Trade Wars, Hot Wars, and the Commercial Peace*

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29 August 2017

Abstract

What do governments want, and why do their objectives bring them into conflict with one another? 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 endemic to international politics. Resources are finite and governments have incompatible policy objectives, realities that force these governments to bargain with one another over who gets what and which policies are implemented. Workhorse models of international conflict take such conflicts of interest 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; Powell, 1999). These models and the research that has sprung from them 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.

In reality, much of the bargaining that takes place in international politics is over which domestic policies will be adopted and who will bear the costs of adjustment induced by changes from the status quo. Domestic policies such as trade tariffs, environmental regulations, currency regimes, and investment protections all affect the welfare of sub-state groups, but also impose externalities (positive or negative) on foreigners. Unlike bargaining over private goods, bargaining over policies has both an efficiency and a distributional component. First, governments must decide which set of joint policies maximizes the size of the pie. Then they must bargain over to whom these gains will accrue. When governments have homogenous preferences over policies and side payments are available, the distributional component of these games mirrors bargaining over a pie of fixed size. Once the pareto frontier has been reached, bargaining is purely distributional.

But when governments have heterogeneous preferences over policies, the magnitude of this distributional conflict can vary dramatically. When governments' policy preferences are largely compatible, the gains from policy coordination are small, meaning that there is a relatively small 'pie' to be bargained over. By contrast, when governments' ideal policies impose large externalities on one another, the question of which joint policies will be adopted becomes more consequential,

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

inducing more acute distributional conflict.

Here, I analyze how such variation in distributional conflict affects bargaining outcomes when governments have both militarized and non-militarized tools to pursue their policy objectives. To fix ideas, I build a simple domestic political economy of trade, inspired by Grossman and Helpman (1995), that defines governments' policy preferences. Governments are differentiated by the extent to which they maximize rents from special interests versus social welfare, following Grossman and Helpman (1994)'s model of Protection for Sale. While this model was built to explain commercial policy formation in democracies, 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. Unlike Grossman and Helpman (1995), governments can employ either noncooperative trade policy *or* military conflict in pursuit of their policy objectives. 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.

In a stylized manner, I therefore model each of the steps of the Open Economy Politics (OEP) theory-building algorithm (Lake, 2009). First, I defined substate actors' preferences over economic outcomes and (implicitly) governments' policies. Then I specify how these preferences are aggregated to produce governments' policy objectives. Finally, I allow governments to bargain over the *joint* policy that will be adopted. While each of these steps is simplified to maintain analytic tractability, modeling them jointly demonstrates how the levels interact with one another (Putnam, 1988), and 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. Because institutions affect governments' ideal policies, they 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. The first premise is problematic on logical grounds. Suppose a government adopts a nonzero tariff on the import of some good in time t. This reflects a preference for the good to bought and sold domestically at a price greater than the international price. If exogenous decreases in trade costs occur at time $t+1$, the government can always increase the tariff to maintain prices at their previous level.[3] Governments that maintain trade policy autonomy can always choose the extent to which they participate in the global economy, so it is not clear why reductions in trade costs would change their proclivity to do so. 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

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

[3]When governments can impose product subsidies, the same logic holds for goods traded at domestic prices lower than the international price. If foreign governments do not change their policies then the international price will fall and the home government may not respond with a duty that fully countervails the trade cost reduction, due to tariff revenue considerations. However if all governments respond to the trade cost shock by seeking to return prices to their previous levels, then prices will remain unchanged.

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 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.[4] 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 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 derives government preferences over a general equilibrium model of trade, in which the governments' policy choices directly affect the welfare of the agents they care about. Underlying international conflicts are disagreements over what prices domestic producers and consumers will face domestically and internationally. The model shares many features with that of Coe (N.d.). The major difference is that comity of interest in this model stems not from the long run growth prospects of democracies, but the short term externalities

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

they impose on one another through trade policy.

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 governments 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.

A Model of Trade Policy Formation and Coercive Bargaining

The model envisions 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.[5] 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 from owners of the specific factor. This domestic influence game defines each government's ideal trade policy, and pins down a 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

[5]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.

assumed to constitute a vanishingly small proportion of the overall population, and therefore care only about these profits. Importers will have a preference for a protective tariff, and exporters will seek export subsidies. Because no intermediate goods are required to produce the non-numeraire good and there are no intra-sector productivity differences, industries have no incentive to lobby for trade liberalization (reductions in import tariffs and export subsidies). As Kim (2017) shows, predicted lobbying behavior is quite sensitive to these assumptions. Firm-level heterogeneity and product differentiation matter in determining trade policy outcomes (Melitz, 2003). In order to investigate trade policy conflicts of interest in the simplest possible setting, I reserve integration of these findings into the model for future work.

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 (political contributions), 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.

Economic Equilibrium

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. 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

[6]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, 2015).

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.

Good 0 serves as the numeraire ($p_{i0} = 1$) and is produced using labor only with constant returns to scale. To normalize the competitive wage to zero, I let $f'_{i0}(L_{i0}) = 1$.[7] Good 1 is produced with both labor and some specific factor. The producers of good 1 own K_{i1} units of this specific factor, and produce q_{i1} units of the good using technology $f_{i1}(L_{i1}, K_{i1})$.

Domestic prices for good 1, p_i, are the product of the international price π and the domestic trade policy τ_i.[8] Note that this formulation allows for domestic prices to be affected by both tariffs or subsidies. For an importer of good 1, $\tau_i = 1$ represents free trade, $\tau_i > 1$ a tariff, and $\tau_i < 1$ a subsidy.[9]

$$p_i = \tau_i \pi \tag{2}$$

In a competitive equilibrium, consumers maximize their utility subject to their budget constraints, producers maximize profits subject to production feasibility, domestic labor markets clear, and international good markets clear.[10] This yields Definition 1.[11]

Definition 1. Economic Equilibrium. In a competitive equilibrium, consumers in both countries maximize their utility, subject to their budget constraint.

$$\max_{\boldsymbol{q}} \quad U_i(\boldsymbol{q})$$

$$\text{subject to} \quad q_0 + p_i q_{i1} \leq L_i$$

[7] Normalization of the competitive wage gives $w_{i0} = w_{i1} = 1$ and simplifies the consumer's budget constraint to $q_0 + p_i q_{i1} \leq L_i$

[8] Note that I suppress the good index, as prices and trade in good 1 will serve as the object of analysis for the remainder of the paper.

[9] The opposite holds for an exporter.

[10] This holds for an arbitrary bilateral trade policy $\{\tau_i, \tau_j\}$. The next subsection endogenizes these trade policies

[11] Producers of the numeraire good maximize $f_{i0}(L_{i0}) - L_{i0}$. Since $f_{i0}(L_{i0})$ exhibits constant returns to scale, we have that $f_{i0}(L_{i0}) = f'_{i0}(L_{i0})L_{i0}$ and since $f'_{i0}(L_{i0}) = 1$, numeraire producers make zero profits in equilibrium and it is sufficient to consider the profit maximization problem of producers of Good 1.

Producers maximize their profits.

$$\max_{\boldsymbol{L_{i1}}} \quad p_i f_{i1}(L_{i1}, K_{i1}) - L_{i1}$$

Domestic labor markets clear.

$$L_{i0} + L_{i1} = L_i$$

And international good markets clear.

$$q_{10} + q_{20} = f_{10}(L_{10}) + f_{20}(L_{20})$$

$$q_{11} + q_{21} = f_{11}(L_{11}, K_{11}) + f_{21}(L_{21}, K_{21})$$

These conditions jointly determine the international price, π, and trade between the countries. I denote the consumer demand for Good 1 induced by maximization of U_i with $d_i(p_i)$, the supply curve induced by profit maximization with $X_i(p_i)$, and net imports to country i with $m_i(p_i)$:

$$m_i(p_i) = d_i(p_i) - X_i(p_i) \tag{3}$$

Tariff revenue, $r(\tau_i, \pi)$, is simply the product of the ad valorem tariff and net imports:

$$r(\tau_i, \pi) = (\tau_i - 1) \cdot \pi \cdot m_i(\tau_i * \pi) \tag{4}$$

How do producers and consumers fare under a given equilibrium? For welfare analysis, I consider the surplus that accrues to consumers and the profits that accrue to producers of the non-numeraire good. Consumer surplus is given by

$$S(p_i) = U_i(\boldsymbol{q}_i^\star) - p_i q_{i1}^\star - q_{i0}^\star \tag{5}$$

where $\boldsymbol{q}_i^\star$ is equilibrium consumption. Producer profits are given by

$$\Pi(p_i) = p_i \cdot f_{i1}(L_{i1}^\star, K_{i1}) - L_{i1}^\star(p_i) \tag{6}$$

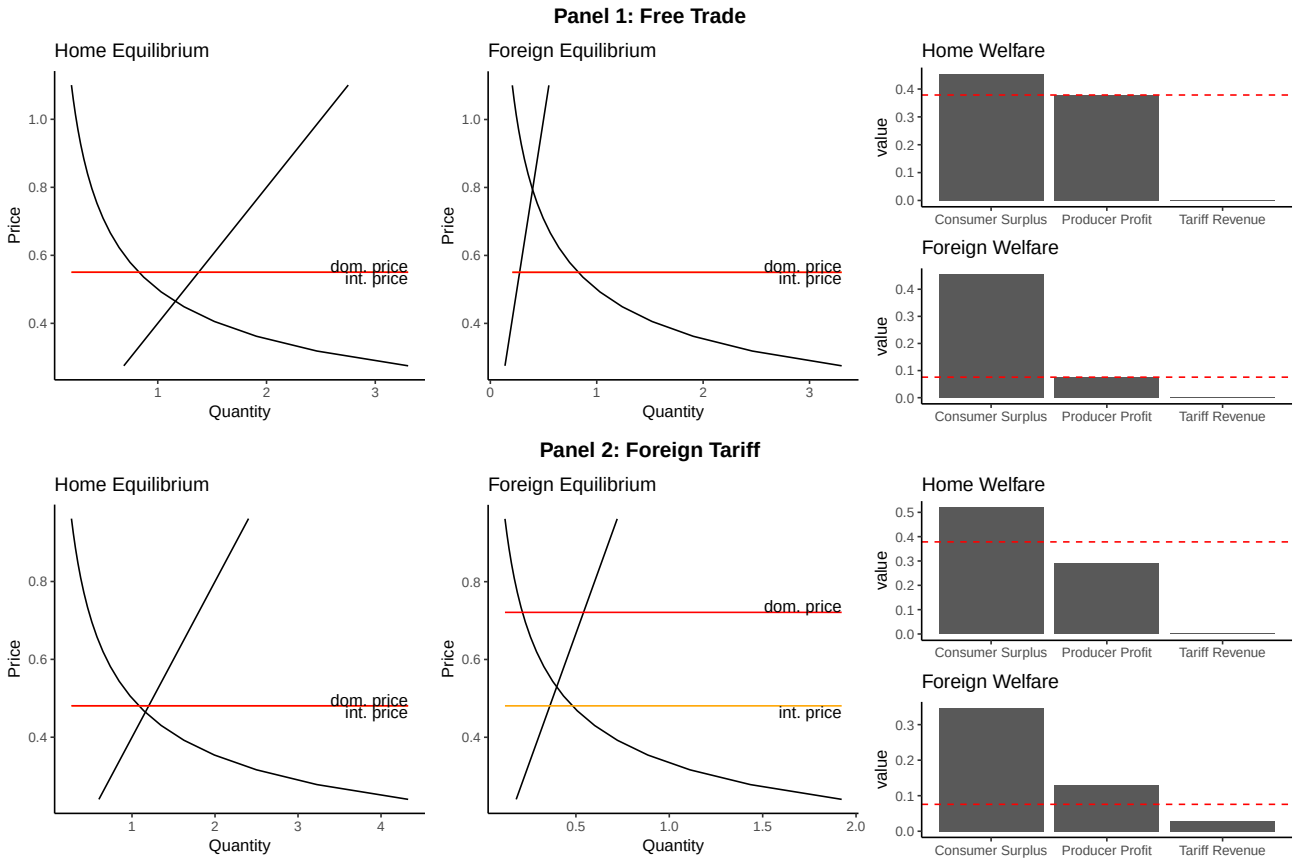

Figure 1: Economic equilibria in a parametric version of the model presented in Defintion 1. Consumer utility is given by $U(\boldsymbol{q}) = q_0 + q_1^{\alpha}$ for some $\alpha \in (0, 1)$. Production of Good 1 is Cobb-Douglas, with $f(K, L) = L^{\beta}K^{1-\beta}$ for some $\beta \in (0, 1)$. The 'Home Equilibrium' and 'Foreign Equilibrium' plots show the domestic supply and demand curves induced by these preferences and production possibilities. The far right plot shows the distribution of income in the home and foreign countries at equilibrium domestic and international prices. In the example pictured here, $\alpha_i = \alpha_j = \beta_i = \beta_j = .5$, $K_i = 5$, and $K_j = 1$, making country 1 the natural exporter of Good 1. In the 'Free Trade' Panel, $\tau_i = \tau_j = 1$, meaning domestic and international prices are equivalent. The 'Foreign Tariff' panel shows the equilibrium and welfare effects of the imposition of a foreign tariff $\tau_j = 1.5$. The dotted lines on the welfare plots are shown at producer profits in the free trade equilibrium. The shifts in Panel 2 show that the imposition of the foreign tariff shifts income from home producers to foreign producers. A fully interactive version of this plot is available at: https://brendancooley.shinyapps.io/twhw/

Note the conflict of interest between domestic producers and consumers. Consumers naturally prefer a lower price for the non-numeraire good, while producers prefer a higher price.

Figure 1 depicts the economic equilibria and welfare implications of bilateral free trade (Panel 1) and the imposition of a foreign tariff (Panel 2). The foreign tariff shifts income both within the foreign country and internationally. Consumer surplus in the foreign country is reduced in exchange for producer profits and tariff revenue. Additionally, producer profits in the *home* country shrink as production shifts toward the foreign country. These profit shifting incentives underlie conflicts of interest between governments in the bargaining model presented below. Before presenting this bargaining game, I first endogenize trade policy and explore how governments' optimal trade policies

change as a function of their welfare-conciousness.

Political-Economic Equilibrium (Trade Wars)

The previous subsection characterizes how the international economy will respond to an arbitrary set of trade policies (induced prices). Now I describe the domestic political process through which those policies are determined. Note that the international price of Good 1 is determined by the trade policy choices of the governments, allowing us to write $\pi(\tau_i, \tau_j)$. Since $p_i = \tau_i \pi$, domestic prices are also a function of the trade policies, giving $p_i(\tau_i, \tau_j)$.

In the next subsection, I will allow governments to bargain over the bilateral trade policy, $\{\tau_i, \tau_j\}$. For now, I assume that the governments are engaged in a simple, noncooperative price-setting game that I will refer to as 'trade wars,' following Grossman and Helpman (1995).[12]

The game proceeds as follows:

1. Producers present contribution schedules to the government, specifying the amount they will contribute for each potential pair of realized home-foreign trade policies, $\{\tau_i, \tau_j\}$.
2. Governments each choose trade policies unilaterally.
3. Policies are implemented. Contributions accrue to the government and production and consumption occur.

Here, I characterize the trade policies and equilibrium contributions that emerge in the Nash Equilibrium of this game. Producers naturally seek to maximize their net welfare (profits less contributions). Letting $C_i(\tau_i, \tau_j)$, denote the political contributions of producers in country i, net producer welfare can be written:[13]

$$W_i(\tau_i, \tau_j) = \Pi_i(\tau_i, \tau_j) - C_i(\tau_i, \tau_j) \tag{7}$$

As discussed in the introduction, governments seek to maximize a weighted average of social welfare and political contributions. Governments are characterized by an exogenous parameter $a_i \in [0, 1]$ which represents the weight they place on social welfare relative to campaign contributions. I refer to this paramter alternatively as a government's welfare consciousness or its bias type. Kleptocrats ($a_i \to 0$) care only about the political contributions and tariff revenue (or subsidy costs)

[12] In the bargaining game presented in the next subsection, this will serve as one of the reversion points available to the governments.

[13] Since p_i is a function of the trade policies, we can write $\Pi(p_i)$ as $\Pi(\tau_i, \tau_j)$.

induced by their policy choices. As a_i approaches 1, the government becomes a pure technocrat, placing no weight on contributions. Government welfare is given by:[14]

$$G_i(\tau_i, \tau_j) = (1-a)C_i(\tau_i, \tau_j) + a\left[\Pi_i(\tau_i, \tau_j) + S_i(\tau_i, \tau_j)\right] + r(\tau_i, \tau_j) \tag{8}$$

An equilibrium of this domestic game consists of a contribution schedule by the producers, $C_i(\tau_i, \tau_j)$, and a trade policy choice $\tau_i^\star(C_i)$ by the government that constitute mutual best responses. Producers have no incentive to change their contribution schedule, given the government's policy choice, and the government has no incentive to change its policy choice, given the contribution schedule. Lemma 1 shows that in any equilibrium of this domestic game, contributions induce the government to maximize a weighted sum of producer welfare and social welfare.[15] Equilibrium contributions are sufficient to make the government indifferent between implementing equilibrium policy and its optimal policy when $C_i(\tau_i, \tau_j) = 0$.

Lemma 1. *For an arbitrary foreign (home) trade policy, τ_j, let τ_i^0 denote the home government's optimal policy in the absence of political contributions ($C_i(\tau_i, \tau_j) = 0$) and $g_i(\tau_i; \tau_j)$ its associated welfare.*

$$\tau_i^0 \in \underset{\tau_i}{\operatorname{argmax}}\, g_i(\tau_i; \tau_j)$$

In a domestic political economic equilibrium, the government chooses trade policy to maximize a weighted sum of producer and social welfare

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

and equilibrium political contributions from producers of Good 1 ($C_i^\star$) satisfy

$$C_i^\star(\tau_i^0, \tau_i^\star; \tau_j) = \Pi_i(\tau_i^\star, \tau_j) + aS_i(\tau_i^\star, \tau_j) + r(\tau_i^\star, \tau_j) - g_i(\tau_i^0; \tau_j)$$

[14] Note that this government welfare function differs slightly from that of Grossman and Helpman (1994), where $G = C + a(\Pi + r + S)$ and $a \in \mathbb{R}_+$. Here, a is bounded in the unit interval and all governments weigh tariff revenue equally. The assumption that tariff revenue is unweighted for all governments ensures G_i is always concave and that best response curves are smooth. In the Grossman-Helpman formulation, unrepresentative governments ($a \to 0$) do not internalize the cost of policy interventions ($r(\tau_i, \tau_j)$) which can yield extremely distortionary optimal policy and sometimes precludes the existence of an equilibrium.

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

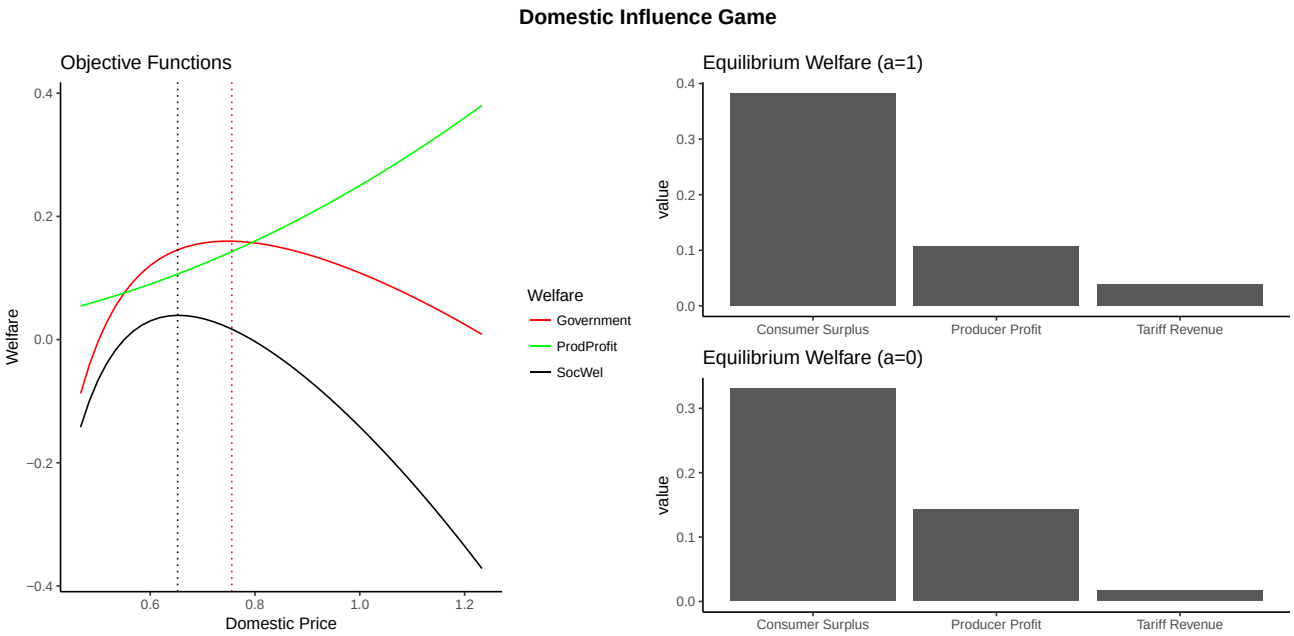

Figure 2: Political economic objective functions an welfare implications of a parametric version of the model. Consumer utility and production possibilities are parameterized as in Figure 1. In this example, $\alpha_i = \alpha_j = \beta_i = \beta_j = .5$, $K_i = 1$, and $K_j = 5$, making country i the natural importer of Good 1. τ_j is fixed at 1. The left panel shows the objective functions of a pure technocrat ($a = 1$, black) and a pure kleptocrat ($a = 0$, red). It demonstrates that contributions induce the technocrat to induce higher protective tariffs. The implications of this behavior are depicted in the right panel. The top plot shows welfare of substate groups under the technocrat while the bottom plot shows welfare under the kleptocrat. A fully interactive version of this plot is available at: https://brendancooley.shinyapps.io/twhw/

for any τ_j.

The proof can be found in the appendix. Governments that are more suceptible to political contributions ($a \to 0$) implement larger trade policy distortions. The social welfare losses incurred by this behavior are offset by contributions from producers. When $a \to 1$, the government's objective function is the same as the society's social welfare function. Therefore, there is little policy distortion and contributions tend to zero. Lemma 1 allows us to 'black box' the domestic influence game for the remainder of the analysis. Governments that maximize a combination of contributions and social welfare and participate in the influence game described above are induced to maximize a weighted average of producer and social welfare.

Figure 2 depicts visually how this game influences the government's objective function. More kleptocratic governments put higher weights on producer welfare, meaning that they prefer higher prices for good 1. This has the effect of shifting welfare from consumers toward producers. Of course, this also comes at the expense of producers abroad. This is the conflict of interest that is explored in

the next subsection.

When governments set trade policy noncooperatively, they each maximize the objective functions given by their respective domestic influence game. This results in a 'trade wars' equilibrium that is pareto *inefficient* from the perspective of the governments and defined in Definition 2.

Definition 2. Trade Wars. In a noncooperative Nash Equilibrium, government trade policies maximize their contribution-induced utility and constitute best responses to one another

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

$$\tau_j^\star \in \underset{\tau_j}{\text{argmax}}\ \Pi_j(\tau_j, \tau_i^\star) + a_j S_j(\tau_j, \tau_i^\star) + r(\tau_j, \tau_i^\star)$$

Political contributions, $C_i^\star(\tau_i^0, \tau_i^\star, ; \tau_j^\star)$, satisfy Lemma 1.

Grossman and Helpman (1995) show that the bilateral tariffs that result from this game have political economic and terms of trade components. In their 'trade talks' model, international bargaining centers around eliminating the deadweight loss induced by the governments' incentives to use tariffs to shift the terms of trade. These terms of trade distortions are unchanged by governments' types ($\{a_i, a_j\}$). The political economic distortions are influenced by governments' biases, however. As shown above, kleptocratic governments face larger incentives to implement trade policy distortions. As a result, the degree of protection that emerges in a trade wars equilibrium depends, in part, on the welfare-conciousness of the governments. This allows us to think of the trade policies that emerge in trade wars as a function of the governments' bias parameters and write $\tau_i^\star(a_i)$. Lemma 2 demonstrates how changes to these bias parameters affect trade policy formation under trade wars.

Lemma 2.

1. *$\tau_i^\star(a_i)$ is strictly decreasing in a_i.*
2. *There is a one-to-one mapping between changes in i's type (a_i) and changes in home (p_i), foreign (p_j), and international (π) prices in a trade wars equilibrium (Def. 2).*

Consistent with the discussion above, more kleptocratic governments adopt higher tariffs

(subsidies) in a trade wars equilibrium. In the political economy presented here, governments' are principally concerned with prices, which are influenced by both their trade policy behavior and that of the foreign government. But because the foreign government's type determines the type of trade policy it adopts in equilibrium, the bias type of the foreign government indirectly affects the welfare of the home government. We can therefore think of the governments' as having preferences over the bias type of their negotiating partner. These preferences play a key role in the bargaining game presented in the next subsection.

International Bargaining and Militarized Force

The domestic political economy of trade developed so far is well-theorized. Trade policies create domestic winners and losers, which generates incentives for groups to organize and lobby for policies closer to their ideal. Theories of commercial policy formation differ principally with respect to which domestic cleavage they predict will be most salient (Rogowski, 1989; Hiscox, 2002; Kim, 2017). As Johnson (1953) demonstrated, 'large' countries' trade policies not only shift the home distribution of income, but also generate externalities abroad. Since Johnson, a large literature has explored how governments can employ formal and informal institutions to manage these externalities and reach efficient outcomes (Maggi, 1999; Bagwell and Staiger, 1999).[16]

The distributional consequences of these institutions have received less attention. 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 disatisfied with the market access conditions abroad have numerous tools at their disposal to seek changes in the trade policies of other governments. If trade threats do not generate sufficient bargaining power, these governments might prefer to tie non-trade inducements (positive or negative) to trade negotiations. The further the range of trade-only bargains is from a given government's ideal point, the greater its incentives to manipulate others' incentives through coercion. In the anarchy of world politics, coercion can always - in principle - take the form of threats, displays, or uses of military force (Fearon, 1997).[17] The question considered here is under what circumstances governments will

[16]Efficiency here being defined by the (possibly rent-seeking) governments.

[17]Instances of 'gunboat diplomacy' - in which military threats were unambiguously tied to market access conditions - are not difficult to find in the historical record.

find pure trade negotiations insufficient to their ends and will be willing to risk military conflict to pursue these ends.

Here, I assume that war can be employed to replace a government with a type of the victor's choosing. In the context of the model presented in the previous subsection, this means forcibly changing the a_i parameter that conditions the foreign government's choice of trade policy by imposing new political institutions (Owen IV, 2002; Lo, Hashimoto and Reiter, 2008). Since a_i determines the ideal bilateral trade policy of each government, war can be used to move the ideal point of a trading partner closer to one's own. This in turn moves the reversion point of the trade policy bargaining game and the set of feasible bargaining outcomes.[18] When contemplating a war, therefore, governments consider both the costs of the war and the benefits they would accrue if they were able to bargain with a partner holding more 'dovish' trade policy preferences. They also consider the outcome in which they lose a war and are replaced by a government of the foreign country's choosing. In this case, the trade policy negotiated by the foreign-installed government is implemented, but the welfare changes resulting from the policy change are weighted by the old government's utility function.[19]

The interaction between the governments proceeds as follows. I consider a bargaining game in which governments can choose whether to settle their differences through pure 'trade talks' (Grossman and Helpman, 1995) or through the use of military force. Governments are each endowed with some exogenously-given military capability $\omega_i \in \mathbb{R}_+$. A contest function $\rho : \{\omega_i, \omega_j\} \rightarrow [0, 1]$ 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 $\rho(\omega_i, \omega_j) + \rho(\omega_j, \omega_i) = 1$.[20] If either state chooses to engage in a war, both governments pay fixed proportion of their post-war welfare,

[18]This also imposes limits on the magnitude of concessions that can be extracted through war. If the home government had control of both trade policy instruments $\{\tau_i, \tau_j\}$, it could use this power to redistribute an arbitrary amount of utility from the foreign government to itself (See Grossman and Helpman, 1995, pp. 699-700). Because victorious governments only get to choose the (bounded) type of their negotiating partner, they can only obtain the concession that the most-favorable type of partner government would be willing to grant.

[19]This assumption is consistent with the conceptualization of the government as an aggregation of substate actors. When contemplating a war, this aggregation considers its (weighted) change in welfare as a result of the imposition of new trade policies under the foreign-installed government. Importantly, unlike most bargaining and war games, this aggregation does not cease to exist ($G_i \neq 0$) in the case of a war defeat.

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

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

denoted $c_i \in [0,1]$. Country i wins the war with probability $\rho(\omega_i, \omega_j)$ and can then replace j's government with an alternative government of its choosing. The value of winning a war stems from the ability to choose the type of government that one will bargain with in future trade policy negotiations. Of course, if i loses the war, then j replaces i's government.

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.[21] Governments' utilities are under the offer are therefore given by

$$G_i^t(\tau_i^j, \tau_j^j, R^j) = G_i(\tau_i^j, \tau_j^j) + R^j \tag{9}$$

$$G_j^t(\tau_j^j, \tau_i^j, R^j) = G_j(\tau_j^j, \tau_i^j) - R^j \tag{10}$$

where $G_i(\tau_i^j, \tau_j^j)$ and $G_j(\tau_j^j, \tau_i^j)$ are given by Equation 8.

Then, country 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 9.
2. **Trade Wars**: Implement noncooperative trade policy, yielding $G_i(\tau_i^\star, \tau_j^\star)$ as given in Definition 2.
3. **Hot Wars**: 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 ($a_j \in [0,1]$) and j proposes a new trade policy pair, $\{\tau_i, \tau_j, R^j\}$, initiating a new bargaining game in which the parties no longer have militarized tools at their disposal.[22] This yields expected utility[23]

$$\tilde{G}_i = \left(\rho(\omega_i, \omega_j)\overline{G}_i + (1 - \rho(\omega_i, \omega_j))\underline{G}_i\right)(1 - c_i) \tag{11}$$

where $\overline{G}_i$ and $\underline{G}_i$ are government i's utilities associated with the induced bargaining games in which it wins and loses the war, respectively.[24]

The game presents government i with a relatively straightforward decision. If it is not satisfied

[21] 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.

[22] This assumption is consistent with the interpretation of the victor-imposed government as a 'puppet' which cannot declare war on the government that put it into power.

[23] I assume governments are risk neutral with respect to costly lotteries (wars).

[24] These utilities are defined in Definition 3.

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 hot wars.[25] The question I consider in the next section is under what conditions the 'hot wars' outcome will 'bind' in determining bargaining outcomes.

This requires reasoning backward from the expected outcome of a 'hot war.' Suppose, without loss of generality, that country i wins the war. It will then choose the type of country j. The puppet will then make a bilateral trade policy offer that i can accept or reject, where rejection imposes the trade wars equilibrium.[26] Naturally, j will extract the bargaining surplus and bargaining will be efficient. This yields Lemma 3.

Lemma 3. *In any take-it-or-leave-it bargaining game in which trade wars* $\left\{\tau_i^\star, \tau_j^\star\right\}$ *(Definition 2) serves as the reversion point and* j *holds proposer power, governments will implement* $\left\{\tau_i^t, \tau_j^t\right\}$ *where*

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

Government j*'s side payment to* i *satisfies*

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

yielding i*'s utility*

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

In the bargaining game, the 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. The resulting utility for the government i, therefore, is dependent on the bias type of its negotiating partner, a_j, because this parameter influences the policies that emerge in a trade wars equilibrium (by Lemma 2). Taking this bargain as given, what type of government

[25] The take-it-or-leave-it bargaining protocol allows j to extract all bargaining surplus.

[26] I allow j to make the offer to be consistent in endowing j with all proposer power throughout the game.

would country i most like to bargain with? Since government i will receive $G_i(\tau_i^\star, \tau_j^\star)$ in any bargain, it would like to choose a_j such that this quantity is maximized. Definition 3 describes this ideal negotiating partner.

Definition 3. War Outcomes. If country i wins a war with country j, it will install a puppet government of type $k(a_i)$ where

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

and $\tau_i^\star(a_i)$ is defined in Lemma 2. This yields utility

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

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

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

The utility the victorious government receives, $\overline{G}_i\left(a_i, k(a_i)\right)$ is simply its utility under the bargaining game in which it optimally chooses the type of its trading partner. The utility of the losing government is slightly more complicated. $\underline{G}_i\left(k(a_j), a_j; a_i\right)$ is determined by how the *old* government evaluates the policy agreed upon by the victor and the *new* puppet government. It is therefore a function of the original type of country i's government, a_i, the type of the victorious government, a_j, and the type of the puppet installed by the victor, $k(a_j)$.

Bias Type Preferences

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. What type of government would the home country like to see in power abroad? As established by Lemma 2, changes in a foreign government's type are equivalent to changes in home and international prices from the perspective of the home government. Lemma 2 also demonstrated that governments with higher bias parameters implement

lower tariffs in trade wars equilibria. The relevant question for the home government is, therefore, whether it would like to see foreign tariffs rise or fall. This question hinges on how such changes would affect the elements of the home government's objective function - producer welfare, consumer surplus, and tariff revenue. While lower tariffs would raise producer welfare, they reduce consumer surplus, meaning that the government's bias parameter (the weight placed on these two elements) plays a strong role in determining its preference. The government also considers the effect of policy changes abroad on its own tariff revenue. Foreign tariffs have an indeterminate effect on tariff revenue, where the direction of the effect depends, for the most part, on whether the country is the exporter or importer of good 1.

At first glance, this presents a somewhat complex problem of deriving government preferences over the two dimensional space $\{\tau_i, \tau_j\}$. Note however, that the choice problem that defines $k(a_i)$ is over a set of trade wars Nash equilibria (Definition 2). Moreover, the governments' choices of trade policies display strategic complementarities - higher foreign tariffs induce the home government to implement higher home tariffs. This means that any Nash equilibrium in which the foreign government implements a higher tariff will also feature the home country implementing a higher tariff. So the government's choice problem reduces to a rather simple one: would it prefer to see increases in home *and* foreign tariffs or decreases in both tariffs? Lemma 4 formalizes this intuition.

Lemma 4. *Let $\left\{\tau_i', \tau_j'\right\}$ denote the trade policies that emerge in the counterfactual trade wars equilibrium in which governments' bias parameters are $\{a_i, k(a_i)\}$ and $\left\{\tau_i^\star, \tau_j^\star\right\}$ denote the policies associated with $\{a_i, a_j\}$. Then*

$$k(a_i) > a_j \implies \left\{\tau_i', \tau_j'\right\} \ll \left\{\tau_i^\star, \tau_j^\star\right\}$$

and

$$k(a_i) < a_j \implies \left\{\tau_i', \tau_j'\right\} \gg \left\{\tau_i^\star, \tau_j^\star\right\}$$

This dramatically simplifies the set of counterfactual worlds we must consider. Reductions in tariffs imply a reduction in domestic prices and an increase in the international price (conversely for tariff increases). Some governments will prefer tariff reductions, and will therefore install relatively welfare-conscious puppets abroad ($k(a_i) > a_j$). Others that prefer tariff increases will install relative kleptocrats abroad ($k(a_i) < a_j$).

Tariff increases (decreases) will not be symmetric, however. Since government's best response functions are concave in their opponent's trade policy, increases in home tariffs (decreases) will be accompanied by larger increases (decreases) in the foreign tariff. Grossman and Helpman (1995) (p. 699) show that the tariff *ratio* is sufficient to determine home, foreign, and international prices. Equiproportionate increases in tariffs serve only to shift income to the importing country by means of increased tariff revenue. When $k(a_i) > a_j$, foreign tariffs fall faster than home tariffs, resulting in an increase in the tariff ratio, (τ_i/τ_j), and a resulting increase in the home price. This also results in an increase in tariff revenue for the exporting country, due to a reduction in export subsidy costs. Conversely, when $k(a_i) < a_j$, foreign tariffs rise faster than home tariffs, causing a decrease in the domestic price. Here, the importer's tariff revenues rise. This discussion suggests that governments' preferences over the bias type of their negotiating partner will hinge on two characteristics. First, it will depend on the government's own bias type, as this determines how it views the domestic price changes implied by the new equilibrium. Second, it will depend on the government's position in the international economy, as this determines the tariff revenue implications of the shift in tariffs.

To ease analysis of these scenarios, consider the level of a_i that would make the home government indifferent between positive and negative tariff changes. This indifference results in a preference for the type of the foreign government to remain unchanged, or $k(a_i) = a_j$ and denote this type with $\tilde{a}_i(a_j)$.[27] Note further that governments preferences over the tariff ratio, through its effect on prices, are also ordered in type (Lemma 2) - higher bias types (a_i) prefer lower tariff ratios (τ_i/τ_j). This means that governments with $a_i > \tilde{a}_i(a_j)$ will prefer tariff increases ($k(a_i) < a_j$) while those with $a_i < \tilde{a}_i$ will prefer tariff decreases ($k(a_i) > a_j$).

Definition 4. Let $\tilde{a}_i$ define the (unbounded) type of home government that desires no change in the type of the foreign government

$$\tilde{a}_i(a_j) = \{a_i | k(a_i) = a_j\}$$

When it is interior, the point $\{\tilde{a}_i(a_j), \tilde{a}_j(a_i)\}$ can be thought of as an a-equilibrium - given the type of the foreign government, the home government prefers to make no change to the bias type of the foreign government and vice versa. Intuitively, this point is the most stable configuration of bias

[27] This value need not be enclosed in the unit interval. In the cases in which $\tilde{a}_i(a_j) < 0$ or $\tilde{a}(a_j) > 1$, *all* feasible types have the same preference over the type of the foreign government

types. Hot wars will (in expectation) deliver precisely the same outcome as trade wars, yielding little incentive for either government to threaten or initiate a hot war.

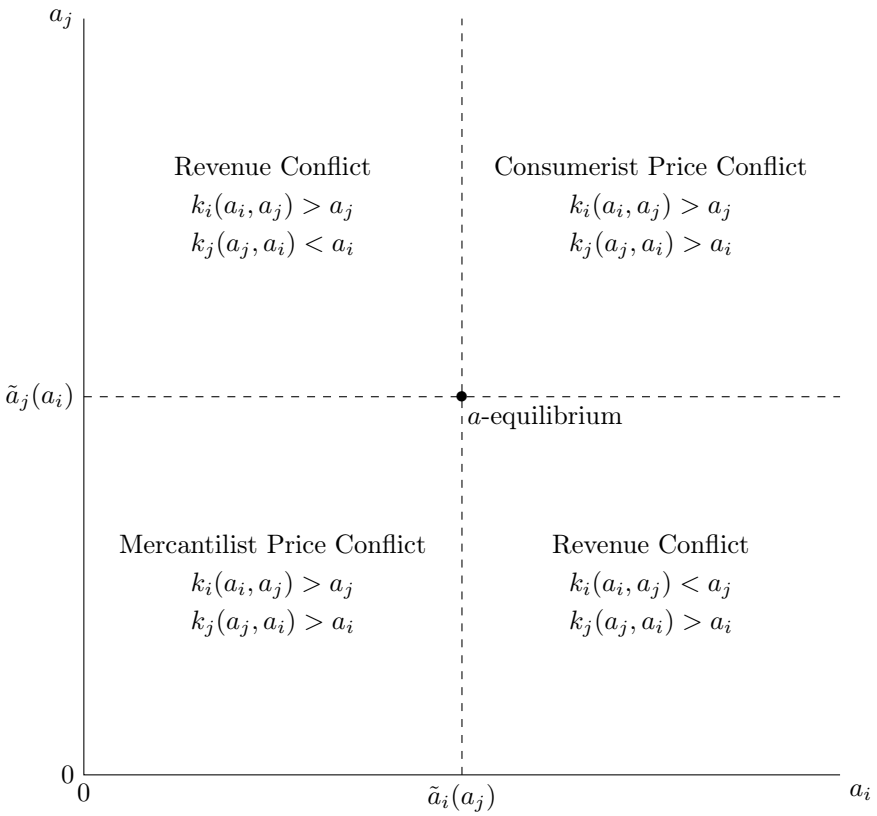

Figure 3: Governments' bias type preferences as functions of their own bias types.

Figure 3 depicts the set of possible preference combinations the governments might hold. In the bottom left, both governments prefer higher domestic prices, inducing a preference for a more technocratic government abroad. In the top right, both governments are relatively consumer-biased, desiring lower domestic prices and more kleptocratic governments abroad. Here, governments price preferences are incompatible. Tariff increases at home cause price decreases abroad and vice versa. In the off diagonal boxes, governments domestic price preferences are compatible, but they remain in conflict over the distribution of tariff revenue. While Figure 3 was constructed to show all logical possibilities, $\tilde{a}$ need not be in the unit interval. Depending on economic and political primitives, certain quadrants in fact may be much larger than the others and some quadrants may not materialize.

Because of the efficiency of the bargaining game, all of these outcomes remain purely counterfactual scenarios. Yet, under certain circumstances, governments lean on on these counterfactuals to achieve advantageous bargaining outcomes. In the next section, I argue that dyads that rely on these outside options are likely to interact differently than those for which pure trade talks determine

outcomes. I also show that the likelihood of these counterfactual scenarios becoming relevant on the game tree laid out above varies systematically as a function of governments' type.

Results

This section presents the main results of the paper. In particular, it shows that the extent to which governments must rely on militarized tools in pinning down bargaining outcomes varies as a function of their bias types. For a subset of 'weak kleptocrats' conflicts of interest grow larger as governments become more kleptocratic ($a_i \to 0$). As a result, they are more likely to lean on militarized options to achieve their objectives. Relatively technocratic governments have more nuanced views of international price changes, because they weigh the interests of both producers (that want higher prices) and consumers (that want lower prices). These countervailing forces mollify conflicts of interest between technocrats and make it more likely that such governments will be able to realize efficient outcomes through pure 'trade talks.' Here, I define conflicts of interest in relation to the model presented in the previous section. Proposition 1 establishes that for weak kleptocrats, conflicts of interest become more severe as governments become more kleptocratic. I then ask, given a distribution of foreign country military capabilities, what is the likelihood that the 'hot wars' outside option will bind in determining bargaining outcomes. Proposition 2 establishes that the larger the conflict of interest, the more likely it is that 'hot wars' will bind in determining bargaining outcomes.

Figure 4 depicts the bargaining game for the parametric model presented above. The left plots show both governments' best response curves and the 'trade wars' bilateral trade policy that is realized at their intersection. The points IP1 and IP2 correspond to the bilateral trade policies that are implemented when countries 1 and 2 choose the type of their bargaining partner. The dotted 'efficiency locus' depicts the set of bilateral trade policies that maximize joint surplus. This can be thought of as a 'distributional axis.' Governments have strictly conflicting preferences over where on this ray bilateral trade policy will settle.[28] As discussed above, however, the set of feasible policies is (implicitly) limited by the bounded set ($a_i \in [0, 1]$) of government types. The right plots depict the distributional implications of these trade policies. The solid diagonal line is the set of pareto efficient agreements. Beneath this line are the 'trade wars' and 'hot wars' reversion points. 'Hot wars' is depicted as a costly lottery - a convex combination of the outcome in which i wins the war (war1)

[28]This also generates the one-to-one mapping between bargains with and without side payments.

and the outcome in which j wins the war (war2).[29] The dotted lines emanating from these points toward the pareto frontier enclose the set of induced utilities that are preferred by both governments to a given outside option. These sets make it relatively easy to see when the 'hot wars' outside option will bind.[30] When these sets do not intersect, at least one government prefers initiating a hot war to *any* agreement in the 'trade wars' set. In accordance with the bargaining game described above, 'hot wars' will therefore bind in determining bargaining outcomes.

How severe are the distributional outcomes of a hot war? 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. Figure 4 also demonstrates the general intuition behind the results presented in this section. Because more kleptocratic governments adopt larger trade policy distortions, they experience larger conflicts of interest. This means that they also have more at stake in a hot war. Depending on the distribution of capabilities ($\rho(\omega_i, \omega_j)$), one government might find a war more attractive than any feasible outcome from trade talks. As a result, the militarized outside option will bind in determining bargaining outcomes. This is the scenario depicted in Panel 2 of Figure 4. Government 2 prefers the expected outcome from a war to the bargain given by trade wars, meaning that Government 1 will be forced to accept a distributional outcome worse than what it would have received under pure trade talks.

Conflicts of Interest

I define government i's conflict of interest with j to be the difference in i's welfare under each possible outcome of the hot war. In the case in which 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. 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.

[29] Recall that governments are risk-neutral with respect to costly lotteries.

[30] The set of cases in which 'hot wars' binds can be larger, depending on the specifics of the bargaining protocol. In the case of no intersection, 'hot wars' will bind for *all* bargaining protocols.

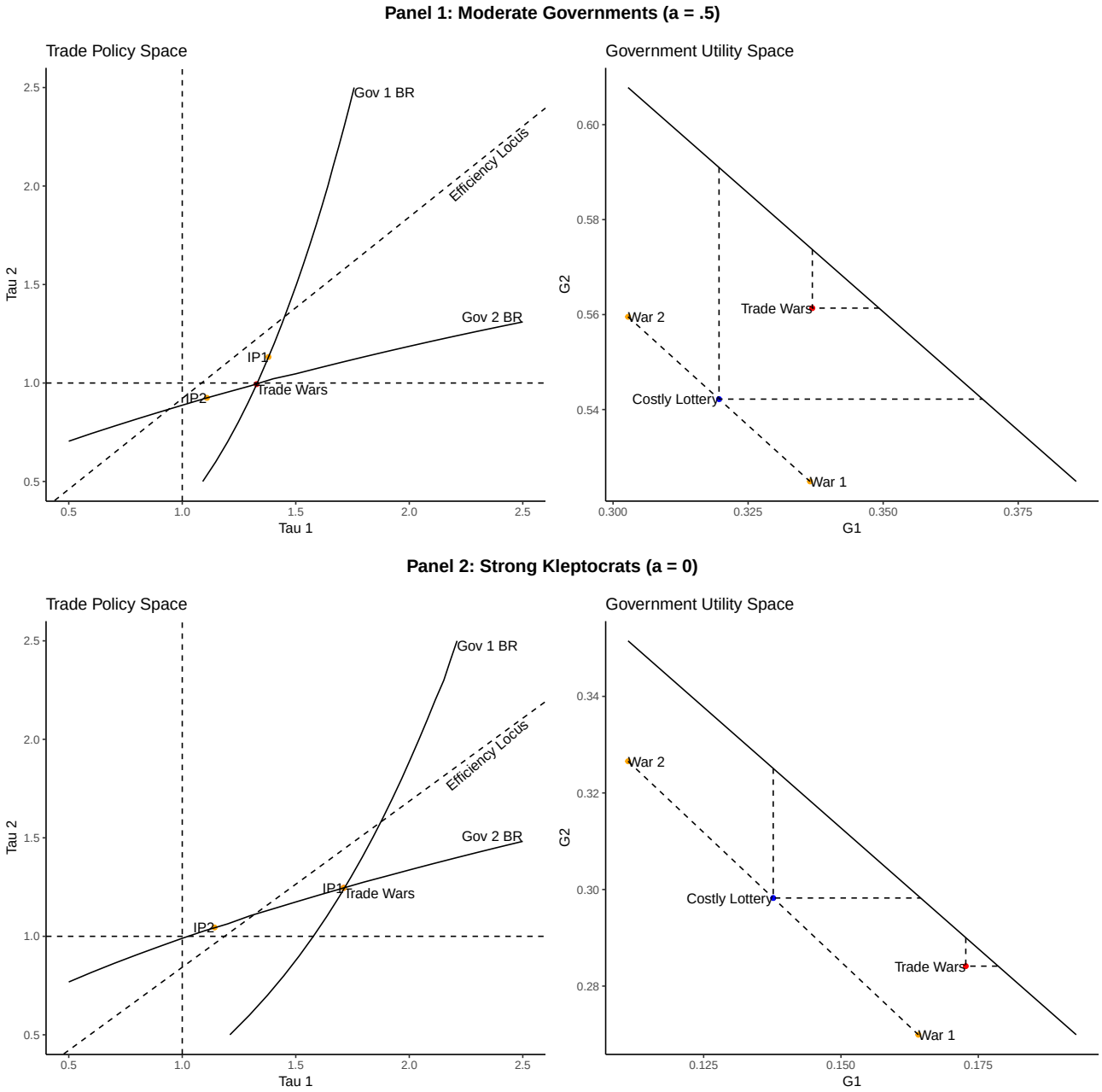

Figure 4: Trade wars equilibrium and induced bargaining space for a parametric version of the model. Consumer utility and production possibilities are parameterized as in Figure 1. In this example, $\alpha_i = \alpha_j = \beta_i = \beta_j = .5$, $K_i = 1$, and $K_j = 5$, making country i the natural importer of Good 1. Panel 1 depicts the interaction between two 'moderate governments', with $a_i = a_j = .5$. Panel 2 depicts the interaction between 'pure kleptocrats,' with $a_i = a_j = 0$. In both Panel 1 and 2, the left plot depicts the governments' best response curves as functions of one another's trade policy choices. Their intersection defines the 'trade wars' equilibrium. IP1 and IP2 denote trade wars equilibria when governments 1 and 2 choose the type of their bargaining partner, respectively. The dotted 'efficiency locus' depicts the set of trade policies that maximize joint surplus. The left plot shows the welfare implications for the governments of different possible bargains. The solid downward sloping line shows the (G1, G2) pairs for the set of possible bargains. The welfare implications of trade wars equilibria is shown as a red dot. War 1 and war 2 denote the (G1, G2) pairs that are realized when either government wins a war. The blue dot is a convex combination of these points, modulated by the power balance, ρ. A fully interactive version of this plot is available at: https://brendancooley.shinyapps.io/twhw/

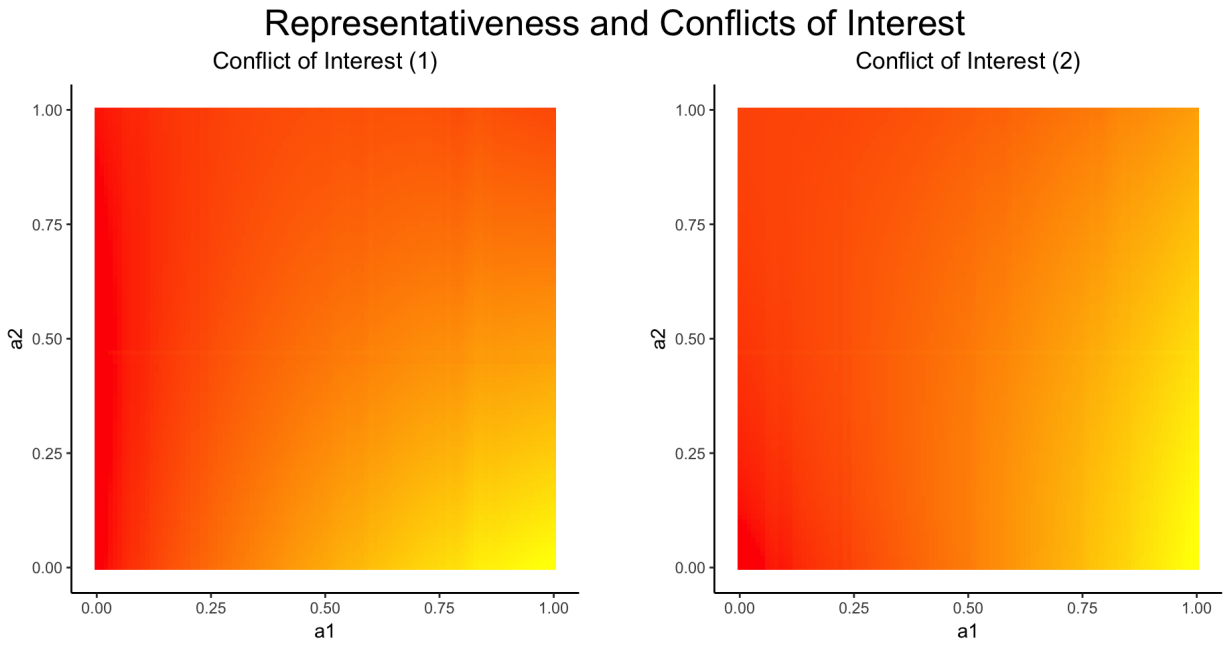

Figure 5: Panel 1 shows government 1's conflict of interest with government 2. Panel 2 shows government 2's conflict of interest with government 1. Red indicates large conflicts of interest. Yellow indicates small conflicts of interest. Data generated from parametric model shown in previous figures with the following parameter specifications: $K_1 = 1$, $K_2 = 5$, $\alpha_1 = \alpha_2 = \beta_1 = \beta_2 = .5$. $K_2 > K_1$ and homogenous consumption/production functions means that country 1 is the natural importer of good 1.

Definition 5. Conflict of Interest. Government i's conflict of interest with j is given by:

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

where $\overline{G}_i$ and $\underline{G}_j$ are as defined in Definition 3

Figure 5 plots conflicts of interest for the parametric model used for presentation so far. The x axis depicts government 1's representativeness (a_1) and the y axis shows government 2's representativeness (a_2). Red regions indicate large conflicts of interest, while yellow regions indicate minimal conflicts of interest. The first panel shows government 1's conflict of interest with government 2, and the second panel the reverse. It shows clearly that they vary as a function of governments' bias types. Intuitively, larger movements away from the a-equilibrium induce larger relative changes in war outcomes. Moreover, governments preferences over these changes are determined in large part by their bias types. Therefore, bias types determine both 1) the magnitude of movements away from the trade wars equilibrium in war outcomes and 2) the way in which governments weight the welfare implications of these movements.

Consider the set of home governments such that $a_i < \tilde{a}_i(a_j)$. These can be thought of as the set of weak kleptocrats, those that seek higher domestic prices, favoring the interests of producers over those of consumers. Such governments prefer to negotiate with foreign governments that adopt lower degrees of protection, $k(a_i) > a_j$. Proposition 1 states that for such governments, conflicts of interest become more intense as they become more kleptocratic.

Proposition 1. *For a fixed a_j and for all $a_i < \tilde{a}_i(a_j)$, $\Gamma(a_i, a_j)$ is decreasing in a_i.*

For this subset of government, why do kleptocrats experience larger conflicts of interest with their trading partners? The logic of Proposition 1 is relatively straightforward. As political contributions (implicitly, producer profits) come to dominate a government's objective function, it has less ambiguous preferences over prices. Higher prices are better. This increases the premium these governments place on being able to control the policy choices of their neighbors, which allows them to extract more rents from domestic producers.

Moreover, as the *foreign* government becomes more kleptocratic ($a_j \to 0$), the set of *home* governments for which this result applies expands. This is because $\tilde{a}_i(a_j)$ is an increasing function of a_j. As the foreign government becomes more protectionist, the set of home governments that prefer prices higher than the status quo contracts. So there are two effects of decreasing the home government's bias parameter. As Proposition 1 shows, this has a direct effect on the i's conflict of interest with j. It also increases the likelihood that that the 'Mercantilist Conflict' box in Figure 3 defines the governments' relations.

It is worth noting, however, that the opposite logic holds for $a_i > \tilde{a}_i(a_j)$. These governments display relative bias toward consumers, desiring relative price *decreases*. Here, as governments become *more* representative, they suffer from larger conflicts of interest. For some sets of initial parameters, conflicts of interest have a non-monotonic relationship with a_i. Our interpretation of Proposition 1 therefore hinges on whether cases of interest are characterized by $a_i < \tilde{a}_i(a_j)$ or $a_i > \tilde{a}_i(a_j)$. Given that governments almost never lobby *for* increases in export subsidies abroad and trade negotiations focus primarily on market access conditions, it seems natural to assume that $a_i < \tilde{a}_i(a_j)$ for most empirically relevant cases. But strong technocrats exist, they would suffer from similar conflicts of interest as strong kleptocrats stemming from pro-consumer biases.

Militarized and Non-Militarized Bargaining

Conflicts of interest are not sufficient to generate conflict. As Fearon (1995) shows, so long as war is costly, there will exist bargains prefered to war and these bargains will be realized in games with perfect information with no commitment problems. These conditions obtain in the model presented here and conflict does not occur in equilibrium. The above analysis of conflicts of interest was focused on establishing the form of the bargaining space induced by interactions between governments with Grossman-Helpman style domestic political economies. It showed that the pie at stake in the negotiation and governments' valuation of that pie varies as a function of their type.

Large conflicts of interest need not even guarantee that the militarized outside option binds in pinning down bargaining outcomes. Which outside option binds is a function of both the magnitude of the conflict of interest and the distribution of military capabilities between the governments. When the trade wars and hot wars outside options deliver similar distributional outcomes, the trade wars will be sufficient to determine the equilibrium trade policy. When one country can ensure itself better distributional outcomes through hot wars than trade wars, then hot wars will bind.

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 'hot wars' 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 'hot wars' binding can therefore alternatively be thought of as the percentage of countries for which military relations (rather than pure trade talks) determines bargaining outcomes.

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 hot war, and when this option will bind in determining bargaining outcomes. In the case of a hot war, the victor will replace the loser's government with its ideal, and j will push i to its reversion point, making it indifferent between the trade wars outcome and its offer. Following Lemma 2, this will yield the following expected utility for i:

$$\tilde{G}_i(a_i, a_j) = \left[\rho(\omega_i, \omega_j)\overline{G}_i\left(a_i, k(a_i)\right) + (1 - \rho(\omega_i, \omega_j))\underline{G}_i\left(k(a_j), a_j; a_i\right)\right](1 - c_i) \tag{12}$$

If the absence of the hot wars option, government i simply receives its trade wars utility, $G_i(\tau_i^\star(a_i), \tau_j^\star(a_j))$.

Note that Equation 12 can be written as a function of i's conflict of interest with j:

$$\tilde{G}_i(a_i, a_j) = \left[\underline{G}_i\left(k(a_j), a_j; a_i\right) + \rho(\omega_i, \omega_j)\Gamma_i(a_i, a_j)\right](1 - c_i) \tag{13}$$

Government i will reject any offer and declare war whenever such an offer leaves it worse off than it expects to be under hot wars. Therefore, 'hot wars' will bind in determining bargaining outcomes whenever[31]

$$\left[\underline{G}_i\left(\right)k(a_j), a_j; a_i) + \rho(\omega_i, \omega_j)\Gamma_i(a_i, a_j)\right](1 - c_i) > G_i(\tau_i^\star(a_i), \tau_j^\star(a_j)) \tag{14}$$

Clearly, the likelihood of this condition binding depends on both the distribution of military capabilities $\{\omega_i, \omega_j\}$ *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 $\rho(\omega_i, \underline{\omega}_j) = 0$ and $\rho(\omega_i, \overline{\omega}_j) = 1$. Proposition 2 examines the likelihood that hot wars will bind for i for any draw from this distribution.

Proposition 2. *For any draw from F_j, the probability that Equation 14 holds is increasing in the magnitude of the i's conflict of interest with j, $\Gamma(a_i, a_j)$.*

Proposition 2 formalizes the intuition laid out at the beginning of this section. As i's conflict of interest with j increases, it has more at stake in the negotiation. While there may be cases in which

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

trade wars and hot wars deliver similar distributional outcomes, this becomes less likely as conflicts of interest grow larger. The bargains made feasible by 'hot wars' and 'trade wars' (depicted in Figure 4) become less and less likely to overlap. For these cases, at least one country prefers all outcomes induced by 'hot wars' to those induced by 'trade wars' and 'hot wars' will bind.

While Proposition 2 considers only the cases in which i prefers a hot war to trade wars, 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 enough and the military balance is favorable, there will be cases in which j prefers hot wars to any bargain made feasible by trade wars. As a result, j will offer i its expected hot wars utility, 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 obtain in a more general setting, however. These results rest on three key assumptions:

1. Governments choose an externality-creating 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 (?).

Perhaps the most contentious assumption is the third. Many scholars argue for the existence of an 'anti-conquest' norm that has emerged and persisted in the post-World War II era (Zacher, 2001; Atzili, 2007; Fazal, 2011). If this norm in fact constrains state behavior, then forcibly overthrowing hostile foreign governments may not be a feasible stratetegy for contemporary governments. The model presented here starts from the assumption that all international negotiations are conducted 'in the shadow of power' (Powell, 1999). It then provides conditions under which such power becomes superfluous in determining international distributional outcomes. When conflicts of interest are small enough, military power confers no additional bargaining advantage over pure policy bargaining. In this sense, it provides conditions under which such a norm might emerge and remain incentive compatible for governments, even when norm enforcement is difficult.

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 hot wars binds 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 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 model rationalizes several features of the post-World War II era and resolves outstanding puzzles in theories of the commercial peace. 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'[32] 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

[32] MID: Militarized Interstate Dispute

'national interests.' Coe (N.d.) terms this lack of antagonism "the modern economic peace," and argues convincingly that existing theories struggle 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 13 that the home government's war utility is given by

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

where we have written $\tilde{G}$ as a function of capabilities instead of bias types. In trade wars, the home government will receive

$$G_i(\tau_i^\star(a_i), \tau_j^\star(a_j))$$

If the government sets $\omega_i = 0$, it will receive either $G_i(\tau_i^\star(a_i), \tau_j^\star(a_j))$ or $\tilde{G}_i(0, \omega_j)$, depending on whether Inequality 14 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:

$$\left(\underline{G}_j\left(k(a_i), a_i; a_j\right) + \rho(\omega_i^\star, \omega_j)\Gamma_j(a_j, a_i)\right)(1 - c_j) = G_j(\tau_j^\star(a_j), \tau_i^\star(a_i)) \tag{15}$$

This would yield utility $G_i(\tau_i^\star(a_i), \tau_j^\star(a_j)) - z(\omega_i^\star)$. Finally, the government could consider investing enough such that it prefers hot wars to trade wars. Here it would invest optimally, equating the marginal benefits from investing with marginal cost

$$\frac{\partial \tilde{G}_i(\omega_i, \omega_j)}{\partial \omega_i} = \frac{\partial \rho(\omega_i, \omega_j)}{\partial \omega_i} \Gamma_i(a_i, a_j)(1 - c_i) - \frac{\partial z_i(\omega_i)}{\partial \omega_i} = 0 \tag{16}$$

Of these three options, the government will then choose the amount of investment that maximizes its utility. The first two options, investing zero and investing enough to meet the foreign government's war constraint, are independent of the magnitude of i's conflict of interest with j. If investment is sufficiently attractive, however, then the optimal level increases in the magnitude of the conflict of interest.

Proposition 3. *Investment in military capability, ω_i, is weakly increasing in it's conflict of interest with the adversary government, $\Gamma_i(a_i, a_j)$.*

While it is not influenced by the government's own conflict of interest, $\omega_i^\star$ is an increasing function of the adversary's conflict of interest, Γ_j. Countries with larger conflicts of interest are harder to appease, so war outcomes must become less attractive as Γ_j grows larger. This necessitates greater military investment from the home government. This defensive effect means that even countries with low incentives for predation may invest at relatively high levels to deter predation by foreign governments.

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. There are strong 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' amount 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, 2012, 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.

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 an arbitrary foreign (home) trade policy, τ_j, let τ_i^0 denote the home government's optimal policy in the absence of political contributions ($C_i(\tau_i, \tau_j) = 0$) and $g_i(\tau_i; \tau_j)$ its associated welfare.*

$$\tau_i^0 \in \underset{\tau_i}{\operatorname{argmax}}\, g_i(\tau_i; \tau_j)$$

In a domestic political economic equilibrium, the government chooses trade policy to maximize a weighted sum of producer and social welfare

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

and equilibrium political contributions from producers of Good 1 ($C_i^\star$) satisfy

$$C_i^\star(\tau_i^0, \tau_i^\star; \tau_j) = \Pi_i(\tau_i^\star, \tau_j) + aS_i(\tau_i^\star, \tau_j) + r(\tau_i^\star, \tau_j) - g_i(\tau_i^0; \tau_j)$$

for any τ_j.

Proof. Government welfare maximization requires

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

Taking this behavior as given, producers implement τ_i to maximize their own welfare. Producer net welfare maximization therefore requires

$$\frac{\partial \Pi(\tau_i)}{\partial \tau_i} - \frac{\partial C_i(\tau_i)}{\partial \tau_i} = 0$$

Substituting these conditions in for one another, we obtain

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

which is consistent with joint welfare maximization on behalf of the government. Given that $\tau_i^\star$ will maximize joint welfare, we can determine equilibrium contributions. Note first that we must have $C_i(\tau_i^0) = 0$. If this were not the case, producers could reduce their contributions and the

government's policy choice would remain unchanged, yielding a profitable deviation. This then becomes the government's individual rationality constraint. Producers will set $C_i(\tau_i^\star)$ such that the government is indifferent between implementing $\tau_i^\star$ and τ_i^0. This indifference requires that

$$C_i^\star(\tau_i^0, \tau_i^\star; \tau_j) = \Pi_i(\tau_i^\star, \tau_j) + aS_i(\tau_i^\star, \tau_j) + r(\tau_i^\star, \tau_j) - g_i(\tau_i^0; \tau_j)$$

or the difference between $G(\tau_i^\star)$ and $g_i(\tau_i^0)$. □

Lemma 2.

1. *$\tau_i^\star(a_i)$ is strictly decreasing in a_i.*
2. *There is a one-to-one mapping between changes in i's type (a_i) and changes in home (p_i), foreign (p_j), and international (π) prices in a trade wars equilibrium (Def. 2).*

Proof. We have

$$G(\tau_i; a_i) = \Pi(\tau_i) + a_i S(\tau_i) + r(\tau_i)$$

with $a_i \in [0, 1]$. Now take a_i, a_i' with $a_i \geq a_i'$ and τ_i, τ_i' with $\tau_i \geq \tau_i'$. We can check that $(-)G(\tau_i, a_i)$ satisfies increasing differences in (τ_i, a_i):

$$G(\tau_i; a_i) - G(\tau_i'; a_i) \leq G(\tau_i; a_i') - G(\tau_i'; a_i')$$

which simplifies to comparing differences in weighted consumer surpluses

$$a_i \left(S_i(\tau_i) - S_i(\tau_i')\right) \leq a_i' \left(S_i(\tau_i) - S_i(\tau_i')\right)$$

$S(\tau_i)$ is a strictly decreasing function of τ_i, which is sufficient to confirm increasing differences. Since $(-)G(\tau_i; a_i)$ satisfies increasing differences and $\tau_i \in \mathbb{R}_+$, optimal τ_i are monotone decreasing in a_i by Ashworth and Bueno de Mesquita (2006) Theorem 1 (Milgrom and Shannon, 1994). This proves part 1.

As noted in 1, domestic and international prices are functions of home and foreign tariff choices, $p_i(\tau_i, \pi)$, $p_j(\tau_j, \pi)$, and $\pi(\tau_i, \tau_j)$. Since i's politically optimal tariffs are in turn functions of a_i, these prices are each implicit functions of a_i as well. For any set of (bounded) prices, we can find an $\{a_i, a_j\}$ that would generate them in a trade wars equilibrium. □

Lemma 3. *In any take-it-or-leave-it bargaining game in which trade wars* $\left\{\tau_i^\star, \tau_j^\star\right\}$ *(Definition 2) serves as the reversion point and* j *holds proposer power, governments will implement* $\left\{\tau_i^t, \tau_j^t\right\}$ *where*

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

Government j*'s side payment to* i *satisfies*

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

yielding i*'s utility*

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

Proof. Suppose that j's offer, $\left\{\tau_i^j, \tau_j^j\right\}$, does not maximize joint welfare,

$$\left\{\tau_i^j, \tau_j^j\right\} \notin \underset{\{\tau_i,\tau_j\}}{\operatorname{argmax}}\, G_i(\tau_i, \tau_j) + G_j(\tau_i, \tau_j)$$

Then j can choose $\left\{\tau_i^j, \tau_j^j\right\}$, shift R_j such that $G_i^j = G_i^t$, and allocate the remainder of the bargaining surplus to itself, a profitable deviation. It then becomes clear that j will choose R^j to satisfy i's individual rationality constraint with equality, yielding

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

□

Lemma 4. *Let* $\left\{\tau_i', \tau_j'\right\}$ *denote the trade policies that emerge in the counterfactual trade wars equilibrium in which governments' bias parameters are* $\{a_i, k(a_i)\}$ *and* $\left\{\tau_i^\star, \tau_j^\star\right\}$ *denote the policies associated with* $\{a_i, a_j\}$*. Then*

$$k(a_i) > a_j \implies \left\{\tau_i', \tau_j'\right\} \ll \left\{\tau_i^\star, \tau_j^\star\right\}$$

and

$$k(a_i) < a_j \implies \left\{\tau_i', \tau_j'\right\} \gg \left\{\tau_i^\star, \tau_j^\star\right\}$$

Proof. Consider $k(a_i) < a_j$. As shown in Lemma 2, governments' choice problems satisfy increasing

differences - lower bias types (a_i) choose higher tariffs. Since both choice problems have this feature, home and foreign tariffs in trade wars Nash equilibria are also decreasing in $\{a_i, a_j\}$ by Tarski's fixed point theorem (Ashworth and Bueno de Mesquita, 2006). Therefore, $k(a_i) < a_j \implies \{\tau_i', \tau_j'\} \gg \{\tau_i^\star, \tau_j^\star\}$

□

Proposition 1. *For a fixed a_j and for all $a_i < \tilde{a}_i(a_j)$, $\Gamma(a_i, a_j)$ is decreasing in a_i.*

Proof. By Definition 4, we know $a_i < \tilde{a}_i(a_j) \implies k(a_i) > a_j$. Take a_i, a_i' with $a_i \geq a_i'$. In Lemma 2 we showed that $(-)G(\tau_i, a_i)$ satisfies increasing differences in $\{\tau_i, a_i\}$. It also satisfies increasing differences in $\{\tau_i/\tau_j, a_i\}$ so $\tau_i^\star/\tau_j^\star$ are monotone decreasing in a_i. Let τ_i/τ_j be the trade wars equilibrium ratio associated with $\{a_i, k(a_i)\}$ ($\overline{G}(a_i)$) and τ_i'/τ_j' be the ratio associated with $\{a_i', k(a_i')\}$ ($\overline{G}(a_i')$). Monotone decreasingness implies $\tau_i'/\tau_j' > \tau_i/\tau_j$. The ratio associated with $\{k(a_j), a_j\}$ ($\underline{G}(a_i)$) does not vary with a_i - denote this with τ_i^0/τ_j^0. From Lemma 2, we have

$$G(\tau_i; a_i) - G(\tau_i^0; a_i) \leq G(\tau_i; a_i') - G(\tau_i^0; a_i') \leq G(\tau_i'; a_i') - G(\tau_i^0; a_i')$$

Replacing with conflicts of interest:

$$\Gamma(a_i) \leq G(\tau_i; a_i') - G(\tau_i^0; a_i') \leq \Gamma(a_i')$$

Which is sufficient to show that conflicts of interest are decreasing in a_i. □

Proposition 2. *For any draw from F_j, the probability that Equation 14 holds is increasing in the magnitude of the i's conflict of interest with j, $\Gamma(a_i, a_j)$.*

Proof. Let $\omega_j^\star$ denote the value of ω_j that solves Inequality 14 with equality

$$\left(\underline{G}_i\left(k(a_j), a_j; a_i\right) + \rho(\omega_i, \omega_j^\star)\Gamma(a_i, a_j)\right)(1 - c_i) = G_i(\tau_i^\star(a_i), \tau_j^\star(a_j))$$

Clearly $\omega_j^\star$ increases with $\Gamma(a_i a_j)$, as the right hand side is unaffected by changes in $\Gamma(a_i a_j)$ and $\rho(\omega_i, \omega_j)$ is a decreasing function of ω_j. Hot wars will bind for i for all $\omega_j < \omega_j^\star$. The probability that

hot wars binds for i is therefore given by

$$\int_{\underline{\omega}_j}^{\omega_j^\star} f(\omega_j) d\omega_j$$

Since $\omega_j^\star$ is increasing in $\Gamma(a_i, a_j)$ this quantity is also increasing in $\Gamma(a_i, a_j)$. □

Proposition 3. *Investment in military capability, ω_i, is weakly increasing in it's conflict of interest with the adversary government, $\Gamma_i(a_i, a_j)$.*

Proof. When conflicts of interest are small and optimal investment does not satisfy first order conditions, investment is invariant of i's conflict of interest with j. So we need only consider the case in which i invests optimally for conflict. If the cross partial of $\tilde{G}_i(\omega_i, \omega_j)$ in ω_i, $\Gamma_i(a_i, a_j)$ is positive, then optimal investment is increasing in $\Gamma_i(a_i, a_j)$. We can confirm this by noting

$$\frac{\partial \tilde{G}_i(\omega_i, \omega_j, \Gamma_i)}{\partial \omega_i \partial \Gamma_i} = \frac{\partial \rho(\omega_i, \omega_j)}{\partial \omega_i}(1 - c_i)$$

which is positive given our assumptions on $\rho(\omega_i, \omega_j)$ and c_i. □

References

Acemoglu, Daron and James A Robinson. 2005. *Economic origins of dictatorship and democracy*. Cambridge University Press. Cited on page 3.

Angell, Norman. 1911. *The great illusion: a study of the relation of military power in nations to their economic and social advantage*. McClelland and Goodchild. Cited on page 4.

Ashworth, Scott and Ethan Bueno de Mesquita. 2006. "Monotone Comparative Statics for Models of Politics." *American Journal of Political Science* 50(1):214–231.
URL: *http://doi.wiley.com/10.1111/j.1540-5907.2006.00180.x* Cited on pages 38 and 40.

Atzili, Boaz. 2007. "When Good Fences Make Bad Neighbors: Fixed Borders, State Weakness, and International Conflict." *International Security* 31(3):139–173.
URL: *http://www.mitpressjournals.org/doi/10.1162/isec.2007.31.3.139* Cited on page 31.

Bagwell, Kyle and Robert W. Staiger. 1999. "An economic theory of GATT." *American Economic Review* 89(1):215–248. Cited on page 15.

Bearce, David H. and Mark Hallerberg. 2011. "DEMOCRACY AND DE FACTO EXCHANGE RATE REGIMES." *Economics & Politics* 23(2):172–194.
URL: *http://doi.wiley.com/10.1111/j.1468-0343.2011.00381.x* Cited on page 30.

Bernheim, B Douglas and Michael D Whinston. 1986. "Menu auctions, resource allocation, and economic influence." *The quarterly journal of economics* pp. 1–31. Cited on page 12.

Brutger, Ryan and Austin L Wright. 2014. The Costs of Conflict: Border Disputes and Trade Diversion. Technical report Mimeo [http://www. austinlwright. com/wp-content/uploads/2014/09/Borders. pdf]. Cited on page 4.

Bueno De Mesquita, Bruce, Alastair Smith, Randolph M Siverson and James D Morrow. 2003. *The logic of political survival*. MIT press. Cited on page 3.

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):264–279.
URL: *https://academic.oup.com/isq/article-lookup/doi/10.1111/isqu.12163* Cited on page 30.

Chatagnier, J Tyson and Kerim Can Kavakli. 2015. "From Economic Competition to Military Combat: Export Similarity and International Conflict." *Journal of Conflict Resolution* p. 0022002715613565. Cited on page 5.

Coe, Andrew J. N.d. "The Modern Economic Peace." . Forthcoming.
URL: *http://docs.wixstatic.com/ugd/c8f493_a539f069ea614ac58fe30479cd94a337.pdf* Cited on pages 5 and 33.

Davis, Christina L. and Sophie Meunier. 2011. "Business as usual? Economic responses to political tensions." *American Journal of Political Science* 55(3):628–646. Cited on page 4.

Fazal, Tanisha M. 2011. *State death: the politics and geography of conquest, occupation, and annexation.* Princeton University Press. Cited on page 31.

Fearon, James D. 1995. "Rationalist explanations for war." *International organization* 49(03):379–414. Cited on pages 2 and 28.

Fearon, James D. 1997. "Signaling foreign policy interests: Tying hands versus sinking costs." *Journal of Conflict Resolution* 41(1):68–90. Cited on pages 15 and 28.

Fearon, James D. 2008. "A simple political economy of relations among democracies and autocracies.". Cited on page 5.

Gartzke, Erik. 2007. "The capitalist peace." *American journal of political science* 51(1):166–191. Cited on pages 3 and 4.

Gartzke, Erik, Quan Li and Charles Boehmer. 2001. "Investing in the peace: Economic interdependence and international conflict." *International organization* 55(02):391–438. Cited on page 4.

Gawande, Kishore, Pravin Krishna and Marcelo Olarreaga. 2009. "What governments maximize and why: the view from trade." *International Organization* 63(03):491–532. Cited on pages 4, 7 and 35.

Gawande, Kishore, Pravin Krishna and Marcelo Olarreaga. 2012. "Lobbying Competition over Trade Policy." *International Economic Review* 53(1):115–132.
URL: *http://doi.wiley.com/10.1111/j.1468-2354.2011.00673.x* Cited on page 35.

Gawande, Kishore, Pravin Krishna and Marcelo Olarreaga. 2015. "A Political-Economic Account of Global Tariffs." *Economics & Politics* 27(2):204–233. Cited on pages 7 and 35.

Goldberg, Pinelopi Koujianou and Giovanni Maggi. 1999. "Protection for Sale: An Empirical Investigation." *American Economic Review* pp. 1135–1155. Cited on page 35.

Grossman, Gene M and Elhanan Helpman. 1994. "Protection for Sale." *The American Economic Review* pp. 833–850. Cited on pages 3, 12 and 35.

Grossman, Gene M and Elhanan Helpman. 1995. "Trade Wars and Trade Talks." *Journal of Political Economy* pp. 675–708. Cited on pages 3, 11, 14, 15, 16, 17, 21 and 35.

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):763–774. Cited on page 4.

Hiscox, Michael J. 2002. *International trade and political conflict: commerce, coalitions, and mobility*. Princeton University Press. Cited on page 15.

Jackson, Matthew O and Massimo Morelli. 2007. "Political bias and war." *The American Economic Review* pp. 1353–1373. Cited on pages 5 and 35.

Jia, Hao, Stergios Skaperdas and Samarth Vaidya. 2013. "Contest functions: Theoretical foundations and issues in estimation." *International Journal of Industrial Organization* 31(3):211–222. Cited on page 16.

Johnson, Harry G. 1953. "Optimum tariffs and retaliation." *The Review of Economic Studies* 21(2):142–153. Cited on page 15.

Kastner, Scott L. 2007. "When Do Conflicting Political Relations Affect International Trade?" *Journal of Conflict Resolution* 51(4):664–688. Cited on page 4.

Kim, In Song. 2017. "Political cleavages within industry: firm-level lobbying for trade liberalization." *American Political Science Review* 111(1):1–20. Cited on pages 7 and 15.

Lake, David A. 1992. "Powerful pacifists: democratic states and war." *American Political Science Review* 86(01):24–37. Cited on pages 5 and 34.

Lake, David A. 2009. "Open economy politics: A critical review." *The Review of International Organizations* 4(3):219–244. Cited on page 3.

Lo, Nigel, Barry Hashimoto and Dan Reiter. 2008. "Ensuring Peace: Foreign-Imposed Regime Change and Postwar Peace Duration, 1914-2001.".
URL: *http://www.jstor.org/stable/40071895* Cited on page 16.

Maggi, Giovanni. 1999. "The role of multilateral institutions in international trade cooperation." *American Economic Review* pp. 190–214. Cited on page 15.

Mansfield, Edward D and Jon C Pevehouse. 2000. "Trade blocs, trade flows, and international conflict." *International organization* 54(04):775–808. Cited on page 4.

Melitz, Marc J. 2003. "The impact of trade on intra-industry reallocations and aggregate industry productivity." *Econometrica* 71(6):1695–1725. Cited on page 7.

Milgrom, Paul and Chris Shannon. 1994. "Monotone Comparative Statics." *Econometrica* 62(1):157.
URL: *http://www.jstor.org/stable/2951479?origin=crossref* Cited on page 38.

Milner, Helen V. 1997. *Interests, institutions, and information: Domestic politics and international relations*. Princeton University Press. Cited on page 5.

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):107–143. Cited on page 5.

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.
URL: *http://doi.wiley.com/10.1111/j.0008-4085.2006.00344.x* Cited on page 35.

Moravcsik, Andrew. 1997. "Taking preferences seriously: A liberal theory of international politics." *International organization* 51(04):513–553. Cited on page 2.

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):649–661. Cited on page 4.

Olson, Mancur. 1965. *The logic of collective action*. Harvard University Press. Cited on page 7.

Oneal, John R and Bruce M Russet. 1997. "The classical liberals were right: Democracy, interdependence, and conflict, 1950–1985." *International Studies Quarterly* 41(2):267–293. Cited on page 4.

Owen IV, John M. 2002. "The Foreign Imposition of Domestic Institutions." *International Organization* 56(2):375–409.
URL: *http://journals.cambridge.org/abstract_S0020818302441744* Cited on page 16.

Pollins, Brian M. 1989. "Conflict, cooperation, and commerce: The effect of international political interactions on bilateral trade flows." *American Journal of Political Science* pp. 737–761. Cited on page 4.

Powell, Robert. 1999. *In the shadow of power: States and strategies in international politics*. Princeton University Press. Cited on pages 2 and 31.

Putnam, Robert D. 1988. "Diplomacy and domestic politics: the logic of two-level games." *International organization* 42(03):427–460. Cited on pages 3 and 5.

Rogowski, Ronald. 1989. *Commerce and coalitions: how trade affects domestic political alignments*. Princeton, NJ: Princeton University Press. Cited on page 15.

Russett, Bruce and John R Oneal. 2001. *Triangulating Peace: Democracy, Interdependence, and International Organizations*. WW Norton & Company. Cited on page 3.

Schultz, Kenneth A. 1998. "Domestic opposition and signaling in international crises." *American Political Science Review* 92(04):829–844. Cited on page 3.

Steinberg, David A. and Krishan Malhotra. 2014. "The Effect of Authorita rian Regime Type on Exchange Rate Policy." *World Politics* 66(03):491–529.
URL: *http://www.journals.cambridge.org/abstract_S0043887114000136* Cited on page 30.

Zacher, Mark W. 2001. "The territorial integrity norm: International boundaries and the use of force." *International Organization* 55(02):215–250. Cited on page 31.