Foreign Influence and Welfare*

Pol Antràs† Gerard Padró i Miquel‡

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Abstract

How do foreign interests influence policy? How are trade policies and the viability of trade agreements affected? What are the welfare implications of such foreign influence? In this paper we develop a model of foreign influence and apply it to the study of optimal tariffs. In a two-country voting model of electoral competition, we allow the incumbent party in each country to take costly actions that probabilistically affect the electoral outcome in the other country. We show that policies end up maximizing a weighted sum of domestic and foreign welfare. Using this formulation we show that foreign influence increases aggregate world welfare when there are no other means of alleviating the externalities that arise from cross-border effects of policies. In contrast, when countries can engage in international agreements, foreign influence can prove harmful as powerful countries may refuse to offer concessions. We also show that power imbalances are particularly detrimental to cooperation when they are positively correlated with economic size.

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†Department of Economics, Harvard University, Littauer 319, Cambridge, MA 02138, United States.

‡Department of Economics, London School of Economics and Political Science, Houghton Street, London WC2A 2AE United Kingdom.

1 Introduction

From the enforcement of labor and environmental standards to intellectual property rights protection, a wide variety of government policies affect neighboring countries. These policy externalities are nowhere more conspicuous than in trade policy, where unilateral government decisions are often made precisely to take advantage of the effect they have on other countries. A large fraction of the effort of international relations practitioners is devoted to mitigating these externalities. In the case of trade policy, this has prompted the creation of the WTO and the signing of numerous trade agreements between countries (see, for instance, Bagwell and Staiger, 2002).

History tells us, however, that open bargaining over policies is far from being the only way governments try to affect foreign policies that concern them. For instance, governments often take actions that can affect the image and political prospects of politicians abroad with the aim of altering fundamental aspects of the political equilibrium in the target country. These influence activities range from the subtle and covert to the obvious and open, and they also vary in intensity. A typical open channel of influence is the careful use of diplomatic gestures such as bilateral meetings between political leaders from different countries.[1] Powerful governments also influence the political equilibrium in other countries with their allocation of foreign aid or by strategically giving contracts to foreign firms (see, for instance, Alesina and Dollar, 2000, and Bueno de Mesquita and Smith, 2007). Furthermore, they exert pressure in multilateral organizations to obtain good deals for "friendly" governments in foreign countries (see Dreher and Jensen, 2007). Countries can also resort to more direct forms of electoral influence that involve transfers to political agents. For instance, the United States routinely allocates funds to organizations dedicated to the promotion of democracy and human rights, and these organizations tend to be aligned with certain "friendly" political parties. Moreover, some governments have allegedly resorted to direct financial support of their preferred political party in a foreign country, and have also provided financial, logistic or direct assistance to coups.[2] These actions are usually done in a covert way as they are

[1] For instance, the President of a powerful country can improve the profile of a foreign politician by receiving him or her in a formal reception. This provides an image of international recognition and can result in an important domestic political boost, particularly if the foreign leader is in the opposition. Diplomatic scheming in the United Nations can also be important. When a country receives a scolding declaration by this international body, it is clear that the government has been outmaneuvered, which reflects poorly on its ability to deal with the international community.

[2] There are plenty of alleged examples of financial involvement. For instance, it is believed that the U.S. gave support to the "color revolutions" in the near abroad of Russia by supporting democratic movements (Simes, 2007). It is also widely believed that Venezuela's President Hugo Chavez has used oil money to support his preferred candidates in several Latin American countries (Shifter, 2006). Weiner (2007) also documents that the United States gave direct financial support to certain political figures in Italy, Japan and Chile among other countries.

illegal in most settings, though recent declassifications of official documents have unveiled their widespread existence.[3] Furthermore, there exists evidence that these foreign influence activities have a significant impact on the structure of international trade flows.[4]

How do these foreign influence activities shape the policy determination process? In particular, how are trade policies and the viability of trade agreements affected? What are the welfare implications of such foreign influence? In order to answer these questions, this paper develops a simple model of foreign influence and applies it to the study of optimal tariffs. Our starting point is a standard probabilistic voting model of electoral competition, in which political parties announce policy "platforms" and individuals vote for whichever party maximizes their welfare. We modify this framework in two ways. First, we consider two countries (Home and Foreign), with policy externalities across their borders. Second, we introduce *foreign influence* by endowing the incumbent government in each country with the ability to take costly actions that probabilistically affect the election outcome in the other country. The model is simple in that it abstracts from special interest politics and other electoral distortions within each country, and assumes that voters have common preferences over the policy under consideration. These simplifying assumptions allow us to better isolate the effect of foreign influence on policy determination and welfare.

Our model delivers a very simple and intuitive (subgame-perfect) *equilibrium*. In particular, each country implements policies which end up maximizing a weighted sum of Home and Foreign welfare. This occurs because the two political parties in a given country (say Home) tilt their platforms in favor of the Foreign country in order to forestall a potential Foreign intervention in support of their domestic opponent. The extent to which they do so (which we refer to as Foreign's *influence power*) depends on characteristics of *both* countries. In our application to trade policy, we show that as a consequence of the positive weight on Foreign's welfare, "optimal" tariffs under foreign influence are still proportional to the inverse of the export supply elasticity faced by a country, but the level of these tariffs is *lower* than in standard models.[5]

Armed with this simple equilibrium representation result, we proceed to examine the welfare consequences of foreign influence. Our analysis brings to light the following key

[3] For descriptions of U.S. interventions in foreign countries, either with financial meddling or by fomenting coups, see Kinzer and Schlesinger (1982), Kinzer (2007), and Weiner (2007). The most notorious U.S.- fomented coups against democratically elected governments are probably the ones in Iran in 1953, in Guatemala in 1954, and in Chile in 1973. These are extreme cases of influence that are somewhat beyond the scope of the model we present, which is focused on democratic politics.

[4] Berger et al. (2010) show, for instance, that CIA interventions are typically followed by increases in foreign-country imports from the U.S., without a similar increase in foreign-country exports to the U.S. See Hirschman (1945) for an early study of the foreign influence activities of Nazi Germany.

[5] This result corresponds to the empirical findings of Broda, Limao, and Weinstein (2008), who find a positive effect of inverse export supply elasticities on import tariffs but with a factor of proportionality much lower than that implied by theory.

insights.

First, despite the fact that the tilted policies resulting from Foreign's influence necessarily reduce Home welfare, we derive very weak conditions under which world welfare is higher with the possibility of Foreign's influence. The reason is that such pressure leads the Home country to partially internalize its effects on Foreign welfare, hence improving international efficiency.

Second, when each country is both influencing and being influenced it is possible that the availability of foreign influence raises welfare in *both* countries. While this is again a direct consequence of the existence of externalities, it requires some qualification. In particular, reciprocal foreign influence leads to Pareto improvements *only* when the worldwide distribution of influence power is sufficiently "balanced" (in a sense to be formalized in the model). Relatively 'weak' countries can be made worse off by foreign influence in a world in which there is no other vehicle to internalize cross-border externalities.

This raises a natural question. What are the welfare effects of foreign influence when governments have alternative means of mitigating externalities, such as the capacity to sign agreements? When we study this issue, we obtain our third main insight. Imbalances of power can easily *reduce* world welfare when trade agreements are also available because powerful countries may see their willingness to offer policy concessions reduced. This effect can render free trade infeasible, and more generally affects the nature of the set of feasible agreements. In line with this intuition, we find that power imbalances are *particularly detrimental* to cooperation when they are positively correlated with economic size. This is the case both when we consider agreements that are enforceable (via international institutions such as the WTO), and when these agreements need to be self-enforcing (via reputational mechanisms). Furthermore, in the latter case, we show that when countries are symmetric, even balanced increases in influence power may reduce world welfare. Taken together, these results suggest that the potentially beneficial welfare properties of foreign influence can easily mutate into negative effects in the presence of other means of internalizing cross-border externalities.

Our model departs from standard political-economy frameworks that study the determination of policies as the outcome of a political game played only by domestic agents (politicians, voters, interest groups).[6] A branch of this literature has studied the implications of allowing for international spillovers of such policies and has stressed the fact that the resulting equilibria are inefficient.[7] We contribute by developing a model in which there is a direct political effect of foreign governments. Our work is also related to a small litera-

[6]For the case of trade policy choices distorted by domestic lobbying see for instance Magee, Brock and Young (1989) or Grossman and Helpman (1994).

[7]See for instance the two-country model in Grossman and Helpman (1995).

ture that introduces foreign lobbying in alternative models of policy making.[8] None of the papers in this literature considers government-to-government pressures which is the focus of our analysis. However, some of the welfare results are related. In Gawande, Krishna and Robbins (2006) foreign lobbying can be welfare enhancing as it can balance internal distortions generated by domestic lobbying. Our welfare results do not rely on this mechanism as we assume no domestic conflict of interest. Our channel is closer to Conconi (2003) and Aidt and Hwang (2008a,b) in that these authors also push the view that foreign lobbying can facilitate the internalization of cross-border externalities (as government pressures do in our model). While these authors only study whether global efficiency is reached or not with foreign lobbying, we characterize the full set of parameter values for which foreign influence can induce Pareto improvements. We view our approach more relevant in a world in which utility is not fully transferable and countries possess asymmetric levels of political power. In any case, since both foreign lobbying and government-to-government pressures exist in the world, we do not view these channels as mutually exclusive. Rather, the aim of this paper is to characterize the effects of the latter.

The rest of the paper is organized as follows. In section 2, we develop our two-country model of electoral competition and illustrate how foreign influence distorts policy determination. In section 3, we develop an application of our model to the study of import tariff choices. The welfare implications of foreign influence in non-cooperative and cooperative scenarios are studied in sections 4 and 5, respectively. We offer some concluding remarks in section 6.

2 A Model of Foreign Influence

In this section we adapt a well-known framework of campaign contributions in a probabilistic voting setup to model government-to-government influence activities.[9] This model provides

[8] Hillman and Ursprung (1988) focus on showing that voluntary export restraints (VERs) can be rationalized if foreign interests are represented in the determination of a country's international trade policy. Gawande, Krishna and Robbins (2006) show that foreign lobbying can serve a domestic welfare-enhancing, counterweighting role when the political process is distorted by domestic lobbies with interests that are misaligned with those of the rest of the electorate. Conconi (2003) studies trade and environmental policies with the presence of green lobbyists and different structures of international policy-making. In parallel work to ours, Aidt and Hwang (2008a,b) show that foreign lobbying can reach world welfare maximizing policies and specialize this result for the case of labor standards. Guriev, Yakovlev and Zhuravskaya (2008) provide empirical evidence supporting the internalization effect of multiregional lobbying groups.

[9] See Persson and Tabellini (2000) for a textbook treatment of the Lindbeck and Weibull (1987) classic framework. Sections 3.5 and 7.4 cover models closest to the one proposed here. Dixit and Londregan (1995, 1998) use a variant of this model to discuss redistributive politics when voters belong to groups with different political sensitivity. Grossman and Helpman (1996) introduce special interest group activities such as campaign contributions in this framework. None of these papers extend this framework to explicitly consider international politics.

a microfoundation for the reduced form effect of influence on welfare that we analyze in detail in subsequent sections.

2.1 Environment and Political Structure

Consider a world with two countries, Home (H) and Foreign (F). In each country electoral competition determines certain dimensions of economic policy, τ^H and τ^F. These policies generate international externalities in that the citizens of country H are affected by τ^F, and viceversa. A natural example of such policies are tariffs on imports, but the framework can accommodate other externalities such as environmental policy. In each country there is an election between two candidates, the incumbent (I) and the opposition (O), and domestic voters elect whichever politician offers them a higher indirect utility. The incumbent in each country can take actions that aim at manipulating electoral results in the foreign country. These costly actions can range from the dissemination of messages aimed at discrediting or extolling the incumbent party, to the provision of funds and logistical help to opposition or incumbent groups or the application of diplomatic pressure on the incumbent. The agents in the model thus are (i) Home and Foreign politicians (two parties in each country), and (ii) Home and Foreign voters.

2.1.1 Voters, Externalities, and Influence

Each country is populated by a unit measure of individuals. If candidate $c \in \{I, O\}$ in country $j \in \{H, F\}$ wins the election, a citizen in country j obtains utility

$$V^j\left(\tau_c^j, \tau^{-j}; \sigma_c^j\right) = v^j\left(\tau_c^j, \tau^{-j}\right) + \sigma_c^j. \tag{1}$$

In this expression, $v^j\left(\tau_c^j, \tau^{-j}\right)$ captures the indirect utility that a voter in country j derives from the policies implemented at home by candidate c, τ_c^j, and from the policies of the foreign country that affect her well-being, τ^{-j}. The dependence of $v^j(\cdot)$ on the foreign policy could be positive, thus reflecting a positive externality of the foreign policy on domestic welfare, or negative, thus reflecting a negative externality of the foreign policy on domestic welfare. For simplicity, we shall consider situations with *symmetric spillover effects*, in the sense that either $\partial v^H/\partial \tau^F > 0$ and $\partial v^F/\partial \tau^H > 0$, or $\partial v^H/\partial \tau^F < 0$ and $\partial v^F/\partial \tau^H < 0$. For now, we also assume that the function $v^j\left(\tau^H, \tau^F\right)$ is globally concave in τ^H and τ^F, which ensures that the second-order condition of the programs we will study below are met.[10]

[10] Global concavity is sufficient but not necessary for the second-order conditions to be satisfied. The welfare functions in our parametric example in section 3 are not globally concave in τ^H and τ^F, and yet the second-order conditions are still met.

As is standard in probabilistic voting models, from the point of view of voters, the different candidates also differ in other dimensions that are independent of their policy proposals. In particular, voters care about characteristics such as competence, honesty or simply personal appeal and charisma. σ_c^j captures the additional utility due to these attributes that a voter in country j enjoys (or expects to enjoy at the time of casting the ballot, since σ_c^j contains many uncertain and subjective components) when party c is in power.[11]

Define by $\sigma^j \equiv \sigma_I^j - \sigma_O^j$ the bias due to non-policy dimensions that citizens in country j have in favor of party I at the time of casting the ballot. Since perceptions can be affected both by deterministic and random elements, we model the bias as $\sigma^j = -\beta^j + \xi^j$, where ξ^j is distributed uniformly in the interval $[-\frac{1}{2\gamma^j}, \frac{1}{2\gamma^j}]$.[12] It then follows that the expected value of the difference $\sigma_I^j - \sigma_O^j$ is simply equal to $-\beta^j$. We shall thus refer to β^j as the *expected pro-opposition bias* in country j.

To introduce *foreign influence* in a simple way, we assume that incumbents can take costly actions e^j that aim to manipulate the electoral results in the foreign country. Following the literature on special interest politics, we assume that this influence e^j can affect the opinion that voters have of their candidates in the foreign country, σ^{-j}.[13] To link σ^{-j} to the actions of the government in country j, we simply assume that $\beta^j = e^j$, so that

$$\sigma^{-j} = -\beta^{-j} + \xi^{-j} = -e^j + \xi^{-j}.$$

In short, we assume that the actions taken by the foreign government affect the expected pro-opposition bias at home one to one. Hence, our specification is such that in the absence of foreign influence, the expected bias would be 0.[14] We let e^j take either positive or negative values, so foreign influence can be aimed at discrediting or endorsing the incumbent party.

[11] Note that in this model, there is no difference in the way voters in country j value each candidacy, as preferences are identical. Our assumptions therefore ensure that, conditional on τ^{-j}, there is a single policy τ^j that every voter i in j prefers. As we are interested in the effects of foreign influence, we endow the country with internal consensus on the conditionally preferred policy τ^j. Hence, any departure from that preferred policy must be due to international political factors.

[12] In assuming a uniform distribution, we follow the bulk of the probabilistic voting literature. This distributional assumption ensures the existence of an equilibrium and considerably simplifies the analysis.

[13] In modelling foreign influence, we build on the work on special interest groups by Baron (1994) and Grossman and Helpman (1996). In particular, we follow this literature and assume that the value of σ^j can be affected by actions taken by third agents. We here assume that these agents are foreign governments as opposed to domestic lobbies.

[14] We make this assumption to isolate the role of foreign influence in shaping the announced policies of each country.

2.1.2 Politicians, Platforms, and Timing

Before the elections in each country $j \in \{H, F\}$, each of the parties $c \in \{I, O\}$ credibly commits to a *platform* or policy τ_c^j to be implemented should that party win the election. Parties choose τ_c^j from a compact subset of the real line, i.e. $\tau_c^j \in \Psi = [\tau_{\min}, \tau_{\max}]$. We will focus throughout on the case in which equilibrium policies lie in the interior of Ψ.[15]

We assume that politicians are partially self-interested. On the one hand, they care about their election prospects, as captured by the probability of their own party c winning the election. On the other hand, politicians independently care about the welfare of their citizens. As a consequence, their preferences also depend on the enacted policy decisions. In particular, we assume that the preferences of party $c = I, O$ in country j can be summarized by:

$$W_c^j = \begin{cases} \alpha^j P_c^j + (1-\alpha^j)\, v^j\left(\tau_w^H, \tau_w^F\right) - \frac{1}{2}\left(e^j/\phi^j\right)^2, & \text{if} \quad c = I \\ \alpha^j P_c^j + (1-\alpha^j)\, v^j\left(\tau_w^H, \tau_w^F\right) & \text{if} \quad c = O \end{cases}, \tag{2}$$

where P_c^j is the probability of party c winning the election in country j, $v^j\left(\tau^j, \tau^{-j}\right)$ is the indirect utility associated with the implemented policies in H and F, and α^j measures the degree of self-interest of politicians (which for simplicity we assume independent of political affiliation). One can also interpret $1-\alpha^j$ as an institutional parameter measuring the extent to which there are constraints on politicians that force them to take into account the public interest (e.g. strength of civil society).[16] Finally, $\frac{1}{2}\left(e^j/\phi^j\right)^2$ captures the cost to the incumbent in country j of exerting influence e^j, where a large ϕ^j reflects that country j is relatively efficient at inflicting international pressure.

As noted above, σ^j includes voters perceptions on the competence, charisma and moral fiber of candidates, and such perceptions can change dramatically due to last-minute revelations on candidate's characteristics (such as performances in head-to-head debates, or corruption accusations) or to the effect of shocks to the political environment such as a show of incompetence dealing with an environmental disaster or foreign policy crisis. Hence, in keeping with the literature, we assume that the particular values σ_I^j and σ_O^j (and therefore σ^j) are unknown to politicians at the time they announce (and commit to) their platforms.

To summarize, the timing of events in the model is as follows:

- $(t = 1)$ The incumbent and opposition parties in each country j announce a policy

[15] This is ensured if γ^j is small enough. Allowing for corner solutions would be straightforward, though it would complicate the algebra while not generating additional insights.

[16] The preference formulation in (2) is also consistent with the following interpretation: politicians are entirely self interested. However, as they are also citizens, they care about the effect that enacted policies have on themselves. In this case, α^j measures the relative weight of the rents associated with holding office. Our results would be essentially identical if politicians placed a weight $1-\alpha^j$ on social welfare under *their* announced policy rather than under that of the winning party: i.e., $W_c^j = \alpha^j P_c^j + \left(1-\alpha^j\right) v^j\left(\tau_c^j, \tau^{-j}\right)$.

platform τ_c^j, $c = I, O$.

- $(t = 2)$ Each country j's incumbent government simultaneously decides how much effort e^j to exert with the goal of affecting the electoral outcome in country $k \neq j$.
- $(t = 3)$ The values of ξ^H and ξ^F are realized.
- $(t = 4)$ Elections occur in each country, policies announced at $t = 1$ by the winners are implemented and payoffs are realized.

2.2 Equilibrium: A Representation Result

We now seek to characterize a subgame perfect equilibrium of the above political game, in which all political parties choose a platform τ_c^j to maximize their utility in (2), each incumbent party chooses an influence level e^j to again maximize (2), and individuals vote for the political party in their country that maximizes their utility in (1). Despite the multiple moving parts of the model, there always exist an equilibrium that has an extremely intuitive structure.[17] In this equilibrium the two political parties in each country announce the same platform, $\tau_I^j = \tau_O^j = \tau^j$. We call this equilibrium *convergent equilibrium*.[18] We describe it in the following result, which is proven in the Appendix.

Proposition 1 *There exists a convergent political equilibrium in which the two political parties in each country $j = H, F$ announce a common policy $\hat{\tau}^j$ and this policy maximizes a weighted sum of domestic and foreign welfare, i.e.,*

$$\frac{\partial v^j\left(\hat{\tau}^j, \hat{\tau}^k\right)}{\partial \hat{\tau}^j} + \mu^{k,j} \cdot \frac{\partial v^k\left(\hat{\tau}^j, \hat{\tau}^k\right)}{\partial \hat{\tau}^j} = 0.$$

Furthermore, the weight $\mu^{k,j}$ on foreign welfare is given by

$$\mu^{k,j} = \frac{\alpha^j\left(1-\alpha^k\right)\phi^k\left(\gamma^j\right)^2}{\alpha^j\gamma^j + \frac{1}{2}\left(1-\alpha^j\right)}, \tag{3}$$

and is increasing in α^j, ϕ^k and γ^j, and decreasing in α^k.

To understand this result, recall the time structure of the game. In the first stage parties announce and commit to a policy platform. They know, however, that in the second stage,

[17] We focus on this equilibrium because it provides a simple and intuitive reduced form and because it is analogous to the familiar results from the special interest politics literature.

[18] Depending on the shape of the functions $v(\cdot)$, the game may also admit non-convergent equilibria in which the two parties in each of the two countries announce different policies. We leave the much more cumbersome study of these equilibria for future research.

foreign incumbents will exert influence in favor of the domestic party that announces a policy most favorable to the foreign constituents. The larger is the difference in policies between parties, the larger is this foreign intervention, since more is at stake for the foreign country. As a consequence, parties feel obligated to tilt their policies in favor of the foreign country. However, such tilting implies reducing the utility of their domestic voters. The equilibrium policy is such that it balances the trade-off between domestic utility and the threat of foreign influence. Since both parties face the same trade-off, they end up announcing the same policy, $\hat{\tau}_c^j = \hat{\tau}^j$. Therefore it follows that in equilibrium the incumbent government in the other country is actually indifferent as to which political party wins the election in that country. As a result, the *equilibrium* amount of foreign influence $\hat{e}^{-j}$ is zero. Nonetheless, the *possibility* or *threat* of foreign influence affects the equilibrium announced policies in a significant manner: $\mu^{k,j}$ is the weight that foreign welfare receives in the domestic policy process and this is entirely as a consequence of the possibility to exercise foreign influence.[19]

The extent to which political parties in country j tilt their policies is increasing in γ^j and ϕ^k, and decreasing in α^k. These variables affect the propensity of foreign countries to exert influence by reducing the cost (ϕ^k), increasing the electoral impact (γ^j) and increasing the benefits to the politician (α^k). In addition, this tilting is increasing in the "political ambition" in the receiving country (α^j) because ambitious candidates give greater importance to winning elections than to the welfare of their constituents. Hence, they are more willing to sacrifice the latter to avoid foreign influence that could diminish their electoral prospects.

Finally, note that country j's policies are relatively more distorted whenever the effect of country j's policies on country k's welfare are larger (as measured by $\partial v^k\left(\hat{\tau}^j, \hat{\tau}^k\right)/\partial \hat{\tau}^j$). Hence, for policies that generate no cross-border externality, the existence of the influence channel makes no difference.

We have generated this weighted average representation result out of a model based on influence over electoral results, in the tradition of Baron (1994) and Grossman and Helpman (1996). However, the literature on special interest politics has also produced a classic framework in which transfers from special interests to the policy-maker are designed to directly buy favorable policies, as in Grossman and Helpman (1994) and Dixit, Grossman and Helpman (1997). This framework also generates equilibrium policies that maximize weighted averages of welfare functions, and it would be straightforward to adapt it to the foreign influence that we are interested in, and to obtain an identical representation result. Hence, the

[19] Some readers might question the appeal of a model of foreign influence in which these influence activities are zero in equilibrium. It would however be straightforward to modify our model in order to generate positive foreign influence *along the equilibrium path*. This could be achieved, for instance, by introducing uncertainty, incomplete information or differences in ideology between political parties. We believe that our simpler formulation serves a useful role in illustrating that the mere *possibility* of foreign influence can have important effects.

world welfare implications that we derive in the next sections are associated with a variety of specific channels of government-to-government influence.[20]

3 An Application to Trade Policy

We next illustrate the implications of our model of foreign influence by developing an application where the policies τ^H and τ^F are import tariffs. The general-equilibrium model we describe below will provide an economic foundation for the abstract indirect utility function $v^j\left(\tau^H, \tau^F\right)$ used above, and in terms of the terminology used above, it will feature negative policy externalities. Furthermore, our assumptions will imply that $v^j\left(\tau^H, \tau^F\right)$ will be separable in its arguments, which will greatly simplify the analysis.

The role of the application is to study the effect of foreign influence on policy determination and welfare. We will first consider situations in which countries behave noncooperatively ("trade wars"), and later we will analyze how foreign influence shapes the characteristics and feasibility of international agreements ("trade talks"). Although some of the results will be specific to the application under study, other results continue to hold in general setups with potentially positive policy externalities (e.g., environmental policy) and nonseparabilities in the function $v^j\left(\tau^H, \tau^F\right)$. We refer the interested reader to our working paper version for details on these general results.

3.1 Economic Model

Consider a world consisting of two countries: Home and Foreign. Each country is populated by a continuum of measure one of individuals with identical preferences:

$$u^j = c_0^j + \sum_{i=1}^{2} u_i^j\left(c_i^j\right), \quad j = H, F \tag{4}$$

where $u_i^j(\cdot)$ is increasing and strictly concave. All individuals inelastically supply one unit of labor. Good 0 serves as the numeraire, is costlessly traded and not subject to tariffs. Its world and domestic price is normalized to 1. It is produced one to one with labor everywhere in the world, which pins down the wage rate to 1 in all countries. The other goods can also be traded internationally, but may be subject to import tariffs. We shall also assume that good 1 is a "natural export" of Home, while good 2 is a "natural export" of Foreign.[21]

[20] Nevertheless, it should be noted that because this alternative model tends to feature positive influence levels in equilibrium, the implications of foreign influence for each country's welfare would not be identical to those in our framework.

[21] We could easily extend the analysis to the case of $N > 2$ goods.

More precisely, we assume that trade policy and "foreign influence" cannot revert "natural" comparative advantage patterns. Our parametric example below will feature this property.

For simplicity, we will focus on a world in which countries only tax their imports. As is well-known, countries may find it optimal to use import tariffs to shift the terms of trade in their favor. Let p_i^W denote the world untaxed price of good i. This corresponds to the price paid by consumers in the exporting country, since there are no taxes nor transport costs involved in that transaction. On the other hand, the domestic price in the importing country j will be given by $\tau_i^j p_i^W$, where $\tau_i^j - 1$ denotes the (percentage) import tariff (to be derived below).

Non-numeraire goods are produced combining labor and sector-specific capital according to a constant returns to scale technology. Let Π_i^j be the aggregate rent accruing to sector i specific factor in country j. Capital is evenly distributed among the measure 1 of workers in each country.

A convenient property of the quasilinear representation of preferences in (4) is that aggregate welfare in country j can be written as $v^j(\mathbf{p}) = I^j(\mathbf{p}) + S^j(\mathbf{p})$, where $I^j(\mathbf{p})$ denotes aggregate income in country j, $S^j(\mathbf{p})$ denotes consumer surplus, and $\mathbf{p}$ is the vector of domestic prices $\mathbf{p} \equiv \left(1, p_1^j, p_2^j\right)$. Given our assumptions, we can further write aggregate income in country j as $I^j = 1 + \Pi_1^j\left(p_1^j\right) + \Pi_2^j\left(p_2^j\right) + R^j\left(\boldsymbol{\tau}, \mathbf{p}^W\right)$, where

$$R^j\left(\boldsymbol{\tau}, \mathbf{p}^W\right) = \begin{cases} \left(\tau_2^H - 1\right) p_2^W \left(c_2^H\left(p_2^H\right) - y_2^H\left(p_2^H\right)\right) & \text{if} \quad j = H \\ \left(\tau_1^F - 1\right) p_1^W \left(c_1^F\left(p_1^F\right) - y_1^F\left(p_1^F\right)\right) & \text{if} \quad j = F \end{cases}$$

is tariff revenue in country j. Note also that consumer surplus is simply given by $S^j(\mathbf{p}) = \sum_{i=1}^2 \left[u_i^j\left(c_i^j\left(p_i^j\right)\right) - p_i^j c_i^j\left(p_i^j\right)\right]$.

Given quasilinear preferences, we can study trade policy sector by sector. We can focus on the problem of a single country setting tariffs on the good that is a natural import for that country. In doing so, it is important to remember that the world price p_i^W is endogenous and must satisfy market clearing, or

$$M_i^j\left(p_i^j\right) \equiv c_i^j\left(p_i^j\right) - y_i^j\left(p_i^j\right) = y_i^{-j}\left(p_i^W\right) - c_i^{-j}\left(p_i^W\right) \equiv X_i^{-j}\left(p_i^W\right) \text{ for } j \neq -j. \tag{5}$$

3.2 A Linear Example

Although our model delivers a general formula for optimal tariffs that naturally generalizes the standard one obtained under social welfare maximization, we will for the most part focus on deriving our results in a widely used parametric example with linear demand and supply function (c.f., Bond and Park, 2002, Maggi and Rodriguez-Clare, 2007). More specifically, we assume that the utility functions u_i^j in (4) are quadratic, so that demand functions are

linear and given by

$$c_i^H\left(p_i^H\right)=\lambda\left(\alpha_i^H-\beta p_i^H\right);\quad c_i^F\left(p_i^F\right)=\alpha_i^F-\beta p_i^F,\quad \text{for } i=1,2, \tag{6}$$

where $\alpha_2^H=\alpha_1^F=\alpha_L>\alpha_S=\alpha_1^H=\alpha_2^F$. Furthermore, the rent functions Π_i^j are also assumed to be quadratic, thus leading to linear supply functions in each country:[22]

$$y_i^H\left(p_i^H\right)=\lambda\left(a+bp_i^H\right);\quad y_i^F\left(p_i^F\right)=a+bp_i^F,\quad \text{for } i=1,2. \tag{7}$$

Notice that both countries share similar demand and supply functions, but Home demand is disproportionately large in sector 2, while Foreign demand is disproportionately large in sector 1. As a result, Home is a natural importer in sector 2, while Foreign is a natural importer in sector 1. In order for equilibrium autarky prices to be positive, we need to assume that $\alpha_L>\alpha_S>a$. Note that the parameter λ captures the relative size of the Home country relative to the Foreign country. To build intuition, we will however study at several times the case $\lambda=1$, in which countries are fully symmetric except for their strength of foreign influence.

4 Foreign Influence and Trade Wars

Having described the structure of our economic model, we next return to the political game in section 2. Our first goal is to study the effect of foreign influence on policy determination and welfare in situations in which countries choose their policies non-cooperatively as dictated by our representation result in Proposition 1. In light of that result, and ignoring irrelevant terms, we can write the Home government problem as:

$$\begin{aligned}\max_{\tau^H}\ &\Pi_2^H\left(p_2^H\right)+\left(\tau^H-1\right)p_2^W\left(c_2^H\left(p_2^H\right)-y_2^H\left(p_2^H\right)\right)+u_2^H\left(c_2^H\left(p_2^H\right)\right)-p_2^Hc_2^H\left(p_2^H\right)\\&+\mu^{F,H}\left[\Pi_2^F\left(p_2^W\right)+u_2^F\left(c_2^F\left(p_2^W\right)\right)-p_2^Wc_2^F\left(p_2^W\right)\right],\end{aligned}$$

subject to $p_2^H=\tau^Hp_2^W$ and $c_2^H\left(p_2^H\right)-y_2^H\left(p_2^H\right)=y_2^F\left(p_i^W\right)-c_2^F\left(p_i^W\right)$. This program delivers the following general solution

$$\hat{\tau}^H-1=\left(1-\mu^{F,H}\right)\frac{1}{\xi_2^F}\equiv\left(1-\mu^{F,H}\right)\frac{X_2^F\left(p_2^W\right)}{p_2^WX_2^{F\prime}\left(p_2^W\right)}. \tag{8}$$

Note that when $\mu^{F,H}=0$, the Foreign country does not exert any influence at Home, and

[22] Remember that by Hotelling's lemma, we have that $\Pi_i^{j\prime}\left(p_i^j\right)=y_i^j$

naturally we obtain the standard optimal tariff formula: Home's import tariff is equal to the inverse of the export supply elasticity it faces. Conversely, when $\mu^{F,H} = 1$, Foreign's influence is so powerful that it precludes any terms-of-trade manipulation on the part of the Home country. In such a case, we have that Foreign's influence leads to free trade in sector 2. This is not surprising because, in such a case, the Home country would be choosing τ^H to maximize aggregate world welfare, and this is achieved with free trade.[23]

In the intermediate cases in which $\mu^{F,H} \in (0,1)$, we have that Home's optimal tariff is still positive but lower than the optimal one when $\mu^{F,H} = 0$.[24] This is easily verified in our linear example, in which Home's optimal tariff is given by (see Appendix for details):

$$\hat{\tau}^H - 1 = \frac{\left(1 - \mu^{F,H}\right)(\alpha_L - \alpha_S)}{(\alpha_L - a) + (\alpha_S - a)\left(\frac{1}{\lambda} + 1 - \mu^{F,H}\right)}, \tag{9}$$

Following analogous steps, we have that Foreign's optimal tariff in sector 1 is given by

$$\hat{\tau}^F - 1 = \frac{\left(1 - \mu^{H,F}\right)(\alpha_L - \alpha_S)}{(\alpha_L - a) + (\alpha_S - a)\left(\lambda + 1 - \mu^{H,F}\right)}. \tag{10}$$

Straightforward differentiation then delivers:

Proposition 2 *In the presence of foreign influence, each country's tariff is decreasing in the influence power of the other country ($\partial\hat{\tau}^j/\partial\mu^{k,j} < 0$). Furthermore, the reduction in tariffs is increasing in the relative size of the influenced country (i.e., $\partial^2\hat{\tau}^H/\left(\partial\mu^{F,H}\partial\lambda\right) < 0$, $\partial^2\hat{\tau}^F/\left(\partial\mu^{H,F}\partial\lambda\right) > 0$).*

The first result is intuitive and can be shown to hold in much more general setups than the one under study (see our working paper version). In particular, given that the Home import tariff generates a negative externality in Foreign, it is natural that an increase in Foreign's influence power over Home leads to a change in the Home policy that is beneficial to Foreign. Similarly, an increase in Home's influence power leads to a decrease in the Foreign tariff.[25]

The second result in Proposition 2 indicates that the effect of foreign influence will be particularly felt in relatively large countries unless these countries are also politically strong

[23] In the extreme case in which $\mu^{F,H} > 1$, our theory predicts that the Home country will adopt an import subsidy. We shall assume throughout, however, that $\left(\mu^{H,F}, \mu^{F,H}\right) \in [0,1] \times [0,1]$.

[24] An interesting feature of the general formula in (8) is that it corresponds to the empirical findings in Broda, Limao and Weinstein (2008), who establish a positive correlation between import tariffs and inverse export supply elasticities for WTO non-members, but with a coefficient markedly lower than that implied by standard theory.

[25] As we show in our working paper version, this result is robust to alternative economic models in which the indirect utility function $v^j(\cdot)$ is not separable in each country's policy.

(in terms of their μ's). This result masks the countervailing effect of two forces. On the one hand, large countries set higher tariffs and thus the absolute change in those tariffs resulting from foreign influence is likely to be relatively high. On the other hand, other things equal, large countries are relatively immune from foreign influence, as the absolute welfare gain attained by a small influencing country will tend to be small, and this will reduce the foreign influence threat faced by the large country. Proposition 2 indicates that the first effect dominates when studying the response of the level of tariffs to increases in the influence of foreign countries.[26]

We next turn to a study of the local (country-level) and global (world-level) welfare consequences of foreign influence. Plugging the equilibrium tariffs in each country's welfare function and differentiating, it is straightforward (though somewhat tedious) to verify that (see Appendix for details):

Proposition 3 *In the non-cooperative equilibrium with foreign influence:*

1. *the welfare level* $v^j\left(\hat{\tau}^H, \hat{\tau}^F\right)$ *of citizens in country* j *is increasing in the influence power* $\mu^{j,k}$ *of her country and decreasing in the influence power of the other country* $k \neq j$.
2. *world welfare is increasing in the influence power of any country* j *whenever* $\mu^{j,k} < 1$ *and is decreasing in this influence power for* $\mu^{j,k} > 1$.

Part 1 of Proposition 3 gives the impression that foreign influence behaves like a zero-sum game. An increase in the power of a country is good for that country and bad for its neighbors. This explains why in most countries, most channels of foreign influence are illegal: countries would like to be completely insulated from foreign influence, while at the same time would like free reign to influence their neighbors. However, part 2 shows that foreign influence power, as long as it is not unreasonably high, will normally generate an increase in aggregate world welfare due to the internalization of externalities.

This second point generates an interesting possibility: is it possible to find power configurations $\left(\mu^{H,F}, \mu^{F,H}\right)$ that provide a Pareto improvement with respect to the case with no foreign influence whatsoever? Proposition 3 examines changes in a single component of the power configuration vector, but to address this question we are interested in exploring how the welfare levels of both countries are affected by general changes in power configurations. This is graphically illustrated in Figures 1 and 2.

The two curves in each graph represent the combinations of $\mu^{H,F}$ and $\mu^{F,H}$ – with $\left(\mu^{H,F}, \mu^{F,H}\right) \in [0,1] \times [0,1]$ – that leave Home and Foreign indifferent between a world

[26] Yet, it is straightforward to show that (the absolute value of the) elasticity of the Home tariff to Foreign's influence parameter $\mu^{F,H}$ is decreasing in λ, and thus in *percentage terms*, tariffs are relatively more abated in relatively small countries. Mathematically, it can easily be verified that $-\partial \ln \hat{\tau}^H / \partial \ln \mu^{F,H}$ is decreasing in λ.

with foreign influence and a world without foreign influence (i.e., $\mu^{H,F} = \mu^{F,H} = 0$). In the Appendix, we show that these schedules are only a function of $\mu^{H,F}$, $\mu^{F,H}$, and λ, and thus they are easily plotted numerically in the space $(\mu^{H,F}, \mu^{F,H})$. The fact that these curves are upward sloping follows from part 1 of Proposition 3. Finally, the fact that these two curves intersect only at $\left(\mu^{H,F}, \mu^{F,H}\right) = (0,0)$ is ensured by part 2 of Proposition 3 (i.e., by the fact that world welfare must be higher at any point $\left(\mu^{H,F}, \mu^{F,H}\right) \in (0,1] \times (0,1]$).

Figure 1 corresponds to the case $\lambda = 1$ so countries are fully symmetric except (possibly) for their influence power. The figure illustrates that a world with foreign influence will Pareto dominate a world without foreign influence only when influence-power imbalances are not too large. Figure 2 considers the implications of a higher λ (in particular, $\lambda = 1.75$), so Home is now a disproportionately large country. In such a case, balanced distributions of influence power are no longer sufficient to induce Pareto gains at the world level. What is needed to generate Pareto gains are increases in influence power that are biased towards the relatively large country (Home, in the graph).[27] The intuition for this result is tightly related to the second statement in Proposition 2: as in the case of tariff levels, the effect of foreign influence on welfare levels is disproportionately larger in larger countries, because they impose larger externalities on their neighbors.[28] We summarize this result as follows (formal results in the Appendix):

Proposition 4 *In comparison to a world without foreign influence ($\mu^{H,F} = \mu^{F,H} = 0$), (i) a sufficiently balanced distribution in foreign influence power will increase welfare in both countries when countries are symmetric (i.e., $\lambda = 1$); (ii) when Home is larger than Foreign ($\lambda > 1$), only distributions in influence power that are biased towards Home will generate welfare gains in both countries.*

This section has illustrated the beneficial welfare properties associated with foreign influence in situations in which countries have no other mechanism to correct inefficiencies stemming from cross-border externalities. In particular, even when Pareto improvements may sometimes demand an asymmetric distribution of influence power across countries, the required positive correlation between economic size and influence power seems empirically plausible. As we shall see below, this favorable view of foreign influence will be substantially qualified when we allow for other forms of cooperation between countries.

[27] It is worth noting that, as a consequence, the distributions of influence power that ensure Pareto gains might be associated with meager gains in world welfare relative to a world without foreign influence. We return to this point in the next section.

[28] Mathematically, one can show that, when $\lambda > 1$, we have $\partial^2 v^H \left(\hat{\tau}^H, \hat{\tau}^F\right) / \left(\partial \mu^{F,H} \partial \lambda\right) < 0$, $\partial^2 v^H \left(\hat{\tau}^H, \hat{\tau}^F\right) / \left(\partial \mu^{H,F} \partial \lambda\right) < 0$, $\partial^2 v^F \left(\hat{\tau}^H, \hat{\tau}^F\right) / \left(\partial \mu^{F,H} \partial \lambda\right) > 0$, and $\partial^2 v^F \left(\hat{\tau}^H, \hat{\tau}^F\right) / \left(\partial \mu^{H,F} \partial \lambda\right) > 0$.

5 Foreign Influence and Trade Talks

In this section, we explore how foreign influence interacts with international negotiations in internalizing terms-of-trade externalities. The key question we want to study is if the positive aspects of foreign influence identified above survive the introduction of alternative means of restoring (or bringing closer) international efficiency. We will first analyze the implications of foreign influence for the incentives of countries to sign agreements that set policies at their world welfare-maximizing level, which in our framework corresponds to free trade. Later, we will consider the feasibility of more general international trade agreements and will also characterize equilibrium agreements in the presence of foreign influence. In doing so, we will consider both the case in which agreements are enforceable (perhaps via the WTO) and the case in which these agreements need to be self-enforcing (via reputational mechanisms).

5.1 Foreign Influence and the Feasibility of Free Trade

In his seminal paper, Johnson (1953-54) showed that when two countries are sufficiently asymmetric in size, the larger country might be better off under the status quo with noncooperative tariffs than under free trade. In the absence of lump-sum transfers across countries, which has been a maintained assumption in our framework, it then follows that free trade will only come about for sufficiently symmetric countries. We next show that, in our model, a free trade agreement may not be viable even when countries are of equal size ($\lambda = 1$), provided that one of them has disproportionately more influence power than the other one.

Note that in our framework, an enforceable free trade agreement corresponds to a shift from a world in which each country obtains a welfare level $v^j\left(\hat{\tau}^j\left(\mu^{H,F},\mu^{F,H}\right),\hat{\tau}^{-j}\left(\mu^{H,F},\mu^{F,H}\right)\right)$ to a world in which each country obtains a welfare level equal to $v^j\left(\hat{\tau}^j\left(1,1\right),\hat{\tau}^k\left(1,1\right)\right)$ – see equations (9) and (10). In words, free trade is isomoporhic to an increase in both influence parameters from their initial values to 1. Part 2 of Proposition 3 ensures that if countries could negotiate a binding agreement *while exchanging lump-sum transfers*, the free trade agreement would indeed be signed for any initial distribution of influence power in $[0,1]\times[0,1]$. Nevertheless, in the absence of means to transfer utility it is far less obvious that a sufficiently powerful country will find it appealing to sign such an agreement.

To illustrate this, Figure 3 depicts the region of the parameter space $\left(\mu^{H,F},\mu^{F,H}\right)\in[0,1]\times[0,1]$ such that both countries would favor an enforceable agreement.[29] With the maintained assumption that the functions $v^H(\cdot)$ and $v^F(\cdot)$ are symmetric, it is easy to show that the point $\left(\mu^{H,F},\mu^{F,H}\right)=(0,0)$ will necessarily belong to this set, as shown in the figure. In words, in the absence of means to affect foreign elections, both countries would agree

[29] The shape of the curves in Figure 3 follows again from parts 1 and 2 of Proposition 3.

to sign an efficient international agreement. Figure 3 then shows that the emergence of imbalances in influence power across countries may lead to the powerful country blocking this efficient agreement. This result embodies a strong intuition: if, absent an agreement, weak countries are already forced to acquiesce with the interests of powerful countries, the latter have little to gain from concerted moves to world welfare maximizing policies.

We can also use an analogous graph to formally study the interaction of economic size and influence power in affecting the viability of free trade agreements. In particular, consider the case in which $\lambda > 1$, so Home is a relatively large country (the case $\lambda < 1$ is analogous). In such a case, Johnson's (1953-54) results suggest that free trade might not be achieved even when influence power is balanced (e.g., when $\mu^{H,F} = \mu^{F,H} = 0$) because Home will block it. In those situations, free trade will only be achievable whenever, despite its large size, Home is worse off without the agreement. This, in turn, can only happen when Home's influence power is small relative to Foreign's so that, in the absence of agreement, Home is forced to impose a small tariff on Foreign. Hence, when λ is large, a free trade agreement will only be signed when $\mu^{F,H}$ is high relative to $\mu^{H,F}$, as illustrated in Figure 4 for the cases $\lambda = 1.25$ and $\lambda = 2$. In sum, the feasibility of a free trade requires a *negative* correlation between size and influence power. It is interesting to note that, in the real world, we often seem to observe a positive correlation between economic size and influence power, which corresponds to situations in which according to our analysis, the achievement of free trade is at greater risk.

So far, we have focused on the study of enforceable agreements. Suppose instead that no supranational institution has the ability to ensure that international trade agreements are enforced. As is well known, in those situations free trade can still be achieved if the tariff game between countries is repeated over time. In order to save space, we focus on the simplest case in which the game described in section 2 is infinitely repeated and governments play trigger strategies in tariffs, with the non-cooperative equilibrium with foreign influence described above characterizing the punishment payoffs. In such a case, if governments discount the future at a rate δ, country j will not deviate from free trade as long as

$$\frac{v^j(1,1)}{1-\delta} \geq v^j\left(\hat{\tau}^j\left(\mu^{H,F},\mu^{F,H}\right),1\right) + \frac{\delta}{1-\delta}v^j\left(\hat{\tau}^j\left(\mu^{H,F},\mu^{F,H}\right),\hat{\tau}^{-j}\left(\mu^{H,F},\mu^{F,H}\right)\right). \qquad (11)$$

As shown in the Appendix, in our economic model, these conditions again depend only the parameters $\mu^{H,F}$, $\mu^{F,H}$, λ, as well as δ, so they can easily be plotted. Figure 5 illustrates the region of the parameter space $\left(\mu^{H,F},\mu^{F,H}\right) \in [0,1]\times[0,1]$ such that neither country deviates from a self-enforcing free trade agreement when $\delta = 0.8$ and $\lambda = 1$ or $\lambda = 1.25$. As in the case of enforceable agreements, the graph illustrates (and our Appendix formally demonstrates) that (i) a sufficiently large increase in a country's influence power renders free trade infeasible

(as this country optimally chooses to deviate from the agreement), and (ii) an increase in a country's size needs to be accompanied by a decrease in their influence power if free trade is to remain feasible. In fact, when $\delta \to 1$, the curves in Figure 5 correspond exactly to those in the case of an enforceable agreement.[30] Note also that as illustrated by Figure 5, when $\delta < 1$, the possibility arises that when $\lambda = 1$ free trade will cease to be feasible even when influence power is evenly distributed (and, for $\lambda > 1$, even when influence power is negative correlated with size). The reason for this is that as the punishment payoffs become closer and closer to the free trade ones, the incentive to deviate for countries increases.

We can summarize the results of this section as follows (see the Appendix for a formal proof of all the statements):

Proposition 5 *For each country $j = H, F$, there exist a threshold $\widetilde{\mu}^{j,k} \in [0,1]$ such that if $\mu^{j,k} > \widetilde{\mu}^{j,k}$, then country j will find it beneficial to opt out of either an enforceable or a self-enforcing free trade agreement. Furthermore, the threshold $\widetilde{\mu}^{j,k}$ is necessarily decreasing in the relative size of country j (i.e., $\partial \widetilde{\mu}^{H,F}/\partial \lambda < 0$ and $\partial \widetilde{\mu}^{F,H}/\partial \lambda > 0$), implying that the feasibility of a free trade agreement requires a negative correlation between size and influence power. When countries are symmetric, a balanced increase in foreign influence (starting from $\mu^{H,F} = \mu^{F,H}$) will not harm the feasibility of an enforceable free trade agreement, but a sufficiently large balanced increase in foreign influence will always render a self-enforcing trade agreement infeasible.*

An immediate corollary of these results is that, relative to a world without foreign influence, world welfare under "trade talks" will be diminished by a sufficiently unbalanced distribution of influencing power across countries, or more precisely, by a distribution of power that is not sufficiently negatively correlated with differences in size across countries. Furthermore, if free trade agreements need to be self-enforcing, world welfare may also be diminished (relative to a world without foreign influence) when influence power is evenly distributed but large. This result contrasts sharply with those obtained in the last section in non-cooperative scenarios. In particular, in the empirically plausible case in which economic size and influence power are positively related, foreign influence appears to generate Pareto gains under "trade wars", while the results in this section suggest that it will render free trade agreements infeasible, thereby reducing world welfare. Furthermore, our last result for the case of symmetric countries and self-enforcing agreements illustrates that balanced increases in influence power may actually reduce welfare *in both countries*, in sharp contrast to our results in Figures 1 or 3.

[30] Our assumption of separability is important for this.

5.2 Foreign Influence and Equilibrium Trade Agreements

In the last subsection, we have focused on the classical question of the feasibility of a free trade agreement. Although these are focal agreements in an international trade setup, in this section we briefly consider the determination of *equilibrium* agreements, whereby governments are allowed to bargain over policies (in the case of an enforceable agreement) or jointly decide to self-enforce a potentially asymmetric agreement.

In order to study enforceable agreements, one needs to specify the bargaining game that governs negotiations between countries. For simplicity, we consider a symmetric Nash bargaining game, in which countries split the gains from cooperation equally.[31] The analysis of self-enforcing agreements in turn requires an equilibrium-selection concept, and we find it natural to assume that countries agree on sustaining the world-welfare maximizing agreement among the set of feasible agreements.

In the last section we argued that countries with sufficiently high influence power will necessarily opt out of either an enforceable or a self-enforcing free trade agreement. This result naturally generalizes to the case of asymmetric trade agreements. In particular, even though equilibrium agreements will tend to be biased in favor of powerful countries, *any* such trade agreement will be rendered unsustainable by a sufficiently large increase in the influence power of a country. The derivation (and intuition) for this result is analogous to that in the case of free trade agreements, so we will not repeat it here. The fact that foreign influence may affect the shape of equilibrium agreements however raises new issues regarding the effects of foreign influence on world welfare. We devote the remainder of this section to study these questions.

In the interest of space, we mostly focus on the case in which countries are symmetric in terms of economic size. Remember that in previous sections, we have argued that, when countries are symmetric, positive and balanced levels of influence power may have good welfare properties because (i) they increase welfare in both countries in the absence of trade agreements, and (ii) they are less likely to render welfare-enhancing trade agreements infeasible. In the case of negotiated enforceable agreements, our first result is a much stronger call for the need for balanced influenced power (see Appendix for a proof):

Proposition 6 *Assume that countries are of equal size, i.e., $\lambda = 1$. When trade agreements are negotiated under symmetric Nash bargaining, the existence of influence power necessarily*

[31] Formally, we have that equilibrium policies (τ^{*H}, τ^{*F}) maximize:

$$\left(v^H\left(\tau^{*H}, \tau^{*F}\right) - v^H\left(\hat{\tau}^H, \hat{\tau}^F\right)\right)^{1/2}\left(v^F\left(\tau^{*H}, \tau^{*F}\right) - v^F\left(\hat{\tau}^H, \hat{\tau}^F\right)\right)^{1/2},$$

where $\hat{\tau}^H$ and $\hat{\tau}^F$ are given in (9) and (10), and we focus on parameter values such that the second-order conditions of this problem are met.

reduces world welfare unless $\mu^{H,F} = \mu^{F,H}$.

In other words, Proposition 6 indicates that *any* imbalance of power will reduce world welfare when countries are symmetric. The result is obviously specific to the case of symmetric countries and symmetric Nash bargaining, but the general insight is that the scope for foreign influence to enhance world welfare is greatly reduced relative to the analyses in section 4. This is illustrated in Figure 6: for an any relative size of the two countries, the lines depicted correspond to the *unique* configuration of influence power such that world welfare is maximized. Consistently with our previous results, it calls for a negative correlation between size and influence power. Furthermore, in contrast to Proposition 1, where we showed that *any* increase in *any* foreign influence parameter $\mu^{j,k}$ in $[0,1] \times [0,1]$ would raise world welfare, we now have that only specific (and empirically implausible) types of increases will prove to be welfare enhancing. For instance, the striped area in Figure 6 depicts the set of power configurations such that an increase in $\mu^{H,F}$ will increase world welfare when Home is twice as large as Foreign ($\lambda = 2$). Clearly, this is a very small subset of $[0,1] \times [0,1]$ and it involves the small Foreign being considerably more powerful than the large Home.

We conclude this section by studying the effects of balanced increases in influence power on the shape of the "best" sustainable equilibrium for the case of self-enforcing agreements. With symmetric countries, we have the following particularly sharp result (see Appendix for a proof):

Proposition 7 *Assume that countries are of equal size, i.e.,* $\lambda = 1$ *and suppose that influence power is balanced across countries, i.e.,* $\mu^{H,F} = \mu^{F,H} = \mu$. *Then, if this common influence power* μ *is higher than the discount rate* δ *(*$\mu > \delta$*), the only sustainable equilibrium policies are the static Nash policies* $\left(\hat{\tau}^H, \hat{\tau}^F\right)$. *Furthermore, for* $\mu < \delta$*, the lowest sustainable equilibrium tariffs* $\tau^{*H} = \tau^{*F} = \tau^*$ *are weakly increasing in* μ.

Figure 7 illustrates how the lowest sustainable equilibrium tariffs vary with the common influence parameter μ.[32] As is clear from the graph, the effect of μ on these tariffs is non-monotonic. When μ is sufficiently low, free trade is sustainable (as shown in the last section) and $\tau^{*H} = \tau^{*F} = \tau^* = 1$. Nevertheless, when μ exceeds a given value, free trade ceases to be sustainable and cooperation is hindered by balanced increases in influence. In that parameter range, world welfare is actually *reduced by balanced* increases in influence power. Finally, for $\mu > \delta$, only the static Nash equilibrium is sustainable, and as shown in Proposition 2, these equilibrium policies are decreasing in influence power. In sum, this result suggests that balanced increases in influence power may, in some circumstances, reduce welfare in all countries even when these countries are fully symmetric.

[32] In the figure, we also assume $a = 1$, $\alpha_L = 2$, $\alpha_S = 1$, as well as $\lambda = 1$.

6 Conclusion

In this paper, we have studied the welfare implications of foreign influence. We have shown that the possibility of foreign meddling in electoral processes may prove to be welfare enhancing from the point of view of world aggregate welfare. The reason is that foreign influence is not random: foreigners will only exert costly influence whenever policies in the influenced country generate externalities on them. As a result, the possibility of foreign influence may help partially alleviate externalities arising from cross-border effects of policies. This also means that as long as influence power is not very unbalanced across countries, the existence of foreign influence may be Pareto superior with respect to a world where no such meddling was possible.

However, we have shown that these positive results need to be strongly modified if countries have access to other means of mitigating externalities, such as the possibility of signing international agreements. In this case, the existence of foreign influence very often reduces world welfare by rendering good agreements unfeasible. We have also shown that, in the context of trade policy, foreign influence is most damaging when it is positively correlated with economic size.

Our framework is admittedly special in many respects. First, in our deterministic setup, foreign influence only occurs off-the-equilibrium path. It would be interesting to modify our model so as to deliver sharper predictions regarding the type of situations in which we expect foreign influence to emerge *in equilibrium*, and also in order to take into account these costs in evaluating the welfare gains from foreign influence. Second, our model has abstracted from domestic conflict (either driven by ideology or special interests): the influencing efforts of each country's incumbent government have sought to protect the general interests of its population. In practice, foreign influence often defends in a disproportionate manner the interests of particular economic agents. It seems reasonable that a proper modelling of these forces could lead to further qualifications of our main welfare results.

A Appendix

A.1 Proof of Proposition 1

To prove existence we focus on analyzing *unilateral* deviations from a convergent equilibrium by a single political party in one of the two countries. Consider the case in which $\tau_I^F = \tau_O^F = \tau^F$ but $\tau_I^H \neq \tau_O^H$.

We solve the game by backwards induction. Consider first the last stage, at which point the platforms $\left(\tau_I^H, \tau_O^H, \tau_I^F, \tau_O^F\right)$, the foreign influence levels $\left(e^H, e^F\right)$, and the perception shocks ξ^H and ξ^F have been determined in both countries. Voters at Home now maximize (1) by voting for the incumbent party whenever $v^H\left(\tau_I^H, \tau^F\right) - v^H\left(\tau_O^H, \tau^F\right) + \xi^H - e^F > 0$. Thus the incumbent party at Home wins the election with probability

$$P_I^H = \frac{1}{2} + \gamma^H\left(v^H\left(\tau_I^H, \tau^F\right) - v^H\left(\tau_O^H, \tau^F\right) - e^F\right). \tag{12}$$

Consider now the stage of the game at which the extent of foreign influence is decided. Remember that at this point the realizations of ξ^H and ξ^F are still unknown. Consider first the choice of foreign influence by the Foreign government. Using equation (2) and noting again that $\tau_I^F = \tau_O^F = \tau^F$, we obtain that the Foreign government will set e^F to maximize

$$W_I^F\left(e^F\right) = \alpha^F P_I^F + \left(1-\alpha^F\right)\left(P_I^H v^F\left(\tau_I^H, \tau^F\right) + \left(1-P_I^H\right) v^F\left(\tau_O^H, \tau^F\right)\right) - \frac{1}{2}\left(e^F/\phi^F\right)^2,$$

subject to P_I^H being given in (12). This program yields a unique equilibrium Foreign influence level:

$$\hat{e}^F = -\left(1-\alpha^F\right)\gamma^H\phi^F\left(v^F\left(\tau_I^H, \tau^F\right) - v^F\left(\tau_O^H, \tau^F\right)\right). \tag{13}$$

Regarding the incentives of the Home government to exert influence, note that the Home government solves

$$W_I^H\left(e^H\right) = \alpha^H P_I^H + \left(1-\alpha^H\right)\left(P_I^H v^H\left(\tau_I^H, \tau^F\right) + \left(1-P_I^H\right) v^H\left(\tau_O^H, \tau^F\right)\right) - \frac{1}{2}\left(e^H/\phi^H\right)^2,$$

subject to P_I^H being given in (12). Because the incumbent's electoral prospects at Home (P_I^H) are independent of e^H, the solution to be above problem is trivial and yields $\hat{e}^H = 0$.

We now move to the policy announcement stage ($t = 1$). Consider the choice of the incumbent party in country H when the two parties in country F have announced a common policy $\tau^F \in \Psi$. I seeks to maximize its welfare W_I^H in (2) subject to the influence "reaction function" in (13) and subject to P_I^H being given by equation (12).[33] Straightforward manipulation delivers the following

[33] In the objective function of the incumbent party, we can ignore the effort cost associated with e^H because starting from a symmetric equilibrium with $\tau_I^F = \tau_O^F = \tau^F$, we have seen that we must have $\hat{e}^H = 0$.

first-order condition for the choice of τ_I^H:

$$\left[\begin{array}{c} \alpha^H\gamma^H + \frac{1}{2}\left(1-\alpha^H\right) + 2\left(1-\alpha^H\right)\gamma^H\left(v^H\left(\tau_I^H,\tau^F\right) - v^H\left(\tau_O^H,\tau^F\right)\right) \\ + \left(1-\alpha^H\right)\phi^F\left(1-\alpha^F\right)\left(\gamma^H\right)^2\left(v^F\left(\tau_I^H,\tau^F\right) - v^F\left(\tau_O^H,\tau^F\right)\right) \end{array}\right] \times \frac{\partial v^H\left(\tau_I^H,\tau^F\right)}{\partial \tau_I^H}$$
$$+ \left(\alpha^H + \left(1-\alpha^H\right)\left(v^H\left(\tau_I^H,\tau^F\right) - v^H\left(\tau_O^H,\tau^F\right)\right)\right)\phi^F\left(1-\alpha^F\right)\left(\gamma^H\right)^2 \times \frac{\partial v^F\left(\tau_I^H,\tau^F\right)}{\partial \tau_I^H} = 0. \tag{14}$$

At the same time, the opposition seeks to maximize

$$W_O^H = \alpha^H\left(1-P_I^H\right) + \left(1-\alpha^H\right)\left(P_I^H v^H\left(\tau_I^H,\tau^F\right) + \left(1-P_I^H\right)v^H\left(\tau_O^H,\tau^F\right)\right)$$

subject also to (13) and to P_I^H being given by equation (12). The first-order condition of the problem is then

$$-\alpha^H\frac{\partial P_I^H}{\partial \tau_O^H} + \left(1-\alpha^H\right)\left(1-P_I^H\right)\frac{\partial v^H\left(\tau_O^H,\tau^F\right)}{\partial \tau_O^H} + \left(1-\alpha^H\right)\frac{\partial P_I^H}{\partial \tau_O^H}\left(v^H\left(\tau_I^H,\tau^F\right) - v^H\left(\tau_O^H,\tau^F\right)\right) = 0$$

which results in

$$\left[\begin{array}{c} \alpha^H\gamma^H + \frac{1}{2}\left(1-\alpha^H\right) + 2\left(1-\alpha^H\right)\gamma^H\left(v^H\left(\tau_O^H,\tau^F\right) - v^H\left(\tau_I^H,\tau^F\right)\right) \\ + \left(1-\alpha^H\right)\phi^F\left(1-\alpha^F\right)\left(\gamma^H\theta^H\right)^2\left(v^F\left(\tau_O^H,\tau^F\right) - v^F\left(\tau_I^H,\tau^F\right)\right) \end{array}\right] \times \frac{\partial v^H\left(\tau_O^H,\tau^F\right)}{\partial \tau_O^H}$$
$$+ \left(\alpha^H + \left(1-\alpha^H\right)\left(v^H\left(\tau_O^H,\tau^F\right) - v^H\left(\tau_I^H,\tau^F\right)\right)\right)\phi^F\left(1-\alpha^F\right)\left(\gamma^H\right)^2 \times \frac{\partial v^F\left(\tau_O^H,\tau^F\right)}{\partial \tau_O^H} = 0. \tag{15}$$

This equation defines the Home's opposition best response function. Note that this equation is entirely symmetric to equation (14). This suggests that incumbent and opposition best response function will intersect at a point in which $\tau_I^H = \tau_O^H = \tau^H$, hence delivering the representation result in Proposition 1.

Nevertheless, we still need to verify that this solution corresponds to the *unique* intersection of each Home party' reaction function (given policy convergence in the Foreign country), and also that the second-order conditions for a maximum are satisfied at this solution. For that purpose, we first further characterize the best response function of Home's opposition party by differentiating the first-order condition (and using (15) and the definition of $P_O^H = 1 - P_I^H$ in (12) to simplify) to obtain the following second-order-condition:

$$\left[\alpha^H\gamma^H+\left(1-\alpha^H\right)\gamma^H\left(v^H\left(\tau_O^H,\tau^F\right)-v^H\left(\tau_I^H,\tau^F\right)\right)\right]\frac{\partial^2 v^H\left(\tau_O^H,\tau^F\right)}{\partial\left(\tau_O^H\right)^2}+\left(1-\alpha^H\right)P_O^H\frac{\partial^2 v^H\left(\tau_O^H,\tau^F\right)}{\partial\left(\tau_O^H\right)^2}$$
$$+\left(\alpha^H+\left(1-\alpha^H\right)\left(v^H\left(\tau_O^H,\tau^F\right)-v^H\left(\tau_I^H,\tau^F\right)\right)\right)\phi^F\left(1-\alpha^F\right)\left(\gamma^H\right)^2\times\frac{\partial^2 v^F\left(\tau_O^H,\tau^F\right)}{\partial\left(\tau_O^H\right)^2}$$
$$-\frac{2\left(1-\alpha^H\right)^2P_O^H}{\left(\alpha^H+\left(1-\alpha^H\right)\left(v^H\left(\tau_O^H,\tau^F\right)-v^H\left(\tau_I^H,\tau^F\right)\right)\right)}\left(\frac{\partial v^H\left(\tau_O^H,\tau^F\right)}{\partial\tau_O^H}\right)^2. \tag{16}$$

This equation suggests that the opposition's party welfare is not globally concave in their announced policy τ_O^H. Still, given the concavity of the $v^j(\cdot)$ functions, we see that the function is strictly concave for the set of announced policies τ_O^H that satisfy

$$\alpha^H+\left(1-\alpha^H\right)\left(v^H\left(\tau_O^H,\tau^F\right)-v^H\left(\tau_I^H,\tau^F\right)\right)>0. \tag{17}$$

Hence, there can be at most one τ_O^H satisfying (17) that maximizes W_O^H. We still need to rule out, however, the existence of a potential alternative solution $\check{\tau}_O^H$ that violates (17) but still satisfies the first-order condition in (15) and the second-order condition in (16), and translates into a larger value of W_O^H than the unique maximizer that satisfies (17). We can conclude this by noting that whenever (17) is violated, we can write

$$\begin{aligned}W_O^H\left(\check{\tau}_O^H\right) &= \left(1-P_I^H\right)\left[\alpha^H+\left(1-\alpha^H\right)\left(\left(v^H\left(\check{\tau}_O^H,\tau^F\right)-v^H\left(\tau_I^H,\tau^F\right)\right)\right)\right]+\left(1-\alpha^H\right)v^H\left(\tau_I^H,\tau^F\right)\\ &\leq \left(1-\alpha^H\right)v^H\left(\tau_I^H,\tau^F\right)<\frac{1}{2}\alpha^H+\left(1-\alpha^H\right)v^H\left(\tau_I^H,\tau^F\right),\end{aligned}$$

where the latter is the welfare that the opposition party can secure by using the simple (sub-optimal) strategy $\tau_O^H=\tau_I^H$. This shows that any $\check{\tau}_O^H$ that violates (17) cannot be part of the opposition's best response function. This in turn implies that the solution to (14) is unique and, because the Home incumbent's problem is entirely symmetric, we have that the unique intersection of the two parties at Home necessarily leads to $\tau_O^H=\tau_I^H$. Furthermore, whenever $\tau_O^H=\tau_I^H$, the condition in (17) is satisfied, so the second-order conditions associated with the convergent equilibrium are satisfied.

Finally, solving the analogous problem of the Foreign incumbent and opposition parties, one can also conclude that, given policy convergence at Home, policy convergence in Foreign will result. This concludes the proof of existence of the convergent equilibrium in Proposition 1.

Convergence in policy platforms allows us to simplify the first-order-condition in (14), as we can set $v^j\left(\tau_I^H,\tau^F\right)-v^j\left(\tau_O^H,\tau^F\right)=0$ for $j=H,F$. In particular for any "domestic" country $j\in\{H,F\}$ and any "foreign" country $k\neq j$, we obtain the following implicit definition of the equilibrium common policy $\hat{\tau}^j$ announced by the two parties in country j:

$$\frac{\partial v^j\left(\hat{\tau}^j,\hat{\tau}^k\right)}{\partial\hat{\tau}^j}+\left(\frac{\alpha^j\left(1-\alpha^k\right)\phi^k\left(\gamma^j\right)^2}{\alpha^j\gamma^j+\frac{1}{2}\left(1-\alpha^j\right)}\right)\frac{\partial v^k\left(\hat{\tau}^j,\hat{\tau}^k\right)}{\partial\hat{\tau}^j}=0. \tag{18}$$

This is the expression in Proposition 1.

A.2 Proof of Proposition 2

We first sketch the derivation of equations (9) and (10). We focus on the determination of the Home import tariff in sector 2 (Foreign's import tariff in sector 1 can be derived analogously). Note that Foreign exports in that sector are given by

$$X_2^F = a - \alpha_S + (b+\beta)\, p_2^W, \tag{19}$$

while Home imports are

$$M_2^H = \lambda \left(\alpha_L - a - (b+\beta)\, \tau^H dp_2^W\right).$$

Goods market clearing – $M_2^H = X_2^F$– thus implies that the world price in sector 2 is given by:

$$p_2^W = \frac{\lambda(\alpha_L - a) + \alpha_S - a}{(b+\beta)(\lambda\tau^H + 1)}. \tag{20}$$

Combining equations (8), (19) and (20) we then obtain $\hat{\tau}^H$ in equation (9). The statements in Proposition 2 then follow from simple differentiation of equations (9) and (10).

A.3 Proof of Proposition 3

We refer the reader to our working paper version for a general proof of this result when the welfare functions $v^H\left(\tau^H, \tau^F\right)$ and $v^F\left(\tau^H, \tau^F\right)$ are additively separable. Here, we provide a more specific proof for the application under study. To do so, we first compute aggregate welfare in each country and then derive the results by differentiation. Although this proves to be much more cumbersome than the general proof in the working paper version, some of the derivations in the proof are useful for subsequent results. Let us begin with Home welfare. Ignoring irrelevant constants, Home welfare in the export sector 1 is given by

$$v_1^H\left(\tau^F\right) = \Pi_1^H\left(p_1^W\left(\tau^F\right)\right) + u_1^H\left(c_1^H\left(p_1^W\left(\tau^F\right)\right)\right) - p_1^W\left(\tau^F\right) c_1^H\left(p_1^W\left(\tau^F\right)\right),$$

while Home welfare in the import sector 2 is

$$\begin{aligned} v_2^H\left(\tau^H\right) &= \Pi_2^H\left(p_2^H\left(\tau^H\right)\right) + u_2^H\left(c_2^H\left(p_2^H\left(\tau^H\right)\right)\right) - p_2^H\left(\tau^H\right) c_2^H\left(p_2^H\left(\tau^H\right)\right) \\ &\quad + \left(\tau^H - 1\right) p_2^W\left(\tau^H\right)\left(c_2^H\left(p_2^H\left(\tau^H\right)\right) - y_2^H\left(p_2^H\left(\tau^H\right)\right)\right). \end{aligned}$$

From the linear demand and supply schedules in (6) and (7), we can back out the corresponding quadratic utility (u_1^H, u_2^H) and rent (Π_1^H, Π_2^H) functions, and appealing to the goods-market clearing condition (5) to solve for equilibrium prices, we can express welfare at home $v^H\left(\tau^H, \tau^F\right)$ as a sum of two functions $v_1^H\left(\tau^F\right)$ and $v_2^H\left(\tau^F\right)$. These expressions are cumbersome, but tedious calculations

allow us to write

$$v^H\left(\hat{\tau}^H\left(\mu^{F,H}\right),\hat{\tau}^F\left(\mu^{H,F}\right)\right) = v_1^H(1)+v_2^H(1)-\frac{1}{2}\frac{\lambda\left(\alpha_L-\alpha_S\right)^2}{(b+\beta)(\lambda+1)^2}\times \quad (21)$$
$$\times\left(\frac{\left(1-\mu^{H,F}\right)\left(2\lambda+3-\mu^{H,F}\right)}{\left(\lambda+2-\mu^{H,F}\right)^2}-\frac{\left(\mu^{F,H}+2\lambda+1\right)\left(1-\mu^{F,H}\right)\lambda^2}{\left(1+2\lambda-\lambda\mu^{F,H}\right)^2}\right),$$

where

$$v_1^H(1) = \frac{\lambda}{2\beta}\left(\alpha_S\right)^2+\frac{\lambda}{2}\frac{\left(\left(\alpha_L-a\right)+\left(\alpha_S-a\right)\lambda\right)}{(b+\beta)(\lambda+1)^2}\left(\alpha_L-a-\left(\alpha_S-a\right)(\lambda+2)\right)$$
$$v_2^H(1) = \frac{\lambda\left(\alpha_L\right)^2}{2\beta}+\frac{\lambda}{2}\frac{\lambda\left(\alpha_L-a\right)+\alpha_S-a}{(b+\beta)(\lambda+1)^2}\left(\alpha_S-a-\left(\alpha_L-a\right)(\lambda+2)\right),$$

denote Home welfare in sectors 1 and 2 under free trade, and are thus independent of $\mu^{H,F}$ and $\mu^{F,H}$.

Following analogous steps, we also find that, in the case of Foreign welfare,

$$v^F\left(\hat{\tau}^H\left(\mu^{F,H}\right),\hat{\tau}^F\left(\mu^{H,F}\right)\right) = v_1^F(1)+v_2^F(1)-\frac{1}{2}\frac{\lambda\left(\alpha_L-\alpha_S\right)^2}{(b+\beta)(\lambda+1)^2}\times \quad (22)$$
$$\times\left(\frac{\left(1-\mu^{F,H}\right)\left(2+\left(3-\mu^{F,H}\right)\lambda\right)\lambda^2}{\left(1+2\lambda-\lambda\mu^{F,H}\right)^2}-\frac{\left(1-\mu^{H,F}\right)\left(\mu^{H,F}\lambda+2+\lambda\right)}{\left(2+\lambda-\mu^{H,F}\right)^2}\right),$$

where $v_1^F(1)+v_2^F(1)$ denote Foreign welfare in sectors 1 and 2 under free trade and are given by an expression which is a function of λ, β, b, a, α_L, and α_S, but not $\mu^{H,F}$ or $\mu^{F,H}$.

The statements in Proposition 3 now follow from simple differentiation of equations (21) and (22) and their sum.

A.4 Proof of Proposition 4

Home will be indifferent between the noncooperative equilibrium with foreign influence and a noncooperative equilibrium without foreign influence as long as

$$v^H\left(\hat{\tau}^H\left(\mu^{F,H}\right),\hat{\tau}^F\left(\mu^{H,F}\right)\right) = v^H\left(\hat{\tau}^H(0),\hat{\tau}^F(0)\right).$$

Given equation (21), this condition can be written as

$$\frac{\left(\mu^{F,H}+2\lambda+1\right)\left(1-\mu^{F,H}\right)\lambda^2}{\left(1+2\lambda-\lambda\mu^{F,H}\right)^2}-\frac{\left(1-\mu^{H,F}\right)\left(2\lambda+3-\mu^{H,F}\right)}{\left(\lambda+2-\mu^{H,F}\right)^2}-\frac{(2\lambda+1)\lambda^2}{(2\lambda+1)^2}+\frac{(2\lambda+3)}{(\lambda+2)^2}=0. \quad (23)$$

For any numerical value for λ, it is straightforward to plot this condition in the space $\left(\mu^{H,F},\mu^{F,H}\right)$. Furthermore, using the implicit function theorem, it is easily verified that the condition implicitly defines a positive relationship between $\mu^{H,F}$ and $\mu^{F,H}$ (with λ affecting the location of this curve).

Following the same steps, we find that Foreign will be indifferent between the noncooperative equilibrium with foreign influence and a noncooperative equilibrium without foreign influence as long as

$$\frac{\left(1-\mu^{H,F}\right)\left(\mu^{H,F}\lambda+2+\lambda\right)}{\left(2+\lambda-\mu^{H,F}\right)^2}-\frac{\left(1-\mu^{F,H}\right)\left(2+\left(3-\mu^{F,H}\right)\lambda\right)\lambda^2}{\left(1+2\lambda-\lambda\mu^{F,H}\right)^2}-\frac{1}{2+\lambda}+\frac{\left(2+3\lambda\right)\lambda^2}{\left(1+2\lambda\right)^2}=0, \quad (24)$$

which again defines a positive relationship between $\mu^{H,F}$ and $\mu^{F,H}$.

The first statement of Proposition 4 then follows from simple inspection of Figure 1, which plots these conditions (23) and (24) for $\lambda = 1$. The second statement follows from noting that, for $\lambda > 1$, the partial derivative with respect to λ of the left-hand-side of both (23) and (24) is of the opposite sign of the partial derivative with respect to $\mu^{H,F}$ and of the same sign as the partial derivative with respect to $\mu^{F,H}$. This implies that in the space $\left(\mu^{H,F},\mu^{F,H}\right)$, an increase in λ is associated with a shift of the "indifference curves" to the right, as illustrated in Figure 2. Of course, this means that to ensure welfare gains in both countries, we now need a distribution of influence power that is relatively more biased towards the large country (Home in this case).

A.5 Proof of Proposition 5

Country $j = H, F$ will be indifferent between the noncooperative equilibrium with foreign influence and an enforceable free trade agreement as long as

$$v^j\left(\hat{\tau}^H\left(\mu^{F,H}\right),\hat{\tau}^F\left(\mu^{H,F}\right)\right)=v^j\left(1,1\right).$$

Given equations (21) and (22), the Home and Foreign indifference conditions can be written as

$$\frac{\left(\mu^{F,H}+2\lambda+1\right)\left(1-\mu^{F,H}\right)\lambda^2}{\left(1+2\lambda-\lambda\mu^{F,H}\right)^2}-\frac{\left(1-\mu^{H,F}\right)\left(2\lambda+3-\mu^{H,F}\right)}{\left(2+\lambda-\mu^{H,F}\right)^2} = 0 \quad (25)$$

$$\frac{\left(1-\mu^{H,F}\right)\left(\mu^{H,F}\lambda+2+\lambda\right)}{\left(2+\lambda-\mu^{H,F}\right)^2}-\frac{\left(1-\mu^{F,H}\right)\left(2+\left(3-\mu^{F,H}\right)\lambda\right)\lambda^2}{\left(1+2\lambda-\lambda\mu^{F,H}\right)^2} = 0. \quad (26)$$

Note first that these conditions depend only on the foreign influence parameters and the relative size λ, so they are again easily graphed in the space $\left(\mu^{H,F},\mu^{F,H}\right)$.

Note next that as $\mu^{H,F}\to 1$, the first equation cannot possibly hold and we necessarily have $v^H\left(\hat{\tau}^H\left(\mu^{F,H}\right),\hat{\tau}^F\left(\mu^{H,F}\right)\right) > v^H\left(1,1\right)$. Similarly as $\mu^{F,H}\to 1$, the second equation cannot possibly hold and we necessarily have $v^F\left(\hat{\tau}^H\left(\mu^{F,H}\right),\hat{\tau}^F\left(\mu^{H,F}\right)\right) > v^F\left(1,1\right)$. This proves the first statement of Proposition 5 for the case of enforceable agreements.

The remaining statements in the Proposition regarding enforceable agreements are obtained by (implicit) differentiation of equations (25) and (26). In particular, the left-hand side of (25) is increasing in $\mu^{H,F}$ and λ and decreasing in $\mu^{F,H}$, while the left-hand side of (25) is decreasing in $\mu^{H,F}$ and λ and increasing in $\mu^{F,H}$. This implies that the thresholds $\widetilde{\mu}^{H,F}$ and $\widetilde{\mu}^{F,H}$ defined in the Proposition necessarily satisfy $\partial\widetilde{\mu}^{H,F}/\partial\lambda < 0$ and $\partial\widetilde{\mu}^{F,H}/\partial\lambda > 0$.

For the case of self-enforcing agreements, country $j = H, F$ will be indifferent between the non-cooperative equilibrium with foreign influence and a self-enforcing free trade agreement whenever

$$\frac{v^j(1,1)}{1-\delta} = v^j\left(\hat{\tau}^j\left(\mu^{H,F},\mu^{F,H}\right),1\right) + \frac{\delta}{1-\delta}v^j\left(\hat{\tau}^j\left(\mu^{H,F},\mu^{F,H}\right),\hat{\tau}^{-j}\left(\mu^{H,F},\mu^{F,H}\right)\right)$$

(see equation (14) in the main text). Using equations (21) and (22), these conditions can be written as

$$\begin{aligned}
\frac{\left(\mu^{F,H}+2\lambda+1\right)\left(1-\mu^{F,H}\right)\lambda^2}{\left(1+2\lambda-\lambda\mu^{F,H}\right)^2} - \delta\frac{\left(1-\mu^{H,F}\right)\left(2\lambda+3-\mu^{H,F}\right)}{\left(\lambda+\left(2-\mu^{H,F}\right)\right)^2} &= 0 \\
\frac{\left(1-\mu^{H,F}\right)\left(\mu^{H,F}\lambda+2+\lambda\right)}{\left(2+\lambda-\mu^{H,F}\right)^2} - \delta\frac{\left(1-\mu^{F,H}\right)\left(2+\left(3-\mu^{F,H}\right)\lambda\right)\lambda^2}{\left(1+2\lambda-\lambda\mu^{F,H}\right)^2} &= 0,
\end{aligned}$$

which are identical to (25) and (26) when $\delta = 1$. Importantly, it is straightforward to verify that the presence of δ does not affect the sign of the derivatives of these expressions with respect to $\mu^{H,F}$, $\mu^{F,H}$ and λ, and hence it continues to be the case that $\partial\widetilde{\mu}^{H,F}/\partial\lambda < 0$ and $\partial\widetilde{\mu}^{F,H}/\partial\lambda > 0$ in the case of self-enforcing agreements.

To prove the last statements in the Proposition regarding balanced increases in power, consider equations (25) and (26) while setting $\mu^{F,H} = \mu^{H,F} = \mu$. Simple differentiation shows that for the case of symmetric countries (i.e., $\lambda = 1$), the left-hand-side of both of these expressions is increasing in μ (as long as $\mu < 1$, which is the relevant parameter range). Furthermore, when $\mu \to 1$, this left-hand-side takes a value of 0. This implies that balanced increases in power always leave this left-hand-side taking negative values, thus implying that both Home and Foreign find it beneficial to sign a free trade agreement. Conversely, for the case of self-enforcing agreements, it is straightforward to see that, when $\lambda = 1$, the left-hand-side of (25) and (26) will be positive when $\mu \in \left(\frac{5\delta-3}{1+\delta}, 1\right)$, thus implying that a free trade agreement is not feasible. It is also possible to show that for $\delta < 3/5$, free trade is infeasible as long as influence power is balanced across countries.

A.6 Proof of Proposition 6

Remember that the Nash bargaining equilibrium policies (τ^{*H}, τ^{*F}) maximize:

$$\left(v^H\left(\tau^{*H},\tau^{*F}\right) - v^H\left(\hat{\tau}^H,\hat{\tau}^F\right)\right)^{1/2}\left(v^F\left(\tau^{*H},\tau^{*F}\right) - v^F\left(\hat{\tau}^H,\hat{\tau}^F\right)\right)^{1/2},$$

where $\hat{\tau}^H$ and $\hat{\tau}^F$ are given in (9) and (10). This produces the following first-order condition for the choice of τ^{*j} in country j

$$\begin{aligned}
&\frac{\partial v^j\left(\tau^{*H},\tau^{*F}\right)}{\partial\tau^{*j}}\left(v^F\left(\tau^{*H},\tau^{*F}\right) - v^F\left(\hat{\tau}^H,\hat{\tau}^F\right)\right) \\
&\qquad + \frac{\partial v^{-j}\left(\tau^{*H},\tau^{*F}\right)}{\partial\tau^{*j}}\left(v^H\left(\tau^{*H},\tau^{*F}\right) - v^H\left(\hat{\tau}^H,\hat{\tau}^F\right)\right) = 0,\ j = H, F.
\end{aligned}$$

Note that if countries are symmetric in size ($\lambda = 1$) and influence power is perfectly balanced across countries ($\mu^{H,F} = \mu^{F,H}$), we must have $\hat{\tau}^H = \hat{\tau}^F$ and $v^H(\tau,\tau) = v^F(\tau,\tau)$ for any $\tau \in \Psi$. This implies that, in such a case, and provided that the second-order conditions are met, the Nash bargaining equilibrium policies (τ^{*H}, τ^{*F}) must satisfy $\tau^{*H} = \tau^{*F} = \tau^*$ and

$$\frac{\partial v^j\left(\tau^{*H}, \tau^{*F}\right)}{\partial \tau^{*j}} + \frac{\partial v^{-j}\left(\tau^{*H}, \tau^{*F}\right)}{\partial \tau^{*j}} = 0.$$

This of course implies that these policies maximize world welfare, and the solution is $\tau^{*H} = \tau^{*F} = \tau^* = 1$, or free trade.

Because a world without foreign influence ($\mu^{H,F} = \mu^{F,H} = 0$) is a particular case of a world with perfectly balanced power, we have that in the absence of foreign influence, world welfare is maximized. Conversely, any distribution of influence power with $\mu^{H,F} \neq \mu^{F,H}$ will deliver a different solution for τ^{*H} and τ^{*F}, and will thus not maximize world welfare.

If we now consider the case of asymmetric countries, we note from the first-order-condition above, that the Nash bargaining equilibrium policies will result in free trade only if

$$v^F(1,1) - v^F\left(\hat{\tau}^H, \hat{\tau}^F\right) = v^H(1,1) - v^H\left(\hat{\tau}^H, \hat{\tau}^F\right).$$

Combining equations (21) and (22), we can write this condition as only a function of $\mu^{H,F}$, $\mu^{F,H}$, and λ:

$$\frac{\left(1-\mu^{H,F}\right)\left(3\lambda + 5 + \mu^{H,F}(\lambda - 1)\right)}{\left(2 + \lambda - \mu^{H,F}\right)^2} = \frac{\left(1-\mu^{F,H}\right)\left(3 + 5\lambda - \mu^{F,H}(\lambda - 1)\right)\lambda^2}{\left(1 + \lambda\left(2 - \mu^{F,H}\right)\right)^2}.$$

The different curves in Figure 6 are generated from this equation.

A.7 Proof of Proposition 7

Because we are assuming the countries are entirely symmetric, we can focus on the effect of μ on the self-enforcing constraint of Home. Given symmetry, this can be written as

$$\frac{v^H(\tau^*, \tau^*)}{1-\delta} \geq v^H\left(\hat{\tau}^H(\mu,\mu), \tau^*\right) + \frac{\delta}{1-\delta} v^H\left(\hat{\tau}(\mu,\mu), \hat{\tau}(\mu,\mu)\right).$$

Now using (21) and imposing $\lambda = 1$, we can write this as

$$\frac{v_2^H(1) + \frac{\lambda(\alpha_L - \alpha_S)^2}{8(b+\beta)} \frac{(1-\mu)(3+\mu)}{(3-\mu)^2} - v_2^H(\tau^*)}{v_1^H(\tau^*) - v_1^H(1) - \frac{\lambda(\alpha_L - \alpha_S)^2}{8(b+\beta)} \frac{(1-\mu)(5-\mu)}{(3-\mu)^2}} \geq \delta.$$

It is straightforward to show that the left-hand-side of this inequality is decreasing in μ and thus the larger is μ, the tighter the constraint and the lower the level of cooperation that is sustainable (i.e., the higher is τ^*). Computing $v_1^H(\tau^*)$ and $v_2^H(\tau^*)$ explicitly and after fairly tedious algebra,

we can write the inequality above as

$$\tau^* - 1 \geq \frac{(3 + \mu - (5 - \mu)\,\delta)\,(\alpha_L - \alpha_S)}{(3 - 2\mu + \delta)\,(\alpha_L - a) + (6 - 4\delta - \mu\,(1 - \delta))\,(\alpha_S - a)}.$$

Now setting this condition to equality (that is, focusing on the world-welfare maximizing self-enforcing agreement), and comparing it to the noncooperative tariff (when $\lambda = 1$), i.e.,

$$\hat{\tau}^H - 1 = \frac{(1 - \mu)\,(\alpha_L - \alpha_S)}{(\alpha_L - a) + (\alpha_S - a)\,(2 - \mu)},$$

we have that $\tau^* < \hat{\tau}$ if and only if $\mu < \delta$. Furthermore, straightforward differentiation demonstrates that τ^* increases in μ, while $\hat{\tau}^H$ decreases in μ.

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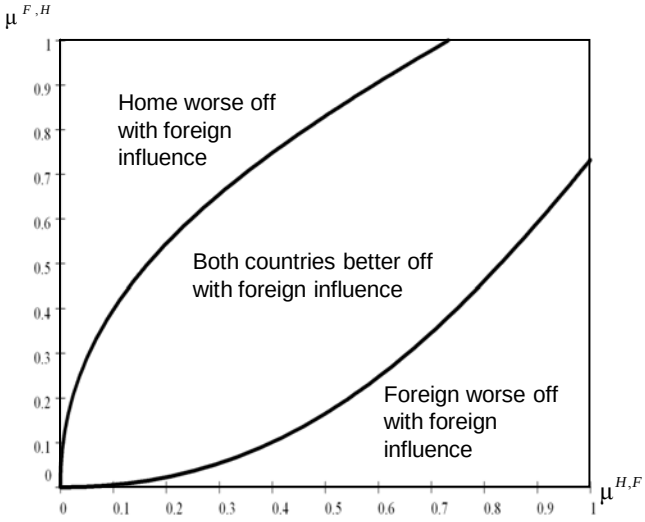

Fig. 1: Pareto Gains with Symmetric Size

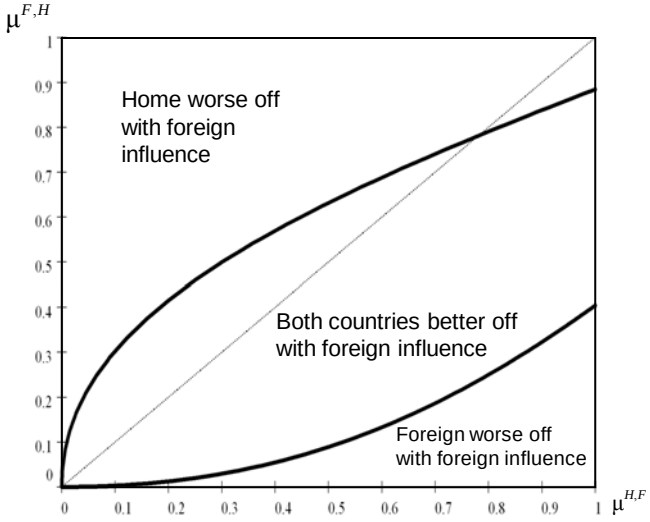

Fig. 2: Pareto Gains when Home is Larger

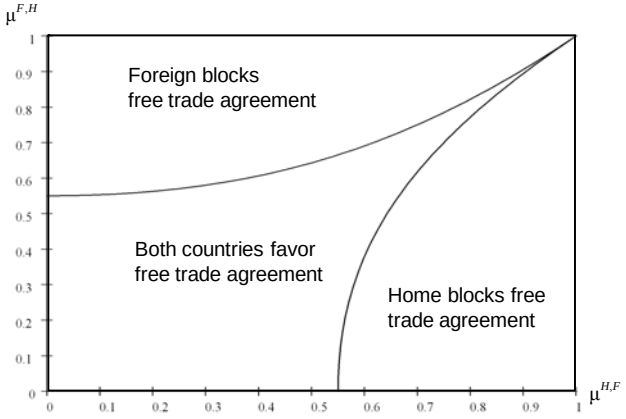

Fig. 3: Feasibility of Free Trade

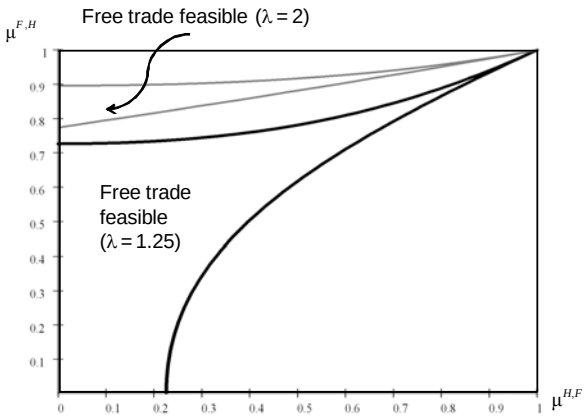

Fig. 4: Free Trade and Asymmetries

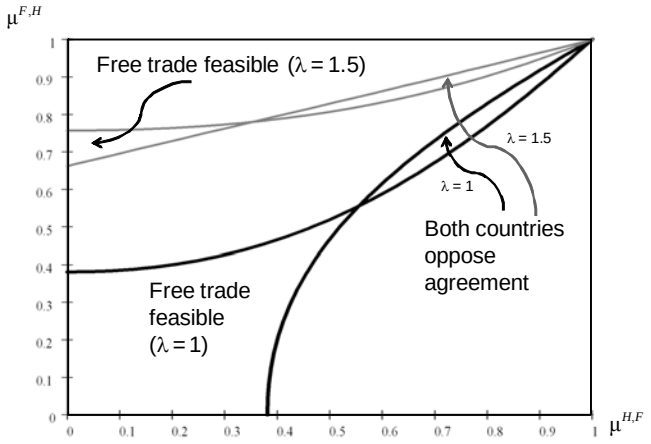

Fig. 5: Free Trade and Self-Enforcing Agreements

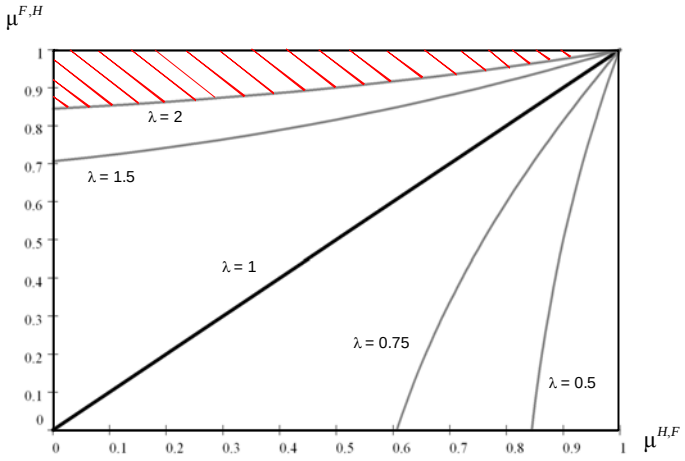

Fig. 6: Free Trade as Equilibrium Agreement

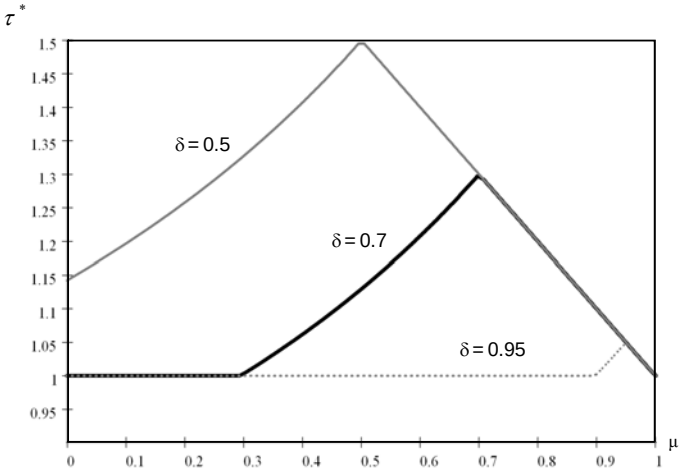

Fig. 7: Balanced Power and Welfare