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Special Interests and Political Business Cycles

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Special Interests and Political Business Cycles*

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Abstract

In this paper we bridge the gap between special interest politics and political business cycle literature. We build a framework where the interplay between the lobby power of special interest groups and the voting power of the majority of the population leads to political business cycles. We apply our set up to explain electoral cycles in government expenditure composition, aggregate expenditures and real exchange rates.

1 Introduction

Over the last decade, there has been a great improvement on the understanding of the mechanisms by which special interest politics affect economic outcomes (Grossman and Helpman 1994, 1996, 2001). In this literature, special interest politics and elections are linked through campaign contributions. Those are offered to policymakers by lobbies in exchange for a tilted economic policy in favor of the interests they represent. The economic content of the distorted policy does not please voters, but it is compensated by the favorable ideological bias induced by the campaign contributions.

Another older strand of the political economy literature, the political business cycle literature, relates electoral cycles on macroeconomic variable to either

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partisan (classical references are Hibbs 1977, and Alesina 1987) or opportunistic motives (e.g. Nordhaus 1975, Lindbeck 1976, Cukierman and Meltzer 1986, Rogoff and Silbert 1988, Persson and Tabellini 1990, and Rogoff 1990), both unrelated to special interest politics.

While special interest politics is often associated with microeconomic policy, and its macroeconomic impact is thought to be negligible, the political business cycle models explain cycles on aggregate macroeconomic variables. In this paper we try to bridge the gap between special interest politics and political business cycle literatures. In our framework, the influence of special interest groups impact macroeconomic variables that have a distributive impact in society, generating electoral cycles in those variables.

In the simple framework we propose, opposite interests divide the society in two groups: one with the lobby power, and the other with the majority of votes. Government policy may affect the distribution of resources in the society between those two groups. This setup has several applications.

One application is on the distribution of resources in an unequal society between the poor and the rich. One may think that public expenditures are mostly beneficial to the poor, while its tax burden is heavily levied on the rich. In this context the poor would like more government spending, leading to higher taxes. This policy is detrimental to the interests of the rich. According to our model, lobbying by the rich may generate electoral cycles in government expenditures .

There is widespread evidence on political business cycles involving fiscal instruments (Shi and Svensson 2002 a,b, and Persson and Tabellini 2002).[1] The political budget cycle in aggregate variables has been interpreted as being caused by the signalling of an opportunistic government in a model where there is asym-

[1] According to Brender and Drazen (2004), the evidence on aggregate data is mainly due to the political budget cycles in "new democracies".

metric information with respect to the incumbent's competency (Rogoff 1990, and Rogoff and Silbert 1988). Our model provides an alternative explanation for the political budget cycles.

However, recent empirical studies have emphasized the importance of electoral cycles on the composition of the fiscal budget (on US, see Peltzman 1992; on Canada, see Kneebone and McKenzie 2001; on Mexico, see Gonzalez 2004; on Colombia, see Drazen and Eslava 2005a). Our framework may also generate such cycles. Assuming that public expenditures are specific to different groups in society, we are able to generate electoral cycles in the composition of government expenditures.

Another application is on exchange rate policy. There is some recent evidence of real exchange rate cycles around elections in Latin America, with more appreciated exchange rates before than after elections (Frieden and Stein 2001, and Ghezzi, Stein and Streb 2004). A more appreciated exchange rate benefits the majority of the population, while there is often lobby by the tradable sector for more devalued rates. Hence our framework can be applied to explain these exchange rate cycles (see also Bonomo and Terra 2005, for a related explanation).

In our proposed framework, electoral cycles are generated by the interplay between political influence of a special interest group and the voting power of the majority of the population. The mechanism behind the cycle is engendered by the incumbent trying to signal that she has not been captured by the special interest group, biasing her policy in favor of the majority of the population before election.

The policymaker may choose to benefit a special interest group through her policy choice in exchange of part of the group's net gain with it. Keeping in mind that there can be no formal contract to enforce the deal, it is realistic to assume that it may fail to be implemented. That is, with some probability the

deal is implemented and the policymaker receives the agreed upon amount, but there is some probability the deal falls apart, resulting on an adverse outcome for the policymaker. This adverse outcome may be explained by the deal may becoming public, resulting in an election defeat. Another possibility is that the unsuccessful deal is not revealed to the public but the policymaker dislikes being betrayed.

We consider deals that are informal agreements, where the policymaker benefits the lobby group and, in return, will be compensated in the future. For example, former policymakers are often chosen to integrate the supervisory board of large corporations. Such deals are not self enforcing, hence they depend on a repeated relationship between the policymaker and the lobbyist.[2] Some agents interact in several instances over time, possibly while performing different roles. As a consequence, we think of the probability of a successful deal as depending on factors such as how well the lobby and the policymaker know each other, how much they trust each other, what other relations and connections they have between them.

The voters do not observe the probability of a successful deal between the lobby and the incumbent because they are not aware of all connections between them. Neither they observe whether a deal between them was set. They can not perfectly infer that information either, for we assume economic policy is observed with noise. This assumption is consistent with Downs (1957) analysis, according to which an individual voter does not have the incentive to spend resources to get informed, since she cannot affect the election results.

The voters would like to pick the politician with less connections with the lobby, since it will be more likely that she will not set a deal with the lobby after election. To increase her reelection probability, in the period before election the

[2] This dependence of repeated interactions to enforce a deal is a wider phenomenon, permeating the economic relations in economies where the formal institutions are not well developed (see Dixit 2004).

policymaker close to the lobby has an incentive to disguise her proximity. She does so by choosing a policy less favorable to the special interests group than the one she would choose if there were no reelection concerns. Analogously, the policymaker far from the lobby, on her turn, will tilt her policy in favor of the majority group to signal her larger distance. This behavior generates policy variables cycles around election.

Note that the incumbent's motivation for wanting to be reelected is the possibility of receiving personal benefits for favoring the lobby after elections, which will depend on her policy choice. Hence, we have built in an endogenous rent from being in office, instead of resorting to the exogenous 'ego rents', which is pervasive in the political economy literature.

The model generates an additional cycle, which is a "contracting" cycle around elections. Since reelection concerns induce the policymaker to favor less the special interest group, the mutual net gains from a deal between the incumbent and the lobby are reduced before elections. Therefore, it is less likely that the policymaker will make a deal with the lobby before elections than after elections.

Our model differs from the special interests politics literature with respect to the impact of the association between the lobby and the policymaker on her election prospects. Here, setting a deal with the lobby jepardizes her reelection chances wheareas, in that literature, the lobby offers campaign contributions to the incumbent that increases her reelection likelihood. This difference stems from the type of policy variable the lobby aims at in the two contexts. The special interest politics literature explains the impacts of lobbying on microeconomic variables. The level of such variables should not be of concern to the majority of the population, hence it should not impact significantly election results.

There are two dimensions in which our model departs from previous political

business cycle models. First, its key tension is on the distribution of resources between two groups in society: one with the lobby power, and the other with the voting power. This allows us to generate cycles not only in the level of macroeconomic variables that have distributive impact, but also in directly distributive variables.

Second, it mixes adverse selection and moral hazard features. The first generation of PBC rational models, initiated by Rogoff and Silbert (1988) and Rogoff (1990), is characterized by hidden information about the policymaker's competence, who chooses an action to signal her type. In equilibrium her type will be revealed. An unappealing feature of these models is that only the most competent incumbent distorts policy.

A more recent generation of PBC models proposes a moral hazard framework to handle this problem (e.g. Lohmann 1998, Persson and Tabellini 2000, and Shi and Svensson 2002). They propose a simple twist in the adverse models: the incumbent chooses her action before knowing her own type. This assumption impels both types of incumbents to choose the same policy. Although the incumbent's action is not observed by the electorate, the observed economic outcome ends up revealing her type as it is determined by the interaction between her competence and the chosen policy. Those models generate the desired result - in equilibrium both types distort policy-, at the expense of an unappealing one - both types choose the same policy.

In our framework, different types of incumbents choose different policies, as in the adverse selection models, and distort policies before elections, as in the moral hazard models. The main departure from adverse selection models driving our results is that policy is observed with noise. This assumption yields the incentive for both types to distort policy, as the incumbent's type can never be perfectly inferred by the voters.

This feature has some important implications. One advantage of a noisy

signal is that a large range of results is consistent with the equilibrium strategies, each one leading to a different belief on the incumbent's type. Then, the equilibrium does not depend on the arbitrary specification of out of equilibrium beliefs, which is common in signaling models. Moreover, we do not need to assume an exogenous popularity or 'looks' shock to make the election result uncertain, as in the adverse selection models.

Other models relate to this paper in generating cycles in distribution of resources. In Bonomo and Terra (2005), an exchange rate cycle distributes income between tradable and nontradable sectors. Voters are unsure about the weight given to their group in the policymaker's preference, and observe policy with a noise. Exchange rate cycles around elections are thus generated. In Drazen and Eslava (2005b), voters suffer from the same information asymmetry with respect to the incumbent's preferences but are also uncertain about how sensitive is their group's voting behavior to government expenditures. The result is a cycle in expenditure composition. Another alternative model of cycle in the expenditure composition is provided by Drazen and Eslava (2005a), where policymakers preferences are formulated in terms of types of expenditures.

Shi and Svensson (2002b) present empirical evidence that supports the mechanism of this paper, where the cycles are generated by policymakers who distort policy in exchange for bribes, or personal benefits. They show that political budget cycles are more accentuated in countries with higher corruption and rent seeking indicators.

We start by developing a simple but general framework, and then provide three applications. In the first one, presented in more detail, government chooses the composition of expenditure between the two groups. In another variation, expenditures benefit the people and taxes are paid only by the lobby group. Finally, we have an exchange rate application, where the tradable sector is associated with the lobby while the nontradable sector is associated with the

majority of the population, and the policymaker chooses the real exchange rate level.

The paper is organized as follows. In the next section we set up the basics of the general framework. In section three we solve the optimal policy problem under lobby influence in a one period setting. The dynamic problem is studied in section four. Section five applies this model to explain electoral cycles in government expenditure composition, aggregate expenditures and real exchange rates. The last section concludes.

2 Model Set up

Society is divided into two groups. One group, which we call people, is the majority (proportion n of the population, $n > 0.5$), and defines the elections outcome. The other group is organized and effective in lobbying for policies that favor their interests.

Government chooses an economic policy, which, by convenience, we model as a strictly positive variable g. This policy affects utility of the two groups in opposite directions. Let $v_i(g)$ be the indirect utility function of a citizen of group i, $i = p$ (people), l (lobby), when the policymaker implements policy level g. Without loss of generality, we assume that the people benefit from higher values of g, whereas, for the lobby, the lower the g the better. That is, $v_p'(.) > 0$ and $v_l'(.) < 0$. We also assume $v_i(.)$ to be concave.

We assume that the welfare function of a benevolent policymaker is utilitarian:

$$U(g) = nv_p(g) + (1-n)v_l(g), \tag{1}$$

hence she would optimally choose:

$$g^* \equiv U'^{-1}(0). \tag{2}$$

Now we add the possibility that policymaker receives some personal benefit $\widetilde{c}$ from the lobby in exchange of a policy choice favoring this group. As we describe later, there is a possibility that the lobby forsakes the agreement, implying a random $\widetilde{c}$. In this case, the policymaker will be deceived, suffering a loss of utility $\widetilde{X}$.

We extend the lobby and policymaker preferences to contemplate this more complex interaction between them.

The lobby group utility function becomes:

$$E\left[\overline{v}_l\left(g,\widetilde{c}\right)\right] = v_l\left(g\right) - E\left(\widetilde{c}\right).$$

Policymakers' well-being depends not only on the citizens' welfare but it is also affected by the personal benefits $\widetilde{c}$ and the loss from being deceived $\widetilde{X}$. We assume that policymakers' preferences with respect to uncertain outcomes can be represented by expected utility:

$$\widetilde{W}\left(g,\widetilde{c},\widetilde{X}\right) = E\left[nv_p\left(g\right) + \left(1-n\right)\overline{v}_l\left(g,\widetilde{c}\right) + \theta\widetilde{c} - \widetilde{X}\right],$$

where θ is the relative weight the policymaker gives to receiving personal benefits vis-a-vis citizens' utility. We assume that $\theta > 1$, so that the policymaker has a net benefit from receiving transfers from the lobby group.

Now the policymaker's utility depends not only on the direct impact of his policy choice g on the groups' utilities but also on the personal benefits and losses that may result from his interaction with the lobby group. The personal benefits she may receive from the lobby depends on the distortion of policy in favor of this group. We assume that she is able to take hold of a portion B from the net gain she creates by distorting policy in favor of the lobby group:

$$c\left(g\right) = B\left(1-n\right)\left[v_l\left(g\right) - v_l\left(g^*\right)\right]. \tag{3}$$

This can be interpreted as being a result of a Nash bargain, where B depends

on the bargaining power of the policymaker vis a vis the lobby group.[3]

As discussed in the introduction, we think of those deals as informal aggreements where the policy is chosen first and the personal benefits will be received in the future. Therefore, it is possible that the policymaker does not receive the contribution, since such deals are not self enforcing. In fact, they depend on a repeated relationship between the policymaker and the lobbyist. The probability that the policymaker will receive the agreed upon benefit later on depends on factors such as extent of their repeated interaction, on the ability of the policymaker to punish the lobbyist in other dimensions. We take these connections between the lobbyist and the policymaker as exogeous, and determining the probability π that the deal is sucessful. This probability will be the source of the information asymmetry between the policymaker and the median voter in the dynamic setting.[4]

When the policymaker does not receive the benefit she incurs in a reduction of X in her utility, instead of an increase of $c(g)$. We interpret this as an emotional cost from being deceived. An alternative interpretation is that, when the deal falls apart, it is revealed to the public. This revelation changes the policymaker's reelection probability, which, in this case, leads to a loss incurred in case of a broken deal. We explore this venue in Appendix A.

The policymaker chooses ex-ante whether to distort policy and enter a bargain with the lobby group or not, maximizing her utility function, which in this particular situation can be represented by:

$$\begin{aligned} W(g, I, \pi) &= nv_p(g) + (1-n)\{v_l(g) - I\pi B[v_l(g) - v_l(g^*)]\} + \\ &\quad + I\{\theta\pi B(1-n)[v_l(g) - v_l(g^*)] - (1-\pi)X\}, \end{aligned}$$

[3] One may argue that, once the policy is chosen, the lobbyist has all the bargaining power. However, we think of this bargaining as being determined by the repeated interaction between the policymaker and the lobbyist along their lives.

[4] The type variable should actually be bidimensional, depending both on the probability of a successful deal and the bargaining power of the policymaker. For simplicity we ignore the extra dimensionality introduced by the the latter.

where I is a indicator function that equals 1 when the policymaker bargains with the lobby group and zero otherwise. The equation can be written as:

$$W(g, I, \pi) = U(g) + I\{\pi b[v_l(g) - v_l(g^*)] - (1-\pi)X\}, \tag{4}$$

where $b \equiv (1-n)(\theta-1)B$.

3 One period problem

Let G be the optimal policy level chosen by the government in the one period problem. We derive the optimal policy choice under contract ($I = 1$) and when no deal is set ($I = 0$). The optimal contracting decision is the one that yields the policymaker the highest utility.

In this one period setting, the optimal policy choice when there is no deal with the lobby is that of the benevolent policymaker, that is, $G = g^*$.

The optimal policy level when there is a deal between the policymaker and the lobby is defined by:

$$g^{\#} = \arg\max W(g, 1, \pi),$$

which is implicitly defined by the first order condition:

$$W_g\left(g^{\#}, 1, \pi\right) = U'\left(g^{\#}\right) + \pi b v_l'\left(g^{\#}\right) = 0. \tag{5}$$

Proposition 1 *The policy choice under a deal with the lobby favors the lobby group to the detriment of the people when compared to the utilitarian policy, that is, $g^{\#} < g^*$. Furthermore, the policymaker will favor more the lobby group under a deal the higher its probability of success, that is, $\frac{dg^{\#}}{d\pi} < 0$.*

Proof. *Using equation (2), we have that $W_g(g^*, 1, \pi) = \pi b v_l'(g^*) < 0$. Since $W(.)$ is concave in g, $g^{\#} < g^*$. Using the implicit function theorem in the first order condition (5), we have that $\frac{dg^{\#}}{d\pi} = -\frac{bv_l'\left(g^{\#}\right)}{U''(g^{\#}) + \pi b v_l''(g^{\#})} < 0$.* ■

The incumbent will choose to distort the policy, setting a deal with the lobby, if her welfare under the deal is higher than the one when there is no deal. That is, she will accept to distort the policy and set a deal with the lobby whenever:

$$W\left(g^{\#},1,\pi\right) \geq W\left(g^{*},0,\pi\right).$$

Hence, the equation:

$$W\left(g^{\#},1,\overline{\pi}\right) = W\left(g^{*},0,\overline{\pi}\right) \tag{6}$$

defines the probability $\overline{\pi}$ for which the incumbent is indifferent between setting or not a deal with the lobby.

It is easy to see that the left hand side of equation (6) is increasing in π, while the right hand side is independent of π. Thus, $\overline{\pi}$ is a cutoff level such that the government sets the deal with the lobby whenever $\pi \geq \overline{\pi}$.

We can summarize the results above in the following proposition.

Proposition 2 *For given values of n, X and b, there is a cutoff probability $\overline{\pi}$, $0 < \overline{\pi} < 1$, defined implicitly in equation (6), such that the incumbent will set a deal with the lobby if, and only if, $\pi \geq \overline{\pi}$.*

If $\pi < \overline{\pi}$, then $g = g^{*}$.

If $\overline{\pi} \leq \pi$, then $g = g^{\#} < g^{*}$, where $g^{\#}$ is defined implicitly in equation (5).

4 The dynamic problem

In this section we solve the dynamic problem, where there is an election at every other period. The main features of our story can be told in a simpler and clearer two-period setup, with an election between them. In Appendix B we sketch a more general multiperiod framework.

The probability of a successful deal π is the source of information asymmetry between the policymaker and the median voter. We assume that there are two

types of policymakers, $\pi_f < \pi_c$, reflecting the connection strength between the policymaker and the lobbyist.[5]

Those connections are likely to be persistent, since they are forged in a long-run relationship between the incumbent and the lobbyist. However, the deal is established by individuals in government and lobby key positions. The assignment for those positions may change, even over the same mandate.

In order to capture those features in the simplest way we assume the types to be randomly assigned to the politician in the period in before election from a Bernoulli distribution, with $\Pr(\pi = \pi_f) = p$ and $\Pr(\pi = \pi_c) = 1 - p$.[6]

4.1 After election problem

Since the after election period is the last one, there is no signaling component in the government's policy decision then.[7] In this case, the proposition 2 for the static problem still applies.

Thus, the after election optimal policy is given by:

$$\left(G_{+1}^{j}, I_{+1}^{j}\right) = \begin{cases} \left(g^{\#}, 1\right) & \text{if } \pi_j \geq \overline{\pi} \\ \left(g^{*}, 0\right) & \text{otherwise} \end{cases} \tag{7}$$

where G_{+1}^{j} and I_{+1}^{j} are, respectively, the after election optimal expenditure and decision of having a deal with the lobby or not, $\overline{\pi}$ is defined implicitly in equation (6), and $g^{\#}$ in equation (5). Since $\pi_c > \pi_f$, from Proposition 1 we have that $G_{+1}^{c} \geq G_{+1}^{f} \geq g^{*}$.

[5] In our notation, f stands for "farther from the lobby" and c for "closer to the lobby".

[6] A popular alternative used in the literature is to assume that the policymaker's specific characteristic is determined by a $MA(2)$ process, as, for example, in Rogoff (1990). This would generate equilibria with four different policy choices for the government at each period, unecessarily complicating the analysis.

[7] It is also true that there is no signaling component in the government's policy decision after election in the multiperiod setting, since there is a new draw for the policymaker's type in between elections.

4.2 Pre-election problem

4.2.1 The voter's problem

We assume that government policy is observed with noise. Specifically, we assume that the people observe $\widehat{g}$, which is given by:

$$\widehat{g} = ge^{\upsilon},$$

where υ is a Gaussian shock with mean zero and variance σ^2. This may justified as resulting from voters' rational inattention (see Sims, 2003, for some applications of rational inattention to economic problems).[8]

We also assume that the people do not observe the policymaker's type π. Hence, voters will try to infer π, given the observed policy. There will be a signaling game between the incumbent and the voters.

The median voter, not belonging to the lobby group, would like to vote for the policymaker who will choose a policy more favorable to the people after election. It is clear from Proposition 1 that this will be the policymaker farthest from the lobby, π_f. Since there is no information about the opposition, it is assumed that the probability of it being far from the lobbyist is equal to the unconditional probability.

The median voter chooses her candidate by comparing the (updated) probability of the incumbent being of type π_f to that of the opponent. As the opponent is not in power, it is assumed that the probability that she is of type π_f is equal to the unconditional probability p. Thus, if the updated probability about the incumbent's type is larger than p, people will vote for the incumbent, and she will be reelected. Otherwise the opponent will win the election. If the updated probability is equal to the unconditional probability, we assume that the incumbent is reelected with probability $\frac{1}{2}$. Let ρ be the median voter's

[8] Citizens have limited information capacity and they have several other decision problems to solve that depend on information. Thus, it is reasonable to assume that, as a result, they will be imperfectly informed about most of the relevant variables.

conjecture that the incumbent is far from the lobby, and vo his vote. Then:

$$vo = \begin{cases} inc, & if\ \rho > p \\ opp, & if\ \rho < p \\ inc \text{ with probability } \frac{1}{2} \text{ if } \rho = p \end{cases}.$$

How do voters form their belief ρ? Given the lognormality assumption for the noise, any level of observed policy could result from any given policy. Then, every positive level for the observed policy is in the equilibrium path. As a consequence, the median voter's belief is generated by the updating of his prior belief over the incumbent's type using Bayes' rule. Thus, the updated probability is:

$$\rho = \Pr\left(\pi_t = \pi_f \,|\widehat{g}_t = \widehat{g}\right) = \tag{8}$$
$$= \frac{p \times f(\widehat{g}_t = \widehat{g}\,|\pi_t = \pi_f)}{p \times f(\widehat{g}_t = \widehat{g}\,|\pi_t = \pi_f) + (1-p) \times f(\widehat{g}_t = \widehat{g}\,|\pi_t = \pi_c)},$$

where $\widehat{g}$ is the observed policy level, and $f(.\,|.)$ is the conditional density function of $\widehat{g}$ given the policymaker's type. The voter will vote for the incumbent, that is $\rho > p$, if and only if:

$$f(\widehat{g}_t = \widehat{g}\,|\pi_t = \pi_f) > f(\widehat{g}_t = \widehat{g}\,|\pi_t = \pi_c). \tag{9}$$

This rule is intuitive. The voter revises upwards his prior that the government is of the distant type if, and only if, the observed policy level is more likely under the distant type's policy than under the policy chosen by the type closer to the lobby.

4.2.2 Reelection probability

Now we can calculate the incumbent's reelection probability as a function of the chosen policy level. To do so, it is necessary to specify the incumbent's actions prescribed by the equilibrium strategy in the period before election $\left\{G^f, G^c\right\}$, which will be used by the voter to update his beliefs.

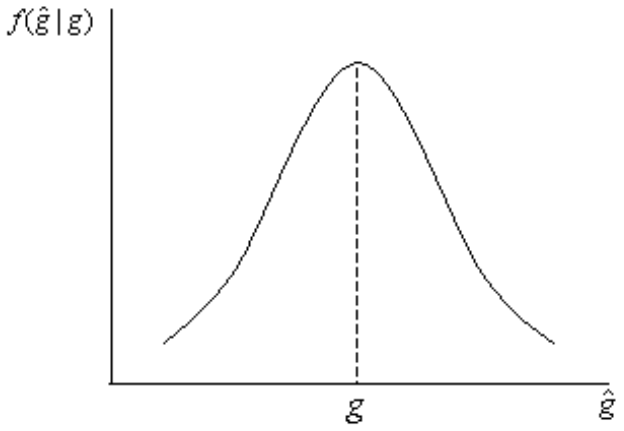
A chosen expenditure level g and a noise υ will determine the observed policy level, $\widehat{g} = ge^{\upsilon}$. Therefore, the conditional density function of $\widehat{g}$ given the

policymaker's type $f(.\,|.)$ is equal to the density function of the noise v that would yield $\widehat{g}$ when the policy level is the one chosen by this type in equilibrium. That is,

$$f(\widehat{g}_t = \widehat{g}\,|\pi_t = \pi_i) = \phi\left(\frac{\ln \widehat{g} - \ln G^i}{\sigma}\right) \tag{10}$$

where ϕ is the density of the standard normal distribution. Figure 1 illustrates the density function of the observed policy, for a given policy chosen.

Figure 1: Observed policy density function



Then, we can write the conditions for reelection in equation (9) as:

$$\phi\left(\frac{\ln \widehat{g} - \ln G^f}{\sigma}\right) > \phi\left(\frac{\ln \widehat{g} - \ln G^c}{\sigma}\right). \tag{11}$$

In the case of a separating equilibrium, with $G^f > G^c$, the policy has a cutoff level $\overline{g}$, such that, whenever the observed policy level is larger than $\overline{g}$ ($\widehat{g} > \overline{g}$), the median voter reelects the incumbent. This policy cutoff level is implicitly defined by:

$$\phi\left(\frac{\ln \overline{g} - \ln G^f}{\sigma}\right) = \phi\left(\frac{\ln \overline{g} - \ln G^c}{\sigma}\right)$$

which, due to the symmetry of the normal distribution, is:

$$\overline{g} = \exp\left[\frac{\ln G^f + \ln G^c}{2}\right].$$

Figure 2: Policy Cutoff Level

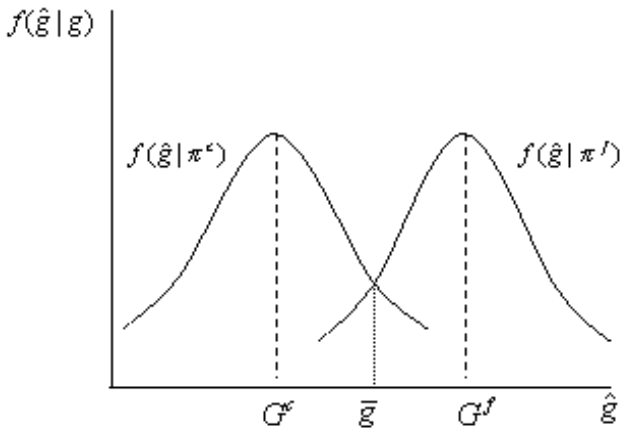


Figure 2 depicts the density functions of the observed policy when the policy level is the one chosen by each type of incumbent in equilibrium, π^f and π^c. The figure also shows the cutoff level of the observed policy $\overline{g}$. Note that condition (11) is satisfied for $\widehat{g} > \overline{g}$.

For a chosen policy g, the reelection probability ($q(.)$) is the probability that the observed policy ($\widehat{g}$) exceeds the cutoff point ($\overline{g}$),[9] that is:

$$\begin{aligned} q\left(g, G^f, G^c\right) &\equiv \Pr\left[\widehat{g} > \overline{g}\right] = \Pr\left[g e^{\upsilon} > \overline{g}\right] = \\ &= \Pr\left[\upsilon > \ln \overline{g} - \ln g\right], \end{aligned}$$

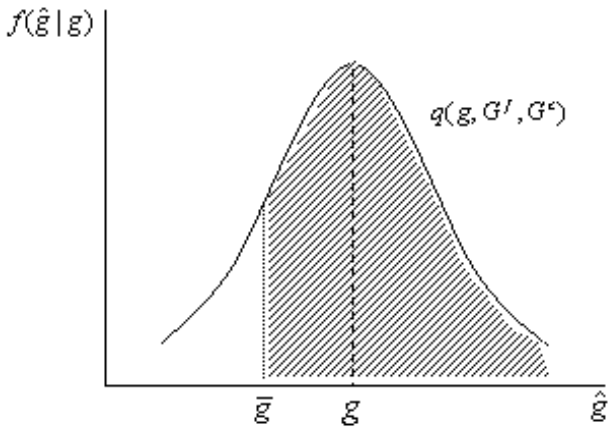
which can be written as:

$$q\left(g, G^f, G^c\right) = 1 - \Phi\left(\frac{\ln \overline{g} - \ln g}{\sigma}\right),$$

where $\Phi(.)$ is the normal cumulative distribution function. The reelection probability is increasing in g, and it is greater than $\frac{1}{2}$ if, and only if, $g > \overline{g}$. Figure

[9] More precisely, the probability of reelection is equal to the probability of the observed expenditure being strictly greater than the cutoff level pluas half the probability of the observed expenditure coinciding exactly with the cutoff level. However, under our continuous distribution assumption, the latter probability is zero.

Figure 3: Probability of reelection



3 illustrates the probability of reelection for a chosen policy level g and for the two types of incumbent equilibrium strategies, G^f and G^c, which determine $\overline{g}$.

Suppose, alternatively, that there is a separating equilibrium with $G^c > G^f$ (we will see later that this equilibrium is not possible). Then, since voting is prospective, the median voter will still prefer the policymaker further away from the lobby, although she will choose a lower policy level before election. As a consequence, the inference problem is reversed, and the probability of reelection as a function of policy level and equilibrium strategy will become:

$$q\left(g, G^f, G^c\right) = \Phi\left(\frac{\ln \overline{g} - \ln g}{\sigma}\right),$$

Now q is decreasing in g, since a lower g increases the probability that the incumbent is of the distant type.

Finally, in the case of a pooling equilibrium, we have always $\rho = p$. Thus, the probability of reelection is $\frac{1}{2}$ and will not be affected by any deviation from equilibrium strategy.

Then, we can summarize the dependence of the probability of reelection

function on the various types of equilibrium as follows:

$$q\left(g, G^f, G^c\right) = \begin{cases} 1 - \Phi\left(\frac{\ln \overline{g} - \ln g}{\sigma}\right), \text{if } G^f > G^c \\ \Phi\left(\frac{\ln \overline{g} - \ln g}{\sigma}\right), \quad \text{if } G^f < G^c \\ \frac{1}{2} \qquad\qquad\quad \text{if } G^f = G^c \end{cases}, \tag{12}$$

where $\overline{g} = \exp\left[\frac{\ln G^f + \ln G^c}{2}\right]$.

4.2.3 The Incumbent's Strategy

Let $FW\left(\pi_i\right)$ be the after election utility of the type π_i government, when re-elected:

$$FW\left(\pi_i\right) \equiv W\left(G^i_{+1}, I^i_{+1}, \pi_i\right)$$

where G^i_{+1} is the expenditure and I^i_{+1} is the decision of setting or not a deal with the lobby, optimally chosen after elections by the reelected incumbent of type π_i. Note that:

$$FW\left(\pi_i\right) \geq U\left(g^*\right), \tag{13}$$

since it is always possible to the policymaker not to make a deal with the lobby and to choose policy level g^*. Moreover, the policymaker will be strictly better off being reelected if her proximity to the lobby enables her to get rents from being in power.

When the incumbent is not reelected her utility will be the benevolent one, since we assume that there is no additional source of personal income or loss of reputation when the policymaker is not in office. Let FU be the expected after election utility of the incumbent, when she is not reelected:

$$FU = pU\left(G^f_{+1}\right) + (1-p)\,U\left(G^c_{+1}\right).$$

Since the policymaker will have no rents when she is not reelected, the best outcome for her is to have the new incumbent setting policy level g^*. When one of the opposition types chooses to set a deal with the lobby, an assumption

we make,[10] her policy choice yields the defeated policymaker a lower utility compared to that resulting from g^*, thus:

$$FU < U\left(g^*\right). \tag{14}$$

Combining equations (13) and (14), we have that:

$$FU < FW\left(\pi_i\right). \tag{15}$$

This last inequality implies that the policymaker always strictly prefers to be reelected. Remember that rents are generated by the potential deal between the policymaker in power and the lobby. Since those rents will depend on the policy implemented, they are endogenous. The difference $FW\left(\pi_i\right) - FU$ has the same role as the exogenous "ego rents" extensively used in the political economy literature.

In equilibrium, the two decisions - the policy level and to set a deal or not with the lobby - will be chosen to solve:

$$\begin{aligned} &\max_{g,I} \left\{V\left(g, \pi_i, I, G^f, G^c\right)\right\} \\ &\text{s.t. } g > 0, \end{aligned} \tag{16}$$

where:

$$\begin{aligned} V\left(g, \pi_i, I, G^f, G^c\right) &= W(g, \pi_i, I) + \\ +\beta\left[q\left(g, G^f, G^c\right) FW\left(\pi_i\right) + \left(1 - q\left(g, G^f, G^c\right)\right) FU\right], \end{aligned} \tag{17}$$

and where β is the incumbent's discount rate and the function q is given by equation (12).

[10] As we argue below, after elections the incentives are more favorable to a deal. If we assume functional forms and parameter values such that no deals are set after elections, the model will generate only an uninteresting pooling equilibrium with the utilitarian policy g^* chosen before and after elections.

Equation (17) can be rewritten as:

$$V\left(g,\pi_i,I,G^f,G^c\right) = \tag{18}$$
$$W(g,\pi_i,I)+\beta q\left(g,G^f,G^c\right)\left[FW\left(\pi_i\right)-FU\right]+\beta FU,$$

which makes clear that a higher reelection probability increases the utility of the incumbent whenever it is advantageous for one of the types to set a deal with the lobby after election.

Whenever reelection increases utility, the incumbent policymaker will choose a policy which will depart from the static optimal level - the one that maximizes $W(g,\pi_i,I)$. As we will show below, the only type of equilibrium consistent with this possibility has $G^f > G^c$. This makes q increasing in g (equation (12)), and the optimal level of g higher than the static one for both types.[11] As the after election policy choices coincide with the static optimal choices, there will be policy cycles around elections, with policy favoring more the people before elections than after elections.

4.3 Equilibrium

An equilibrium requires a fixed point in the solution of the incumbent problem (16). That is:

$$G^c = \underset{g,I}{\arg\max}\left\{V\left(g,\pi_c,I,G^f,G^c\right)\right\} \tag{19}$$
$$\text{s.t. } g>0,$$

[11] Formally, let G^j_{+1} be the after election optimal expenditure for type j. Then $\frac{\partial W(G^j_{+1},\pi_i,I)}{\partial g}=0$. Hence,

$$\begin{aligned}\frac{\partial V\left(G^j_{+1},\pi_i,I,G^f,G^c\right)}{\partial g} &= \frac{\partial W(G^j_{+1},\pi_i,I)}{\partial g}+\beta\frac{\partial q\left(G^j_{+1},G^f,G^c\right)}{\partial g}\left[FW\left(\pi_i\right)-FU\right]\\ &= \beta\frac{\partial q\left(G^j_{+1},G^f,G^c\right)}{\partial g}\left[FW\left(\pi_i\right)-FU\right]>0.\end{aligned}$$

and:

$$G^f = \underset{g,I}{\arg\max} \left\{ V\left(g, \pi_f, I, G^f, G^c\right) \right\} \tag{20}$$
$$\text{s.t. } g > 0.$$

We can sum up the conditions for an equilibrium, when it exists, as follows. A perfect Bayesian equilibrium in pure strategies, when it exists, should satisfy the following conditions:

1. after election an incumbent of type j will choose to make a deal with the lobby whenever its type $\pi_j < \overline{\pi}$, where $\overline{\pi}$ is defined implicitly by equation (6), and sets policy level $g^{\#}$ if she has a deal with the lobby and g^* otherwise;

2. before election an incumbent chooses to set a deal or not with the lobby and the policy level to maximize her expected intertemporal utility function, that is, to solve problem (16), where the probability of reelection function $q(g, G^c, G^f)$ is given by expression (12);

3. the policy level for each type is a fixed point, that solves problems (19) and (20), respectively.

We assume that the parameter values are such that the type closer to the lobby benefits substantially from a deal with the lobby after election. This will produce an equilibrium with the following features. First, $G^f > G^c$. An equilibrium with $G^f < G^c$ is not possible, since in this case the probability function will be decreasing in g and the type π_c will choose a lower policy level than π_f.

Second, there will be policy cycles around elections, that is, policy favors more the people before elections than after. More precisely, whenever is advantageous to one of the policymaker types to make a deal with the lobby after

elections, there will be electoral incentives that stimulate a policy more favorable to the poor before election than after for each policymaker type.

The third feature is that a deal between the policymaker and the lobby is more likely to happen after election than before. More specifically, whenever an incumbent of a certain type makes a deal with the lobby before election, she will also do it after election, but the converse is not true. A deal with the lobby is profitable for the incumbent only if the policy favors substantially this group. However, elections induce the policymaker to set a policy more favorable to the people, reducing the gain of an agreement with the lobby. Therefore an agreement with the lobby is less likely before elections.

There is no guarantee that a pure strategy equilibrium exists. The model may not have an equilibrium if the type closer to the lobby benefits only marginally from a deal with the lobby after election. The argument is outlined in Appendix C. However, a parameter configuration which leads to no equilibrium is not plausible in the context of the present model. The model relies on the possibility of deals between the policymaker and the lobby, and on non-observable comparative advantages of certain types to benefit from those deals. Thus, it is reasonable to assume that those deals benefit substantially (not marginally) the type most attracted to them, π_c, under the most favorable conditions to them, that is, after elections.

For the same reason, a configuration of parameters for which the type closer to the lobby would not make a deal after elections is not plausible either. This would yield an uninteresting pooling equilibrium where both types would never make a deal with the lobby and would choose the same policy g^* before and after elections.

5 Applications

5.1 Government expenditure cycles

5.1.1 Expenditure composition cycles

There is evidence of electoral cycles on the composition of the fiscal budget in several countries (on US, see Peltzman 1992; on Canada, see Kneebone and McKenzie 2001; on Mexico, see Gonzalez 2004; on Colombia, see Drazen and Eslava 2005). We now show how the framework developed above can be applied to generate such electoral expenditures composition cycles.

In the simple formulation we choose, taxes are fixed and there are two types of public goods, specific to each of the two groups. The government budget constraint is represented by:

$$\tau = (1-n)\, g_l + n g_p,$$

where τ, g_l and g_p are taxes, expenditures for the lobby and for the people, respectively (all per capita). It can be rearranged as:[12]

$$g_l = \frac{\tau - n g_p}{1-n}.$$

The utility function of a citizen of group i, u_i, is represented by:

$$u_i\left(c_i, g_i\right) = c_i + \log g_i, \text{ for } i = p, l, \text{ and } \alpha > 1,$$

where c_i is her private consumption, and g_i is the amount of the public expenditure available to her group. Given that $c_i = y_i - \tau$, indirect utility functions may be written as:

$$v_l\left(g\right) = y_l - \tau + \log\left(\frac{\tau - ng}{1-n}\right), \text{ and} \tag{21}$$

$$v_p\left(g\right) = y_p - \tau + \log g, \tag{22}$$

[12] Note that, in this case, it is economically reasonable to impose an upper bound for g_p ($0 < g_p \leq \frac{\tau}{n}$) to prevent a negative value for g_l. However, this new restriction is never binding in equilibrium.

where we use $g = g_p$ for simplicity.

Substituting equations (21) and (22) into the utilitarian welfare function of a benevolent policymaker, represented by equation (1), we get:

$$U(g) = y - \tau + n \log g + (1 - n) \log \left(\frac{\tau - ng}{1 - n} \right), \tag{23}$$

where $y = ny_p + (1 - n) y_l$ is the average per capita income. The benevolent policymaker would optimally choose:

$$g^* = \tau = g_l, \tag{24}$$

that is, all citizens would receive the same spending level.

The optimal spending level under a deal in a one-period setting, that is, the spending level that satisfies equation (5), is given by:

$$g^{\#} = \frac{\tau}{1 + \pi b}. \tag{25}$$

Note that in this application we have an explicit solution for the spending level. It is easy to check Proposition 1: $g^{\#} < g^*$ and $g^{\#}$ is decreasing in π.

The cutoff probability $\overline{\pi}$ defined by equation (6) now becomes implicitly defined by:

$$(1 - n + \overline{\pi} b) \log \frac{1 - n + \overline{\pi} b}{(1 - n)} - (1 + \overline{\pi} b) \log (1 + \overline{\pi} b) = X (1 - \overline{\pi}). \tag{26}$$

Following the setup above, we are able to show that there will be an electoral cycle in the expenditures composition, with more spending for the people before than after election. We provide a numerical example to illustrate the model's ability to generate electoral cycles.

Numerical example Table 1 presents examples of the three possible equilibrium types. The examples differ in the value of the loss X due to an unsuccessful deal with lobby, while the other parameter values are set constant at: $\pi_f = 0.25$,

$\pi_c = 0.75$, $n = 0.7$, $b = 0.5$, $\sigma = 0.25$, $p = 0.5$, and $\beta = 0.9$. The first line presents the results for a relatively small value for X, 0.01, which makes a deal with the lobby always beneficial to both types before and after elections. We observe that there is an expenditures cycle for both incumbent types, with higher expenditures for the people before elections.

Table 1: Expenditure Composition Electoral Cycle

X	$\frac{G^f}{\tau}$	$\frac{G^c}{\tau}$	$\frac{G^f_{+1}}{\tau}$	$\frac{G^c_{+1}}{\tau}$	I^f	I^c	I^f_{+1}	I^c_{+1}
0.01	0.9219	0.8206	0.8889	0.7273	1	1	1	1
0.02	1.0237	0.8122	0.8889	0.7273	0	1	1	1
0.2	1.0195	0.7832	1	0.7273	0	1	0	1
Parameter values: $n = 0.7, \beta = 0.9, b = 0.5, \pi_f = 0.25, \pi_c = 0.75, \sigma = 0.25$								

When we increase X to 0.02, we generate additionally a lobby activity electoral cycle. Before the election, a deal with the lobby becomes not advantageous to the type less connected with the lobby, despite being beneficial after election. In order to increase her reelection probability, the policymaker of this type prefers to increase her expenditure to the people to a level above the optimal one, distorting expenditure in a direction opposed to the lobby interests.

Increasing the damage of an unsuccessful deal further, to $X = 0.2$, will make even an after election agreement with the lobby not beneficial to the distant type policymaker. However, the close type, having a higher probability of success in the deal with the lobby, is still able to profit from the agreement, before and after elections. We still have an expenditure cycle, with the close type choosing to set a deal with the lobby before and after election, and the distant type not setting the deal at any time.

Finally, an increase of X to the point that prevents any deal with the lobby (not presented in the table) will result in an not very interesting type of equilibrium. Both types choose to spend τ for both types of citizens, before and after

elections.[13]

5.1.2 Aggregate expenditure cycles

Electoral cycles in aggregate expenditures can be generated by a simple change in the model described above. Suppose that the people are not taxed and receive the only public good. Indirect utility functions become:

$$v_l(g) = y_l - \tau, \text{ and} \tag{27}$$

$$v_p(g) = y_p + \log g. \tag{28}$$

We still assume a balance budget: $g = \tau$.

An utilitarian policymaker without lobby influence and electoral incentives will choose:

$$g^* = \frac{n}{1-n}.$$

If the policymaker chooses to spend $g < g^*$, she can increase the lobby group utility by $g - g^*$ and get a share $B(g - g^*)$. Hence, if she has a deal with the lobby, she would choose:

$$g^{\#} = \frac{n}{1-n+\pi b} = \frac{g^*}{1+\frac{g^*\pi b}{n}}, \tag{29}$$

where $b \equiv [\theta - (1-n)]\, B$.

With information asymmetry about the two different policymaker types, π_c and π_f, as before, the model generates electoral cycles in aggregate expenditures. This result is in line with the empirical evidence, as in Brender and Drazen (2004), Shi and Svensson (2002a,b), and Persson and Tabellini (2002).[14]

[13] As common in political business cycle models, a reverse cycle may happen, although with lower probability, when a incumbent closer to the lobby looses the election for an opponent of the other type.

[14] Note that the balanced budget assumption also generates a counterfactual electoral tax cycle. In a more complex version of the model, we could assume, instead, that taxes are hard to change and that any eventual budget imbalances could be financed by government debt. This setting would generate an intertemporally balanced budget equilibrium with expenditures and budget deficits electoral cycles.

Moreover, the mechanism in our paper, which is based on policymakers receiving personal benefits from interest groups, is consistent with the evidence provided by Shi and Svensson (2002b). They show that political budget cycles are stronger in countries with higher corruption and rent seeking indicators.

5.2 Exchange rate cycles

There is empirical evidence of exchange rate electoral cycles for Latin American countries (cross-country evidence for Latin America is provided by Frieden, Ghezzi and Stein, 2001, and Ghezzi, Stein and Streb, 2004, for Brazil, see Bonomo and Terra, 2001, Grier and Hernández-Trillo, 2004, for Mexico, and Pascó-Fonte and Ghezzi, 2001, for Peru). Bonomo and Terra (2005) presents a model that generates real exchange rate electoral cycles, in a setting with informational asymmetry over the policymaker's preferences. Here we derive the same result in a simpler model based of the special interests politics proposed in this paper.

Consider a endowment economy with two sectors: a tradable a nontradable sector. The nontradable sector has the majority of the population, while the tradable sector has the lobby power. All consumers are assumed to have the same CES utility function:

$$u\left(N_i, T_i\right) = \left(N_i^{\frac{r}{1+r}} + T_i^{\frac{r}{1+r}}\right)^{\frac{1+r}{r}}, \tag{30}$$

where N_i and T_i are the amount consumed of nontradable and tradable goods, respectively, and $r > 1$. Now let e be the tradable good relative price, which is the real exchange rate. Define $g \equiv \frac{1}{e}$ As expected, the indirect utility function is decreasing in the real exchange rate for a citizen in the nontradable sector, and increasing for the tradable sector:

$$v_N\left(e\right) = \left(1 + g^{-r}\right)^{-\frac{1}{r}} E^N, \text{ and} \tag{31}$$

$$v_T\left(e\right) = \left(1 + g^{r}\right)^{-\frac{1}{r}} E^T, \tag{32}$$

where E^N and E^T are the per capita endowment for the nontradable and tradable sectors, respectively.

A benevolent (utilitarian) policymaker would choose to set the exchange rate at a level:[15]

$$g^* = \left(\frac{nE^N}{(1-n)\,E^T} \right)^{\frac{1}{r-1}}. \tag{33}$$

The policymaker may choose to set a more depreciated exchange rate, $g < g^*$ (which means $e > e^* \equiv \frac{1}{g^*}$) in order to favor the tradable sector and get a share of its gain. Proceeding as before, we find that when there is an agreement with the tradable sector the chosen exchange rate is given by:

$$g^{\#} = \left(\frac{nE^N}{(1-n)\,E^T + \pi b E^T} \right)^{\frac{1}{r-1}} \tag{34}$$

$$= g^* \left(\frac{1-n}{1-n+\pi b} \right)^{\frac{1}{r-1}} \tag{35}$$

By assuming that there are two types of policymakers, π_c and π_f, information asymmetry engenders a mechanism by which exchange rate electoral cycles are generated. The policymaker will choose a more appreciated exchange rate before than after election.

6 Conclusion

Special interest politics is often associated with microeconomic policy, and its macroeconomic impact is thought to be negligible. Here we are concerned with opposite interests which divide the entire society in two groups: one with the lobby power, and the other with the majority of votes. Government policy may affect the distribution of resources in the society between those two groups.

[15] We implicitly assume that the government manipulates its expenditure level in nontradable goods to make the chosen exchange rate consistent with equilibrium in both nontradable and tradable goods markets. The government budget can be balanced intertemporally by a fixed lump sum tax on each citizen. Cyclical government budget imbalances are financed by foreign investors. For an example of a model where the relation between fiscal policy and exchange rate is explicitly taken into account, see Bonomo and Terra (2005).

In this paper we propose a link between special interest politics and political business cycles. We build a framework where the lobby power of a special interest group interacts with the voting power of the majority of the population, leading to political business cycles. The model generates an additional cycle, which is a "contracting" cycle around elections. Since reelection concerns induce the policymaker to favor less the lobby group, the mutual net gains from a deal between the incumbent and the lobby are reduced before elections. Therefore, it is less likely that the policymaker will make a deal with the lobby group before elections than after elections.

We showed that those same ideas could be applied to generate cycles around election in other economic variables, such as government expenditures level, and the real exchange rate.

The mechanism we propose in this paper does not exclude the operation of traditional political business cycle channels, as proposed by the opportunistic and partisan literature. The relative importance of our proposed channel in explaining the electoral cycle in different variables should be investigated in future research.

Appendix A: When an unsuccessful deal is revealed to the public

In this appendix we drop the assumption that the incumbent incurs in an exogenous utility loss when her deal with the lobby is not successful. We assume, instead, that an unsuccessful deal is revealed to the public. In this case, the policymaker's loss from an unsuccessful deal will be due to the effect of this revelation on her reelection probability.

The policymaker preferences are now represented by:

$$\widetilde{W'}\left(g,\widetilde{c},\widetilde{X}\right)=E\left[nv_{p}\left(g\right)+\left(1-n\right)\overline{v}_{l}\left(g,\widetilde{c}\right)+\theta\widetilde{c}\right],$$

which implies the following indirect utility function:

$$W'(g, I, \pi) = U(g) + I\pi b\left[v_l(g) - v_l(g^*)\right], \tag{36}$$

where $b \equiv (1-n)(\theta - 1)B$.

In this model, both types of incumbent will choose to make a deal with the lobby after election, as there is no penalty from an unsuccessful deal. The optimal after election policy chosen is also implicitly defined by equation (5).

Before election, the incumbent will take into account the effect of the chosen policy on her reelection probability. Here we will restrict our analysis to the case in which there exists an equilibrium where, before election, the incumbent closer to the lobby chooses to make a deal, while the other type does not.

Now the voter observes, not only the policy (with noise), but also whether there was an unsuccessful deal. Let ρ_j be the voter's updated belief that the incumbent is of type π_f, after observing $\widehat{g}$ and whether an unsuccessful deal occurred or not ($I_x = j$ with $j = 1$ when the deal is unsuccessful and 0 otherwise). Formally:

$$\rho_j = \Pr\left(\pi_t = \pi_f \,|\widehat{g}_t = \widehat{g}, I_x = j\right)$$

If an unsuccessful deal occurs, the voter will infer that the policymaker type is π_f. Therefore $\rho_1 = 0$, and the incumbent will not be reelected.

The updated belief when the voter receives no signal of an unsuccessful deal is:

$$\rho_0 = \frac{p \times h(\widehat{g}_t = \widehat{g}, I_x = 0 \,|\pi_t = \pi_f)}{p \times h(\widehat{g}_t = \widehat{g}, I_x = 0 \,|\pi_t = \pi_f) + (1-p) \times h(\widehat{g}_t = \widehat{g}, I_x = 0 \,|\pi_t = \pi_c)}, \tag{37}$$

where $h(\widehat{g}_t = \widehat{g}, I_x = 0 \,|\pi_t = \pi_i)$ is the joint density of observing a policy signal $\widehat{g}$ and receiving no information about an unsuccessful deal, given the incumbent type is π_i.

It is clear that:

$$\begin{aligned} h\left(\widehat{g}_t = \widehat{g}, I_x = 0 \,|\pi_t = \pi_c\right) &= \pi_c \times f\left(\widehat{g}_t = \widehat{g}\,|\pi_t = \pi_c\right), \text{ and} \\ h\left(\widehat{g}_t = \widehat{g}, I_x = 0 \,|\pi_t = \pi_f\right) &= f\left(\widehat{g}_t = \widehat{g}\,|\pi_t = \pi_f\right), \end{aligned} \tag{38}$$

since the success of the deal is assumed to be independent of the policy chosen by the incumbent when the incumbent makes a deal with the lobby.

When the voters receive no information about an unsuccessful deal, the incumbent will be reelected if $\rho_0 > p$, which, after substituting equation (38) into (37), can be seen to be equivalent to:

$$f\left(\widehat{g}_t = \widehat{g}\,|\pi_t = \pi_f\right) > \pi_c \times f\left(\widehat{g}_t = \widehat{g}\,|\pi_t = \pi_c\right).$$

Given the assumed lognormal distribution for the noise, the cutoff for the observed policy signal $\widetilde{g}$ will be given by:

$$\ln \widetilde{g} = \frac{\ln G^f + \ln G^c}{2} + \frac{\ln \pi_c}{\ln G^f - \ln G^c}$$

The reelection probability for an incumbent which chooses a policy g and whether to set a deal I can easily be shown to be given by:

$$q'\left(g, I, G^f, G^c\right) = \left[1 - I\left(1 - \pi_i\right)\right]\left[1 - \Phi\left(\frac{\ln \widetilde{g} - \ln g}{\sigma}\right)\right]. \tag{39}$$

Note that the reelection probability decreases when the incumbent chooses to make a deal with the lobby.

The intertemporal utility function of the incumbent becomes:

$$\begin{aligned} &V'\left(g, I, \pi_i, G^f, G^c\right) = \\ &W'(g, I, \pi_i) + \beta q'\left(g, I, G^f, G^c\right)\left[FW\left(\pi_i\right) - FU\right] + \beta FU. \end{aligned} \tag{40}$$

Observe that, when $I = 0$, $V'(.)$ becomes the same function as in the original problem. However, this does not mean that G^f will be the same as before, since

it depends on G^c. The closer type faces a different objective function, as the reelection probability is a different function of g.

Appendix B: A multiperiod framework

Here we sketch the problem in a multiperiod framework. The main modification is in defining a value function for the incumbent problem and solving it by dynamic programming. Instead of breaking the value function into one period pieces, as usual, here it is appropriate to break it into two-period pieces.

Let $Y(\pi_i)$ be the value function for the type i. Then we have a pair of Bellman equations:

$$Y(\pi_i) = \max_{g,I} W(g,\pi_i,I) + \beta \left[\begin{array}{c} q\left(g,G^f,G^c\right) FW(\pi_i) + \\ \left(1-q\left(g,G^f,G^c\right)\right)\frac{FU}{1-\beta} \end{array} \right] + \\ + \beta^2 q\left(g,G^f,G^c\right)\left[pY(\pi_f) + (1-p)Y(\pi_c)\right] \qquad \text{for } i = f,c$$

where we assumed that once the incumbent looses the election, she will be a regular citizen forever.

As before, in equilibrium G^f, G^c solves the problem for $i = c, f$. Then, we have

$$Y(\pi_i) = W(G^i,\pi_i,I^i) + \beta\frac{FU}{1-\beta} + \\ + \beta q\left(G^i,G^f,G^c\right)\left[FW(\pi_i) + \beta\left(pY(\pi_f) + (1-p)Y(\pi_c)\right) - \frac{FU}{1-\beta}\right] \\ \text{for } \; i = f,c$$

The term between square brackets represents the gain from being reelected, and we will show that it is strictly positive and greater than the rents from being reelected once, $FW(\pi_i) - FU > 0$. It can be rewritten as:

$$FW(\pi_i) - FU + \beta\left[\left(pY(\pi_f) + (1-p)Y(\pi_c)\right) - \frac{FU}{1-\beta}\right]. \qquad (41)$$

In order to evaluate the term between square brackets, note that:

$$Y(\pi_i) \geq U(g^*) + \beta \frac{FU}{1-\beta} \quad \text{for } i = f, c,$$

since in the first period the incumbent is in charge and g^* is in her policy choice set. As for the continuing utility, if she is not reelected, she will get FU thereafter. If she is reelected, her continuing utility is greater than FU, as shown in equation (15).

Furthermore, using equation (14), we also have that:

$$U(g^*) + \beta \frac{FU}{1-\beta} > \frac{FU}{1-\beta}.$$

Combining the two inequalities above, we have that:

$$Y(\pi_i) > \frac{FU}{1-\beta} \quad \text{for } i = f, c.$$

which implies:

$$(pY(\pi_f) + (1-p)Y(\pi_c)) - \frac{FU}{1-\beta} > 0\,.$$

Hence, this result renders the incumbent a gain greater than $FW(\pi_i) - FU$ from being reelected. Thus, the incentives for getting reelected are even higher, leading to more pronounced cycles, in this multiperiod setting.

Appendix C: Conditions under which there is no pure strategy equilibrium

The model may not have an equilibrium if the type closer to the lobby benefits only marginally from a deal with the lobby after election. The argument is outlined below.

Let the parameters be such that the policymaker of type π_c opt for a contract after election but for no contract before. As we will argue, this happens when $0 < \pi_c - \overline{\pi} < \varepsilon$, for a sufficiently small positive ε, where $\overline{\pi}$ is the probability cutoff level defined by equation (26). In this case the incumbent of type π_c

chooses to make a deal with the lobby after election and distorts policy. Thus, $FW(\pi_j) > FU$ for both incumbent types, that is, they strictly prefer to be reelected. For this reason, both incumbent types have an incentive to distort policy to increase their reelection probability. Assume that, in equilibrium, $G^f > G^c$, so that the reelection probability is increasing in g (by equation (12)). The policymaker of type π_c will face a conflict of incentives between a policy which leads to a higher probability of reelection - a higher g - and a policy which will lead to higher personal benefits - a lower g. However, for a sufficiently low ε the deal with the lobby after elections is only *marginally* advantageous to her, so that the additional electoral incentive makes a deal with the lobby before election not advantageous. It is clear that the incumbent of type π_f will have even less incentives to set a deal with the lobby before elections, since she faces a higher probability of a bad outcome. Hence, neither incumbent types set a deal with the lobby before election. Their different incentives in the pre-election policy choice comes from their different electoral incentives. Since $FW(\pi_c) - FU > FW(\pi_f) - FU$, the policymaker of type π_c will have a higher reelection gain, therefore she will make a higher effort to be reelected by choosing a higher g. That is, $G^f < G^c$, which contradicts our initial assumption that $G^f > G^c$.

An equilibrium with $G^f < G^c$ is not possible either, since in this case the probability function will be decreasing in g and the type π_c will choose a lower policy level than π_f. Then, the only remaining possibility is a pooling equilibrium, with both types choosing policy level g^*. However, this cannot be an optimal choice for type π_c, since in this case the incentives the policymaker faces before election are the same she does after election, when she chooses to have a deal with the lobby.

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