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# Disentangling Political and Institutional Determinants of Budget Forecast Errors: A Comparative Approach\*

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## Abstract

This paper provides a unique comparison between French and Portuguese local governments with respect to the nature and determinants of budget forecast errors. It starts by documenting and comparing their statistical properties. The results point at biased and inefficient budget forecasts, which seem to have been more cautious in French departments than in Portuguese municipalities. Second, we examine the political, institutional and economic determinants of forecast biases. Overall, we find that they are essentially driven by electoral motivations and by institutional differences across the two countries. In particular, opportunistic forecasting is more prevalent where governments enjoy greater margin of maneuver, and there is evidence of conservatism in French departments where fiscal autonomy is greater.

**JEL Classification:** D72; H72.

**Keywords:** Fiscal forecasting; Opportunism; Elections; Institutions; Local governments; France; Portugal.

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# 1 Introduction

This paper assesses the reliability of budget forecasts presented by local governments in France and Portugal, comparing the expenditures and revenues predicted (forecasted) in the approved local budgets for the upcoming year with the values that materialized. It addresses two main empirical questions regarding budget forecast errors: (1) Are budget forecasts systematically biased at the local level, and to what extent? (2) How do political and institutional factors influence these biases?

The analysis of budget forecasts is motivated by the key role that they play in economic policy. In fact, revenue forecasts are an important input in the design of fiscal policy (Auerbach, 1999), and revenue overestimation can lead to shortcuts in the provision of public goods. For instance, in the context of French departments which are responsible of welfare assistance, overoptimistic budget forecasts could result in welfare losses. More generally, regarding the sound public finances debate, Jonung et al. (2006) show that budget forecast errors have contributed to the increase of structural deficits in the European Union countries. Repeated overestimation of revenues and/or underestimation of expenditures at the local level could result in considerable debt accumulation, whose burden would decrease the funds available for the provision of public goods, with a negative impact on local welfare.

By selecting two countries with different institutional structures, we are able to analyze the impact of institutions on budget forecast errors at the local level. For instance, French departmental presidents and Portuguese mayors have different degrees of autonomy regarding the management of local finances, the capacity to approve their budgets without having to negotiate with opposition parties, and only Portuguese mayors face a limitation on the number of consecutive terms in office. Moreover, at the country level, and in a recent contribution, Giuriato et al. (2016) find that the forecasting bias is more effectively countered in presidential and semi/presidential systems, in parliamentary systems with strong bicameralism, and when executive/legislature relations are constrained by checks and balances. In this paper, we take this analysis to the local level by arguing that the political system of French departments can be compared to majoritarian parliamentarism, while the Portuguese municipalities' system can be seen as presidentialism. The comparative perspective adopted in this paper allows us to check how the above-described institutional differences impact on budget forecast performance. Additionally, we investigate if the electoral cycle affects budget forecasting differently in these two countries, and discuss how differences in the degree of electoral opportunism may result from different institutional settings.

Another relevant contribution of this paper to the literature is that, unlike previous comparative studies, it is concerned with local governments and their disaggregated fiscal data (total revenue and total expenditure, as well as their components). Existing compar-

ative studies analyze forecasting errors of international organizations (e.g., Dreher et al., 2008, for the International Monetary Fund), errors for EU countries (Pina and Venes, 2011) or OECD countries (Jochimsen and Lehmann, 2017), and/or mainly focus on the consequences of forecast errors for the budget balance. Although Benito et al. (2015) look at disaggregated revenues and expenditures data, they do it within a single country (Spain). Here, we are mainly interested in the political and institutional determinants of local governments' budget forecast errors. This is important because of the relevant role subnational governments play in the provision of public goods, and because high and persistent forecasts errors may endanger that provision, thus negatively impacting welfare. Moreover, the uncertainty or the variability associated with some specific budget components may be different from that of budget aggregates, which calls for a more detailed analysis of forecasts than those available panel country studies. In addition, we distinguish between current and capital components of the budget in order to capture possible opportunistic expenditure/revenue composition manipulations close to elections (Rogoff, 1990).

The empirical questions presented above are at the core of the literature on the political economy of fiscal forecasting. Previously, scholars have focused on the unintentional sources of forecast errors, such as technical and calculation limitations, data availability, among others (Leal et al., 2008). But, many studies on fiscal performance have recently began to tackle systematically the issue of how differences in political and institutional conditions affect the quality of fiscal forecasts (Brück and Stephan, 2006; Boylan, 2008; Bischoff and Gohout, 2010; Buettner and Kauder, 2010; Chatagny, 2015; Buettner and Kauder, 2015; Benito et al., 2015; Giuriato et al., 2016). Most of these studies focus on either the influence of electoral business cycles (Brück and Stephan, 2006; Boylan, 2008; Cimadomo, 2016; Kauder et al., 2017) or partisan politics (Bretschneider et al., 1989; Mocan and Azad, 1995; Paleologou, 2005; Heinemann, 2006; Chatagny, 2015). Other papers look at institutional and organizational factors (Buettner and Kauder, 2010; Giuriato et al., 2016). Most papers analyze the behavior of central governments and very few focus on local authorities, particularly in Europe (exceptions being Goeminne et al., 2008; Sedmihradská and Čabla, 2013; Galinski, 2013; and Benito et al., 2015).<sup>1</sup> Additionally, to the best of our knowledge, no study has tested a possible impact of fiscal decentralization on budget forecast errors.

Consequently, our paper aims at extending the existing literature in two ways. First, by studying the link between fiscal decentralization and forecast cycles. Second, by adopting a comparative perspective which uses data for French departments and Portuguese municipalities. The focus of our analysis is, not only to characterize fiscal forecasting accuracy in these countries, but also to ascertain if and how forecasts at the local level

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<sup>1</sup>At the sub-national level, many studies come out of North America (Feenberg et al., 1989; Mocan and Azad, 1995; and Boylan, 2008, among others).

are influenced by political, economic, and institutional factors.

The paper is structured as follows. Section 2 briefly reviews the related literature and derives the hypotheses to be tested. Section 3 first describes the institutional frameworks in which French departments and Portuguese municipalities operate. Then, it presents the estimation model and the data used. Finally, it describes the empirical results and their implications for the hypotheses derived in section 2. Finally, section 4 concludes the paper.

## 2 Theoretical framework and hypotheses

This section briefly reviews the related literature and derives the main hypotheses to be tested using a panel dataset composed of 95 French departments and 308 Portuguese municipalities.

### 2.1 Opportunistic budget forecast cycles

A classical argument in political economy holds that incumbent policymakers manipulate fiscal policy in order to increase their probability of reelection. This is the political budget cycle (PBC) theory (see Dubois, 2016, for a survey). Analogously, Brück and Stephan (2006) introduced the concept of “Electoral Forecast Cycle”. They argue that the process of developing revenue forecasts and spending budgets serves as a political tool by incumbents who seek to manage the electorate’s expectations of overall job performance, particularly during an election cycle. For instance, it is logical to think that more promises will be made just before elections to increase the incumbent’s popularity among voters (Blais and Nadeau, 1992). Likewise, Heinemann (2006) considers that under the vote or popularity maximization assumption, the government might be tempted to use non-binding financial planning as a marketing instrument for depicting a bright fiscal future in order to gain political support.

Information asymmetries between the government and voters on the fiscal future do clearly exist. The consequence is that the government has a certain leeway to cheat voters. Indeed, the lack of transparency in the budgetary process enables politicians to strategically manipulate fiscal forecasts. Thus, politicians can have incentives to be optimistic or pessimistic (Goeminne et al., 2008; Chatagny and Soguel, 2012). First, optimism over revenue (overestimation) allows governments to provide increased services without an immediate increase in taxes, or to satisfy a balanced-budget requirement. In addition, optimistic revenue forecasts carry a lower political cost in terms of potential loss of votes than tax increases. Second, pessimistic revenue forecasts (underestimation) may provide a cushion for unanticipated expenditures or revenue shortages, and show that prudent management results in year-end operating savings (Benito et al., 2015).

In line with the insights on voting cycles, a particularly optimistic assessment of the budgetary future is to be expected before an election. Generally, this leads to budget deficits.<sup>2</sup> We then hypothesize the following:

**Hypothesis 1: The government tends to underestimate expenditure and overestimate revenue for the election years.**

## 2.2 Fiscal autonomy and budget forecasts

This paper relates also to the literature on the political economy of fiscal decentralization (Joanis, 2014; Bröthaler and Getzner, 2011; González et al., 2013). We put forward the concept of fiscal autonomy in order to link it to budget forecast bias. Fiscal autonomy of sub-national governments is understood as a gradual range of decision power on own resources and expenditure. Own taxes represent the highest degree of sub-national autonomy. Shared taxes, which are distributed between the levels and units of public authorities, represent a middle degree of autonomy (Bröthaler and Getzner, 2011).

From a theoretical viewpoint, more control over a policy instrument implies more accountability. In fact, decentralization alters the government's structure so as to increase citizen voice and change the deep incentives that politicians face. Recently, scholars examined the possibility that, if some costs of electoral fiscal manipulation could be shifted outside the jurisdiction (e.g., to the central government), it may affect voters' attitudes towards the manipulation and, accordingly, the tendency of local policymakers to induce political budget cycles (Baskaran et al., 2016; Asatryan et al., 2015)

Jonung et al. (2006) show that budget forecast errors have contributed to the accumulation of budget deficits. Under high fiscal autonomy, deficits are expected to lead to higher taxes in the future. The latter have electoral costs for politicians (Brender, 2003; Drazen and Eslava, 2010), inducing them to refrain from opportunistic budgeting. When fiscal autonomy is lower, the costs of opportunistic deficits in a given circumscription are not fully internalized by its voters, as costs will be shared with taxpayers of the rest of the country. In such cases, opportunistic budgeting, and the resulting election-year deficits, may actually pay off at the polls. Hence, we postulate the following:

**Hypothesis 2: Greater fiscal autonomy should induce more conservatism in budget forecasting.**

## 2.3 Partisan budget forecast cycles

The partisan theory posits that government policies are sensitive to ideological motives (Hibbs, 1977). Traditionally, left-wing governments are expected to run more expansion-

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<sup>2</sup>However, recurrent deficits suggest nonfeasance and incompetence on the part of those charged with financial management. Thus, governments may want to register compensating surpluses in non-election years. According to Larkey and Smith (1989), greater optimism is expected in election years because revenue increases and expenditure cuts cost votes.

ary policies than right-wing incumbents. Thus, they may also be more willing to run deficits. Following this literature, Heinemann (2006) suggests that the government might use financial projections as a strategic tool to influence budgetary processes according to its ideological view on the future of the government. A left-wing government with a preference for the expansion of the public sector may consciously depict a particularly optimistic picture about the future of public finances. By doing so, it might hope to convince the public that a present expansion can be financed. A right-wing government, with opposite preferences, would depict a particularly gloomy picture of the fiscal future, as a way to lobby for budgetary cuts. Based on the preceding arguments, we formulate our third hypothesis as follows:

**Hypothesis 3: Left-wing governments tend to produce positive markups on budgeted revenues when compared to right-wing governments. The opposite holds for expenditures.**

## 2.4 Reelection probability and strategic budgeting

Aidt et al. (2011) investigate theoretically and empirically the interaction between the incentive to generate political budget cycles and electoral competition. Extending the Rogoff (1990) model, these authors show that when a close election race is expected, the incumbent's incentive to manipulate fiscal policy for electoral gain intensifies, thereby increasing the magnitude of the opportunistic distortion.

In the context of budget forecasting, opportunistic behavior leads to biased budgets. According to Bischoff and Gohout (2010), biased tax projections can help the incumbent party in its struggle for reelection. Higher expenditures and/or lower taxes have a positive effect on the incumbent's popularity as they may result in short-term increases in employment and output, and can be targeted to important groups of voters or interest groups, as a way to gain votes and support. Thus, incumbents may want to overstate budgets for election years (Hypothesis 1).

But how do incumbent policymakers behave when they expect to be defeated? In that case, they may have an incentive to use debt strategically. By raising debt prior to elections to an inefficiently high level, the incumbent can afford more spending programs or tax cuts and, at the same time, limit the scope of action of the following government (Tabellini and Alesina, 1990). Thus, incumbents who face a low probability of reelection have an incentive to overestimate fiscal revenues. The "stubborn conservative government hypothesis" (Persson and Svensson, 1989) would have similar implications for right-wing incumbents, but not for left-wing ones. While right-wing parties want to prevent their left-wing successors from increasing public expenditures in areas which the conservatives consider unnecessary or even harmful (see also Pettersson-Lidblom, 2001), left-wing incumbents, who have a preference for larger governments, may prefer to leave

more resources for their right-wing successors. On the other hand, Hibbs (1977) argues that left-wing governments are more willing to run (open or hidden) deficits because their constituents benefit more from possible reductions in the unemployment rate than they are harmed by the negative impact of higher deficits on inflation. Thus, biased tax projections may be used by both left- and right-wing governments.

According to Bischoff and Gohout (2010), as reelection is never certain, the incentive to bring forward extra expenditures or cut taxes exists in all years of government. The negative impact of overstated tax projections for non-election years creates incentives to overstate tax projections less for non-election years than for election years. Nevertheless, they may remain positive, especially if the incumbent is currently unpopular.

Taking into account the arguments above, and considering that Aidt et al. (2011) show that Portuguese mayors increase the opportunistic distortion in local finances when the expected win margin is smaller, we hypothesize that opportunistic budget bias will be higher when the probability of reelection is lower.

**Hypothesis 4: Lower probability of reelection leads to higher opportunistic budget forecast bias.**

## 3 Empirical setting

This section briefly describes the institutional framework in which French departments and Portuguese municipalities operate, presents the empirical model, and describes the data used in the paper.

### 3.1 Institutional framework

Institutions determine the rules in a society and shape the incentives of policymakers and voters. Therefore, institutional differences between the two countries considered in this paper may help explain differences in results regarding the determinants of budget forecast biases. Mainly for readers not familiar with local governments in France and/or Portugal, we provide in this section a brief description of the institutional frameworks in which French departments and Portuguese municipalities operate.

#### 3.1.1 French departments

The French institutional setting is a four-tier system comprising the central government, 18 regions, 101 departments, and about 36,000 municipalities. In this study we focus on metropolitan France which is divided into 96 departments. A department is composed of several counties (*cantons*) and of several constituencies (*circonscriptions*). In constituencies, voters elect their representatives at the National Assembly and, in counties, voters



elect their representatives at the General Council.<sup>3</sup>

The councilors are nominated through democratic elections for six years. Before 2013, these elections took place once every three years (generally in March) in which half of the departmental council was elected in each department. In the context of a multi-party-system, a two-round majority vote is used. To be elected in the first round, a candidate must get at least half of the votes plus one, and a number of votes equal to at least 25% of the registered voters. To be a candidate in the second round, it is necessary to have obtained in the first round a number of votes equal to at least 10% of the registered voters. However, if only one candidate clears this threshold, the one ranked second can remain a candidate. The candidate who gets the biggest number of votes in the second round is elected. After every election, the departmental council elects a president. Since 2013, the electoral rule has changed, to a bi-nominal majority vote with two rounds. Every county is represented by a “twin-ticket” (“binôme” in French) of a man and a woman, and the whole departmental council is to be elected every six years. To be elected in the first round, the binôme must obtain at least half of the votes plus one, and a number of votes equal to at least 25 per cent of the registered voters. If a second round is necessary, all the binômes with at least 12.5% of registered voters can compete. The reelection rule is as in the previous paragraph.

The decentralization Act of 1982 (and afterwards the Act of 2003) provided the departmental council with new competencies and a relative autonomy. The President of the departmental Council prepares and implements the department’s budget. The departmental resources rely in part on central government transfers (about 40%) and on own resources such as local taxes. In terms of competencies, French departments are responsible for the management of a number of social and welfare allowances, of junior high school (*collège*) buildings and technical staff, of local roads, school and rural buses, and for a contribution to municipal infrastructures.

For the elaboration of budget forecasts, the ministry of finance provides departmental councils the macroeconomic forecasts. On this basis and given their needs, departments set their own tax rates on a common tax base for a large range of local direct taxes. Budgets are prepared by the president of council with the help of a technical staff. Before being enacted, the budget has to be voted by the council.

### 3.1.2 Portuguese municipalities

The Portuguese institutional setting comprises the central government, regional governments in the autonomous regions of Azores and Madeira, and 308 municipalities (278 in the mainland, 19 in Azores and 11 in Madeira). All municipalities, regardless of location,

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<sup>3</sup>Given the particularity of Paris as municipality and department, we exclude it from our analysis. Since the reform of 2013, General Councils are renamed into departmental councils. Indeed, French departments are governed by the departmental council.

share the same institutional structure and are governed by the same laws and financial regime. Municipalities are responsible for the promotion of local economic development and territorial organization, as well as for the provision of several public goods related to water and sewage, energy, transportation, housing, healthcare, education, culture, sports, environmental protection and public order.

Regarding the municipal institutional structure, the representative branches of municipalities' government are the Town Council (*Câmara Municipal*), which holds the executive power, and the Municipal Assembly, the deliberative branch. The latter approves the general framework for local policies and the municipal budgets and accounts, while the Town Council is responsible for their elaboration and implementation. In the last quarter of each year, the Town Council submits a plan of activities and a budget for approval by the Municipal Assembly. Although the latter has the power to reject those documents, it is not allowed to introduce amendments to them. The members of both chambers are elected by the registered voters of each municipality for a four-year term.<sup>4</sup> While all members of the Town Council are elected directly by voters, half plus one of the members of the Municipal Assembly are elected directly, and the others are the presidents of the parishes that belong to the municipality. The leader of the most voted list for the Town Council becomes the mayor.

Besides presiding the Town Council and choosing which executive competencies are delegated to other elected members, the mayor has ample autonomy regarding human resource management, authorization of contracts, and allocation of financial resources. Additionally, the mayor's party generally holds a majority of deputies in both the Town Council and Municipal Assembly, making the budgets proposed by the mayor's team easy to approve. Although mayors have ample autonomy regarding the allocation of resources, most municipalities have limited ability to raise own revenues and are, therefore, dependent on transfers from the central government. Portuguese municipalities can obtain loans, but medium to long term debt (over one year) can only be used to fund investment expenditures. The current limit on municipal gross debt corresponds to 1.5 times the average current revenues of the last three years.

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<sup>4</sup>The elections for both chambers, and those for the parish assemblies, are concurrent and take place in all municipalities at the same time. Voters cast their votes in party or independent closed lists, and votes are transformed into mandates using the Hondt method, which is a highest averages method for allocating seats. After all the votes have been tallied, the following quotient ( $V/(S + 1)$ ) is calculated for each party, where V is the total number of votes that the list received and S is the number of seats that the party has been allocated so far (initially 0 for all parties). The party having the largest quotient gets the first seat allocated, and its quotient is recalculated given its new seat total. The process is repeated until all seats have been allocated. Parishes (*freguesias*) are subdivisions of municipalities and constitute the lowest administrative unit in Portugal.

## 3.2 Estimation model

In this subsection, we start by describing our forecasting error indicator, the error tests to evaluate forecast accuracy, and the estimation model used in efficiency tests. Then, we describe the empirical model used to analyze the main economic, political and institutional determinants of budget forecast errors for a panel of French departments and Portuguese municipalities.

### 3.2.1 Forecast Accuracy and Efficiency

The first step of our empirical analysis is to check the rationality of budgetary plans. Hence, it is important to define the concept of forecast error. Generally, it is defined as the difference between forecasted and realized values. Forecasted values for year  $t$  are taken from the local budget for year  $t$ , approved at the end of year  $t - 1$ . The realized values are those from the approved final accounts of year  $t$ . Let  $A$  denote the actual revenue/expenditure and  $F$  the forecast value of the same variable. This paper uses the following budget inaccuracy or forecasting error indicator:

$$PFE_{x,t} = \frac{(A_{x,t} - F_{x,t}) * 100}{A_{x,t}} \quad (1)$$

where  $x$  is the analyzed budget segment (revenues, expenditures or a part of them), and  $PFE$  is the Percent Forecast Error. This indicator gives information about the direction and the extent of the bias. On the revenue side, a positive  $PFE$  corresponds to an under-estimate or conservative forecast and a negative  $PFE$  to an optimistic forecast. The opposite stands on the expenditure side.

We evaluate the forecasts by means of the following error tests (MPFE, MAPE):

1. *The Mean Percentage Forecast Error (MPFE)* measures the average of percentage errors by which forecasts differ from outcomes. It shows whether systematic over- or under-prediction is present. Since positive and negative forecast errors can offset each other, it tends to minimize the overall size of the error.

$$MPFE_{x,t} = \frac{1}{T} \sum_{t=1}^T PFE_{x,t}$$

2. *The Mean Absolute Percentage Forecast Error (MAPFE)* measures the average percentage absolute difference between the forecast and the outturn. Since positive and negative errors no longer cancel each other out, it is a more accurate measure of the average forecast error than the MPFE.

$$MAPFE_{x,t} = \frac{1}{T} \sum_{t=1}^T | PFE_{x,t} |$$

Regarding unbiasedness, these indicators should be equal to zero, otherwise forecasts are biased.

In addition, we test for efficiency by regressing forecast errors on their twice lagged values and current forecast values. We thus estimate the following model:

$$PFE_{i,t} = \lambda_0 + \lambda_1 PFE_{i,t-2} + \lambda_2 F_{i,t} + u_{i,t} \quad (2)$$

where  $F$  denotes the forecast and  $u_{i,t}$  being an i.i.d. residual.

Efficiency requires that budget-makers fully exploit the information available at the time of the forecast. Conventionally, forecast efficiency implies that the deviation between the outcome and the projection is not related to information available at the time the projection was made (see, e.g., Keane and Runkle, 1990). Therefore, a condition for weak efficiency is that:  $\lambda_1 = \lambda_2 = 0$ .<sup>5</sup>

### 3.2.2 Determinants of budget forecast errors

In order to test the hypotheses mentioned in section 2, we estimate a model for French departments and Portuguese municipalities. As mentioned above, forecast errors are related to the political and institutional characteristics of the department or municipality. As main explanatory variables, we consider the electoral cycle (*Cycle*), fiscal autonomy (*Autonomy*), the ideology of the incumbent government (*LeftWing*), and the margin of victory of the incumbent party relative to the largest opposition party (*Wm*). Several other political and economic variables are included as controls. The empirical model can be summarized as follows:

$$PFE_{i,t} = c + \rho_1 PFE_{i,t-1} + a_1 Cycle_{i,t} + a_2 Autonomy_{i,t} + a_3 LeftWing_{i,t} + a_4 Wm + X'_{i,t} \theta + \gamma_i + \nu_t + \varepsilon_{i,t} \quad (3)$$

where  $PFE$  is the percentage forecast error,<sup>6</sup> the main explanatory variables are as described above (more details are given below),  $\mathbf{X}$  is a vector of economic and financial control variables,  $\gamma_i$  are fixed-effects covering the unobservable heterogeneity between departments (France) or municipalities (Portugal),  $\nu_t$  captures year fixed-effects which are included to control for common shocks.  $c$  is a constant and  $\varepsilon_{i,t}$  is the residual. Note

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<sup>5</sup>The absence of both bias and auto-correlation is sometimes called “weak form informational efficiency”. It is worth noting that, since forecasts for year  $t$  are produced in the fall of year  $t - 1$ , the once lagged forecast error ( $PFE_{i,t-1}$ ) is not yet known when the forecasts are being made. For that reason, it is not included in Equation (2).

<sup>6</sup>In order to account for the persistence in forecast errors, we include the lagged PFE as an explanatory variable. When the second lag of PFE is included as an additional explanatory variable, it is seldom statistically significant. Nevertheless, it is also worth noting that our system-GMM models use the second lag of PFE as an instrument for the first lag (which is endogenous).

that equation (3) represents a test of the rationality hypothesis. The joint null hypothesis is that all the coefficients of the right-hand side variables are equal to zero.

A large number of previous studies test for the presence of electoral bias using a dummy variable for the election year (e.g., Larkey and Smith, 1989; Boylan, 2008; Pina and Venes, 2011). Here, we also include a dummy for the pre-election year, as opportunistic policies may be implemented sooner, especially in France, where departmental elections take place in the first quarter of the election year. Since Portuguese municipal elections take place in the last quarter of the year, opportunistic policies may be implemented mostly during the election year. Thus, the following two dummy variables are included in the model:  $Elec_{i,t}$ , which is a dummy variable that takes the value 1 for each election year, and zero otherwise; and  $YBElec_{i,t}$ , which is a dummy variable that takes the value 1 in the year before the election, and zero otherwise. According to Hypothesis 1, negative and statistically significant coefficients for revenue items would be consistent with an opportunistic overestimation of revenues prior to elections. The inverse applies to expenditures.

To test our second main hypothesis, we introduce the variable *Autonomy* to capture the impact of fiscal autonomy on budget forecast errors. We expect this variable to have a positive sign on the revenue side and a negative sign on the expenditure side, indicating greater conservatism when fiscal autonomy is higher.

We include the *LeftWing* dummy variable in order to control for partisan effects. Left-wing council presidents or mayors are supposed to be more optimistic, or less pessimistic, than right-wing and independent incumbents. Thus, a negative sign is expected for the coefficient of the variable *LeftWing* for PFEs in revenues, and a positive one for PFEs in expenditures.

In order to test the reelection probability hypothesis, election polls should be taken as independent variables. But, the lack of polls at the local level induces the usage of a proxy. Given the persistence in the votes each party receives, prior margins of victory may reasonably indicate how close the next elections will be. Therefore, we use the win-margin ( $Wm$ ) in the previous local elections, that is, the difference in the vote shares of the incumbent president's or mayor's party and the largest opposition party. If the incumbent president of the council (mayor) anticipates reelection, she will not have incentives to overestimate revenues. Conversely, if she anticipates a defeat or a close race, she will have an incentive to overestimate revenues. Thus, we expect the variable win-margin ( $Wm$ ) to have a negative sign.

In order to check if the effects of the above-referred variables differ in the two countries, we interact them with the dummy variable  $PT$  which takes the value of 1 for Portuguese municipalities and 0 for French departments.<sup>7</sup> While the estimated coefficients of the

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<sup>7</sup>The dummy variable  $PT$  cannot be included by itself in the model because it would be collinear with the department/municipal fixed effects ( $\gamma_i$ ).

variables of interest indicate their impact in the case of French departments, the effects for Portuguese municipalities are obtained by adding the estimated coefficient of the variable of interest with that of the respective interaction with *PT*.

As a first control variable, we include a measure of political strength of the local government (*Majority*). This dummy variable takes the value of 1 when the party of the President/Mayor has majority in the department/municipal chamber(s), and equals zero otherwise. As fragmentation may lead to over-optimism, its absence is expected to lead to more conservative (pessimistic) budget forecasts. We add other political variables as controls, such as *Government party (GovParty)*, *Terms in office (Terms)*, and *Run for reelection (RR)*. The variable *GovParty* is a dummy variable which takes the value of 1 if the national government is led by the party of the mayor or of the president of the council. *Terms in office* is the number of consecutive mandates the incumbent has been in office. *RR* is a dummy variable which takes the value of 1 if the president of the council or the mayor runs for a new mandate, and 0 otherwise. Coded like this, it indicates the opposite of the lame-duck effect (Larkey and Smith, 1989). Because an incumbent running for a new term has to worry about winning elections, her budget formulations may be influenced by electoral considerations.

Some additional economic and demographic variables are also added as controls, namely the *unemployment rate (Unemp)*, *regional GDP per capita growth (Rgdpg)*, *Budget stress*, and *population growth (Popgr)*. Boylan (2008) brought forward that the unemployment rate plays a crucial role for the accuracy of fiscal forecasts, with states in the U.S. overestimating tax revenue changes in times of high unemployment. Thus, a negative sign is expected for the unemployment rate on the revenue side and a positive sign on the expense side. We use the previous year values of these variables since that is the information local governments have at the time the budget is made. Since GDP data are not available at the department or municipality levels, we use the *regional GDP per capita growth*.<sup>8</sup> We consider its growth as a proxy of economic expansion or recession. Thus, the coefficient of *Rgdpg* should have the opposite sign to that of *Unemp*. In order to account for economic crises which affected the countries, with greater incidence in Portugal, we include the dummy variable *Crisis*, which takes the value of one in recession years and equals zero in the remaining years. We use the *Budget stress* ( $Bss = \frac{Revenues - Expenditures}{Revenues} * 100$ ) as a proxy of the fiscal pressure the local government faces. This variable assesses the fiscal situation of the local government at the time that the budget was being formulated and approved. As the fiscal condition of a government worsens (i.e., *Bss* values become more negative), presidents of councils or mayors will have less leeway to underestimate budget deficits. Population growth is another control variable we consider. It is measured as the

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<sup>8</sup>For Portugal, we use regional GDP per capita at the NUTS III level. NUTS is the European Union nomenclature for territorial statistical units. Portugal is subdivided into three NUTS I regions (Mainland, Azores and Madeira), seven NUTS II regions, and 25 NUTS III regions. Each NUTS III region aggregates several municipalities, which correspond to the NUTS IV level.

year-on-year growth rate in the population. As labor force and taxpayers, the evolution of the number of inhabitants may affect local taxes and overall total revenue and, in turn, budget forecast errors.

The full linear dynamic panel data model can be written as:

$$\begin{aligned}
PFE_{i,t} = & c + \rho_1 PFE_{i,t-1} + \alpha_1 YBElec_{i,t} + \alpha_2 YBElec_{i,t} * PT + \alpha_3 Elec_{i,t} \\
& + \alpha_4 Elec_{i,t} * PT + \alpha_5 Autonomy_{i,t} + \alpha_6 Autonomy_{i,t} * PT \\
& + \alpha_7 LeftWing_{i,t} + \alpha_8 LeftWing_{i,t} * PT + \alpha_9 Wm_{i,t} + \alpha_{10} Wm_{i,t} * PT \\
& + \alpha_{11} Majority_{i,t} + \alpha_{12} RR_{i,t} + \alpha_{13} Terms_{i,t} + \alpha_{14} GovParty_{i,t} \\
& + \alpha_{15} Unemp_{i,t-1} + \alpha_{16} Rgdpg_{i,t-1} + \alpha_{17} Crisis_{i,t-1} + \alpha_{18} Bss_{i,t-1} \\
& + \alpha_{19} Popgr_{i,t} + \gamma_i + \nu_t + \varepsilon_{i,t}
\end{aligned} \tag{4}$$

We now turn to the estimation method. Given the fact that the set of cross-sectional units (French departments or Portuguese municipalities) is not randomly selected, a fixed effects model would be preferable to random effects. But, equation (4) contains a lagged dependent variable and the time dimension is short relative to the number of departments or municipalities. In this case, Nickell (1981) pointed that the lagged dependent variable's coefficient is biased due to the correlation between the fixed effects and the lagged dependent variable.

Several alternative estimators were proposed to cope with this problem, such as N-consistent Generalized Method of Moments (GMM) estimators, with the two most popular being the difference-GMM by Arellano and Bond (1991) and the system-GMM by Blundell and Bond (1998). We follow the recommendations by Roodman (2009) and use the system-GMM estimator, which is more appropriate for large-N, small-T datasets such as ours, in which the dependent variable is persistent.

### 3.3 Data

For comparative purposes, this study employs two databases. The first covers 95 French departments over the period 2004-2015. The second encompasses all 308 Portuguese municipalities through the period 1998-2015. We restrict our analysis to these periods because of data availability. Financial and economic variables were gathered from the Directorate General of Local Governments (France) and its equivalent in Portugal (DGAL). Political variables come from the Ministries of Internal Affairs of both countries. These data-sets are suitable for the purpose of this paper. First, all French departments operate under the same institutional framework, and the same applies to Portuguese municipalities. Second, the local governments decide autonomously on the projected fiscal resources and expenses they use in the budgetary process.

Regarding our dependent variable, we concentrate on actual and budgeted (one year ahead) amounts for seven variables: total revenue, total expenditure, current revenue, capital revenue, direct taxes, current expenditure, and capital expenditure. In the time period under review, four departmental elections (2004, 2008, 2011 and 2015) were held in France and four municipal elections (2001, 2005, 2009 and 2013) in Portugal.

Concerning ideology, we include the dummy variable *Left wing*, which takes the value of 1 if the president of a French departmental council belongs to a left-wing party (Parti Socialiste, PS; Divers Gauche, DVG; Parti Radical de Gauche, PRG or Parti Communiste Français, PCF) or if the mayor of a Portuguese municipality belongs to a left-wing party (Partido Socialista, PS; Partido Comunista Português, PCP; or Bloco de Esquerda, BE), and equals 0 otherwise. In the French database, the percentage of left-wing presidents of councils is 53%, whilst the rightist represent 42%. The remaining 5% are from the centre. Thus, on average, more left-wing presidents are present in the French data. In the Portuguese case, there is the same pattern: also 53% of mayors are leftists, while 45% are from the right-wing, and 2% are independent. In France, 43% of the council presidents belong to the government party, and 76% run for reelection. The figures for Portuguese mayors are quite similar, 42% and 75%, respectively.

Regarding the economic environment, the unemployment rate varies between 4.2% and 16%, for a mean of 8.9% in French departments. In Portuguese municipalities, it ranges from 0.64% to 18.29%, for a mean of 6.7% over the period under study.

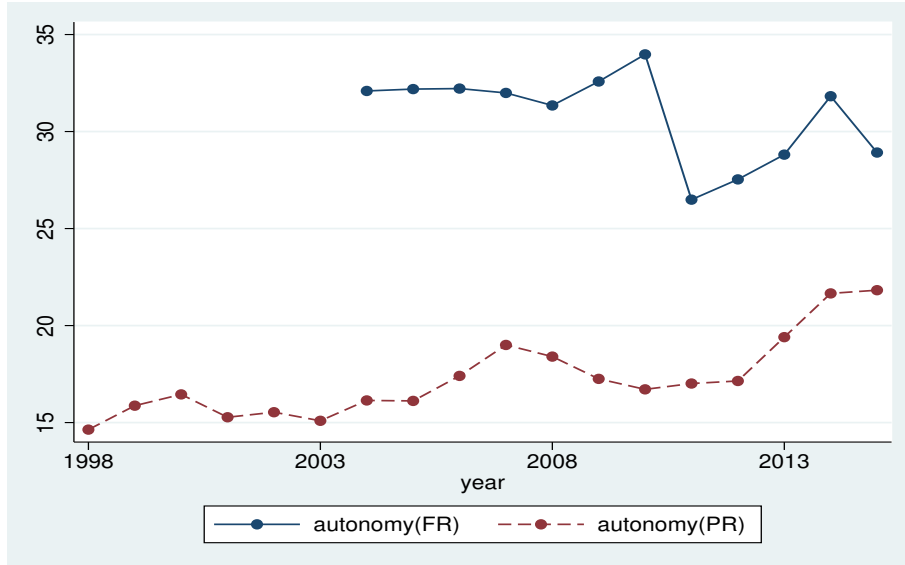
As for a measure of fiscal autonomy, we consider the ratio of Direct Taxes to Total revenue of the local entity.<sup>9</sup> The average value of this variable is about 30.72% for French departments and 17.44% for Portuguese municipalities. From Figure 1, it appears that, on average, French departments rely considerably more on local taxes than Portuguese municipalities. Hypothesis 2 implies that, being more fiscally autonomous, French departments should be more conservative in their budget forecasts than Portuguese municipalities.

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<sup>9</sup>Direct taxes represent the bulk of local governments' tax revenues (roughly 56% in French departments and 95% in Portuguese municipalities).



Figure 1: Fiscal Autonomy (Direct Taxes as % of Total Revenues)



Descriptive statistics of the variables for which annual data was collected are presented in Tables A.1 and A.2 of the Online Appendix, for French departments and Portuguese municipalities, respectively.

### 3.4 Empirical Results

This section presents the results of bias and efficiency tests, and of those regarding the main economic, political and institutional determinants of budget forecast errors. The results of robustness tests are also briefly discussed in the end of the section.

#### 3.4.1 Bias test

To check for the presence of biases in budget forecasts, we summarize their statistical properties in Table 1, which presents the mean values of the forecasting performance indicator (the Percent Forecast Error, PFE, and its absolute value) and its standard deviations in French departments and in Portuguese municipalities during the time span considered in each country.<sup>10</sup>

[Insert Table 1 about here]

Table 1 shows that the executives of French departments have overestimated total and capital revenues on average by 3.3% and 41.4%, respectively, underestimated direct taxes, and over-forecasted all expenditure items we analyzed. Regarding Portuguese municipalities, the Mean Percentage Forecast Error over the period 1998-2015 is negative for all

<sup>10</sup>We have a longer time span for Portuguese municipalities due to greater availability of budget forecasts. However, restricting the analysis to the same period as in French departments does not change the standing of the results.

the budget items considered. For instance, the average PFE for total revenue (excluding loans) is  $-56.7\%$  and for total expenditure it is  $-57.1\%$ . Overall, there is evidence of optimistic revenue and pessimistic expenditure forecasts in Portuguese municipalities. Altogether, the calculations show that, on average, the forecasts of total revenue and of the other budget components exceed actual outcomes.

We also compute the Absolute Percent Forecast Error (APFE). This indicator reveals the real average size of the forecast errors. For instance, total revenue and total expenditure were over-forecasted by about  $5.4\%$  in French departments. For Portuguese municipalities, these values are, respectively, of  $57.1\%$  and  $55.2\%$ . The standard deviations (SD) of the PFE and the APFE are larger for capital revenue than for the other budget items, which indicates that this variable may be more difficult to forecast.

On the basis of these summary statistics, we can conclude that budget forecasts are biased in both French departments and in Portuguese municipalities. It is interesting to notice that forecast errors are considerably lower in French departments than in Portuguese municipalities. This may happen because most Portuguese mayors ( $81\%$ ) are supported by majorities in the Town Council and the Municipal Assembly, which makes budgets relatively easy to approve, even if they are somewhat unrealistic. On the contrary, French departmental presidents usually depend on coalition partners and may have a harder time negotiating budgets which involve forecast manipulation. It is also possible that larger forecast errors in Portuguese municipalities are explained by the fact that they are, on average, considerably smaller than French departments (in terms of population and size of the local economy), and have smaller staffs working on budget forecasts. But, if larger forecast biases are due to lack of staff or expertise, they should not be affected by the political cycle. As shown in the next section, this does not appear to be the case.

### 3.4.2 Efficiency test

We now turn to the analysis of efficiency. Tables 2 and 3 present estimates of equation 2 for both revenue items and expenditure ones. The results indicate that the twice lagged revenue PFE contributes positively to the explanation of the current revenue PFE, especially in Portuguese municipalities. As for French departments,  $PFE_{t-2}$  is only statistically significant for capital revenue and revenue from direct taxes, with a negative sign, indicating that larger past errors contribute to smaller current ones. Regarding expenditures, past forecast errors positively contribute to current errors in total and capital expenditures, both in French departments and Portuguese municipalities. Overall, forecast errors are persistent and past errors not corrected, especially in Portuguese municipalities.

The results show also that the PFE depends on the magnitude of the forecast itself.  $\lambda_2$  is always statistically significant, both for French departments and Portuguese municipalities. Nevertheless, higher forecasts seem to imply lower mistakes, as  $\lambda_2$  has a negative sign. An explanation of this result could be that higher forecasts are a matter of big

jurisdictions which may dispose of relatively better budget staffs than small ones.

To conclude this section, we note that budget forecasts in French departments and Portuguese municipalities are generally biased and inefficient. Thus they are inaccurate. In a broader international comparison, such inaccuracy patterns are not uncommon, as evidenced by previous studies (Goeminne et al., 2008 ; Chatagny, 2015). The disturbing fact is the magnitude of the errors attained: while Goeminne et al. (2008) reported Total revenue forecast error reaching -0.4%, the relevant French departments and Portuguese municipalities forecasts produced respectively -3.26% and -56.73% of errors. It is then interesting to check for the forces which drive these inaccuracies. Are these forces similar in both countries (for instance, political, economic and demographic factors), or different according to the institutional arrangements?

**[Insert Tables 2 and 3 about here]**

### **3.4.3 Determinants of budget forecast errors**

In this sub-section, we turn to the analysis of the estimation results regarding the determinants of percentage forecast errors (PFE). The results of system-GMM estimations for total revenues and expenditures are presented in columns (1) and (2) of Table 4, respectively. All explanatory variables, except election and year dummies, were treated as potentially endogenous. Their twice lagged levels were used as instruments in the first-difference equations and their once lagged first-differences were used in the levels equation. We report two-step results using robust standard errors corrected for finite samples, as suggested by Windmeijer (2005). The p-values of autocorrelation and Hansen tests are reported at the end of the Table.<sup>11</sup> The dependent variable is the percent forecast error (PFE) as defined by equation (1). The lagged PFE is always positive and statistically significant, indicating that forecast errors are persistent.

**[Insert Table 4 about here]**

One interesting feature of Table 4 is the similarity of the estimated coefficients in the regressions for revenue and expenditure PFEs. Not only the statistically significant variables are essentially the same, but also the signs are equal and the magnitudes of the coefficients are not too different. This may be due to the fact that local governments have to present balanced budgets, thus adjusting their forecasts for expenditures to the forecasted revenues. In fact, the correlation between the PFEs for total revenues and

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<sup>11</sup>The validity of the results depends on the absence of second order autocorrelation and on the appropriateness of the instrument matrix (evaluated by the Hansen test). This is clearly the case as the p-values of the AR(2) and Hansen tests are above 0.1. Since taking first-differences causes first order autocorrelation, the AR(1) test should reject its absence, which is also the case. Additionally, our model does not seem to suffer from problems of multicollinearity, as Variance Inflation Factors are clearly within accepted values (see Table B.3 in the Online Appendix) and the correlations among the explanatory variables are relatively low (see Table B.4).

expenditures is 96.9%, which is indicative of this adjustment. Therefore, our comments will focus more on the results for revenue PFEs.

The results point at the presence of an electoral bias, both in French departments and in Portuguese municipalities. There is evidence that presidents of departmental councils tend to underestimate both revenues and expenditures in the year before the elections. The coefficients for the election year are not statistically significant, eventually because the departmental elections take place in the first quarter, which implies that only policies implemented in the year before the election produce visible results before voters go to the polls. As for Portuguese municipalities, the results indicate overestimation of revenues and expenditures, both for the election year and the year before.<sup>12</sup>

Overall, these results indicate that revenue forecasts are managed opportunistically (overestimated) in Portugal, while the opposite happens in France. This is consistent with the fact that Portuguese mayors have larger room of maneuver than departmental presidents, not only because they are generally supported by majorities in the Town Council and in the Municipal Assembly, but also because Portuguese mayors play a more prominent role in the conduct of their local governments than French departmental presidents. Therefore, for Portuguese municipalities, the empirical evidence gives support to Hypothesis 1, according to which politicians opportunistically manipulate budget forecasts in the pre-election period. These findings also confirm those of previous studies (Brück and Stephan, 2006; Benito et al., 2015). The opposite seems to happen for expenditures, with evidence of underestimation in France, but not in Portugal. In Portuguese municipalities, actual revenues in the election year and the year before are considerably lower than the forecasts, which would lead to huge deficits if the mayors spent all that was predicted in the budget. Thus, mayors generally spend less than the forecasted expenditures, but more than actual revenues, ending up with a deficit in the election year, as shown by Aidt et al. (2011). That is, Portuguese mayors manage expenditures opportunistically, even though they tend to overestimate them in the initial budget.

The results indicate that fiscal autonomy is relevant for electoral forecasts, pushing Presidents of departmental councils to be conservative when forecasting revenues. But, for Portuguese mayors, fiscal autonomy does not seem to affect budget forecasts, as a Wald test does not reject the hypothesis that the effect is zero. Overall, Hypothesis 2, which postulates a positive link between fiscal autonomy and conservatism in revenue forecasts, is verified in France, but not for Portugal. These results are consistent with Feld and Baskaran (2010) who argue that more revenue autonomy may imply more responsibility. We also check the existence of partisan effects. Given that the coefficient for left wing governments and its interaction with the dummy for Portugal are not statistically significant,

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<sup>12</sup>The coefficients of the interactions with *PT* are negative and larger in absolute value than those for the election dummies. Additionally, Wald tests reject the hypothesis that the effects for Portuguese municipalities are equal to zero.

our estimations for total revenue and expenditure PFEs do not provide empirical support for Hypothesis 3. Larger win margins in the previous elections seem to be associated with the overestimation of revenues and expenditures by French departments. While the result for expenditures is consistent with Hypothesis 4, the opposite sign was expected for revenues. As for Portuguese municipalities, Wald tests do not reject the hypothesis that the effect is zero, for both revenues and expenditures. That is, there is very little support for Hypothesis 4.

Regarding the other explanatory variables, *Majority*, *Run for reelection*, *Terms in Office*, and *Government party*, are generally insignificant, providing no evidence of fragmentation, *lame duck*, experience, or party similarity effects. Unemployment rates, regional GDP per capita growth, and crisis years seem to be associated with the overestimation of revenues. The result for GDPpc growth is a bit strange, as stronger growth is generally associated with greater actual revenues, leading to smaller overestimation. Another constraint that could influence politicians' behavior in revenue forecasting is the fiscal pressure. In our study, the variable capturing this effect is *Budget stress*. It has a positive and statistically significant coefficient, indicating that greater budget stress leads to more conservative revenue forecasts.

In the estimations whose results are shown in Table 5, we account for the possibility that Hypotheses 1 and 2 are interrelated, and effects vary with the values of the election dummies and fiscal autonomy. We do this by including interaction terms between the election dummies and fiscal autonomy, for French departments (*FR* is a dummy for France) and Portuguese municipalities. Fiscal autonomy only seems to matter for French departments. In non-election years, greater fiscal autonomy is associated with more conservative revenue forecasts, but in the election year and in the year before the opposite is true. For Portuguese municipalities, the interaction terms are not statistically significant, and a Wald test does not reject the hypothesis that the effect of fiscal autonomy is zero. These results are consistent with those of Table 4, where we only found evidence of effects of fiscal autonomy for French departments.

**[Insert Table 5 about here]**

In order to check what lies behind these results for total revenues and expenditures, we also undertake estimations for their main components. We use the economic classification of revenues and expenditures. Although there is data on the functional classification of expenditures for French departments, for Portuguese municipalities there is data only on the economic classification. The results for current and capital revenue PFEs are shown, respectively, in columns (1) and (2) of Table 6. In column (3), we show the results for revenues from direct taxes, an important component of current revenue, and the major source of local taxes. Finally, the results for current and capital expenditures are reported, respectively, in columns (4) and (5).

[Insert Table 6 about here]

Electoral manipulations of current revenue forecasts seem to drive those for total revenue, as the results of column (1) of Table 6 are very similar to those of column (1) of Table 4. That is, French departments make conservative forecasts prior to elections, while Portuguese municipalities overestimate current revenues. Essentially the same happens with forecasts of direct taxes (column 3), which are an important component of current revenues. Electoral manipulation of capital revenue forecasts does not seem to happen in French departments, as the election dummies are not statistically significant. In the case of Portuguese municipalities, there is evidence of opportunistic overestimation of capital revenues in the year before the elections. Concerning current and capital expenditure forecasts, both are electorally manipulated, and their results are essentially in line with those found for total expenditure forecasts (column 2 of Table 4).

Concerning the other Hypotheses, fiscal autonomy is associated with conservative forecasts for current revenue and current and capital expenditure in French departments (as postulated in Hypothesis 1), while the effect is essentially zero in Portuguese municipalities for those three components. Regarding capital revenue, greater fiscal autonomy in Portuguese municipalities is associated with more optimistic forecasts. Political ideology and the win margin do not seem to robustly affect forecast errors of revenue and expenditure components, thus providing no support for Hypotheses 3 and 4.

#### 3.4.4 Robustness tests

The robustness of our results was checked in several ways. First, two alternative sample periods were used: a common time period (2004-2015) for both countries (see columns (1) and (2) of Table C.5 in the Online Appendix); and exclusion of 2015 (see columns (3) and (4)). The latter restriction leads to the exclusion of the 2015 departmental elections in France, for which electoral rules were different from those of previous elections. For both alternative sample periods, the results are very similar to those of Table 4.

Second, we estimated separate models for French departments and for Portuguese municipalities (see Table C.6). Again, the main results are similar to those of Table 4, with pre-electoral underestimation of revenues in France and overestimation in Portugal. One drawback of this separate estimation is that we need to exclude year dummies, since these would be collinear with the election dummies (all French departments have elections in the same year and all Portuguese municipalities have elections in the same day). Now, the election dummies, not also capture electoral effects, but also the effects of events which happened in those years and are common to all localities. This identification problem was avoided in the common sample, as elections in France and Portugal occurred in different years.

Third, we estimated separate models for French departments and for Portuguese mu-

municipalities, excluding the last local elections in each country. As mentioned above, the exclusion of the 2015 departmental elections in France avoids the potential problem of including an election with different electoral rules. As shown in Table C.5 for the combined sample, the results for French departments, reported in columns (1) and (2) of Table C.7, remain practically the same. The exclusion of the 2013 elections in Portugal, and of all years after the 2009 elections, takes into account the fact that there were changes in fiscal rules in 2012 and 2013 which limited the mayors' incentives to overestimate revenues. Concretely, Law n. 8/2012, regulating commitments and arrears, established that public entities cannot commit to expenditure if they do not have available funds. Given this restriction, we expect that the evidence for opportunistic overestimation of revenues is stronger for a sample that only includes years before this law entered into force. This is exactly what happens, since the election year dummy is highly statistically significant in column (3) of Table C.7, while it was only marginally significant in column (3) of Table C.6. Additionally, the magnitude of the effect is almost three times greater in this restricted sample (-7.52 against -2.63).

Finally, we checked if the results were sensitive to the use of some alternative explanatory variables. In column (1), we defined fiscal autonomy as the share of total taxes (rather than just direct taxes) in total revenues. Then, in column (2), we used an ideology variable which takes the value of one for left-wing presidents/mayors, the value of two for center or independent, and equals three for right-wing incumbents. In column (3), we used the share of votes the incumbent's party obtained in the previous elections, instead of the win margin. Finally, in column (4), we replaced the dummy for when the party of the president/mayor holds a majority with the number of coalition parties in government (which is one, in case of a single-party government). Our main results concerning the electoral bias in budget forecasts remain practically unchanged in the estimations of Table C.8.

## 4 Conclusion

In this paper, we tested four hypotheses based on the existing literature about the political economy of budget forecast errors, using a panel dataset for 95 French metropolitan departments and 308 Portuguese municipalities. In a first step of the empirical analysis, we characterized the statistical properties of budget forecast errors of local governments in each country, and found that budget forecasts are biased and inefficient both in French departments and in Portuguese municipalities, with greater biases for the latter. Then, we proceeded to the analysis of the political, institutional, economic and demographic determinants of these biases.

The results of system-GMM estimations suggest that local budgets are affected by electoral motives, thus providing some support for Hypothesis 1, which suggests that lo-

cal governments opportunistically underestimate expenditure and overestimate revenue for election years. Concretely, we found that French departments underestimate expenditures in pre-election years. Since departmental elections take place in the first quarter of the election year, it makes sense that the strongest evidence of opportunistic manipulation of budget forecasts is found for the year before the elections. But, contrary to Hypothesis 1, revenue forecasts in French departments are mainly conservative. Regarding Portuguese municipalities, there is opportunistic overestimation of revenues (total, current, and from direct taxes), both in the election year and the year before. Although there is some tendency for overestimation of expenditures, this happens essentially in the year before elections. In the election year, which is the one that matters most for Portuguese municipalities (elections occur in the last quarter), the weak evidence of overestimation is due to capital expenditures, which represents only about 25% of total expenditures, while there is no evidence of election year bias in current expenditure forecasts.

Overall, the evidence of opportunistic budget forecasting is stronger in Portugal, which is consistent with the greater margin of maneuver that mayors enjoy when compared to French departmental presidents. Portuguese mayors generally enjoy the support of majorities in both the Town Council and the Municipal Assembly, making budget approval relatively easy, while French departmental presidents usually need to negotiate budget proposals with opposition parties. Additionally, operating in a system resembling presidentialism, mayors play a more prominent role in their governments than departmental presidents, who operate in a system comparable to majoritarian parliamentarism. Greater opportunism in Portuguese municipalities may also result from the fact that most of them are highly dependent on central government transfers. Therefore, voters may not fully internalize the costs of the budget deficits which result from the opportunistic management of budget forecasts, and actually tend to reward opportunism at the polls (see Aidt et al., 2011, and Veiga and Veiga, 2007). Concerning the other hypotheses, our results suggest that, in French departments, greater reliance on local direct taxes leads to conservatism bias in the budget forecasting (Hypothesis 2), and there is little or no evidence regarding partisan effects (Hypothesis 3) or of strategic budgeting (Hypothesis 4).

Besides contributing to the literature by analyzing the determinants of budget forecast errors in a comparative perspective, involving French departments and Portuguese municipalities, this paper shows that electoral motives and institutional differences across countries help explain forecast biases. More concretely, we learn from this paper's results that opportunistic management of budget forecasts is more likely to happen when it is easier for local governments to approve their budgets without much need of negotiation with opposition parties, as is the case in the vast majority of Portuguese municipalities. Given the incentives to implement opportunistic policies, in the absence of strict fiscal rules, more political room of maneuver will likely result in more opportunism. This could be counteracted by changing the electoral system in a way that led to a smaller number of



majorities (as happens in French departments) or, perhaps more effectively, by tightening fiscal rules. Not allowing commitments for expenditures if the required revenues are not guaranteed, as done in Portugal during the Economic Adjustment Program funded by the EU and the IMF, is one possibility. Alternatively, one could penalize local governments that clearly overestimate revenues, or set more effective balanced budget rules, coupled with severe restrictions to the accumulation of debt. Our results also suggest that increasing the degree of fiscal autonomy of local governments, therefore reducing their reliance on central government transfers, would lead to more conservative budget forecasts.

Finally, having identified a number of instances of budget forecast cycles, future research could look at the electoral consequences of these budget forecast manipulations.

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## Bias test

Table 1: Descriptive statistics of Forecast Performance Indicators

Variable	French Departments (2004-2015)			Portuguese Municipalities (1998-2015)		
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
	<b>Percent Forecast Errors (PFE)</b>					
PFE-Total Revenue	1045	-3.26	6.29	4496	-56.73	46.77
PFE-Current Revenue	1045	3.2	2.97	4496	-14.09	24.95
PFE-Capital Revenue	1045	-41.35	38.99	4496	-191.37	254.17
PFE-Direct taxes	1045	1.47	5.57	4496	-5.4	36.38
PFE-Total Expenditure	1045	-3.83	5.95	4496	-54.5	45
PFE-Current Expenditure	1045	-1.18	2.94	4496	-16.38	25.61
PFE-Capital Expenditure	1045	-15.65	24.35	4496	-114.75	104.81
	<b>Absolute Percent Forecast Errors (APFE)</b>					
APFE-Total Revenue	1045	5.38	4.6	4496	57.1	46.32
APFE-Current Revenue	1045	3.52	2.59	4496	16.85	23.18
APFE-Capital Revenue	1045	48.15	30.17	4496	192.15	253.58
APFE-Direct taxes	1045	3	4.91	4496	20.32	30.66
APFE-Total Expenditure	1045	5.4	4.57	4496	55.18	44.16
APFE-Current Expenditure	1045	2.36	2.11	4496	18.75	23.93
APFE-Capital Expenditure	1045	20.55	20.38	4496	116.1	103.32

## Efficiency test

Table 2: Efficiency test (Revenue)

	French departments				Portuguese municipalities			
	Total Revenue	Current Revenue	Capital Revenue	Direct Taxes	Total Revenue	Current Revenue	Capital Revenue	Direct Taxes
PFE_lag2	0.0462 (0.0431)	-0.0250 (0.0461)	-0.0880** (0.0357)	-0.130*** (0.0285)	0.0562*** (0.0173)	0.0675* (0.0346)	0.139*** (0.0512)	0.0674** (0.0287)
Forecast	-22.13* (11.27)	-13.54*** (5.098)	-7.606** (3.318)	-14.76*** (4.512)	-123.3*** (4.402)	-58.01*** (5.576)	-74.81*** (6.220)	-52.99*** (5.517)
Constant	188.0* (97.35)	117.8*** (43.28)	4.940 (21.90)	110.8*** (33.36)	1472.5*** (54.11)	666.2*** (64.97)	691.2*** (74.23)	520.4*** (54.71)
Observations	950	950	950	950	4162	3908	3908	3907
Adjusted $R^2$	0.083	0.129	0.020	0.117	0.612	0.377	0.055	0.233

Fixed effects estimations. Robust standard errors in parentheses. Significance levels: \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

Table 3: Efficiency test (Expenditure)

	French departments			Portuguese municipalities		
	Total Expenditure	Current Expenditure	Capital Expenditure	Total Expenditure	Current Expenditure	Capital Expenditure
PFE_lag2	0.144*** (0.0540)	-0.0173 (0.0293)	0.231*** (0.0689)	0.0655** (0.0283)	0.0769 (0.0521)	0.0599** (0.0276)
Forecast	-20.87** (9.478)	-5.235*** (1.277)	25.98*** (6.872)	-94.44*** (6.537)	-50.05*** (6.195)	-89.40*** (3.946)
Constant	176.9** (81.91)	42.47*** (10.67)	-202.0*** (49.44)	1122.8*** (80.60)	566.0*** (71.53)	942.5*** (46.69)
Observations	950	950	950	3908	3908	3907
Adjusted $R^2$	0.107	0.044	0.050	0.462	0.329	0.237

Fixed effects estimations. Robust standard errors in parentheses. Significance levels: \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$

## Determinants of PFE

Table 4: Determinants of PFE - Totals (Combined Sample)

	(1)	(2)
	Total Revenue	Total Expenditure
PFE_lag1	0.40*** (0.064)	0.41*** (0.072)
Year before elections	14.7*** (2.81)	14.0*** (2.79)
Year before elections*PT	-35.5*** (5.13)	-34.1*** (5.02)
Election year	3.62 (2.26)	1.01 (1.89)
Election year*PT	-12.3*** (3.78)	-5.94* (3.50)
Fiscal autonomy	0.79*** (0.18)	0.84*** (0.18)
Fiscal autonomy*PT	-0.72*** (0.13)	-0.72*** (0.15)
Left wing	4.10 (3.15)	4.40 (3.00)
Left wing*PT	1.07 (3.69)	0.70 (3.39)
Win margin	-0.17*** (0.063)	-0.14** (0.056)
Win margin*PT	0.20* (0.11)	0.21** (0.10)
Majority	2.88 (3.21)	1.93 (3.26)
Run for reelection	-0.76 (2.04)	-1.58 (2.12)
Terms in Office	-0.45 (0.66)	-0.58 (0.69)
Government party	1.61 (1.17)	2.02* (1.20)
Unemployment rate	-1.63** (0.67)	-1.62** (0.71)
Regional GDP per capita growth	-1.11*** (0.36)	-1.03*** (0.34)
Crisis	-10.9*** (1.82)	-11.2*** (1.92)
Population growth	0.20 (0.57)	0.15 (0.44)
Budget stress	0.77*** (0.19)	0.76*** (0.19)
Observations	5541	5541
Adj. R-squared		
AR(1) P-val	0.000	0.000
AR(2) P-val	0.310	0.928
Hansen P-val	0.299	0.330

Notes: System-GMM estimations. All variables, except the dummies related to election years and the year dummies, were treated as potentially endogenous. Their twice lagged levels were used as instruments in the first-difference equations and their once lagged first-differences were used in the levels equation (380 instruments). Two-step results using robust standard errors corrected for finite samples (see Windmeijer, 2005). Significance levels: \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

Table 5: Interactions of election years with fiscal autonomy

	(1)	(2)
	Total Revenue	Total Expenditure
Lagged-PFE	0.41*** (0.065)	0.43*** (0.071)
Year before elections*FR	37.7*** (7.29)	34.7*** (7.49)
Year before elections*FR*Fiscal autonomy	-0.67*** (0.20)	-0.60*** (0.20)
Election year*FR	35.2*** (7.46)	30.3*** (6.51)
Election year*FR*Fiscal autonomy	-1.12*** (0.24)	-1.05*** (0.21)
Year before elections*PT	-21.2*** (3.50)	-18.5*** (3.33)
Year before elections*PT*Fiscal autonomy	-0.067 (0.11)	-0.14 (0.093)
Election year*PT	-12.1*** (2.77)	-7.53*** (2.74)
Election year*PT*Fiscal autonomy	0.074 (0.085)	0.071 (0.084)
Fiscal autonomy	0.58*** (0.16)	0.63*** (0.15)
Fiscal Autonomy*PT	-0.64*** (0.13)	-0.66*** (0.12)
Left wing	4.40 (2.88)	4.21 (2.66)
Left wing *PT	0.15 (3.38)	0.42 (3.09)
Win margin	-0.12** (0.056)	-0.13*** (0.049)
Win margin*PT	0.12 (0.11)	0.15 (0.10)
Majority	2.34 (2.79)	0.70 (2.62)
Run for reelection	-0.42 (1.99)	-1.06 (1.86)
Terms in Office	-0.31 (0.68)	-0.14 (0.65)
Government party	1.82 (1.17)	2.00* (1.19)
Unemployment rate	-1.14* (0.65)	-1.13* (0.66)
Regional GDP per capita growth	-1.10*** (0.36)	-0.97*** (0.34)
Crisis	-8.91*** (1.67)	-9.16*** (1.67)
Population growth	0.52 (0.40)	0.43 (0.35)
Budget stress	0.78*** (0.18)	0.70*** (0.19)
Observations	5541	5541
AR(1) P-val	0.000	0.000
AR(2) P-val	0.297	0.797
Hansen P-val	0.177	0.179

Notes: System-GMM estimations in which all variables, except the dummies related to election years and the year dummies, were treated as potentially endogenous. Two-step results using robust standard errors corrected for finite samples (see Windmeijer, 2005). Significance levels: \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .



Table 6: Determinants of PFE - Components (Combined Sample)

	(1)	(2)	(3)	(4)	(5)
	Current Revenue	Capital Revenue	Direct Taxes	Current Expenditure	Capital Expenditure
PFE_lag1	0.40*** (0.100)	0.44*** (0.080)	0.16*** (0.055)	0.17** (0.068)	0.41*** (0.058)
Year before elections	8.66*** (1.73)	9.52 (15.5)	8.04*** (2.11)	6.42*** (1.29)	43.5*** (7.52)
Year before elections*PT	-18.5*** (3.06)	-59.0** (26.6)	-25.8*** (4.59)	-16.9*** (2.68)	-93.2*** (14.0)
Election year	4.94*** (1.14)	-15.7 (20.9)	4.47* (2.32)	1.53 (1.05)	1.59 (5.44)
Election year*PT	-5.83*** (1.77)	-10.9 (27.4)	-16.4*** (3.36)	0.79 (2.03)	-20.1** (9.38)
Fiscal autonomy	0.23*** (0.070)	0.79 (1.11)	0.050 (0.12)	0.24*** (0.078)	1.46*** (0.40)
Fiscal autonomy*PT	-0.18** (0.073)	-4.44*** (0.84)	0.16 (0.10)	-0.44*** (0.086)	-1.34*** (0.32)
Left wing	0.54 (1.72)	28.4* (16.4)	0.41 (2.26)	3.18* (1.63)	13.3* (7.55)
Left wing*PT	-0.64 (1.89)	-3.64 (19.4)	-0.81 (2.97)	-1.90 (2.24)	-5.24 (9.26)
Win margin	-0.0096 (0.025)	-0.12 (0.21)	0.017 (0.041)	-0.0067 (0.028)	-0.45*** (0.15)
Win margin*PT	-0.020 (0.056)	0.85 (0.80)	-0.11 (0.11)	-0.075 (0.067)	0.89*** (0.27)
Majority	0.97 (1.92)	-22.9 (29.0)	-0.37 (3.00)	0.47 (2.30)	6.73 (8.02)
Run for reelection	-1.98* (1.18)	22.7** (11.1)	0.43 (1.57)	-0.84 (1.30)	-0.53 (5.25)
Terms in Office	-0.66 (0.40)	2.09 (5.06)	0.066 (0.56)	0.49 (0.46)	-2.97* (1.71)
Government party	0.48 (0.66)	3.10 (5.83)	-1.95* (1.14)	1.57** (0.74)	2.04 (2.74)
Unemployment rate	-0.95** (0.40)	-19.9** (7.74)	-2.04*** (0.59)	-1.35*** (0.44)	-3.51** (1.57)
Regional GDP per capita growth	-0.66*** (0.17)	-5.00** (2.11)	-1.22*** (0.46)	-0.54*** (0.16)	-1.22 (0.85)
Crisis	-7.76*** (1.31)	-5.38 (7.93)	-4.08** (1.66)	-8.09*** (1.28)	-24.1*** (4.56)
Population growth	-0.27 (0.21)	4.41 (4.37)	-0.39 (0.37)	0.050 (0.21)	0.40 (1.36)
Budget stress	0.13 (0.12)	3.84 (2.72)	0.71*** (0.15)	-0.049 (0.13)	2.35*** (0.40)
Observations	5541	5541	5541	5541	5541
R-squared					
AR(1) P-val	0.001	0.000	0.000	0.020	0.000
AR(2) P-val	0.784	0.521	0.179	0.628	0.411
Hansen P-val	0.426	0.474	0.358	0.329	0.385

Notes: System-GMM estimations in which all variables, except the dummies related to election years and the year dummies, were treated as potentially endogenous. Their twice lagged levels were used as instruments in the first-difference equations and their once lagged first-differences were used in the levels equation. Two-step results using robust standard errors corrected for finite samples (see Windmeijer, 2005). Significance levels: \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

# Online Appendix

## A Descriptive statistics

Table A.1: Descriptive statistics of independent variables(French departments)

Variable	Obs	Mean	Std. Dev.	Min	Max
Year before elections	1045	.18	.39	0	1
Election year	1045	.27	.45	0	1
Fiscal autonomy (Share of Direct Taxes in T.Revenue)	1045	30.72	5.12	12.19	51.27
Fiscal autonomy 2 (Share of Total Taxes in T.Revenue)	1045	56.01	7.45	27.28	90.54
Left wing	1045	.53	.5	0	1
Right wing president	1045	.42	.49	0	1
Centre president	1045	.05	.23	0	1
Ideology (Left=1; Center/Independent=2; Right=3)	1045	1.89	.97	1	3
Win margin (previous election)	1045	4.33	15.68	-43.93	75.78
Share of votes of the incumbent's party (prev. election)	1045	27.33	15.67	0	65.51
Majority	1045	.05	.22	0	1
Number of coalition parties	1045	2.76	.81	1	6
Terms in Office	1045	1.37	1.2	0	10
Government party	1045	.43	.5	0	1
Run for reelection	1045	.76	.43	0	1
Unemployment rate	1045	8.91	1.88	4.2	16
Regional GDP per capita growth	1045	2.21	2.57	-5.58	7.69
Population growth	1045	.68	.95	-1.4	6.31
Budget stress	1045	-.34	3.04	-16.95	17.45
Crisis	1045	.09	.29	0	1
Population	1045	639673.1	468917.9	76800	2627956
Population density (inhabitants per km2)	1045	333.3	1203.82	14.2	9033.85
Regional GDP per capita	1045	28384.05	6568.41	21685.21	53416.33
Total revenue per capita	1045	1053.93	184.29	264.06	1879.17
Current revenue per capita	1045	936.66	160.56	250.65	1587.69
Capital revenue per capita	1045	117.47	71.53	13.41	622.77
Direct taxes per capita	1045	318.8	55.95	63.27	598.67
Total expenditure per capita	1045	1051.79	182.37	273.86	1803.92
Current expenditure per capita	1045	804.61	152.69	235.06	1317.75
Capital expenditure per capita	1045	247.17	83.73	38.8	666.64

Sources: French Directorate General of Local Governments and Ministry of Internal Affairs.

Table A.2: Descriptive statistics of independent variables (Portuguese municipalities)

Variable	Obs	Mean	Std. Dev.	Min	Max
Year before elections	4496	.26	.44	0	1
Election year	4496	.26	.44	0	1
Fiscal autonomy (Share of Direct Taxes in T.Revenue)	4496	17.44	13.7	.11	68.38
Fiscal autonomy 2 (Share of Total Taxes in T.Revenue)	4496	18.8	15.04	.11	75.74
Left wing	4496	.53	.5	0	1
Right-wing mayor (PPD-PSD or CDS-PP)	4496	.45	.5	0	1
Independent mayor (Group of Citizens)	4496	.02	.14	0	1
Ideology (Left=1; Center/Independent=2; Right=3)	4496	1.93	.99	1	3
Win margin (previous election)	4496	19.94	14.11	.02	75.75
Share of votes of the incumbent's party (prev. election)	4485	51.54	9.21	7.22	83.12
Majority	4496	.81	.39	0	1
Number of coalition parties	4496	1.06	.27	1	4
Run for reelection	4496	.75	.43	0	1
Terms in Office	4496	2.5	1.75	0	10
Government party	4496	.42	.49	0	1
Unemployment rate	4496	6.71	2.83	.64	18.29
Regional GDP per capita growth	4496	.85	3.73	-15.65	14.84
Population growth	4496	-.29	2.13	-21.56	24.98
Budget stress	4496	-1.03	10.45	-68.36	40.26
Crisis	4496	.32	.47	0	1
Population	4496	34346.52	55312.08	430	580436
Population density (inhabitants per km2)	4496	296.29	809.56	4.3	7535.72
Regional GDP per capita	3950	14847.29	3412.34	9129.65	26169.33
Total revenue minus loans (effective revenue) per capita	4496	903.61	489.25	255.55	7500.72
Current revenue per capita	4496	619.4	321.87	173.43	3075.86
Capital revenue minus loans per capita	4496	285.87	248.48	2.07	5230.39
Direct taxes per capita	4496	128.37	107.58	4.31	1251.59
Total expenditure per capita	4496	969.84	540.37	284.71	7883.85
Current expenditure per capita	4496	566.78	319.81	116.79	2546.89
Capital expenditure per capita	4496	259.31	216.29	3.26	2165.28
Personnel expenditure per capita	4496	273.41	170.65	39.4	1582.62

Sources: Portuguese Directorate General of Local Authorities (DGAL), Ministry of Internal Affairs (MAI), and National Institute of Statistics (INE).

## B VIF Tests and Correlation Matrix

Table B.3: Results of VIF test

Variables	VIF
Year before elections	7.90
Year before elections*PT	8.20
Election year	5.91
Election year*PT	6.09
Fiscal autonomy	5.93
Fiscal autonomy*PT	5.99
Left wing	6.62
Left wing*PT	7.61
Win margin	6.15
Win margin*PT	7.17
Majority	1.85
Run for reelection	1.14
Terms in Office	1.22
Government party	1.06
Unemployment rate	1.23
Regional GDP per capita growth	1.47
Crisis	1.42
Population growth	1.19
Budget stress	1.04
Mean VIF	4.17

Table B.4: Correlations among explanatory variables

	Year before elections	Election year	Win margin	Financial autonomy	Left Wing	Majority	Run for reelection	Terms in Office	Government party	Unemployment rate	Regional GDPpc growth	Crisis	Population growth	Budget stress
Year before elections	1.000													
Election year	-0.293	1.000												
Win margin	0.027	-0.057	1.000											
Fiscal autonomy	-0.016	0.017	-0.188	1.000										
Left wing	-0.009	-0.018	-0.057	0.049	1.000									
Majority	0.032	-0.059	0.490	-0.279	-0.011	1.000								
Run for reelection	-0.012	0.001	-0.023	-0.001	0.024	-0.032	1.000							
Terms in Office	0.047	-0.026	0.297	-0.101	0.018	0.289	-0.242	1.000						
Government party	0.021	-0.021	-0.014	0.001	-0.094	0.000	-0.017	-0.027	1.000					
Unemployment rate	-0.075	0.037	-0.147	0.183	0.168	-0.207	-0.057	-0.110	-0.048	1.000				
Regional GDPpc growth	-0.130	-0.172	-0.095	-0.054	-0.011	-0.059	0.164	-0.094	-0.034	-0.145	1.000			
Crisis	-0.034	0.258	0.096	-0.066	-0.014	0.118	-0.182	0.115	0.030	0.053	-0.463	1.000		
Population growth	-0.022	0.103	-0.069	0.314	0.021	-0.102	0.052	-0.025	-0.003	-0.034	0.139	-0.104	1.000	
Budget stress	0.050	0.047	-0.028	0.070	0.029	-0.034	-0.043	-0.035	-0.015	0.126	-0.116	0.090	-0.046	1.000

## C Robustness Tests

Table C.5: Alternative sample periods

	Common period (2014-2015)		Before 2015	
	(1) Total Revenue	(2) Total Expenditure	(3) Total Revenue	(4) Total Expenditure
PFE_lag1	0.52*** (0.057)	0.51*** (0.081)	0.37*** (0.064)	0.38*** (0.077)
Year before elections	11.4*** (2.47)	12.0*** (2.84)	13.4*** (2.62)	12.6*** (2.75)
Year before elections*PT	-27.2*** (4.66)	-27.4*** (4.75)	-29.7*** (4.80)	-28.2*** (4.75)
Election year	3.10 (2.27)	0.018 (2.00)	11.7*** (2.79)	8.09*** (2.45)
Election year*PT	-9.12** (3.73)	-1.86 (3.68)	-19.0*** (4.02)	-11.6*** (3.61)
Financial autonomy	0.49** (0.21)	0.48** (0.21)	0.97*** (0.21)	0.98*** (0.22)
Financial autonomy*PT	-0.60*** (0.14)	-0.61*** (0.17)	-0.90*** (0.16)	-0.87*** (0.18)
Left wing	1.93 (2.32)	2.49 (2.28)	0.40 (3.49)	1.54 (3.24)
Left wing*PT	2.73 (3.28)	2.18 (3.15)	5.26 (4.29)	4.02 (3.92)
Win margin	-0.078* (0.044)	-0.073* (0.040)	-0.12** (0.055)	-0.11** (0.051)
Win margin*PT	0.14 (0.13)	0.15 (0.13)	0.16 (0.11)	0.18 (0.11)
Majority	1.54 (3.81)	-1.29 (3.46)	2.15 (3.80)	1.33 (3.68)
Run for reelection	-2.21 (1.90)	-3.08 (1.93)	-1.80 (2.37)	-2.30 (2.27)
Terms in Office	-0.99* (0.59)	-0.80 (0.60)	-0.48 (0.75)	-0.78 (0.74)
Government party	2.30* (1.35)	2.58* (1.40)	1.31 (1.30)	1.59 (1.22)
Unemployment rate	-0.66 (0.63)	-0.41 (0.69)	-1.92** (0.75)	-1.87** (0.80)
Regional GDP per capita growth	-0.54 (0.34)	-0.45 (0.29)	-1.20*** (0.36)	-1.14*** (0.34)
Crisis	-8.60*** (1.86)	-9.13*** (1.91)	-11.1*** (1.82)	-11.3*** (1.92)
Population growth	-0.073 (0.59)	-0.22 (0.43)	0.089 (0.56)	0.065 (0.44)
Budget stress	1.14*** (0.17)	1.04*** (0.20)	0.62*** (0.21)	0.59*** (0.22)
Observations	4286	4286	5143	5143
AR(1) P-val	0.000	0.000	0.000	0.000
AR(2) P-val	0.090	0.188	0.337	0.962
Hansen P-val	0.180	0.269	0.110	0.125

Notes: System-GMM estimations in which all variables, except the dummies related to election years and the year dummies, were treated as potentially endogenous. Their twice lagged levels were used as instruments in the first-difference equations and their once lagged first-differences were used in the levels equation. Two-step results using robust standard errors corrected for finite samples (see Windmeijer, 2005). Significance levels: \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

Table C.6: Separate country samples

	French departments		Portuguese municipalities	
	(1)	(2)	(3)	(4)
	Total Revenue	Total Expenditure	Total Revenue	Total Expenditure
PFE_lag1	0.45*** (0.11)	0.47*** (0.073)	0.46*** (0.066)	0.50*** (0.076)
Year before elections	3.01*** (1.06)	2.47*** (0.85)	-8.63*** (1.72)	-8.39*** (1.66)
Election year	1.40** (0.63)	-0.51 (0.65)	-2.63* (1.58)	-1.15 (1.65)
Fiscal autonomy	-0.52*** (0.14)	-0.57*** (0.13)	0.14 (0.12)	0.18 (0.13)
Left wing	2.73* (1.38)	0.97 (1.17)	2.36 (2.11)	2.24 (2.27)
Win margin	-0.0035 (0.022)	-0.016 (0.018)	-0.0016 (0.11)	0.0044 (0.11)
Majority	-0.33 (1.74)	0.87 (1.60)	4.43 (3.82)	4.18 (3.98)
Run for reelection	0.81 (0.66)	0.59 (0.57)	7.04*** (2.61)	7.84*** (2.60)
Terms in Office	-0.33 (0.42)	-0.21 (0.32)	0.73 (0.77)	1.21 (0.78)
Government party	0.68 (0.62)	0.091 (0.55)	2.22 (1.64)	2.63* (1.54)
Unemployment rate	-1.58*** (0.27)	-1.44*** (0.24)	1.58** (0.64)	0.99 (0.69)
Regional GDP per capita growth	-0.14 (0.11)	-0.11 (0.094)	-0.75** (0.30)	-0.68** (0.28)
Crisis	8.64** (3.37)	6.60** (2.67)	-5.77*** (1.76)	-5.52*** (1.55)
Population growth	-3.92*** (1.18)	-2.12** (0.98)	-0.69 (0.86)	-0.32 (0.82)
Budget stress	-0.075 (0.31)	-0.14 (0.14)	0.99*** (0.19)	1.23*** (0.20)
Observations	950	950	3942	3942
AR(1) P-val	0.000	0.000	0.000	0.000
AR(2) P-val	0.545	0.852	0.470	0.520
Hansen P-val	0.233	0.189	0.211	0.198

Notes: System-GMM estimations in which all variables, except the dummies related to election years and the year dummies, were treated as potentially endogenous. Two-step results using robust standard errors corrected for finite samples (see Windmeijer, 2005). Significance levels: \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

Table C.7: Separate country samples, with alternative time periods

	French departments Excluding the 2015 elections		Portuguese municipalities Excluding the 2013 elections	
	(1)	(2)	(3)	(4)
	Total Revenue	Total Expenditure	Total Revenue	Total Expenditure
PFE_lag1	0.37*** (0.13)	0.43*** (0.078)	0.29*** (0.078)	0.30*** (0.089)
Year before elections	1.66** (0.64)	1.01** (0.50)	-8.60*** (1.83)	-7.60*** (1.91)
Election year	2.13*** (0.67)	0.11 (0.62)	-7.52*** (1.66)	-6.67*** (1.74)
Fiscal autonomy	-0.33*** (0.11)	-0.38*** (0.11)	0.28** (0.14)	0.35** (0.14)
Left wing	1.06 (1.66)	1.26 (1.85)	7.64** (3.36)	8.00** (3.30)
Win margin	-0.0077 (0.017)	-0.023 (0.015)	0.035 (0.16)	-0.0092 (0.14)
Majority	-0.022 (1.40)	-1.60 (1.62)	3.68 (5.22)	5.06 (4.84)
Run for reelection	0.024 (0.64)	0.26 (0.61)	1.69 (4.52)	2.54 (3.82)
Terms in Office	-0.64 (0.46)	-0.40 (0.33)	3.15*** (1.11)	1.89* (1.10)
Government party	-0.14 (0.73)	-0.58 (0.81)	-0.22 (1.83)	0.70 (1.84)
Unemployment rate	-1.41*** (0.25)	-1.44*** (0.24)	-3.32*** (0.78)	-3.60*** (0.71)
Regional GDP per capita growth	-0.021 (0.11)	-0.10 (0.11)	-1.63*** (0.42)	-1.51*** (0.40)
Crisis	2.78* (1.60)	1.77 (1.57)	-7.39*** (1.95)	-5.21*** (1.89)
Population growth	-2.06*** (0.61)	-0.55 (0.56)	-1.33 (0.94)	-1.69* (0.93)
Budget stress	0.073 (0.27)	-0.30*** (0.11)	0.47* (0.25)	0.43* (0.24)
Observations	950	950	2668	2668
AR(1) P-val	0.000	0.000	0.001	0.003
AR(2) P-val	0.241	0.032	0.523	0.111
Hansen P-val	0.213	0.152	0.232	0.135

Notes: System-GMM estimations in which all variables, except the dummies related to election years and the year dummies, were treated as potentially endogenous. Two-step results using robust standard errors corrected for finite samples (see Windmeijer, 2005). Significance levels: \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .



Table C.8: Alternative political variables - Results for Total Revenue

	(1)	(2)	(3)	(4)
	Fiscal autonomy 2	Ideology	Share of votes	Coalition members
PFE_lag1	0.41*** (0.063)	0.40*** (0.065)	0.41*** (0.065)	0.40*** (0.064)
Year before elections	18.2*** (2.80)	14.8*** (2.78)	14.8*** (2.72)	14.4*** (2.73)
Year before elections*PT	-40.6*** (5.22)	-35.6*** (5.11)	-35.5*** (5.02)	-35.9*** (5.30)
Election year	3.10 (2.15)	2.92 (2.24)	2.10 (2.25)	4.34** (2.16)
Election year*PT	-16.0*** (3.60)	-11.8*** (3.58)	-12.3*** (3.69)	-13.1*** (3.65)
Financial autonomy		0.67*** (0.19)	0.41 (0.25)	0.96*** (0.19)
Fiscal autonomy*PT		-0.60*** (0.16)	-0.40* (0.22)	-0.86*** (0.14)
Fiscal autonomy 2 (Share of Total Taxes in Tot.Revenue)	0.31*** (0.089)			
Fiscal Autonomy2*PT	-0.28*** (0.084)			
Left wing	6.44** (3.04)		3.06 (2.67)	3.39 (2.94)
Left wing*PT	-1.86 (3.59)		2.07 (3.37)	1.21 (3.54)
Ideology (Left=1; Center/Independent=2; Right=3)		-0.77 (1.31)		
Ideology*PT		-1.83 (1.61)		
Win margin	-0.14** (0.060)	-0.16*** (0.062)		-0.17*** (0.059)
Win margin*PT	0.16 (0.11)	0.19* (0.11)		0.23** (0.11)
Share of votes of the incumbent's party (previous election)			0.022 (0.056)	
Share of votes of the incumbent's party*PT			-0.26* (0.14)	
Majority	0.72 (3.09)	3.09 (3.18)	6.28* (3.22)	
Number of coalition parties				-3.88** (1.56)
Run for reelection	-1.63 (2.13)	-0.46 (2.09)	-0.79 (2.06)	-0.55 (2.06)
Terms in Office	-0.61 (0.69)	-0.46 (0.69)	-0.35 (0.67)	-0.29 (0.67)
Government party	1.73 (1.21)	1.36 (1.17)	1.91 (1.22)	1.67 (1.16)
Unemployment rate	-1.55** (0.64)	-1.66** (0.67)	-1.60** (0.66)	-1.60** (0.68)
Regional GDP per capita growth	-1.24*** (0.36)	-1.12*** (0.35)	-1.15*** (0.34)	-1.21*** (0.36)
Crisis	-9.24*** (1.73)	-10.5*** (1.93)	-8.98*** (1.94)	-11.7*** (1.88)
Population growth	0.23 (0.57)	0.22 (0.58)	0.23 (0.56)	0.19 (0.60)
Budget stress	0.80*** (0.19)	0.78*** (0.18)	0.80*** (0.20)	0.73*** (0.19)
Observations	5541	5541	5530	5541
AR(1) P-val	0.000	0.000	0.000	0.000
AR(2) P-val	0.288	0.324	0.319	0.268
Hansen P-val	0.336	0.311	0.339	0.346

Notes: System-GMM estimations in which all variables, except the dummies related to election years and the year dummies, were treated as potentially endogenous. Their twice lagged levels were used as instruments in the first-difference equations and their once lagged first-differences were used in the levels equation. Two-step results using robust standard errors corrected for finite samples (see Windmeijer, 2005). Significance levels: \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .