

Heterogeneous Lobbying Effectiveness

What's the Smell of Lobbies' Money? *

Julien VAUDAY †

February 5, 2010

Abstract

This paper proposes an original approach of the lobbying activity that endogenizes the heterogeneity of lobbies' effectiveness. The intuition is that a sector that signals itself as a lobbyist increases the weight of its characteristics on the government policy choice. The main idea is that lobbies' effectiveness has two components, one is passive and the other active. First, under passive effectiveness that passes through the effect of lobbies on a given policy, the standard equilibrium of the literature hold. Second, under active effectiveness that passes through the form of the offer lobbies make to the government, two lobbies exhibiting the same sensitivity to the policy may have different effects on equilibrium policies, contrary to what usually happens in the literature. Not only the similarity of their interests as lobbyists plays, but also the similarity of their effects on the whole economy plays. When applied to endogenous protection, it is shown that a tariff is generally nil under active effectiveness in small open economies, thus giving strong support to the large sectors hypothesis for explaining non nil tariffs. However, lobbying activity has a large leverage effect on the optimal tariff.

J.E.L.: F13,D70

Key-words: Endogenous Policy Decision, Heterogeneous effectiveness, Lobbying

***Acknowledgments:** I would like to thank Fabian Gouret, Didier Laussel, Cuong Levan, Frédéric Robert-Nicoud, Farid Toubal and Vincent Vicard for helpful comments and/or discussions. I also thank seminar participants of the EEA, ETSG, PET and LAGV Days for their comments. The usual disclaimer applies.

†CEPN (UMR 7115) - University of Paris XIII. E-mail: julien.vauday@univ-paris13.fr

1 Introduction

Independently of who or what is influenced, two aspects characterizing the lobbying activity emerge from the literature. First, a special interest common to several agents that induces them to organize to obtain their interest to be favored. Second, the method employed in order to do so. These two aspects are sources of heterogeneity in terms of lobbies' effectiveness. The nature of the special interest as well as the ability to organize and cooperate obviously have an effect on the outcome of the political relationship between the lobbies and the decision maker or body. A lobby may also be more effective under a mode of lobbying compared to another.

It seems however that even after controlling for these aspects, some effectiveness heterogeneity remains among lobbies. There is an unobserved factor that is discriminating and suspects behind this factor are numerous. For instance, the talent of the lobbyist that has been hired by a special interest group may have an effect on the issue of the negotiation. The networking of the CEO's who have been graduated the same year than an important decision maker may increase the effectiveness of each dollar spent in lobbying activity. Many ways through which the lobbying activity may be more or less successful.

So far, the literature has implicitly assumed that all lobbies use the same way to formulate their offer such that they only differ by their identity once controlled for the method employed. This suppresses many dimensions of potential heterogeneity of effectiveness. This paper proposes to endogenize heterogeneity of effectiveness to make appear other sources of effectiveness than those mentioned above. Its object is neither to focus on the quality of the lobbyist nor on the networking activity of CEOs. It deals with the two following questions. First, how to incorporate this heterogeneity factor that looks like unobservable variables in empirical estimations? As many arguments may come to mind when trying to explain this factor, this complicates the establishment of a general effect of heterogeneity. Second, what are the effects of this heterogeneity?

The aim is to differentiate the ability of two lobbies similarly affected by a policy (i.e the same theoretical identity) to obtain the policy they wish. The idea behind this is to show that the

effectiveness emerges from two components or effects (of the offer made by a lobby), one being passive and the other being active. To do this, we propose that what could make the difference between lobbies and thereby what generates the heterogeneous effectiveness on a broad basis is that the way the offer is formulated influences directly the effective contribution. This amounts to endogenize how each lobby formulates its offer. So the offer has two dimensions, its *origin* (who formulates it) and its *form* (the context). In simple words, for instance, asking somebody something nicely or not should also yield a different reaction, and a different outcome. So the passive effect is due to an incentive scheme that depends on the identity of the sender of the offer and the active effect comes from the way the incentive scheme is proposed.

More concretely, the offers of lobbies are first assumed to influence the contributions they will pay only through their effects on the government policy choice; the influence is then *indirect* and is related to the origin of the offer. This is the effect that has already been studied in the literature. Second, the possibility that the formulation of the offer also influences the equilibrium is studied. The consequence is that the offer a lobby makes influences *indirectly and directly* the contribution it will pay, taking into account both dimensions of the offer, the origin and the form.

Hence the key variable of this paper is the offer, also called contribution schedule. The lobbies' welfare maximization with respect to the contribution schedule yields an optimal contribution schedule that is taken into account by the government when setting a policy. The effectiveness does not represent a strategic choice. A firm¹ that is disadvantaged because of this effect can not renounce to it. Renouncing to this amounts to renounce to any lobbying activity. The first part on the indirect influence is then a theoretical exercise which aim is to show that the existing literature has missed one important dimension of lobbying effectiveness.

When direct influence is introduced, it results that not only the contribution schedules are affected but also the level of optimal policies which are not truthful anymore. We show that the direct effectiveness introduces a *social effect*. That is, a lobby cannot ask for something without inducing the government to also overweight the social position of the lobby, or the social

¹The words firm, sector and lobby will be used interchangeably. Indeed, the share of the population the lobbies represent is assumed to be negligible and there is one firm per sector.

effect of the policy the lobby wants to influence. When applied to endogenous protection, except for highly threatened sectors in countries where the policy makers have little concerns for the social welfare, there are no positive protection policies in small open economies². This supports strongly the hypothesis of large sectors, as developed in Broda *et al.* (2008), since it appears that the firms' political activities do not explain positive tariffs in small sectors (that have no market power). A last aspect this result implies is that the relationship between exposure to imports and protection level is not monotonic, thus confirming the findings of Imai *et al.* (2008).

Some papers have dealt with this issue assuming the lobbies' effectiveness is heterogeneous. But most of these papers assume this heterogeneity is given exogenously. Glachant (2007) introduces two differentiated parameters that weight the contributions of lobbies in an environmental political game. Hence, the ranking of these parameters determines which lobby is more effective. Esteban and Ray (2001) and Kohli and Singh (1999) also use similar parameters to differentiate lobbies' effectiveness in order to study rent seeking. More recently, Dekel *et al.* (2009) study the effect of lobbies' differentiated budget constraints and political proximities to decision makers in a sequential lobbying game of vote buying. But in their model lobbies are characterized by diverging preferences over a policy level. Hence, lobbies necessarily differ, *per se*, in terms of preference. Other have explored the possibility of an ex-ante decision to invest in the lobbying activity as in Hillman *et al.* (2001).

This paper will mainly make reference to the endogenous policy literature (Grossman and Helpman, 1994; Mitra, 1999; Bombardini, 2008). Recent developments in this strand are based on a common agency framework (Bernheim and Whinston, 1986). This framework has the particular feature that the effect a lobby has on the equilibrium policy levels, if it faces no opposition, depends uniquely on the sensitiveness of its welfare to this policy. Hence, two lobbies sharing the same welfare sensitiveness exhibit no heterogeneity of effectiveness through their actions as lobbyists.³

²In the sense these economies do not influence world prices in the sector of interest.

³Introducing an opposition of interest between lobbies does not change the story. The possible modifications of heterogeneity of effectiveness this would induce would also come from the identity of all lobbies' members under a common lobbying protocol.

These models are equivalent to add a weight higher than one to the domestic producer surplus of organized sectors in domestic government’s objective functions (See Bagwell and Staiger, 2001, for instance). As foreign producer surpluses are logically not part of the host government objective⁴, foreign lobbies have necessarily a lower influence on domestic policies than their domestic counterparts, *ceteris paribus*. This contradicts recent empirical findings. For instance, Desbordes and Vauday (2007) show that foreign multinational enterprises (MNE) are more influential than pure domestic firms and that they are as influential as domestic MNE on a large sample of developing countries. More recently, Bombardini and Trebbi (2009) suggest that the organizational form of the lobbying, i.e firms alone or through trade associations, modifies the level of protection they obtain. More precisely, trade associations obtain higher protection levels. A last point this study highlights is that influence for trade policy passes mostly through lobbying. Lü *et al.* (2010) also underlines that the effect highlighted in theoretical studies of endogenous protection is too systematic and does not hold in a cross country comparison. This paper shows that lobbying has an effect but that is limited and argues, as suggested by Lü *et al.* (2010), that a positive protection in a small sector is not due to the lobbying activity.

The truthful equilibrium (Bernheim and Whinston, 1986) also implies the relationship between exposure to imports and protection to be monotonic as in Grossman and Helpman (1994)⁵. The higher the effect of the trade policy on the sectors’ welfare, the higher the level of protection of this sector. Hence, the effectiveness of lobbying has nothing to do with the protection level each lobby obtains.⁶ Imai *et al.* (2008) propose to estimate directly this relationship and find no evidence that the Protection For Sale (PFS) model predicts accurately the political equilibrium in the US.⁷ Despite their results, as they put it, should be interpreted carefully, there seems to

⁴At least, not integrally if one takes account of local taxes.

⁵The abbreviation G & H 94 will be used instead of the full names and year.

⁶Or this would mean that a more threatened lobby is more effective. If so, on what basis should we assess the validity of this statement?

⁷In another paper (Imai *et al.*, 2009), they also show that a much simpler model they call “Surge for Protection” in which the government protects industries facing large difficulties has the same predictable power than the PFS model, hence highlighting a social motive for protection. This is not surprising since studies that have estimated the PFS model find a huge value of the weight the government grants to the social welfare with respect to its private revenues. This means the social welfare drives much of the motives for protection, as Imai et al. show it. The model presented in this paper, through this *social* effect could explain that result.

have a non monotonic relationship between the inverse import ratio and the protection. These results, combined with the observation that apparently disadvantaged lobbies such that foreign ones can achieve a greater influence, are probably due to a heterogeneity in effectiveness (or experience) of the lobbying activity.

The remaining of the paper is organized as follows. Section 2 develops the general framework. Section 3 exposes the result linked to a non strategic offer. This offer becomes strategic in section 4 and a comparison between both equilibrium policies is proposed in section 5. The results are interpreted with regard to trade policy in section 6. The last section briefly discusses the results and concludes.

2 General framework

The form adopted in this paper is a sub-game perfect Nash equilibrium. At the first stage, by maximizing their welfare with respect to the contribution schedule, lobbies design a contribution schedule that represents the offer they make to the government. The latter then chooses the optimal policy in the second stage. Finally, in the third stage which is left implicit, firms compete.

As in Ornelas (2005), lobbies are assumed to represent a negligible share of the population. Hence lobbies are only composed by firms. There are no strategic interactions between lobbies through the consumer surplus of the lobbies' members. This implies that an action of a lobby does not directly diminish the welfare of the other lobbies. In addition, we keep from adopting one particular type of competition. Depending on the studied subject, it is more useful to adopt price competition as in Bagwell and Staiger (1999), where they study competition between countries at the GATT tariffs negotiations, or quantity competition as in Ornelas (2005) who studies the strategic implementation of Free Trade Areas or monopolistic competition as in Rebeyrol and Vauday (2008) who develop a political economy framework on regulation adoption.

Lastly, for simplicity, there are n firms/sectors and each firm/sector is assumed to represent one distinct lobby. This however does not alter the generality of the results. We next present a few notations and assumptions used in the paper. Afterwards, the different stages of the model

are developed.

2.1 Basic assumptions

2.1.1 Notations

Let derive a polynomial function $h(\tau_i)$, τ_i being a policy. Its derivative with respect to τ_i , h' , has two components, one that depends on τ_i and an other one that is constant with respect to τ_i . They will be respectively labeled h'_τ and $h'_{-\tau}$. Formally,

$$h(\tau_i) = a + b\tau_i + \tilde{h}(\tau_i)$$

Hence,

$$h'(\tau_i) = b + \tilde{h}'(\tau_i)$$

Then, $b = h'_{-\tau}$ and $\tilde{h}'(\tau_i) = h'_\tau$.

2.1.2 Firms

The welfare of a firm is equal to $W_i = \Pi_i - C_i$, where Π_i is the profit of firm i and C_i , the contribution she pays to the government.

2.1.3 Social Welfare

The social welfare has the following form

$$W = CS + \lambda \sum_i^n \Pi_i + T \tag{1}$$

where CS is the consumer surplus, $\sum \Pi_i$, the producer surplus and T denotes the policy revenues or cost, depending on the type of policy instrument (e.g a subsidy or a tariff). λ is a parameter that measures the “natural” disposition of the government to favor producers. For instance, a

government could decide to protect an industry either because it has connections to the business world, or because this sector represents a lot of workers (hence there would be as many λ s as sectors). Further, we assume that the social welfare is a separable function with respect to each sector.

2.1.4 Government objective function

The government has a linear benthamite objective function given by

$$H = W + \alpha \sum_{i=1}^n C_i(\tau) \quad (2)$$

The parameter α represents the relative preference of the government for private revenues. α can be compared to the coefficient a in G & H (94).⁸

2.2 Political framework

The contribution is *defined* as the primitive of the contribution schedule. The contribution represents what is effectively paid, whereas the contribution schedule represents the rule that allows the government to determine what it will get depending on the chosen policy. Therefore, the contribution schedule is the rule that defines how the contribution evolves with respect to the policy.

Definition 1 *In this paper the contribution schedule is the rule that allows to determine, for each level of policy the contribution the government will get.*

A simple example would be the following: if the rule is 3 millions times the protection level (so the contribution schedule is equal to 3,000,000), the government knows from this simple offer that either it implements a policy of 10 percent and it gets 300,000 dollars, or it implements a 20 percent policy and it gets 600,000 dollars.

⁸In their article, a is the relative weight of the social surplus. Here for analytical purpose, it is assumed that it is the relative weight of the private revenues. Hence $a = 1/\alpha$.

This rule is defined with respect to the contribution: Any complex rule of calculation, contribution schedule, is understood here as the derivative of the contribution with respect to the policy vector.

The contribution schedule is denoted c_{τ_i} . To sum up,

$$C'_i(\tau_i) \equiv c_{\tau_i} \quad (3)$$

Since the contribution is the primitive of the contribution schedule, the former may take an infinity of forms. The contribution is the sum of a constant and a function of the policy vector. Bernheim and Whinston (1986), Grossman and Helpman (1994) and Laussel and Breton (2001), among others, have extensively studied the share of the political rent that occurs through the constant. We aim here at studying ways through which the second component may affect the equilibrium trade policy.

In order to design the optimal contribution schedule, firms take into account the government's reaction to their choices. The model is then solved by backward induction, starting with the government's maximization of the welfare function with respect to the trade policy.⁹

2.3 Government's stage

We assume that the objective function is a sum of the welfare derived from each firm/sector. The objective function of the government with n firms is given thus by:

$$H = \sum_{i=1}^n CS_i(\tau_i) + \lambda \sum_{i=1}^n \Pi_i(\tau_i) + \sum_{i=1}^n T_i(\tau_i) + \alpha \sum_{i=1}^n C_i(\tau) \quad (4)$$

The first order condition is:

$$\frac{\partial H}{\partial \tau_i} = CS'_i(\tau_i) + \lambda \Pi'_i(\tau_i) + T'_i(\tau_i) + \alpha c_{\tau_i} = 0 \quad (5)$$

⁹Since the competition stage is let implicit.

This allows to express the optimal trade policy:

$$\tau^* = \frac{CS'_{-\tau} + \lambda\Pi'_{-\tau} + T'_{-\tau} + \alpha c_{\tau_i}}{(-CS'_{\tau} - \lambda\Pi'_{\tau} - T'_{\tau})/\tau} = \frac{W'_{-\tau} + \alpha c_{\tau_i}}{-W'_{\tau}/\tau} \quad (6)$$

The unique function that is not partitioned is the contribution schedule.

In order to ease the comparison between different government's programs, it is possible to start with the benchmark case without any lobby

Lemma 1 *When no lobbies are active, the optimal program of the government yields an optimal policy τ^* such that*

$$W'(\tau^*) = 0$$

or, equivalently, $W'_{\tau} + W'_{-\tau} = 0$.

Under lobbying, the government's policy choice depends on the firms' proposed contribution schedule. As the next sections emphasize this may modify entirely the objective function of the government.

2.4 Firms' stage

In the first stage, firm i program is

$$\max_{c_{\tau_i}} W_i = \Pi_i - C_i \quad (7)$$

such that:

$$\frac{\partial \Pi(c_{\tau_i})}{\partial c_{\tau_i}} - \frac{\partial C_i(c_{\tau_i})}{\partial c_{\tau_i}} = 0 \quad (8)$$

Each firm maximizes its profit with respect to the contribution schedule itself. As we shall see, this will allow to introduce the intuitive idea that the offers formulated by lobbies influence the

contribution they pay.

2.5 Design of the contribution schedule

As it has been argued before, all lobbies may not have the same influence on the equilibrium policy, all else equal. We propose that modifying a function necessarily modifies its primitive.

The idea behind this is to show that the effectiveness emerges from two components or effects (of the offer made by a lobby), one being indirect and the other being active. What makes the difference between lobbies and thereby what generates the heterogenous effectiveness on a broad basis is that the way the offer is formulated influences directly the effective contribution. This amounts to endogenize how each lobby formulates its offer. So the offer has two dimensions, its *origin* (who formulates it) and its *form* (the context). In simple words, asking somebody something nicely or not should also yield a different reaction, and a different outcome. So the passive effect is due to an incentive scheme that depends on the identity of the sender of the offer and the active effect comes from the way the incentive scheme is proposed.

Concerning the *origin* aspect, this means that the lobby asking for something is identified as representing a given sector which welfare is sensitive in a given measure to the policy. In this model, the theoretical identity that corresponds to what has been done in the previous literature is therefore the derivative of the lobby's welfare with respect to the policy. This dependance on the policy will define the incentive scheme as in Bernheim and Whinston (1986).

The *form* aspect is then aimed at encompassing the way the lobby formulates its offer. Very generally, we will consider that modifying c_{τ_i} , which primitive is by definition the contribution a lobby will pay, should modify C_i . So modifying the form of the offer has a direct effect on the value of the contribution paid, and this is endogenous. This paper then states there are two ways to modify the equilibrium level of the primitive: either this passes through the argument, here the policy vector, or through the parameters of the derivative.

More concretely, the offers of lobbies are first assumed to influence the contributions they will pay only through their effects on the government policy choice; the influence is then *indirect* and is related to the origin of the offer. This is the effect that has already been studied in the

literature. Second, the possibility that the formulation of the offer also influences the equilibrium is studied. The consequence is that the offer a lobby makes influences *indirectly and directly* the contribution it will pay, taking into account both dimensions of the offer, the origin and the form.

Lemma 2 *Around the equilibrium, when firm i designs its optimal contribution schedule, the maximization program is the following*

$$\begin{aligned} \frac{dW_i}{dc_{\tau_i}} &= 0 \\ \Leftrightarrow \frac{\partial \Pi}{\partial \tau} \frac{\partial \tau}{\partial c_{\tau_i}} &= \frac{\partial C}{\partial c_{\tau_i}} + c_{\tau_i} \frac{\partial \tau}{\partial c_{\tau_i}} \end{aligned} \quad (9)$$

The first term of the right hand side is therefore the *form* effect whereas the second one is the *origin* effect. If we consider a function such that $C_i = c_{\tau_i} \tau_i + B$ where c_{τ_i} is a variable that does not depend on τ_i ,¹⁰ we have that the derivative of C_i with respect to τ_i is equal to c_{τ_i} .

In the next section, we show that if we do not take into account the first term, then we find the result of Grossman and Helpman (1994). Then, we will highlight the consequence of taking account of it.

3 Indirect effectiveness

This corresponds to an offer that does not influence the level of the contribution directly. The contribution schedule has then no *direct* effect on the level of the contribution, that is $\frac{\partial C}{\partial c_i} = 0$ in equation (9). In that case, we have that $\frac{\partial \Pi}{\partial \tau} = c_{\tau_i}$.¹¹

Lemma 3 *The optimal contribution set by a firm in order to influence the government follows the rule*

$$c_{\tau_i}^* = \frac{\partial \Pi_i}{\partial \tau_i^*}(\tau_i(c_{\tau_i})) \quad (10)$$

¹⁰This looks like a strong assumption. However, this does not distort the main message.

¹¹In that case, the overall effect of c_{τ_i} passes through τ_i . Hence, the fact c_{τ_i} does not depend on τ_i is not problematic. Assume that the best policy for the firm is τ_b , adding a constant in τ^* is enough to reach the value τ_b .

This is true whatever the strategy the government adopts.

Instead of justifying the truthfulness of the contribution schedule by the fact this is true around the equilibrium policy, as in G & H 94, this paper justifies it by the behavior of lobbies. In the PFS set-up, the truthfulness is assumed locally, i.e around the equilibrium. Here, this is true for every τ .

The derivative of the profit with respect to the policy depends on τ_i that depends on the contribution schedule (from the government stage). Consequently, the optimal contribution schedule is an implicit function. In the remaining of the section, we remove subscripts i in order to ease the reading.

First, in order to allow for comparisons, we derive the optimal policy that corresponds to a locally truthful equilibrium. From equation (6), we obtain the truthful equilibrium result (denoted with the subscript *tf*), using that around the equilibrium $c_{\tau_i} = \frac{\partial \Pi_i}{\partial \tau_i} = \Pi'$:

$$\tau_{tf}^* = \frac{CS'_{-\tau} + (\lambda + \alpha)\Pi'_{-\tau} + T'_{-\tau}}{(-CS'_{\tau} - (\lambda + \alpha)\Pi'_{\tau} - T'_{\tau})/\tau} = \frac{G'_{-\tau}}{-G'_{\tau}/\tau} \quad (11)$$

Where G is the equilibrium objective function of the G & H 94's government: $G = CS + \lambda\Pi + T + \alpha\Pi$.

We shall recall that each derivative with respect to τ_i is a sum of a part that depends on τ_i , labeled Π'_{τ} for instance, and a part that does not depend on τ_i , labeled $\Pi'_{-\tau}$. We extract the

terms c_{τ_i} of power one from the right hand side and obtain the following result:¹²

$$\begin{aligned}
c_{\tau_i} &= \Pi'(\tau) \\
\Leftrightarrow c_{\tau_i} &= \frac{\Pi'_\tau}{\tau} \tau + \Pi'_{-\tau} \\
\Leftrightarrow c_{\tau_i} &= \left(\frac{\Pi'_\tau}{\tau} \right) \frac{W'_{-\tau} + \alpha c_{\tau_i}}{(-W'_\tau)/\tau} + \Pi'_{-\tau} \\
\Leftrightarrow c_{\tau_i} &= \frac{\Pi'_\tau(-W'_{-\tau}) + \Pi'_{-\tau}(W'_\tau)}{G'_\tau}
\end{aligned} \tag{12}$$

Where $W'_{-\tau}$, W'_τ and G'_τ follow the notations exposed above for the social welfare and the government objective function. It is easy to show that if we posit that

$$\frac{\Pi'_\tau(-W'_{-\tau}) + \Pi'_{-\tau}(W'_\tau)}{G'_\tau} = \Pi'_\tau + \Pi'_{-\tau} \tag{13}$$

this only holds for $G'_\tau + G'_{-\tau} = G' = 0$. Moreover, it is easy to check that setting $\alpha = 0$ implies that the program becomes $W' = 0$ (the denominator turns to W'_τ). This is expected since this means lobbying has no incidence on the choice of the government.

Proposition 1 *Under indirect effectiveness, the optimal contribution schedule follows the following rule:*

$$c_{\tau_i} = \Pi'_\tau \left(-\frac{W'_{-\tau}}{G'_\tau} \right) + \Pi'_{-\tau} \left(\frac{W'_\tau}{G'_\tau} \right) \tag{14}$$

As for the optimal policy, when the contribution schedule does not affect directly the contribution, τ^ is equal to the locally truthful equilibrium policy.*

The program of the government is given by: $\frac{W'_\tau}{G'_\tau} G' = 0$. Hence it corresponds to $G' = 0$ or equivalently to $W' + \alpha \Pi' = 0$.¹³

¹²The term $\frac{\Pi'_\tau}{\tau}$ is, by definition, the coefficient of terms depending on τ in the first order derivative divided by a constant equal to the power of τ in the original function. As a consequence, this times τ is exactly the expression of the fact that τ is still present in the right hand side.

¹³Proof is in appendix.

This proposition shows that the difference between a situation with indirect influence and one without lobbying amounts to add the term $\alpha\Pi'$ in the objective program of the government. So the influence of a lobby on the government's program depends uniquely on the effect the policy has on its welfare. However, the contribution a lobby has to pay to obtain the truthful policy level does not uniquely depends on $\Pi(\tau_i)$ but also on $W(\tau)$.

So, this section has shown that despite a different method to solve the model, the solution is a truthful policy combined to a locally truthful contribution schedule. However, the equation (10) is a polynomial with an argument c_{τ_i} . Implicitly, it admits a number of solutions that do not depend on τ that are locally truthful in the sense they are solutions of $c_{\tau_i} = \partial\Pi/\partial\tau$. The power of the polynomial determines the theoretical number of solutions. The power of $G'(\cdot)$ is equal to $\max[\text{power of } W'(\cdot); \text{power of } \Pi'(\cdot)]$.

This method yields then a general contribution schedule, since it holds for every τ . As a consequence, this provides an explanation for the designing of a truthful contribution schedule by lobbies. It is however important to note that if, for any reason, the government is not able to set $\tau = \tau_{tf}^*$, because of a tariff ceiling in the case of a tariff for instance, hence $c_{\tau_i} \neq \partial\Pi/\partial\tau$.

4 Direct effectiveness

We have shown that for a standard function in economics, that is a polynomial, the optimal policy is the truthful one when the contribution schedule has no direct effects on the level of the contribution. However, this is a particular case that induces all lobbies similarly affected by a policy to be strictly equally effective with respect to the policy they obtain through their political relations with the government despite some have to pay more than others. Formally, the difference between the government's program whether a lobby is organized ($G'_i = 0$), or not ($W'_i = 0$), is equal to $\alpha\Pi'_i$, as underlined by proposition 1. Hence, if two lobbies are equally affected by the policy τ , the effect of both lobbies is the same, i.e a dollar spent by these two lobbies has the same effectiveness. In these conditions, lobbies' money has no smell.

Yet, the fact that both lobbies are similarly affected by a policy should not imply that these

two lobbies have the same financial power or have a similar effectiveness in the lobbying activity (think for instance to the case of foreign lobbies evoked in the introduction). We propose that this corresponds to the idea that the offer made by the lobbies, the contribution schedule, has a direct effect on the level of the contribution. This implies that $\frac{\partial C}{\partial c_{\tau_i}} \neq 0$. This simply represents that, for instance, the same offer made while smiling or not may not have the same effect for instance. In the International Political Science literature, authors as Baldwin (1979) or Joseph S. Nye (1990) have emphasized the idea that

“Some countries are better in converting their resources into effective influence, just as some skilled card players win despite weak hands” (Joseph S. Nye, 1990)

We believe this holds for lobbies. Two players having the same cards in hand with exactly the same amount on the poker table and on their banking accounts, with the same financial characteristics, will not face the same issue. Going on with the poker metaphor, some players succeed in bluffing whereas others do not and this is not only due to the effect of winning the pot on their welfare. This implies that the offer, the raise, is not the unique effect that explains the probability of success.

The idea that the offer influences directly the contribution is aimed at encompassing a very broad view of the effectiveness. It could be due to a perception bias from the government, to a lobby that presents much better their wills or else.

The same method is used in order to obtain the value of c_{τ_i} given that $\frac{\partial C}{\partial c_{\tau_i}} \neq 0$. From the equation 8:

$$c_{\tau_i} = \frac{\partial \Pi}{\partial \tau_i} - \frac{\partial C}{\partial c_{\tau_i}} / \frac{\partial \tau_i}{\partial c_{\tau_i}} \quad (15)$$

Using that $\frac{\partial C}{\partial c_{\tau_i}} = \tau_i$,

$$\begin{aligned} c_{\tau_i} &= \frac{\partial \Pi}{\partial \tau_i} - \tau_i / \frac{\partial \tau_i}{\partial c_{\tau_i}} \\ &\Leftrightarrow \\ c_{\tau_i} &= \frac{\partial \Pi}{\partial \tau_i} \left(\frac{e_{\tau}}{1 + e_{\tau}} \right) \end{aligned} \quad (16)$$

where e_{τ} is defined as the elasticity of τ with respect to c_{τ_i} . In order to keep things simple the denominator of (6) is assumed to be independent of τ_i .¹⁴ Therefore, this last equation can be rewritten as follows:

$$c_{\tau_i} = \frac{\alpha \Pi'_{\tau} W'_{-\tau} + W'_{-\tau} W'_{\tau} - \alpha \Pi'_{\tau} W'_{\tau}}{-\alpha (W'_{\tau} + G'_{\tau})} \quad (17)$$

In addition, it is possible to compare this result to the contribution schedule that is not truthful but that yields the G & H 94 locally truthful outcome, denoted c^{GH} .¹⁵

$$c_{\tau_i} = \frac{-\alpha G'_{\tau} c_{\tau_i}^{GH} + W'_{\tau} W'_{-\tau}}{-\alpha (G'_{\tau} + W'_{\tau})} \quad (18)$$

We then derive the following proposition:

Proposition 2 *Under direct effectiveness the equilibrium contribution schedule is*

$$c_i^* = \frac{\partial \Pi_i}{\partial \tau_i} \left(\frac{e_{\tau_i}}{e_{\tau_i} + 1} \right)$$

Where $e_{\tau_i} = \tau'_i(c_i^*)c_i^*/\tau_i(c_i^*)$ is the elasticity of the trade policy to the contribution schedule.

This proposition establishes as a rule that, depending on the reaction of the government to the contribution schedule, the social welfare effect, the contribution schedule designed will be more

¹⁴Relaxing the assumption on the denominator of (6) would make the problem more complex. It is however not necessary to highlight the effect of the direct effectiveness. Moreover, this assumption on equation (6) simply implies that the social welfare is quadratic in its argument τ_i . In order to have a social optimum, this is sufficient. If for instance the denominator is linear in τ_i , then the derivative of τ_i with respect to c_{τ_i} would be $\alpha/\sqrt{\Delta}$, where Δ is the discriminant of the polynomial of τ_i in (6).

¹⁵The truthful contribution schedule would be equal to $\partial \Pi / \partial \tau$.

or less large.

Remark 1 *That this result is still close to the one of G & H 94. However, in their paper, the social welfare effect in the contribution schedule comes from the hypothesis that lobbies are owned by non negligible shares of the population. In this paper, this comes from the effectiveness effect.*

5 The new government's program and equilibrium

From the proposition just above and the additivity nature of the optimal policy due to the benthamite government objective function, it is obvious that the difference between both optimal policies is explained by the differences between the two contribution schedules presented in the previous sections.

The notations τ and τ_{tf} will denote the outcome of the previous section and the locally truthful outcome, respectively.

Proposition 3 *The new program that yields the maximum is as follows :*

$$0 = \frac{W'_\tau}{W'_\tau + G'_\tau} \left(\alpha \Pi'_\tau + W' + G'_\tau \right) \quad (19)$$

Or equivalently, $W' + \alpha \Pi' + G' - \alpha \Pi'_{-\tau} = 0$ or $W' + \alpha \Pi' + W' + \alpha \Pi'_\tau = 0$

Therefore, two new effects are at work in order to determine the equilibrium policy level. Whether they pressurize downward or upward the previous effect, the optimal policy will be lower or higher. We discuss the implications of these variables on the optimal policy level in the next section. This highlights that depending of the relative strength and signs of these two effects, the impact of $\alpha \Pi'$ added in the program as in the previous section may be reduced or increased. This may explain the result of Imai *et al.* (2008) that the relationship between the imports penetration ratio and the protection is not monotonic.

To have a precise idea of the difference between both policies, we use equations (6) and (18).

From the first one, the difference between both optimal policies can be expressed as

$$\tau^{tf} - \tau = \frac{\alpha}{-W'_\tau/\tau}(c^{GH} - c_{\tau_i}) \quad (20)$$

where c^{GH} is the contribution schedule that yields the truthful equilibrium. From the second equation, the difference between both contribution schedules is equal to

$$c^{GH} - c_{\tau_i} = \frac{W'_\tau[W'_{-\tau} + \alpha c_{\tau_i}]}{\alpha G'_\tau} \quad (21)$$

Proposition 4 *The difference between both optimal policies is given by*

$$\tau^* = \tau^{tf} + \frac{\alpha}{G'_\tau/\tau}[W'_{-\tau} + \alpha c_{\tau_i}] \quad (22)$$

or

$$\tau^* - \tau^{tf} = \alpha \frac{W'_\tau}{G'_\tau} \tau$$

which yields

$$c^{GH} - c_{\tau_i} = \frac{W'^2_\tau}{G'_\tau}$$

The optimal policy is therefore not truthful anymore.

This section then highlights a *social effect* that emerges in the government's program. A way to interpret this comes from sociology. In the 70's, Serge Moscovici has developed a theory named the *social representation theory*. Simply put, it means that there are some common social values that emerge in some groups or in the whole society. Sharing these values will help communicating and working together for instance. In this model, the presence of the two terms W' and $\alpha\Pi'_\tau$ in the program with lobbying correspond to that. If the lobby contributes in a good way to the

social welfare, then this will ease its political relationship with the government. In a dynamic approach, lobbying is much more fruitful when a firm is not under media spotlights because of something that is socially undesirable.

A consequence is that a firm that has an obvious and strong negative effect on the social welfare may not wish to lobby the government as this *social effect* may outweigh the positive effect of its own welfare. These predictions are under perfect information. So the government perfectly knows the effect a sector has on the social welfare. This is of course rather unrealistic and this suggests that lobbies should engage in a strategic communication with the government as in Crawford and Sobel (1982). The aim being to send information on the positive effect of an increase in the policy level on the lobby's welfare without mentioning the negative effect of this same increase on the social welfare.

Note that in G & H 94, there also is a part of the social welfare in the government's program due to the share of the population represented in lobbies. First, as this share cannot exceed one, it cannot add more than W' in the program, but very generally it would add less than one. Second, this eventual population effect would not replace the two terms in (19), it would be added to them.

In a nutshell, the effect of the trade policy on the social welfare affects the design of the contribution schedule as well as the equilibrium policy. The determination of the equilibrium is not just affected by an additional weight on the profits of the organized sectors in the social welfare. Therefore, considering that the offers of the lobbies influence directly the level of the contribution introduces some new effects that may distort the equilibrium trade policy.

6 Interpretation of the results

From this section, we will consider the policy is a protection policy. More precisely, we will assume this is a tariff. With respect to this assumption, we will be able to characterize the various actors that enter the game and therefore we will show under what conditions the optimal policy and the optimal contribution schedules are higher or lower. However, this framework

would perfectly apply to other problematics in political economy. The unique requirement is to know (or to assume) the effects the studied policy may have on the welfare of the different actors of the game. The following subsections present some stylized representations of the actors involved in the game and the possibilities this paper encompasses.

6.1 Firms

Firms can have various reactions with respect to the trade policy, depending on their type.

6.1.1 Pure Domestic Firms

Pure Domestic Firms are defined as firms that uniquely operate on the domestic market. The theory as well as the empirical works have proven that these types of firms are always interested in an increase in the protection (See Bagwell and Staiger, 1999; Grossman and Helpman, 1994, for instance). The Pure Domestic Firms are labeled PD. we assume the marginal effect of a raise in the protection on these firms' welfare is increasing. This implies that a small tariff increase is not enough to have a large effect on their profits. Their profit is therefore convex and increasing.

6.1.2 Multinational Firms

These firms, by definition, operate in at least one other country. The literature has also provided strong support that a protectionist measure will probably generate a retaliation by commercial partners. Hence, a Multinationale may be interested in an increase in the protection up to a threshold. From this threshold, its profit may decrease because of possible retaliations abroad. Hence, the profit functions of these firms, labeled MNE, have the form of an inverted U-shape function. As a consequence, the closer to zero the turning point of the profit curve, the more active abroad an MNE is.

6.2 Country

The theory of the optimal tariff, initiated by Bickerdicke (1907) and Johnson (1953-1954), argues that a large country may transfer a part of the distortions induced by its protection policy to the rest of the world through its effect on the world prices. Hence, a large open economy may tolerate a positive optimal tariff. This type of economy, labeled LOE, has then a welfare function that has the form of an inverted U-shape curve.

To the contrary, a small open economy (SOE) has no social incentive to implement a tariff. Since its social optimal policy is free trade, its welfare function is decreasing and concave. However, as it will be clear, an increase in λ implies a country may turn from being a small open economy to being a large open economy.

6.3 Government

In a locally truthful framework, around the equilibrium, we have that $\frac{\partial W_i}{\partial \tau_i} = \frac{\partial C_i}{\partial \tau_i}$. This corresponds to a locally truthful equilibrium. Consequently, when the government maximizes its objective function, the following equality holds:

$$\begin{aligned} \nabla W(\tau_i^*) + \alpha \sum_{i=1}^N \nabla C_i(\tau_i^*) &= 0 \\ \nabla CS(\tau_i^*) + \nabla T_i(\tau_i^*) + \nabla(\lambda + \alpha) \sum \Pi_i(\tau_i^*) &= 0 \end{aligned} \quad (23)$$

Therefore, in a G & H 94 framework, the objective function has necessarily the form of an inverted U-shape.

6.4 Representation of the functions

Since the policy is a positive value, the coefficient of the non constant part has the same sign than the second order derivative (SOD). Hence, for instance, an inverted U-shape function is such that $h'_{-\tau} < 0$ and $h'_{\tau} > 0$. The first order derivative (FOD) turns from being positive to being negative; this characterizes the presence of an optimum. Hence, for a low τ_i , the positive

constant part is larger than the negative non constant part. And as τ_i increases, this increases the non constant part which finally overcomes the constant part. The same reasoning holds for the other functions. we do not discuss the U-shape function since it does not correspond to any actor type.¹⁶ The following definition sums up all the possibilities.

Definition 2 1. *Regarding firms,*

- MNE are characterized by $\{f'_\tau < 0, f'_{-\tau} > 0\}$ (inverted U-shape), or
- Pure domestic (PD) firms by $\{f'_\tau > 0, f'_{-\tau} > 0\}$ (increasing and convex)

2. *As for the social welfare, Large Open Economies (LOE) correspond to $\{W'_\tau < 0, W'_{-\tau} > 0\}$ (inverted U-shape) and Small Open Economies (SOE) to $\{W'_\tau < 0, W'_{-\tau} < 0\}$ (decreasing and concave).*

3. *The condition that ensures a maximum exists in the G & H 94 framework is that $H(\tau_i)$ has an inverted-U shape. This corresponds to $\{H'_\tau < 0, H'_{-\tau} > 0\}$.¹⁷*

6.5 Direct effectiveness: the social effect

First, note that proposition 5 implies, when considering the case of a tariff, that the difference between τ^{tf} and τ^* is equal to positive. So $\tau^{tf} > \tau^*$, which fits with the observation that generally, despite political strength are at work, tariffs are generally low in large open economies.

The exercise therefore consists in analyzing the effect on the policy by itself and not compared with the one of the previous section. We obtain the following optimal policy

Proposition 5 *The optimal tariff is such that*

$$\tau^* = -\frac{\alpha\Pi'_\tau + W'_{-\tau}}{(G'_\tau + W'_\tau)/\tau} \quad (24)$$

¹⁶A table in the appendix presents the full nomenclature of the actors.

¹⁷The maximization program proposed in this paper does not require this assumption on G' . It would indeed be possible to study other forms for $G(\tau_i)$.

This implies the tariff is positive for LOE and mostly nil for SOE, except for small unproductive sectors, for a high α or a high λ

This very simple equation yields a striking result. Under direct effectiveness, the equilibrium tariff is almost never positive for a small open economy (on a sectoral basis). Except for a $\alpha\Pi'_{-\tau}$ very large and positive, the optimal tariff is nil. For an MNE, a large $\alpha\Pi'_{-\tau}$ is impossible. Hence, only PD firms may obtain a positive tariff. This would correspond to a firm that reacts quite strongly to a small tariff increase. Not surprisingly, a large α also explains a positive tariff in a SOE, but uniquely in the case of a PD firm. In contrast, it is positive in large open economies. As a robustness check of the result, it is easy to show that if $\alpha = 0$, then the tariff is nil for a SOE, whereas it is positive for a LOE. So the result here states the lobbying activity has, in most cases, only a leverage effect. Lobbying activity cannot change the mind of the policy maker of a country that otherwise would not set a positive tariff.

However, as noticed in subsection 6.2, a high λ may change the nature of the objective of the government that would turn to being a large open economy. It is however not in the lobbying activity of firms that one could find an explanation of a positive and large λ , as this is the lobbying activity is identified by coefficient α . Any effect that passes through λ , and this is the reason of its presence, is not due to the lobbying activity.

Hence, this means that the objective function of the government without taking account of the contribution (here referred as the social welfare) should, in a small open economy, be positive and concave. For instance a country may have decided that developing infant industries is a top priority (hence a forward looking behavior). Another possible explanation comes from the literature on political systems. For instance, Persson and Tabellini (2005) show that a presidential regime will tend to favor small elites, contrary to parliamentary regimes. Their argument is not related to money transfers from the elites to the decision bodies, but rather to the idea that maintaining in power these elites helps them to stay in place. So the clearcut empirical prediction is that a dummy indicating whether a sector is organized or not should be non significant for sectors without any (world) market power when explaining tariff levels.

So this result brings a strong support to the hypothesis of the large sector, as developed

by Broda *et al.* (2008). The lobbying may indeed increase the government incentive to raise the tariff, but it cannot switch the government's incentive. Many studies have tested the PFS hypothesis on the US protection which is with no doubts a large country. This would explain this result. Moreover, in Broda *et al.* (2008), they show that the market power has an effect that is 1.6 times larger than the political economy effect. This could be indicative that the political economy is only active when the market power is large. The present paper suggests that contrary to the market power that always has an effect on the tariffs, the lobbying only has an effect when combined with a large sector. This could then explain why the coefficient of market power is larger and this could be empirically checked.

A last aspect should here be evoked. The fact $G(\cdot)$ has an inverted U-shape is a restriction due to the truthful maximization. Yet, under direct effectiveness, there are no reasons to assume this function is concave. In order to observe a positive tariff, the function could be of three types: U-shape, decreasing and convex or increasing and convex. Given that switching from $W(\cdot)$ to $G(\cdot)$ amounts to add $\alpha\Pi(\cdot)$, the first two solutions seem unlikely. As for the third one, it would necessitate a strong increase through $\alpha\Pi(\cdot)$. So the profit of the firm should be strongly increasing in the policy and the parameter α should be quite large. So this refers to small and quite unproductive sectors in countries where policymakers have little concerns for the social welfare.

We will close this analysis of the optimal tariff by showing what affects the policy. As it is obvious, if $W'_{-\tau}$ increases, which means that the socially optimal tariff of the LOE increases, *ceteris paribus*, then the politically optimal tariff increases. Using equation (19), in addition to the truthful effect (i.e $W(\cdot)$ becomes $G(\cdot)$), we have that if G'_τ tends to 0, this also has an effect. This can be due to a variation of the profit, but also to a variation of the remaining elements in the social welfare, then echoing the proposition 4 that highlights the presence of two additional terms in the optimization program of the government, W' and W'_τ . This *social effect* is unavoidable when the effectiveness is active. This effect introduces social concerns that appear when a non neutral offer has been made, when the effectiveness is active. It seems that except for political campaign where the offer is rather atomistic, a lobbying/influence activity is hard

to conduct while being neutral. In other words, it is not possible that the government ignores who/what you are. The government acts that way not for an electoral purpose but because a lobbyist came to it.

In proposition 2, when the elasticity tends to zero, the protection becomes very low. The elasticity is higher when the reaction of the import demand to the trade policy is weak and more generally when $|CS'_\tau + \lambda\Pi'_\tau + T'_\tau|$ is large. Then the protection is lower when the second order derivative of the social welfare is large in absolute value. However, effects can vary across firms. For a given effect of the trade policy on the welfare of a lobby, the total effect can be the same with a large $|T'_\tau|$ and a low $|CS'_\tau|$ or the inverse. This is coherent with the findings of Imai *et al.* (2008) who show that the relationship between the inverse of imports penetration ratio and the protection is not monotonic.

This highlights that with this endogenous heterogeneity of effectiveness, even the “truthful” relationship between exposure to imports and the level of protection does not hold. The fact lobbies’ importance in the economy has an active effect on the effectiveness of their activity as lobbyists, implied by the effect their offers have on the level of contribution they pay, magnifies or impedes their influence. This result is the first that offers a theoretical formalization that allows some lobbies to achieve a more influential relationship than others on a basis which is not how the lobby is affected by a policy level. Compared to τ_{tf} , defined by a truthful relationship that implies a direct causality between the import penetration ratio and the protection of a given sector, this result explains why some firms may obtain more or less than the truthful relationship predicts.

6.6 The case of Foreign Lobbying

The last aspect to discuss in this paper is the case of foreign lobbies. Since their profits do not appear in the objective function of the government, the optimal policy they would obtain in a G & H 94 fashion political game would be the one of the equation (11) where $\lambda_i = 0$. It is obvious that, all else equal, a foreign lobby will obtain a lower protection rate than its domestic counterpart. Comparing the programs of the government whether it negotiates with a domestic

lobby or a foreign ones shows that a positive effect is missing in the second.

As for the active effectiveness, as argued above, the fact G'_τ tends to 0 should increase the tariff. If one removes $\lambda\Pi'_\tau$ from G'_τ , one removes a negative weight on G'_τ . As the foreign lobby probably act as an MNE, setting $\lambda_i = 0$ has a positive impact. This reduces the social effect in the optimal tariff. This may compensate the disadvantage of being a foreign lobby.

7 Discussion and Conclusion

This paper suggests an intuitive idea that could be at the origin of the heterogeneity in effectiveness and shows that it indeed changes drastically some well-known results. This effect cannot be ignored as lobbies, even if not consciously, formulate their offer in a particular way and this influences the outcome of the political relationship. A striking application of this effect is that lobbies are not able to change the orientation of the government they influence, they can only have a leverage effect on the optimal policy. This being due to the social environment in which lobbies operate that a government cannot ignore. Another important consequence is that lobbies may benefit from their “social situation”, i.e how they weigh on the economy, in order to have more influence than others. So yes, lobbies’ money has a smell, and this influences the reaction of the government they seek to influence.

In other words, it is shown that, contrary to what the PFS framework would predict, two players having the same cards in hand with exactly the same amount on the poker table and on their banking accounts, with the same financial characteristics, will not face the same issue. Some players succeed in bluffing whereas others do not and this is not only due to the effect of winning the pot on their welfare. This implies that the offer, the raise, is not the unique effect that explains the probability of success.

This paper shows that heterogeneity in effectiveness yields different policy levels for lobbies exhibiting identical welfare. Effectiveness may increase the role of the government’s social motives in the protection decision. As a consequence, foreign lobbies may gain compared to their domestic counterpart thanks to their effectiveness. This paper underlines that each dollar spent by a lobby

suffers from or enjoys the social position of the lobby. It also provides an explanation to the various situations of political equilibria highlighted by recent empirical studies as Imai *et al.* (2008) or Bombardini and Trebbi (2009).

In a way, this paper is complementary to the recent literature (See Gawande *et al.*, 2009, , for instance) that tries to estimate and to explain the a parameter in Grossman and Helpman (1994). Here, α replaces this parameter and the endogenous effectiveness suggests that the relative weight of the private revenues of a government compared to the social welfare may also be explained from the lobbying side.¹⁸

The effectiveness of the lobbying activity may increase or decrease the influence of firms. We also find that when the demand of imports reacts strongly to the trade policy, this induces the contribution schedule to fall. Thus inducing the government to increase in a smaller extent the tariff as the payoff associated to a raise of the trade policy is smaller. A raise of the “socially” optimal tariff, that is the propensity of the government to be protectionist, increases the contribution schedule. Firms are induced to pay more for an identical increase of the trade policy. Finally, the results of this paper imply that there is rarely a positive tariff in small open economies (more precisely, in sectors that do not have any market power). This brings a strong support to the hypothesis of the large sectors.

Finally, this model is more about lobbying than endogenous trade policy determination, since the case of a tariff is only developed in order to illustrate the general effects. It allows to consider all types of trade policies but not only. One could use this formalization to describe various political relations effects on domestic or international policy choices. What is needed is to have a precise idea of the effects the policy would have on the different components of the economy, on the government, as well as on the other actors. In this paper, Π has been interpreted as the firms’ or sectors’ profit. However, it could well be the welfare of many other lobbying group such as consumers for instance. We have considered situations where LOE may socially gain from the implementation of the policies. It could well be a standard. Whether it has no

¹⁸G & H 94 underline to that end that the a parameter could be replaced by two coefficients, a_1 and a_2 , that weight each component of the objective function.

social enhancing effects, as in Rebeyrol and Vauday (2008), or it has, the decision maker would correspond to a Small Open Economy or a Large Open Economy, respectively.

Appendix

A Proof of proposition 2

Proof. First, we show that the optimal policy is the same:

From the optimal policy τ^* , we now have an equation of τ that depends on c_{τ_i} . It is then reintroduced in the next step (when each lobby designs its optimal contribution schedule). It is necessary to recall here that the contribution is defined as a function such that $\frac{\partial C(c_{\tau_i}, \tau_i(c_{\tau_i}))}{\partial \tau_i} \equiv c_{\tau_i}$.

The denominator of c_{τ_i} is the same than τ_{tf}^* . Therefore, introducing the optimal contribution schedule in τ^* allows to compare the numerator of τ_{tf}^* and the following expression:

$$\frac{(-W'_{-\tau})(G'_\tau) - \alpha [\Pi'_\tau(-W'_{-\tau}) + \Pi'_{-\tau}(W'_\tau)]}{W'_\tau} \quad (\text{A1})$$

After having factorized by $(-W'_{-\tau})$, this last equation is indeed equal to the numerator of τ_{tf}^* .

Now we show that the program corresponds to $G' = 0$:

The program of the government now is

$$W' + \alpha \left[\frac{\Pi'_\tau(-W'_{-\tau}) + \Pi'_{-\tau}W'_\tau}{G'_\tau} \right] = 0 \quad (\text{A2})$$

$$\Leftrightarrow \frac{W'G'_\tau + \alpha\Pi'_\tau(-W'_{-\tau}) + \alpha\Pi'_{-\tau}W'_\tau}{G'_\tau} = 0 \quad (\text{A3})$$

$$\Leftrightarrow \frac{W'_\tau[G'_\tau + \alpha\Pi'_{-\tau}] + W'_{-\tau}[G'_\tau - \alpha\Pi'_\tau]}{G'_\tau} = 0 \quad (\text{A4})$$

$$\Leftrightarrow \frac{W'_\tau[G'_\tau + \alpha\Pi'_{-\tau} + W'_{-\tau}]}{G'_\tau} = 0 \quad (\text{A5})$$

This corresponds to $\frac{W'_\tau G'_\tau}{G'_\tau} = 0$. From the first part of the proof, we know that $W'_\tau = 0$ is not possible, otherwise the optimal policy would not exist, so we can conclude that the program is

$$G' = 0.$$

■

B Various functions forms

Function's shape $h(\cdot)$	Corresponding characteristics	Government's Objective function $h(\cdot) = G(\cdot)$	Welfare $h(\cdot) = W(\cdot)$	Firms' profit $h(\cdot) = \Pi(\cdot)$
Inverted U-shape	$h'_\tau < 0$ and $h'_{-\tau} > 0$	LOE/SOE	LOE	MNE
U-shape	$h'_\tau > 0$ and $h'_{-\tau} < 0$	\emptyset	\emptyset	\emptyset
Exponential type	$h'_\tau > 0$ and $h'_{-\tau} > 0$	No max.	\emptyset	PD
Plummet type	$h'_\tau < 0$ and $h'_{-\tau} < 0$	No game	SOE	\emptyset

Functions with respect to the trade policy τ_i

SOE: Small Open Economy / LOE: Large Open Economy

MNE: Multinational Enterprise / PD: Pure Domestic firm

Table 1: Corresponding type according to the nature of the actor

References

- BAGWELL, K. and STAIGER, R. W. (1999), “An economic theory of GATT”, *The American Economic Review*, vol. 89 n° 1: pp. 215–248. 6, 21
- BAGWELL, K. and STAIGER, R. W. (2001), “Reciprocity, non-discrimination and preferential agreements in the multilateral trading system”, *The European Journal of Political Economy*, vol. 17: pp. 281–325. 5
- BALDWIN, D. (1979), “Power Analysis and World Politics: New Trends versus Old Tendencies”, *World Politics*, vol. 31 n° 2: pp. 161–194. 16
- BERNHEIM, D. B. and WHINSTON, M. D. (1986), “Menu Auctions, Resource Allocation, and Economic Influence”, *The Quarterly Journal of Economics*, vol. 101 n° 1: pp. 1–31. 4, 5, 9, 11
- BICKERDICKE, C. (1907), “Review of A.C. Pigou’s Protective and Preferential Import Duties”, *The Economic Journal*, vol. 17: pp. 98–108. 22
- BOMBARDINI, M. (2008), “Firm Heterogeneity and Lobby Participation”, *Journal of International Economics*, vol. 75 n° 2: pp. 329–348. 4
- BOMBARDINI, M. and TREBBI, F. (2009), “Competition and Political Organization: Together or Alone in Lobbying for Trade Policy?”, *NBER Working Paper*, n° 14771. 5, 28
- BRODA, C., LIMÃO, N. and WEINSTEIN, D. E. (2008), “Optimal Tariffs and Market Power: The Evidence”, *The American Economic Review*, vol. 98 n° 5: pp. 2032–2065. 4, 25
- CRAWFORD, V. P. and SOBEL, J. (1982), “Strategic Information Transmission”, *Econometrica*, vol. 50 n° 6: pp. 1431–1451. 20
- DEKEL, E., JACKSON, M. O. and WOLINSKY, A. (2009), “Vote Buying: Legislatures and Lobbying”, *Quarterly Journal of Political Science*, vol. forthcoming. 4

- DESBORDES, R. and VAUDAY, J. (2007), “The Political Influence of Foreign Firms in Developing Countries”, *Economics and Politics*, vol. 19 n° 3: pp. 421–451. 5
- ESTEBAN, J. and RAY, D. (2001), “Social Decision Rules are not Immune to Conflict”, *Economics of Governance*, vol. 2: pp. 59–67. 4
- GAWANDE, K., KRISHNA, P. and OLARREAGA, M. (2009), “What Governments Maximize and Why: The View from Trade”, NBER Working Papers 14953, National Bureau of Economic Research, Inc. 28
- GLACHANT, M. (2007), “Non-binding voluntary agreements”, *Journal of Environmental Economics and Management*, vol. 54: pp. 32–48. 4
- GROSSMAN, G. M. and HELPMAN, E. (1994), “Protection for Sale”, *The American Economic Review*, vol. 84 n° 4: pp. 833–850. 4, 5, 9, 12, 21, 28
- HILLMAN, A. L., LONG, N. V. and SOUBEYRAN, A. (2001), “Protection, lobbying, and market structure”, *Journal of International Economics*, vol. 54: pp. 383–409. 4
- IMAI, S., KATAYAMA, H. and KRISHNA, K. (2008), “A Quantile-Based Test of Protection For Sale Model”, NBER Working Paper n° 13900. 4, 5, 18, 26, 28
- IMAI, S., KATAYAMA, H. and KRISHNA, K. (2009), “Protection for Sale or Surge for Protection?”, *European Economic Review*, vol. Forthcoming. 5
- JOHNSON, H. G. (1953-1954), “Optimum Tariffs and Retaliation.”, *The Review of Economic Studies*, vol. 21 n° 2: pp. 142–153. 22
- JOSEPH S. NYE, J. (1990), “The Changing Nature of World Power”, *Political Science Quarterly*, vol. 105 n° 2: pp. 177–192. 16
- KOHLI, I. and SINGH, N. (1999), “Rent seeking and rent setting with asymmetric effectiveness of lobbying”, *Public Choice*, vol. 99: pp. 275–298. 4

- LÜ, X., SCHEVE, K. F. and SLAUGHTER, M. J. (2010), “Envy, Altruism, and the International Distribution of Trade Protection”, Working Paper 15700, National Bureau of Economic Research. 5
- LAUSSEL, D. and BRETON, M. L. (2001), “Conflict and Cooperation The Structure of Equilibrium Payoffs in Common Agency”, *Journal of Economic Theory*, vol. 100: pp. 93–128. 9
- MITRA, D. (1999), “Endogenous Lobby Formation and Endogenous Protection: A Long-Run Model of Trade Policy Determination”, *The American Economic Review*, vol. 89 n° 5: pp. 1116–1134. 4
- ORNELAS, E. (2005), “Endogenous free trade agreements and the multilateral trading system”, *Journal of International Economics*, vol. 67 n° 2: pp. 471–497. 6
- PERSSON, T. and TABELLINI, G. (2005), *The Economic Effects of Constitutions*, vol. 1 of *MIT Press Books*, The MIT Press. 24
- REBEYROL, V. and VAUDAY, J. (2008), “Live or Let Die: Intra-Sectoral Lobbying on Entry”, *CES Working Papers*, n° 2008.36. 6, 29