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Intergovernmental fiscal transfers as pork barrel

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Abstract:

This paper simultaneously analyses the determinants of intergovernmental fiscal transfers and the votes that these transfers earn in subsequent legislative elections in Portugal. Results suggest that election year increases in transfers by the central government to municipalities secure added votes, and that these transfers are targeted at jurisdictions where the government faces risk of losing support.

Keywords: intergovernmental transfers, electoral competition, pork-barrel politics.

JEL codes: H77, D72, D78, E62

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1. Introduction

Intergovernmental fiscal transfers are financed by broad-based taxation but generate benefits that are geographically limited. Previous studies have demonstrated that governments take their own interests, specifically, electoral successes, into account when allocating grants to lower levels of governments (e.g., Johansson, 2003; Ansolabehere and Snyder, 2006; Solé-Ollé and Sorribas-Navarro, 2008). The existence of political motivations in grant allocation may generate welfare losses, excessive government spending, and inequities (see Boadway and Shah, 2006). However, there has been little empirical study of the political determinants of increases in intergovernmental grants in pre-electoral periods or of the electoral benefits of grant-funded pork barrel for incumbent politicians (Ferejohn, 1974).

This paper tries fills this gap in the literature by analyzing an extensive dataset that covers legislative elections in Portugal. The data set spans the period from the restoration of democracy in 1974 until 2005 and covers 278 mainland Portuguese municipalities. Portugal is an interesting case study because transfers from the central government represent an important source of funding for municipalities, and because all municipalities have identical institutional structures and policy concerns. Additionally, legislative elections dates are defined exogenously from the perspective of the government.

Veiga and Pinho (2007) found strong evidence of increases in intergovernmental fiscal transfers during election years in Portugal. The present paper analyses the determinants of pork-barrel spending in the allocation of grants by the Portuguese central government to local jurisdictions, and also the efficacy of those grants in producing votes for the incumbent government. If grants are used strategically to enhance re-election probabilities, then the incentive to manipulate grants should be

stronger when the incumbent is lagging behind opposition candidates. This suggests that the determinants of re-election prospects and pork barrel spending measures should be analyzed simultaneously in empirical studies. But, to the best of our knowledge, that has not been done so far.

The paper is organized as follows. The next section presents a brief review of the literature on pork barrel policies and voting functions. Section 3 introduces the Portuguese institutional background. The data and the econometric model are described in section 4. Section 5 presents the empirical results and, finally, section 6 concludes the paper.

2. Review of the literature

An important question in political economy is how economic events affect voting behavior. The theory's starting point is the responsibility hypothesis (Downs, 1957): voters hold the Government responsible for economic outcomes. This relationship is reflected in voting functions, which explain vote support for incumbents with variables measuring economic and political conditions. The first papers on this topic appeared in the 1970s (Goodhart and Bhansali, 1970; Mueller, 1970; and, Kramer, 1971). Since then many papers have followed, analyzing specific countries or panels of countries, but with most studies use aggregate data.[1] The number of papers estimating the impact of local conditions on electoral results is rather small and focuses primarily on the US and the UK.[2] For the Portuguese case, Veiga and Veiga (forthcoming) found that the performance of the national economy is important for legislative election

[1] For surveys on economic voting see Duch and Stevenson (2008), and Paldam (2004).

[2] Among others, see Holbrook (1991), Strumpf and Phillippe (1999), Eisenberg and Ketcham (2004) for U.S. presidential elections; and Johnston and Pattie (2001) for British general elections. For French legislative elections refer to Auberger and Dubois (2005).

results, but that local economic conditions also influence electoral outcomes. Building on the previous paper, we investigate how changes in transfers to municipalities influence electoral results and whether these transfers are used as a political tool to win elections.

According to the first generation literature on fiscal federalism (Oates, 1999) the two main normative objectives for intergovernmental fiscal transfers are the enhancement of efficiency and a more equitable allocation of resources among local jurisdictions. More recently, a second generation of fiscal federalism studies[3] has emerged that "examines the workings of different political and fiscal institutions in a setting of imperfect information and control with a basic focus on the incentives that these institutions embody and the resulting behaviour they induce from utility-maximizing participants" (Oates, 2005, p. 356). In such a setting, the distribution of central government resources among local jurisdictions may also be influenced by positive considerations, such as the enhancement of the incumbent re-election probabilities (Ferejohn, 1974), and the satisfaction of powerful interest groups (Olson, 1965).

Two alternative theories have been put forward by the literature on redistributive politics that can be applied to the study of intergovernmental grants as a political tool. According to Lindbeck and Weibull (1987, 1993) and Dixit and Londgren (1998) upper-layer governments should allocate more money towards swing regions where voters do not have a strong attachment to either the government or opposition parties. In contrast, Cox and McCubbins (1986) argue that central governments are risk averse, and therefore invest where they already have a strong support.

[3] See Weingast (2009) for a survey.

Several papers have tested these two theories and found that, besides local expenditure needs and local fiscal capacity, political factors play an important role in the allocation of per capita intergovernmental grants among local jurisdictions. For the Swedish case, Dahlberg and Johansson (2002) and Johansson (2003) found strong evidence in favour of the Lindbeck and Weibull (1987) model. Case (2001) found that, in Albania, more assistance was allocated not only to swing communes but also to those that might be pivotal to winning a majority of seats in Parliament. For the US, Ansolabehere and Snyder (2006) found that states transfer more to local governments that provide them with the strongest electoral support, and found little or no evidence in favor of the swing voter model. The Portuguese case was investigated by Veiga and Pinho (2007). Their results present strong evidence of grant increases during election years, and that municipalities with many swing voters received more grants, particularly during the early years of democracy.

This paper improves on the previous literature by simultaneously analysing how grant increases in electoral years produce votes, and how electoral prospects influence opportunistic behaviour in the distribution of grants.

3. Institutional background

Democracy was restored in Portugal on April 25, 1974, after 48 years of dictatorship. A new constitution came into effect on April 25, 1976, and elections for the Assembly of the Republic, the Portuguese unicameral Parliament, were held on the same day. The first years of the democratic period were characterized by strong political instability, with coalition or minority governments falling before the ends of their terms. The first government having a majority in Parliament emerged in the 1987 elections, under the leadership of Cavaco Silva, from the Social Democratic Party. This

party achieved a second majority in 1991, but lost the following election to the Socialists. The Socialist Party ruled the country with minority governments until the resignation of António Guterres as Prime-Minister, in 2001, following poor results in the municipal elections. The Social Democrats took over again in 2002 under the leadership of Durão Barroso. Following a Presidential dismissal of the government, elections were called for February 2005. The Socialists won a majority in Parliament and, in the midst of an economic crisis, were again victorious in 2009, although they failed to retain a majority of deputies in parliament.

[Insert Table 1 about here]

Since the constitutional revision of 1982, that eliminated the Council of the Revolution, the organs of sovereignty in Portugal are the President of the Republic, the Assembly of the Republic, the Government, and the Courts. The Assembly of the Republic is the Portuguese unicameral Parliament, currently composed of 230 deputies elected for a four year term by direct and secret universal adult suffrage, using a proportional representation system in multi-seat constituencies, the districts. The Government consists of the Prime Minister (generally the leader of the party that received the most votes in the last elections), the Ministers, the Secretaries of State, and the Under-Secretaries of State. The Government formulates the general policy of the country and is the highest organ of public administration. It proposes the National Budget to the Assembly of the Republic, where transfers to municipalities are set according to the Local Finance Law.

Portugal is a unitary state,[4] comprising 278 municipalities in its mainland territory.[5] Municipalities are concerned with improving the well-being of the population

[4] For an analysis of three decades of democratic local governments in Portugal see Silva Costa (2008).

that live in their territories. They promote social and economic development, organization of the territory, and supply local public goods (water and sewage, energy, transportation, housing, healthcare, education, culture, sports, defence of the environment and protection of the civilian population).[6]

Budgeting rules and institutions are identical across Portuguese mainland municipalities, but the law regulating local public finances changed during the period considered. Although there has been an increase in the relative importance of local taxes and user charges over time, municipalities still have a low level of fiscal autonomy. The Portuguese Constitution establishes that municipalities have the right to share national fiscal revenues, and transfers from the Central Government are the main source of funding for municipalities. In our sample, real per capita transfers represent (on average) 64% of real per capita revenues. Municipalities receive conditional and unconditional transfers. The former are allocated by the central government and are usually regulated by contracts and specific programs. The central government has less discretionary power over unconditional transfers, since they are distributed among municipalities according to a formula that takes into account their needs and resources (namely population, area, number of *freguesias* - the lowest level of local government, taxes collected in the municipality, and the level of socio-economic development). The formula has changed over time, following revisions of the Local Finance Laws[7].

[5] There are also 30 municipalities in the Administrative Regions of Azores and Madeira, which are not considered in this study. While municipalities are the main local authorities in mainland Portugal, there are regional governments in Azores and Madeira. Thus, their municipalities are not perfectly comparable to those of the mainland.

[6] Laws 159/99 and 1969/99 modified by law 5-A/2002 define the attributions and competences of Portuguese local governments.

[7] There were four local finance laws: Law n. 1/79, Law n. 1/87, Law n. 42/98, and Law n. 2/07.

However, even for formula transfers, until 1998 the central government could influence the total amount distributed, which means that it could use them for electoral purposes.

4. Data and econometric model

The dataset used in this study covers the 278 municipalities of continental Portugal, with annual data from 1979 to 2005. Legislative election dates and results were obtained from the Technical Staff for Matters Concerning the Electoral Process (STAPE) of the Portuguese Internal Affairs Ministry. Data on transfers from the central government to the municipalities were obtained from the local authority's (*Direcção Geral das Autarquias Locais - DGAL*) annual publication *Finanças Municipais*. This report exists from 1979 to 1983 and from 1986 to 2006. 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 national consumer price index, real GDP, and industrial production index were obtained from the IMF's *International Financial Statistics*, and the unemployment rate from the OECD's *Main Economic Indicators*. Finally, demographic data was obtained in the 1970, 1981, 1991 and 2001 *Census* and in the *Anuário Estatístico Regional* of the National Statistics Office (INE).

The main purpose of our empirical analysis is to test the following hypotheses: (1) election-year increases in grants transferred to a municipality lead to higher vote shares for the government; and, (2) increases in grants in election years are influenced by the expected change in vote shares from one election to the other. Hypothesis (1) will be tested by estimating a voting function in which the dependent variable, $\Delta Votes_{it}$, is the change, from one election to the next, in vote shares received in the municipality by the national government party ($\Delta Votes_{it} = Votes_{it} - Votes_{i,t-1}$). A *pork barrel* equation

will be estimated in order to test Hypothesis (2), in which the dependent variable, $\Delta Grants_{it}$, is the percentage change in real total grants *per capita* in the election year.

The above-mentioned hypotheses imply that the dependent variable of one equation appears as an explanatory variable in the other equation. Given this endogeneity, the most appropriate empirical strategy is to estimate a system of two simultaneous equations.

Our baseline model consists of a voting function (1), and an equation for the growth of intergovernmental grants (2).

$$\Delta Votes_{it} = \alpha + \beta_1 \Delta Grants_{it} + \beta_2 Grant\_Mean_{it} + \beta_3 Votes_{it-1} + \beta_4 Same\_Party_{it} + \beta_5 Inflation_{t-1} + \beta_6 \Delta Unemp\_Rate_{t-1} + \nu_i + \delta_t + \varepsilon_{it} \quad (1)$$

$$\Delta Grants_{it} = \gamma + \varphi_1 \Delta Votes_{it} + \varphi_2 Grant_{i,t-1} + \varphi_3 Same\_Party_{it} + \varphi_4 Votes_{it-1} + \varphi_5 Majority_{it} + \varphi_6 Pop_{i,t-1} + \varphi_7 Pop^2_{i,t-1} + \varphi_8 Pop65_{i,t-1} + \varphi_9 SD(Votes)_{it} + \lambda_i + \phi_t + \mu_{it} \quad (2)$$

i = 1, ..., 278 is the index for municipalities, t indicates time, α and γ are constants, β_1-β_6 and φ_1-φ_9 are parameters to be estimated, ν_i and λ_i are the individual effects of municipality i, δ_t and ϕ_t are dummy variables for the election of year t, and ε_{it} and μ_{it} are the errors terms.

In the voting function (1), election year increases in real *per capita* grants transferred by the central government to municipalities ($\Delta Grants_{it}$) are expected to improve re-election prospects. Transfers represent the main source of funding for municipalities and condition expenditure decisions that generate welfare gains for the citizens. Higher average total grants *per capita* received by the local government over

the entire term of the Government ($Grant\_Mean_{it}$) are also expected to increase votes. Thus, we expect positive signs for β_1 and β_2.

Since governments with a larger support base tend to have more swing voters, a negative sign is expected for the coefficient (β_3) associated with the share in votes in the previous election ($Votes_{it-1}$). In order to evaluate if voters prefer not to concentrate all the power in one party, we included a dummy variable ($Same\_Party_{it}$) which takes the value of one when the mayor's party is in the national government, and equals zero otherwise. Following Alesina and Rosenthal (1996), a negative sign is expected for β_4.

According to Veiga and Veiga (2004), Portuguese voters hold governments responsible for the evolution of the economy. There is also evidence that they are myopic, namely that events that occurred in the recent past are more important determinants of voting behavior than those that occurred longer ago. Thus, the change in the vote share of the government party from one election to the next is very likely to be affected by changes in macroeconomic variables, such as consumer prices and unemployment rates in the year before elections. Concretely, we expect that positive percentage changes in consumer prices ($Inflation_{t-1}$) and in unemployment rates ($\Delta Unemp\_Rate_{t-1}$) will lead to decreases in vote shares of the government party (negative signs are expected for β_5 and β_6). Since voters will not know the values of those variables for the election year when they vote, their first lags (the values in the pre-election year) are used in the estimations.

Equation (2) explains the growth rate of intergovernmental grants *per capita* in election years. If grants are used as pork barrel, during election years the central government will target municipalities where it faces higher risks of losing support. Therefore, a negative sign is expected for the coefficient (φ_1) associated with $\Delta Votes_{it}$, which proxies the expected change in votes, estimated in equation (1). Since large

increases in grants are harder where they are already large, a negative sign is expected for the coefficient (φ_2) associated with real total grants per capita in the year prior to the election ($Grant_{i,t-1}$).

To test Cox and McCubbins' (1986) hypothesis that electoral increases in grants are higher to municipalities where the government has stronger political support, a dummy for party similarity between the government and the mayor ($Same\_Party_{it}$), and a variable measuring the share in votes in the previous election ($Votes_{it-1}$) were included. Positive signs of both coefficients, φ_3 and φ_4, are expected.

When a majority of the deputies in parliament belongs to the government party, budgets that allow for electoral manipulation of intergovernmental grants are more likely to be approved. This hypothesis is tested by including in the model the dummy variable $Majority_{it}$, which takes the value of one for governments having a majority at the National Assembly (Parliament), and equals zero otherwise. The estimated coefficient (φ_5) is expected to be positive.

$Pop_{i,t-1}$ represents a municipality's population, in thousands. The bigger the population of a municipality is, the costlier it is for the government to increase the grants *per capita* transferred to it. Thus, a negative coefficient is expected for φ_6. Population squared ($Pop^2_{i,t-1}$) was also included to allow for non linear effects. Taking into account that voter awareness may reduce the electoral pay-off of pork barrel measures, we introduced the percentage of the population over 65 years old ($Pop65_{i,t-1}$), as a proxy for low education levels (φ_8 is expected to be positive).[8]

Finally, the standard deviation of the difference in the percentage of votes obtained by the two main parties (PSD and PS) alternating in the central government,

[8] Demographic variables are lagged one year in order to avoid endogeneity problems that could result from the fact that increased transfers to a municipality could induce people to move to it.

$SD(VOTES_{it})$, is used to test Lindbeck and Weibull's (1993) hypothesis that politicians target swing voters.[9] A positive estimated coefficient (φ_9) is expected.

Descriptive statistics of the variables referred to above are presented in Table 2. The mean of the growth in total grants per capita from the pre-electoral year to the electoral period is 9.85 euros of 2000, while for the whole sample is 5.11, which supports the hypothesis that central governments behave opportunistically. A positive value is also observed for the growth in current and capital grants, with the latter almost doubling the former. This suggests a larger manipulation of capital grants than of current grants, which is accordance with evidence provided by Veiga and Veiga (2007b) of larger political business cycles in municipal capital expenditures than in current expenditures.

[Insert Table 2 about here]

Equations (1) and (2) are estimated as a system of simultaneous equations, using Generalized Method of Moments (GMM) which is a robust estimator in that it does not require information of the exact distribution of the disturbances.[10] GMM estimation is based upon the assumption that the disturbances in the equations are uncorrelated with a set of instrumental variables. The set of instrumental variables of each equation used in our estimations includes all exogenous right-hand side variables of both equations (including municipal and time dummies). The GMM estimator selects parameter estimates so that the correlations between the instruments and disturbances are as close to zero as possible, as defined by a criterion function. By choosing the weighting matrix

[9] This variable is defined as the standard deviation of the vote difference (PSD-PS) in all previous elections since 1976. It varies over time as more observations (elections) become available.

[10] This is an advantage relative to Full Information Maximum Likelihood (FIML), an alternative method for the estimation of systems of simultaneous equations, which assumes that the contemporaneous errors have a joint normal distribution. Another caveat of FIML is that it propagates to the system any specification error in the structure of the model.

in the criterion function appropriately, GMM can be made robust to heteroskedasticity and/or autocorrelation of unknown form.[11]

5. Empirical results

The systems of simultaneous equations were estimated using Generalized Method of Moments (GMM) on a panel of 278 municipalities, over ten national legislative elections (1979, 1980, 1983, 1985, 1987, 1991, 1995, 1999, 2002, and 2005). Estimations were performed controlling for fixed effects of municipalities and election-specific effects.[12] The results of the estimation of Equation (1) are shown in Table 3-A, and those of Equation (2) in Table 3-B.[13]

The results shown in Table 3-A provide strong evidence that increases in intergovernmental grants in electoral years improve political outcomes. According to the results of column 1, a one standard deviation increase in the growth of real total grants *per capita* increases the vote share of the government party by approximately 1 (=0.03*33.52) percentage point, which is by no means a negligible effect. Furthermore, if we take into account the fact that there are many cases in which total grants more than double in the election year, the opportunistic manipulation of intergovernmental transfers may be capable of affecting the outcome of close elections.

The average level of grants received by a municipality over the governments' term does not seem to influence electoral outcomes, suggesting that voters are myopic:

[11] In the presence of heteroskedasticity, the GMM estimator brings efficiency gains relative to Three-Stage Least Squares (3SLS), another alternative method of estimation of systems of simultaneous equations.

[12] One election year dummy must be dropped for each national macroeconomic variable included.

[13] Although it would be preferable to show all results in just one table, it would imply using a very small font size, which would make results hard to read. Thus, we opted to split Table 3 in two tables, one for each equation.

they only reward increases in spending close to elections, not the level of spending over an entire term. As expected, governments lose more votes in municipalities were they had higher vote shares in previous elections, but party similarity between the mayor and the government does not seem to affect votes. National economic performance strongly conditions electoral outcomes, supporting the hypothesis that voters hold incumbents responsible for the evolution of the economy. This result is consistent with the evidence in favour of the responsibility hypothesis found in most of the vote/popularity functions literature.

The results for the determinants of pork barrel measures, shown in Table 3-B, reveal that municipalities where the government expects votes to increase less, or to decrease more, (lower $\Delta Votes_{it}$) benefit from higher increases in grants in election years. That is, grants are used strategically to win elections. A one standard deviation reduction in the vote share leads to an increase in total grants *per capita* of approximately 13 (=-1.13*11.57) percentage points.

We also find evidence that governments target municipalities with higher percentages of the population over 65 years old (with lower education and voter awareness). There is a U-shaped statistical relationship between changes in grants and municipal population, with the turning point at about 420,000 inhabitants. The negatively sloped part of this relationship is due to financial constraints: it is costlier to increase grants *per capita* in more populous municipalities. The positively sloped part reveals that central governments assign more political importance to winning votes in Lisbon, the Portuguese capital, which is the only municipality with more than 420,000 inhabitants. Finally, as expected, changes in grants depend negatively on the amount transferred in the pre-electoral year.

Percentage changes in grants do not seem to depend on the support received in the previous election, on party similarity between the mayor and the government, on the incidence of swing voters, or on whether the government is majoritarian or not.

The results of a more parsimonious model are shown in column 2 of Table 3 (A and B). This model excludes the explanatory variables that were not statistically significant in the estimation of column 1,[14] and the empirical results are virtually the same. Then, as a robustness check, alternative proxies for the evolution of the national economy were used in Equation 1, replacing the *Change in the Unemployment Rate*. Real *GDP Growth* is used in the estimation of column 3, while *Growth of the Industrial Production Index* is used in that of column 4. Both are highly statistically significant, with the expected positive sign. That is, as anticipated, higher growth rates of GDP or of the industrial production index, both indicating better economic performance, lead to higher vote shares for the government. The results concerning the other explanatory variables are very similar to those shown in column 2.

To check the robustness of the results to a change in the system estimation method, we also performed the estimations using Full Information Maximum Likelihood (FIML), which 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 results obtained when using this alternative system estimation method are reported in columns 1 and 2 of Table 4 (A and B). They are very similar to those of columns 1 and 2 of Table 3 (obtained using GMM). Thus, regardless of the system

[14] Wald tests allow for the exclusion of those variables.

estimation method chosen, there is clear empirical support for the theoretical predictions.[15]

All estimations referred to above were performed using real total grants *per capita*. It is interesting to check if similar results are obtained when considering only capital grants or current grants. Since Veiga and Veiga (2007b) found empirical evidence of political business cycles in municipal capital expenditures, namely in investment expenditures highly visible to the electorate, but not in current expenditures, we anticipate that the strategic allocation of grants by the national government is stronger for capital grants than for current grants.[16] The results obtained when considering capital grants only are reported in columns 3 and 4 of Table 4 (A and B). They are very similar to those of columns 1 and 2 of Table 3 (A and B). Thus, we reach the same conclusions when using capital grants instead of total grants. Although the results for current grants are also similar in the political outcome equation (columns 5 and 6 of Table 4-A), the *Change in vote shares* is not statistically significant in the pork barrel equation (columns 5 and 6 of Table 4-B). This implies that intergovernmental transfers of current grants are not affected by the expected electoral results for the government.

These results are consistent with those of Veiga and Veiga (2007a), who show that the opportunistic election-year behaviour of mayors pays off in terms of increased vote shares when spending consists of investment items such as overpasses, streets, rural roads, and other constructions. Since they do not find evidence that increases in municipal current expenditures lead to larger votes shares, it is no surprise that

[15] We also estimated the models of columns 3 and 4 of Table 3 using FIML. Again, the results, not shown here in order to economize space, are very similar to those obtained with GMM. These are available from the authors upon request.

[16] Veiga and Veiga (2007b) also show that increases in capital transfers from the central government lead to increases in investment expenditures of municipalities.

governments do not strategically manipulate the transfers of current grants, but do so for capital grants.

6. Conclusion

Several studies have demonstrated that intergovernmental grants tend to increase during balloting years. However, the determinants of the distribution of these pork barrel grants, as well as their political return, have received very little attention. Elections provide a mechanism for citizens to express their preferences and to hold politicians accountable for economic conditions. However, in centralized countries like Portugal, democracy also creates political incentives for central governments to distribute more "pork" during electoral periods, particularly to jurisdiction where they are in greater danger of losing votes.

Using a sample of all Portuguese mainland municipalities, and covering ten elections (1979-2005), we find strong evidence that electoral year increases in intergovernmental grants pay off in terms of electoral support, and that the central government targets municipalities where it expects greater losses of votes. Consistent with the responsibility hypothesis, the results also reveal that legislative political outcomes in municipalities are influenced by the macroeconomic situation of the country. Therefore, a policy recommendation that can be extracted from our research is that it would be desirable to attribute more financial independence to local governments That is, to adopt decentralization measures that reduce the degree of fiscal discretion of central governments to use transfers as a political tool to win elections.

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Table 1: Legislative elections and parties in government

Dates of elections	Winning party	% Votes	Prime-Minister	Form of government
April 25, 1976	PS	34.9%	Mário Soares	One party, minority
-	-	-	Mota Pinto	Presidential appointment (1978-79)
-	-	-	M. L. Pintassilgo	Presidential appointment (1979-80)
December 2, 1979	AD	42.2%	Sá Carneiro	Coalition (AD=PSD+CDS+PPM)
October 5, 1980	AD	44.4%	Pinto Balsemão	Coalition (AD=PSD+CDS+PPM)
April 25, 1983	PS	36.3%	Mário Soares	Coalition (PS+PSD)
October 6, 1985	PPD/PSD	29.7%	Cavaco Silva	One party, minority
July 19, 1987	PPD/PSD	50.1%	Cavaco Silva	One party, majority
October 6, 1991	PPD/PSD	50.4%	Cavaco Silva	One party, majority
October 1, 1995	PS	43.8%	António Guterres	One party, minority
October 10, 1999	PS	44.0%	António Guterres	One party, minority
March 17, 2002	PPD/PSD	40.1%	Durão Barroso[(a)]	Coalition (PSD+CDS/PP)
February 20, 2005	PS	45.0%	José Sócrates	One party, majority
September 27, 2009	PS	36.6%	José Sócrates	One party, minority

Source: Technical Staff for Matters Concerning the Electoral Process of the Internal Affairs Ministry.
Notes: PPD/PSD - People's Democratic Party / Social Democratic Party; PS - Socialist Party; CDS/PP - Democratic and Social Center / People's Party; PPM - Monarchic People's Party.

(a) In July 2004, Durão Barroso resigned (in order to become the President of the European Commission) and a new government, also a coalition of PSD and CDS/PP, was formed under the leadership of Santana Lopes.

Table 2: Descriptive Statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Change in vote shares	2099	-3.68	11.57	-30.78	36.34
Share in Votes in the Previous Election	2099	43.73	14.53	5.47	85.45
Growth in Total Grants relative to the previous year	2099	9.85	33.52	-76.14	538.99
Total Grants	2099	346.13	323.04	37.10	3079.16
Total Grants (Term Mean)	2099	318.53	251.65	48.95	1785.88
Mayor Belongs to a Government Party	2099	0.43	0.49	0.00	1.00
Inflation Rate (Annual)	2099	9.19	7.92	2.29	25.11
Change in the Unemployment Rate (Annual)	2099	2.37	14.42	-17.73	24.08
GDP Growth (Annual)	2099	2.92	2.66	-0.19	8.45
Growth of the Industrial Production Index (Annual)	2099	2.49	3.16	-1.30	8.99
Majority	2099	0.39	0.49	0.00	1.00
Population (thousands)	2099	34.95	59.56	1.77	770.90
% Population Over 65 Years Old	2099	18.37	6.07	5.59	42.02
Standard Deviation of Votes	2099	16.31	3.68	2.27	35.67
Growth in Capital Grants relative to the previous year	2098	14.98	67.55	-95.82	1158.20
Capital Grants	2098	188.56	222.20	5.54	2791.42
Capital Grants (Term Mean)	2098	171.49	145.78	19.74	1171.89
Growth in Current Grants relative to the previous year	2097	7.87	11.11	-86.66	148.59
Current Grants	2097	157.80	124.53	0.03	979.14
Current Grants (Term Mean)	2099	147.11	114.90	0.03	930.63

Sources: DGAL, IMF, INE, OECD, MTSS, Marktest, STAPE and municipal official accounts.

Note: Grants are measured in euros per capita at 2000 prices.

Table 3-A: Pork Barrel and Votes (Political Outcome Equation)

	1	2	3	4
Equation (1): *Political outcome*				
*(*Dependent Variable: *Change in vote shares)*				
Growth in Total Grants relative to the previous year	.03	.03	.02	.03
	(10.7)**	(13.1)**	(8.85)**	(13.1)**
Total Grants (Term Mean)	-.00001			
	(-.19)			
Share in Votes in the Previous Election	-.07	-.06	-.07	-.06
	(-8.24)**	(-10.8)**	(-11.4)**	(-10.8)**
Mayor Belongs to a Government Party	.26			
	(1.50)			
Inflation (-1)	-1.38	-1.38	-0.06	-2.74
	(-62.4)**	(-63.2)**	(-6.81)**	(-69.8)**
Change in the Unemployment Rate (-1)	-9.31	-9.33		
	(-67.5)**	(-70.1)**		
GDP Growth (-1)			11.49	
			(78.4)**	
Growth of the Industrial Production Index (-1)				11.02
				(70.1)**
# Observations	2099	2099	2099	2099
Adjusted R^2	.89	.89	.89	.89

Notes: Systems of simultaneous equations estimated by GMM. Models estimated with municipal and election-year dummies. Robust t-statistics are in parenthesis. Significance level at which the null hypothesis is rejected: **1%; and *, 5%.

Table 3-B: Pork Barrel and Votes (Pork Barrel Equation)

	1	2	3	4
Equation (2): *Pork barrel*				
*(*Dependent Variable: *Growth in Total Grants relative to the Previous Year)*				
Change in vote shares	-1.13	-1.18	-1.20	-1.18
	(-4.93)**	(-6.39)**	(-6.27)**	(-6.39)**
Total Grants (-1)	-.02	-.02	-.02	-.02
	(-3.80)**	(-4.21)**	(-4.00)**	(-4.21)**
Share in Votes in the Previous Election	-6.65			
	(-1.07)			
Majority	-2.95			
	(-1.33)			
Mayor Belongs to a Government Party	2.61			
	(1.65)			
Population (-1)	-.42	-.39	-.39	-.32
	(-4.07)**	(-4.47)**	(-4.59)**	(-3.30)**
Population Squared (-1)	.0005	.0005	.0005	.0005
	(3.76)**	(4.10)**	(4.21)**	(4.10)**
% Population Over 65 Years Old (-1)	.72	.62	.60	.62
	(3.55)**	(3.25)**	(3.10)**	(3.25)**
Standard Deviation of Votes	.21			
	(1.27)			
# Observations	2099	2099	2099	2099
Adjusted R^2	.32	.22	.28	.22

Notes: Systems of simultaneous equations estimated by GMM. Models estimated with municipal and election-year dummies. Robust t-statistics are in parenthesis. Significance level at which the null hypothesis is rejected: **1%; and *, 5%.

Table 4-A: Robustness Tests (Political Outcome Equation)

	1 **FIML** Total Grants	**2** **FIML** Total Grants	**3** **GMM** Capital Grants	**4** **GMM** Capital Grants	**5** **GMM** Current Grants	**6** **GMM** Current Grants
Equation (1): ***Political outcome***						
*(*Dependent Variable: *Change in vote shares)*						
Growth in Grants relative to the previous year	.04	.03	.01	.01	.05	.02
	(3.15)**	(2.79)**	(5.03)**	(6.75)**	(2.16)*	(2.23)*
Grants (Term Mean)	-.0001	-.0004	.00003		.0002	
	(-1.45)	(-.75)	(.11)		(.37)	
Share in Votes in the Previous Election	-.08	-.07	-6.97	-6.38	-7.15	-5.93
	(-8.88)**	(-9.56)**	(-10.3)**	(-10.8)**	(-10.5)**	(-10.2)**
Mayor Belongs to a Government Party	.37		.31		.32	
	(1.80)		(1.77)		(1.78)	
Inflation (-1)	-1.38	-1.39	-1.39	-1.39	-1.41	-1.42
	(-33.9)**	(-33.5)**	(-63.2)**	(-64.3)**	(-63.5)**	(-67.1)**
Change in the Unemployment Rate (-1)	-9.53	-9.61	-9.33	-9.34	-9.45	-9.49
	(-69.8)**	(-68.8)**	(-68.3)**	(-71.3)**	(-68.9)**	(-72.4**
# Observations	2099	2099	2098	2098	2097	2097
Adjusted R^2	.89	.89	.90	.90	.90	.90

Notes: Systems of simultaneous equations estimated with municipal and election-year dummies. Robust t-statistics are in parenthesis. Significance level at which the null hypothesis is rejected: **1%; and *, 5%.

Table 4-B: Robustness Tests (Pork Barrel Equation)

	1 **FIML** Total Grants	**1** **FIML** Total Grants	**3** **GMM** Capital Grants	**4** **GMM** Capital Grants	**5** **GMM** Current Grants	**6** **GMM** Current Grants
Equation (2): *Pork barrel*						
*(*Dependent Variable: *Growth in Grants relative to the Previous Year)*						
Change in vote shares	-1.23	-1.09	-2.09	-1.97	.10	.03
	(-2.44)*	(-2.41)*	(-4.86)**	(-5.91)**	(.85)	(.58)
Grants (-1)	-.02	-.02	-.09	-.09	-.01	-.003
	(-2.91)**	(-3.05)**	(-5.53)**	(-5.75)**	(-2.21)*	(-.70)
Share in Votes in the Previous Election	-8.45		-8.53		13.08	
	(-.81)		(-.70)		(1.61)	
Majority	-1.71		-.41		-6.26	
	(-.29)		(-.09)		(-2.57)*	
Mayor Belongs to a Government Party	-.93		5.38		-2.64	
	(-.47)		(1.76)		(-.68)	
Population (-1)	-.28	-.28	-.78	-.68	-.07	.03
	(-4.95)**	(-5.05)**	(-5.00)**	(-5.13)**	(-1.47)	(1.01)
Population Squared (-1)	.0004	.0004	.001	.001	.00001	-.00001
	(3.83)**	(3.89)**	(4.75)**	(4.88)**	(1.06)	(-1.38)
% Population Over 65 Years Old (-1)	.50	.53	1.74	1.63	.26	.21
	(2.26)*	(2.41)**	(4.73)**	(4.63)**	(3.51)**	(2.93)**
Standard Deviation of Votes	.19		.49		-.01	
	(.70)		(1.57)		(-.15)	
# Observations	2099	2099	2098	2098	2097	2097
Adjusted R^2	.10	.11	.10	.10	.07	.02

Notes: Systems of simultaneous equations estimated with municipal and election-year dummies. Robust t-statistics are in parenthesis. Significance level at which the null hypothesis is rejected: **1%; and *, 5%.

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