The nuisance power of lobbies

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Abstract

In the present paper, we analyze an original channel of interaction between politicians and lobbies i.e. its nuisance power. Some lobbies are influencing public policies just because they are able to impact negatively the image of a politician. More particularly, we develop a setting in which lobbies/unions may transmit some information *to the voters* about *the quality of the government* via a costly signal i.e. a strike. In our setting lobbies/unions represent departments of the public sector (Health, Police, Education,...).

An incumbent government seeking reelection allocates a fixed budget among several unionized departments. Strikes are costly and transmit information to voters about the quality of the government. The politician may have interest to distort the budget allocation away from the efficient one in order to maximize his/her probability of reelection. In most cases an hostile union/lobby receives more than a neutral/friendly one.

1 Introduction

Scholars have up to now analyzed the influence of interest groups on policy determination in basically two different ways : via contributions or via transmission of information to decision markers. The first approach relies on common agency theory such as developed for instance by Bernheim and Whinston (1986): the interest groups, or at least some of them, are supposed to transfer money to an incumbent government conditionally on the policy selected (see for instance Helpman and Grossman (1994) for an application to trade policy). In other words the lobbies are supposed to *buy* the politicians. The second approach builds on Crawford and Sobel (1982) analysis of strategic communication in signaling games. Interest groups influence policy decisions by providing relevant informations to the decision maker. This potential influence is an incentive to acquire information even if it is costly (see, among others, Austen-Smith (1995), Lohmann (1994) , Laffont (1999) and Bennedsen and Feldmann (2002)). More recently Bennedsen and Feldmann (2006) analyze the interaction between the two types of instruments, i.e. contributions and information transmission.

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In the present paper, we analyze another channel of interaction between politicians and lobbies i.e. the nuisance power of a lobby. Some lobbies are influencing public policies because they are able to impact negatively the image of decision makers. More particularly, we develop a setting in which unions may transmit some information *to the voters* about *the quality of the government* via a costly signal i.e. a strike. In our setting unions represent sectors of the economy. Typically a group of interest wants to extract some budget in order to improve the welfare of its members or of the society. For instance, the teachers or students' unions recurrently ask for an increase of the budget for education in order to improve the working conditions in the schools. Medical doctors and nurses unions urge for an increase of the budgets of the hospitals to improve the quality of the cares. Facing unlimited demands, governments have to make some arbitrage. Their probability of reelection depends on the way they settle the allocation of the public funds. We define the quality of a government as its ability to do a lot out of a little money. A good government is able to distribute out of the same budget more than a bad one. Social peace allows a maximal production of the public good but reveals little information about the quality of the government while social unrest may reveal some information but at the cost of a lower production of public good. When the unions are unbiased, i.e. have no exogenous hostility against or sympathy for the incumbent government, strikes may occur only when the government is "bad" and are unambiguously informative: the existence of unions/lobby is potentially welfare improving. This is not necessarily the case when some or all unions/lobby are biased against the incumbent government: a good government may be overthrown as a consequence of a strike since the occurrence of a strike against a bad government is more likely than against a good one. Even more interesting is the case where some unions are biased against the government while the others are neutral or even friendly: the government may well have to distort the budget allocation away from the efficient one in order to maximize its probability of reelection. We show that "bad" governments have a tendency to favor the lobbies that are biased against them: they "buy" the biased lobbies while the good governments face two possible strategies : buying the biased lobbies or making the possible signal of lobbies ineffective. We show that good governments favor their political enemies only when they are not too biased.

Close to our approach are Prat (2002a and 2002b). Prat explicitly studies how contributions of lobbies' to political advertising may be analyzed as a signal of the quality of politicians. He builds on Milgrom and Roberts (1986) IO theory on commercial advertising. Political advertising is a credible signal of the "valence" or quality of a politician. Prat assumes that high valence political candidates, everything else being equal, have a higher probability of being elected. Therefore, if the lobbies are able to observe the quality of a candidate, they are more prone to contribute to high valence candidates. Uninformed voters take political advertising as a credible signal of quality. Politicians "burn" money to show to the uninformed voters that lobbies have identified them as high quality candidates. Our approach differs from the latter in the channel used of communication. In our case, the costly signal comes from a political action as strike and not from money spending. Our modelization of the quality of the politician also differ. In Prat the quality/valence of a politician is independent of its ability to tackle policy problems. There is a positive value of having a good politician even if that politician takes decision against the interest of the voters. In our setting a high quality politician is able to do more than a low quality one. The quality level of the politician influences its budget constraint leaving room for an interaction between policy choice and quality.

Cukierman and Tommasi (1998) reach conclusions similar to ours. They show that incumbent politicians whose reelection takes place before the consequences of the policy selected can be observed may take decisions that favor their political enemies. They call it the "policy reversal". Nixon going to China or Begin signing a Peace agreement with Sadat illustrate that type of policy reversal. In their setting, the politicians have better information than voters about the state of the world and their preferences have a stochastic component which is not known by the public. Therefore the policy proposed by the incumbent is only a *noisy* signal of the state of the world. In this framework Cukierman and Tommasi show that extreme policies are more likely to be implemented by unlikely parties because they are more credible when they are argue that these policies are desirable. To sum up, policy reversals in the Cukierman and Tommasi framework bear on decisions with long-run consequences, imply extreme but rarely proposed policies and require a large uncertainty about the incumbent's preferred policy position compared to the uncertainty about the state of the world. We show here that policy reversals may be both more moderate and more pervasive and may happen in other circumstances. We indeed obtain in our framework incumbents favoring hostile lobbies with no uncertainty about politicians' preferences and when the election takes place after the realization of the outcome (policies with short-run consequences).

We want to argue that our model may be better suited to explain some noticeable cases of policy reversal. For instance Clinton's decision in favor of the NAFTA was clearly a cost for the labor unions, one of his important political supports. The president of the 1.3-million-member American Federation of State County and Municipal Employees, Gerald W. McEntee declared to the NYT of the 16th of September 1993 "NAFTA hits the hot button. Health care is important. Reducing the deficit is important. But No. 1 is still jobs, and Nafta has a direct relationship to jobs. People understand that. They see a real possibility their companies will go south." Clinton expected that this would not alienate the support of the labor unions for its reelection. Donald R. Sweitzer, political director of the Democratic National Committee, said to the NYT February 21, 1994 "There are some scars left over from Nafta, some of which will never heal. But these are pragmatic people. We want to move on to things we can agree on." In this case, the effect of NAFTA were expected to be already observable at the reelection time.

There are more European examples: in France, Mitterrand, as a newly elected president in 1981, deeply modified the status of university teachers despite the important support teachers unions provided him. Among others, the reform almost doubled the teaching load. More recently, during the preparation of the 2007 budget law, the Italian finance Ministry proposed a draft budget with heavy cuts to teachers' salary bill. Although the Italian coalition government in 2006 was a leftist one, having on board all leftist parties, including two extreme left post-communist parties, teachers have always been a typical electoral basin for the left, and teachers' unions are aligned to the left of the political spectrum. The Italian 2007 budget law in its final form did not include the planned cuts in the teachers' salary bill, but the story is indicative that a government may find it convenient to go against its traditional allies.

In the same spirit as Cukierman and Tommasi (1998), Grossman and Helpman (1999) analyze political endorsements as a mean of transmitting information on the preferences of the politician from *interest groups leaders to interest groups members* and subsequently study the competition between parties for endorsements.

In section 2 we set up the model. In Section 3 we analyze the case when one union is exogenously biased against the incumbent government while the other one is neutral or even friendly. In section 4 we present concluding remark and discuss some possible extensions.

2 The model

We analyze here the interaction between rational voters, office seeking politicians and strategic lobbies/unions. We consider a two period model. In each period the government allocates a fixed budget between the n public sectors of the economy, each of them producing a public good such as education, health, police,... Each of these sectors is represented by an union which wants to maximize the output of its sector. Teachers, medical doctors, nurses or the police unions for instance recurrently want to get more money for the sectors they represent. In the first period the lobbies/unions are playing a game with the incumbent government which will apply for a second term at the end of the period. Lobbies decide whether to go on strike or not. Strikes are costly not only for voters, they reduce the provision of public goods, but also for unions as they decrease spending in their sector. They are therefore potentially credible signals about the quality of the government.

2.1 The production of the public goods

The production of the public goods depends on the budget allocated to that sector and the conjuncture which is a random variable ε distributed according to a density function $f(\varepsilon) > 0$, $\forall\ \varepsilon \in [\underline{\varepsilon}, \overline{\varepsilon}]$, where we denote by $\hat{\varepsilon} = E(\varepsilon)$.

The production of the public good when the allocation of the budget among the lobbies is $\mathbf{b} = (b_1, ...b_n)$ and given a conjuncture ε, is

$$I = G(\varepsilon \mathbf{S}\ \mathbf{b})$$

where $\mathbf{S}$ is a n x n diagonal matrix such that $S_{ii} = 0$ (resp.$S_{ii} = 1$) when lobby i goes (resp. doesn't go) on strike. We shall assume that G is increasing in all its arguments and, for analytical convenience, is homogeneous of degree 1.

The homogeneity assumption implies that, whatever the budget and the conjuncture, the same sharing rule $\boldsymbol{\alpha}^*$ maximizes the production of the public good. We shall call it the *optimal sharing rule*. The maximum production of the public good is $\varepsilon\theta g^*$ with $g^* = G(\boldsymbol{\alpha}^*)$

2.2 The government

The incumbent government is assumed to be office oriented. More precisely any politician, whether the incumbent or a challenger, has lexicographical preferences, namely he/she first cares about reelection and, everything else equal, he/she prefers a higher production of public good to a lower one. This means that, in the second period which is the last one, any government maximizes the overall production of public good.

We shall assume that government are of two types, able and unable ones. An able government makes more out of its budget. With a budget B, he manages to distribute $\overline{\theta}B$

to the different sectors. An unable government is less efficient and therefore distributes only $\underline{\theta}B$ with $\underline{\theta} <.\overline{\theta}$

Ex ante, the ability of the government (and of potential challengers) is perceived by the voters as a random variable. With probability p the government (or a potential challenger) is unable. We denote the expected governmental efficiency by $\hat{\theta} = p\underline{\theta} + (1-p)\overline{\theta}$.

The strategy space of the government is the sharing rule it uses to allocate its budget i.e. $\mathbf{b}(\boldsymbol{\theta}) =(b_1, b_2, ..., b_n)$ with $\theta B = \sum_{i=1}^{n} b_i$[1]. The incumbent government chooses $\mathbf{b}(\boldsymbol{\theta})$ in order to maximize its probability of reelection. In the second period the government chooses $\mathbf{b}(\boldsymbol{\theta})$ in order to maximize public good production[2]. We denote by $\underline{\mathbf{b}}^* = \underline{\theta}\alpha^*$ and $\overline{\mathbf{b}}^* = \overline{\theta}\alpha^*$the optimal allocation of the budget for respectively an able and an unable government.

2.3 Timing of the game

The timing of the game is as follows :

In the first period a type $\theta-$government is randomly chosen.

- *Before the realization of the conjuncture variable*, the government chooses $\mathbf{b}(\theta)$, the allocation of its budget among the different sectors.

- *After the conjuncture random variable realizes* the unions non-cooperatively decide about going on strike or not. The sectors that are not on strike produce. Voters enjoy I and vote.

In the second period, either the government is reelected or a new government is randomly chosen. Like in the first period, the government chooses the allocation of its budget, conjuncture unfolds and unions decide about strike.

2.4 The lobbies/unions

We assume that a lobby cares about two things : its budget[3] and its bias for or against the government. We say that a lobby i is biased against (resp. for) the government when it derives an exogenous benefit (resp. bears an exogenous cost) k_i from getting rid of the government.

As the second period budget allocation is efficient, i.e. lobby i receives a budget $\alpha_i^*\theta$ from a type $\theta-$government, the lobbies know that in the second period their budgets depend only on the quality of the government. If the government is reelected, the expected utility of a lobby which gets a budget b_i in the first period is given by

$$\varepsilon b_i + \hat{\varepsilon}\alpha_i^*\theta$$

If, following a strike, the government is turned down, the lobby gets

$$k_i + \hat{\varepsilon}\alpha_i^*\hat{\theta}$$

[1] In the following we set $B = 1$ without any loss of generality.

[2] This end of the game assumption helps us to get simple analytical results. Adding other period would not change the analysis as long as there is a last period.

[3] We could interprete ε as measuring the need for public intervention, unions ouput as the level of "social peace". As ε is larger it is easier to obtain more "social peace".

It is clear from here that a strike is costly and that an union goes on strike only when this is necessary to turn down the incumbent government.

Therefore, **if a lobby i expects its decision to be critical in the reelection of the government**, it will go on strike only if

$$\varepsilon b_i + \hat{\varepsilon}\alpha_i\theta < k_i + \hat{\varepsilon}\alpha_i\hat{\theta}$$

i.e. iff $\varepsilon < \varepsilon^U(b_i, k_i, \theta)$ where

$$\varepsilon^U(b_i, k_i, \theta) = \frac{k_i + \hat{\varepsilon}\alpha_i(\hat{\theta} - \theta)}{b_i}$$

In equilibrium there is never more than one union which goes on strike. Given the budget allocation $\mathbf{b}(\theta)$and the state of nature ε the unions play a non-cooperative game which determines which of those which would benefit from the overthrowing of the government will go on strike. Of course this game has as many equilibria as there are unions i for which the inequality $\varepsilon < \varepsilon^U(b_i, k_i, \theta)$ holds. Notice that we have a problem of collective action when there is more than one union. The unions when deciding whether or not to go on strike do not account for the benefits which the strike would bring to the others.

2.5 Voters

A majority of voters are assumed to care only about the public goods[4]. Voters do not observe directly the type of the government nor the conjuncture but only the aggregate amount of public good,

$$I = \varepsilon G(\mathbf{S}\ \mathbf{b})$$

They see if one or several unions go on strike, i.e. they observe $\mathbf{S}$. They rationally expect the allocation of the budget by each type of government. We define $\overline{\mathbf{b}} = (\overline{\mathbf{b}}_1, ..., \overline{\mathbf{b}}_n)$ and $\underline{\mathbf{b}} \equiv (\underline{\mathbf{b}}_1, ...\underline{\mathbf{b}}_n)$ respectively the rationally expected budget allocation of a good and a bad government with $\sum_{i=1}^{n} \overline{\mathbf{b}}_i = \overline{\boldsymbol{\theta}}$ and $\sum_{i=1}^{n} \underline{\mathbf{b}}_i = \underline{\boldsymbol{\theta}}$.

Given the ongoing strikes represented by $\mathbf{S}$, the government is detected as bad if the overall output I is lower than the lowest output which can be expected under a "good" government, i.e. iff $I = \varepsilon G(\mathbf{S}\ \mathbf{b}) < \underline{\varepsilon} G(\mathbf{S}\ \overline{\mathbf{b}})$ or, equivalently, iff $\varepsilon < \varepsilon^V(\overline{\mathbf{b}}, \underline{\mathbf{b}}, \underline{\varepsilon}, \mathbf{S})$ where

$$\varepsilon^V(\overline{\mathbf{b}}, \underline{\mathbf{b}}, \underline{\varepsilon}, \mathbf{S}) = \underline{\varepsilon}\left(\frac{G(\mathbf{S}\ \overline{\mathbf{b}})}{G(\mathbf{S}\ \underline{\mathbf{b}})}\right)$$

Despite the ongoing strikes, the government is detected as "good" iff the overall output is larger than the largest output which can be obtained under a "bad" government, i.e. iff $\varepsilon G(\mathbf{S}\ \mathbf{b}) > \overline{\varepsilon} G(\mathbf{S}\ \underline{\mathbf{b}})$ or, equivalently, if $\varepsilon > e^V(\overline{\mathbf{b}}, \underline{\mathbf{b}}, \overline{\varepsilon}, \mathbf{S})$ where

$$e^V(\overline{\mathbf{b}}, \underline{\mathbf{b}}, \overline{\varepsilon}, \mathbf{S}) = \overline{\varepsilon}\left(\frac{G(\mathbf{S}\ \underline{\mathbf{b}})}{G(\mathbf{S}\ \overline{\mathbf{b}})}\right)$$

[4]The quality of the government affects the welfare of the voters indirectly via the level of the aggregate public good. In Prat (2002a) (2002b), the "valence" of the politician was entering directly the utility of the voters. In these papers, high valence politicians, in exchange for the political contributions, were biasing their decisions in favor of their contributing lobbies against the interest of the median voter.

We shall deal in this paper with the non trivial case where the largest output under a bad government is larger than the lowest output under a good government[5]. In this case the voters do not obtain any information about the government's type whenever $\varepsilon^V(\overline{\mathbf{b}}, \underline{\mathbf{b}}, \underline{\varepsilon}, \mathbf{S}) \leq \varepsilon \leq e^V(\overline{\mathbf{b}}, \underline{\mathbf{b}}, \overline{\varepsilon}, \mathbf{S})$.

Assumption 1: $\frac{\overline{\varepsilon}}{\underline{\varepsilon}} \in \left[\frac{\overline{\theta}}{\underline{\theta}}, \frac{\overline{\theta}}{\alpha_2 \underline{\theta}}\right]$

This assumption states that the best output under a bad government is larger than the worst output under a good government (without this assumption our problem becomes trivial) but lower than $1/\alpha_2$ this output (a quite reasonable assumption which will guarantee that a good government can always ensure its reelection).

For further use we denote $d = \frac{\overline{\theta}}{\underline{\theta}} \frac{\underline{\varepsilon}}{\overline{\varepsilon}}$ the "detectability index" which is the ratio between the worst output under a good government and the best output under a bad government. From Assumption 1, this index is lower than 1 but larger than α_2.

In this setting, the voters reelect the government iff it is not detected as a bad one.

As usual this game will be solved backward. We concentrate in the following on the case where there exist two different unions, the first one being hostile to the incumbent government while the second is neutral or even friendly. The case of identical unions is left to the readers[6].

2.6 One hostile and one neutral/friendly union

Assume that one of the unions, say Union 1, is biased against the government, i.e. $k_1 > 0$, while the other is unbiased or biased in favor of the government, i.e. $k_2 \leq 0$[7]. For expositional simplification, we shall assume that the bias is large enough, i.e.

$$k_1 > \underline{k} = \underline{\varepsilon \theta} - \hat{\varepsilon}\alpha_1(\hat{\theta} - \underline{\theta})$$

This ensures that even if the bad government allocates all its budget to the hostile union it will go on strike with positive probability $i.e : \varepsilon^U(\underline{\theta}, k_1, \underline{\theta}) > \underline{\varepsilon}$ [8].

The government, whatever its type, allocates its budget between the two unions taking into account the anticipations $\overline{\mathbf{b}}$ and $\underline{\mathbf{b}}$ of the voters and given how a strike is interpreted by voters.

A strike is interpreted by the voter as a signal of low quality for the government when two conditions are satisfied:

1. they anticipate that the probability of going on strike against a good government is lower than against a bad government, i.e.

$$\varepsilon^U(\bar{b}_i, k_i, \bar{\theta}) = \frac{k_i + \hat{\varepsilon}\alpha_i(\hat{\theta} - \bar{\theta})}{\bar{b}_i} < \varepsilon^U(\underline{b}_i, k_i, \underline{\theta}) = \frac{k_i + \hat{\varepsilon}\alpha_i(\hat{\theta} - \underline{\theta})}{\underline{b}_i} \tag{1}$$

[5] Would this not be the case, the result would be trivial : (i) a bad (resp. good) government is always detected as bad (resp. good) since $\varepsilon^V(\mathbf{b}(\overline{\theta}), \mathbf{b}(\underline{\theta}), \underline{\varepsilon}) \geq \overline{\varepsilon}$ (resp. $e^V(\mathbf{b}(\overline{\theta}), \mathbf{b}(\underline{\theta}), \overline{\varepsilon}, \mathbf{S}) \leq \underline{\varepsilon}$), (ii) whatever the conjuncture, no union goes on strike and (iii) the government always chooses the socially optimal allocation since this has no influence on its probability of reelection.

[6] Very intuitively when the unions are identical the government always chooses an efficient (egalitarian) budget allocation.

[7] With n unions all we need is that there is at least one union which is not biased against the gouvernment and will never go on strike against a good government. This condition ensures that the voters always have an opportunity to detect a good government.

[8] This assumption enables us to reduce drastically the number of cases to be discussed. Nevertheless, note that this assumption doesn't influence the conclusion of the paper.

2 the government is not identified as good[9], i.e. $I > \overline{I} = \overline{\varepsilon} G(0, \underline{b}_2)$.

$$\varepsilon > e^V = \overline{\varepsilon} \frac{G(0, \underline{b}_2)}{G(0, \overline{b}_2)} = \overline{\varepsilon} \frac{\underline{b}_2}{\overline{b}_2}. \qquad (2)$$

We shall analyze the behavior each type of government given what the other type of government is anticipated to do.

2.6.1 The bad government

A bad government is concerned by two possible events: being identified as such, i.e. if $\varepsilon < \varepsilon^V(\mathbf{b}(\overline{\theta}), \mathbf{b}(\underline{\theta}), \underline{\varepsilon}, \mathbf{0}) = \underline{\varepsilon} \left(\frac{G(\overline{\mathbf{b}})}{G(\underline{\mathbf{b}})} \right)$, or having one of the union going on strike, i.e. if $\varepsilon < \max[\varepsilon^U(\underline{b}_1, k_1, \underline{\theta}), \varepsilon^U(\underline{b}_2, k_2, \underline{\theta})]$. The occurrence of only one of these events is enough to prevent reelection.

It follows that the bad government willing to maximize its probability of reelection minimizes the **largest** of these values. Figure 1 below depicts the different possible cases. Given the budget allocation $\mathbf{b}(\overline{\theta})$ which is rationally expected by the good government ε^V is a U-shaped function of $\underline{b}_1$ which takes its minimum value at $\underline{b}_1^* = \alpha_1 \underline{\theta}$.

On the other hand $\varepsilon^U(\underline{b}_1, k_1, \underline{\theta})$ is a decreasing function of $\underline{b}_1$ while $\varepsilon^U(\overline{\theta} - \underline{b}_1, k_2, \underline{\theta})$ is an increasing function of $\underline{b}_1$. Moreover two of these curves intersect only once as it is straightforward to show. Geometrically speaking the bad government's problem is to allocate its budget in order to reach the lower point on the upper envelope of the three curves.

Under our assumptions there are only three possible cases (as formally shown in Lemma 1 below). In Case (a) of Lemma 1 the equilibrium allocation is the one which gives its minimum value to ε^V, i.e. the efficient allocation. The dominant concern for the government the possibility to be identified as bad. A strike is not an option as, would one of the lobby have an incentive to go on strike, the government would anyway be identified as bad. Case (b) corresponds to the point where $\varepsilon^U(\underline{b}_1, k_1, \underline{\theta})$ and ε^V intersect. Threat to government reelection is the possibility to be identified as bad but he doesn't minimize this possibility because he wants to insure that Union 1 doesn't go on strike (i.e. the probabilities of the government being detected as bad and of Union 1 going on strike are equalized). As a consequence, the hostile union 1 receives a larger share of the budget. Finally in Case (c) of Lemma 1 the equilibrium allocation corresponds to the point where $\varepsilon^U(\underline{b}_1, k_1, \underline{\theta})$ and $\varepsilon^U(\overline{\theta} - \underline{b}_1, k_2, \underline{\theta})$ (i.e. the probabilities of Union 1 and Union 2 going on strike are equalized): the hostile union gets an even larger share of the budget. In this case what really drives the allocation of the budget is the probability of a strike.

In the following we define $\underline{b}_1^{UU}$ by the equality $\varepsilon^U(\underline{b}_1^{UU}, k_1, \underline{\theta}) = \varepsilon^U(\underline{\theta} - \underline{b}_1^{UU}, k_2, \underline{\theta})$. We easily get

$$\underline{b}_1^{UU} = \underline{\theta} \frac{k_1 + \hat{\varepsilon}\alpha_1(\hat{\theta} - \underline{\theta})}{k_2 + k_1 + \hat{\varepsilon}(\hat{\theta} - \underline{\theta})} \qquad (3)$$

which is increasing with k_1. One can easily check that $\underline{b}_1^{UU} > \alpha_1 \underline{\theta}$ as long as $k_1 > k_2$.

[9] Union 2 never goes on strike when the government is good.

We also define $\underline{b}_1^{UV}$ by the equality $\varepsilon^U(\underline{b}_1^{UV}, k_1, \underline{\theta}) = \varepsilon^V(\overline{\mathbf{b}}, \underline{b}_1^{UV}, \underline{\varepsilon}, \mathbf{0})$. This budget allocation is the one that minimize the probability of a strike. It can be written as

$$\underline{b}_1^{UV} = \underline{\theta}[1 + \gamma(\frac{\underline{\varepsilon} G(\overline{\mathbf{b}})}{k_1 + \hat{\varepsilon}\alpha_1(\hat{\theta} - \underline{\theta})})]^{-1} \tag{4}$$

where $\gamma(G)$ is the inverse function of $G(1, \gamma)$. $\gamma(G)$ is an increasing and concave function.

The optimal budget allocation of the *bad* government typically depends on what a *good* government is expected to do, i.e. on $G(\overline{\mathbf{b}})$. Somehow, the good government disciplines the bad one. The more efficient the sharing rule of the good government and the higher its ability, the more efficiently the bad government has to behave. An increase in $G(\overline{\mathbf{b}})$, shifts ε^V up and therefore increases the concern for the bad government of being identified. For high values of $G(\overline{\mathbf{b}})$, this is the only concern of the government.

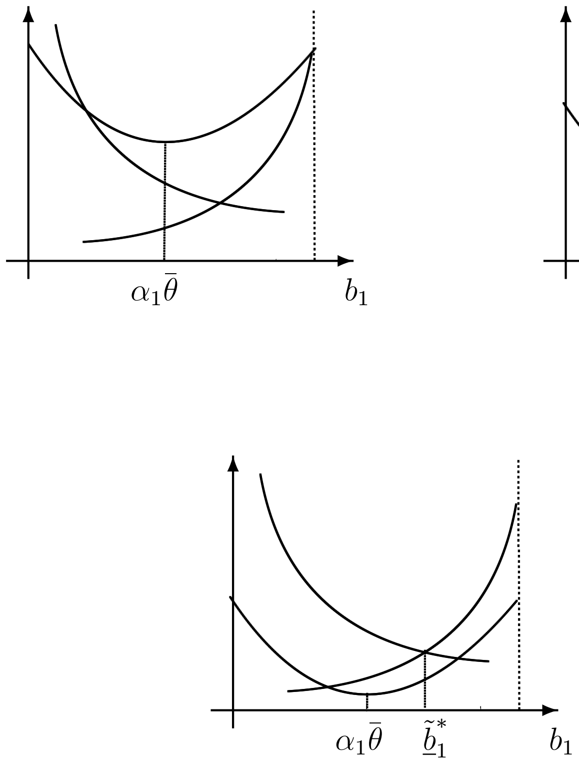
When $G(\overline{\mathbf{b}})$ is intermediate the bad government not only fears to be identified as a bad one but is also afraid that the biased union goes on strike and it is $\underline{b}_1^{UV}$ which minimizes that probability. When $G(\overline{\mathbf{b}})$ is small, ε^V is low, being directly identified as a bad government is no more a concern, the government therefore minimizes the probability that one of the union goes on strike by choosing $\underline{b}_1^{UU}$. One can easily check that as soon as $G(\overline{\mathbf{b}})$ is not too large, the bad government gives to the biased union $\min[\underline{b}_1^{UV}, \underline{b}_1^{UU}]$.

All this is summarized in the following lemma:

Lemma 1 *(a) If* $G(\overline{b}_1, \overline{b}_2) \geq \frac{G(\alpha_1,\alpha_2)}{\alpha_1} \frac{k_1+\hat{\varepsilon}\left(\widehat{\theta}-\underline{\theta}\right)}{\underline{\varepsilon}}$ *the bad government selects the efficient allocation* $\underline{b}_1 = \alpha_1\underline{\theta}$

(b) If $\frac{G(\alpha_1,\alpha_2)}{\alpha_1} \frac{k_1+\hat{\varepsilon}\left(\widehat{\theta}-\underline{\theta}\right)}{\underline{\varepsilon}} \geq G(\overline{b}_1, \overline{b}_2) \geq \frac{G(\underline{b}_1^{UU}, \underline{\theta}-\underline{b}_1^{UU})}{\underline{\varepsilon}} \frac{k_1+\hat{\varepsilon}\left(\widehat{\theta}-\underline{\theta}\right)}{\underline{b}_1^{UU}}$ *the bad government selects* $\underline{b}_1 = \underline{b}_1^{UV}$;

(c) If $\frac{G(\underline{b}_1^{UU}, \underline{\theta}-\underline{b}_1^{UU})}{\underline{\varepsilon}} \frac{k_1+\hat{\varepsilon}\left(\widehat{\theta}-\underline{\theta}\right)}{\underline{b}_1^{UU}} \geq G(\overline{b}_1, \overline{b}_2)$ *the bad government selects* $\underline{b}_1 = \underline{b}_1^{UU}$



Case(c)

Figure 1: Bad government optimal budget sharing

2.6.2 The good government

A good government is always reelected except if the hostile Union is willing **and** able to turn him down with a strike. This is to say that a good government is reelected iff $\varepsilon \geq \min\{\varepsilon^U(\overline{b}_1, k_1, \overline{\theta}), \overline{\varepsilon}\frac{\underline{b}_2}{\overline{b}_2}\}$, i.e. it is overthrown if the hostile Union is willing to on strike **and** it is not detected as good. This corresponds to two different cases. If $\varepsilon^U(\overline{b}_1, k_1, \overline{\theta}) < \overline{\varepsilon}\frac{\underline{b}_2}{\overline{b}_2}$ it is reelected because the "hostile" Union 1 has no incentive to go on strike even when the conjuncture is such that a strike would overthrow the government[10]. If $\varepsilon^U(\overline{b}_1, k_1, \overline{\theta}) > \overline{\varepsilon}\frac{\underline{b}_2}{\overline{b}_2}$ a strike, though possibly profitable for Union 1 if it could overthrow the government, would be ineffective: the government would be detected as a good one despite the strike. Obviously if there is a budget allocation such that $\min\{\varepsilon^U(\overline{b}_1, k_1, \overline{\theta}), \overline{\varepsilon}\frac{\underline{b}_2}{\overline{b}_2}\} \leq \underline{\varepsilon}$ the good government is reelected for sure. We are now going to analyze the two possible strategies which a good government can use in order to maximize its probability of being reelected: *trying to be detected as good* or *trying to avoid a strike*. We will subsequently analyze which is the precise strategy selected by the good government, given what is expected by the bad ones.

[10] This is the case when $\varepsilon \in [\varepsilon^U(\overline{\theta}_1, k_1, \overline{\theta}), \overline{\varepsilon}\frac{\underline{\theta}_2}{\overline{\theta}_2}]$.

Trying to be detected as good The first possible strategy is to maximize the probability of being identified as good even when Union 1[11] goes on strike. The strategy consists in giving enough to the union favorable to the government such that would union 1 go on strike, the voters would be able to identify the quality of the government. This is typically the case in which the government favors its political friends. By doing that it ensures that their political enemies never go on strike.

The first case to consider is when there exists a feasible budget allocation (b_1, b_2) which ensures that the government is always detected as a good one despite a strike, i.e. which is such that $e^V = \bar{\varepsilon}\frac{\underline{b}_2}{b_2} \leq \underline{\varepsilon}$ .This is equivalent to the existence of a couple $\left(\bar{b}_1^s, \bar{b}_2^s\right)$ $\in \{(b_1, b_2) \in \left[0, \bar{\theta}\right]^2 : b_1 + b_2 \leq \bar{\theta}\}$ such that $\bar{\varepsilon}\frac{\underline{b}_2}{\bar{b}_2^s} = \underline{\varepsilon}$. The candidate values are obtained as

$$\begin{aligned} \bar{b}_2^s &= \frac{\bar{\varepsilon}}{\underline{\varepsilon}}\underline{b}_2 \\ \bar{b}_1^s &= \bar{\theta} - \frac{\bar{\varepsilon}}{\underline{\varepsilon}}\underline{b}_2 \end{aligned}$$

Therefore, all budget allocation giving at least $\bar{b}_2^s$ to Union 2, ensures reelection.

It is not always the case that the government has to distort its budget allocation from efficiency. When $\bar{b}_2^s < \alpha_2\bar{\theta}$, choosing the efficient allocation is enough to ensure reelection.

The second case of interest is when for all feasible budget allocations there is a positive probability of the government not being detected as a good one, i.e.; $\bar{\varepsilon}\frac{\underline{b}_2}{b_2} > \underline{\varepsilon}$ for all b_2. In this case maximizing the probability of being detected as good using that strategy implies to give all the budget to the neutral/friendly union. We see clearly here that what is expected from the bad government has a direct influence on the strategy of the good one. The higher $\underline{b}_2$, the more difficult it is to secure reelection.

To sum up, we obtain a priori three distinct possibilities, depending on what a bad government is expected to decide:

1. when $\bar{b}_2^s < \alpha_2\bar{\theta} \Leftrightarrow \underline{b}_2 \leq \alpha_2\frac{\underline{\varepsilon}}{\bar{\varepsilon}}\bar{\theta}$, by implementing the efficient budget allocation $(\alpha_1\bar{\theta}, \alpha_2\bar{\theta})$ the good government ensures its reelection.

2. when $\alpha_2\frac{\underline{\varepsilon}}{\bar{\varepsilon}}\bar{\theta} \leq \underline{b}_2 \leq \frac{\underline{\varepsilon}}{\bar{\varepsilon}}\bar{\theta}$, the government can secure its reelection by announcing the budget allocation $\left(\bar{b}_1^s, \bar{b}_2^s\right)$ which is such that $\bar{\theta} \geq \bar{b}_2^s \geq \alpha_2\bar{\theta}$.

3. when $\underline{b}_2 > \frac{\underline{\varepsilon}}{\bar{\varepsilon}}\bar{\theta}$, $\left(\bar{b}_1^s, \bar{b}_2^s\right)$ is not a feasible allocation and the government, which cannot ensure this way its reelection, has to give all its budget to the unbiased union to maximize its probability of being reelected despite a strike.

However we know from Lemma 1 that the equilibrium value of $\underline{b}_2$ is bounded above by $\alpha_2\underline{\theta}$. It follows that the third case never appears since this would imply that $\alpha_2\underline{\theta} \geq \underline{b}_2 > \frac{\underline{\varepsilon}}{\bar{\varepsilon}}\bar{\theta}$ and then $\left(\frac{\bar{\varepsilon}}{\underline{\varepsilon}}\right) > \frac{\bar{\theta}}{\alpha_2\underline{\theta}}$, contradicting our Assumption 1. Under this assumption **a good government can always ensure its own reelection** by selecting a budget allocation such that it is detected as good.

We finally define $b_2^* = \max\{\alpha_2\bar{\theta},\ \bar{b}_2^s\}$. We define as k^* the value[12] of k_1 which is such that $\alpha_2\bar{\theta} = \bar{b}_2^s$.

[11] Union 2 never goes on strike against a good government.

[12] We will show below that this value is unique.

2.6.3 Trying to avoid a strike

An alternative strategy is to minimize the probability of a strike. Under this strategy, the government favor its political enemy in order to dissuade him to go on strike. When a union gets a big budget, its opportunity cost of going on strike is high. Clearly, higher the bias of Union 1, the more difficult it is to buy it. We shall therefore consider different cases as a function of k_1. When k_1 is not to important and the government is a high quality (i.e. $(\overline{\theta} - \hat{\theta})$ is big), the government has not to depart from efficiency to avoid a strike. We define $\tilde{k}$, the limiting bias such that the efficient budget allocation ensures that no strikes occurs i.e. $\tilde{k}$ such that $\varepsilon^U(\alpha_1\overline{\theta}, \tilde{k}, \overline{\theta}) = \underline{\varepsilon}$. We obtain

$$\tilde{k} = \underline{\varepsilon}\alpha_1\overline{\theta} + \hat{\varepsilon}\alpha_1(\bar{\theta} - \hat{\theta}). \tag{5}$$

For higher values of k_1, the government may still ensure no strike but at some efficiency cost. It has to give to the biased union more than its efficient share in the budget, we say then that the government is favoring its political enemy. We denote $\overline{b}_1^{ns}$ the budget needed to avoid a strike. It which solves $\varepsilon^U(b_1, k_1, \overline{\theta}) = \underline{\varepsilon}$. We obtain

$$\overline{b}_1^{ns} = \frac{k_1 + \hat{\varepsilon}\alpha_1(\hat{\theta} - \bar{\theta})}{\underline{\varepsilon}} \tag{6}$$

But there is some limit in the level of the bias. When Union 1 is too biased, it may be that giving it the all budget is not enough to ensure that it will not go on strike. We define $\tilde{\tilde{k}}$ as this limiting bias; i.e. $\tilde{\tilde{k}}$ is such that $\varepsilon^U(\overline{\theta}, \tilde{k}, \overline{\theta}) = \underline{\varepsilon}$. We obtain

$$\tilde{\tilde{k}} = \underline{\varepsilon}\overline{\theta} + \hat{\varepsilon}\alpha_1(\bar{\theta} - \hat{\theta}). \tag{7}$$

Let us on the other hand define $b_1^* = \min\{\alpha_1\overline{\theta}, \overline{b}_1^{ns}\}$.
To sum up:

1. when $k_1 \leq \tilde{k}$ the good government ensures its reelection by implementing the efficient budget allocation $b_1^* = \alpha_1\bar{\theta}$
2. when $\tilde{k} \leq k_1 \leq \tilde{\tilde{k}}$, the good government can ensure its reelection by announcing a budget allocation such that $b_1^* = \overline{b}_1^{ns}$.
3. When $k_1 > \tilde{\tilde{k}}$, it is not possible to avoid for sure the strike from the biased union.

We may conclude from the study of the strategies of the good government that it can always reach its first goal which is to ensure its own reelection. When the two strategies just described (trying to be detected as good or to avoid a strike) are available it will select the one which yields the maximum overall output.

2.7 Equilibria

The equilibrium behavior of a bad government has been characterized by Lemma 1, given what the good government is expected to do (i.e. depending on $G(\overline{\mathbf{b}})$. As we just saw the results about the good government' s behavior depended in turn, through $\underline{b}_2$, on what the bad government is expected to do. It is time now to characterize the bad and good governments' optimal policies as an only function of the parameters of the model. It turns out that there are two different cases depending on the parameters values and especially on the "detectability index" defined above.

We begin by the more tractable case: when the detectability index is large enough the good government always selects the efficient allocation so that the bad government' behavior can be characterized very neatly.

Proposition 1 *Iff the detectability index* $d \geq \widehat{d}$*, where*

$$\widehat{d} = \frac{1}{\alpha_2} \frac{k_2 + \alpha_2 \hat{\varepsilon}\left(\widehat{\theta} - \underline{\theta}\right)}{k_2 + \alpha_2 \hat{\varepsilon}\left(\widehat{\theta} - \underline{\theta}\right) + \alpha_1(\underline{\varepsilon}\overline{\theta} + \hat{\varepsilon}\left(\overline{\theta} - \widehat{\theta}\right)} \text{ if } g^* > \hat{g}$$

and $\widehat{d} = \frac{\gamma(\xi)}{1+\gamma(\xi)}$ *otherwise with* $\xi = \frac{g^*}{\alpha_1}(1+\frac{\widehat{\varepsilon}}{\underline{\varepsilon}}\frac{\overline{\theta}-\theta}{\overline{\theta}})^{-1}$ *and* $\hat{g} = G\left(k_1 + \alpha_1 \hat{\varepsilon}(\widehat{\theta} - \underline{\theta}), k_2 + \alpha_2 \hat{\varepsilon}(\widehat{\theta} - \underline{\theta})\right)/(\underline{\varepsilon}\overline{\theta})$[13]*, there exists an equilibrium such that*

(a) the good government selects the efficient budget allocation for all $k_1 \geq 0$;

(b) the bad government selects the efficient budget allocation when $k_1 \in \left[0, \underline{\varepsilon}\alpha_1\overline{\theta} - \widehat{\varepsilon}(\widehat{\theta} - \underline{\theta})\right]$;

(c) the bad government chooses $\underline{b}_1 = \underline{b}_1^{UV}$[14] *when* $k_1 \in \left[\underline{\varepsilon}\alpha_1\overline{\theta} - \widehat{\varepsilon}(\widehat{\theta} - \underline{\theta}), \underline{\varepsilon}\alpha\overline{\theta} - \widehat{\varepsilon}(\widehat{\theta} - \underline{\theta})\right]$;

(d) the bad government chooses $\underline{b}_1 = \underline{b}_1^{UU}$[15] *when* $k_1 \geq \underline{\varepsilon}\alpha\overline{\theta} - \widehat{\varepsilon}(\widehat{\theta} - \underline{\theta})$.

Proof. see Appendix. ■

In order to characterize the good government's behavior in the complementary case where the detectability index is low enough we need some preliminary results and definitions. We show in Appendix that (a) $\overline{b}_1^s$ is an increasing function of k_1 (Claim 1), (b) $\overline{b}_2^{ns}$ is a decreasing function of k_1 (Claim 2) and (c) there exists a k^{**} such that $G(\overline{b}_1^*(k^{**}), \overline{\theta} - \overline{b}_1^*(k^{**})) = G(\overline{\theta} - \overline{b}_2^*(k^{**}), \overline{b}_2^*(k^{**}))$ and that the good government's equilibrium budget allocation is given by $(\overline{b}_1^*, \overline{\theta} - \overline{b}_1^*)$ when $k_1 \leq k^{**}$ and by $(\overline{\theta} - \overline{b}_2^*, \overline{b}_2^*)$ when $k_1 \geq k^{**}$ (Claim 3).

Proposition 2 *Iff the detectability index* $d < \widehat{d}$

(a) when the hostile union is not too biased, i.e. $k \leq k^{**}$*, the good government shares the budget in such a way that the hostile union is not willing to go on strike. The biased union never gets* less *than its efficient budget share, i.e.* $\overline{b}_1 \geq \alpha_1\overline{\theta}$*. Moreover, the larger the bias the larger the biased union's share.*

(b) when the hostile union's bias is large, $k \geq k^{**}$*, the good government shares the budget in such a way that, even if the biased union goes on strike, the ability of the government is revealed. The biased union never gets more than the efficient share of the budget, i.e.* $\overline{b}_1 \leq \alpha_1\overline{\theta}$*. Nevertheless, the larger the bias the larger the budget share of the biased union.*

Proof. see Appendix.

■

[13]Notice that in any case $\widehat{d} < \frac{1}{\alpha_2}$.

[14]where $\underline{b}_1^{UV}$ is given by equation (4) where $\overline{\theta}g^*$ has been substituted for $G(\overline{b}_1, \overline{b}_2)$.

[15]$\underline{b}^{UU}$ is given by equation (3).

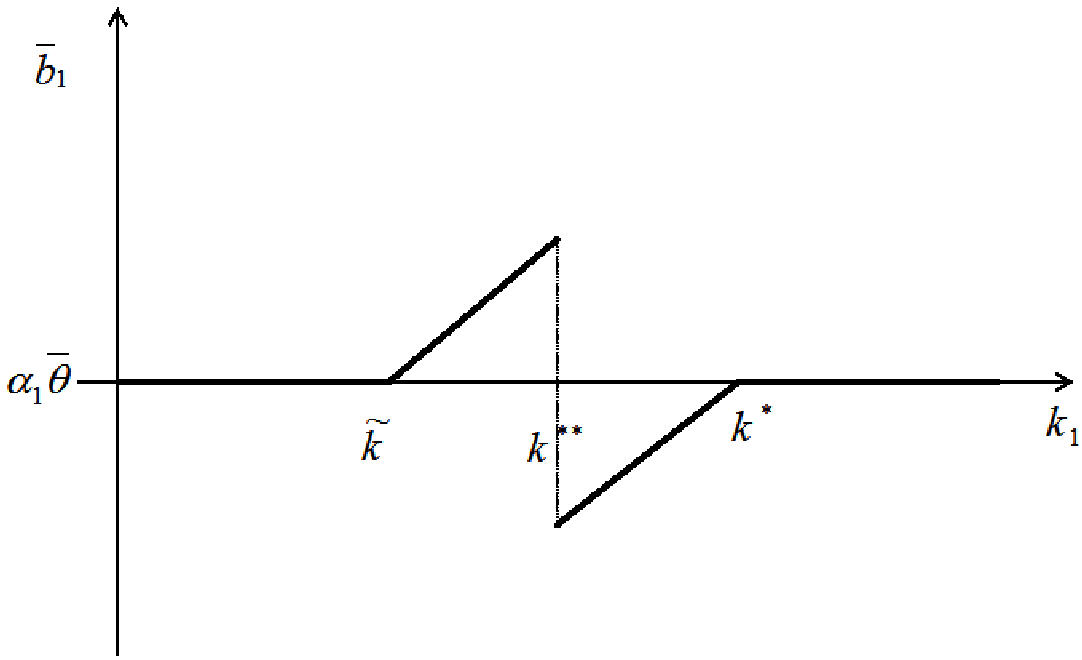


Figure 2: The equilibrium good government's budget allocation to the hostile union

In Case (a) of Proposition 2 the good government buys its political enemy. In Case (b) it favors its friends. In order to reduce Union 1's incentive to go on strike, the bad government distorts the budget allocation by giving it a larger share when the union's bias k_1 becomes larger than a critical value. This share is subsequently an increasing function of k_1 so that the more hostile Union 1 is, the larger budget share it will receive from the bad government. A contrario when the detectability index is large enough the good government selects the efficient budget allocation: when k_1 is low (moderately hostile Union 1) the hostile union has no incentive to go on strike and when k_1 would be such that Union 1 would otherwise go on strike the efficient budget sharing is become sufficient to signal that the government is good[16]. Notice that in the two cases examined above and under Assumption 1 (a detectability index larger than 1/2) the good government is always reelected.

3 Concluding remarks

In this paper we have analyzed an alternative channel trough which lobbies can influence a government. We have shown that when lobbies can use a costly signal, like a strike, governments may distort their policies away from efficiency. Lobbies do not give any contribution to the government, only the credible threat of going on strike drives the allocation of the budget. One interesting conclusion we reached in this paper is that, in most cases, an incumbent government seeking reelection favors its enemies, i.e. gives a larger share of the budget to the hostile union in order to reduce its incentives to go on strike. This is always the case of a low ability government. This is equally the case

[16] This is simply because the budget share of the neutral union under the bad government is a decreasing function of k_1.

when the government is efficient but the hostile union's bias is not too large. Only when the government is good and the hostile union's bias large does the government favor its friends, trying by doing so to be detected as good despite any possible strike. This gives a new glance at the policy reversals identified by Cukierman and Tommasi (1998).

Our model does not have the pretension to be exhaustive in the analysis of the interaction between government an lobbies. We only show that when the strategic variable of a lobby is its nuisance power, it is almost always the lobbies that are not favorable to the incumbent government that take advantage of such interactions as they are the more credible in their threat.

We claim that the mechanism presented in this paper is far more general than the model itself. We purposedly limited the model to two lobbies and two periods to make our argument as simple as possible. Extending the model in order to include several hostile unions would be rather cumbersome but would not modify substantially our results, at least when detectability is above the critical value which ensures that the good government chooses the efficient budget allocation: a bad government would favor more the more hostile unions. The addition of more periods in the model wouldn't modify our results as long as there is a last period.

Appendix

Proof of Lemma 1:

(a) It is sufficient to see that $G(\bar{b}_1, \bar{b}_2) \geq \frac{G(\alpha_1,\alpha_2)}{\alpha_1} \frac{k_1+\hat{\varepsilon}\left(\widehat{\theta}-\underline{\theta}\right)}{\underline{\varepsilon}} \Leftrightarrow \varepsilon^V(\mathbf{b}(\overline{\theta}), \alpha_1\underline{\theta}, \underline{\varepsilon}, \mathbf{0}) \geq \varepsilon^U(\alpha_1\underline{\theta}, k_1, \underline{\theta})$ (as a consequence we also have that $\varepsilon^V(\mathbf{b}(\overline{\theta}), \alpha_1\underline{\theta}, \underline{\varepsilon}, \mathbf{0}) > \varepsilon^U(\alpha_2\underline{\theta}, k_2, \underline{\theta})$). Hence the condition in (a) means that at the efficient allocation the probability of a strike is lower than the probability of the government being detected as bad.

(b) It is enough to notice that $\frac{G(\alpha_1,\alpha_2)}{\alpha_1} \frac{k_1+\hat{\varepsilon}\left(\widehat{\theta}-\underline{\theta}\right)}{\underline{\varepsilon}} \geq G(\bar{b}_1, \bar{b}_2) \Leftrightarrow \varepsilon^V(\mathbf{b}(\overline{\theta}), \alpha_1\underline{\theta}, \underline{\varepsilon}, \mathbf{0}) \leq \varepsilon^U(\alpha_1\underline{\theta}, k_1, \underline{\theta})$ (equivalently $\underline{b}_1^{UV} \geq \alpha_1\underline{\theta}$) and $G(\bar{b}_1, \bar{b}_2) \geq \frac{G(\underline{b}_1^{UU}, \underline{\theta}-\underline{b}_1^{UU})}{\underline{\varepsilon}} \frac{k_1+\hat{\varepsilon}\left(\widehat{\theta}-\underline{\theta}\right)}{\underline{b}_1^{UU}} \Leftrightarrow \underline{b}_1^{UV} \leq \underline{b}_1^{UU}$. At this equilibrium the probability of Union 1 going on strike and of the government being detected as bad are equalized and larger than the probability of Union 2 going on strike.

(c) Straightforward (see above). The probabilities of Union 1 and of Union 2 going on strike are equalized are larger than the probability of the government being detected as bad. ■

Proof of Proposition 1:

We already know that, whenever $k_1 \leq \tilde{k}$, Union 1 has no incentive to go on strike against a good government which has selected the efficient budget sharing . Iff, when selecting the efficient budget allocation, it is detected as good for values of k_1 larger than some $k^* \leq \widetilde{k}$ then the equilibrium strategy of a good government is to select the efficient allocation for all values of k_1. This condition is equivalent to having $\overline{b}_2^s \leq \alpha_2\overline{\theta}$ for $k_1 = \tilde{k}$. At this point $G(\overline{b}_1, \overline{b}_2) = \overline{\theta}g^*$ and we can substitute this in Lemma 1 and in the equation (4) which defines $\underline{b}_1^{UV}$. We then compute $\overline{b}_2^s(\tilde{k})$ in the two possible cases which correspond to (b) and (c) of Lemma 1[17]. Notice that Case (b) occurs iff

[17]Notice that $\tilde{k} > \frac{1}{\sqrt{2}}(\underline{\varepsilon}\sqrt{\overline{\theta}} - \widehat{\varepsilon}(\sqrt{\widehat{\theta}} - \sqrt{\underline{\theta}})$ so that case (a) is irrelevant.

$$g^* \geq \widehat{g} = G(1, \frac{k_2 + \alpha_2 \hat{\varepsilon}\left(\widehat{\theta} - \underline{\theta}\right)}{k_1 + \alpha_1 \hat{\varepsilon}\left(\widehat{\theta} - \underline{\theta}\right)}) \frac{k_1 + \alpha_1 \hat{\varepsilon}\left(\widehat{\theta} - \underline{\theta}\right)}{\underline{\varepsilon}\bar{\theta}}$$

while case (c) occurs iff

$$g^* < \widehat{g} = G(1, \frac{k_2 + \alpha_2 \hat{\varepsilon}\left(\widehat{\theta} - \underline{\theta}\right)}{k_1 + \alpha_1 \hat{\varepsilon}\left(\widehat{\theta} - \underline{\theta}\right)}) \frac{k_1 + \alpha_1 \hat{\varepsilon}\left(\widehat{\theta} - \underline{\theta}\right)}{\underline{\varepsilon}\bar{\theta}}$$

It is then easy to see that

$$\bar{b}_2^s \leq \frac{\bar{\theta}}{2} \Leftrightarrow d > \widehat{d} = \frac{1}{\alpha_2} \frac{k_2 + \alpha_2 \hat{\varepsilon}\left(\widehat{\theta} - \underline{\theta}\right)}{k_2 + \alpha_2 \hat{\varepsilon}\left(\widehat{\theta} - \underline{\theta}\right) + \alpha_1 (\underline{\varepsilon}\bar{\theta} + \hat{\varepsilon}\left(\bar{\theta} - \widehat{\theta}\right)}$$

in case (b) and $\overline{b}_2^s \leq \frac{\bar{\theta}}{2} \Leftrightarrow \widehat{d} \geq \frac{\gamma(\xi)}{1+\gamma(\xi)}$ with $\xi = \frac{g^*}{\alpha_1}(1 + \frac{\hat{\varepsilon}}{\bar{\varepsilon}} \frac{\bar{\theta} - \underline{\theta}}{\bar{\theta}})^{-1}$ in case (c). ■

Proof of Proposition 2:

We will first show that $\overline{b}_2^{ns}$ is a decreasing function of k_1 and that $\overline{b}_1^s$ is an increasing function of k_1.

We will then show that the equilibrium budget sharing of the good government is defined by ($\overline{b}_1^*$,$\bar{\theta} - \overline{b}_1^*$) when $k_1 < k^{**}$ and by ($\bar{\theta} - \overline{b}_2^*$, $\overline{b}_2^*$) otherwise.$\frac{k_1 + \hat{\varepsilon}\alpha_1(\hat{\theta} - \bar{\theta})}{\underline{\varepsilon}}$

Claim 1 $\overline{b}_1^s$ *is an increasing function of* k_1.
Proof. *It directly follows from the definition of* $\overline{b}_1^*$ ■

$$\overline{b}_1^* = \begin{cases} \alpha_1 \bar{\theta} & \text{when} \quad k_1 < \tilde{k} \\ \frac{k_1 + \hat{\varepsilon}\alpha_1(\hat{\theta} - \bar{\theta})}{\underline{\varepsilon}} & \text{when} \quad \tilde{k} < k_1 \end{cases}$$

Claim 2 $\overline{b}_2^*$ *is a decreasing function of* k_1
Proof. $\overline{b}_2^* = \max\{\alpha_2 \bar{\theta}, \overline{b}_2^s\}$, *its therefore enough to show that* $\overline{b}_2^s$ *is a decreasing function of* k_1 *when* $\overline{b}_2^s > \alpha_2 \bar{\theta}$. *As we showed in lemma 1 that* $\underline{b}_2$ *is a continuous function defined by part, it is enough to show that for each part of the function* $\underline{b}_2$, $\overline{b}_2^s$ *is decreasing function of* k_1. *It is therefore enough to show that the* $\bar{b}_2$ *implicitly defined by each of the following system is decreasing in* k_1

$$\begin{cases} \bar{b}_2 = \frac{\bar{\varepsilon}}{\underline{\varepsilon}} \underline{b}_2 \\ \underline{b}_2 = \alpha_2 \underline{\theta} \end{cases}$$

$$\begin{cases} \bar{b}_2 = \frac{\bar{\varepsilon}}{\underline{\varepsilon}} \underline{b}_2 \\ \underline{b}_2 = \underline{\theta} - \underline{b}_1^{UU} \end{cases}$$

$$\begin{cases} \bar{b}_2 = \left(\frac{\bar{\varepsilon}}{\underline{\varepsilon}}\right)^2 \underline{b}_2 \\ \underline{b}_2 = \underline{\theta} - \underline{b}_1^{UV} \end{cases}$$

For the two first cases, $\overline{b}_2^s$ *is clearly a decreasing function of* k_1 *as* $\underline{b}_2$ *is defined independently from the* $\overline{b}_2$ *and is decreasing in* k_1*. For the third case one have to rely on the implicit function theorem:*

$$\underline{b}_2 = \underline{\theta} - \underline{b}_1^{UV} = \underline{\theta}\frac{\gamma(\frac{\underline{\varepsilon}G(\overline{b}_1,\overline{b}_2)}{k_1+\hat{\varepsilon}\alpha_1(\hat{\theta}-\underline{\theta})})}{1+\gamma(\frac{\underline{\varepsilon}G(\overline{b}_1,\overline{b}_2)}{k_1+\hat{\varepsilon}\alpha_1(\hat{\theta}-\underline{\theta})})}$$

In the first case, $\underline{b}_2$ *is defined independently from the strategy of the good government and is clearly decreasing in* k_1 *implying that* $\overline{b}_1^*$ *is increasing in* k_1*.* ■

Proof.
In the second case, it is a system of equation that implicitly defines $\underline{b}_2$ *and* $\overline{b}_2$

$$\begin{cases} \underline{b}_2 = \underline{\theta}\frac{\gamma(\xi)}{1+\gamma(\xi)} \\ \overline{b}_2 = \frac{\overline{\varepsilon}}{\underline{\varepsilon}}\underline{b}_2 \end{cases}$$

with $\xi = \frac{\underline{\varepsilon}G(\overline{b}_1,\overline{b}_2)}{k_1+\hat{\varepsilon}\alpha_1(\hat{\theta}-\underline{\theta})}$ *and* $\gamma' > 0$*One can therefore study* $\overline{b}_2$ *as a function of* k_1 *by implicitly deriving the following function:*

$$H(\overline{b}_2, k_1) = \overline{b}_2\frac{\overline{\varepsilon}}{\underline{\varepsilon}} - \underline{\theta}\frac{\gamma(\xi)}{1+\gamma(\xi)}$$

Since $\overline{b}_2 > \alpha_2\overline{\theta}$, $G(\overline{b}_1, \overline{b}_2)$ *is decreasing in* $\overline{b}_2$*. One therefore easily check that* H *is increasing in* $\overline{b}_2$ *and in* k_1*. Therefore*

$$\frac{d\overline{b}_2}{dk_1} = -\frac{dG/dk_1}{dG/d\overline{b}_2} < 0$$

which also insures that

$$\frac{d\underline{b}_2}{dk_1} = -\frac{dG/dk_1}{dG/d\overline{b}_2} < 0$$

cqfd ■

Claim 3 *There exists a* k^{**} *such that* $G(\overline{b}_1^*(k^{**}), \overline{\theta} - \overline{b}_1^*(k^{**})) = G(\overline{\theta} - \overline{b}_2^*(k^{**}), \overline{b}_2^*(k^{**}))$ *and that the good government's equilibrium budget allocation is given by* $(\overline{b}_1^*, \overline{\theta} - \overline{b}_1^*)$ *when* $k_1 \leq k^{**}$ *and by* $(\overline{\theta} - \overline{b}_2^*, \overline{b}_2^*)$ *when* $k_1 \geq k^{**}$

Proof. *For a given probability of reelection, the government chooses the policy that maximizes social welfare. Note that* $dG(\overline{b}_1^*(k), \overline{\theta} - \overline{b}_1^*(k))/dk < 0$ *as* $\overline{b}_1^*(k)$ *is increasing in* k *and* $\overline{b}_1^*(k) > \alpha\overline{\theta}$ *and that* $dG(\overline{\theta} - \overline{b}_2^*(k), \overline{b}_2^*(k))/dk > 0$ *as* $\overline{b}_2^*(k)$ *is decreasing in* k *and* $\overline{b}_2^*(k) > \alpha_2\overline{\theta}$*. Note also that when* $k > k^*$ $G(\overline{\theta} - \overline{b}_2^*(k), \overline{b}_2^*(k)) = \overline{\theta}g^* > G(\overline{b}_1^*(k), \overline{\theta} - \overline{b}_1^*(k))$ *while when* $k < \tilde{k}$*,we have that* $G(\overline{b}_1^*(k), \overline{\theta} - \overline{b}_1^*(k)) = \overline{\theta}g^* > G(\overline{\theta} - \overline{b}_2^*(k), \overline{b}_2^*(k))$*. This implies that, when* $k^* > \tilde{k}$ *there exists a* $k^{**} \in [\tilde{k}, k^*]$ *such that when* $k <$ *(resp.* $>$*)*k^{**}*,* $(\overline{b}_1^*(k), \overline{\theta} - \overline{b}_1^*(k))$ *is more (resp. less) efficient than* $(\overline{\theta} - \overline{b}_2^*(k), \overline{b}_2^*(k))$ *both of them leading to reelection for sure.* ■

References

[1] Austen-Smith, D., 1995, Campaign contributions and access, The American Political Science Review, 89, 566-581.

[2] Bennedsen, M. and S.E. Feldmann, 2002, Lobying legislatures, Journal of political Economy 110, 919-946;

Bennedsen, M. and S.E. Feldmann, 2006, Informational Lobbying and Political Contributions, 90, 631-56

[3] Bernheim B.D. and M.D. Whinston, 1986, Menu auctions, resource allocation and economic influence, The Quarterly Journal of economics 101, 1-32;

[4] Crawford, V.P. and J. Sobel, 1982, Strategic information transmission, Econometrica 50, 1431-1451.

[5] Cukierman A. and M. Tommasi,1998, When does it take a Nixon to go to China, American Economic Review 88, 180-197.

[6] Helpman, E. and G. Grossman, 1994, Protection for sale, American Economic Review 84, 833-850.

[7] Grossman, G. and E. Helpman, 1999, Competing for endorsements, American Economic Review 89, 501-524.

[8] Laffont, J.-J., 1999, Political Economy, Information and Incentives; European Economic Review 43, 649-69.

[9] Lohmann, S., 1994, Information aggregation through costly political action, American Economic Review 84, 518-530.

[10] Milgrom, P. and J. Roberts, 1986, Price and advertising signals of product quality, Journal of Political Economy 94, 796.

[11] Prat, A., 2002, Campaign advertising and voter welfare, Review of Economic Studies 69, 999-1017.

[12] Prat, A., 2002, Campaign Spending with Office-Seeking Politicians, Rational Voters, and Multiple Lobbies, Journal of Economic Theory 103, 162-189.