

Political Business Cycles through Lobbying*

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Abstract

In this paper 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 as well as to cycles in aggregate expenditures and in real exchange rates.

1 Introduction

Over the last decade, there has been a great progress on the understanding of the mechanisms by which lobbying affects economic outcomes (Grossman and Helpman 1994, 1996, 2001). In this literature, special interest politics and elections are linked through campaign contributions. Those are provided by lobbies in exchange for a tilted economic policy in favor of the interests they represent.

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 lobby activity of groups.

While the lobby activity of special interest groups 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 propose a framework in which the influence of lobbies impact macroeconomic variables that have a distributive effect in society, generating electoral cycles in those variables.

In the simple framework we propose, opposite interests divide the society in two groups: one with lobby power¹, and the other with the majority of votes. Government policy may affect the distribution of resources in the society between those two groups. The lobby group offers the policymaker personal benefits for a tilted policy in its favor, which is interpreted as corruption, as further discussed below.

This approach can explain cyclical variation of several macroeconomic variables around election (e.g. budget variables, inflation, nominal and real exchange rate). It is further motivated by the empirical evidence provided by Shi and Svensson (2006). They find that corruption and rent seeking indicators are positively related to the size of the electoral fiscal cycle. They also find that the fiscal balance election year deterioration is only statistically significant for the group of developing countries. However, when controlling for corruption and rent seeking indicators, the electoral fiscal cycles are no longer related to development. The evidence that corruption and rent seeking activities are the relevant variables to explain electoral cycles is consistent with our model, but

¹By lobby power we denote the capacity to influence policy decisions for reasons unrelated to the number of votes of the group.

not with the traditional political business cycle ones.

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.

We consider deals that are informal agreements, where the policymaker biases policy to benefit the lobby group and, in return, is compensated later on.² 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, in an environment where some agents interact in several instances over time, possibly while performing different roles.³

It is, then, reasonable 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.⁴ We think of the success probability of a deal as depending on factors such as how well the lobby and the policymaker know each other, how much they trust each other, and what other relations and connections they have between them.

²In the special interest literature, such as Grossman and Helpman (1994 and 1996), the policymaker first receives the campaign contributions from the lobbies and then implements the agreed upon policy. Here, the policymakers receive illegal or unethical personal benefits, which should be hidden from the public. As the policymaker is subject to more intense media scrutiny while in office, her compensation is more likely to be given later on.

³This 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).

⁴This adverse outcome may be explained by the deal may becoming public, resulting in an election defeat, as in the variant of the model developed in Appendix A. Another possibility is that the unsuccessful deal is not revealed to the public but the policymaker dislikes being betrayed.

The voters do not observe the success probability of a 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.⁵

The median voter 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 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 distance. This behavior generates policy variables cycles around election.

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.⁶

This setup has several applications. With regard to the overall government budget, the distribution in the population of the benefit of government expenses net of the costs of taxation is unequal. For several countries, it is plausible to assume that the fiscal situation is such that the large majority of the population would benefit from an increase in government expenses. A smaller group, for

⁵This 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.

⁶This is in contrast with specific interests lobbying activity where politicians are rewarded with campaign contributions reward in exchange of microeconomic policy biases.

which the cost would exceed the benefit, would have an incentive to organize themselves to lobby for lower taxation. According to our approach, the result would be a budget cycle around election, which, depending on institutional details, could yield either a simultaneous increase in expenses and taxation or an increase of the fiscal deficit before elections. This is consistent with the above mentioned evidence in Shi and Svensson (2006).

When the public expenditures are specific to groups in society our model is able to generate electoral cycles in the composition of government expenditures. This is in line with the recent empirical evidence of electoral cycles on the composition of the fiscal budget (on Canada, see Kneebone and McKenzie 2001; on Mexico, see Gonzalez 2004; on Colombia, see Drazen and Eslava 2005a).

Our model can also be applied to explain real exchange rate cycles around elections. Movements in the exchange rate have a distributive impact, favoring citizens whose income is positively related to prices of tradable goods in detriment to citizens with income linked to nontradable prices. In countries where the nontradable group entails the majority of the population while the tradable group has lobby power, one could expect to see more appreciated exchange rates before than after elections. There is strong empirical evidence of this type of cycle in Latin American countries (see Frieden, Ghezzi and Stein, 2001, and Ghezzi, Stein and Streb, 2004, for cross-country evidence, Bonomo and Terra, 2001, Grier and Hernández-Trillo, 2004, and Pascó-Fonte and Ghezzi, 2001, for Brazil, Mexico and Peru, respectively).

Our model has some distinctive features. The association with lobbies is politically costly to the incumbent. In this respect, it differs from the special interests politics literature. Here, setting a deal with the lobby jeopardizes her reelection chances instead of improving it, as in that literature. 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 mi-

macroeconomic variables. The level of such variables has less widespread effect over the populations. Hence it should not impact significantly election results.

There are three dimensions in which our model departs from previous political business cycle models. First, the 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 directly in distributive variables.

Second, the incumbent's motivation for being 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 usual exogenous 'ego rents'.

Third, 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 thereby 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.

We start by developing the basics of a simple but general framework in the next section. 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. In section five we provide three applications to the model. In

the first one, presented in more detail, government chooses the composition of expenditure between the two groups. In the second application, we generate political budget cycles by assuming that increase in government expenditures benefit the majority of the population, while the lobby group is hurt when taxes are increased. Finally, we have an exchange rate model, engendering real exchange rate cycles around election, when we associate the tradable sector to the lobby while the nontradable sector is assumed to have the voting power. In this context, the policy variable is the real exchange rate level. 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, for 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, $v_p'(\cdot) > 0$ and $v_l'(\cdot) < 0$. We also assume $v_i(\cdot)$ to be concave.

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

$$U(g) = nv_p(g) + (1 - n)v_l(g), \quad (1)$$

hence she would optimally choose:

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

We add the possibility that policymaker receives some personal benefit from the lobby in exchange of a policy choice favoring this group. We extend the lobby and policymaker preferences to contemplate this more complex interaction between them. 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, $c(g)$, depends on the distortion of policy in favor of this group. More specifically, we assume that she is able to take hold of a portion B from the net gain she creates to the lobby group by distorting policy in its favor, that is:

$$c(g) = B(1 - n) [v_l(g) - v_l(g^*)]. \quad (3)$$

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.⁷

As discussed in the introduction, we think of those deals as informal agreements 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. 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 exogenous, and determining the probability π that the deal is successful. This probability will be the source of the information asymmetry between the policymaker and the median voter in the dynamic setting.⁸

⁷One 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.

⁸The variable that determines the type of the policymaker could be bidimensional, depending not only on the probability of a successful deal, but also on the bargaining power of the policymaker. For simplicity we ignore this extra dimensionality.

When the policymaker does not receive the agreed upon 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 set a deal with the lobby group to distort policy in its favor or not so as to maximizing her utility function, which in this particular situation can be represented by:

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

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

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

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

3 One period problem

Let G be the optimal policy level chosen by the government if there were only one period, with no election concerns. We derive the optimal policy choice under a deal ($I = 1$) 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:

$$W_g(g^\#, 1, \pi) = U'(g^\#) + \pi b v_l'(g^\#) = 0. \quad (5)$$

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

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

$$W(g^\#, 1, \pi) \geq W(g^*, 0, \pi).$$

Hence, the equation:

$$W(g^\#, 1, \bar{\pi}) = W(g^*, 0, \bar{\pi}) \quad (6)$$

defines the probability $\bar{\pi}$ 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, $\bar{\pi}$ is a cutoff level such that the government sets the deal with the lobby whenever $\pi \geq \bar{\pi}$.

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 $\bar{\pi}$, $0 < \bar{\pi} < 1$, defined implicitly in equation (6), such that the incumbent will set a deal with the lobby if, and only if, $\pi \geq \bar{\pi}$.*

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

If $\bar{\pi} \leq \pi$, 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 to show the results obtained in the two period set up described in this section would still hold.

The success probability of a deal π is the source of information asymmetry between the policymaker and the median voter. We assume that there are two types of policymakers, f and c , with $\pi_f < \pi_c$, reflecting the connection strength between the policymaker and the lobbyist.⁹

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 before election from a Bernoulli distribution, with $\Pr(\pi = \pi_f) = p$ and $\Pr(\pi = \pi_c) = 1 - p$.¹⁰

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.¹¹ In this case, the proposition 2 for

⁹In our notation, f stands for "farther from the lobby" and c for "closer to the lobby".

¹⁰A 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, unnecessarily complicating the analysis.

¹¹Note that 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 policy-

the static problem still applies.

Thus, the after election optimal policy is given by:

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

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 for policymaker of type j , $\bar{\pi}$ is defined implicitly in equation (6), and $g^\#$ in equation (5). Since $\pi_c > \pi_f$, from Proposition 1 we have that $G_{+1}^c \leq G_{+1}^f \leq g^*$. Thus, we established that after elections the policy maker closer to the lobby will distort more the policy than the farther type.

4.2 Pre-election problem

4.2.1 The voter's problem

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

$$\hat{g} = ge^v,$$

where v is a Gaussian shock with mean zero and variance σ^2 . This can be rationalized as resulting from voters' rational inattention.¹²

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

maker's type in between elections.

¹²Citizens 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. See Sims (2003) for some applications of rational inattention to economic problems.

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

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

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. Therefore, every positive level for the observed policy is in the equilibrium path. The median voter's belief ρ is generated by the updating of his prior belief p over the incumbent's type using Bayes' rule:

$$\begin{aligned} \rho &= \Pr(\pi_t = \pi_f | \hat{g}_t = \hat{g}) = \\ &= \frac{p \times f(\hat{g}_t = \hat{g} | \pi_t = \pi_f)}{p \times f(\hat{g}_t = \hat{g} | \pi_t = \pi_f) + (1 - p) \times f(\hat{g}_t = \hat{g} | \pi_t = \pi_c)}, \end{aligned} \quad (8)$$

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

$$f(\hat{g}_t = \hat{g} | \pi_t = \pi_f) > f(\hat{g}_t = \hat{g} | \pi_t = \pi_c). \quad (9)$$

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 $\{G^f, G^c\}$, which will be used by the voter to update his beliefs.

A chosen expenditure level g and a noise v will determine the observed policy level, $\hat{g} = ge^v$. Therefore, the conditional density function of \hat{g} given the policymaker's type, $f(\cdot|\cdot)$, is equal to the density function of the noise v that would yield \hat{g} when the policy level is the one chosen by this type in equilibrium. That is,

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

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

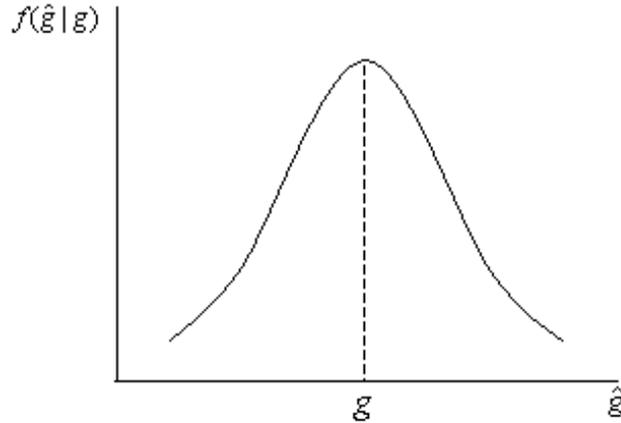
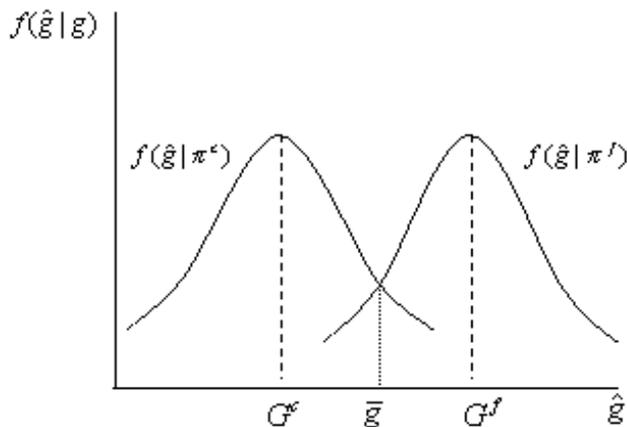


Figure 2: Policy Cutoff Level



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

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

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

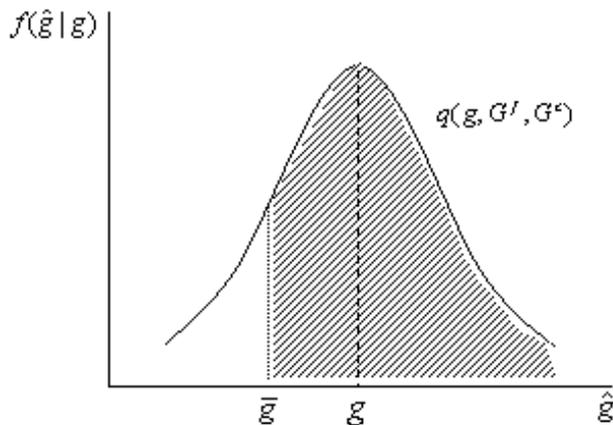
$$\phi\left(\frac{\ln \bar{g} - \ln G^f}{\sigma}\right) = \phi\left(\frac{\ln \bar{g} - \ln G^c}{\sigma}\right)$$

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

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

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 \bar{g} . Note that condition (11) is satisfied for $\hat{g} > \bar{g}$.

Figure 3: Probability of reelection



For a chosen policy g , the reelection probability, $q(\cdot)$, is the probability that the observed policy, \hat{g} , exceeds the cutoff point, \bar{g} ,¹³ that is:

$$\begin{aligned} q(g, G^f, G^c) &\equiv \Pr[\hat{g} > \bar{g}] = \Pr[ge^v > \bar{g}] = \\ &= \Pr[v > \ln \bar{g} - \ln g], \end{aligned}$$

which can be written as:

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

where $\Phi(\cdot)$ 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, $g > \bar{g}$. Figure 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 \bar{g} .

Suppose, alternatively, that there is a separating equilibrium with $G^c > G^f$ (we will see in section 4.3 that this equilibrium is not possible). Then, since

¹³More precisely, the probability of reelection is equal to the probability of the observed expenditure being strictly greater than the cutoff level plus half the probability of the observed expenditure coinciding exactly with the cutoff level. However, under our continuous distribution assumption, the latter probability is zero.

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:

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

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 candidate equilibria as follows:

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

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

4.2.3 The Incumbent's Strategy

Let $FW(\pi_i)$ be the after election utility of the type π_i government, when reelected:

$$FW(\pi_i) \equiv W(G_{+1}^i, I_{+1}^i, \pi_i)$$

where G_{+1}^i is the expenditure and I_{+1}^i is the decision of setting or not a deal with the lobby, optimally chosen after elections by the reelected incumbent of type π_i (refer to section 4.1). Note that:

$$FW(\pi_i) \geq U(g^*), \quad (13)$$

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. Alternatively, we can motivate this specification by assuming that the policymaker will become a member of the majority group with probability p and a member of the lobby group with probability $1-p$. Let FU be the expected after election utility of the incumbent, when she is not reelected:

$$FU = pU(G_{+1}^f) + (1-p)U(G_{+1}^c).$$

Since the policymaker will have no rents when she is not reelected, the best outcome for her is to have the new incumbent setting the socially optimal policy level g^* . When at least one of the opposition possible types chooses to set a deal with the lobby, an assumption we make,¹⁴ her policy choice yields the defeated policymaker a lower utility compared to that resulting from g^* , thus:

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

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

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

This last inequality implies that the policymaker always strictly prefers to be reelected. Note that the benefit from being in power is generated by the potential deal between the policymaker in power and the lobby. Since this benefit will depend on the policy implemented, it is endogenous. The difference

¹⁴As we argue in section 4.3, 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.

$FW(\pi_i) - FU$ has the same role as the exogenous “ego rents” from being in power extensively used in the political economy literature.

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

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

where:

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

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

Equation (17) can be rewritten as:

$$\begin{aligned} V(g, \pi_i, I, G^f, G^c) = & & (18) \\ W(g, \pi_i, I) + \beta q(g, G^f, G^c) [& FW(\pi_i) - FU] + \beta FU, \end{aligned}$$

which makes clear that a higher reelection probability increases the utility of the incumbent whenever it is advantageous for at least 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, which maximizes only $W(g, \pi_i, I)$. 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. 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.¹⁵

4.3 Equilibrium

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

$$\begin{aligned} G^c &= \arg \max_{g, I} \{V(g, \pi_c, I, G^f, G^c)\} \\ \text{s.t. } &g > 0, \end{aligned} \quad (19)$$

and:

$$\begin{aligned} G^f &= \arg \max_{g, I} \{V(g, \pi_f, I, G^f, G^c)\} \\ \text{s.t. } &g > 0. \end{aligned} \quad (20)$$

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 set a deal with the lobby whenever her type satisfies: $\pi_j > \bar{\pi}$, where $\bar{\pi}$ is defined implicitly by equation (6). She sets policy level $g^\#$ (which is implicitly defined by equation (5)) if she has a deal with the lobby and g^* (defined by equation (2)) otherwise;
2. Before election, an incumbent chooses whether to set a deal with the lobby and the policy level so as 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);

¹⁵Formally, we have that $\frac{\partial W(G_{+1}^j, \pi_i, I)}{\partial g} = 0$. Hence,

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

3. Before election, the policy level chosen by each type of policymaker 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 from a deal with the lobby after election. This will produce an equilibrium with the following features. First, it must be the case that $G^f > G^c$, since an equilibrium with $G^f < G^c$ is not possible.¹⁶

Second, there will be policy cycles around elections, that is, the policy favors more the people before elections than after. More precisely, whenever it is advantageous to at least 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 that group. However, election concerns 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

¹⁶As the type π_c has higher rents from being reelected, his chosen policy before election will be more distorted to increase his reelection probability. As the reelection probability function would be decreasing in g in this case, before election the type π_c would choose a policy level actually *lower* than that of type π_f , leading to a contradiction.

comparative advantages of certain types to benefit from those deals. Thus, it is reasonable to assume that those deals benefit substantially, rather than marginally, the policymaker that have access to them (the closer type, π_c) under the most favorable conditions to them, that is, 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 the budget is always balanced, 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 are taxes per capita that are uniform over the population, g_l and g_p are expenditures for the lobby and for the people, respectively (all per capita).

It can be rearranged as:¹⁷

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

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

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

¹⁷Note 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 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:

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

$$v_p(g) = y_p - \tau + \log g, \quad (22)$$

where we use $g \equiv g_p$ for simplicity.

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

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

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

$$g^* = \tau = g_l, \quad (24)$$

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:

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

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 $\bar{\pi}$ defined by equation (6) now becomes implicitly defined by:

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

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.¹⁸

Table 1: Expenditure Composition Electoral Cycle

X	$\frac{G^f}{\tau}$	$\frac{G^c}{\tau}$	$\frac{G_{+1}^f}{\tau}$	$\frac{G_{+1}^c}{\tau}$	I^f	I^c	I_{+1}^f	I_{+1}^c
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

¹⁸As common in political business cycle models, a reverse cycle may happen, although with lower probability, when an incumbent closer to the lobby loses the election for an opponent of the other type.

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.

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:

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

$$v_p(g) = y_p + \log g. \quad (28)$$

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 she has a deal with the lobby, she will choose:

$$g^\# = \frac{n}{1-n+\pi b} = \frac{g^*}{1+\frac{g^*\pi b}{n}}. \quad (29)$$

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).¹⁹

¹⁹Note 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 electoral cycle in expenditures and budget deficits.

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 on lobby politics proposed in this paper.

Consider an endowment economy with two sectors: a tradable and 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:

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

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:

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

$$v_T(g) = (1 + g^r)^{-\frac{1}{r}} E^T, \quad (32)$$

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.²⁰

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

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 whenever there is an agreement with the tradable sector the chosen exchange rate is given by:

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

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

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 Empirical Implications: Lobbying vs. Competence

In this session, we compare the implications of our model to those of Rogoff's (1990) framework, and relate them to the empirical literature. The two mechanisms are not mutually exclusive, and have some similar implications. Therefore, part of the empirical facts found in the literature could be explained by either approach. However, some new empirical findings can only be accounted for by our model.

The electoral cycles generated by competence signaling in Rogoff's model are also generated by our lobbying model. The government expenditure cycles

²⁰We 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).

around elections, traditionally modeled as a result of competence signaling can also be engendered by our mechanism when the fiscal policy has a distributive character (see section 5.1.2 above). Exchange rate electoral cycles have also been modeled through the competence mechanism (Ghezzi, Stein, and Streb, 2006), but are naturally modeled in our framework, as changes in the exchange rate redistribute resources between tradable and nontradable sectors (see Bonomo and Terra, 2005, and section 5.2 above).

Additionally, our model is able to generate distributive cycles, such as the electoral cycle in government expenditure composition (see section 5.1.1). The cycle should entail a pre-election increase in expenditures that benefit the majority of the population at the expense of a reduction in expenditures that favor lobby groups. Competence based models may also generate government expenditure composition cycles, but of a different type. Visible expenses should increase before election in detriment of those less easily observable.

Recent empirical studies have uncovered electoral composition cycles in government spending that is consistent with both models. In a cross-country analysis involving 35 developing countries, Schuknecht (1994) unveils larger capital expenditures before elections. Drazen and Eslava (2005) and Khemani (2004) show similar cycles in country studies for Colombia and India, respectively. Capital expenditure can be interpreted as spending that benefits a large part of the population, what makes this electoral cycle consistent with our model. If the capital expenditures are made in visible items, it may also be consistent with the competence model.

Our business cycle mechanism has some distinctive features, since it is based on lobby and/or corruption activities. A necessary condition for our mechanism to be relevant is that the country's institutional environment does not prevent those activities. There is evidence that lobby/corruption activities do happen in numerous countries, benefiting firms involved in them. Faccio (2006), exam-

ining a sample of 47 countries, finds that firm's political connections are more common in countries with less stringent regulation of conflict of interests, being particularly common in countries that are perceived as being highly corrupt. Furthermore, political connections are found to increase the firms' value, corroborating country specific evidence provided by Fisman (2001) and Claessens et al. (2005) for Indonesia and Brazil, respectively.

Shi and Svensson (2006) offer a more directly supportive evidence of our mechanism. They investigate the existence of political budget cycles in a sample of 85 countries, from 1975 to 1995. First, they use the entire sample and found that the fiscal balance deteriorates in election years. When they split the sample in developed and developing countries, the cycle appears only in the developing countries sample. Finally, using one country level indicator of corruption and another one for rent seeking activities they find that those two indicators are significantly related to the budget electoral cycle. Furthermore, controlling for those indicators, the development dummy does not significantly alter the cycle. The results indicate that corruption and rent seeking are positively related to the size of political budget cycles. The earlier evidence that those cycles were related to the development of the country were due to the correlation between corruption and rent seeking, on one side, and the level of development, on the other.

7 Conclusion

In this paper we propose a mechanism by which lobbying may generate political business cycles. We build a framework where the lobby power of an economic 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. However, the evidence provided by Shi and Svensson (2006) that political business cycles are stronger in countries with higher corruption and rent seeking indicators does suggest that our proposed mechanism may be indeed important. The relative importance of our proposed channel in explaining the electoral cycle in different variables should be investigated in future research.

References

- [1] Alesina, A. (1987), “Macroeconomic Policy in a Two-Party System as a Repeated Game,” *Quarterly Journal of Economics* 102: 651-78.
- [2] Bonomo, M. and C. Terra (2005). “Elections and Exchange Rate Policy Cycles,” *Economics and Politics* 17(2): 151-176.
- [3] Bonomo, M. and C. Terra (2001), “The Dilemma of Inflation vs. Balance of Payments: Crawling Pegs in Brazil, 1964-98,” in: J. Frieden and E. Stein, eds., *The Currency Game: Exchange Rate Politics in Latin America* (IDB, Washington).

- [4] Brender, Adi and Allan Drazen (2005), "Political Budget Cycles in New Versus Established Democracies," *Journal of Monetary Economics* 52(7): 1271-1295.
- [5] Cukierman, A. and A.Meltzer (1986), "A Positive Theory of Discretionary Policy, the Costs of Democratic Government, and the Benefits of a Constitution," *Economic Inquiry* 24: 367-88.
- [6] Dixit, A. (2004), *Lawlessness and Economics*, Princeton University Press.
- [7] Downs, Anthony (1957), *An Economic Theory of Democracy*, Addison Wesley.
- [8] Drazen, A. and M. Eslava (2005a), "Electoral Manipulation via Expenditure Composition: Theory and Evidence," NBER Working Paper 11085.
- [9] Drazen, A. and M. Eslava (2005b), "Political Budget Cycles When Politicians Have Favorites," mimeo, University of Maryland.
- [10] Frieden, J. and E. Stein (2001), *The Currency Game: Exchange Rate Politics in Latin America*, IDB, Washington.
- [11] Frieden, J., P. Ghezzi and E. Stein (2001), "Politics and Exchange Rates: A Cross Country Study," in: J. Frieden and E. Stein, eds., *The Currency Game: Exchange Rate Politics in Latin America* (IDB, Washington).
- [12] Ghezzi, P., E. Stein and J. Streb (2004), "Real Exchange Rate Cycles around Elections," *Economics and Politics*, forthcoming.
- [13] Gonzalez, Maria de los A. (2002), "Do Changes in Democracy Affect the Political Budget Cycle?," *Review of Development Economics* 6(2): 204-224.
- [14] Grier, Kevin B. and Fausto Hernández-Trillo (2004), "The Real Exchange Rate Process and Its Real Effects," *Journal of Applied Economics* VII(1): 1-25

- [15] Grossman, Gene and Elhanan Helpman (1994), "Protection for Sale," *American Economic Review* 84: 833-50.
- [16] Grossman, Gene and Elhanan Helpman (1996), "Electoral Competition and Special Interest Politics," *Review of Economic Studies* 63: 265-286.
- [17] Grossman, Gene and Elhanan Helpman (2001), *Special Interest Politics*, MIT Press.
- [18] Hibbs, D. (1977), "Political Parties and Macroeconomic Policy," *American Political Science Review* 71: 146-87.
- [19] Holmstrom, Bengt (1999), "Managerial Incentive Problems: A Dynamic Perspective," *Review of Economic Studies* 66: 169-182.
- [20] Khemani, S. (2004), "Political Cycles in a Developing Economy: Effect of Elections in the Indian States." *Journal of Development Economics* 73, 125-154.
- [21] Kneebone, R. and K. McKenzie (2001), "Electoral and Partisan Cycles in Fiscal Policy: an Examination of Canadian Provinces," *International Tax and Public Finance* 8: 753-774.
- [22] Lindbeck, A. (1976), "Stabilization Policies in Open Economies with Endogenous Politicians," *American Economic Review Papers and Proceedings*, 1-19.
- [23] Nordhaus, W. (1975), "The Political Business Cycle," *Review of Economic Studies* 42: 169-90.
- [24] Pascó-Fonte, A. and P. Ghezzi (2001), "Exchange Rates and Interest Groups in Peru, 1950-1996," in: J. Frieden and E. Stein, eds., *The Currency Game: Exchange Rate Politics in Latin America* (IDB, Washington).

- [25] Peltzman, S. (1992), “Voters as Fiscal Conservatives,” *Quarterly Journal of Economics* 107: 327-361.
- [26] Persson, T. and G.Tabellini (2000), *Political Economics: Explaining Economic Policy* (The MIT Press).
- [27] Rogoff, K. (1990), “Equilibrium Political Budget Cycles,” *American Economic Review* 80: 21-36.
- [28] Rogoff, K. and A. Silbert (1988), “Elections and Macroeconomic Policy Cycles,” *Review of Economic Studies* 55: 1-16.
- [29] Shi, E. and J. Svensson (2006), “Political budget cycles: Do they differ across countries and why?,” *Journal of Public Economics* 90: 1367– 1389.
- [30] Sims, C. (2003), “Implications of Rational Inattention,” *Journal of Monetary Economics* 50(3).
- [31] Veiga, F. and L.Veiga (2007), “Political Business Cycles at the Municipal Level,” *Public Choice* 131(1-2), 45-64.

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:

$$W'(g, I, \pi) = U(g) + I\pi b [v_l(g) - v_l(g^*)], \quad (36)$$

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 \hat{g} and whether an unsuccessful deal occurred or not ($I_x = j$ with $j = 1$ when the deal is unsuccessful and 0 otherwise). Formally:

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

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:

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

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

It is clear that:

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

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:

$$f(\hat{g}_t = \hat{g} | \pi_t = \pi_f) > \pi_c \times f(\hat{g}_t = \hat{g} | \pi_t = \pi_c).$$

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

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

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:

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

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:

$$V'(g, I, \pi_i, G^f, G^c) = \quad (40)$$

$$W'(g, I, \pi_i) + \beta q'(g, I, G^f, G^c) [FW(\pi_i) - FU] + \beta FU.$$

Observe that, when $I = 0$, $V'(\cdot)$ 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:

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

where we assumed that once the incumbent loses 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:

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

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:

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

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 $0 < \pi_c - \bar{\pi} < \varepsilon$, for a sufficiently small positive ε , where $\bar{\pi}$ 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.