Endogenous Politics and the Design of Trade Institutions*

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May 17, 2020

Abstract

While most of the literature on the design of trade agreements and trading institutions takes the political pressure governments face to be exogenous, this paper endogenizes politics in a standard model for studying trade policy design questions. One can use this simple modeling framework to distinguish between the dynamics induced by exogenous political shocks and endogenous incentives of political actors, unifying these two strands of literature. The modeling framework can also provide fuller answers to trade policy design questions by elucidating the interactions between exogenous and endogenous political forces. Applications to tariff caps and the escape clause show that important insights are missed if attention is restricted to exogenous political shocks. Most notably, endogenous politics destroys a traditionally-defined escape clause's ability to provide flexibility in the face of political shocks when lobbies use the flexibility to seek rents. This can explain why WTO Safeguard use is conditioned on measurable economic indicators.

*I thank Kyle Bagwell, Mostafa Beshkar, Rick Bond, Renee Bowen, Chad Bown, Paola Conconi, David DeRemer, James Lake, Nuno Limão, Giovanni Maggi, Devashish Mitra, Peter Rosendorff, Bob Staiger, Maurizio Zanardi, Ben Zissimos and participants in seminars at McGill, Rochester, Ryerson, Wesleyan, ETSG, InsTED, the Midwest International Trade Meetings, PEIO, SITE, and the University of Nebraska for very helpful comments and discussions.

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1 Introduction

The intensity and ubiquity of lobbying is a salient feature of trade policy making. The United States–Korea Free Trade Agreement was famously delayed by over four years, mainly by concerns from the U.S. auto industry. Over the last two decades in the United States alone, anywhere between 700 and 1200 entities reported lobbying on trade issues each year. Bombardini and Trebbi (2012) find that total annual lobbying expenditure on trade issues in 1999-2001 when Lobbying Disclosure Act data first became available was about $200 million. Campaign contributions are harder to attribute cleanly to a specific issue but are likely an order of magnitude larger.

Despite the obvious importance of interest groups in the trade policy-making process, relatively few papers have examined lobbying incentives in trade agreement and trade institution design. This is understandable, as models of endogenous politics following Grossman and Helpman (1994) are complex. It can be quite challenging to endogenize politics along these lines while also taking account of complex institutional features. Thus we have very important (e.g. Mitra (2002), Maggi and Rodríguez-Clare (2007)) but also very few models in this literature in which political pressure is modeled as endogenous.

However, it seems likely that many questions of trade agreement and trade institution design are impacted in important ways by decisions taken by political pressure groups, who themselves respond to features of the designed environment. In order to take account of endogenous politics when asking questions of trade policy design, I use a simple model that is standard in the literature (e.g. Bagwell and Staiger (2001), Bown (2002a), Bown (2004), Bagwell and Staiger (2005), Martin and Vergote (2008), Bagwell (2009), Beshkar (2010a), Maggi and Staiger (2015a), and Maggi and Staiger (2015b)) and add an endogenously-determined element to the usual exogenously-determined political economy weights. This framework is more tractable than those in the Grossman and Helpman (1994) tradition and allows the incorporation of endogenous politics when asking a rich set of institutional design questions, including in repeated-game settings.[1]

[1]Repeated non-cooperative-game models of trade agreements have been considered by McMillan (1986, 1989), Dixit (1987), Bagwell and Staiger (1990, 1997a,b, 2002), Kovenock and Thursby (1992), Maggi (1999), Coates and Ludema (2001), Ederington (2001), Rosendorff (2005), Bagwell (2009), and Park (2011). Buzard (2016) features a repeated-game model similar in spirit to the model under consideration here but focusing on questions of optimal punishments when the government is non-unitary.

After introducing the modeling framework, I use it to carefully examine the assumptions implicit in the government objective functions that are most commonly used in the literature. The Baldwin (1987)-style government objective function is everywhere increasing in political pressure. Grossman and Helpman (1994) and its extension to trade agreements in Grossman and Helpman (1995) provide microfoundations for this Baldwin (1987)-style government objective function, where a fixed weight of $1+a$ is attached to the surplus of groups who lobby, and a to the surplus of those who don't lobby.[2] This cannot microfound a flexible model as in Long and Vousden (1991) or in which shocks to the political-economy weights come from shocks to any parameter other than the weight the government places on social welfare.

More importantly, this standard functional form leads inexorably to the conclusion that governments do not want to discourage political pressure except in the presence of some kind of dynamic inefficiency such as in Mitra (2002) or Maggi and Rodríguez-Clare (2007). The modification to the government objective function I propose leads to the result that governments may indeed want to use trade agreements to reduce lobbying in a much wider set of circumstances than those identified in the previous literature.[3] Examining this alternative welfare function in combination with endogenous lobbying can provide a bridge between the theoretical literature and the claims of trade policy practitioners that an important role of trade agreements is to rein in protectionist pressure.

Having looked carefully at the government's objective function, I then use the model to carefully distinguish between the dynamics induced by exogenous and endogenous politics for two example policies: tariff caps and escape clauses. I show that the model captures results from both the exogenous politics (i.e. Bagwell and Staiger (2005) and the endogenous politics (i.e. Maggi and Rodríguez-Clare (2007)) literatures on tariff caps. The presence of endogenous political pressure changes the optimal choice of tariff bindings within a trade agreement in quite significant ways compared with the case where political pressure is assumed to be exogenous. Additionally, endogenous political pressure makes it harder to incentivize cooperation through repeated game incentives. As in Maggi and Rodríguez-Clare (2007), I show in this simpler framework that allows for easy comparison to the exogenous shocks case that one of the uses of tariff caps is to incentivize the lobby to engage in the

[2]Note that a is the weight the government places on social welfare.

[3]With only one lobby in each country, the governments will be unable to encourage lobbying in excess of that which is optimal from the lobby's point of view.

political process after the trade agreement is in place. Combined with the idea that governments can use tariff caps to restrain endogenous political pressure, a story emerges in which governments employ trade agreements to carefully manipulate lobbying incentives in order to maximize their political objectives.

The changes induced by endogenous politics are even more stark for the escape clause. Here one finds that the standard, theoretical escape clause can't work in the presence of endogenous political pressure. The idea of the escape clause is that it is often advantageous to grant governments a period of relief from trade commitments when there is asymmetric information about the strength of ex-post political economy shocks. That is, one would rather allow a short period of "escape" from the agreement rather than have the agreement violated because domestic political opposition is temporarily too strong to be resisted. Unfortunately, the logic breaks down in the presence of endogenous political pressure. An escape clause allows a government to apply a higher tariff barrier when it experiences intense political pressure. When political pressure is chosen endogenously by special interest groups *and* the government gets a free pass at the WTO whenever it feels sufficient political pressure from domestic interest groups, those interest groups have a strong incentive to exert the required level of pressure regardless of the underlying state of the world, eviscerating the escape clause. I argue on this basis that if design choices might affect lobbying incentives, one should carefully consider when it is appropriate to assume that political pressure is given exogenously.

When we turn to another attractive feature of the model—that one can study the simultaneous effects and interactions of exogenous and endogenous political forces—we derive a clear explanation for why the conditions for invoking the WTO Safeguards measure rely on purely observable economic variables, and why the level of protection governments can choose when invoking a Safeguard is related to the injury imposed by the shock and not its political impact. The model formalizes the intuition that if the WTO's Dispute Settlement Body actually followed the procedures suggested by the literature—that is, it enforced commitments based on signals of the political pressure experienced by governments—pressure groups would simply exert more pressure and the Safeguard clause could not play the escape-providing role for which it was intended. On the other hand, if the purpose of contingent protection measures is actually to provide a political safety valve, this analysis could help explain the infrequency with which safeguards are invoked under the WTO, as I argue below that the WTO's escape clause appears to have been designed to provide relief only from economic shocks.

We miss important dynamics like this one when we assume political pressure is exogenous as is done for tractability in almost all the literature that studies trading rules and institutions (see Maggi and Rodríguez-Clare (2007), Limao and Tovar (2011) and Buzard (2016) for exceptions).[4] The main contribution of this paper is to provide a tractable framework for integrating lobbying incentives into these analyses. While others (cfr. Maggi and Rodríguez-Clare (2007), Mitra (2002)) have formulated models in which some dynamic inefficiency induces a government objective that is non-monotonic in lobbying effort, I can achieve results with the same flavor in a more tractable framework. The framework can therefore be used to study a wider range of questions, including dispute settlement design, optimal retaliation schemes and the depth of integration among others. It can also examine exogenous shocks to political weights and lobbying incentives simultaneously, unifying the two distinct literatures.

Through the lens of the examples considered in this paper, one can see that modeling choices concerning both the source of political pressure and the form of governments' political objective functions have important impacts on questions of the design of and motives behind trade agreements as well as the institutions that help to enforce them. It is important to consider how these features interact with the question being asked. For some inquiries, such as those that are the focus of Maggi and Staiger (2011, 2015a) in which the impact of the political economy parameter on the government's objective function is not crucial, there may be no loss in employing a simple form with exogenous political pressure. However, for other questions in which lobbying incentives might be impacted or the government's desire for a commitment mechanism is central, a more general treatment seems prudent.

A few additional comments on the literature. Tariff caps have received particular attention in the literature that takes political pressure to be exogenous. The basic result on the political efficiency of tariff caps established in Bagwell and Staiger (2005) has been extended in numerous directions. Horn, Maggi, and Staiger (2010) show that the basic logic concerning tariff caps is unaltered in a model with contracting costs and multiple policy instruments, while Limão and Saggi (2008) show that the result holds when fines are allowed as punishments, although the politically efficient tariffs may not be achievable when enforcement of the punishment is taken into consideration.

Amador and Bagwell (2012) consider that the weight that tariff revenue receives in the govern-

[4]Cole, Lake, and Zissimos (2017) also endogenize lobbying using a new approach, that of a contest model.

ment welfare function may be private information and show that tariff caps remain optimal under certain conditions, while Amador and Bagwell (2013) show that the result goes through when the Bagwell and Staiger (2005) model is generalized to include monopolistic competition as well as more general payoff and distribution function. Beshkar and Bond (Forthcoming) extend the theory to an environment with asymmetric country sizes with costly state verification and show that tariff caps and escape clauses can both emerge endogenously in optimal trade agreements. Beshkar, Bond, and Rho (2015) and Nicita, Olarreaga, and Silva (2014) provide evidence on the relationship between tariff caps, binding overhang and market power that confirms the predictions of the terms of trade theory.

On escape clauses, Bagwell and Staiger (1990) is similar in spirit to Bagwell and Staiger (2005). Here, there is no private information and trade volume shocks in the presence of self-enforcement constraints are behind the need for an escape clause. Bown and Crowley (2013) find empirical support for this theory. Beshkar (2010b) compares the GATT escape clause to the WTO Safeguards agreement and shows that the Dispute Settlement Body as a non-binding arbitrator can assist governments in self-enforcing their trade agreements. Maggi and Staiger (2015a) study the optimal form of the trade agreement in the presence of renegotiation where compensation between governments is inefficient.

In the next section, I present the model and an in-depth discussion of the political welfare function of the government. Section 3 contains an analysis of tariff caps without the flexibility of escape and introduces the repeated-game environment. Section 4 explores questions regarding the design of the escape clause. Section 5 concludes.

2 The Model

2.1 Setup

I begin by describing the economic setting within which trade occurs.[5] It is a three-good model with two countries: home (no asterisk) and foreign (asterisk). In the home country, the representative consumer maximizes

$$u = c_N + u_X(c_X) + u_Y(c_Y).$$

[5]Note this is the economic environment of Grossman and Helpman (1995) specialized to two tradable goods with symmetry assumed for simplicity of exposition. The basic economic and political structure is similar in many ways to that in Buzard (2017).

where c_i for $i \in \{i, X, Y\}$ denotes consumption of the numeraire, X and Y goods respectively. The functions $u_X(\cdot)$ and $u_Y(\cdot)$ are assumed to be increasing, strictly concave and differentiable. The demand functions for X and Y are written $D(P_i)$ where $D(\cdot)$ is the inverse of $u_i'(\cdot)$ and P_i (P_i^*) denotes the home (foreign) price of good $i \in \{N, X, Y\}$. Demand is assumed symmetric in foreign.

Good N is produced with labor alone so that $Q_N = l_N$. I assume the aggregate labor supply l is large enough to ensure that the output of good N is positive. The production of goods X and Y requires labor and a sector-specific factor that is available in inelastic supply and is non-tradable so that the income of owners of the specific factors is tied to the price of the good in whose production their factor is used. Production of these goods is also assumed to exhibit constant returns to scale. The supply functions for good X are $Q_X(P_X)$ and $Q_X^*(P_X^*)$ and are assumed strictly increasing and twice continuously differentiable for all prices that elicit positive supply. For any such P_X, I assume $Q_X^*(P_X) > Q_X(P_X)$ so that the home country is a net importer of good X. The production structure for good Y is symmetric.

For simplicity, I assume each government's only trade policy instrument is a specific tariff on its import-competing good: the home country levies a tariff τ on good X while the foreign country applies a tariff τ^* to good Y. Local prices are then $P_X = P_X^W + \tau$, $P_X^* = P_X^W$, $P_Y = P_Y^W$ and $P_Y^* = P_Y^W + \tau^*$ where a W superscript indicates world prices. Equilibrium prices are determined by the market clearing conditions

$$M_X(P_X) = D(P_X) - Q_X(P_X) = Q_X^*(P_X^*) - D(P_X^*) = E_X^*(P_X^*)$$

$$E_Y(P_Y) = Q_Y(P_Y) - D(P_Y) = D(P_Y^*) - Q_Y^*(P_Y) = M_Y^*(P_Y^*)$$

where e.g. M_X are home-county imports and E_X^* are foreign exports of good X. The price of the numeraire is equal to one in both countries and on the world market.

Note that P_X^W and P_Y^W are decreasing in τ and τ^* respectively, while P_X and P_Y^* are increasing in the respective importing country's tariff. As profits and producer surplus (identical in this model) in a sector increase in the price of its good, profits in the import-competing sector also increase in the domestic tariff. This economic fact, combined with the assumptions on specific factor ownership, is what motivates political activity.

I next describe the politically-relevant actors, which are a government and import-competing lobby in each country. In order to focus attention on protectionist political forces, I assume that

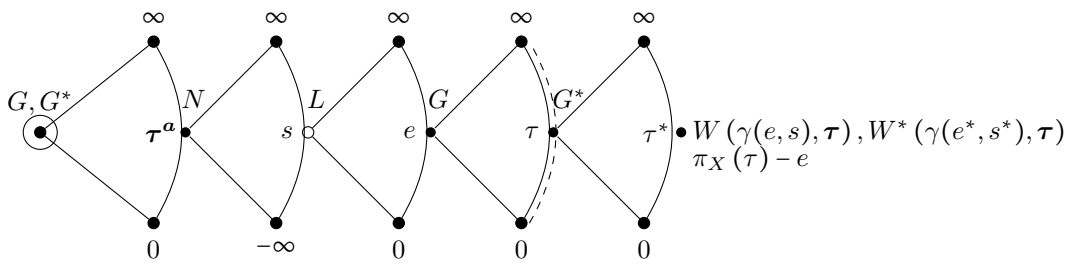

Figure 1: Extensive Form of the Stage Game (Home Country)

only the import-competing industry in each country is politically-organized and able to lobby and that it is represented by a single lobbying organization. Each country's government can set trade policy either unilaterally or through a negotiated trade agreement and then choose an applied tariff that is potentially different from that agreed upon in a trade negotiation.

The stage-game timing is shown in Figure 1 for the home country. First, the governments cooperatively form a trade agreement.[6] After the trade agreement is concluded, any exogenous shock is realized. Next the special interest group representing the import-competing industry in each country lobbies the government for protection in the form of tariffs. Finally, given the trade agreement, enforcement conditions, and political pressure it experiences, each government chooses the applied tariff on its import-competing good.

As this game is solved by backward induction, it is intuitive to start by describing the incentives of the government in setting the applied tariff in the final stage. As the economy is fully separable and the economic and political structures are symmetric, I focus here on the home country and the X-sector. The details are analogous for Y and foreign.

The per-period welfare function of the home government is given by

$$W(\gamma(s,e),\tau,\tau^*) = CS_X(\tau) + \gamma(s,e)\cdot\pi_X(\tau) + CS_Y(\tau^*) + \pi_Y(\tau^*) + TR(\tau) - e \qquad (1)$$

where CS is consumer surplus, π represents profits, $\gamma(s,e)$ is the weight placed on profits (producer surplus) in the import-competing industry, s is an exogenous state variable, e is lobbying effort in terms of the numeraire, and TR is tariff revenue. Here, the weight the government places on the profits of the import-competing industry, $\gamma(s,e)$, may be affected both by a shock (due to Maggi and

[6] See Section 3 for a discussion of why lobbies are assumed not to be involved at the trade agreement formation stage.

Staiger (2011)) and by the level of lobbying effort.[7] I will use "γ" to represent the political economy parameter in a general sense, "$\gamma(s)$" when treating the case of pressure arising from exogenous shocks only, and "$\gamma(e)$" when referring to the case where political pressure results from the rent-seeking behavior of lobbies only. I subtract the cost of lobbying effort from the government's objective function because if stands to reason that if the government cares about the lobby's gross profits, it should also care about the costs.[8] This is often abstracted from in the closely-related literature, but it seems important to take into account in this environment of non-transferable utility and decreasing returns to lobbying. Note that there can be no cost of lobbying effort in models that assume political pressure is exogenous only.

Assumption 1. *$\gamma(s, e)$ is continuously differentiable, strictly increasing and concave in e.*

Assumption 1 represents the idea that the government favors the import-competing industry more the higher is its lobbying effort, but that there are diminishing returns to lobbying activity.

This objective function for the government is consistent with Becker and Murphy (1993), which explores advertising and the goods being advertised as complementary in a 'stable metautility function.' Their consumers are sophisticated and can advocate for policy to change the level of advertising with which they will be confronted. Similarly, the government here has a stable mapping from the amount of lobbying effort it experiences to its optimal choice of tariffs and it can use the trade agreement to change the level of lobbying effort with which it will be confronted. The government's preferences don't change with e, as the preferences related to lobbying effort are represented by the mapping $\gamma(\cdot)$. When e changes, the metautility function is evaluated at a different value.

As Figure 1 makes clear, lobbying, as well as the realization of any shocks, occurs after the trade agreement is negotiated and before the applied tariff decision. $\gamma(s, e)$ is thus evaluated at the ex-post stage, while the trade agreement is negotiated in the shadow of the realizations of s and e. We can

[7] While the standard 'Protection for Sale' modeling of Grossman and Helpman (1994) would specify $W = C + aW$, this form allows the incorporation of endogenous political pressure into the government objective function that is most often used to examine questions concerning the design of international trade agreements and the institutions that facilitate them. See Section 2.2 for a detailed discussion.

[8] Aside from making the government's optimum interior in γ in most specifications, taking account of the cost of lobbying changes the results that follow quantitatively but not qualitatively because there is no marginal impact on the government's decision-making regarding the optimal applied tariff.

thus interpret the fundamental structure of preferences in a couple of ways. We can think of lobbying effort as a kind of persuasion than affects decision making of a single policy maker or we can think of lobbying effort as influencing the identify of the ex-post decision-maker. In either case, $\gamma(s,e)$ is the weight the decision-maker places on the lobbying industry's profits ex-post, and the realization of this weight changes with the realization of the shock and lobbying effort even while the mapping—the preferences—do not.[9]

Expression 1 can be written $W(\gamma(s,e),\tau,\tau^*) = W_X(\gamma(s,e),\tau)+W_Y(\tau^*)$, where $W_X(\gamma(s,e),\tau)$ is the utility derived from consumer surplus, producer surplus and tariff revenues in the import-competing industry and $W_Y(\tau^*)$ is the utility derived from consumer and producer surplus in the exporting industry. As there are no interactions between τ and τ^*, when setting the tariff unilaterally, the government simply maximizes $W(\gamma(s,e),\tau,\tau^*)$ by choice of τ given $\gamma(s,e)$ and τ^* and sets the non-cooperative tariff

$$\tau^N(\gamma(s,e)) = \max_{\tau} W_X(\gamma(s,e),\tau) \tag{2}$$

I refer to this as the Nash tariff because it is the result of Nash equilibrium play in the non-cooperative game between the governments.

Given the government's preferences, the home lobby chooses its lobbying effort e to maximize profits net of lobbying effort:

$$U_{\mathrm{L}} = \pi_X(\tau(\gamma(s,e))) - e \tag{3}$$

where $\pi(\cdot)$ is the current-period profit and τ is the home country's tariff on the import good.

τ^N is increasing in γ and, given Assumption 1, the lobby's incentives imply that the realization of γ is such that the government's second order condition is satisfied.[10] This does not in general rule out that the solution to Expression 2 could be the prohibitive tariff.

[9]The model also admits an interpretation in which the decision-making body is non-unitary, such as a large legislature. Here, s and e determine the identity of the median legislator. This interpretation results in minor, qualitative changes to the repeated-game results because the non-unitary decision-maker knows that different decision-makers will be in power in the future and evaluates future welfare with her own preferences. In contrast, the unitary decision-maker evaluates future welfare according to the lobbying effort she expects to experience in the future.

[10]See Page 28 of Buzard (2017) for a proof of this point. In the case of exogenous shocks only, an assumption that the upper limit of the support of the shocks is bounded by the value of $\gamma(s)$ that would lead to the prohibitive tariff is sufficent. Note that for an interior solution to the lobby's problem, we need a limit on the convexity of the profit function relative to $\tau(\gamma(s,e))$.

I assume the lobby's contribution is not observable to the foreign government. The implication is that the lobby can directly influence only the home government, and so the influence of one country's lobby on the other country's government occurs only through the tariffs selected.[11] $\gamma(s,e)$ is assumed to be private information of the government. This makes the environment one of asymmetric information, with asymmetries potentially coming from two sources: the exogenous shocks and the endogenous behavior of the special interest group.

In the first stage, the governments choose the trade agreement tariffs via a negotiating process that I assume to be efficient. In this strand of the literature, it is typically assumed that trade agreements are negotiated to maximize the expected welfare of politically motivated governments given the exogenously-determined political pressure they expect to face at the time of the agreement's implementation. I will follow this convention throughout, making necessary adjustments for endogenous politics. The trade negotiation therefore is assumed to maximize the joint payoffs produced by the trade agreement:

$$W(\gamma(s,e),\gamma^*(s^*,e^*),\tau,\tau^*) = W(\gamma(s,e),\tau,\tau^*) + W^*(\gamma^*(s^*,e^*),\tau,\tau^*) \tag{4}$$

Government welfare in both countries is additively separable in τ and we can write the welfare of the foreign government as $W^*(\gamma^*(s^*,e^*),\tau,\tau^*) = W_Y^*(\gamma^*(s^*,e^*),\tau^*) + W_X^*(\tau)$. Therefore maximizing Expression 4 in τ is equivalent to maximizing $W_X(\gamma(s,e),\tau) + W_X^*(\tau)$. The trade agreement tariff is then given by

$$\tau^a(\gamma(s,e)) = \max_{\tau} W_X(\gamma(s,e),\tau) + W_X^*(\tau) \tag{5}$$

As in the applied tariff problem, I assume the realization of γ is below the threshold needed to ensure the second order condition is satisfied.

Note that in this symmetric environment, this problem is equivalent to solving the Nash bargaining solution where the disagreement point is the welfare resulting from the Nash equilibrium in the non-cooperative game.

2.2 Political Objective Functions and the Role of Trade Agreements

There are several advantages to using the government objective function in Expression 1, first among them tractability for analyzing institutional design questions. I do not propose this alternative lightly,

[11] cfr. Grossman and Helpman (1995), page 685.

and it is closely related to objective functions that are well-studied in the literature.

Grossman and Helpman (1994)'s well-known government objective function both restricts the returns to lobbying to be constant and assumes that utility is transferable between the government and lobby, preventing analysis of distributional questions. Dixit, Grossman, and Helpman (1997) point this out and propose a more general form where the government objective is a function of a policy vector and payments from each interest group (here (τ, τ^*)) and e, respectively). When there are no exogenous shocks, Expression 1 is therefore a special case of the Dixit, Grossman, and Helpman (1997) objective function.

Part of the appeal of the Grossman and Helpman (1994) model is that it provides theoretical foundations for the standard Baldwin (1987)-style political objective function that is often used in the literature on the design of trade institutions:

$$W(\gamma(e), \tau, \tau^*) = CS_X(\tau) + \gamma \cdot \pi_X(\tau) + CS_Y(\tau^*) + \pi_Y(\tau^*) + TR(\tau) \tag{6}$$

The Grossman and Helpman (1994) result is that γ must equal $1 + a$, where a is the weight the government places on social welfare. The literature that uses both the endogenous and the exogenous versions of this welfare function has typically concluded that without some kind of long-run inefficiency, governments will not want to use the trade agreement to reduce lobbying. That is, trade agreements internalize the terms of trade externality but nothing more. Careful inspection of Expression 6 helps explain why. If we ask where the maximum of the objective function is in terms of γ, an envelope-theorem style result implies that the first order condition is the same in the unilateral and joint problems: $\frac{\partial W_x}{\partial \gamma} = 0$. See the Appendix for details. An interior solution does not exist to this problem. By inspection, the partial derivative of government welfare with respect to γ is simply producer surplus in the import sector. This is always positive. Thus, under the government welfare function in Expression 6, government welfare is maximized when γ takes on the highest value achievable.

Thus the objective function in Grossman and Helpman (1994) and Expression 6 are not well-suited to answering the question of whether governments would like to use trade agreements as a political commitment device because the functional forms rule this out by assumption. For the exogenous version to be well micro-founded, it also requires the assumption that lobbies present truthful contribution schedules that are contingent, take-it-or-leave-it offers. With one lobby, this means the

government never receives any surplus. Even if the government did not prefer as much political pressure as possible, in the menu-auction set-up the government is made indifferent between all outcomes. This feature remains in the more general Dixit, Grossman, and Helpman (1997) model because it's a result of the take-it-or-leave-it offer of the lobby.

We would like a framework in which the government's payoff is not constant. An appealing candidate is Maggi and Rodríguez-Clare (2007), which is in the spirit of Grossman and Helpman (1994) but uses a bargaining framework. In my setup, the lobby is not active during the trade agreement negotiation; in order to to fit into the framework of Maggi and Rodríguez-Clare (2007), we can assume that capital is perfectly mobile in the long run so that it is not worthwhile for the lobby to expend resources to influence the negotiation of the trade agreement. Of course, I consider only the case of perfectly immobile capital in the short run, whereas Maggi and Rodríguez-Clare (2007) examine all possible levels of capital mobility.

Although Maggi and Rodríguez-Clare (2007) assume the constant returns form and that either the lobby or the government has all the bargaining power, Limao and Tovar (2011) extend this framework to one with decreasing returns to lobbying and general bargaining weights in an environment with no ex-ante lobbying.

In Limao and Tovar (2011)'s setup, the government, with objective function $G = \Psi(e) + aW(\tau, \tau^*)$, decides whether to commit in an international agreement and then Nash bargains with the lobby over e and the tariff.[12] They show that the government will use the trade agreement to commit vis-à-vis the lobby as long as it doesn't have all the bargaining power and there are decreasing returns to lobbying. Here, the government does not have an interest in maximizing joint surplus because it is unable to appropriate all the gains.[13]

The setup that I have assumed is similar to Limao and Tovar (2011) and produces very similar dynamics.[14] When the cost of lobbying effort is included in government welfare as in Equation 1,

[12] I have changed notation to match that which I use here and restricted attention to their Section 3.3. with the tariff only; their main results address the choice between tariffs and non-tariff barriers.

[13] In the working paper version of Maggi and Rodríguez-Clare (2007), a similar result is demonstrated for the case of immobile capital when the government has all the bargaining power and there is no ex-ante lobbying.

[14] If one takes $a = 1$, the only difference between the Limao and Tovar (2011) government objective function and Expression 1 is that Expresion 1 replaces $\Psi(e)$ with $[\gamma(e) - 1]\pi_x(\tau) - e$. This means there's a positive cross derivative between lobbying effort and tariffs in my formulation, so that an increase in tariffs increases government welfare more the higher

the monotonicity in γ inherent in Expression 6 typically breaks down. For most specifications of the $\gamma(e)$ function, there is an interior optimum. If a government's objective function is closer to Expression 1 than Expression 6 with endogenous political pressure, the government will likely be interested in using the trade agreement to manipulate the lobby's behavior. By setting a tariff cap below the lobby's optimal tariff, the government can use the trade agreement to improve welfare by changing lobbying incentives and therefore the political pressure it encounters.[15]

I do not argue that the government welfare function in Expression 1 perfectly represents the preferences of policy makers. I simply want to make the point that assumptions on the features of the government objective function can be important drivers of results on the role that trade agreements can play. And this can potentially provide a bridge between the theoretical literature and the claims of trade policy practitioners that an important role of trade agreements is to rein in protectionist pressure.

There are several additional advantages to the setup assumed here. First, it is very tractable, making it easily adopted to ask how endogenous politics might change the answers to a wide range of policy questions. Second, it allows me to take lobbying incentives into account in the same framework typically used in the literature to examine institutional design questions so that comparisons to the existing literature are direct. Third, if one prefers a non-unitary interpretation of the government, this framework in which the lobby exerts effort that determines the identity of the pivotal decision-maker within the government is more appealing than bargaining. Finally, in an environment where exogenous shocks are present, contingent lobbying effort / payments are hard to reconcile with many types of uncertainty.

3 Rigid Tariffs with Endogenous Political Pressure

We are now ready to demonstrate the implications of taking account of endogenous political pressure on some central design features of trade agreements. I develop some basic results about the design of trade agreements with tariff caps when political pressure is endogenous and compare and contrast

is lobbying effort. Note that this is still consistent with the Dixit, Grossman, and Helpman (1997) form, although I have the lobby maximizing net profits instead of making a take-it-or-leave-it offer.

[15]There are many candidates for the government objective function that are not monotonic in political pressure. For example, in Ethier (2012), returns to lobbying decrease as tariffs increase. In the current model, one could take government welfare to be quadratic in γ or make the weights on the terms in the objective function sum to one.

these results to the case where political considerations are exogenous.

In Section 4.3 I will examine the more realistic case where endogenous and exogenous political forces coexist. Until then, I will consider the cases separately to clearly establish the different dynamics that arise from the two distinct types of influence. I begin with the case of rigid tariffs—that is, trade agreements that have no provision for flexibility. Rigid tariffs cannot be made to depend on the realized level of γ and so incentive compatibility considerations do not come into play.

Because the trade agreement is set ex-ante—that is, before political pressure is realized, regardless of its source—the process of choosing the optimal tariffs differs across the two cases. When γ is exogenous, the government must plan for level of γ it will face *in expectation*. When political pressure in purely endogenous, the government has perfect foresight to plan for the γ it will face but must confront the fact that its decisions affect lobbying incentives.

With the introduction of endogenous political pressure, one must take a stand on whether lobbies influence the formation of the trade agreement or are only active once the trade agreement is in place. Since a central goal here is to determine the impact of relaxing the assumption that political pressure is exogenously determined, I assume the latter to make the comparison most direct to this literature in which by definition there can be no endogenous political pressure at the trade agreement formation stage. Results for the former, which is undoubtedly an important possibility in many institutional settings, are available upon request from the author.[16]

3.1 Perfect External Enforcement

I begin by assuming that perfect external enforcement is available for ensuring that the trading partners abide by the terms of the trade agreement. Although this is an unrealistic assumption, it establishes an important baseline case. Section 3.2 adds the requirement that trade agreements be self-enforcing.

I restrict attention to the case of weak bindings throughout as this is the more interesting and realistic case.[17] Weak bindings are commonly referred to as tariff caps. When bindings are weak, the

[16]Note that the endogenous trade policy literature that involves trade agreements (e.g. Grossman and Helpman (1995), Maggi and Rodríguez-Clare (2007)) explicitly assumes that trade agreements are formed in the face of political pressure.

[17]There *is* an extreme difference in outcome for strong bindings between exogenous and endogenous cases. When the terms of the agreement are that tariffs must be set at the precise value stipulated, the lobby has no incentive to exert effort and the trade agreement tariff is set at zero. Results are available upon request from the author.

applied tariff can take any value as long as it is no greater than that which is agreed upon.

When political pressure is endogenous, in place of taking expectations over a range of probabilistically-determined levels of exogenous political pressure, we backward induct to determine the lobby's effort decision and the government's optimal choice of tariff caps in anticipation of the lobby's behavior.

In the final stage, the government will seek to maximize its welfare by choice of τ given the political pressure that it faces and the enforcement of the tariff cap, here denoted τ_e^R for the case of endogenous political pressure with rigid bindings, as distinct from τ^R in the case of exogenous political pressure with rigid bindings. The home government unilaterally maximizes Expression 1 so that the applied tariff is the Nash tariff $\tau^N(\gamma(e))$ as long as $\tau^N(\gamma(e)) \leq \tau_e^R$. Otherwise, the government must set $\tau = \tau_e^R$ since the weak binding τ_e^R is externally enforced.

Knowing how the government will set the applied tariff, in the second stage the lobby makes its effort decision to maximize net profits according to Expression 3. If the lobby's optimal effort level in the unconstrained problem (label it e^L) would lead to $\tau^N(\gamma(e)) > \tau_e^R$, the lobby will reduce its choice so that no effort is wasted. I label the lobbying effort choice that leads to the weak binding level as e^R so that $\tau^N(\gamma(e^R)) = \tau_e^R$. The lobby will choose e^R when its optimal effort would lead to a tariff level higher than that allowed by the weak binding; otherwise it will choose its unconstrained optimal effort e^L.

We are now in a position to determine how the governments set trade agreement tariffs. Their goal is to maximize their joint welfare as in Expression 4 given the behavior they expect from the lobbies. Again, we can restrict attention to the home country and the X sector because of the symmetry and separability of the economy.

I assume for simplicity of exposition that the government does not set the tariff binding τ_e^R higher than that which would result from the lobby's optimal effort e^L, as setting a higher tariff cap would not change lobbying behavior or outcomes in any way.[18]

This is in contrast to the case of exogenous political pressure, for which Bagwell and Staiger (2005) show several interesting results.[19] In particular, they find that when governments negotiate

[18]The government's tariff cap choice can reduce lobbying effort; it cannot, however, increase lobbying effort above e^L. The government is unable to use a weak binding to encourage extra lobbying when only import-competing interests are represented by a lobby. Introducing lobbies for the export industry could reverse this: lobbying effort by exporters could be encouraged in support of capping the import tariffs of the partner country.

[19]Bagwell and Staiger (2005) assume that γ and γ^* are each drawn independently from probability distributions with

commitments that take the form of weak bindings, the tariff caps they choose imply that applied tariffs will be set strictly below the bound level when governments experience low realizations of political pressure.

To understand how the optimal home tariff τ_e^R under the trade agreement is set, notice that it must maximize joint government welfare. As argued in Section 2, joint government welfare (with variables that do not affect the X sector suppressed) is

$$W_x\left(\gamma(e),\tau\right)) + W_x^*\left(\tau\right) \tag{7}$$

where the lobby will exert no more effort than that which produces the capped $\tau_e^R = \tau^N(\gamma(e^R))$. Recall that the Nash tariff, $\tau^N(\gamma(e))$ is the solution to the unilateral optimization problem the home government faces when choosing the applied tariff level in the final stage of the game. It is given by Expression 2, which contains the mapping between the political pressure the lobby exerts and the government's unilateral tariff response. We can therefore use Expression 2 to determine the level of e the lobby must exert in order to receive a particular $\tau^N(\gamma(e^R))$ equal to the tariff cap τ_e^R.

Ex-post lobbying will constrain the governments in that the $\gamma\left(e^R\right)$ they experience will be determined through the unilateral maximization problem in the last stage. The governments get to choose the τ_e^R that maximizes their joint welfare, but they cannot change this future lobbying process; they can only reduce the level at which it takes place through the tariff cap.

Notice that the maximand in Expression 7 is exactly the same as that in the third-stage maximization problem except it adds foreign government welfare. This implies that τ_e^R is (weakly) lower than the unilateral tariff as the terms-of-trade externality is internalized.[20]

A second motive may be operative here that is absent in the case of exogenous political pressure. When the government's optimum in terms of $\gamma(e)$ is lower than the lobby's, the government will use the trade agreement as a domestic political commitment device to manipulate ex-post lobbying

cumulative distribution functions $H(\gamma)$ with $h(\gamma) = H'(\gamma)$. The support for this probability distribution is $\left[\underline{\gamma},\overline{\gamma}\right]$ where $\overline{\gamma}$ is small enough that the government's optimal tariff will be non-prohibitive. They also assume γ and γ^* are private information and that supply and demand are linear.

[20]The terms-of-trade motivation for the trade agreement may not strictly lower the tariff if the solution to the government's joint maximization problem is not interior in the sense that the governments want as much lobbying as possible. To illustrate: if joint welfare is everywhere increasing in γ, although reducing tariffs would improve welfare when γ is *exogenously given* because each country would not be imposing the terms-of-trade externality on the other, when γ is endogenous, reducing the tariff reduces γ and therefore joint welfare.

incentives. Whenever the cap is strictly below the non-cooperative level, that is when $\tau_e^R < \tau^N$, the weak binding restrains political pressure.

On the other hand, if the level of the optimal weak binding τ_e^R is strictly positive, the weak binding is at least in part serving to generate political effort—most often thought of as campaign contributions—that the government finds beneficial from its politically-motivated point of view. The government could have chosen a cap of zero and eliminated lobbying activity altogether. In fact, any strong binding accomplishes this very feat, but is also *unable* to generate lobbying activity because of its effect on lobbying incentives. Thus the introduction of endogenous political pressure provides an explanation for the prevalence of tariff caps: they are a a sort of carrot to encourage political contributions, or perhaps they should be seen as a stick with which to threaten the removal of protection if political support does not continue.

Proposition 1. *When political pressure is entirely endogenous and governments negotiate commitments that take the form of weak bindings, they will not set applied tariffs strictly below the bound level. Governments may use the weak tariff binding to restrain and/or encourage endogenous political pressure.*

Thus we see that the governments can use a tariff cap to manipulate lobbying incentives so that political effort is neither too low or too high. The fact that the applied tariffs are equal to the negotiated binding is reminiscent of Maggi and Rodríguez-Clare (2007). Exactly the same dynamic is at play here: specifying trade agreement tariffs as caps instead of strong bindings keeps the lobby active during periods where the trade agreement is honored. At the same time, in both models the government typically wants to use the trade agreement tariff cap to reduce lobbying below the lobby's optimum. In the model of this paper, it is because the government gets disutility from very high lobbying expenditure; in Maggi and Rodríguez-Clare (2007), it is because high tariff rates encourage inefficient over-investment in the import-competing industry.

Note that Maggi and Rodríguez-Clare (2007) do not have this result for the case of perfectly immobile capital in the published version of the paper, so this would seem to be an extension of their result. It is, but in a limited sense. In the working paper version of their paper, this result goes through for fixed capital when the government has all the bargaining power and there is no ex-ante lobbying. To truly extend those results, it must be shown that the results hold when lobbying is possible ex

ante—that is, when special interests are able to influence the formation of the trade agreement. This is indeed the case; the results with ex-ante lobbying are available from the author upon request.

3.2 Self-Enforcing Trade Agreements

Here I remove the assumption of perfect external enforcement since external enforcement is not widely available in the context of international trade relations. External enforcement is replaced with promises of future cooperation and punishment is modeled via a repeated game. I begin by describing the repeated-game set-up.

3.2.1 Repeated Game

Because the governments are faced with asymmetric information in that lobbying effort and political shocks can't be observed across international borders, perfect public equilibrium (PPE) is the appropriate solution concept. Here attention is restricted to symmetric, stationary PPE.

In order to establish an equilibrium, we must ensure that both the on-schedule (static) incentive constraint and the off-schedule (repeated-game) incentive constraint are satisfied. The former is trivially satisfied for the case of rigid bindings, so it is only the repeated-game constraint that must be considered here. Following most of the literature, I assume that any deviation triggers a reversion to the static Nash equilibrium—what is known as 'grim trigger.'[21]

3.2.2 Self Enforcement

When political pressure is exogenous, Bagwell and Staiger (2005) perform a standard repeated-game prisoner's dilemma analysis and show that if governments are patient enough, the optimal weak binding from the perfect external enforcement setting can always be sustained with repeated-game incentives.

When γ is endogenously-determined, repeated-game enforcement is altered relative to the case of exogenously-given political pressure. This is because, in place of a stochastic process that determines

[21] See Klimenko, Ramey, and Watson (2008) for an alternative that takes seriously the threat of governments renegotiating out of punishments that are not themselves incentive compatible.

γ, γ is determined by a new repeated-game player who cares whether the trade agreement is followed or reversion to the non-cooperative Nash outcome takes place.

Recall that the government's most preferred trade agreement tariff in this setting is the one that would allow it to provide the level of protection that is demanded *ex-post*. Enforcement considerations do not change the protection demands when γ is exogenous. Similarly, because the government's objective function does not change and it is able to use the tariff cap to control the lobby's effort level, as long as the government is sufficiently patient, it would like to set the same tariff cap in the face of self-enforcement constraints as when the agreement is externally enforced.

When γ is exogenous, the optimal trade agreement tariff is the same under perfect external enforcement and self-enforcement because the change in enforcement conditions cannot affect the realization of γ. In contrast, moving from a static problem with external enforcement to a repeated-game problem with an enforcement constraint changes the lobby's decision problem. Moving to the repeated-game environment with self enforcement does not alter the government's ideal trade agreement tariff, but the introduction of the lobby creates the possibility that the politically-optimal trade agreement tariff may not be self-enforcing.

Let us see how this works. Again, because of symmetry and separability, we can focus on the home government's choice of τ and the X industry.

The government's incentive constraint is given by

$$\frac{\delta}{1-\delta}\left\{W_X(\gamma(e^R),\tau_e^R)+W_X^*(\tau_e^R)-\left[W_X(\gamma(e^N),\tau^N(\gamma(e^N))+W_X^*(\tau^N(\gamma(e^N))\right]\right\}$$
$$\geq W_X(\gamma(e^B),\tau^B(\gamma(e^B))-W_X(\gamma(e^R),\tau_e^R) \quad (8)$$

where δ is the discount factor assumed common to the government and lobby, τ_e^R is the same tariff cap from Section 3.1, and τ^B is the "break" tariff. Any $\tau > \tau_e^R$ is sufficient to breach the trade agreement and trigger Nash reversion; $\tau^B(\gamma(e^B))$ is defined as the tariff the government would choose as unilaterally optimal if faced with e^B, where e^B is the minimum lobbying effort that would give the government incentive to break the trade agreement in the absence of external enforcement.

On the left side of the inequality is the discounted gain from maintaining the trade agreement relative to Nash reversion. In order for the government to have the incentive to abide by the agreement, this must be at least as large as the benefit to cheating. The benefit is the current period increase in unilateral welfare from the tariff applied when breaking the agreement and is given on the righthand

side of Inequality 8.

For a given δ, τ^B and e^B are derived using Equation 2 and Expression 8 evaluated at equality. e^B can be interpreted as the minimum level of lobbying effort that will persuade the government to abrogate the agreement. It must provide significantly more unilateral welfare than the trade agreement tariff in order to compensate the government for the loss of cooperation in every future period.

The lobby's incentives must also be satisfied, as the government's decision on whether to abide by the agreement or break it depends on the amount of lobbying effort it encounters. In order for the lobby to prefer the trade agreement tariff to the option of causing the agreement to be broken and tariffs to revert to the non-cooperative level, the following must hold

$$\frac{1}{1-\delta}\left[\pi_X(\tau_e^R) - e^R\right] \geq \pi_X(\tau^B) - e^B + \frac{\delta}{1-\delta}\left[\pi_X(\tau^N) - e^N\right] \tag{9}$$

That is, the present discounted value of net profits under the trade agreement must be weakly higher than one period of net profits from the "cheater" tariffs and the discounted future Nash profits.

Here we have the possibility of a starkly different result from that under exogenous political pressure. The addition of a second incentive constraint can make it impossible to sustain the politically efficient tariffs.

To see this, start by noticing that the lefthand side of Expression 8 is increasing in δ, while the righthand side is constant in δ. That is, as the government becomes more patient, it is easier to satisfy the government's constraint. Equivalently, it requires a larger e^B to violate the constraint.

Shifting attention to the lobby's incentive constraint in Expression 9, this becomes harder to satisfy as δ increases for most levels of the trade agreement tariff. That is, the lefthand side is decreasing and the righthand side is increasing as a direct function of δ. When taking into account the influence of δ from the government's constraint on e^B, for a small part of the parameter space where e^B must be very large, it's possible for the lobby's constraint to eventually loosen as δ increases since $\pi_X(\tau^B) - e^B$ decreases to the right of τ^N. In general, however, we cannot be guaranteed that even the most patient government can sustain cooperation at the politically optimal trade agreement level. At issue is the behavior of the lobby, which is now a formal player in its own right and must be incentivized to keep its behavior on the equilibrium path. More patient lobbies are willing to work harder to encourage the government to break the trade agreement so that they can enjoy infinite periods of Nash tariffs. Increasing the discount factor makes it more difficult rather than easier to satisfy the

lobby's constraint.[22]

Proposition 2. *The presence of the lobby as a repeated-game player may imply that the politically optimal self-enforcing trade agreement tariff is strictly greater than* τ_e^R.

If there is no δ such that Inequalities 8 and 9 hold simultaneously, the governments must raise the trade agreement tariff, which loosens both incentive constraints simultaneously.

4 Endogenous Political Pressure and the Escape Clause

I begin by following the literature in examining a trade agreement with an escape clause modeled as a second negotiated binding so that there is one (weak) binding for when political pressure is low and a higher, weak binding for exceptional circumstances of high levels of political pressure. Escape clauses are common features of trade agreements in practice, and when one models political pressure as exogenous, an escape clause seems attractive: in the presence of a particularly large negative political shock, being bound to a tariff designed for normal times would cause significant welfare losses to the politician.

However, because the tariff allowed under the trade agreement with an escape clause varies with the announced level of political pressure, introducing an escape clause leads to a concern about incentive compatibility. It must be in a government's best interest to truthfully reveal its γ or else it will misrepresent its private information about γ in order to raise tariffs and create a terms-of-trade gain, thereby improving its unilateral welfare. Bagwell and Staiger (2005) provide conditions that guarantee incentive compatibility, but they also show that a trade agreement with a costless escape clause cannot improve welfare because it cannot be made incentive compatible. No matter the realization of the stochastic γ, it is always in the government's interest to announce that γ is high, which allows it to apply any tariff up to the higher weak binding. This deviation improves unilateral welfare while imposing a terms-of-trade externality on the trading partner.

A similar problem arises in the case of endogenous political pressure, but with no parallel potential gain. The problem of asymmetric information remains, as lobbying effort is not observable to the trading partner. The appeal of an escape clause is to provide the flexibility of a higher binding in

[22]The essential point underlying this result was first made by Buzard (2016).

exceptional circumstances when political pressure is randomly high. But in the stark case under examination here with purely endogenous politics, an exceptionally high γ can only derive from higher effort exerted by the lobby. If one chooses an optimal tariff cap for normal times, a second, higher cap can only encourage excess lobbying that is sub-optimal from the point of view of the government.

Thus, while with a costless escape clause there is no way to make truth-telling incentive compatible, this is of little consequence. The government would actually be *truthfully* reporting the higher level of $\gamma(e)$ as long as it is worthwhile for the lobby to increase its effort to this level. The appeal of an escape clause is missing in this case. What remains is the potential for governments to be forced ex-post to exploit the escape clause in a way that damages their ex-ante welfare.[23]

4.1 Escape Clauses with Strong Bindings

Suppose that political pressure derives only from endogenous sources but an escape clause is to be implemented anyway. In order for an escape clause to be useful to the government, it should be costly so that its use can be made incentive compatible. Bagwell and Staiger (2005) suggest several avenues for introducing a cost for the use of the escape clause.

One possibility is to make the escape clause tariff a strong binding instead of a weak binding. The cost imposed here is the following: if the realization of γ is such that the optimal tariff is above the agreed-upon weak binding for normal times but below the strong binding for exceptionally high realizations of political pressure, the government must choose between applying the lower weak binding and the precise escape-clause tariff. In this case, there are welfare losses from implementing a sub-optimal tariff level that are not present if the escape clause tariff is a weak binding.

When γ is endogenous, the government is not subject to such random, unpredictable realizations of political pressure. It can avoid such costs by setting the escape clause tariff precisely at the level the lobby will find optimal to ask for; it thus avoids the mechanism that allows for incentive compatibility as well. In addition, given that the lower, normal binding could be set optimally for the government, the government only stands to lose from entering into a trade agreement with such an escape clause.

[23] Notice that the ex-post rent-seeking that creates this ex-ante loss is different in the two cases. With exogenous shocks, the government increases its welfare through the terms-of-trade channel. With endogenous political pressure, the lobby extracts the rents.

This is, again, assuming that there is no exogenous source of political shocks for which flexibility is desired.

Thus, in this case the strong binding does not create an incentive-compatibility-inducing cost, but again the central problem is that of lobbying incentives. This could explain, as Bagwell and Staiger (2005) point out, why the WTO does not incorporate strong bindings for the escape clause.

4.2 Escape Clauses with Side Payments

Suppose instead that the use of the escape clause must be accompanied by a side payment when the higher tariff is applied. In efficiency terms, this will only redistribute surplus from the trading partner who invokes the escape clause to the partner whose goods are targeted by the higher tariff. This is not entirely realistic as cash transfers are rarely observed in the WTO and other trade agreements; instead compensation is in the form of retaliatory tariffs, which are not efficient.[24]

Recall that the transfer function must satisfy two incentive compatibility conditions: the static condition that makes it worthwhile to truthfully reveal one's true γ, and the repeated-game incentive constraint required for self-enforcement. Given these requirements, Bagwell and Staiger (2005)'s Proposition 5 establishes that an appropriate transfer scheme can make a trade agreement with an escape clause incentive compatible.

Given the limited nature of the result in Section 3.2.2, for the case of endogenous γ I restrict attention to economies in which the jointly optimal weak binding is supportable. The conditions given in Lemma 1 of Bagwell and Staiger (2005) are not materially changed by substituting endogenous γ for exogenous γ, so incentive compatibility in the static sense is ensured.

It is the repeated-game, or off-schedule, constraint that is significantly altered. The new element compared to self-enforcement without the escape clause is that the government can cheat on both its tariff and its transfer payment. With no lobby, the Bagwell and Staiger result shows that this temptation can be overcome; the question is whether the presence of a lobby makes this more difficult.

The answer is that it does not. Assuming the lobby represents a negligible share of the population, the lobby does not bear the cost of the transfer. In fact, because it receives all the benefit of the tariff increase under the escape clause with none of the burden of paying for it, the lobby is much better off

[24]Note also that the WTO Safeguards agreement has a dynamic use constraint but removes the requirement for compensatory action in the first three years.

under the trade agreement with escape and transfers than the trade agreement without escape.

Here, we have a mechanism that is incentive compatible despite the presence of lobbying. And although the burden of paying for the transfer falls on others in the economy, at least the trading partner is compensated. Here the government is truthfully revealing the level of political pressure it faces, but that pressure is created by endogenous forces that are intensified by the existence of the escape clause. The escape clause is incentive compatible, but again the spirit of the escape clause is not upheld because the high binding is—always—used to accommodate pure rent-seeking instead of invoked only when necessary to accommodate a political shock.

In the next section, I turn to the implications for the structure of the WTO procedures for administered protection, and the escape clause in particular, in a more realistic setting where both exogenous political shocks and endogenous lobbying are present.

4.3 Escape Clauses with both Exogenous and Endogenous Political Pressure

When γ is exogenous, the purpose of the escape clause is clear: it improves welfare in expectation by allowing the government to apply a higher tariff when the realization of γ is particularly high. In this case, the government would suffer significant welfare losses from abiding by the lower, normal tariff binding, and may find its interests are better served by abrogating the trade agreement if no escape were permitted.

There is no such benefit when political pressure is purely endogenous. All political pressure can be anticipated by the government and accounted for in the normal binding, so any higher tariff provided for escape would either not be used or would reduce government welfare by encouraging excess political pressure in the case where the trade agreement tariff is being employed to reduce lobbying.

In reality, it is likely that both exogenous shocks and endogenous forces contribute to the pressure to which policy makers are subject. Thus, the need for flexibility that derives from the purely exogenous case remains and we would like to know if it is possible to implement an escape clause in the face of the additional endogenous source of political pressure.

So we go back to the general formulation where γ is a function of both lobbying effort e and exogenously-determined events s that create political pressure as in Maggi and Staiger (2011). Let us

take a simple case where the political pressure from the two sources are additively separable so that $\gamma(s,e) = \gamma(s) + \gamma(e)$. Various interpretations are possible, including that some part of $\gamma(s)$ derives from lobbying associated with the exogenous shock, while $\gamma(e)$ is pure rent-seeking. Assume the interesting case that $\gamma(\underline{s}) < \gamma(\overline{s}) < \gamma(e^L)$; that is, the optimal political economy parameter from the lobby's point of view is greater than that which results from even the highest value of the exogenous shock variable. This implies that the lobby has the incentive for all realizations strictly below $\overline{s}$ to add pressure to that which comes directly from exogenous sources.

Imagine first that s and its mapping $\gamma(s)$ are completely unverifiable so as to make the analogy to the exogenous shocks examined above complete. When the realization of the shock is high, the government will report the high shock and apply the escape clause tariff. But when the shock is low, the lobby will exert effort so that the sum of $\gamma(s)$ and $\gamma(e)$ equals $\gamma(\overline{s})$.

Proposition 3 (Ineffectiveness of Political Criterion for Escape Clause)**.** *Assume $\gamma(s,e)$ is additively separable in s and e with s and e independent. If an escape clause conditions on $\gamma(s,e)$ and the lobby's preferred tariff is higher than the escape clause binding, the lower "normal" tariff binding will never be applied.*

From the point of view of maximizing the political welfare of the governments, this is only problematic if the governments' ex-ante welfare is reduced by excess lobbying.

Given that the intent of the escape clause is to provide flexibility for high realizations of $\gamma(s)$, we see that the presence of endogenous lobbying can easily destroy its efficacy as the lower binding will never be used. The water in the escape clause will be filled in by endogenous political pressure.

This is not a problem of incentive compatibility. Similar to Beshkar (2010b), it can be shown that a dispute settlement body that provides an independent signal about the value of $\gamma(s,e)$ on which the governments condition punishments for misreporting can make truth-telling incentive compatible. That is, a government will not over-report its political-economy pressure in order to impose a terms-of-trade externality on its trading partner. But this is of little consequence because the political-economy parameter will always take on its highest value.

Given the inability of achieving the first best in this environment, what can be done? Unless political pressure that comes from a shock can be distinguished from political pressure that is purely rent-seeking, there appears to be little hope that the two can be disentangled through the investigation

of a body such as the WTO's Dispute Settlement Body. 'Costly state verification' as in Beshkar and Bond (Forthcoming) would help only if it could separately verify the part of γ that comes from shocks. This seems prohibitively difficult in practice and, in fact, the Dispute Settlement Body does not appear to take into account political conditions at all in its rulings.

It seems plausible that this kind of dynamic is the reason that use of the WTO Safeguards are predicated on verifiable economic indicators–the s's. This would appear to be the only way to prevent lobbies from exploiting the escape clause for uses for which it was not intended. However, once a shock has occurred, given that the Dispute Settlement Body cannot distinguish between $\gamma(s)$ and $\gamma(e)$, determining the tariff that should be applied could only be done if (a) the Dispute Settlement Body has the mapping $s \to \gamma$ *and* this strong form of separability holds. These conditions seem unlikely to be met in reality and we observe, again, that the Dispute Settlement Body makes no attempt to determine the political mapping. Without this information, it thus can only certify the legitimacy of a Safeguard measure and perhaps the level of tariff that is necessary to counteract s. It cannot determine the correct level at which the Safeguard measure should be applied for the purposes of matching the applied tariff to the political pressure felt by the government.

In the next section, I turn to the kind of escape clause that is both implementable and able—at least in some cases—to address shocks without encouraging rent-seeking.

4.4 An Escape Clause For Endogenous Politics

In this world that is far from first best, I next demonstrate how a WTO-style escape clause can allow flexibility in the face of fundamental shocks s while discouraging lobbyists from using the shock as cover for rent-seeking behavior. The timeline is as follows:

1. The government sets the trade agreement tariff τ_e^F cooperatively. I assume this is a weak binding. The superscript F denotes the environment with flexibility to deal with shocks.

2. The exogenous shock s is realized. Its level is assumed costlessly verifiable for simplicity.

3. The lobby chooses its effort level e^F.

4. The government chooses the applied tariff level from among τ_e^F, $\tau(s)$ and $\tau^B(\gamma(s, e^F))$.

I take the higher, 'escape' tariff $\tau(s)$ to be continuous. If the government applies τ_e^F, implementation of the agreement goes on as before. Consistent with the WTO Agreement on Safeguards, the government can apply the tariff that is necessary to remedy the economic injury—not necessarily equal to the political injury—caused by the shock, $\tau(s)$, with no retaliation for three periods. If the government applies a tariff that is higher than either τ_e^F or $\tau(s)$, it will choose its myopic best response to the pressure it experiences. I label this tariff $\tau^B(\gamma(s, e^F))$, where e^F must be high enough to give the government incentive to break the trade agreement in the absence of external enforcement.

This is a violation of the trade agreement even in the presence of the safeguard and incurs retaliation. It is a violation of the agreement because the applied tariff level is higher than is needed to remedy the injury caused by the shock; the WTO Agreement on Safeguards instructs that "A Member shall apply safeguard measures only to the extent necessary to prevent or remedy serious injury and to facilitate adjustment" (Article 5.1).[25]

To see how such a scheme works in the context of repeated-game enforcement, we look to the incentive constraints of the government and lobby. I follow Buzard (2016) by using limited reversions to the stage-game Nash equilibrium outcome. For ease of analysis, I use a punishment length of two periods. This implies that a country would return to the agreement either after applying a valid escape clause for three years or after violating the agreement.

The government's incentive constraint is given by

$$\begin{aligned}\left[1+\delta+\delta^2\right]\left\{W_x(\gamma(s,0),\tau(s))+W_x^*(\tau_e^F)\right\} \geq \\ W_X(\gamma(s,e^F),\tau^B(\gamma(s,e^F))+W_x^*(\tau_e^F)+\left[\delta+\delta^2\right]\left\{W_X(\gamma(s,e^N),\tau^N)+W_x^*(\tau^N)\right\} \quad (10)\end{aligned}$$

Label $\overline{e}$ the level of e^F that is just high enough to cause the government to throw the trading relationship into dispute. We use $\overline{e}$ in the lobby's constraint, in which the lobby optimally exerts no effort if the government applies the safeguard tariff $\tau(s)$:

$$\left[1+\delta+\delta^2\right]\pi_X(\tau(s)) \geq \left[1+\delta+\delta^2\right]\{\pi_X(\tau(\gamma(s,\overline{e}))-\overline{e}\} \quad (11)$$

[25]The paragraph goes on to give even more clarification: "If a quantitative restriction is used, such a measure shall not reduce the quantity of imports below the level of a recent period which shall be the average of imports in the last three representative years for which statistics are available, unless clear justification is given that a different level is necessary to prevent or remedy serious injury."

Depending on the level of s and the properties of $\gamma(s, e)$, the government may choose to set the trade agreement tariff in the presence of an escape clause (τ_e^R) so that in some cases the lobby's incentive constraint is violated. This would lead to the government's constraint being violated as well, creating a dispute when the government applies the tariff $\tau^B(\gamma(s, e^F))$.

One important outcome *does not* occur in this environment: lobbies do not use the escape clause as cover for rent seeking. The government may use the escape clause to provide extra protection to compensate for a shock. This provides a looser incentive constraint than in the absence of the escape clause and improves self-enforceability of the agreement. Or the lobbies may still find it in their interest to exert effort to encourage the government to provide this higher level of protection $\tau(\gamma(s, e^F))$. This will provoke a dispute, but the protection afforded by the higher tariff will not be hidden behind the escape clause. So an escape clause for the purposes of providing breathing room from exogenous shocks *is* possible.

It still does not seem feasible to provide this flexibility at precisely the level that the shock impacts the government's preferences $\gamma(s)$ if the WTO does not know the mapping from s to γ. What's more, this may provide an answer to why Safeguard measures have fallen out of use.[26] If the real purpose is to provide an outlet for political pressure, I have demonstrated above that the current WTO-style Safeguards rules seem designed explicitly to discourage such rent-seeking behavior. Thus if other measures such as Anti-Dumping Duties are more susceptible to manipulation, it seems natural that lobbies' efforts would migrate there.

5 Conclusion

I have shown that accounting for endogenous lobbying has important implications for the design of trade agreements. For instance, tariff caps may be used alternatively to reduce lobbying activity, or to incentivize lobbies to remain active after a trade agreement is in place.

The addition of the lobby can make it harder to sustain cooperation and complicates the incentive compatibility problem associated with both self-enforcement and the use of escape clauses. The temptation for lobbies to exploit the opportunity presented by an escape clause provides a justification for the WTO requirements that verifiable economic conditions are met in order to legally invoke these

[26] This is by no means the only proposed explanation. See Bown (2002b) and Sykes (2003) for example.

protections.

I introduce a government utility function that incorporates endogenous political pressure into the standard Baldwin-style government objective function to demonstrate that it may be in even a politically-motivated government's interest to use a trade agreement to restrain political activity. The fact that the WTO Safeguards Agreement replaced compensation in the first three years of the invocation of a safeguard with a dynamic use constraint is consistent with the idea that the organization and the governments that constitute it are working to reduce rent seeking by lobbies. Section 4 demonstrates that lobbies do not care about the compensation since the costs do not fall on them, whereas a dynamic use constraint directly affects their ability to receive protection in the future.

There are many exciting avenues to extend this work. This simple framework demonstrates a tractable way to introduce endogenous political pressure into many of the important questions that have been and are currently being explored concerning the design of trade agreements and the institutions that facilitate them.

Taking into account the interactions between multiple lobbies, the influence of WTO rules, and differences in the γ functions across industries—that is, in how political pressure translates into weight in the policy-making process—seems like an important and interesting avenues for further study.

In particular, here there is no scope for the government to encourage lobbying above the level that is optimal from the special interest group's point of view; adding additional lobbies may create insights to this effect. There is also strong potential to gain insights concerning very realistic dynamics between political and economics shocks and lobbying, especially insofar as they impact questions of the choice between various forms of protection over time.

As in Zissimos (2007), it would also be interesting to compare the Nash-reversion punishment to punishment via 'withdrawal of equivalent concessions,' as it appears on the face of it that this environment may provide a justification its use. The intuition is the following: Buzard (2016) shows that the lobbying effort required to cause the government to enter into a dispute is higher than the Nash equilibrium effort levels. Then the tariffs during a dispute are also higher, and punishment at this higher level would be more severe than Nash—both for the government and the lobby.[27]

[27] Beshkar (2010a) shows that when one assumes that utility is not transferable between countries as has become common in the literature, the optimal mechanism involves less-than-proportional retaliation against parties who have defected from the agreement. Martin and Vergote (2008) demonstrate that future punishment provides for higher welfare than

6 Appendix

Unilateral and Joint Welfare Maximized at same γ:

Starting with the non-cooperative maximization problem with respect to γ:

$$\max_{\gamma} W_x(\gamma, \tau) + W_y(\tau^*)$$

The first order condition is

$$\frac{\partial W_x}{\partial \gamma} + \frac{\partial W_x}{\partial \tau}\frac{\partial \tau}{\partial \gamma} = 0$$

In an envelope-theorem style result, because the Nash tariff is the result of the government's optimization with respect to τ, $\frac{\partial W_x}{\partial \tau} = 0$ so that the first order condition reduces to $\frac{\partial W_x}{\partial \gamma} = 0$.

Turning to the maximization of joint welfare in the trade agreement, we have

$$\max_{\gamma} W_x(\gamma, \tau) + W_y(\tau^*) + W_x^*(\tau) + W_y^*(\tau^*)$$

The first order condition is

$$\frac{\partial W_x}{\partial \gamma} + \frac{\partial W_x}{\partial \tau}\frac{\partial \tau}{\partial \gamma} + \frac{\partial W_x^*}{\partial \tau}\frac{\partial \tau}{\partial \gamma} = \frac{\partial W_x}{\partial \gamma} + \left[\frac{\partial W_x}{\partial \tau} + \frac{\partial W_x^*}{\partial \tau}\right]\frac{\partial \tau}{\partial \gamma} = 0$$

Here, it is the efficient joint tariff that is chosen, and it is chosen precisely by setting the term in brackets equal to zero so that we have the first order condition simplifying to the same expression as in the unilateral case. ■

contemporaneous punishment when governments are sufficiently patient. Indeed, they show that retaliation is a necessary feature of any efficient equilibrium in this environment. Hungerford (1991) and Riezman (1991) also consider the impact of different assumptions about reactions and timing of punishments for deviations from agreements.

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