a_i)}{\partial a_i} \\ \frac{\partial \tau_j(a_i)}{\partial a_i} \end{bmatrix} = -\begin{bmatrix} \frac{\partial^2 G_i}{\partial \tau_i^2} & \frac{\partial^2 G_i}{\partial \tau_i \partial \tau_j} \\ \frac{\partial^2 G_j}{\partial \tau_i \partial \tau_j} & \frac{\partial^2 G_j}{\partial \tau_j^2} \end{bmatrix}^{-1} \begin{bmatrix} \frac{\partial^2 G_i}{\partial \tau_i \partial a_i} \\ \frac{\partial^2 G_j}{\partial \tau_j \partial a_i} \end{bmatrix}$$

Inverting the interior matrix,

$$\begin{bmatrix} \frac{\partial \tau_i(a_i)}{\partial a_i} \\ \frac{\partial \tau_j(a_i)}{\partial a_i} \end{bmatrix} = -\frac{1}{\frac{\partial^2 G_i}{\partial \tau_i^2}\frac{\partial^2 G_j}{\partial \tau_j^2} - \frac{\partial^2 G_i}{\partial \tau_i \partial \tau_j}\frac{\partial^2 G_j}{\partial \tau_i \partial \tau_j}} \begin{bmatrix} \frac{\partial^2 G_j}{\partial \tau_j^2} & -\frac{\partial^2 G_i}{\partial \tau_i \partial \tau_j} \\ -\frac{\partial^2 G_j}{\partial \tau_i \partial \tau_j} & \frac{\partial^2 G_i}{\partial \tau_i^2} \end{bmatrix} \begin{bmatrix} \frac{\partial^2 G_i}{\partial \tau_i \partial a_i} \\ \frac{\partial^2 G_j}{\partial \tau_j \partial a_i} \end{bmatrix}$$

Government j's best response is invariant to a_i, so $\frac{\partial^2 G_j}{\partial \tau_j \partial a_i} = 0$. This reduces the equation to

$$\begin{bmatrix} \frac{\partial \tau_i(a_i)}{\partial a_i} \\ \frac{\partial \tau_j(a_i)}{\partial a_i} \end{bmatrix} = -\frac{1}{\frac{\partial^2 G_i}{\partial \tau_i^2}\frac{\partial^2 G_j}{\partial \tau_j^2} - \frac{\partial^2 G_i}{\partial \tau_i \partial \tau_j}\frac{\partial^2 G_j}{\partial \tau_i \partial \tau_j}} \begin{bmatrix} \frac{\partial^2 G_j}{\partial \tau_j^2}\frac{\partial^2 G_i}{\partial \tau_i \partial a_i} \\ -\frac{\partial^2 G_j}{\partial \tau_i \partial \tau_j}\frac{\partial^2 G_i}{\partial \tau_i \partial a_i} \end{bmatrix}$$

$\frac{\partial^2 G_i}{\partial \tau_i \partial a_i} = \frac{\partial S_i}{\partial \tau_i} < 0$. $\frac{\partial^2 G_i}{\partial \tau_i^2} < 0$ and $\frac{\partial^2 G_j}{\partial \tau_j^2} < 0$ by Assumption 1. By Assumption 2, $\frac{\partial^2 G_i}{\partial \tau_i \partial \tau_j} > 0$ and $\frac{\partial^2 G_j}{\partial \tau_i \partial \tau_j} > 0$. Therefore, $\frac{\partial \tau_i(a_i)}{\partial a_i} < 0$ and $\frac{\partial \tau_j(a_i)}{\partial a_i} < 0$ as desired.

Lemma 4: *In any take-it-or-leave-it bargaining game in which trade wars* $\left\{\tau_i^\star, \tau_j^\star\right\}$ *(Lemma 3) serves as the reversion point and j holds proposer power, governments will implement* $\left\{\tau_i^t, \tau_j^t\right\}$ *where*

$$\left\{\tau_i^t, \tau_j^t\right\} \in \underset{\{\tau_i, \tau_j\}}{\text{argmax}}\, G_i^\star(\tau_i, \tau_j) + G_j^\star(\tau_j, \tau_i)$$

Government j's side payment to i satisfies

$$R^j = G_i^\star(\tau_i^t, \tau_j^t) - G_i^\star\left(\tau_i^\star(a_i), \tau_j^\star(a_j)\right)$$

yielding i's utility

$$G_i^t\left(\tau_i^t, \tau_j^t, R^j\right) = G_i^\star(\tau_i^t, \tau_j^t) + R^j = G_i^\star\left(\tau_i^\star(a_i), \tau_j^\star(a_j)\right)$$

Proof: j's optimal offer can be formulated as a the solution to a constrained maxi-

mization problem

$$\begin{aligned} \max_{\tau_i, \tau_j, R_j} \quad & G_j^\star(\tau_j, \tau_i) - R_j \\ \text{subject to} \quad & G_i^\star(\tau_i, \tau_j) + R_j \geq G_i^\star\left(\tau_i^\star(a_i), \tau_j^\star(a_j)\right) \end{aligned}$$

This gives the Legrangian

$$\mathcal{L} = G_j^\star(\tau_j, \tau_i) - R_j + \lambda\left[G_i^\star(\tau_i, \tau_j) + R_j - G_i^\star(\tau_i^\star(a_i), \tau_j^\star(a_j))\right]$$

and three first order conditions

$$\frac{\partial \mathcal{L}}{\partial \tau_i} = \frac{\partial G_j^\star}{\partial \tau_i} + \lambda \frac{\partial G_i^\star}{\partial \tau_i} = 0$$

$$\frac{\partial \mathcal{L}}{\partial \tau_j} = \frac{\partial G_j^\star}{\partial \tau_j} + \lambda \frac{\partial G_i^\star}{\partial \tau_j} = 0$$

$$\frac{\partial \mathcal{L}}{\partial R_j} = -1 + \lambda = 0$$

The last condition gives $\lambda = 1$ which implies $\{\tau_i, \tau_j\}$ must be chosen to maximize joint welfare $(G_i^\star + G_j^\star)$. Naturally, j will extract all of the surplus, meaning the constraint will hold with equality,

$$G_i^\star(\tau_i, \tau_j) + R_j = G_i^\star\left(\tau_i^\star(a_i), \tau_j^\star(a_j)\right)$$

Lemma 5: *$k(a_i) > a_j$ and $\left\{\tau_i^\star(a_i), \tau_j^\star(k(a_i))\right\} \ll \left\{\tau_i^\star(a_i), \tau_j^\star(a_j)\right\}$*

Proof: $G_i^\star(\tau_i, \tau_j)$ is submodular in (τ_i, a_i), which implies $\frac{\partial G_i^\star}{\partial \tau_j} < 0 \quad \forall \quad a_i < \bar{a}_i$. $\tau_j^\star(a_j)$ is an strictly decreasing function by Lemma 3. If

$$k(a_i) = \underset{a_j \in [0,1]}{\text{argmax}}\ G_i^\star\left(\tau_i^\star(a_i), \tau_j^\star(a_j)\right)$$

then we must have $k(a_i) > a_j$.

$\left\{\tau_i^\star(a_i), \tau_j^\star(k(a_i))\right\} \ll \left\{\tau_i^\star(a_i), \tau_j^\star(a_j)\right\}$ follows from Assumption 2 which states

that (τ_i, τ_j) are strategic complements. $k(a_i) > a_j \implies \tau^\star(k(a_i)) < \tau^\star(a_j)$ by Lemma 3. In proving Lemma 3 we also showed that $\tau_j^\star(a_i)$ is strictly decreasing in a_i.

Proposition 1: *For all $(a_i, a_j) \ll (\bar{a}_i, \bar{a}_j)$, $\Gamma_i(a_i, a_j)$ is decreasing in a_i.*

Proof: We can write

$$\begin{aligned}\Gamma_i(a_i, a_j) =& \overline{G}_i(a_i) - \underline{G}_i(a_i, a_j) \\ =& \left[\Pi_i(\tau_i^\star(a_i), \tau_j^\star(k(a_i))) + a_i S_i(\tau_i^\star(a_i), \tau_j^\star(k(a_i))) + r(\tau_i^\star(a_i), \tau_j^\star(k(a_i)))\right] - \\ & \left[a_i \left(\Pi_i(\tau_i^\star(k(a_j)), \tau_j^\star(a_j)) + S_i(\tau_i^\star(k(a_j)), \tau_j^\star(a_j))\right)\right]\end{aligned}$$

Let $\overline{\Pi}_i = \Pi_i(\tau_i^\star(a_i), \tau_j^\star(k(a_i)))$, $\underline{\Pi}_i = \Pi_i(\tau_i^\star(k(a_j)), \tau_j^\star(a_j))$ and analagously for S_i and r_i. By the envelope theorem, $\frac{\partial \overline{G}_i}{\partial a_i} = \overline{S}_i$. Differentiating with respect to a_i (and ignoring second-order effects on $\tau_j^\star(k(a_i))$) then gives

$$\begin{aligned}\frac{\partial \Gamma_i(a_i, a_j)}{\partial a_i} =& \overline{S}_i - \underline{S}_i - \underline{\Pi}_i \\ =& \Delta S_i - \underline{\Pi}_i\end{aligned}$$

$\tau_i^\star(a_i) > \tau_i^\star(k(a_j))$ by Lemma 5 and $S_i(\tau_i, \tau_j)$is a decreasing function, so $\Delta S_i < 0$. $\Pi_i(\tau_i, \tau_j)$ is bounded below at 0, so $-\underline{\Pi}_i < 0$, implying $\frac{\partial \Gamma_i(a_i, a_j)}{\partial a_i} < 0$.

Proposition 2: *There exists a $c_i^\star \in [0, 1]$ such that for all $c_i > c^\star$, the probability that Equation 19 holds is decreasing in a_i.*

Proof: Start with Inequality 19

$$\left[\underline{G}_i(a_i, a_j) + q(\omega_i, \omega_j)\Gamma_i(a_i, a_j)\right](1 - c_i) > G_i^\star(\tau_i^\star(a_i), \tau_j^\star(a_j))$$

We can solve this for the $q^\star(\omega_i, \omega_j)$ that makes it hold with equality

$$q^\star(\omega_i, \omega_j) = \frac{\frac{1}{1-c_i} G_i^\star(\tau_i^\star(a_i), \tau_j^\star(a_j)) - \underline{G}_i(a_i, a_j)}{\overline{G}(a_i) - \underline{G}_i(a_i, a_j)} \tag{22}$$

where $\Gamma_i(a_i, a_j) = \overline{G}(a_i) - \underline{G}_i(a_i, a_j)$.

Inequality 19 will bind whenever $q(\omega_i, \omega_j) > q^\star(\omega_i, \omega_j)$. Alternatively, letting $\omega_j^\star$ solve Equation 22 with equality, whenever $\omega_j < \omega_j^\star$. Given our distribution of foreign capabilities, $F_j(\omega_j)$, Inequality 19 will bind with probability $F_j(\omega_j^\star)$.

How does $q^\star(\omega_i, \omega_j)$ change with a_i?

$$\begin{aligned}\frac{\partial q^\star(\omega_i,\omega_j)}{\partial a_i} &= \frac{\overline{G}_i\left(\frac{1}{1-c_i}\frac{\partial G_i^\star}{\partial a_i} - \frac{\partial \underline{G}_i}{\partial a_i}\right) + \frac{1}{1-c_i}G_i^\star\left(\frac{d\underline{G}_i}{\partial a_i} - \frac{\partial \overline{G}_i}{\partial a_i}\right) + \underline{G}_i\left(\frac{\partial \overline{G}_i}{\partial a_i} - \frac{1}{1-c_i}\frac{\partial G_i^\star}{\partial a_i}\right)}{\left(\overline{G}_i - \underline{G}_i\right)^2} \\ &= \frac{\overline{G}_i\left(\frac{1}{1-c_i}S_i^\star - (\underline{\Pi}_i + \underline{S}_i)\right) + \frac{1}{1-c_i}G_i^\star\left((\underline{\Pi}_i + \underline{S}_i) - \overline{S}_i\right) + \underline{G}_i\left(\overline{S}_i - \frac{1}{1-c_i}S_i^\star\right)}{\left(\overline{G}_i - \underline{G}_i\right)^2}\end{aligned}$$

Because $S_i^\star - (\underline{\Pi}_i + \underline{S}_i) > 0$ and $\overline{G}_i > \underline{G}_i$, $c_i \to 1 \implies \frac{\partial q^\star(\omega_i,\omega_j)}{\partial a_i} \to \infty$. Let $c_i^\star$ solve

$$\frac{\partial q^\star(\omega_i, \omega_j)}{\partial a_i}(c_i) = 0$$

We can show that $\frac{\partial q^\star(\omega_i,\omega_j)}{\partial a_i}$ is monotonically increasing in c_i

$$\frac{\partial^2 q^\star(\omega_i,\omega_j)}{\partial a_i \partial c_i} = \frac{(\overline{G}_i - \underline{G}_i)\frac{\partial G_i^\star}{\partial a_i} + G_i^\star\left(\frac{\partial \underline{G}_i}{\partial a_i} - \frac{\partial \overline{G}_i}{\partial a_i}\right)}{(1-c_i)^2(\overline{G}_i - \underline{G}_i)^2} = \frac{(\overline{G}_i - \underline{G}_i)S_i^\star + G_i^\star\left(\underline{S}_i - \overline{S}_i\right)}{(1-c_i)^2(\overline{G}_i - \underline{G}_i)^2}$$

$\underline{S}_i > \overline{S}_i$ by our argument in the proof of Proposition 1 giving $\frac{\partial^2 q^\star(\omega_i,\omega_j)}{\partial a_i \partial c_i} > 0$. This implies $\frac{\partial q^\star(\omega_i,\omega_j)}{\partial a_i} > 0$ for all $c_i > c_i^\star$. This implies $\frac{\partial \omega_j^\star}{\partial a_i} < 0$ which further implies $\frac{\partial F(\omega_j)}{\partial a_i} < 0$, demonstrating the proposition.

Proposition 3: *There exists a $c_i^\star \in [0,1]$ such that for all $c_i > c^\star$, optimal military investment $\omega_i^\star(a_i)$ is weakly decreasing in a_i.*

Proof: Consider first the investment sufficient to produce deterrence, given by Equation 20

$$\left(\underline{G}_j + q(\omega_i^\star, \omega_j)\Gamma_j(a_j, a_i)\right)(1 - c_j) = G_j^\star(\tau_j^\star(a_j), \tau_i^\star(a_i))$$

Solving for $q(\omega_i^\star, \omega_j)$ gives

$$q(\omega_i^\star, \omega_j) = \frac{\frac{1}{1-c_i} G_i^\star(\tau_i^\star(a_i), \tau_j^\star(a_j)) - \underline{G}_i(a_i, a_j)}{\overline{G}(a_i) - \underline{G}_i(a_i, a_j)}$$

A proof analagous to that of Proposition 2 will show that $\omega_i^\star(a_i)$ is decreasing in a_i.

Now consider optimal investment for regime change bids, given by Equation 21:

$$\frac{d\tilde{G}_i(\omega_i, \omega_j)}{d\omega_i} = \frac{\partial q(\omega_i, \omega_j)}{\partial \omega_i} \Gamma_i(a_i, a_j)(1 - c_i) - \frac{\partial z_i(\omega_i)}{\partial \omega_i} = 0$$

If $\Gamma_i(a_i, a_j)$ is decreasing in a_i, then $\omega_i^\star(a_i)$ must also be decreasing in a_i. We have $\Gamma_i(a_i, a_j)$ decreasing in a_i by Proposition 1.

Because optimal investment is either invariant to a_i or increasing in a_i whenever $c_i > c_i^\star$, we conclude $\omega_i(a_i)$ is a weakly increasing function.

References

Acemoglu, Daron, and James A Robinson. 2005. *Economic origins of dictatorship and democracy*. Cambridge University Press.

Anderson, James E., and Eric Van Wincoop. 2004. "Trade Costs." *Journal of Economic Literature* 42: 691–751.

Angell, Norman. 1911. *The great illusion: a study of the relation of military power in nations to their economic and social advantage*. McClelland; Goodchild.

Bearce, David H., and Mark Hallerberg. 2011. "Democracy and De Facto Exchange Rate Regimes." *Economics & Politics* 23 (2): 172–94.

Bernheim, B Douglas, and Michael D Whinston. 1986. "Menu auctions, resource allocation, and economic influence." *The Quarterly Journal of Economics*, 1–31.

Brutger, Ryan, and Austin L Wright. 2014. "The Costs of Conflict: Border Disputes and Trade Diversion."

Bueno De Mesquita, Bruce, Alastair Smith, Randolph M Siverson, and James D Morrow. 2003. *The logic of political survival*. MIT press.

Cao, Xun, and Hugh Ward. 2015. "Winning Coalition Size, State Capacity, and Time Horizons: An Application of Modified Selectorate Theory to Environmental Public Goods Provision." *International Studies Quarterly* 59 (2): 264–79.

Carroll, Robert J. 2017. "War and Peace in the Marketplace."

Chatagnier, J Tyson, and Kerim Can Kavakli. 2015. "From Economic Competition to Military Combat: Export Similarity and International Conflict." *Journal of Conflict Resolution*, 1–27.

Coe, Andrew J. n.d. "The Modern Economic Peace."

Davis, Christina L., and Sophie Meunier. 2011. "Business as usual? Economic responses to political tensions." *American Journal of Political Science* 55 (3): 628–46.

Dixit, Avinash. 1985. "Tax policy in open economies." In *Handbook of Public Economics*, edited by A.J. Auerbach and M. Feldstein, 1:313–74.

———. 1996. "Special-Interest Lobbying and Endogenous Commodity Taxation."

Eastern Economic Journal 22 (4): 375–88.

Fearon, James D. 1995. "Rationalist explanations for war." *International Organization* 49 (03): 379–414.

———. 1997. "Signaling foreign policy interests: Tying hands versus sinking costs." *Journal of Conflict Resolution* 41 (1): 68–90.

———. 2008. "A simple political economy of relations among democracies and autocracies."

Gartzke, Erik. 2007. "The capitalist peace." *American Journal of Political Science* 51 (1): 166–91.

Gartzke, Erik, Quan Li, and Charles Boehmer. 2001. "Investing in the peace: Economic interdependence and international conflict." *International Organization* 55 (02): 391–438.

Gawande, Kishore, Pravin Krishna, and Marcelo Olarreaga. 2009. "What governments maximize and why: the view from trade." *International Organization* 63 (03): 491–532.

———. 2012. "Lobbying Competition over Trade Policy." *International Economic Review* 53 (1): 115–32.

———. 2015. "A Political-Economic Account of Global Tariffs." *Economics & Politics* 27 (2): 204–33.

Goldberg, Pinelopi Koujianou, and Giovanni Maggi. 1999. "Protection for Sale: An Empirical Investigation." *American Economic Review*, 1135–55.

Grossman, Gene M, and Elhanan Helpman. 1994. "Protection for Sale." *The American Economic Review*, 833–50.

———. 1995. "Trade Wars and Trade Talks." *Journal of Political Economy*, 675–708.

———. 1996. "Electoral Competition and Special Interest Politics." *Review of Economic Studies* 63: 265–86.

Hegre, Håvard, John R Oneal, and Bruce Russett. 2010. "Trade does promote peace: New simultaneous estimates of the reciprocal effects of trade and conflict." *Journal*

of Peace Research 47 (6): 763–74.

Jackson, Matthew O, and Massimo Morelli. 2007. "Political bias and war." *The American Economic Review*, 1353–73.

Jia, Hao, Stergios Skaperdas, and Samarth Vaidya. 2013. "Contest functions: Theoretical foundations and issues in estimation." *International Journal of Industrial Organization* 31: 211–22.

Kastner, Scott L. 2007. "When Do Conflicting Political Relations Affect International Trade?" *Journal of Conflict Resolution* 51 (4): 664–88.

Kim, In Song. 2017. "Political cleavages within industry: firm-level lobbying for trade liberalization." *American Political Science Review* 111 (1): 1–20.

Krugman, P. 1980. "Scale economies, product differentiation, and the pattern of trade."

Lake, David A. 1992. "Powerful pacifists: democratic states and war." *American Political Science Review* 86 (01): 24–37.

Li, Quan. 2009. "Democracy, Autocracy, and Expropriation of Foreign Direct Investment." *Comparative Political Studies* 42 (8): 1098–1127.

Lo, Nigel, Barry Hashimoto, and Dan Reiter. 2008. "Ensuring Peace: Foreign-Imposed Regime Change and Postwar Peace Duration, 1914-2001."

Mansfield, Edward D, and Jon C Pevehouse. 2000. "Trade blocs, trade flows, and international conflict." *International Organization* 54 (04): 775–808.

Melitz, Marc J. 2003. "The impact of trade on intra-industry reallocations and aggregate industry productivity." *Econometrica* 71 (6): 1695–1725.

Milner, Helen V. 1997. *Interests, institutions, and information: Domestic politics and international relations*. Princeton University Press.

Milner, Helen V, and Keiko Kubota. 2005. "Why the move to free trade? Democracy and trade policy in the developing countries." *International Organization* 59 (01): 107–43.

Mitra, Devashish, Dimitrios D. Thomakos, and Mehmet Ulubasoglu. 2006. "Can we obtain realistic parameter estimates for the 'protection for sale' model?" *Canadian*

Journal of Economics 39 (1): 187–210.

Moravcsik, Andrew. 1997. "Taking preferences seriously: A liberal theory of international politics." *International Organization* 51 (04): 513–53.

Morrow, James D, Randolph M Siverson, and Tressa E Tabares. 1998. "The political determinants of international trade: the major powers, 1907–1990." *American Political Science Review* 92 (03): 649–61.

Olson, Mancur. 1965. *The logic of collective action*. Harvard University Press.

Oneal, John R, and Bruce M Russet. 1997. "The classical liberals were right: Democracy, interdependence, and conflict, 1950–1985." *International Studies Quarterly* 41 (2): 267–93.

Owen IV, John M. 2002. "The Foreign Imposition of Domestic Institutions." *International Organization* 56 (2): 375–409.

Pollins, Brian M. 1989. "Conflict, cooperation, and commerce: The effect of international political interactions on bilateral trade flows." *American Journal of Political Science*, 737–61.

Powell, Robert. 1999. *In the shadow of power: States and strategies in international politics*. Princeton University Press.

Putnam, Robert D. 1988. "Diplomacy and domestic politics: the logic of two-level games." *International Organization* 42 (03): 427–60.

Russett, Bruce, and John R Oneal. 2001. *Triangulating Peace: Democracy, Interdependence, and International Organizations*. WW Norton & Company.

Schultz, Kenneth A. 1998. "Domestic opposition and signaling in international crises." *American Political Science Review* 92 (04): 829–44.

Steinberg, David A., and Krishan Malhotra. 2014. "The Effect of Authoritarian Regime Type on Exchange Rate Policy." *World Politics* 66 (03): 491–529.