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Endogenous Politics and the Design of Trade Institutions

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Abstract

Political pressure is undoubtedly an important influence in the formulation of trade agreements and the institutions that govern them. Much of the literature that speaks to the design of trade policy institutions takes the political pressure that governments face as resulting from an exogenous, stochastic process. This paper shows that when political pressure arises endogenously, important results may be overturned and new insights into the motivation for features of the trade agreements we observe and rules of organizations such as the WTO come to light. Developing a model that integrates both exogenous and endogenous political pressure and taking a general approach to the government objective function, I show that governments may want to use tariff caps both to force special interest groups to continue lobbying after a trade agreement is signed and to reduce the magnitude of that lobbying effort. The presence of endogenous politics can also destroy the ability of an escape clause as traditionally defined in the literature to provide flexibility in times of large negative political shocks when lobbies use the flexibility to seek rents. This can explain why the use of WTO Safeguards are conditioned on measurable economic indicators.

1 Introduction

Much of the work on the political economy of trade agreements focuses on questions of the optimal design of trade agreements, trade agreement negotiations, and trade dispute settlement that arise in the presence of asymmetric information about shocks to an exogenous political economy parameter. The

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assumption that political economy forces are entirely driven by exogenous forces is a rather drastic simplifying assumption. Do the predictions of our models hold up if this simplifying assumption is lifted?

One of the basic ideas that emerges from this literature is that in the presence of asymmetric information about the strength of the ex-post political economy shocks, it is often advantageous to grant governments a period of relief from trade commitments. That is, one would rather allow a short period of "escape" from the agreement rather than have the agreement abandoned forever because domestic political opposition is temporarily too strong to be resisted.

This is an intuitively appealing story, but it turns out that the logic can break 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. But if a 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.

This is one example of a design question whose answers are sensitive to assumptions about the endogeneity of political pressure. In order to examine this question and others, I use a model that is comparable to Bagwell and Staiger (2005), adding an endogenously-determined element to their exogenously-determined political economy weights in a repeated-game setting. Because of its tractability, this model can address a wide range of institutional design questions while also allowing endogenous politics to be taken into account.[1]

I first establish the baseline case with tariff caps and no escape clause. Here, I find that 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. As in Maggi and Rodríguez-Clare (2007), I show that one of the uses of tariff caps is to incentivize the lobby to engage in the political process after the trade agreement is in place.

[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 (2015) features a repeated-game model similar in spirit to the model under consideration here but focusing on questions of optimal punishments when the government has a separation-of-powers structure.

This, perhaps, provides an explanation for the ubiquity of tariff caps. 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.[2]

In order to make this point clear, I compare welfare under the standard Baldwin (1987)-style government objective function and a similar, fully-weighted version of the government's objective function. At issue is the fact that the standard government objective function is everywhere increasing in political pressure. The objective function use in the foundational work in the endogenous political economy of trade, Grossman and Helpman (1994) and its extension to trade agreements in Grossman and Helpman (1995) is also everywhere increase in political pressure. This leads inexorably to the conclusion that governments do not want to discourage special interest groups from exerting pressure except in special cases such as those demonstrated by Maggi and Rodríguez-Clare (2007) and Mitra (2002).

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 many environments.[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.

In the main example of this paper, I show that the same combination—endogenously-determined political pressure and a general approach to the government's objective function—can explain 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—

[2]Both points extend results from Maggi and Rodríguez-Clare (2007) to the case of perfectly immobile specific factors considered in this paper. 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. The results with ex-ante lobbying are available from the author upon request.

[3]In the environment 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.

pressure groups would simply exert more pressure and the Safeguard clause could not play the escape-providing role for which it was intended. If the purpose of contingent protection measures is actually to provide a political safety valve, this could provide an explanation for the infrequency with which safeguards are invoked under the WTO, as I argue that the WTO's escape clause has been designed to provide relief only from economic shocks.

Through the lens of these examples, one can see that modeling choices concerning both the source of political pressure and the form of governments' political objective function 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, 2015) in which the impact of the political economy parameter on the shape of the objective function is not crucial, there may be no loss in employing the simple form. However, for other questions that directly involve the government maximizing with respect to political pressure, a more general treatment may be prudent.[4]

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 government 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 (2012) extend the theory to an environment with asymmetric country sizes with costly state verification and show that tariff caps and escape clauses

[4]Note that, although Grossman and Helpman (1994) provide microfoundations for one particular Baldwin (1987)-style objective function, it is a very specific form with fixed weights in which $1 + a$ is attached to the surplus of groups who lobby, and a to the surplus of those who don't lobby. This cannot microfound a flexible model as in Long and Vousden (1991) in which weights depend on lobbying activity or in which weights are the result of shocks.

can both emerge endogenously in optimal trade agreements. Beshkar, Bond, and Rho (2014) 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 DSB as a non-binding arbitrator can assist governments in self-enforcing their trade agreements.

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

I employ a two good partial equilibrium model with two countries: home (no asterisk) and foreign (asterisk). The countries trade two goods, X and Y, where P_i denotes the home price of good $i \in \{X, Y\}$ and P_i^* denotes the foreign price of good i.

The fundamentals here are chosen to match those of Bagwell and Staiger (2001, 2005). Home country demand, supply and profits are given by $D(P_i) = 1 - P_i$, $Q_X(P_X) = \frac{P_X}{2}$, $Q_Y(P_Y) = P_Y$, $\Pi_X(P_X) = \frac{(P_X)^2}{4}$, and $\Pi_Y(P_Y) = \frac{(P_Y)^2}{2}$. Foreign is taken to be symmetric.

This implies Home-country imports of X and exports of Y of $M_X(P_X) = 1 - \frac{3}{2}P_X$ and $E_Y(P_Y) = 2P_Y - 1$, with foreign imports of Y and exports of X given by $M_Y^*(P_Y^*) = 1 - \frac{3}{2}P_Y^*$ and $E_X(P_X^*) = 2P_X^* - 1$. With the only trade policy instruments being tariffs on import-competing goods, world prices are $P_X = P_X^W + \tau$, $P_X^* = P_X^W$, $P_Y^* = P_Y^W + \tau^*$, and $P_Y = P_Y^W$. Market clearing implies that world and home prices of X are $P_X^W = \frac{4-3\tau}{7}$ and $P_X = \frac{4+4\tau}{7}$, symmetric for Y.

As is standard in the literature, I assume that the production of each good requires the possession of a sector-specific factor that is available in inelastic supply and is non-tradable so that the income of owners of the specific factor is tied to the price of the good in whose production their factor is used.

Figure 1: Extensive Form

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 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.[5] 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 as follows. 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

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

where CS is consumer surplus, π represents profits, $\gamma(s,e)$ is the weight placed on profits (producer

[5] Adding a pro-trade lobby for the exporting industry would serve to strengthen some results.

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

surplus) in the import-competing industry, s is an exogenous state variable, e is lobbying effort, 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 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.

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

$$U_{\mathrm{L}} = \pi(\tau(\gamma(s,e))) - e \tag{2}$$

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

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.[8] $\gamma(s,e)$ is assumed to be private information of the government, with specifics about its distributions given below. 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. This process therefore maximizes the joint payoffs produced by the trade agreement:

$$W(\gamma(s,e),\gamma^*(s^*,e^*),\tau,\tau^*) = W(\gamma(s,e),\tau,\tau^*) + W^*(\gamma^*(s^*,e^*),\tau,\tau^*) \tag{3}$$

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

[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. An isomorphism can be made between the two forms as discussed in Buzard (2014).

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

2.1 Nash Tariffs and Internationally Efficient Tariffs

The home government's welfare is $W(\gamma(s,e),\tau,\tau^*) = W_X(\gamma(s,e),\tau) + W_Y(\tau^*)$, where

$$W_X(\gamma(s,e),\tau) = \frac{9}{98} - \frac{5}{49}\tau - \frac{34}{49}\tau^2 + \frac{1}{98}\gamma(s,e)\left[8 + 16\tau + 8\tau^2\right]$$
$$W_Y(\tau^*) = \frac{25}{98} - \frac{3}{49}\tau^* + \frac{9}{49}(\tau^*)^2$$

$W_X(\gamma(s,e),\tau)$ 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.

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^*. As there are no interactions between τ and τ^*, the government simply maximizes $W_X(\gamma,(s,e),\tau)$ and sets the non-cooperative tariff

$$\tau^N(\gamma(s,e)) = \frac{8\gamma(s,e) - 5}{68 - 8\gamma(s,e)}. \tag{4}$$

I refer to this as the Nash tariff because it is the result of Nash equilibrium in the non-cooperative game between the governments. τ^N is increasing in γ and the second order condition is satisfied for all values of $\gamma < 17/2$. Because $\gamma = 7/4$ is enough to achieve the prohibitive tariff of $1/6$ I assume that this condition is satisfied in equilibrium.

In order to derive the jointly efficient tariff choice—that is, the tariff that maximizes the joint welfare of the home and foreign government, we also need the welfare of the foreign government. We can write $W^*(\gamma^*(s^*,e^*),\tau,\tau^*) = W_Y^*(\gamma^*(s^*,e^*),\tau^*) + W_X^*(\tau)$, where

$$W_Y^*(\gamma^*(s^*,e^*),\tau^*) = \frac{9}{98} - \frac{5}{49}\tau^* - \frac{34}{49}(\tau^*)^2 + \frac{1}{98}\gamma^*(s^*,e^*)\left[8 + 16\tau^* + 8(\tau^*)^2\right]$$
$$W_X^*(\tau) = \frac{25}{98} - \frac{3}{49}\tau + \frac{9}{49}(\tau)^2.$$

The internationally efficient home tariff is the τ that maximizes $W(\gamma(s,e),\tau,\tau^*)+W^*(\gamma^*(s^*,e^*),\tau,\tau^*)$. Since government welfare in both countries is additively separable in τ, this is equivalent to maximizing $W_X(\gamma(s,e),\tau) + W_X^*(\tau)$. The solution to this problem is the internationally efficient tariff

$$\tau^E(\gamma(s,e)) = \frac{4\left[\gamma(s,e) - 1\right]}{25 - 4\gamma(s,e)} \tag{5}$$

The second order condition is satisfied for $\gamma < \frac{25}{4}$, so again for all values of γ that lead to a non-prohibitive tariff.

2.2 Political Objective Functions and the Role of Trade Agreements

When political pressure is determined endogenously, a government can predict the political pressure it will face. I argue below that in some cases a government may want to use a trade agreement to alter lobbying incentives. If this is true, then the perceived role that trade agreements can play is influenced by the choice of government objective function.

Let's begin with the Baldwin (1987)-style government objective function that is most common in the recent literature on trade agreements, specialized to the case of endogenous pressure only.

$$W(\gamma(e), \tau, \tau^*) = CS_X(\tau) + \gamma(e) \cdot \pi_X(\tau) + CS_Y(\tau^*) + \pi_Y(\tau^*) + TR(\tau) \tag{1}$$

The government chooses τ according to Equation 5 when setting tariffs in the context of a trade agreement. The government knows that this trade agreement tariff will impact lobbying incentives and therefore the realization of $\gamma(e)$ at the applied tariff-setting phase. We want to know how $\gamma(e)$ affects the government's welfare so that we can see how the desire to manipulate lobbying incentives may influence the government's choice of trade agreement tariff.

Envelope-theorem style results imply that the first order condition in 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 1, government welfare is maximized when γ takes on the highest value achievable.

This can be seen in Figure 2, which displays a graph of the partially weighted government welfare function from Expression 1. Note that the graph is in terms of tariffs, which are monotonically increasing in γ. You can see that from $\tau = 0.05$—the tariff the home government optimally sets when making unilateral policy with no political pressure—government welfare steadily increases as the trade agreement tariff increases. This is because the governments can expect that ex-post political pressure will increase in the trade agreement tariff, and government welfare increases everywhere in political pressure.

This result that government welfare is strictly increasing in the political pressure parameter would seem to be related to the fact that, although γ is often referred to as a "political economy weight,"

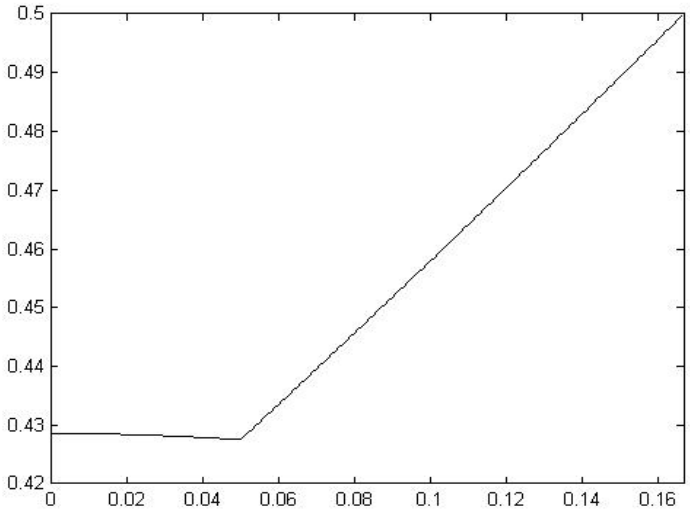

Figure 2: Government Welfare with Partially Weighted Objective Function

Expression 1 is only partially weighted. That the extra importance given to profits of importers when γ increases is pure additional welfare with no concomitant reduction elsewhere may be an assumption worth weakening, particularly in the context of endogenous political activity.

One alternative formulation for the government objective function is one in which γ is a true weight in the following straightforward sense:

$$\frac{1}{4+\gamma(e)}CS_X(\tau)+\frac{\gamma(e)}{4+\gamma(e)}PS_X(\tau)+\frac{1}{4+\gamma(e)}CS_Y(\tau^*)+\frac{1}{4+\gamma(e)}PS_Y(\tau^*)+\frac{1}{4+\gamma(e)}TR(\tau) \quad (6)$$

See the Appendix for the mathematical derivations corresponding to Figure 3. They show that, particularly for the trade agreement tariffs, government welfare first declines and then increases, with the minimum value occurring around $\tau = 0.057$ and $\gamma = 1.05$. The maximum still unquestionably occurs at the maximum value of γ, which leads to the prohibitive tariff of $\frac{1}{6}$. But if a government's objective function is closer to Expression 6 than Expression 1, the government may be interested in using the trade agreement to manipulate the lobby's behavior and therefore the political pressure that it experiences.

Whether or not the optimal trade agreement would set a tariff cap aimed at reducing lobbying depends on the lobby's incentives, which depends in turn on the shape of $\gamma(e)$. Let's look at two parameterizations in a simple family of functions for $\gamma(e)$ that demonstrate drastically different out-

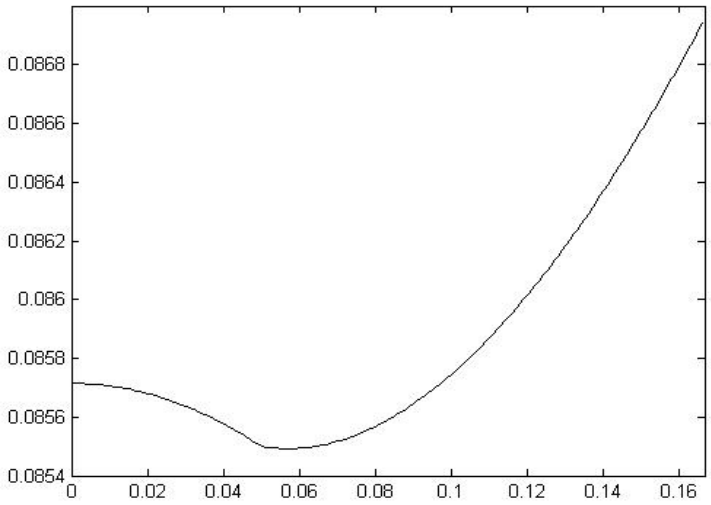

Figure 3: Government Welfare with Weighted Objective Function

comes.

I begin with $\gamma(e) = 1 + e^{.1}$. With no trade agreement, the lobby maximizes its net profits by choosing $e = 0.0016$, which results in $\gamma = 1.525$ and a Nash tariff of 0.129. Import-competing producer (net) profits are 0.1025, while government welfare is 0.0862. Because joint government welfare is convex in the tariff, the solution will be at a corner: either at $\tau^R_{W,e} = 0$ or at the highest level for which the lobby will exert effort, i.e. the Nash tariff. Since joint welfare at the zero tariff is 0.0857, the tariff cap is set at the trivial level of the non-cooperative Nash tariff.

Here, given the way in which lobbying effort is translated into political support as represented by γ, the government cannot improve its welfare by manipulating lobbying incentives. Discouraging lobbying would reduce welfare; in this parameter range, the government's interest is solely in encouraging lobbying effort, and there is nothing it can do in this regard.

This example stands in contrast to one in which $\gamma(e) = 1 + e^{.3}$. With no trade agreement, the lobby maximizes its net profits by choosing $e = 0.0010$, which results in $\gamma = 1.126$ and a unilateral tariff of 0.068. Import-competing producer (net) profits are 0.0921, while government welfare is 0.0855. Since joint government welfare is higher at free trade, the trade agreement will set $\tau^R_{W,e} = 0$, profits decrease to 0.0816, and government welfare increases to 0.0857.

In this case, again the government does not have means to encourage any additional lobbying, but

it can improve its situation by discouraging lobbying. By setting a tariff cap of zero—assuming the conditions for self enforcement outlined in Section 3.2.2 are met—the government can use the trade agreement to improve welfare by changing lobbying incentives and therefore the political pressure it encounters. The stark prediction that the best the government can do is to set the trade agreement to zero would be softened in an environment such as that in Section 4.3 where there are both endogenous and exogenous sources of political pressure or with a government welfare function that has an interior global maximum in γ. A candidate for the government objective function in which the maximum is strictly interior is one in which returns to lobbying decrease as tariffs increase as in Ethier (2012). In the current model, one would take γ to be a decreasing function of τ. This implies that government welfare must eventually decrease in γ, providing for the required concavity in γ.

With the fully-weighted welfare function, we see that the trade agreement is employed to different ends depending on $\gamma(e)$. If the lobby's ability to make an impact on the political process is strong enough, the government will be chiefly concerned with the profits of the import-competing industry and will use the trade agreement solely to internalize the terms-of-trade externality. However, if the lobby's impact is below a given threshold, the distortions that protection create are weighed more heavily and the government will use the trade agreement to rein in lobbying activity.

I do not argue that the government welfare function in Expression 6 perfectly represents the preferences of those who negotiate trade agreements. I only 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.

Examining these alternatives in combination with endogenous lobbying points out that the idea that trade agreements can function as domestic political commitment devices may be more general than previously demonstrated. It can also 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.

2.3 Exogenous Political Pressure and Incentive Compatibility

In order to compare the results for the case of endogenous political pressure to Bagwell and Staiger (2005) results for exogenous political shocks, I provide the essentials of their setup.

They assume that γ and γ^* are each drawn independently from probability distributions with cumulative distribution functions $H(\gamma)$ with $h(\gamma) = H'(\gamma)$. The support for this probability distribution is $\left[\underline{\gamma}, \overline{\gamma}\right]$ where $\overline{\gamma} < \frac{7}{4}$. They also assume γ and γ^* are private information.

This 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. They provide conditions that guarantee incentive compatibility on page 481.

On a separate note, it is important to make clear that in this strand of the literature, it is 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.

3 Rigid Tariffs with Endogenous Political Pressure

In this section and the next, I demonstrate the implications of taking account of endogenous political pressure on some central design features of trade agreements. I begin by developing some basic results about the design of trade agreements with tariff caps when political pressure is endogenous. I then compare these results to those from from Bagwell and Staiger (2005) for the design of trade agreements when 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 will do 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. The former, which is undoubtedly an important possibility in many institutional settings, is left as an important extension.[9]

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 it is widely agreed that this is unrealistic, this is an important baseline case in which there is no incentive compatibility problem because the contractually-allowed tariff may not vary with γ. Section 3.2 will relax this assumption and require 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.[10] Weak bindings are commonly referred to as tariff caps. When bindings are weak, the 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 can 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 $\tau^R_{W,e}$ for the case of endogenous political pressure, as distinct from τ^R_W in the case of exogenous political pressure. The home government unilaterally maximizes Expression 1 so that the applied tariff is the Nash tariff

[9]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 while answering a different set of questions. Results for the case of ex-ante lobbying are available from the author upon request.

[10]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.

$\tau^N(\gamma(e))$ as long as $\tau^N(\gamma(e)) \leq \tau^R_{W,e}$. Otherwise, it must set $\tau = \tau^R_{W,e}$ since the weak binding $\tau^R_{W,e}$ 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 2. If the lobby's optimal effort level in the unconstrained problem (label it e^L) would lead to $\tau^N(\gamma(e)) > \tau^R_{W,e}$, 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 $e^R_{W,e}$ so that $\tau^N(\gamma(e^R_{W,e})) = \tau^R_{W,e}$.

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 3 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.

We know that the lobby will choose one of two effort levels: its unconstrained optimal effort e^L or $e^R_{W,e}$ in the case that its optimal effort would lead to a tariff level higher than that allowed by the weak binding. 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 in the case with only one import-competing lobby under consideration here.[11]

I assume for simplicity of exposition that the government does not set the tariff binding $\tau^R_{W,e}$ 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. This is in contrast to the case of exogenous political pressure, for which Bagwell and Staiger (2005) show several interesting results. In particular, they find that when governments negotiate 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 $\tau^R_{W,e}$ under the trade agreement is set, notice that it must maximize joint government welfare. As argued in Section 2.1, 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 $\tau^R_{W,e} = \tau^N(\gamma(e))$.

[11] 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.

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 4, which contains the mapping between the political pressure the lobby exerts and the government's unilateral tariff response. We can therefore use Expression 4 to determine the level of e the lobby must exert in order to receive a particular $\tau^N(\gamma(e))$ equal to the tariff cap $\tau^R_{W,e}$. This e is that which is labeled $e^R_{W,e}$ above.

Ex-post lobbying will constrain the governments in that the $\gamma\left(e^R_{W,e}\right)$ they experience will be determined through the unilateral maximization problem in the last stage according to the chosen tariff cap $\tau^R_{W,e}$. The governments get to choose the $\tau^R_{W,e}$ 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 this third-stage maximization problem except it adds foreign government welfare. This implies that $\tau^R_{W,e}$ is (weakly) lower than the unilateral tariff as the terms-of-trade externality is internalized.[12]

A second motive is operative here that is absent in the case of exogenous political pressure: the trade agreement can act as a domestic political commitment device, allowing the home government to manipulate ex-post lobbying incentives. In fact, whenever the cap is strictly below the non-cooperative level, that is when $\tau^R_{W,e} < \tau^N$, the weak binding serves to restrain political pressure whether or not the governments desire it.

On the other hand, if the level of the optimal weak binding $\tau^R_{W,e}$ is strictly positive, the weak binding is at least in part serving to generate political involvement—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

[12]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 do not 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 imposing the terms-of-trade externality on the other, when γ is endogenous, reducing the tariff reduces γ and therefore joint welfare.

explanation of 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.[13]

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.

3.2 Self-Enforcing Trade Agreements

Here I drop 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, 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 is satisfied. We know that 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.'[14]

[13] Note that this is related to a point made by Maggi and Rodríguez-Clare (2007); in their model, tariff caps and exact tariff commitments are equivalent when factors are perfectly immobile as in this model.

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

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 (δ is sufficiently high), 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 γ, γ is determined by a new repeated-game player who has incentives relative to whether the trade agreement is followed or reversion to the non-cooperative Nash outcome takes place.

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. We will see that 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 governments costs and benefits so that the government's optimal trade agreement tariff is invariant to the enforcement conditions. This creates the possibility that the politically-optimal trade agreement tariff may not be self-enforcing.

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 it is sufficiently patient, it will set the same tariff cap.

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

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

where δ is the discount factor assumed common to the government and lobby, $\tau^R_{W,e}$ is the same tariff cap from Section 3.1, and τ^B is the "break" tariff. Any $\tau > \tau^R_{W,e}$ 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 per-period 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. This 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 4 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

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

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, where Bagwell and Staiger (2005) show that sufficiently patient governments can always sustain the optimal trade agreement tariffs. Instead, 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 in 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. That is, the lefthand side is decreasing in δ and the righthand side is increasing in δ, and this relationship holds even taking into account the influence from the government's constraint on e^B as long as e^B is to the left of the lobby's optimal choice of effort. Once e^B passes e^L, $\pi(\tau^B) - e^B$ begins

to decrease and it's possible for the effect of δ on the lobby's constraint to eventually be overturned.

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, so increasing the discount factor makes it more difficult rather than easier to satisfy the lobby's constraint.[15]

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* $\tau^R_{W,e}$.

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 Bagwell and Staiger (2005) in examining a trade agreement with an escape clause by adding a second negotiated binding to the agreement 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, the incentive compatibility constraint now comes into play: a government may gain an advantage by misreporting the level of γ it experiences. In their Proposition 4, Bagwell and Staiger 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.

[15]The essential point underlying this result was first made by Buzard (2015).

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 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, a second, higher cap can only encourage excess, sub-optimal lobbying.

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.[16]

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. As Bagwell and Staiger (2005) point out, 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. They 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

[16]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.

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. 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 really create an incentive-compatibility-inducing cost, but again the central problem is that of lobbying incentives. This could explain, as Bagwell and Staiger 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.[17]

Bagwell and Staiger (2005) show that, again, 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, their 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 lobby makes this more difficult.

The answer is that it does not. Assuming the lobby represents a negligible share of the population,

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

it 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 under the trade agreement with escape than the trade agreement without escape.

Here, we have a mechanism that is incentive compatible despite the presence of lobbying. It makes the lobby exert effort in order to receive the higher level of protection under the escape clause just as in the other mechanism. And although the burden of 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 as will be clarified in the next section, the spirit of the escape clause is not necessarily upheld.

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 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 desire to see 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. There is a large parameter space over which an escape clause could not function in the way it is intended. 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 the high realization.

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, as demonstrated in Section 2.2, 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 [formal result coming soon] 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 DSB. In fact, in its rulings the DSB does not appear to take into account political conditions at all.

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 DSB cannot distinguish between $\gamma(s)$ and $\gamma(e)$, determining the tariff that should be applied could only be done if (a) the DSB 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 DSB makes no attempt to determine the political parameter. 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 $\tau^F_{W,e}$ cooperatively. I assume this is a weak binding and add the subscript F to denote 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 $\tau^F_{W,e}$, $\tau(s)$ and $\tau^B(\gamma(s, e^F))$.

Here I take the higher, 'escape' tariff to be continuous instead of set at a given binding. If the government applies $\tau^F_{W,e}$, 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 injury caused by the shock, $\tau(s)$, with no retaliation for three periods. If the government applies a tariff that is higher than either $\tau^F_{W,e}$, $\tau(s)$, 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 is the minimum lobbying effort that would 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).[18]

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 (2015) 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

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

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 $\tau(s)$:

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

[18]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 chooses to set the trade agreement tariff in the presence of an escape clause $\left(\tau^F_{W,e}\right)$ so that in some cases the lobby's incentive constraint is violated. This would lead to the legislature's constraint being violated as well, creating a dispute.

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. 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 $\gamma(s)$. What's more, this may provide an answer to why Safeguard measures have fallen out of use. 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 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.

As in Zissimos (2007), I also plan 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 (2015) 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.[19]

[19] 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 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.

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 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 protections.

I introduce a fully-weighted government utility function that is a slight modification of 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 enforcement and administered protection.

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. ■

Optimal γ for Weighted Government Welfare Function:

The first order condition for the weighted welfare function in Expression 6

$$\frac{\partial W}{\partial \gamma} = \frac{1}{(4+\gamma(e))^2}\left[-CS_X + 4 \cdot PS_X - CS_Y - PS_Y - TR\right] = 0$$

Examining the expression in brackets:

$$-CS_X + 4 \cdot PS_X - CS_Y - PS_Y - TR =$$

$$-\frac{9 - 24\tau + 16\tau^2}{98} + 4\frac{4 + 8\tau + 4\tau^2}{49} - \frac{7\tau - 42\tau^2}{49} - \frac{9 + 18\tau + 9\tau^2}{98} - \frac{16 - 24\tau + 9\tau^2}{98}$$

$$= \frac{-9 + 32 - 9 - 16}{98} + \frac{24 + 64 - 14 - 18 + 24}{98}\tau + \frac{-16 + 32 + 84 - 9 - 9}{98}\tau^2$$

$$= \frac{-2}{98} + \frac{80}{98}\tau + \frac{82}{98}\tau^2$$

This expression is negative at $\tau = 0$ and increases monotonically with an interior minimum; note the second derivative is strictly positive.

Because τ is an increasing function of γ, this pattern holds for γ as well. $\frac{1}{(4+\gamma(e))^2}$ is positive (and decreasing as a function of γ), so the pattern holds for the derivative as a whole. Thus the FOC delivers a minimum point and the maximum must be at one of the endpoints. Calculations show that $W(\gamma = 1.75) > W(\gamma = 1)$. ■

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