

# An Integrated View of Electoral Results and Opportunistic Policies\*

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## Abstract

The literature on political business cycles suggests that politicians systematically manipulate economic conditions before elections. The literature on vote and popularity functions suggests that economic conditions systematically affect election outcomes. This paper integrates these two strands of literature. We use Rogoff (1990)'s model of the rational political business cycle to derive the two-way relationship between the win-margin of the incumbent politician and the size of the opportunistic distortion of fiscal policy. This relationship is estimated, for a panel of 275 Portuguese municipalities (from 1979 to 2001), as a system of simultaneous equations (by FIML). The results clearly support the theoretical predictions: (1) Opportunism pays off, leading to a larger win-margin for the incumbent; (2) incumbents behave more opportunistically when they expect a close election race.

*Keywords:* Voting functions, opportunism, political business cycles, local governments, system estimation, Portugal.

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## 1 Introduction

To what extent are economic policies in democratic societies distorted by the competitive struggle for votes? How strong is the impact of the economy on election results? These

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questions have puzzled researchers for a long time, but have tended to be investigated separately. On the one hand, the literature on political business cycles (PBCs) has focused on identifying distortions in macroeconomic and fiscal variables around election times.<sup>1</sup> On the other hand, the literature on vote and popularity (VP) functions has focused on identifying the impact of economic and fiscal conditions on election results.<sup>2</sup> Yet, the PBC and the VP function are intimately related: rational politicians would not attempt to create a PBC if it did not help them win elections and rational voters would not base their vote decisions on economic and fiscal conditions if it did not help them select better politicians. The aim of the present paper is to bridge these two strands of literature and to estimate jointly the VP function and the fiscal distortion created by opportunistic politicians trying to win elections.

Research on electoral economics took off in the 1970's with the seminal works of Goodhart and Bhansali (1970), Mueller (1970), and Kramer (1971) on the VP function and with the work of Nordhaus (1975) and Hibbs (1977) on political business cycles. Since then, many papers have investigated similar issues, but tend to research the VP function and the PBC independently. A notable exception in this first generation of papers is the study by Frey and Schneider (1978) which highlighted the importance of analyzing the interrelationship between the economy and the polity, by presenting estimates of popularity functions for the US president along with government expenditure reaction functions that took into account a re-election constraint capturing the popularity of the incumbent.

The rational expectations revolution brought new challenges to the literature since rational voters cannot be systematically fooled one election after the other by opportunistic politicians. New models were developed where the PBC resulted from asymmetries of information between politicians and voters. Alesina (1987), for example, showed that pre-election uncertainty about the ideology of the party to take office after the election can explain rational partisan cycles in macroeconomic aggregates. In rational opportunistic models, such as Rogoff and Sibert (1988) and Rogoff (1990), incumbents signal their

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<sup>1</sup>See Drazen (2000: 219-308), Mueller (2003: 429-471) and Paldam (1997) for overviews of this literature.

<sup>2</sup>See Nannestad and Paldam (1994) and Paldam (2004) for surveys.

competence to the electorate by manipulating fiscal policy instruments before elections.<sup>3</sup>

The first generation of empirical papers on the political business cycle, based on Nordhaus (1975) and Hibbs (1977), made use of national-level data on elections, policies, and economic outcomes. With the introduction of rational expectations into the models, empirical research shifted the focus to economic policy instruments, particularly to those of fiscal policy. Following a suggestion by Rogoff (1990: 33-34), a number of researchers have looked for political business cycles using data for state and local elections.<sup>4</sup> The interest in electoral politics has recently been renewed, but most of the current discussion is about which characteristics of a polity might support or discourage political business cycles. Shi and Svensson (2006) present empirical evidence supporting the hypothesis that the electoral cycle in budget deficits is stronger in developing countries. Brender and Drazen (2005) argue that opportunistic fiscal manipulation works better in “new” than in “established” democracies because, in the former, voters are inexperienced with electoral politics or have less information available to evaluate the fiscal manipulation. Brender (2003) and Akhmedov and Zhuravskaya (2004), working with local government data from Israel and Russia, respectively, report evidence consistent with this view. On the other hand, Alt and Lassen (2006) argue that, conditional on the degree of fiscal policy transparency, political business cycles do exist in advanced industrialized economies. However, as Willet and Keil (2004: 414) point out in their survey of the literature on the PBC, the micro incentives for political business cycles have received insufficient empirical attention.

Theoretically, the micro incentives behind the PBC are clear: PBC models with rational voters à la Rogoff (1990) not only predict that politicians will try to signal their type by distorting fiscal choices before elections, it also suggests that politicians are re-

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<sup>3</sup>Some public choice scholars have pointed to an alternative explanation of the PBC: rational ignorance of voters in the face of information costs. Instead of assuming that citizens have high levels of information that allow them to detect and punish opportunistic politicians, they argue that many economic actors have little incentive to be informed about economic policies and that opportunistic politicians will take advantage of this, in particular when the percentage of uninformed voters is high (see Willet and Keil (2004)).

<sup>4</sup>Blais and Nadeau (1992) and Rosenberg (1992) were the first to test political budgetary cycles using local data. For an extended revision of the empirical literature about the U.S. see Besley and Case (2003). For studies about Germany see Seitz (2000) and Galli and Rossi (2002). For Sweden see Petterson-Lidbom (2001). Finally, see Akhmedov and Zhuravskaya (2004) for Russia, and Drazen and Eslava (2005) for Colombia.

warded for doing so at the polls. In fact, the theory suggests that the vote and popularity function and the fiscal distortion created by opportunistic politicians are jointly determined and therefore should be estimated together. Two recent studies by Akhmedov and Zhurasvskaya (2004) and Drazen and Eslava (2005), dealing with local governments in Russia and Colombia respectively, do estimate vote functions along side with tests for opportunistic cycles in fiscal policy, but treat the two as being independent. To the best of our knowledge, no study has yet taken the theory seriously and attempted to estimate the vote function and the extent of the opportunistic political business cycle jointly as a system of equations. The purpose of this paper is to fill this gap. We, firstly, develop a simple model of the rational political business cycle from which we derive the two equations to be estimated. Secondly, we estimate these equations on data from 278 Portuguese municipalities using a Full Information Maximum Likelihood system estimator.

We use data from Portuguese municipalities for several reasons. First, we have gathered a large and detailed data set covering all mainland municipalities (278) since 1979 to 2002. Second, the mayor is a principal decision-maker in the allocation of resources and the distribution of investment in the municipality. Third, the institutional structure of local governments and the policy instruments available are the same for all Portuguese localities. Finally, election dates are fixed and exogenous from the perspective of the local authorities, and all municipalities have elections on the same day. Taken together these factors make this data set a very promising testing ground for a study of the interrelationship between the VP function and the political business cycle.

The article is organized as follows. Section 2 presents some institutional information about Portuguese municipalities. Section 3 describes the model and derives the two equations to be estimated. The data sources and the empirical strategy adopted are explained in section 4. The empirical results obtained are presented in section 5. Finally, conclusions are reported in section 6.

## 2 Local Government in Portugal

This section presents some background information on Portuguese municipalities. Democracy was re-established in Portugal by the bloodless military coup of April 25, 1974, which put an end to 48 years of dictatorship. Portuguese municipalities were formally established in the Constitution of 1976 and the first municipal elections took place in December of the same year. Portuguese local governments are responsible for improving their populations' well-being, promoting social and economic development, territory organization, and for supplying local public goods (water and sewage, energy, transportation, housing, health-care, education, culture, sports, defence of the environment, and protection of the civilian population).<sup>5</sup>

The representative branches of municipalities' government are the Town Council and the Municipal Assembly.<sup>6</sup> The members of the Town Council are elected directly by voters registered in the municipality, who vote for party or independent lists. Votes are then transformed into mandates using the Hondt method, and the mayor is the first candidate from the list that receives the most votes. Part of the Municipal Assembly is elected directly by voters while the remaining members are the presidents of the councils of the *freguesias* that belong to the municipality.<sup>7</sup> The Municipal Assembly approves the general framework for local policies, while the Town Council, which holds the executive power, is responsible for its elaboration and implementation. The mayor is the president of the Town Council and has a prominent role in the executive.

Budgeting rules and institutions are the same for all Portuguese mainland municipalities, although the law regulating local public finances changed during the period considered.<sup>8</sup> Municipalities are financially autonomous. They have their own employees and assets, and they define the local budget and the plan of activities without a requirement of authorization from a higher-ranked authority. As part of the general government sector, local authorities are, however, subject to several control mechanisms by central government

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<sup>5</sup>Law 159/99 defines the areas of intervention of Portuguese local governments.

<sup>6</sup>Law 169/99 establishes the competencies and the legal framework of municipalities' branches.

<sup>7</sup>*Freguesias* are subdivisions of municipalities. They are the lowest administrative unit in Portugal.

<sup>8</sup>Law 1/79, Decree-Law 98/84, Law 1/87 and, currently, Law 42/98.

agencies. These limit their access to revenues as well as their expenditure choices.

It is worth noting that election dates are defined exogenously from the perspective of the local authorities and that during our sample period there was no legal restriction to the number of terms a mayor could stand for re-election. Since the re-establishment of Democracy in 1974, there were local elections in December of 1976, 1979, 1982, 1985, 1989, 1993, 1997 and 2001, and in October 2005.

### 3 Theory

In this section, we lay out a version of the rational political business cycle model developed by Rogoff (1990) and Rogoff and Sibert (1988). The purpose of the exercise is, firstly, to draw out implications of the theory which have not yet been subject to systematic testing and, secondly, to allow theory to guide our identification strategy.

#### 3.1 The model

We consider a simple two-period economy ( $t = 1, 2$ ) populated with a continuum of citizen-voters.<sup>9</sup> Citizen-voters care about private consumption ( $c_t$ ) and two types of public goods ( $g_{1,t}$  and  $g_{2,t+1}$ ). As in Aidt and Dutta (2007), public good 1 ( $g_1$ ) is a short-term public good while public good 2 ( $g_2$ ) is a long-term public good. Investments in the short-term public good lead to immediate provision of services that can be directly observed within the period. Investments in the long-term public good, on the other hand, lead to provision only with a one period time lag. As a consequence, citizen-voters cannot infer how much was invested in this good until later when they observe the provision levels generated by past investments. The life-time utility function of a representative citizen-voter is

$$u^v = c_1 + \ln g_{1,1} + \theta \ln g_{2,1} + \beta (c_2 + \ln g_{1,2} + \theta \ln g_{2,2}), \quad (1)$$

where  $\beta \in (0, 1)$  is the discount factor and  $\theta$  is the relative importance of long-term public goods.<sup>10</sup> Each citizen-voter is endowed with  $y$  units of a non-storable good each period,

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<sup>9</sup>The model is a simplified version of Rogoff (1990).

<sup>10</sup>We assume that  $g_{2,1} = 1$ .

pays the lump sum tax  $\tau_t$  and consumes  $c_t = y - \tau_t$ . Public goods are produced from tax revenues by an elected politician using a simple linear technology:

$$g_{1,t} + g_{2,t+1} = \tau_t + \varepsilon_t \tag{2}$$

where  $\varepsilon_t$  is a stochastic competency term. We note that the cost of investment in the long-term public good provided in period  $t + 1$  is incurred in period  $t$ .

Each period a citizen-voter is elected to run the government and to produce public goods. To simplify the analysis, we assume that  $\tau$  is exogenously given and that the politician, therefore, only has to decide on the allocation of resources between the two types of public goods. Citizen-voters differ with respect to their talent for being politicians and some are more competent than others. Specifically, a citizen-voter is either competent ( $\varepsilon_t = \varepsilon_H$ ) or incompetent ( $\varepsilon_t = \varepsilon_L < \varepsilon_H$ ) as a politician. We assume that competency is permanent, i.e., if a politician is competent in period 1 he is also competent in period 2 and vice versa. The probability that a randomly selected citizen-voter is competent is  $\rho \in (0, 1)$ . Politicians derive utility from private and public goods, but also care about holding in office per se because of the power or prestige that goes with it. To capture this we assume that politicians receive the ego-rent  $m$  per period in office. In addition to competency, citizen-voters also care about the ideology of their elected politician. This is modelled as a random shock to citizen-voters' preference for the incumbent relative to that of the challenger in each election. Specifically, we assume that the relative ideological advantage of the incumbent at time  $t$  is  $\alpha_t$  which is drawn before each election from a uniform distribution on  $[-a, b]$  with  $b \geq a$ . The ideological bias lasts for one period only and is unrelated to competency.

The information structure of the model can best be laid out by listing the timing of events:

1. At the beginning of period 1, the incumbent observes his competency  $\varepsilon_1$  and decides on how to allocate resources between the two public goods  $(g_{1,1}, g_{2,2})$ .
2. Voters observe  $\alpha_1$  and how much is provided of the short-term public good  $(g_{1,1})$ .

3. At the end of period 1, an election takes place where the incumbent runs against a randomly chosen challenger. The incumbent is reelected if he is supported by a majority of citizen-voters; otherwise the challenger takes office.
4. At the beginning of period 2, the incumbent, if reelected, decides how much to invest in the short-term public good.<sup>11</sup> If the challenger is elected she observes her competency ( $\varepsilon_2$ ) and decides on how much to invest in the short-term public good.

We notice that the incumbent in period 1 does not observe the ideological bias until after he has decided fiscal policy for the period. This, as we shall see, implies that he cannot be sure about the outcome of the election. He does, however, know the distribution and that allows him to form a judgement about how close or competitive the election is going to be.

The structure described above is a sequential game of incomplete information and the natural solution concept is Perfect Bayesian Equilibrium (PBE). A PBE is a pair of first-period fiscal allocations  $\{g_{1,t}^L, g_{1,t}^H\}$ , one for each type, and a reelection rule for citizen-voters (that determines the probability of reelecting the incumbent as a function of observed fiscal policy) such that the incumbent of each type selects an optimal fiscal allocation given the reelection rule; citizen-voters' reelection rule is optimal given their beliefs about the type of the incumbent and the incumbent's strategies; and beliefs are whenever possible updated according to Bayes's rule. To narrow down the set of equilibria we shall impose additional restrictions on out-of-equilibrium beliefs below.

## 3.2 Equilibria

We begin by noting that the optimal fiscal policy in the second period is to invest all resources in the short-term public good and so  $g_{1,2} = \tau + \varepsilon_i$  irrespective of the type of the second-period incumbent. Supposing that the first-period incumbent is reelected, we can write the second-period utility of a citizen-voter, net of the benefit of the long-term public

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<sup>11</sup>In period 2, nothing is invested in the long-term public good because it is the last period.

good, as a function of the type of the first-period incumbent as

$$W(i) = y - \tau + \ln(\tau + \varepsilon_i) \quad \text{for } i \in \{L, H\}, \quad (3)$$

The corresponding net second-period utility if a challenger of unknown type is elected is

$$W(C) = y - \tau + \rho \ln(\tau + \varepsilon_H) + (1 - \rho) \rho \ln(\tau + \varepsilon_L), \quad (4)$$

where  $C$  represents "challenger". If citizen-voters only cared about provision of public goods, then it is clear from these expressions that they would reelect an incumbent who is known to be competent for sure and boot out an incumbent who is known to be incompetent. However, in practice citizen-voters also care about ideology and a representative citizen-voter casts a vote in favour of the incumbent if and only if

$$\widehat{\rho}(g_{1,1}) W(H) + (1 - \widehat{\rho}(g_{1,1})) W(L) - W(C) + \alpha_1 \geq 0, \quad (5)$$

where  $\widehat{\rho}(g_{1,1})$  represents the updated beliefs of citizen-voters after having observed the first-period investment in short-term public goods. From the point of view of the first-period incumbent, who does not observe  $\alpha_1$  until after he has decided on fiscal policy, the probability of getting reelected is

$$\pi(\widehat{\rho}(g_{1,1})) = \frac{b}{a+b} + \frac{\widehat{\rho}(g_{1,1}) W(H) + (1 - \widehat{\rho}(g_{1,1})) W(L) - W(C)}{a+b} \quad (6)$$

which is increasing in the belief that the incumbent is competent.<sup>12</sup> We see that the reelection probability consists of two terms which we shall call the natural advantage and the signalling term respectively. Following Snyder (1989) and others, we say that the incumbent has a natural advantage in the election if, under the condition that both types of incumbents choose the same level of spending and thus  $\widehat{\rho}(\cdot) = \rho$ , the probability of reelection is greater than  $\frac{1}{2}$ . Notice that for  $\widehat{\rho}(\cdot) = \rho$ , we have

$$\pi(\rho) = \frac{b}{a+b}. \quad (7)$$

The incumbent's natural advantage is increasing in  $b$  and the closer  $b$  is to  $a$  the more competitive or close is the election. The effect of  $b$  on the signalling term,  $\frac{\widehat{\rho}(g_{1,1})W(H)+(1-\widehat{\rho}(g_{1,1}))W(L)-W(C)}{a+b}$

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<sup>12</sup>We assume throughout that  $a$  is such that  $\pi \in (0, 1)$  for all  $\widehat{\rho}$ .

is, on the other hand, ambiguous and depends on the sign of the nominator. If, given their beliefs, voters expect the incumbent to deliver better outcomes than the challenger, then a larger natural advantage reduces the marginal effect on the reelection probability of signalling. Conversely, if voters expect the incumbent to deliver worse outcomes than the challenger, then a larger natural advantage decreases the (negative) marginal effect of signalling.

Faced with this reelection rule, the first-period incumbent, whether competent or not, decides how to allocate resources between the two types of public goods taking into account how this choice affects his reelection chances. Following Persson and Tabellini (1990, chapter 5), it is convenient to define the following two objects: the *value of reelected* and the *cost of signalling*. The (expected) value of being reelected for a politician of type  $\varepsilon_i$  is

$$V(\varepsilon_i) = m + (W(i) - W(C)). \quad (8)$$

He gets the ego-rent for another period and benefits (or not) from the fact that he, in expectation, is more (or less) efficient at providing public goods than a randomly chosen challenger. We assume that  $m$  is sufficiently large to make  $V(\varepsilon_L) > 0$ . The cost of signalling is

$$C(g_{1,1}^i, \varepsilon_i) = \ln\left(\frac{\tau + \varepsilon_i}{1 + \beta\theta}\right) + \beta\theta \ln\left(\frac{\beta\theta(\tau + \varepsilon_i)}{1 + \beta\theta}\right) - \ln g_{1,1}^i - \beta\theta \ln(\tau + \varepsilon_i - g_{1,1}^i). \quad (9)$$

Signaling entails a distortion of first-period resources (too much is spend on short-term public goods and too little is spend on long-term public goods). The cost of signalling, therefore, is the difference between the short-run optimal allocation of first-period resources between short- and long-term public goods and the actual choice of allocation ( $g_{1,1}^i$ ).<sup>13</sup>

**Proposition 1** (*Equilibrium*) *The unique intuitive Perfect Bayesian Equilibrium in undominated strategies is a separating equilibrium and is characterized by the following strategies and beliefs:*

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<sup>13</sup>With the logarithmic utility functions, the short-run optimal allocation is  $\hat{g}_{1,1}^i = \frac{\tau + \varepsilon_i}{1 + \beta\theta}$  and  $\hat{g}_{2,2}^i = \frac{\beta\theta(\tau + \varepsilon_i)}{1 + \beta\theta}$ .

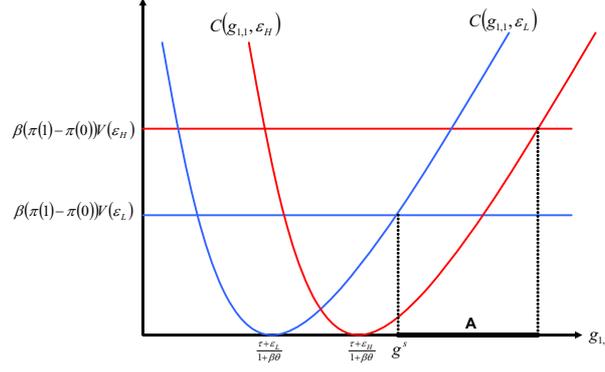


Figure 1: Separating Equilibria

1. An incumbent of type  $L$  sets  $g_{1,1}^L = \frac{\tau + \epsilon_L}{1 + \beta\theta}$  and  $g_{2,2}^L = \frac{\beta\theta(\tau + \epsilon_L)}{1 + \beta\theta}$  in period 1. If reelected, he sets  $g_{1,2}^L = \tau + \epsilon_L$  in period 2.
2. An incumbent of type  $H$  sets  $g_{1,1}^H = g_{1,1}^s$  and  $g_{2,2}^H = (\tau + \epsilon_H - g_{1,1}^s)$  in period 1 where

$$g_{1,1}^s = \max \left\{ \frac{\tau + \epsilon_H}{1 + \beta\theta}, g^s \right\} \quad (10)$$

with  $g^s$  being defined as

$$g^s = \max \left\{ g \mid C(g, \epsilon_L) = \beta \left( \pi(\hat{\rho}(g_{1,1}^s)) - \pi(\hat{\rho}(g_{1,1}^L)) \right) V(\epsilon_L) \right\}. \quad (11)$$

If reelected, he sets  $g_{1,2}^H = \tau + \epsilon_H$  in period 2

3. Citizen-voters' posterior beliefs are  $\hat{\rho}(g_{1,1}) = 1$  for all  $g_{1,1} \geq g_{1,1}^s$  and  $\hat{\rho}(g_{1,1}) = 0$  for all  $g_{1,1} < g_{1,1}^s$  and the reelection rule is given by equation (5).

**Proof.** See Appendix ■

The equilibrium is illustrated in Figure 1 where we have drawn the cost of signaling and the expected value of reelection for the two types of incumbents as a function of  $g_{1,1}$ .

The expected value of reelection is always larger for a competent than for an incompetent incumbent. This is because the former can provide more second-period public goods

than the average politician while the latter cannot. The cost of signaling is represented by the parabolas with the competent incumbent's cost of signaling shifted to the right reflecting the fact that it is "cheaper" for the competent incumbent to increase spending on the short-term public good from his short-run optimal level ( $\frac{\tau+\varepsilon_H}{1+\beta\theta}$ ) than it is for the incompetent incumbent to match it. In a separating equilibrium, an incumbent of type  $L$  sets  $g_{1,1}^L = \frac{\tau+\varepsilon_L}{1+\beta\theta}$  and prefers to do so pretending to be competent as long as  $g_{1,1}^H$  is no less than  $g^s$ . An incumbent of type  $H$ , on the other hand, is, if needed, willing to deviate upwards from his short-run optimal policy choice to signal to citizen-voters that he is competent as long as the cost of signaling is no greater than the expected benefit of reelection. Any  $g_{1,1}^H$  in the interval  $A$  indicated with bold in the Figure constitute a separating Perfect Bayesian Equilibrium. It is clear, however, that  $g_{1,1}^H > g^s$  is more costly to the competent incumbent and thus dominated by  $g_{1,1}^H = g^s$ .<sup>14</sup> The theory therefore predicts that fiscal policy is distorted before the election because competent politicians need to convince rational voters that they are indeed competent. This is the Rational Political Business Cycle (RPBC).

The extend of signalling depends among other things on the natural advantage of the incumbent (captured by  $b$ ) as shown in the next proposition.

**Proposition 2** (*Natural Advantage*) (1) *The larger the natural advantage of the incumbent is, the lower is the incentive of the competent incumbent to signal, i.e.,  $g_{1,1}^H = g^s$  is non-increasing in  $b$ .* (2) *Moreover, having a natural advantage increases the reelection chance of all types of incumbents.*

**Proof.** Part (1). From equation (11), we note that the degree of signalling depends on

$$\pi(1) - \pi(0) = \frac{W(H) - W(L)}{a + b}$$

which is clearly decreasing in  $b$ . It follows that  $\frac{dg^s}{db} \leq 0$ . Part (2). Notice that

$$\pi(1) = \frac{b}{a + b} + \frac{W(H) - W(C)}{a + b} \tag{12}$$

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<sup>14</sup>Since reelection is random, pooling equilibria in which both types of incumbents chose  $g_{1,1} = \frac{\tau+\varepsilon_H}{1+\beta\theta}$  in period 1 can be ruled out by the intuitive criterion.

$$\pi(0) = \frac{b}{a+b} + \frac{W(L) - W(C)}{a+b} \quad (13)$$

It is immediate that  $\frac{\partial \pi(0)}{\partial b} > 0$  since  $W(L) - W(C) < 0$ . Calculate

$$\frac{\partial \pi(1)}{\partial b} = \frac{a - (W(H) - W(C))}{(a+b)^2}. \quad (14)$$

Since we assume that  $\pi(1) < 1$ , it must be the case that  $-(W(H) - W(C)) > -a$  and so  $\frac{\partial \pi(1)}{\partial b} > 0$  ■

The proposition shows that, *ceteris paribus*, the need for competent incumbents to signal their competency is larger in situations where incumbency is not associated with a large natural advantage. In other words, the political business cycle peaks when the election race is "close". The reason is that the marginal value of signalling (in terms of improved reelection chances) is higher in situations where voters are not ideologically committed to the incumbent. The second part of the proposition shows that having a natural advantage, *ceteris paribus*, improves the reelection prospect irrespective of the type of incumbent.

We are interested in testing the relationship implied by the theory between what we might call the (average) *opportunistic distortion* (*OD*) and the (average) *win-margin* of the incumbent (*WM*). Theoretically, the opportunistic distortion is given by

$$\rho \left( g^s(b; \theta, \tau, m) - \frac{\tau + \varepsilon_H}{1 + \beta\theta} \right), \quad (15)$$

where  $g^s$  is implicitly defined by equation (11), and is simply an *ex ante* measure of the size of the average political business cycle. Theoretically, the average win-margin can be defined as

$$\rho \pi(\hat{\rho}(g_{1,1}^H)) + (1 - \rho) \pi(\hat{\rho}(g_{1,1}^L)), \quad (16)$$

which is the type-weighted *ex ante* probability that the incumbent is reelected. According to the theory, *OD* and *WM* are jointly determined at equilibrium: the degree of signalling along with the natural advantage of the incumbent determine the win margin, while the win margin, through its effect on the reelection differential between competent and incompetent politicians, determines the degree of signalling and thus the size of the opportunistic

distortion. We can therefore write the structural form of the model laid out above as

$$WM = \beta_1 OD + Z\beta_z \quad (17)$$

$$OD = \phi_1 WM + X\phi_x, \quad (18)$$

where  $\beta_1, \phi_1, \beta_z$  and  $\phi_x$  are scalars and vectors of parameters and  $X$  and  $Z$  are (possibly overlapping) vectors of other determinants of the opportunistic distortion and the win-margin. The theory of the RPBC imposes restrictions on  $\beta_1$  and  $\phi_1$  which we are interested in testing. Firstly, since the posterior belief that the incumbent is competent,  $\hat{\rho}(g_{1,1})$ , is non-decreasing in  $g_{1,1}$ , the model predicts that opportunistic behavior pays off in the sense that the win-margin is (weakly) increasing in the size of the opportunistic distortion ( $\beta_1 \geq 0$ ). Secondly, the theory predicts that the effect of an increase in the win-margin on the opportunistic distortion can be decomposed into two separate effects related to signalling and to the natural advantage of the incumbent respectively. First, there is a self-reinforcing positive link between the degree of signalling and the win-margin. To see this, notice that starting from a hypothetical situation where  $g_{1,1}^H < g^s$ , an increase in  $g_{1,1}^H$  increases  $\pi(\hat{\rho}(\cdot))$  which in turn increases the benefit of signalling (see equation (11)). Second, an increase in the win-margin triggered by an increase in the natural advantage of the incumbent leads to a reduction in the opportunistic distortion (see proposition 2). Empirically, we conjecture that the second effect is more important and our null hypothesis is that the opportunistic distortion is larger the closer the election, i.e., ( $\phi_1 \leq 0$ ).

As noted above both the win-margin and the opportunistic distortion are endogenous variables. Accordingly, to identify the links between them empirically, we need to impose restrictions on the structure form. We use the theory to motivate some of these exclusion restrictions. Firstly, we note that the parameter  $\theta$ , which controls the relative importance of long-term versus short-term public goods, affects the opportunistic distortion directly, while its impact on the win-margin is indirect (through its effect on the opportunistic distortion). In particular, the larger is  $\theta$ , the higher the cost of signaling and the lower is

$g^s$  and, ceteris paribus, the opportunistic distortion.<sup>15</sup> More broadly, we can interpret  $\theta$  as a measure of voter awareness of the opportunity cost of spending on easily observable expenditure items. Secondly, the availability of funds ( $\tau$ ) also has a direct (positive) effect on  $g^s$  because the cost of signalling falls and the value of reelection ( $V(\varepsilon_L)$ ) increases, while the effect on the win-margin is indirect. Thirdly, the ego-rent increases the benefit of reelection and directly increases the opportunistic distortion. Based on these observations, it is reasonable to exclude factors that affect voter awareness, the availability of funds and the ego-rent from the equation for the win-margin ( $WM$ ). On the other hand, the opportunistic distortion is unlikely to be directly affected by general economic conditions, while these factors are likely to affect the win-margin directly. We shall build on this identification strategy in the empirical specification below and defined  $X$  and  $Z$  accordingly.

## 4 Data and Empirical Specification

The data set consists of political, financial and economic variables for the 278 Portuguese mainland municipalities, for the local election years of 1979, 1982, 1985, 1989, 1993, 1997 and 2001.<sup>16</sup> Municipal election dates and results were obtained from the Technical Staff for Matters Concerning the Electoral Process (Secretariado Técnico dos Assuntos para o Processo Eleitoral - STAPE) of the Internal Affairs Ministry. Data on municipal local accounts were obtained from the local authority's (Direcção Geral das Autarquias Locais - DGAL) annual publication called *Finanças Municipais* (Municipal Finances). This report

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<sup>15</sup>Differentiating equation (9) with respect to  $\theta$  gives:

$$\frac{\partial C(\cdot, \varepsilon_L)}{\partial \theta} = \ln\left(\frac{\beta\theta(\tau + \varepsilon_L)}{1 + \beta\theta}\right) - \ln(\tau + \varepsilon_L - g^s) + \frac{1}{\theta(1 + \beta\theta)} > 0.$$

This implies that  $\frac{\partial g^s}{\partial \theta} < 0$ . Since  $\frac{\tau + \varepsilon_H}{1 + \beta\theta}$  also decreases in  $\theta$ , the overall effect on the opportunistic distortion is ambiguous.

<sup>16</sup>Although there was also an election in October 2005, data on the municipal financial accounts is only available until 2003. The election of 1979 is not covered in several estimations (whenever lags, term means or deviations from term means are included). For the three municipalities created in 1997 (Odivelas, Trofa and Vizela) there is only election data for 2001 (the last election in our sample), which means that there is no data for the votes obtained in the previous elections. Thus, in the estimations, we have a maximum of 275 municipalities.

exists from 1979 to 1983 and from 1986 to 2003. For the two missing years data was obtained directly from the municipalities' official accounts and are incomplete: we have 182 observations for 1984 and 189 for 1985. The consumer price index and the national unemployment rate were taken from the OECD's Main Economic Indicators. Data on the total number of employees in firms within each municipality and on their average wages, from 1985 to 2003, was obtained from the "Quadros de Pessoal" database, of the Portuguese Ministry of Labour and Social Solidarity (MTSS).<sup>17</sup> Finally, demographic data was obtained from the National Statistics Office (INE).

As discussed above, our empirical model consists of a system of two simultaneous equations: a vote and popularity function represented by the win-margin and an equation for the opportunistic distortion. We measure the win-margin of the incumbent as the difference between the vote share of the mayor's party and that of the largest opposition party ( $WM$ ). We measure the opportunistic distortion ( $OD$ ) as the percentage deviation of investment expenditures ( $IE$ ) from the election term average.

Since RPBC are more likely to occur in budgetary items whose timing of implementation is controlled by the mayor and are visible to the electorate, we concentrate our analysis on investment expenditures. Local governments do not have much freedom to set revenue instruments, as transfers from the central governments represent their main source of funding, particularly in the earlier years of the sample, and they all have access to the same type of taxes. Regarding spending decisions, current expenditures are strongly conditioned by salaries that are regulated by rigid labor contracts, both in terms of duration and wage rates, not leaving much flexibility to be changed before elections. Capital expenditures include transfers to lower levels of government and investment expenditures. It is therefore, likely that opportunistic behaviour occurs through investment decisions.<sup>18</sup>

Based on the discussion of exclusion restrictions above, we can expand equations (17)

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<sup>17</sup>The "Quadros de Pessoal" is a yearly mandatory employment survey that covers virtually all privately owned firms employing paid labor in Portugal (public servants and own employment are not included). Although the most recent year for which data is available is 2003, there is no data on wages for 2001. In order to avoid missing values, for each municipality, we set the wages for 2001 equal to the simple average between those of 2000 and 2002.

<sup>18</sup>For a detailed description of municipal finances in Portugal and for results indicating that opportunism occurs in investment expenditures, see Veiga and Veiga (2007).

and (18) as follows:

$$\begin{aligned}
WM_{it} &= \beta_1 OD_{it} + \beta_2 IE_{it} + \beta_3 YM_{it} + \beta_4 RR_{it} \\
&+ \beta_5 WM_{i,t-1} + \beta_6 GP_{it} + \beta_7 Emp_{it} \\
&+ \beta_8 Wages_{it} + \nu_i + \delta_t + \epsilon_{it}
\end{aligned} \tag{19}$$

$$\begin{aligned}
OD_{it} &= \phi_1 WM_{it} + \phi_2 IE_{it} + \phi_3 YM_{it} + \phi_4 RR_{it} \\
&+ \phi_5 CTtm_{it} + \phi_6 \Delta CT_{it} + \phi_7 Pop65_{it} \\
&+ \phi_8 PopDens_{it} + \phi_9 Right_{it} + \gamma_i + \varphi_t + \mu_{it}
\end{aligned} \tag{20}$$

where  $i = 1, \dots, 275$  is the index for municipalities and  $t$  indicates election years.<sup>19</sup> Both equations include municipal fixed effects ( $\gamma_i$  and  $\nu_i$ ) and election year fixed effects ( $\varphi_t$  and  $\delta_t$ ).  $\beta_1$  to  $\beta_8$  and  $\phi_1$  to  $\phi_9$  are parameters to be estimated and  $\mu_{it}$  and  $\epsilon_{it}$  are random error terms with  $E(\mu_{it}) = E(\epsilon_{it}) = 0$ . Our main objective is to estimate jointly the effect of opportunism ( $OD$ ) on the win-margin ( $WM$ ) and the effect of the win-margin on the degree of opportunism. The theoretical analysis suggests that  $\beta_1 > 0$  and  $\phi_1 < 0$ .

We divide the exogenous variables into three groups. The first group contains three variables that are included in both equations. They are: average investment expenditures during the election term preceding the election of year  $t$  ( $IE$ ); the number of years the incumbent mayor has been in office ( $YM$ ); and a dummy variable equal to 1 if the incumbent mayor runs for reelection and 0 otherwise ( $RR$ ). We expect that low average investment expenditures ( $IE$ ) make it easier to be opportunistic and to create a large percentage deviation of investment expenditures from the average at election times ( $\phi_2 < 0$ ). We also expect that average investment expenditures are positively related to the win-margin as voters reward mayors for keeping investments high on average throughout the term ( $\beta_2 > 0$ ). We expect that the number of years the incumbent mayor has served ( $YM$ ) reduces the win-margin because, as documented by e.g., Mueller (1970), Frey and Schneider (1978) and Veiga and Veiga (2004a), popularity tends to erode with time in office ( $\beta_3 < 0$ ) and that mayors with longer tenures are more experienced and so are more

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<sup>19</sup>The election years are 1979, 1982, 1985, 1989, 1993, 1997 and 2001.

able to manage investment expenditures opportunistically ( $\phi_3 > 0$ ). Finally, we expect that mayors who do not run for reelection ( $RR = 0$ ) are unwilling to incur the cost of signalling and thus would not attempt to increase investments opportunistically ( $\phi_4 > 0$ ). Likewise, the party of the incumbent mayor is expected to do better when the mayor runs for reelection than when a new, often unknown, candidate is presented ( $\beta_4 > 0$ ).

The second group contains variables that are excluded from the equation for the win-margin. Firstly, it includes two variables which are directly related to the availability of funds, namely the average capital transfer from the national government during the preceding election term ( $CTtm$ ) and the election year change in the capital transfer ( $\Delta CT$ ). Theory suggests that the availability of funds, here represented transfers, increases the opportunistic distortion in election years without having a direct effect on the win-margin. We expect that  $\phi_5$  and  $\phi_6$  are positive. Secondly, the second group also includes two variables that are related to voter awareness which, as suggested by the theory, tends to reduce the magnitude of the political business cycle. Akhmedov and Zhuravskaya (2004) in their study of the budget cycle in Russian regions use education and urbanization to measure voter awareness. Unfortunately, data on education attainment at the municipality level are not available for the time period analyzed in this paper. But, in Portugal, older people have, on average, much less education than younger people. Thus, we can use the percentage of the population over 65 years of age ( $Pop65$ ) to proxy for low average education levels<sup>20</sup> and use population density ( $PopDens$ ) to proxy for urbanization. We expect  $Pop65$  to be associated with low and  $PopDens$  to be associated with high levels of voter awareness and we predict that  $\phi_7 > 0$  and  $\phi_8 < 0$ . Finally, this group also includes a dummy variable that is equal to 1 if the mayor belongs to a right-wing party ( $Right$ ). We have no prior on the sign of  $\phi_9$ .

The third group contains variables that are excluded from the equation for the opportunistic distortion. According to Carsey and Wright (1998), the electorate may wish to reward, or punish, the national government in second tier (local) elections. Since voters tend to punish the national government for bad economic outcomes,<sup>21</sup> higher unemploy-

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<sup>20</sup>The same applies to the illiteracy rate, which will also be used in the empirical analysis.

<sup>21</sup>For evidence on the Portuguese case, at the national level, see Veiga and Veiga (2004a and 2004b).

ment rates should lead to a lower percentage of votes for incumbent mayors who belong to same party as the national government. We capture this with the variable  $GP$  which is the interaction between a dummy variable that takes the value of 1 if the mayor belongs to the same party as the prime minister of Portugal and the national unemployment rate. A negative sign is expected for  $\beta_6$ . Since voters are expected to reward mayors who achieve high levels of municipal employment ( $Emp$ ) or high average municipal real wages ( $Wages$ ) during their tenure, we also expect  $\beta_7$  and  $\beta_8$  to be positive. Finally, we include the win-margin in the pervious election ( $WM_{i,t-1}$ ). This variable picks up unobserved factors such as the mayor's personal characteristics and ideology and party affiliation of voters. We expect persistence in voter preferences (and thus in voting behavior) and predict that  $\beta_5$  is positive.

Descriptive statistics for all the variables included in the empirical model are presented in Table 1. Since the Win-margin measures the difference in the percentage of votes between the incumbent and his main opponent, it assumes negative values in case of defeat. The Win-margin in the previous election must be positive, since it refers to the results obtained by the incumbent mayor. In some cases, the percentage deviation of investment expenditures from their term mean assumes negative values, indicating that not all mayors behave opportunistically.

[Insert Table 1 about here]

## 5 Results

The results of the estimation of equations (19) and (20) as a system of simultaneous equations, using the Full Information Maximum Likelihood (FIML) method,<sup>22</sup> are reported in Table 2. T-statistics are shown in parenthesis and the levels of statistical significance of the estimated coefficients are signalled with asterisks. The number of observations and

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For a survey of the international literature, see Paldam (2004).

<sup>22</sup>FIML is the asymptotically efficient estimator for linear and nonlinear simultaneous models, under the assumption that the disturbances are multivariate normal. When this assumption fails, FIML may still be asymptotically efficient.

the adjusted R-squared for each equation are also reported. Finally, at the foot of the Table, the dummy variables used to control for geographical and time specific effects are indicated.<sup>23</sup>.

[Insert Table 2 about here]

There is clear support for the main prediction of the RPBC model: opportunism pays off, as the opportunistic distortion ( $OD$ ) has a statistically significant positive effect on the win-margin in all four specifications of equation (19), and the win-margin ( $WM$ ) has the expected negative effect on the size of the opportunistic distortion in all four specifications of equation (20). In other words, the data strongly support the prediction that incumbent politicians can increase their reelection chances by inflating spending in the year before an election and that they have most reason or incentive to do so when they expect the election race to be close or when they are lagging behind their main opponent in the polls. Opportunistic behavior is minimized when the incumbent expect a comfortable victory margin.

Concerning the magnitude of the effects, a one-point increase in the opportunistic distortion ( $OD$ ), increases the win-margin ( $WM$ ) by approximately 0.05 points, while a one-point increase in the win-margin decreases the opportunistic distortion by 0.3 points. Although the first effect may seem small, if the mayor, in the election year, doubles investment expenditures relative to their term mean, the win-margin increases by 5 points, which could be the difference between winning and losing in a close election. The second effect implies that a one-standard deviation increase in the win-margin decreases the opportunistic distortion by roughly 6 points.

Our estimates also give support to some of the secondary hypotheses. Firstly, from the estimates of equation (19) there is evidence that the win-margin is persistent, that time in

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<sup>23</sup>The specifications reported in the first two columns include dummy variables for municipalities (municipal fixed effects) and election years. In order to check if results were sensitive to the geographical dummies chosen, two alternatives were implemented. First, in column 3, dummies for districts replaced the municipal fixed effects (there are 18 districts in mainland Portugal). Second, in column 4, we included dummy variables for three of the four population categories that, according to the Portuguese law, are used to determine the mayors' wages: (1) Lisbon and Porto; (2) other municipalities with population above 40,000 inhabitants; (3) municipalities with population above 10,000 and below 40,000 (the dummy left out is that for the small municipalities, with a population below 10,000 inhabitants)

office reduces the win-margin, that the mayor’s party does better when the incumbent runs for re-election, and that mayors belonging to the same party as the national government are penalized in municipal elections for high national unemployment.<sup>24</sup> Municipal employment (*Emp*) and average real wages (*Wages*) turned out not to be statistically significant in the specification reported in column 1. Since the inclusion of these variables reduces the sample size substantially, because data on employment and wages are available only from 1985 onwards, we decided to exclude them from the specifications reported in the following columns.<sup>25</sup>

Secondly, from the estimation of equation (20), we note that the data support the hypothesis that opportunism is greater when the incumbent runs for re-election, when she belongs to a left-wing party ( $\text{Right}=0$ ), and when there are increases in capital transfers from the central government in the election year. But, opportunism does not seem to depend on the average investment expenditures over the term, on whether or not the mayor’s party controls a majority of deputies in the Municipal Assembly, on the average capital transfers over the term, or on the proxies for voter awareness (percentage of the population over 65 years old and population density).<sup>26</sup>

To check the robustness of these results, we report in Table 3 results for an alternative specification where we use the level of investment expenditures in the election year instead of the percentage deviation of investment expenditures from their election term average as a measure of the opportunistic distortion. Since the former is highly correlated with the election term average, the later variable was excluded from equation (19). In equation (20), investment expenditures in the previous year replaces the term average of those expenditures, in order to account better for the persistence in this series.

[Insert Table 3 about here]

Results are very similar to those of Table 2. Again, opportunism pays off, as higher investment expenditures in the election year lead to a larger win-margin for the incumbent

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<sup>24</sup>This effect is, however, not significant in the specification reported in column 1.

<sup>25</sup>The number of observations rises from 1214 to 1465 (an increase of 17.1%), and Wald tests allow the exclusion of these variables.

<sup>26</sup>Results are the same when the illiteracy rate is used instead.

party (equation (19)). Also as expected, investment expenditures in the election year are larger the smaller the (expected) win-margin is (equation (20)). The major differences in results from those of Table 2 are that there is less evidence that opportunism depends on whether or not the mayor runs for re-election or on her ideology, and that the election term average of capital transfers is now always highly statistically significant.<sup>27</sup>

## 6 Conclusion

Building on the literatures of political business cycles and vote/popularity functions, this paper presents a theoretical model and empirical tests which combine the two sides of the interaction between economics and politics. A voting function and an equation for the determinants of opportunistic economic policies are estimated as a system of two simultaneous equations, using the Full Information Maximum Likelihood method, for a sample comprising 275 Portuguese municipalities and covering the period 1979-2001.

Empirical results clearly support the hypothesis that opportunism pays off, as greater expenditures in the election year (when compared to the term mean or, simply in euros per capita) lead to greater vote differences between the incumbent and her main opponent. Regarding the vote function equation, there is also evidence of persistence in vote differences, of negative effects of time in office, that the mayor's party does better when the incumbent runs for re-election, and that the government's party is penalized in municipal elections for higher national unemployment.

The hypothesis that the magnitude of opportunism is inversely proportional to the estimated win-margin also receives empirical support. Thus, the opportunistic distortion is smaller when the incumbent expects to win by a comfortable margin, and is greater when the election is close or if the incumbent lags behind her main opponent. Opportunism will also be greater when the incumbent runs for re-election, when she belongs to a left-wing

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<sup>27</sup>Results are very similar when the estimations of Tables 2 and 3 are performed using capital expenditures instead of investment expenditures. The same is true for the categories of the latter for which Veiga and Veiga (2007) found greater evidence of opportunistic political business cycles, such as Overpasses, streets and complementary works. As expected, results are much weaker for total expenditures, for which the above-mentioned authors found little evidence of opportunistic manipulation. These results are not shown here, but are available from the authors upon request.

party, and when there are increases in capital transfers from the central government in the election year.

## 7 Appendix

**Proof of Proposition 1** We start by constructing the set of separating equilibria and then impose restrictions on out-of-equilibrium beliefs to narrow down the set down to a singleton and to rule out pooling equilibria. Let  $\{g_{1,1}^L, g_{1,1}^H\}$  denote candidate first-period equilibrium strategies of the two types of incumbents with  $g_{1,1}^L \neq g_{1,1}^H$ . Firstly, in any separating equilibrium an incumbent of type  $L$  must chose the short-run optimal allocation of first-period resources, i.e.,  $g_{1,1}^L = \frac{\tau + \varepsilon_L}{1 + \beta\theta}$ . Thus, Bayes's rule implies that  $\hat{\rho}\left(\frac{\tau + \varepsilon_L}{1 + \beta\theta}\right) = 0$ . Under the assumption that citizen-voters hold pessimistic out-of-equilibrium beliefs in the sense that for any  $g_{1,1} \neq g_{1,1}^H$ ,  $\hat{\rho}(g_{1,1}) = 0$ , it would not be beneficial for an incumbent of type  $L$  to pretend to be of type  $H$  if

$$C(g_{1,1}^H, \varepsilon_L) \geq \beta(\pi(1) - \pi(0))V(\varepsilon_L). \quad (21)$$

Moreover, an incumbent of type  $H$  prefers to play  $g_{1,1}^H$  rather than his short-run optimal choice  $\frac{\tau + \varepsilon_H}{1 + \beta\theta}$  if

$$C(g_{1,1}^H, \varepsilon_H) \leq \beta(\pi(1) - \pi(0))V(\varepsilon_H). \quad (22)$$

Notice that these the two intervals overlap, that any  $g_{1,1}^H$  within this intersection is a separating PBE and that the intersection may contain  $\frac{\tau + \varepsilon_H}{1 + \beta\theta}$ . Call the intersection  $A$ . Since for  $g_{1,1} \in A$  an incumbent of type  $H$  is worse off the further away  $g_{1,1}^H$  is from  $\frac{\tau + \varepsilon_H}{1 + \beta\theta}$ , all separating equilibria within  $A$  are dominated by  $g_{1,1}^H = g^s$  (defined in equation (11)) and can be ruled out by assuming that citizen-voters hold the (out-of-equilibrium) belief that the incumbent is of type  $H$  for all  $g_{1,1} \in A$ . Pooling equilibria in which both types set  $g_{1,1} = \frac{\tau + \varepsilon_H}{1 + \beta\theta}$  can be ruled out by the intuitive criterion (Cho and Kreps, 1987) as in Rogoff (1990).

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**Table 1: Descriptive Statistics**

<b>Variable Name</b>	<b>Variable Abbreviation</b>	<b>Obs.</b>	<b>Mean</b>	<b>Stand. Dev.</b>	<b>Min.</b>	<b>Max.</b>
Win-Margin (vote difference)	<i>WM</i>	1889	14.49	20.28	-72.62	87.93
Win-Margin in the previous election	<i>WM<sub>t-1</sub></i>	1897	19.32	14.64	0.02	87.93
Investment Expenditures	<i>InvExp</i>	1772	182.69	137.28	5.04	1439.10
Investment Expenditures (Term Mean)	<i>IE</i>	1623	162.35	105.02	14.13	944.52
Opportunistic Distortion: % Deviation of Investment Expenditures from their Term Mean	<i>OD</i>	1500	13.96	30.31	-88.55	169.34
Average Real Wages	<i>Wages</i>	1367	515.32	115.65	290.67	1196.98
Capital Transfers (Term Mean)	<i>CT<sub>tm</sub></i>	1623	129.53	92.54	16.97	879.48
% Change in Capital Transfers (From Previous Year)	<i>ΔCT</i>	1522	10.82	40.30	-87.38	287.56
Government's Party	<i>GovParty</i>	1893	0.44	0.50	0.00	1.00
Government's Party * Unemployment Rate	<i>GP</i>	1897	2.79	3.28	0.00	9.17
Illiteracy Rate	<i>IR</i>	1897	19.35	8.63	3.75	54.98
Municipal Employment	<i>Emp</i>	1367	15.09	9.73	1.04	89.73
Population Density	<i>PopDens</i>	1897	2.82	9.05	0.06	112.75
% Population Over 65 Years Old	<i>Pop65</i>	1897	16.98	5.68	5.35	41.22
Right	<i>Right</i>	1897	0.48	0.50	0.00	1.00
Run for Re-election	<i>RR</i>	1813	0.80	0.40	0.00	1.00
Unemployment Rate (National)	<i>Unemp</i>	1897	6.45	1.54	4.07	9.17
Years Mayor	<i>YM</i>	1893	7.01	4.61	1.00	25.00

**Sources:** DGAL, INE, MTSS, OECD, STAPE.

**Table 2: Opportunism and Vote Difference**

Votes	1	2	3	4
<b>Equation (1): <i>Win-margin</i></b>				
Opportunistic distortion (% Deviation of Investment Expenditures from their Term Mean)	.045 (1.79)*	.053 (2.01)**	.059 (2.09)**	.058 (2.11)**
Investment Expenditures (Term Mean)	-.002 (-.34)	.007 (1.56)	.010 (1.87)*	.007 (1.41)
Years Mayor	-.442 (-4.14)***	-.378 (-3.59)***	-.389 (-3.64)***	-.348 (-3.29)***
Run for Re-election	8.668 (6.49)***	8.963 (6.80)***	9.208 (6.92)***	8.852 (6.69)***
Win-margin in previous election	58.282 (16.9)***	43.660 (16.6)***	42.254 (16.2)***	43.114 (16.7)***
Government's Party * Unemployment Rate	.005 (.03)	-.542 (-3.69)***	-.503 (-3.22)***	-.554 (-3.72)***
Municipal Employment	.038 (.77)			
Average Real Wages	-.002 (-.36)			
# Observations	1214	1465	1465	1465
Adjusted R <sup>2</sup>	.24	.18	.19	.17
<b>Equation (2): <i>Opportunistic distortion (% Deviation of Investment Expenditures from their Term Mean)</i></b>				
Win-margin	-.308 (-3.34)***	-.277 (-2.71)***	-.267 (-2.25)**	-.286 (-2.67)***
Investment Expenditures (term mean)	-.015 (-1.23)	-.008 (-.76)	-.003 (-.28)	-.002 (-.23)
Years Mayor	-.072 (-.48)	-.046 (-.34)	-.103 (-.75)	-.075 (-.55)
Run for Re-election	4.041 (1.92)*	4.979 (2.54)***	4.576 (2.19)**	4.969 (2.48)**
Capital Transfers (Term Mean)	.014 (.82)	.006 (.44)	-.0004 (-.03)	-.014 (-1.15)
% Change in Capital Transfers (From Previous Year)	.379 (25.3)***	.373 (27.5)***	.375 (26.3)***	.375 (26.9)***
% Population Over 65 Years Old	.133 (.69)	.110 (.72)	.269 (1.49)	.215 (1.56)
Population Density	.143 (1.56)	.124 (1.55)	.062 (.72)	.063 (.76)
Right	-5.368 (-3.58)***	-5.315 (-3.94)***	-4.567 (-2.94)***	-4.667 (-3.59)***
# Observations	1214	1465	1465	1465
Adjusted R <sup>2</sup>	.36	.37	.36	.36
<b>Specific Effects Dummies:</b>				
Municipal dummies	X	X		
District dummies			X	
Population category dummies				X
Election dummies	X	X	X	X

**Sources:** DGAL, INE, MTSS, OECD, STAPE.

**Notes:** System of simultaneous equations estimated by FIML, controlling for geographic and time specific effects as indicated at the foot of the table. Models estimated with a constant in each equation. T-statistics are in parenthesis. Significance level at which the null hypothesis is rejected: \*\*\*, 1%; \*\*, 5%, and \*, 10%.

**Table 3: Investment and Vote Difference**

Votes	1	2	3	4
<b>Equation (1): <i>Win-margin</i></b>				
Opportunistic distortion (Investment Expenditures)	.007 (1.80)*	.004 (2.14)**	.016 (3.76)***	.012 (2.62)***
Years Mayor	-.432 (-4.03)***	-.406 (-3.77)***	-.442 (-4.16)***	-.379 (-3.62)***
Run for Re-election	8.568 (6.60)***	8.832 (6.66)***	9.287 (7.06)***	9.001 (6.83)***
Win-margin in previous election	52.788 (16.1)***	39.611 (15.9)***	41.963 (15.8)***	44.032 (16.9)***
Government's Party * Unemployment Rate	.061 (.38)	-.595 (-3.98)***	-.413 (-2.65)***	-.578 (-3.83)***
Municipal Employment	.063 (1.32)			
Average Real Wages	.002 (.42)			
# Observations	1212	1463	1463	1463
Adjusted R <sup>2</sup>	.21	.18	.19	.17
<b>Equation (2): <i>Opportunistic distortion (Investment Expenditures)</i></b>				
Win-margin	-.466 (-2.18)**	-.477 (-2.11)**	-.448 (-2.00)**	-.678 (-2.74)***
Investment Expenditures (-1)	.606 (29.9)***	.604 (38.9)***	.616 (41.5)***	.658 (48.2)***
Years Mayor	.409 (1.18)	-.045 (-.14)	.571 (1.72)*	.469 (1.33)
Run for Re-election	6.135 (1.02)	7.468 (1.36)	8.610 (1.56)	11.199 (1.88)*
Capital Transfers (Term Mean)	.564 (18.2)***	.622 (36.3)***	.594 (32.4)***	.572 (32.4)***
% Change in Capital Transfers (From Previous Year)	1.099 (37.4)***	1.026 (38.5)***	1.050 (35.1)***	1.082 (36.7)***
% Population Over 65 Years Old	.381 (.98)	-.496 (-1.72)*	-.345 (-1.08)	-.340 (-.93)
Population Density	.321 (1.50)	.297 (1.35)	.283 (1.31)	-.149 (-.41)
Right	-3.454 (-.92)	-4.431 (-1.29)	-6.895 (-1.99)**	-7.313 (-2.17)**
# Observations	1212	1463	1463	1463
Adjusted R <sup>2</sup>	.83	.82	.82	.82
<b>Specific Effects Dummies:</b>				
Municipal dummies	X	X		
District dummies			X	
Population category dummies				X
Election dummies	X	X	X	X

**Sources:** DGAL, INE, MTSS, OECD, STAPE.

**Notes:** System of simultaneous equations estimated by FIML, controlling for geographic and time specific effects as indicated at the foot of the table. Models estimated with a constant in each equation. T-statistics are in parenthesis. Significance level at which the null hypothesis is rejected: \*\*\*, 1%; \*\*, 5%, and \*, 10%.