Who Needs Lobbies?

Asymmetric Information and Non-Monetary Lobbying

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Abstract

This paper focuses on the policy decisions of a self-interested government influenced by special interest lobby groups through monetary contributions. The main innovation of the paper is the focus on asymmetric information between the lobby group and the government which is introduced through certain parameters of the objective function of the lobby group and the economic environment. Then the game can be analyzed as a standard signaling problem in which the monetary contributions are used to credibly reveal the type of the lobby group as well as to distribute the gains from the policy distortion. First we analyze the interaction between these two functions and show that the distortion is decreased. Next we introduce other costly non-contributory lobbying processes that have been neglected in the literature. We introduce various scenarios and aim to determine under which conditions the lobby prefers to use such mechanisms as opposed to direct monetary contributions.

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1 Introduction

The standard models of lobbying view the strategic interaction between the lobby group as one of exchange of monetary contributions in return for socially ine±cient policies. For example, Grossman and Helpman, analyze equilibrium trade policy formation in a series of papers [1994, 1995a, 1995b] where special interest are represented by lobbies who present the government with a menu of options where there is a trade-o® between monetary contribution and distortionary trade policy. They show that the equilibrium outcome maximizes the joint surplus of the lobby and the government at the expense of social welfare. However, a casual observation of actual lobbying behavior reveals that a major portion of the lobbying activities and expenses are not in the form of direct monetary contributions. Furthermore, most lobbyists claim that they serve a unique purpose of providing information to the politicians. The aim of this paper is to close the gap between actual lobbying behavior and analytical models by focusing on these two observations.

There is an emerging literature, especially in political science, which argues that lobbying plays a signi±cant informational role. In his standard undergraduate textbook, Wright [1996] devotes a whole chapter to the issue of access, uncertainty and strategic use of information. The main argument in this book and many other papers is that interest groups achieve their aims by strategically providing information that is valued by the politicians. As most other economic agents, politicians and legislators operate under a heavy cloud of uncertainty and any information about the ultimate implication of the policy decisions are extremely valuable. Given the limited time and other resources and the comparative advantage of interest groups is gathering information, it is natural to observe collaborative e®orts between the interest groups and the legislators. However, information is power and the interest groups have all the incentive to distort the facts to in°uence the decisions of the politicians who are keenly aware of this fact. This is the rst important point of our paper. Monetary contributions will serve as a source of credibility for the interest groups since only the information provided by the groups who can put their money where their mouth is" will be listened to. This signaling and information transmission role of the contributions is a subtle, yet important one compared to the traditional role of distributing the gains between the lobby and the politician from policy distortions.

The next important question in the paper is on the prevalence of non-contributory lobbying
activities. These include advertising and public relations campaigns, grassroots activities, mailing and telephone campaigns, demonstration, hiring expensive lawyers as lobbyists in the capitol. Most of these activities are aimed to provide information to the politician and they do not directly enter his objective function. However, these activities actually constitute a big majority of the expenditures of many lobby groups. Despite their economic and political significance, there are almost no papers in the literature which asks what motivations lead the lobby groups to implement such activities as opposed to direct monetary contributions. It is important to identify the conditions under which non-contributory activities will be employed instead of monetary contributions as information transmission mechanisms. We show that if the objective function of the lobby group satisfies the single-crossing condition (SCC), then the lobbies will always use monetary contributions to reveal their types and will never use other costly lobbying activities. Single-crossing means the marginal benefit of the policy distortion has to be increasing in information parameter and in a signaling game this condition is sufficient for different types to sort themselves and reveal their types in equilibrium. More importantly, this result is robust to the fact whether the socially optimal policy depends on the information parameter or not. Even if the social welfare depends on this parameter and there are other mechanisms to reveal the information, the lobby group will choose direct contributions as long SCC is satisfied. This implies that lobbies will use non-contributory activities whenever the single-crossing condition is not satisfied and the information cannot be revealed through contributions. However, these activities will be used only when the government cares about the private information, in other words, socially optimal policy depends on this parameter. Finally, we ask under what conditions the lobby groups might restrict their ability to make monetary contributions. We show that, as long as the contributions can reveal the information efficiently, this will never happen. Even in situations where they can not be used and other activities are used to reveal information, contributions are used to distribute the gains from distortion. The only time lobbies would commit to not using contributions is when it would enable them to employ valuable non-contributory activities such as collaboration with other lobby groups.

There is a related strand in the political science literature. The main argument is that the lobbies make monetary contributions to gain access to the politicians (who have limited time) and to convince them about the optimal policies. Austen-Smith [1993, 1995, 1997] provide models where
campaign contributions act as signals of policy preferences. Lohmann [1995] provides a model where the lobby groups provide reports about their private information and have to pay contributions to enhance their credibility when reports are conflicting. Her main focus, though, is on the free-riding problem rather than the conflict between different roles played by contributions. Lohmann [1993] provides models where the government observes private political activity to obtain better information about the state of the world and analyzes the incentives for these actions. Lohmann [1993, 1995, 1998] provides models with multiple lobbies where the interests of different lobbies are opposed and the government infers the true value of a policy parameter from the strategic interaction between these lobbies. However, a major shortcoming in the literature is the absence of the explanation for the common presence of non-monetary lobbying activities. This is the main difference between this paper and the literature on lobbying.

This paper focuses on the policy decisions of a self-interested government. In a partial equilibrium framework, a lobby representing the interests of the producers tries to influence the government through monetary contributions as in the Grossman and Helpman [1994] model of influence-driven contributions and the electoral competition models of Magee, Brock and Young [1989]. The main questions of the paper are addressed in a trade policy context, but can be easily extended to a general framework. The first model depicts a small country where the socially optimal policy is free trade regardless of the demand and supply parameters. A positive tariff rate simply creates distortions in the economy and the contributions are used to distribute the joint surplus between the lobby and the government. The lobby makes an offer that consists of a tariff and a contribution and the government decides to accept or reject. We introduce informational asymmetry through a supply parameter and show that the problem becomes a simple signalling problem. In equilibrium, the high types choose jointly efficient tariffs as in the perfect information case, but the low type, however, implements lower tariffs compared to the jointly optimal one. This is the first important result of the paper. Informational problems actually improve social welfare and they prevent the lobby and the government to collude perfectly when the lobby tries to reveal his information.

Then we introduce other costly lobbying activities that can potentially signal the type of the lobby. However, we show that these will never be used in equilibrium since the monetary contributions are more efficient as long as the single-crossing property is satisfied. We also show that the lobbies will never need to commit themselves to not using monetary contributions since
these are still used to distribute the gains.

In the next model, we assume that the country is large and it can affect the world prices which causes the optimum tariff to be positive. The optimal tariff depends on the supply parameter which would provide a social welfare rationale for lobbying. We show that all of results from the small country model are carried to this model. The lobbies sort themselves and reveal their types perfectly and they never use other non-monetary activities in equilibrium despite the fact their information is valuable to the government. The monetary contribution is a sufficient and more efficient mechanism to extract all of the information from the lobby group.

Finally, we introduce another form of uncertainty about the demand parameters. The small country results carry on this section as well since the socially and the jointly optimal policies do not depend on this parameter. However, in a large country setting where the socially optimal policy depends on this parameter, the results are completely altered. When the objective function of the lobby group no longer satisfies the single-crossing condition the separating equilibrium can no longer be satisfied. The lobbies can not reveal their types credibly through contribution mechanisms although it is in their and the governments's interest to do so. If the cost function of non-contributory lobbying activities satisfy the single-crossing condition, then they will be used by the lobbies to credibly convey information to the government, especially by the high types. A coordinated effort between the producer and the consumer is an example of this sort of activities. Furthermore, it might be efficient for the lobby group to commit not to use monetary contributions in equilibrium, since it might make it easier to coordinate activities with the consumers. This might explain why the lobby groups would actually support limits on campaign contributions.

In the next section, we set up the simple small country model. Then we introduce asymmetric information through the demand parameters and set up the mechanism design problem. Next we look at whether non-contributory activities would arise in equilibrium. Then we carry out the same analysis for the large country setting. We then introduce asymmetric information through the demand parameter and show how costly lobbying activities would arise as equilibriums strategies. Conclusions follow.
2 A Model of a Small Country

All of the models in this paper will analyze the interaction between a self interested government and a lobby group representing a single industry that has to compete with foreign producers. We will be employing a very stylized partial equilibrium model to derive analytical solutions but, as it will be clear, the results can be easily extended to a more general setting. In this first section we will model a small country which will take the world prices \( p_w \) of a product given. The domestic price will simply be the world price and the tariff rate which the main policy instrument available to the government:

\[ p_d = p_w + t \]

The demand is given by a simple linear relationship:

\[ p_d = A - Q \]

where \( Q \) is the total domestic consumption. The domestic supply \( Q_d \) is given by the following equation

\[ Q_d = q + \bar{p}_d \]  

and the rest of the consumption is imported. The quantity imported is denoted by \( Q_w \) and, by definition, we have \( Q = Q_w + Q_d \). In this simple market structure, the consumer surplus, producer surplus and tariff revenue are given by

\[
\begin{align*}
\text{CS} (t) &= \frac{1}{2} [A + p_i t]^2 \\
\text{PS} (t) &= q[p_w + t] + \frac{1}{2} [p_w + t]^2 \\
\text{TR} (t) &= t[A + q_i (1 + \bar{p}) (p_w + t)]
\end{align*}
\]

The social welfare is the sum of these three welfare measures:

\[ W (t) = \text{CS} (t) + \text{PS} (t) + \text{TR} (t) \]

It can be easily shown that free trade maximizes social welfare. Following the standard approach in the literature, we assume that the government’s objective function is a linear sum of the monetary
contributions it collects from the lobby group that represents the producers' interests and the aggregate social welfare:

\[ G(t; C) = \bar{\omega} W(t) + C \]

where \(1, \bar{\omega}, 0\) is the relative weight attached to the social welfare. We assume that the members of the lobby group managed to overcome the free-rider problem and they maximize the joint welfare of the producers. These members constitute a negligible portion of the consumers in the society so that the objective function of the lobby group is the producer surplus minus the monetary contributions:

\[ L(t; C) = PS(t) - C \]

Grossman and Helpman [1994] assume that the strategic interaction between the lobby group and the government takes the form of a menu auction described by Bernheim and Whinston [1986]. In their model, the lobby groups choose a political contribution schedule as a function of the tari\(\bar{\omega}\) rates. In the second stage, the government chooses the tari\(\bar{\omega}\) rate that maximizes its welfare. Then the tari\(\bar{\omega}\) is implemented and the monetary contribution is made. The lobby will propose the tari\(\bar{\omega}\) rate and the contribution that will leave the government indifferent between this proposal and the free trade: \(C(t) = \bar{\omega}[W(0) \mid W(t)]\). When we substitute this into the lobby group's objective function, we get \(L(t) = PS(t) - \bar{\omega}[W(0) \mid W(t)]\). The optimal tari\(\bar{\omega}\) will simply maximize this expression which means that the equilibrium tari\(\bar{\omega}\) rates maximize the joint welfare of the government and the lobby group:\(^1\)

\[ t_j = \arg\max_t PS(t) + \bar{\omega} W(t) = \frac{q + \bar{\omega} p_w}{\bar{\omega}(1 + \bar{\omega})} \]

The equilibrium contribution, \(C_j\), will leave the government indifferent between the free trade outcome and implementing \(t_j\). This is given by

\[ C_j = \bar{\omega}[W(0) \mid W(t_j)] = \frac{1}{2}\bar{\omega}[1 + \bar{\omega}]t_j^2 \]

In equilibrium, the lobby will offer to pay a political contribution of \(C_j\) in return for implementing \(t_j\) and the government will accept. Grossman and Helpman [1994] setting assumes that the lobby

\(^1\)We will assume that \(\bar{\omega} < \frac{\omega}{1 + \omega}\) so that the equilibrium tari\(\bar{\omega}\) rates are positive.
group has all of the bargaining power and therefore captures all of the surplus. We will continue to make this assumption when we extend the model to the asymmetric information setting. More specifically, we will assume that the lobby group possesses some private information that would affect the welfare of the government. The lobby will make a combined offer of contributions for higher tariffs and the government will decide to accept or reject. With the introduction of asymmetric information, the strategic interaction turns into a signalling game from a menu auction.

Assignment of the bargaining power to the lobby group might sound restrictive, but the qualitative results of the paper will continue to hold even if the government had some of the bargaining power. However this would take us into the rather complicated world of bargaining games under asymmetric information where analytical tractability becomes rather scarce!

3 Asymmetric Information

We will introduce the asymmetric information into this model through the parameters in the domestic supply function given in [1]. In this function there are two parameters, $q$ and $\bar{q}$, that can provide the uncertainty. For a moment assume that $\bar{q}$ is known by the government with certainty but $q$ can take multiple values and only the lobby knows the true value. We know that the lobby will offer the contribution $C_j$ given by [4] in return for the implementation of the tariff $t_j$ given by [3]. However, the contribution $C_j$ does not depend on $q$ and, therefore, regardless of their information (their type), all lobbies will offer the same contribution; although they will demand different tariff rates. The offer made to the government will reveal the true type of the lobby even though the type of the lobby has no strategic value for the government since it does not enter its objective function. The conclusion is that the asymmetric information need to affect the welfare of both parties for it to be of any economic and strategic interest.

In light of this discussion, we will assume that $\bar{q}$ can take two values. At the beginning of the game the nature can assign a low value $^-1$ with probability $p$ and a high value $^-h$ with probability $[1-p]$ where $^-h > ^-1$. The lobby group observes the true value of $^-q$ while the government knows only the above probabilities. We should note that the socially optimal outcome is still free trade and therefore it does not depend on the type of the lobby group. However, the contribution demanded from the lobby group and the distorted tariff $t_j$ depend on $^-q$. Furthermore, we will also assume
that $q = 0$ for the time being to simplify the analysis.

The strategic interaction between the lobby group and the government is a simple signalling game, as we discussed above, given the nature of the asymmetric information. In a signalling game, the sender (the lobby) sends a message (the tariff demanded and contribution offered) and the receiver (the government) observes the message without the knowledge of the true type of the lobby. Then the receiver chooses an action from the feasible set (which is to accept and implement the proposed tariffs or to reject and implement free trade) and the payoffs are realized. The equilibrium requires that (1) the government should use the Bayes’ rule to update its beliefs about the type of the lobby according to the signal observed, (2) the government’s action should maximize its payoff given these beliefs, (3) the lobby’s signal should maximize its payoff given the expected response of the government. In signalling games, we can have separating (where each type sends a different signal which would reveal the true type), pooling (where different types would send the same signal and no new information is revealed) or hybrid equilibria depending on the parameters of the game and equilibrium concept being used.

In this section, we aim to determine what the equilibrium of the signalling game will look like. First, note that the objective function of the lobby group, $L(t; C; \bar{\gamma}) = PS(t; \bar{\gamma}) - C = \frac{1}{2} [p_w + t]^2$; $C$, satisfies the single crossing condition:

$$PS_t t; \bar{\gamma} > PS_t t; \bar{\alpha}$$

The marginal value of the tariff is higher for high types. Single-crossing property can be more easily observed in graph [1] where we have the indifference curves of different lobby types between contributions and the tariff. The low type “nds the bene”t from a given increase in the tariff less valuable than the high type and, thus, would be willing to contribute less for it. Since the seminal paper of Spence on job-market signalling, this property has important implications on the nature of the equilibrium that will be chosen in this game.

The government is concerned about correctly identifying the lobby from the signal sent. Under perfect information, the contribution equals the loss in payoff for the government from implementing a given tariff. We will let $t^h$ ($t^l$) and $C^h(C^l)$ denote the tariff and the contribution offered of a high (low) type under perfect information$.^2$ These are given by given by [3] and [4]. For the same

$^2$For the rest of the paper, we will refer to the government as “it”, the low type as “he” and the high type as
signals to be sent under asymmetric information, neither type should have the incentive to imitate the other one. Low type will prefer to send $t_l$ and $C_l$ if the following holds:

$$PS^{\frac{3}{2}} t_l; -l \tilde{l} \tilde{C} > PS^{\frac{3}{2}} t_h; -l \tilde{l} \tilde{C}$$

We know that $C = \frac{1}{2}[1 + \frac{1}{\psi}]t^2$ and $t_l = \frac{1}{\psi} \psi \frac{1}{1 + \frac{1}{\psi} t^2}$.

This implies $PS^{\frac{3}{2}} t_l; -l \tilde{l} \tilde{C} > PS^{\frac{3}{2}} t_h; -l \tilde{l} \tilde{C}$.

We also know that $PS^{\frac{3}{2}} t_h; -l \tilde{l} \tilde{C} \frac{1}{2}[1 + \frac{1}{\psi} t^2] > PS^{\frac{3}{2}} t_h; -l \tilde{l} \tilde{C} \frac{1}{2}[1 + \frac{1}{\psi} t^2]$. These two inequalities, together, imply that $PS^{\frac{3}{2}} t_l; -l \tilde{l} \tilde{C} > PS^{\frac{3}{2}} t_h; -l \tilde{l} \tilde{C}$. Therefore, in equilibrium, the low type will never want to imitate the high type. The parallel condition to prevent the high type from imitating the low type is given by

$$PS^{\frac{3}{2}} t_h; -h \tilde{C} > PS^{\frac{3}{2}} t_l; -h \tilde{C}$$

Unfortunately this condition does not necessarily hold for all parameter values. If it did hold, then both types would make the "rst-best offers and maximize their welfare. The government would identify their types, accept the offers and the game would end. It can be shown that the higher the $\tilde{l}$ and closer the values of $h$ and $l$ are, the less likely that this incentive constraint will hold. Furthermore, if the type space was continuous, then the continuous equivalent of the above constraint would never hold. An example where the high type would like to imitate the low type is given in graph [2]. For the rest of the paper, we will assume that the above condition is not satisfied which causes the high type to "envy" the low type and to want to imitate its actions.

If the low type were to make his "rst-best offer $(t_l; C_l)$ in equilibrium, high type will make the same offer. Then the government will maintain its prior beliefs about the types since no information is revealed in a pooling equilibrium and will reject the offer to implement free trade. This response from the government makes both types worse off and in equilibrium, the low type will alter his offer to prevent imitation by the high type. This can be more easily seen in graph [2]. Curves denoted by $G^h$ and $G^l$ are the indifference curves for the government when the lobby is high and low type respectively. Curve $L^h$ ($L^l$) is the indifference curve for the high (low) type lobby going through its "rst-best point denoted by $H$ ($L$). High type prefers point $L$ to its own optimal point if the government were to accept it since she would save considerably on contributions without sacrificing.
too much on the tari®. However, if the government knew it was the high type who o®ered L, it would certainly reject the o®er since the o®er lies to the right of the indifference curve $G^h$ going though the free trade point (0; 0). Given this incentive of the high type to imitate, low type will actually o®er the tari® contribution pair given by point E. The high type is indifferent between E and H (they are on the same indifference curve $L^h$) so has no incentive to imitate the low type. The government is also indifferent (it is on the indifference curve $G^l$), but the low type is worse o® compared to the perfect information case since it is to the left of his indifference curve $L^l$.

This equilibrium is not the only perfect Bayesian equilibrium of this signaling game. Actually there are many other separating equilibria as well numerous other pooling and hybrid equilibria. This multiplicity arises from the fact that we did not specify the beliefs about the out-of-equilibrium actions. Many strange equilibria can be supported by equally strange, but perfectly acceptable, beliefs as perfect Bayesian equilibria. To resolve this problem, Cho and Kreps [1987] propose a re®nement to eliminate many of these unreasonable equilibria called the intuitive criterion. We will not go into the technical details on the restrictions they impose on the o® the equilibrium beliefs and refer the reader to their paper. Instead, we will simply provide the implication of their result for signaling games with the single-crossing property for our model:

Proposition 1: In the signaling game described above, only the following equilibrium is consistent with the intuitive criterion: The high type o®ers H, its perfect information optimal point. The low type o®ers E which gives a lower and lower contribution than her perfect information optimal point. The government accepts both o®ers.

Given this equilibrium, we can state the first important result of the paper which directly follows from it:

Corollary 2: The distortion from the socially efficient outcome (free trade) is lower under asymmetric information than under perfect information.

In this signaling game, the monetary contribution o®ered to the government serves two purposes. The first is to divide the surplus obtained between the government and the lobby (at the expense of the society) through distortion of the outcome away from the socially efficient free trade level.
Since we assume the lobby makes the offer, it has all of the bargaining power and extracts all of this surplus. This is the role that has been emphasized many times in the literature (see Helpman’s survey [1995].) The second and more interesting one is the role played by the contribution in equilibrium so that the private information is perfectly revealed. More specifically, a low type has to offer an even lower tariff and contribution pair (than what perfect information scenario requires) to prove that the tariff is not too valuable to him and to credibly signal his type. A higher contribution means higher marginal benefits from distortion and therefore leads higher tariffs and signals that the lobby is a high type. The two purposes of the monetary contributions are opposing in the scenario for the low type which causes the tariff to be below the jointly optimal level. In other words, the government and the lobby’s inability to perfectly coordinate their activities due to asymmetric information, decreases the social distortion they would otherwise create and actually benefits the society. The role of monetary contributions as a signaling device is not emphasized in the overall political economy literature mainly due to the absence of imperfect information models.

There are several comparative statics observations we can make. First, the gap between the type parameters $h_l - h_l$, has interesting implications. The closer the two types are, the more likely it will be for the high type to imitate the low type. However, the closer the parameters are, the closer the points $H$ and $L$ are which means closer will be $L$ and $E$. Therefore, there will be an optimum difference between the two parameters from the society’s perspective.

Another interesting observation is about $\beta$, the weight attached by government to social welfare. First, the distortion will be lower when this parameter is higher since it increases the cost of distortion to the lobby. Second, high type will be more likely to imitate the low type when $\beta$ is higher since, again, it has to pay a much higher compensation. Therefore, higher $\beta$ provides two benefits: One is to lower jointly efficient tariffs (from the government and the lobby’s perspective) and the second is to push low type into choosing a separating equilibrium where tariffs are even lower.

Finally, we will look at the social cost of implementing positive tariffs. Denote $\zeta (t)$ as the social cost of implementing positive tariffs: $\zeta (t) = W (0) + W (t) = \frac{1}{2} [1 + \zeta] t^2$. The expected social cost under perfect information is $\beta \int \tilde{c}_{t_0}^C + [1; \ \ p] \tilde{c}_{t_0}^C$ and under asymmetric information it is $\beta \int \tilde{c}_{t}^C + [1; \ \ p] \tilde{c}_{t}^C$. The second components are the same since same tariff levels are implemented for the high types. The social welfare gain due to informational asymmetry is $p \tilde{c} (i t^C_i + d_0 t^C_0)$. This
expression is always positive as we would expect since there are social gains when the lobby is a low type. We observe the largest gains from uncertainty at the highest value of p (just below perfect information) when the actual uncertainty is low.

4 Other Lobbying Activities

Most lobby groups claim that their activities are aimed to provide the government with information so that socially efficient policies are implemented as we mentioned in the introduction. In the case of a small country, the socially efficient policy is free trade (tariff rates equal to zero) regardless of the lobby group's type so the lobbying activity is simply aimed to distort the policy away from the socially optimal level to earn rents. Contributions are mainly used to distribute this joint surplus through monetary contributions.

Another neglected point in the literature is the availability of lobbying mechanisms (other than monetary contributions) to the lobby groups. These can include, but are not restricted to, mailing campaigns, telephone marathons, hiring expensive lawyers to lobby on their behalf to meet politicians and hiring retired politicians. A casual analysis would reveal that direct campaign contributions are actually a small portion of the overall budgets of large lobby groups. These activities are as costly as far as the lobby groups are concerned but do not involve any direct transfers to the government. These activities do not directly enter the objective function of the government (as opposed to monetary contributions), but their value arises from the signals they convey to the government about the private information (types) possessed by the lobby groups. We will refer to these as non-contributory lobbying activities as opposed to monetary contributions and will denote them as $P$.

The second aim of this paper is to see under what conditions would the lobbies prefer to engage in these activities as opposed to (or together with) monetary contributions in order to have their preferred policies implemented. We will assume that the modified objective function of the lobby group is given by

$$L(t; P; C; ^-) = PS(t; ^-) + Z(P; ^-) + C$$

where $Z(P; ^-)$ is the cost of other non-contributory lobbying activities. We will assume that $Z^0; ^- = Z^0; ^- = 0$, $Z_P (P; ^-) > 0$, $Z_{PP} (P; ^-) > 0$ and $Z(P; ^-)$ satisﬁes the single crossing
condition as well:

\[ Z^3 P^3;^{−1} > Z^3 P^3;^{−h} \]

This expression implies that the marginal cost of engaging in non-contributory activities are lower for high types. Since the marginal benefit of a tari® is increasing in the type parameter, it is natural to assume that the marginal cost is decreasing in the type parameter. This assumption can be justified by several observations. It might be easier for high types to overcome collective action problems to form a lobby and collect money for the overall budget (and other lobbying activities) since the potential payo® from a marginal tari® increase \( PS_t(t;^{−}) \) is higher. Higher \( − \) also implies higher number of \( − \) firms if we assume that the industry is composed of identical \( − \) firms. With more members, the lobby can generate more letters to the president and telegrams to the Congress at a lower marginal cost.

The modified game progresses according the following sequence of actions. First its type is revealed to the lobby group. Next the lobby decides whether to engage in other activities \( P \). If it decides to do so, these activities are undertaken. The government observes a positive value of \( P \) and updates its beliefs about the type of the lobby according to this signal. Then the lobby decides on the tari® and contribution offer to the government. The government updates its beliefs according to the observation of this offer, decides to accept or reject. Finally, the tari® is implemented, the contribution is made and the payo®s are realized.

In the previous section, we showed that the government and the high type manage to establish the tari® that maximizes their joint payo® in the absence of any other activities. To signal its true type, the low type lobby ends up o®ering a tari® and a contribution lower than the rst-best under perfect information. Given this outcome, the high type has no incentive to engage in other lobbying activities \( P \) and spend extra resources since it can not do any better.

The low type, on the other hand, would like to nd another and less costly mechanism to signal its type. If the low type was successful in credibly signalling its type to the government in this stage, then there would be no need to o®er the tari® contribution pair given by point \( E \) in the next stage to prevent the high type from imitating it. Instead, the low type would o®er point \( L \), since the government would accept it (knowing it is coming from the low type). Suppose the low type
sends signal $P^1$ in the rst stage. Then we need the following to hold:

$$Z^3 P^1; -l < PS^3 t^l; -l_i C^l; PS^3 t^E; -l_i C^E$$ (7)

where $(t^E; C^E)$ are the tari® and the contribution at point $E$. This condition states that the bene®t of sending the signal $P^1$ should be higher than its cost. If we assume that $Z^3 P^1; -l$ is continuous, this condition will be satisfied for some positive value of $P$ since $Z^3 0; -l = 0$. Second, it should not be in the interest of the high type to imitate the low type and send the same signal in this stage:

$$PS^3 t^h; -h_i C^h > PS^3 t^l; -h_i Z^3 P^1; -h_i C^l$$ (8)

First, we will note that $Z^3 P^1; -h < Z^3 P^1; -l$ because of the single-crossing property of this cost function. Two two constraints jointly imply that

$$PS^3 t^l; -l_i C^l; PS^3 t^E; -l_i C^E > PS^3 t^l; -h_i C^l; PS^3 t^h; -h_i C^h$$

The high type is indifferental between $H$ and $E$ which implies

$$PS^3 t^h; -h_i C^h = PS^3 t^E; -h_i C^E$$

Substituting this expression into the previous one leads to

$$PS^3 t^l; -l_i PS^3 t^E; -l > PS^3 t^l; -h_i PS^3 t^E; -h$$

However this cannot be true when $t^l > t^E$ because of the single-crossing property of the $PS (t; -)$. Therefore, the two constraints can never be satisfied simultaneously implying the high type will also try to imitate the low type and send $P^1$ as well. The following proposition will summarize the equilibrium of this modified game with non-contributory lobbying activities:

**Proposition 3**: No type of lobby group will engage in any other lobbying activities.

We should once again emphasize that the we used the single crossing property of the producer surplus function $PS (t; -)$ and the cost function $Z (P; -)$ to derive these results. We will relax the “rst assumption in a later section in the paper. The second assumption is more signi®cant. The cost of sending any signal is lower for the high type, therefore there is no way for the low type
to credibly signal his type to the government since the high type can easily imitate this action. Actually, for credible signalling, we need to opposite of that assumption to hold. The marginal cost of a signal has to be lower for the low type: \[ Z_p i^P; n < Z_p i^P; h. \] We can conclude that there will be no non-contributory lobbying unless this condition is satisfied which is unlikely under many reasonable assumptions about the lobby formation.

Another interesting issue arises when the lobbies can commit not to make monetary contributions after they take the action \( P \). This can be imposed through campaign contribution limits and the issue is likely to be among the most widely discussed ones in the upcoming Presidential elections. We will assume that the lobbies can credibly commit not to make any contributions. Furthermore, the government knows that once a positive \( P \) is observed, then there will be no contributions in the next stage. Upon observation of \( P \), regardless of the its value, the government will simply implement zero tariffs since that maximizes its welfare. Since these activities are costly and do not impact the actions of the government, they will not be undertaken either. However, both types of lobbies obtain higher payoffs by offering contributions in exchange for distortionary tariffs. Therefore, we will never observe voluntary commitment to abstaining from making contributions by any lobby type in equilibrium.

As we had stated earlier, we had two aims in this paper. Analyze the strategic issues in lobbying when there is asymmetric information and analyze the significance of non-contributory lobbying activities. Although, the analysis is carried out in a trade policy context, it can easily be extended to other policy contexts. When the imperfect information is only about the type of the lobby group and the socially optimal policy (in the absence of lobbying) is known by the government, lobbies will not engage in other non-contributory activities to reveal their types. The same outcomes can be obtained through direct contributions without incurring the costs of these activities. Thus we can conclude that, lobby groups will engage in other activities only when it provides information about socially efficient outcomes. This is the scenario we will analyze in the next section.

5 A Model of A Large Country

In this section, we will modify the above game so that the socially optimal policy is no longer "fixed" regardless of the type of the lobby group. We will assume that the world supply is given by \( Q_w = p_w \)
where the country can implement positive optimum tariffs since it can affect the world price of the product. The domestic demand is the same as in the small country case and the domestic supply is given by $Q_d = q$ to simplify the analysis. Under these assumptions, the consumer surplus, producer surplus and the tariff revenue are given by the following:

$$CS(t) = \frac{1}{8} [A + q + t]$$

$$PS(t) = \frac{1}{2} q [A + q + t]^2$$

$$TR(t) = t [A + q + t]$$

The social welfare is again the sum of these three terms:

$$W(t) = CS(t) + PS(t) + TR(t)$$

However, the socially optimal tariffs is no longer zero since the country can affect the world prices. More specifically, socially optimal tariffs is given by

$$t_s = \arg \max_t W(t) = \frac{A + q}{3}$$ (9)

Similarly, the objective function of the government is the sum of the social welfare and the monetary contributions $G(t; C) = W(t) + C$ and the lobby's objective function is the producer surplus minus the contributions $L(t; C) = PS(t) - C$. The equilibrium tariffs under perfect information will maximize the joint welfare of the lobby group and the government. The contributions again are used to distribute the excess joint surplus compared to $t_s$. This tariff level is given by

$$t_j = \arg \max_t W(t) + PS(t) = \frac{A}{3} + \frac{q(2i + \frac{\delta}{3})}{3}$$

As expected, the jointly optimal tariff level is always higher than the socially optimal one since $t_j = t_s + \frac{2q}{3}$. Under perfect information, the lobby would ask for the tariff level $t_j$ and offer the contribution $C_j$ that would leave the government indifferent between this proposal and the socially optimal tariff $C_j = (W(t_s) - W(t_j))$.

We will introduce asymmetric information through the lobby type as we did in the previous section. However, we should note that the socially optimal tariff $t_s$, now depends on the type of the lobby group as seen in expression [9]. The lobby can be of high (low) type, $q^h(q)$ with probability $p(1|\: p)$. 

17
The analysis will be almost identical to the previous section with the small country. The socially optimal tariff is denoted by $t_h^s(t_l^s)$ when the lobby's type is high (low). When the quantity supplied is higher, the optimal tariff will be lower: $t_h^s < t_l^s$. These points can be seen in graph [3]. $G^h$ ($G^l$) is the government's indifference curve going through the socially optimal tariff (and zero contribution) point when the lobby is high (low) type. $L^h$ ($L^l$) is the indifference curve for the high (low) type going through the jointly optimal tariff/contribution point $H$ ($L$) that would be chosen under perfect information. The objective function of the lobby still satisfies the single crossing condition.

The structure of the signalling game is identical to the previous case. The lobby group makes an offer that includes a contribution in return for a higher tariff rate and the government decides to accept or reject. The low type will never want to imitate the high type as can be seen in the graph. The perfect information outcome of the low type, $L$, is more attractive for the high type compared to her own outcome $H$. Therefore, in equilibrium the low type will never offer $L$ since the high type would do the same thing causing the government to reject both types' offers. Instead, the low type will offer point $E$ which makes the high type indifferent between this offer and $H$ causing her to offer her perfect information outcomes. The governments will accept since $E$ lies on its indifference curve. Of course, the low type is worse off. To summarize the results:

Proposition 4: The following strategies form a perfect Bayesian equilibrium of the signalling game and satisfy the intuitive criterion: The high type offers $H$, her perfect information outcome. The low type offers $E$ which is worse than his perfect information outcome $L$. The government accepts both offers.

The equilibrium outcome did not change even when the socially optimal policy depends on the private information of the lobby groups. It is qualitatively identical to the previous case where the private information is completely revealed to the government through the offers since different types can credibly signal their types. Again, when the lobby is a low type, the equilibrium tariff is lower than the perfect information outcome which benefits the society.

Another interesting question is whether the presence of the lobbies actually improves welfare compared to the environment where the government implements policies under uncertainty. Without perfect information on $q$, the government will choose the tariff that maximizes the expected
social welfare:

\[
\begin{align*}
  t^w &= \arg\max_p W^t; q^l + [1 \cdot p] W^t; q^h \\
       &= pt^l + (1 \cdot p)t^h
\end{align*}
\]

When this type is implemented, overall welfare will be equal to \( pW^i t^E; q^E + [1 \cdot p] W^i t^E; q^h \). When the lobbies are allowed to operate, \( t^h (t^E) \) will be implemented if the type is high (low) and the expected social welfare is \( pW^i t^E; q^E + [1 \cdot p] W^t; q^h \). We know that \( t^E > t^h \), \( t^h > t^E \), \( t^E > t^s \), and \( t^h < t^s < t^l \). Since \( \alpha < 1 \), we will also have \( t^h > t^l \). Thus the ordering will be the following: \( t^h > t^l > t^E > t^s > t^a > t^h \). Since the social welfare function is concave with a maximum value at \( t^a \), the society will always be worse off under the lobbying game. It is true that the lobbies provide valuable information to the government, but that is only used to increase their joint surplus at the expense of the society, not to improve its welfare.

6 Other Lobbying Activities

In this section, as we did previously, we will analyze the equilibrium outcome when the lobbies are able to engage in costly activities, other than monetary contributions. The new objective function of the lobby group is given by

\[
L(t; P; C; q) = PS(t; q) + Z(P; q) + C
\]

and the structure of the game is the same as described for a small country. The lobby decides to engage in the costly non-contributory activities \( P \) which is observed by the government who updates its beliefs. Then the lobby makes its contribution \( o \) in return for a tari \( \alpha \) and the government decides to accept or reject. If \( P = 0 \), then the equilibrium strategies for the rest of the game are the ones described in the previous section. High type knows that it will obtain its first-best payo \( \alpha \) and has no incentive to implement positive \( P \) if the low type implements \( P = 0 \) as well. The low type would like to signal her type credibly in this stage so she can propose \( t^l; C^l \) in the second stage instead of \( t^E; C^E \) without worrying about high type imitating him. Again, we come across the same problem as before. Any signal \( P \) that would be sent by the low type can also be sent by the high type at a lower cost. The low type can credibly signal her type if and only if \( Z_P (P; q) < 0 \).
which makes the unrealistic assertion that the marginal cost of engaging in lobbying activities is lower for the low type. In conclusion, neither type will again engage in non-contributory activities.

The next issue is if these conclusions would change if the lobby could commit to not providing any monetary contributions in a later stage. Suppose this credible commitment is undertaken at the very beginning of the game and the government observes this commitment. If there are no other lobbying activities available, the government will simply maximize the expected social welfare and implement $t^a$ (as defined above) where $t^0_s < t^a < t^1_s$. The government would definitely like to "nd out the true value of $q$ so it can implement the optimal tariff. In the absence of contributions, the high type knows that $t^0_s$ will be implemented if he reveals her type which is worse for her compared to $t^a$. On the other hand, the low type is better off under perfect information and would like to convey her true type. Furthermore, the high type would like the government to believe that her type is low since it would imply an even higher tariff. A separating equilibrium can never be sustained since the high type has the incentive to imitate actions of the low type and the low type has no credible mechanism to reveal her type. Since no non-contributory actions $P$ will be implemented, both types of lobbies will now want to make monetary contributions. The payo®s at $H$ and $E$ are higher than $(t^a; 0)$ for both types. Therefore, commitment to not making monetary contributions can never be credible.

The conclusion from this section is identical to the previous one despite the fact that the socially e±cient policy depends crucially on the information possessed by the lobby. In equilibrium, only monetary contributions will be used since they are the most e±cient mechanisms to credibly transmit the information while compensating the government for the distortion in social welfare. Contribution is e±cient because the payo® function of the lobby satis®es the single-crossing condition between the information parameter $q$ and the policy parameter $t$. The lobby does not improve social welfare since the distortion caused by the collusion between the lobby and the government always leads to a worse policy. We will also never observe other forms of lobbying activities since the information cannot be transmitted credibly given the assumptions about the cost of these activities. Furthermore, the lobbies can never credibly commit to not using contributions since it will always be in their interest to do so.
7 Demand Uncertainty

We have shown that under a wide variety of scenarios, neither type of lobby will ever employ non-monetary activities. However, as we stated earlier, direct monetary contributions are a small portion of the expenses incurred by the lobby groups which implies we have so far failed at our objective to explain the conditions that would lead to this empirical regularity. We will now extend the model to a scenario which would account for this type of activities. We will assume that the uncertainty is about the demand parameter \( A \) rather than the supply parameter \( q \). The lobby knows the true value of this parameter but the government only knows that it is \( A_l(\bar{A}^{h}) \) with probability \( p(1; p) \).

In the small country case, the socially optimal tariff \( t = 0 \) and the jointly optimal tariff \( t_j = q = 0 \) (given by equation [3] when \( \bar{A} = 0 \)) do not depend on \( A \). Therefore, the strategic interaction between the government and the lobby is straightforward. Both types of lobbies will offer the same contribution \( C_j = \frac{1}{2}t_j^2 \) in return for the same tariff \( t_j = q = 0 \) and the government will accept. Again the lobby groups, will have no incentive to use other activities, \( P \), since it will have no impact on the next stage. Also, they will never agree to ban contributions since they would be worse off under free trade.

If the country is large, the socially optimal tariff is given by \( t_s = \frac{A_l}{3} \) and the jointly optimal tariff is given by \( t_j = \frac{A_l}{3} + \frac{q(2)}{3} \). The payoff for the lobby group is \( L(t; C) = P S(t; A) \) \( C = \frac{1}{2}q(A; q + t) \). In this case the single crossing condition is not satisfied since \( \frac{dL}{dA} = 0 \). This has significant implications for the signalling game since the lobbies cannot credibly reveal their types to the government. In other words, there are no pairs of tariffs and contributions that would jointly satisfy the incentive compatibility constraints stated in equations [??] and [6]. In the absence of political contributions the government will choose the tariff level that will maximize expected social welfare:

\[
t^* = \arg\max_{t} t; A^l \quad 3 \quad 3
\]

\[
\quad \text{where } t^*_l < t^*_a < t^*_h. A \text{ proposal to implement tariff } t \text{ would lead to the following decrease in the}
\]
government welfare which needs to be compensated by the contribution:

$$C_j^u = \frac{1}{24} \delta p A^l + (1 + p) A^h \frac{1}{6} q$$

(10)

The lobby groups' payoffs are given by

$$L(t; C; A) = \frac{1}{2} q[A^l \times (q + t)]_i + \frac{1}{24} \delta p A^l + (1 + p) A^h \frac{1}{6} q$$

The tariff that maximizes this expression is

$$t_j^u = \frac{\delta p A^l + (1 + p) A^h \frac{1}{6} q}{3 \delta}$$

In equilibrium, both types of lobbies will offer the above tariff $t_j$ in return for the contribution $C_j$ given in equation [10] and the government will accept. The gain for each lobby is $PS(t; A) = \frac{1}{2} q^2 \frac{\delta p A^l + (1 + p) A^h \frac{1}{6} q}{3 \delta}$ compared to the tariff $t_j^u$.

The inability to separate themselves in equilibrium is the reason why the lobbies will engage in other non-contributory activities. Recall that the tariff implemented under perfect information are $t_j^h = \frac{A^h \delta q + (2 + \delta q)}{3 \delta}$ and $t_j^l = \frac{A^l \delta q + (2 + \delta q)}{3 \delta}$ for the high and the low types respectively while the contributions are $C_j^h = \frac{1}{24} \delta p A^h \frac{1}{6} q$ and $C_j^l = \frac{1}{24} \delta A^l \frac{1}{6} q$. The equilibrium outcomes of the imperfect information game, $C_j^u$ and $t_j^u$ are ineficient for the high type. The gain for her from implementing her perfect information policies is $\frac{1}{6} \delta p A^h \frac{1}{6} q > \frac{1}{3} q^2 \frac{\delta p A^l + (1 + p) A^h \frac{1}{6} q}{3 \delta}$. On the other hand, the perfect information outcome would decrease the low type's payoffs by $\frac{1}{6} q(1 + p) A^h \frac{1}{6} q$. In this situation, the high type would like to signal her type while the low type is happy with the status quo.

When we allow other lobbying activities a new equilibrium can be implemented. For the moment, assume that there are no contributions allowed. If the domestic demand is high ($A^h$), then the socially optimal tariff is higher than the one implemented by the government under uncertainty. Then the high type will aim to signal her true type since it can obtain a higher payoff $L(t_j^h; 0) > L(t_j^l; 0)$. However, the low type will also try to send the same signal since his payoff is increasing in the tariff rate. For the government to implement $t_j^h$, the signal needs to be credible. Recall that the cost function for other lobbying activities $Z(P; A)$ satisfies the single-crossing condition $\frac{\partial Z}{\partial A} > 0$ which meant that the marginal cost of engaging in non-monetary activities needs
to be decreasing in $A$. When this happens, the high type can engage in higher level of $P$ that would credibly signal to the government the true state of the world.

This proposition provides the conditions under which we will observe non-contributory activities. First, the payoff function for the lobby $PS(t;A)$ should not satisfy the single crossing condition so that the contributions can not be used as signals. Second, cost function for other activities need to satisfy the single-crossing condition so that the type can be truthfully revealed through such actions. Furthermore, if the monetary contributions are available, the government and the lobby can collaborate further. The lobby would offer $C_j$ in return for the tariff $t_j$ which would be accepted since the information has already been revealed. This would imply that lobby groups would again never commit to banning contributions. We had stated that contributions serve signalling and distributional purposes. Although they can not fulfill the first function, since contributions can still serve to distribute the gains from socially inefficient policies. We can summarize the results:

**Proposition 5**: Suppose the non-contributory political activities satisfy the single-crossing condition. Then either both types of lobbies (or at least the high) type will engage in such activities to credibly signal her type to the government. The government then implements the proposed optimal tariff $t^h_j$ (or $t^l_j$).

It is natural to ask what kinds of cost functions $Z(P;A)$ satisfy these criteria. If we look at the payoff for the consumers, we notice that their payoff is also increasing in $A$ although it is decreasing in $t$. If the lobby groups representing the producers could mobilize the consumers (who also receive the tariff revenue), for example, this would be a very powerful signal. Under certain restriction on the relative values of $q$ and $A^h$, the consumers would prefer to have $t^h$ implemented compared to $t^l$ since the loss in consumer surplus is easily made up by the increase in tariff revenue. If the consumers demand a higher tariff (through their e-mails and letters), the government will be convinced about the claims of a higher $A$.

The cooperation between the lobby group and the consumer can create another interesting outcome. If the monetary contributions are possible, the equilibrium tariff is higher than the socially efficient outcome although the lobby group is indifferent since the government extracts all of the surplus. In the presence of contribution, the government implements $t^c_j = \frac{PA^l + [1_p P^h]}{3} + \frac{Q_{d} (2^c) Q_{d} (2^c)}{3^d}$. 
with no signalling and \( t_j^h = \frac{A^h}{3} + \frac{Q_d(2i/3)}{3} \) with signalling where \( t_j^h > t_j^a \). The change in consumer surplus and tariff revenue from these two outcomes is given by
\[
\Delta CS = \frac{1}{8} t_j^h i + 6A^h + 10Q_d + 7t_j^h + 7t_j^a
\]

If monetary contributions are banned, then the government implements \( t_s^h = \frac{pA^i + [1 - p]A^h i Q_d}{3} \) when it is uncertain about \( A \) and implements \( t_s^h = \frac{A^h i Q_d}{3} \) when \( A \) is known. The change in consumer welfare is given by
\[
\Delta CS = \frac{1}{8} t_s^h i + 6A^h + 10Q_d + 7t_s^h + 7t_s^a
\]

After some algebra, we can show that \( \Delta CS = \frac{1}{8} t_j^h i + 6A^h + 10Q_d + 7t_j^h + 7t_j^a \). The consumers prefer the outcomes where the government and the lobby cannot collude and extract rents at their expense. A commitment towards not using monetary contributions can be powerful tool to convince the consumers to take actions to signal true \( A \) to the government since it provides a higher payoff to the consumers. Since the its payoff is same regardless of whether there are contributions or not, the lobby might nd it in its interest to commit not to use contributions to convince the consumers to act jointly. Thus, the nal result of the paper becomes the following proposition.

**Proposition 6:** Suppose the lobby can commit to not using monetary contributions and the consumers are not organized into lobby groups but they are identical. Also assume \( \Delta CS = \frac{1}{8} t_j^h i + 6A^h + 10Q_d + 7t_j^h + 7t_j^a \) holds which means each individual consumer is better under the policy implemented under perfect information. If the demand parameter is \( A^h \), then the lobby will commit not use monetary contributions and the consumers and lobby will coordinate their activities to credibly signal the true value of \( A \). The government will implement \( t_j^h \).

8 Conclusions

There are two important observations about the lobbying process. First, it operates under a heavy cloud of uncertainty and asymmetric information and second it mostly involves non-contributory
activities. Although the informational role of lobbying has been somewhat addressed in the literature, the second point receives no attention. Our aim is to analyze strategic issues that arise when lobbying is done under asymmetric information and more importantly, determine which factors lead the lobby groups to choose other activities over direct contributions.

The most important conclusion of the paper is the significance of the single-crossing condition which is necessary for credible information revelation and existence of separating equilibrium. When the payo® function of the lobby groups satis®es single-crossing between the type and the policy parameter, lobbies will always use monetary contributions and never use other activities. This is true regardless of whether the socially e±cient policy depends on this parameter or not. Monetary contributions, putting you money where you mouth is, is the most e±cient mechanism to transmit information credibly. non-contributory activities, on the hand, will only be used when the payo® function does not satisfy single-crossing and when the socially optimal policy depends on the information parameter. of course, the cost function of these activities needs to satisfy single-crossing between type and intensity of lobbying for credible signaling.

We presented our results in a series of trade policy models, but they can be easily extended to other settings. For example, suppose the policy in question is agricultural subsidies, where the optimal policy is zero subsidy. Then in equilibrium, we should expect only monetary contributions. On the other hand, if the policy in question involves optimum degree of environmental safety where the payo® functions might be downward sloping after a level and the optimal policy is not perfectly known, we should expect to see more non-contributory lobbying.

There are several obvious shortcomings of the paper. The rst is the absence multiple and presumably opposing lobbies. This might provide motivations for intentional restrictions on direct contributions since the game becomes a Prisoners’ Dilemma game where the government extracts all surplus. Second the type of non-contributory activities might enable the lobby to get organized in the rst place. People with common interest might be more easily convinced to write a letter to their congressman, rather than making a contribution to the lobby which will pass it on the politician. In other words, the nature of non-contributory activities might solve the free-riding problems in lobbies. Rather than discouragement, we hope these shortcomings will provide motivation for other papers.
References


