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Public Investment and Re-election Prospects in Developed Countries

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Abstract

A growing body of literature suggests that office-motivated politicians manipulate fiscal policy instruments in order to enhance their re-election prospects. This paper directly examines the impact of fiscal policy on incumbents' re-election prospects by focusing on the impact of public investment. This impact is estimated using a panel of 20 OECD countries over the period 1972-1999. We find that the level of public investment in the earlier years of an incumbent's term in office improves their re-election prospects, whereas election year manipulation of public investment is neither rewarded nor punished. Our evidence also suggests that, after controlling for the level of deficit and public investment, the level of government revenue both in the election and non-election years does not seem to affect re-election prospects. Moreover, we find that deficit creation during elections and in non-election years are not rewarded by voters.

JEL Classification: D72, E62

Keywords: Political budget cycles, elections, quality of public expenditure, public investment

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1. Introduction

Since the seminal work of Nordhaus (1975), a rich body of literature suggests that office-motivated incumbents manipulate fiscal policy in order to improve their chances to get re-elected.¹ In a rational expectations framework, political budget cycles (PBC) still arise under the driving assumption of temporary information asymmetries between voters and politicians regarding the competence level of the latter.² Electoral manipulation of fiscal policy can also affect the composition rather than the level of public spending. Rogoff (1990) provided a firm theoretical foundation showing that electorally motivated incumbents signal their competence by shifting public spending toward more visible government consumption and away from public investment goods that are mostly long-term projects and will increase voters' utility upon completion.

Many empirical studies find evidence of electorally timed shifts in the composition of public spending not only at the national but also at the local level. It is important to note, though, that for studies conducted at the local level, evidence suggests that authorities attempt to signal their competence by expanding the level of investment spending (see, e.g., Khemani (2004); Drazen and Eslava (2010)) while policymakers at the national level provide immediate benefit to voters through consumption or taxation whereas capital spending decreases (see, e.g., Vergne (2009); Katsimi and Sarantides (2012)). These findings may reflect that Rogoff's (1990) assumption of lower visibility of capital expenditures (e.g., infrastructure) conforms much better to central government rather than to local level spending.

In fact, manipulation of the composition of fiscal policy seems particularly relevant in developed economies in which the incumbent may avoid deficit creation due to the fear of voters' disfavour. Indeed, Brender and Drazen (2013) find that election years are associated with larger expenditure composition changes in established democracies, the majority of which are developed economies, while incumbents in 'new democracies' tend to increase the overall level of expenditures in election years (see Brender and Drazen (2005)).

¹ In contrast, the partisan approach focuses on the role of government ideology on fiscal policy priorities (see, e.g., Hibbs (1977); Alesina (1987); Chappell and Keech (1988)). For empirical evaluations of the impact of ideology on the composition of fiscal policy, see, among others, Potrafke (2011).

² For a discussion of the implications of theoretical PBC adverse selection and moral hazard type models, see Shi and Svensson (2003). Empirical evidence on the budgetary impact of elections, until recently, suggested that PBC was a phenomenon of less-developed countries (see, e.g., Schuknecht (1996); Shi and Svensson (2006)) or of the so-called 'new democracies' (see Brender and Drazen (2005)). Recent studies for developed countries provide mixed evidence both in favour of (see Efthyvoulou (2012) for a sample of 27 EU member states) and against (see Klomp and de Haan (2013)) the existence of PBCs.

A complementary literature investigates the impact of fiscal policy choices on the voting behaviour and on incumbents' re-election prospects. Empirical studies that attempt to assess the impact of fiscal policy on re-election prospects either include fiscal variables in the estimation of a voting function or they employ binary models in order to estimate the probability of an incumbent's re-election.

The first approach belongs to the literature on economic voting based on the seminal papers of Goodhart and Bhansali (1970), Mueller (1970) and Kramer (1971). This literature estimates popularity/voting functions in order to investigate the impact of economic variables on voting behaviour. Based on the "Responsibility Hypothesis" according to which voters hold the government responsible for the economy, an extensive literature investigates the channels through which voting behaviour depends on voters' economic experiences and on their perception and evaluation of the macro economy. However, most multi-country studies that estimate the impact of the economy on the incumbents' share of the votes at national elections measure economic performance in terms of output growth, inflation and unemployment without taking into account government's fiscal performance (for a survey see Paldam (1981); Norpoth et al. (1991); Nannestad and Paldam (1994); Lewis-Beck and Paldam (2000)). An exception is Veiga (2013) who finds that voters reward positive budget balances whereas after the 2008 crisis there is evidence that they have become more determinedly fiscally conservative.

The second approach of estimating a binary model has been used by the majority of the limited number of empirical studies on the impact of fiscal policy on the incumbent's re-election prospects at national level.³ Their findings suggest that in established democracies, well-informed voters act as fiscal conservatives and punish rather than reward loose fiscal policies at the polls (see, e.g., Brender and Drazen (2008) and Alesina et al. (2012)).⁴

For elections at the state and local levels researchers have estimated both binary models and voting functions. The dominant result that voters penalize expansive fiscal policies (see, among others, Peltzman (1992); Brender (2003)) has recently been challenged for some developing countries (see, e.g., Akhmedov and Zhuravskaya (2004); Sakurai and Menezes-Filho (2008); Jones et al. (2012)). Regarding the relationship between public investment expenditures and re-election prospects, limited studies using both approaches are

³ Although they do not directly test the impact of fiscal policy on re-election, Klomp and de Haan (2013) find that election-motivated budget cycles have a significant positive (but fairly small) effect on the electoral support for the political parties in government.

⁴ It should be noted that, under certain assumptions regarding preferences and the nature of uncertainty, a number of theoretical models can support the opposite result, namely that electoral manipulation of fiscal policy increases re-election probability (see Rogoff (1990); Milesi-Ferretti and Spolaore (1994); Hodler et al. (2010)).

exclusively concentrated at the local level and their results are mixed (see, e.g., Veiga and Veiga (2007) and Drazen and Eslava (2010)).

Two points should be noted about these contradicting results at the local level. First, as emphasized by Brender and Drazen (2008), empirical conclusions drawn from country studies should, strictly speaking, be limited to these countries. Given that fiscal items that are clearly identifiable as provincial government responsibilities differ from one country to another, it is difficult to derive more general policy conclusions from country studies. Secondly, as already mentioned, local authorities tend to expand expenditures on investment projects near elections, indicating that Rogoff's (1990) prediction of shifts in public spending toward more visible government consumption and away from public investment goods may not hold for local governments in which public investment may not be characterized by low visibility.

The contribution of the present paper is found in its focus on the role of national public investment as an instrument for affecting re-election prospects of the incumbent in developed countries. We believe that this is an important step because we empirically test the following predictions implicitly derived from the existing literature: Firstly, if public capital spending is invisible, as suggested by Rogoff (1990), then the manipulation of public investment just before elections should not affect the re-election prospects of the incumbent. We analyze the impact of public investment on voting behaviour and re-election probability by using a sample of established democracies, because we believe it makes sense to look at the countries in which this type of electoral manipulation has been supported by empirical evidence (see Katsimi and Sarantides (2012) and Brender and Drazen (2013)). Our paper complements this literature by testing whether electoral manipulation in the form of a fall in public investment in developed established democracies found by Katsimi and Sarantides (2012) affects the incumbents' re-election prospects.⁵ Secondly, public investment expenditures that occurred in the earlier years of an incumbent's term in office should be observable by voters near the completion of the term, since these expenditures are mostly long-term projects which are noticed with a lag. Given the positive impact of productive expenditure on long-run growth emphasized by the relevant literature, we expect voters to

⁵ Brender and Drazen (2013) also find evidence for electoral manipulation in public spending in the same group of countries but their decomposition does not include capital spending. In their paper "composition" refers to the functional classification of public spending that distinguishes transactions by policy purpose or type of outlay (e.g., healthcare expenditures). Throughout this paper, though, we use the economic classification that divides public spending into capital and current expenditures, and the term "composition" is used to refer specifically and only to the percentage of capital to current expenditures.

reward a rise in this type of expenditure.⁶ For a given level of deficit, voters are likely to reward this type of expenditure if they perceive it as more 'productive' than current expenditure.

We test the impact of public investment on re-election prospects by estimating both a binary model and a voting function. Our empirical results using a sample of 20 OECD countries over the period of 1972-1999 suggest that the level of public investment in the earlier years of an incumbent's term in office improves re-election prospects whereas election year manipulation of public investment is neither rewarded nor punished.⁷ Given that public investment expenditures at the national level are mostly long-term projects, this result is consistent with Rogoff's (1990) assumption of the lower visibility of this type of expenditure and explains previous empirical findings for electoral manipulation of public investment.

Our paper builds on the existing literature on the effect of fiscal policy on electoral results at the national level. Brender and Drazen (2008) study a sample of 77 countries over the period 1960-2003 and find that deficits in an election year are punished by voters in developed countries that are established democracies. Alesina et al. (2012) analyse a sample of 19 OECD countries for the 1975-2008 period and find no evidence that fiscal adjustments increase the turnover of governments. Veiga (2013) uses a voting function for a panel of 15 European Union countries for the 1970-2011 period in order to analyze the impact of the European integration process on voters' evaluations of governments' economic performance and finds that the vote share of the government depends positively on budget surpluses.

However, although our paper also examines the impact of deficit creation on re-election prospects, its main focus on the impact of public investment and the composition of public spending is novel. Moreover, it investigates whether the main predictions of the existing literature regarding the political cost of electoral deficit creation can be found after controlling for other elements of the government's budget constraint such as revenue and expenditure composition. We find that, similar to Brender and Drazen (2008), deficit creation both in the election year and during the term in office is never rewarded by voters in developed countries (it is either punished or it does not affect the re-election prospects). We also find some evidence that the vote share of the main government party increases with the level of budget surplus in the election period which is a result consistent with the findings of Veiga (2013). Our results are not directly comparable to Alesina et al. (2012) who use a

⁶ Paul et al. (2004) and Henderson and Kumbhakar (2006) emphasize the positive impact of public capital on productivity whereas Kneller et al. (1999) and Bleaney et al. (2001) find a positive effect of productive expenditures on long-run growth.

⁷ In section 2.1 we discuss the reasons for limiting our sample to the years 1972-1999.

different specification and focus mainly on large fiscal adjustments but their finding that fiscal adjustments are not punished by voters is consistent with our results.

The remainder of the paper is organized as follows. Section 2 describes the data, specifies the econometric model, and contains our basic findings. Section 3 reports the results of robustness tests. In section 4 we test whether our results are replicated by estimating a voting function. The last section concludes.

2. Empirical Analysis

2.1. Data and estimation method

In order to estimate the effect of public investment expenditure and the composition of public expenditure on re-election prospects, we use data for 20 OECD countries over the period of 1972-1999.⁸ Our sample consists of countries that can be characterised as developed economies and established democracies, since the existing literature indicates that manipulation of the composition of fiscal policy seems particularly relevant in countries with these characteristics.⁹ The countries in our sample are also included in the sample used by Brender and Drazen (2008), Katsimi and Sarantides (2012) and Brender and Drazen (2013) allowing us to relate our results with the findings of these papers. In line with Brender and Drazen (2008), we estimate the impact of fiscal policy on the incumbent's probability of re-election in a binary model although in a later section we test the robustness of our results by estimating a voting function. The dependent variable re-election is based on information from the World Statesmen Encyclopedia and from the Inter-Parliamentary Union database. These data allow us to follow the terms of individual leaders and parties in office from appointment to termination and to associate them with election dates. It is worth noting that we only include legislative elections for countries with parliamentary political systems and presidential elections for countries with presidential systems. In line with Brender and Drazen (2008), the re-election variable includes observations in which the leader (the president for the United States and the prime minister for all other countries of our sample) has been in

⁸ A key variable for our empirical analysis is not available after 1999, as discussed in the following.

⁹ The countries of our sample are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxemburg, Netherlands, Norway, Portugal, Spain, Sweden, the United Kingdom and the United States. Iceland is excluded from our sample because as a small and isolated country it lacks some characteristics that may distinguish voting behaviour between national and local elections such as the low 'visibility' of national public investment. As noted earlier, the differences in the electoral manipulation of public investment between local and national elections found in the literature may reflect that in the local level public investment is considered a 'visible' component of public expenditure. Due to the small size of our sample, we keep Luxemburg but it is worth noting that when it is dropped our results remain similar. Finally, South Korea and New Zealand are also excluded from the our sample because in the first country the president cannot run for re-election in the two elections periods we consider (1992 and 1997), while there is no availability of fiscal data for the second country.

office for at least two years prior to the elections. It takes value 1 if the incumbent chief executive is re-elected and 0 otherwise. It also allows for the following special cases:

- (i) In cases in which the leader quits within the year of the election, re-election receives the value 0.
- (ii) In cases in which, during the election year, a leader is replaced because she/he died or resigned due to health problems, re-election takes the value 1 if the successor leader gets re-elected and 0 otherwise.
- (iii) For the United States, where the president is subject to a legal limit, re-election receives the value 1 if the reigning leader's party wins the election and 0 if it loses.¹⁰
- (iv) Finally, in a coalition government, the re-election variable takes the value 1 if the appointed prime minister comes from the same party as that of the prime minister before the elections, and 0 otherwise. In addition, to ensure that the prime minister has not been changed because he became unpopular, we consider re-election only in the case in which the party of the appointed prime minister of the governing coalition received in the current elections a higher vote share in comparison to the previous elections. Overall we have 106 campaigns in which the leader was re-elected in 58 cases.¹¹

Regarding our main variables of interest, we obtain our fiscal data from the 'Global Development Network Growth Database' (GDNGD), whose primary source is the IMF "Government Finance Statistics" (GFS) database. It should be noted that GFS is the only multi-country data source for disaggregated central government data. For this reason, it is the standard database used in empirical research studying either aggregate fiscal variables (see, e.g., Brender and Drazen (2008)) or the composition of fiscal policy instruments (see Schuknecht (2000); Vergne (2009)).¹²

Unfortunately, we cannot expand our dataset beyond the 1972-1999 period since GFS modified the methodology of calculating the fiscal variables. In fact GFS until the late nineties has been calculated using Government Finance Statistics Manual 1986 (GFSM

¹⁰ In our sample, in the US elections of 1988, the candidate could not run for re-election after the termination of the second mandate. Besley and Case (1995) show that the candidate who cannot run for re-election behaves differently regarding the manipulation of public expenditures. In contrast, though, it can be said that some party loyalty can justify the maintenance of public budget manipulation. To confirm that the results are robust, when we drop this observation our results remain unaffected.

¹¹ Although we follow the *leader's re-election*, in order to lengthen our sample, we follow the *party's re-election* for special cases (ii), (iii), and (iv). However, when we narrow the sample in order to follow leader's re-election in all cases, our results remain unaffected.

¹² We use central government data for several important reasons: Firstly given that general government data include all levels of government (state, local, central), results based on such data would be more difficult to interpret. As noted by Schuknecht (2000), the government only controls directly the central government budget, while changes in public spending of the general government may be affected by both general and local elections. Secondly, data from general government accounts are less consistent across countries and time periods.

1986) classification, while data beyond this point have been calculated according to the Government Finance Statistics Manual 2001 (GFSM 2001). The new GFSM 2001 classification provides observations for the years 1990-2011, but not for our main variable of interest, namely public investment expenditures. This means that we can neither estimate our equations for two separate samples (1972-1999) and (1990-2011), nor harmonize the data streams for both classifications and re-run regressions from 1972 to 2011.

We analyze the impact of public investment on re-election prospects, by estimating two different specifications:

In the first one we are interested in the impact of the overall capital spending of the incumbent during her term in office. Therefore, we include on the right hand side of our specification a variable capital term defined as the average of capital expenditures during the leader's current term in office, scaled by GDP and expressed as percentage. Likewise, in order to investigate the impact of composition of expenditures on re-election prospects, we construct a variable composition term defined as the percentage of capital to current expenditures during the term in office of the incumbent.¹³ Both variables cover the whole period of leader's current term in the office, starting with the year after the previous election and including the election year of current elections.¹⁴

In the second specification we investigate the central question of our paper, which is whether the pre-electoral deviation of capital expenditures affects re-election prospects (see also Veiga and Veiga (2007); Sakurai and Menezes-Filho (2008)). Similar to the first specification, we are interested in public investment as well as the composition of public spending. Regarding public investment, we split the variable capital term into capital deviation and capital non-election. The former reflects the change in capital/GDP percentage in the election year relative to the average of the previous years since the last election. The latter is the average of capital/GDP percentage starting with the year after the previous election and excluding the election year of current elections. Moreover, in direct analogy to the first specification, we focus on the ratio of capital/current spending and we split composition term into composition deviation and composition non-election.

Following Kneller et al. (1999) and Drazen and Eslava (2010), our empirical method is based on a full specification of the government budget constraint. Kneller et al. (1999, pp 174-5) show that incomplete specification of the budget constraint results in substantial

¹³ According to the descriptive statistics in the Appendix A, the average of our sample for the variable composition term is 8.183. This means that capital spending is on average 8.183% of the current expenditure.

¹⁴ However, in a few cases where the leader was replaced during the term, we follow the term of the new successor as long as he/she stayed in office for at least two years.

biases in parameter estimates. To address this problem, we want to include in our empirical analysis all elements of the budget constraint but one in order to avoid perfect multicollinearity. Therefore we add in our specification the following fiscal variables: i) the central government's budget surplus/deficit, which according to Brender and Drazen (2008) is positively/negatively related to re-election prospects in developed economies and ii) the central government's total revenues.¹⁵ In accordance to the definition of variables capital and composition, we construct for central government's budget surplus/deficit the variables surplus term, surplus deviation and surplus non-election. Similarly for total revenues we construct the variables revenues term, revenues deviation, and revenues non-election. Fiscal variables surplus and revenues are scaled to GDP and expressed as percentages.

Apart from the fiscal variables, we include in our estimations the following political and socio-economic control variables that we expect to affect re-election prospects:

(i) Macroeconomic conditions: We control for a number of macroeconomic variables that, according to the relevant literature, are expected to affect voting behaviour (see, e.g., Peltzman (1992); Alesina and Rosenthal (1995), Brender and Drazen (2008); Aidt et al. (2011) and Alesina et al. (2012)). These are the average growth rate of output (growth term), the average inflation rate (inflation term), and the average unemployment rate (unemployment term) during the term in office. Our data for growth term and inflation term are taken from the World Bank's World Development Indicators, while those for unemployment term are from the OECD Labour Force Statistics.¹⁶

(ii) New democracy effect: Based on the approach of Brender and Drazen (2005), we consider as elections held in a 'new democracy' the first four elections after a shift to a democratic regime, indicated by the first year of a string of uninterrupted positive polity values as obtained from the POLITY IV annual time series. We expect that in 'new democracies', the first period after the transition to a democratic regime may be characterized by underdeveloped democratic institutions that may lead to an incumbency advantage (e.g., limited media independence).¹⁷

¹⁵ In order to avoid perfect multi-collinearity, we omit current expenditures from our specification but our results remain the same if we omit revenues instead. Regarding the interpretation of the results, the estimated coefficient on the fiscal variable measures the marginal impact of this variable on re-election prospects, net of the marginal impact of the fiscal variable that we exclude from the specification and is assumed to be the financing element. This implies that current expenditures are the financing element in columns (1) and (2) and total expenditures in columns (3) and (4).

¹⁶ It is worth noting that the macroeconomic variables do not seem to display problematic correlations. In addition, when the variable growth term, which does not affect re-election prospects, is dropped from the specification, the results remain unaffected.

¹⁷ We included Greece, Portugal, and Spain in our sample, because we did not want to reduce its already small size. However, when we drop these countries from our estimations, our qualitative results remain unaffected.

(iii) *Level of “voter awareness”*: A large body of theoretical literature agrees that electoral accountability depends positively on the level and the quality of the information available to voters (Persson and Tabellini (2000); Besley and Prat (2006); Pande (2011)). Several recent empirical studies use the educational background of the population as a proxy for “voter awareness”, meaning the ability of electorate to process available information that comes with education (see, among others, Akhmedov and Zhuravskaya (2004); Aidt et al. (2011)). We expect that this ability may have an impact on voters’ evaluation of government’s policies thereby affecting the incumbent’s re-election prospects. We proxy “voter awareness” with the illiteracy rate among the population aged 15 years old and above obtained by Barro and Lee (2010).

(iv) *Cabinet characteristics*: In order to check whether cabinet ideology actually matters for re-election, we create the dummy variable *left* (*right*) that receives the value 1 if the share of seats in the cabinet for left (*right*) wing parties is larger than 66.6 percent. Moreover, we create the dummy variable *centre* that takes the value 1 if the share of seats in the cabinet for centrist parties is higher than 50%, or if we have right-centre or left-centre complexion where the centre party holds more than 33.3 percent of the seats. Additionally, we create the dummy variable *fragmentation* that takes the value 1 when left and right parties form a government that is not dominated by one side or the other.¹⁸ Finally, we create the dummy variable *coalition* that takes the value of 1 if the cabinet includes ministers from more than one party and 0 otherwise. Data for the type of government and on cabinet composition are taken from Armingneon et al. (2008). We expect that coalition governments, irrespective of ideological orientation or fragmentation, are more likely to face internal issues that can adversely affect the re-election prospects of the chief executive in power.

(v) *European Union effect*: Finally, we include in our estimations the dummy variable *EU* that receives the value 1 for the period 1993-1999 for countries that are European Union members and signed the Maastricht treaty. For Austria, Finland, and Sweden that become members of the European Union on January 1, 1995, it takes the value of 1 for the period 1995-1999. Note that the period after the adjustment of ERM bands and before the establishment of the Euro-area was characterized by EU member states’ efforts to comply with the convergence criteria. This effort included a process for extensive structural reforms

¹⁸ In addition, we have also borrowed from Keefer (2012) variable *govfrac* and from Henisz (2000) variable *h_polcon3* to control for party and legislative fragmentation, respectively. Both variables were found insignificantly related to re-election prospects and therefore, they are not included in the specification

and fiscal consolidation. Thus, this variable may capture the impact of the countries' efforts to adopt the Euro on the incumbent's re-election prospects.

A complete list of all variables used in our estimations with details on data sources and descriptive statistics is provided in Appendix A. Moreover, Appendix B depicts a correlation matrix for the right-hand-side variables of our main specification in Table 1. It is worth noting that in general our fiscal variables are not very highly correlated.

Furthermore, it should be mentioned that we have attempted to include in our model a series of other control variables, such as the percentage of votes the incumbent received in the previous election, dummies to control for majoritarian vs. proportional systems, and presidential vs. parliamentary governments as well the number of terms the incumbent chief executive has been in office. However, none of these variables had a significant effect on re-election prospects, and in order to preserve degrees of freedom, we do not include them in our estimations.¹⁹

Given that our dependent variable is binary, we have to apply a non-linear estimator to model the determinants of re-election. We prefer the logit rather than the probit estimator because it allows us to obtain consistent estimates through a fixed effects-like approach as implemented by Chamberlain (1980). Before proceeding to the estimations, we compare the pooled logit estimator, the panel random effects logit estimator and the conditional (fixed effects) logit estimator in the following ways: First, we apply a likelihood ratio test to compare the random effects estimator with the pooled logit. According to the results, we cannot reject the null hypothesis that all slope coefficients are simultaneously equal to zero. Second, we compare the conditional with the pooled logit estimator using a Hausman test. The test statistic resulted in very small or negative values. Small values support the pooled estimator, whereas negative values indicate that the sample size is insufficient to test the hypothesis. Finally, it is worth noting that in our panel the number of cross-sections exceeds the number of time units, which implies the pooled logit model is more efficient, since it requires fewer parameters to be estimated in comparison with a random effects or a fixed effects model.²⁰ Therefore, we have decided to use the pooled logit as our basic specification, where standard errors are robust to both heteroskedasticity and possible autocorrelation

¹⁹ Note that including these additional control variables in our specification does not change our basic findings. Results are available upon request.

²⁰ We have also attempted to include GDP per capita in our specification in order to capture possible heterogeneity between countries. For example, a government's re-election probability may depend on the financial wealth of the country. GDP per capita turns out to be insignificantly related to re-election prospects and we decided to exclude it from the specification. We do, however, test the robustness of our results in the presence of country heterogeneity by including fixed effects in section 3.2.

within countries.²¹ In order to test the robustness of our results to the presence of fixed effects capturing heterogeneity across countries, in section 3 we re-estimate our baseline regressions using the conditional (fixed-effects) logit estimator.

2.2. Results

In Table 1, we examine the effect of capital expenditures and the composition of public expenditures on the probability of re-election. Regarding the macroeconomic variables, we observe that the variable growth term is insignificantly related to re-election prospects in all regressions, while the variable inflation term produces results that indicate a robust negative effect on the probability of re-election. These results seem to verify the previous studies of Alesina et al. (1998) and Brender and Drazen (2008), who found that voters dislike inflation while the growth rate does not seem to affect re-election prospects. In general, studies for developed countries are contradictory regarding the effect of the growth rate of output on voting behaviour (see, e.g., Alesina and Rosenthal (1995)). As far as the variable unemployment term is concerned, it turns out to be insignificantly related to re-election, in line with most empirical evidence (see, e.g., Peltzman (1992); Aidt et al. (2011) and Alesina et al. (2012)).

Variable illiteracy term is positive when statistically significant, reflecting that the ability of the electorate to process available information can affect the incumbent's re-election prospects. A possible explanation for this result is that the incumbent may have an advantage in informing the voters, which may decrease with the level of voters education/sophistication. Milligan et al. (2004) looking at the US and the UK find that more educated citizens appear to have more information on candidates and campaigns. Our result may reflect that less educated voters may rely more on a narrower set of sources of information influenced by the incumbent (e.g., the "popular" media). The same may be true for less "experienced" voters, which may explain the positive and statistically significant coefficient of the variable new democracy in the majority of specifications in Table 1.²² The transition period to a democratic regime may be complemented by an incumbency advantage due to a lower level

²¹ Pooled probit equations, though, yielded very similar qualitative results.

²² It is reasonable to expect that in new democracies illiteracy rates are higher. In fact, as can be seen in Appendix B, variables new democracy and illiteracy term are highly correlated. However, they both seem to affect re-election prospects and when we drop one variable at a time the results remain unaffected. Thus, we decided to keep both variables in the specification as they may reflect different characteristics of the electorate. The former reflects the electoral responses of inexperienced voters, and the latter the electoral responses of voters with higher illiteracy rate. Both characteristics may lead to a similar voting behaviour. Of course, it is meaningful to expect a multiplicative effect for illiterate voters in new democracies. It is worth noting, however, that when we interact these two variables the effect is insignificant. Moreover, when we interact these variables with the fiscal variables of interest, again the interaction terms are statistically insignificant.

of political competition since it may take time to safeguard democratic principles (e.g., freedom of press) and to transform the political system (e.g., number of political parties). For example, Keefer (2007) argues that, in younger democracies, political competitors are not able to make broadly credible pre-electoral promises to voters.²³

Regarding the government's ideology, we obtain a positive but insignificant coefficient for the variable left, indicating that the probability of success is identical between left-wing and right-wing governments (omitted category). The centre variable is negative and insignificantly related to re-election prospects in Table 1. Although, in some other (unreported) specifications centre seems to have a negative effect on re-election, this effect is not robust. Moreover, variable fragmentation is negative and significantly related to re-election prospects. This finding may reflect that ideologically fragmented governments are more likely to face internal issues that can deteriorate the re-election prospects of the chief executive in power. The coalition variable, on the other hand, is insignificantly related to re-election prospects.²⁴ Finally, we find that the probability of re-election is significantly lower for the European Union members in the pre-EMU era after the enforcement of the Maastricht treaty. The efforts of this group of countries to implement structural reforms before the adoption of the common currency may have proven detrimental for the chief executives in power.

Table 1 here

Turning now to the effect of fiscal performance over the whole term in office on re-election prospects, in column (1) we find that the coefficient of capital expenditure is marginally insignificant, while surplus term is positive and significant at the 10% level. This result indicates that an increase of 1 percentage point in budget surplus as a share of GDP over the whole term in office can improve the chances of re-election by about 2.6 percentage points. On the contrary, in column (3) we find that all fiscal variables are insignificantly related to the probability of re-election.

²³ Besley and Part (2006) develop a model that allows for the possibility that the incumbent can influence the media through promises and threats. Their empirical evidence indicates that the length of the term of the chief executive or the party depends on media characteristics. Prior (2006) shows that the growth of television contributed to the rise in the incumbency advantage in U.S. through its effect on less-educated voters for whom television presented a new, less demanding source of news.

²⁴ The variable coalition seems to be negatively and significantly related to re-election prospects only in the absence of the variables that capture the ideological orientation of the cabinet. In particular, when we drop the variable fragmentation, the coefficient of the variable coalition is more than doubled. This is an indication that these two variables are two sides of the same coin. However, we choose to keep the variable coalition in our specification because it depicts a significant relation with the vote share specification in section 4.

As a next step, in columns (2) and (4) we split all fiscal variables in order to disentangle the electoral effect of fiscal policy (fiscal variable deviation) versus the effect of fiscal policy prior to the election year (fiscal variable non-election). As can be seen in columns (2) and (4), electoral policies that affect public investment expenditures (capital deviation) or the composition of public spending between capital and current expenditures (composition deviation) do not affect re-election prospects. Existing empirical evidence for the same sample of countries suggests that capital expenditures decrease during the election period (see Katsimi and Sarantides (2012)).²⁵ This finding indicates that an electoral fall in capital expenditure does not affect voting behaviour. This result may be attributed to a time-lag in the visibility of this type of expenditure during the election period. Capital expenditures (e.g., infrastructure) are mostly long-term projects that will increase voters' utility upon completion. Likewise, a change in the expenditure composition initiated by the fall in capital expenditure may not affect voting behaviour, because this cut may not be visible in the election period. On the contrary, the variables capital non-election and composition non-election, which capture policies prior to the election year, are positive and significantly related to re-election.²⁶ More specifically, an increase of 1 percentage point in capital non-election (composition non-election) can increase the probability of re-election by 13.8 (3.0) percentage points.²⁷

Our results indicate that the timing of public capital spending is important for incumbent's re-election: although both term average public investment as well as its level in the election year does not seem to affect voting behaviour, capital spending in the years before the electoral period does affect re-election probability. This implies that an incumbent who wishes to maximize his re-election prospects should frontload public spending; he should spend on capital as soon as he is elected in order to allow for a sufficient period for this spending to be materialized and probably observed by voters while he should lower

²⁵ As already mentioned, in the full specification of the budget constraint that we adopt, we choose as the omitted variable current expenditures but our results remain essentially the same if the omitted variable is total revenues.

²⁶ A Wald test for the equality of coefficients between the variable capital (composition) deviation and capital (composition) non-election in columns (2) and (4) of Table 1 is performed. The value of the Wald test rejects the null of equal coefficients of variables capital (composition) deviation to the coefficient of capital (composition) non-election; the p-values are 0.09 and 0.10 for variables capital and composition, respectively.

²⁷ We tested if our results are driven by outlier observations using two different approaches. First, we re-estimated our baseline model after dropping one country at a time. Second, we applied the method implemented by Hadi (1992). This method measures the distance of data points from the main body of data and then iteratively reduces the sample to exclude distant data points. We set the significance level for outlier cut off at $p=0.1$. Results suggest 2 outlier observations for the variables capital deviation, composition deviation, deficit deviation, revenue deviation, and 4 outlier observations for variable composition term and composition non-election. However, if we either drop one country at a time or all identified outlier observations simultaneously, our qualitative results remain unaffected.

capital spending in the final year of his term, when this type of spending is not rewarded by voters.

Regarding the effect of total revenues and budget balances on re-election prospects, the former, irrespective of the timing during the term in office, has no effect on the probability of re-election.²⁸ On the contrary, and in line with the findings of Brender and Drazen (2008), we find that in developed economies, voters dislike deficits and even more so if the deficit is perceived as electorally motivated. More specifically, in column (2) we observe that a decrease of 1 percentage point in surplus non-election leads to a decrease of about 3.9 percentage points in the chances of re-election. The impact of a deficit creation in the election period is punished more heavily: a decrease of 1 percentage point in surplus deviation leads to a decrease of about 7.7 percentage points in the chances of re-election. Accordingly, Brender and Drazen (2008) showed that an increase of 1 percentage point in the central government deficit can decrease the probability of re-election by 3-5 percentage points, whereas an increase of 1 percentage point in the deficit during an election year decrease the probability of re-election by 7-9 percentage points.²⁹

3. Robustness

The main finding of the previous section is that, although voters seem to reward a high level of public investment in the non-election years, a deviation in capital expenditure from this level in the election year does not affect voting behaviour. In this section we want to test the robustness of this result in the following ways: First, in Table 2 we re-estimate our regressions by including capital expenditures and the composition of spending only for the election year. Second, in Table 3 we conduct a battery of robustness checks on our main regressions in columns (2) and (4) of Table 1, where we distinguish between electoral and pre-electoral effects of fiscal policies. More specifically, we check if our results are affected by the inclusion of country fixed effects. Moreover, we test if our results remain the same when we adjust for the timing of elections. Furthermore, we modify the definition of the dependent variable to follow more explicitly the party rather than leader re-election. Finally,

²⁸ It should be noted that the qualitative results remain essentially the same after dropping revenues from our regressions.

²⁹ Although the GFS does not provide data after 1999 for our main variables of interest which are capital and composition, we applied the approach of Gemmell et al. (2007) and Katsimi and Sarantides (2012), in order to expand our sample to 2011 for all other variables. Our results indicate that all macroeconomic variables are correctly signed and are significantly related to re-election prospects. Moreover, the variable illiteracy term becomes insignificant. Regarding the fiscal variables, results remain similar to those presented in Table 1 apart from the impact of the variable surplus deviation which remains positive and significantly related to re-election prospects only when our sample ends in 2007. When we include the period of the financial crisis during which fiscal deficits increased substantially for many countries, our results do not show a negative effect of deficit creation in the election period on the probability of re-election probably because deficit creation in this period was not perceived as the result of electoral manipulation (results available upon request).

we distinguish between coalition and single-party cabinets, and we re-estimate our baseline specification only for the latter. Due to space limitation only fiscal variables are reported in Table 3.³⁰

3.1. The level of fiscal policy and macroeconomic conditions around elections

Following previous studies, in our baseline specification in order to capture the electoral effect of fiscal performance we use the deviation of election year value from the average value of non-election years (see Veiga and Veiga (2007); Sakurai and Menezes-Filho (2008)). According to the literature, the change rather than the level of fiscal policy variables reflect better the impact of the incumbent on policy outcomes (see Brender and Drazen (2008)). However, in Table 2 we test if including the level rather than the deviation of fiscal variables in the election year affects our results (see, e.g., Jones et al. (2012)). Moreover, we test if controlling for the impact of the macroeconomic variables in the election year may affect the re-election prospects. We run the regressions including the level of fiscal and macroeconomic variables in the election year, and not their term average or their non-election years average for two reasons. First, when we calculate the average for the whole term in office, we include the value of the election year. Second, the value of fiscal and macroeconomic variables in the election year is highly correlated with the average in the previous years of the term, which can significantly distort the results. Hence, in columns (1) and (2) of Table 2, we re-run the regressions of columns (1) and (3) of Table 1, including the value of fiscal and macroeconomic variables in the election year rather than the average value of the whole term.

Table 2 here

As can be seen in Table 2, the level of public investment expenditures in the election year, namely the variable capital, has no significant impact on re-election prospects. The same holds also for the variables revenues and composition. However, in accordance with our previous findings, the variable surplus affects significantly the probability of re-election. Regarding macroeconomic conditions, once again only the inflation rate has a significant negative impact on re-election prospects. Moreover, as far as the other control variables are

³⁰ The full set of results is available upon request.

concerned, the qualitative results presented in Table 2 remain very similar to those depicted in columns (1) and (3) of Table 1.

3.2. Country fixed effects

As already mentioned, the specification tests that we performed and the characteristics of our panel induce us to use the pooled logit model as our basic specification. However, we want to exclude the possibility that the results presented in Table 1 are driven by country specific characteristics. Regarding our main variables of interest, if the share of investment expenditures over GDP differs systematically between countries, and those countries with higher shares of investment expenditures have more stable governments, then this would certainly influence the estimation results. Therefore, in this sub-section we want to assess the robustness of our results by introducing country fixed effects in our estimations. To do that we apply the conditional logit model as proposed by Chamberlain (1980), which is the only non-linear estimator designed for binary models, as in our case, which allows obtaining consistent estimates through a fixed effects-like approach.³¹

As can be seen in the first two columns of Table 3, the inclusion of fixed effects does not alter the statistical significance of our main variables of interest. More specifically, capital deviation and composition deviation remain insignificant, capital non-election is significant close at the 1% level, whereas variable composition non-election is significant at the 10% level. Moreover, as before, variables surplus deviation and surplus non-election have a statistically significant effect on re-election prospects.

3.3. The timing of elections

Regarding the timing of elections, the first check we perform is to exclude ‘early’ elections from our sample, since they can introduce an important bias in our results. As argued by Heckelman and Berument (1998), the timing of elections may not be exogenous but is chosen strategically by the incumbent when economic conditions and the re-election probability are favourable, raising issues of a reverse causation in our specification. Moreover, Rogoff (1990) argues that, during predetermined elections, opportunistic incumbents have ample time to use fiscal policy in order to increase re-election probabilities, far greater than in the case of elections being called earlier. Consistent with that theoretical prediction, Katsimi and

³¹Two issues are worth noting here. First, the conditional logit estimator drops observations for Finland and France, because the re-election variable shows no variation. Second, we report logit coefficients in columns (1) and (2) of Table 3 instead of marginal effects, because the latter could not be estimated with respect to the fixed effect specification.

Sarantides (2012) found that, only during predetermined elections, incumbents reduce capital expenditures and shift the composition of expenditures towards public investment. Hence, in line with Brender and Drazen (2005), we look at the constitutionally determined election interval, and we keep in our sample those elections that are characterized as predetermined and are held during the expected year of the constitutionally fixed term. As can be seen in column (3) of Table 3, excluding early elections does not affect the statistical significance of the variable capital non-election. More precisely, we observe that an increase of 1 percentage point in capital non-election leads to an increase of about 11.9 percentage points in the chances of re-election during predetermined elections. Although the value of the coefficient of composition non-election in column (4) increases compare to the one reported in Table 1, it becomes marginally insignificant. However, this result seems to be driven by the cases of the predetermined elections where the leader does not spent the whole term in office.³² Variable surplus loses its significance during predetermined elections. This is in direct analogy with Brender and Drazen (2008), who also find that in predetermined elections their result that voters punish election and pre-election year deficits in old democracies is not robust.³³

One could further argue that an endogeneity bias can arise if an incumbent certain of winning by a large margin may not manipulate expenditure, as in the case of a close race. However, this source of endogeneity may not be important, since on the one hand, it is not obvious why a strategy that helps re-election will only be followed by unpopular incumbents (see Brender (2003)), and, on the other hand, even incumbents who are certain about their re-election will still have an incentive to increase the number of the Parliament seats for their party (see Veiga and Veiga (2007)).

³²It is worth noting that when we keep in the sample only the cases of the predetermined elections where the leader spent the whole term in office, coefficient of the variable composition non-election appears statistically significant whereas the coefficients of the variables capital non-election and composition non-election increase beyond the level of those depicted in Table 1. Moreover, when we attempt to capture the long term effect of public investment on re-election probability by including public investment in the first year of the term in office, our results indicate a positive impact of the initial public investment on the probability of re-election. Results available upon request.

³³ An alternative approach to test for the impact of early elections, without however addressing the endogeneity issues, is to interact a dummy variable for early elections with the fiscal variables. In order to avoid the complications of interaction terms in non-linear models, we follow the approach of Ai and Norton (2003) which encompasses not only statistical procedures but also graphical presentations. The graphical presentation of the interaction term is extremely useful, because, according to the authors, the interaction effect depends on other covariates and it can vary widely in sign and size, making the average value generated by their statistical procedure not reliable in many instances. Given that we have only 106 observations we can only rely on the average value of the interaction term. When we apply the proposed statistical procedure to variables capital and composition, our results, available upon request, indicate a significant and negative coefficient for the interaction term on the capital non-election variable. This implies that in early elections the impact of capital spending in the non-election period on the re-election probability is lower, which is consistent with the interpretation of the results presented in this section.

Another form of endogeneity bias is that a known change in political majority may affect public spending if the incumbent has different preferences over the level or the composition of public spending than the opposition (see, among others, Persson and Svensson (1989); Alesina and Tabellini (1990); and Milesi-Ferretti and Spolaore (1994)). In our case, an incumbent with low popularity and a higher relative preference for current expenditure than his opponent may raise this type of expenditure at the expense of capital spending. Following Brender (2003), we attempted to minimize the possibility of an endogeneity bias in the following ways: First, we tried to mitigate the effect of popularity on public spending by controlling for the share of votes received in the previous elections. The inclusion of this variable has no impact to our results and its coefficient is statistically insignificant in every specification. Therefore, we exclude it from our specification. Moreover, by looking at the data, we found very weak evidence suggesting that the most unpopular incumbents adopted the largest cuts in public spending before elections in order to improve their popularity. More specifically, in the case of single-party governments, we found that, among the incumbents that decreased the capital to current expenditure ratio by the largest amount, the highest percentage (55%) belonged in the middle of the distribution, according to the share of votes they received, while 15% belonged in the upper quartile and 30% in the bottom quartile of our sample.³⁴

Finally, one very important issue concerns the specific dates that elections took place during the term in office. More specifically, in our specification the term in office starts after the year that elections took place, and finishes in the election year of the end of the term. However, one might argue that if the election was held in January, the newly elected government can influence next year's expenditures, while if elections were held later in the year, the incumbent may not had enough time to affect fiscal policy instruments. In order to deal with this problem to the degree possible, we adjust our specification to take into account whether elections took place in the first or in the second half of the year (see Vergne (2009)). More specifically, if the election took place in the first half of the year, we define as election year the year before the election. Alternatively, if the election took place in the second half of the year, we define as election year the year of the election. For example if an election took place in January 1990 and the next election in December 1993, in the new specification the term is defined as the 1990-1993 period. On the contrary, if an election took place in

³⁴ We restrict our attention to single party incumbents since in coalition governments, the expected difference in the preferences between the party in power and the opposition party is less clear. Moreover, ranking incumbents according to popularity is more meaningful in single party governments since the share of votes received by the incumbent is in this case better comparable between countries.

December 1990 and the next election in January 1993, the term is defined as 1991-1992. In columns (5) and (6) of Table 3, we estimate regressions (2) and (4) of Table 1 after re-adjusting our sample for this new definition of term and election year. As can be seen, the qualitative results for fiscal variables capital and revenues are in line with those depicted in Table 1. Once again, the effect of variable surplus becomes weaker.

Table 3 here

3.4. Party vs. leader re-election

The definition of the re-election variable in our baseline specification, which is broadly consistent with the definition of Brender and Drazen (2008), is restricted in order to follow the leader of the party in power until the election year. Although, in that way the re-election variable allows for a clearer relationship between the leader and his/her policies, it does not allow for a broader relationship between the party and its policies. Hence, at this point we set the value of the re-election variable equal to 1 if the newly elected president/prime minister is from the same party as the predecessor, irrespective of whether his predecessor quits in the election year for whatever reason. As expected, in some cases the values of the two key political variables deviate. Hence, when the leader in office resigns within the year of election variable leader re-election takes value 0, while party re-election takes value 1 if the successor leader comes from the same party and gets re-elected. By following parties that have been in office for at least 2 years we have 115 campaigns in which the party in power was re-elected in 71 cases. It is worth noting that the term in office is adjusted from appointment to termination of parties rather than of individual leaders.

In columns (7) and (8) of Table 3, results for the variables capital and composition and revenues are in line with those depicted in Table 1. Party re-election does not seem to be affected by the level of deficit in the non-election year although our previous results indicate that voters punish the leader of the party for a rise in deficit in the election year. This could reflect the fact that when the leader in office resigns within the year of election and the successor leader comes from the same party (variable leader re-election takes value 0, while party re-election takes value 1) voters are more lenient in judging the policy choices of the successor leader who has been in power for only a few months. The same holds for the variable surplus deviation which becomes insignificant in column (7), while it is statistically significant only at the 10% level in column (8).

3.5. Single-party incumbents

Until now, we have included in our regressions observations in which the chief executive can be the leader of a coalition, but also of a single-party government. The final robustness check that we apply in our basic specification is to exclude from our regressions coalition incumbents. Although until now we include a dummy variable to control for this category of incumbents, we perform this check for two reasons. First, because, although our re-election variable takes the value 0 in cases where the leader after the election comes from a different party, this change can simply be a routine personnel replacement in a stable coalition government (see Alesina et al. (2012)). Second, an interesting issue concerning this literature is that coalition governments can be more heterogeneous and ‘vulnerable’ than single-party governments (see, e.g., Alesina et al. (1997)), and as a consequence, they adopt different fiscal policies raising issues of reverse causation in our specification (see, e.g., Roubini and Sachs (1989); Perotti and Kontopoulos (2002)). Although when we drop coalition incumbents from our estimations we are left with only 52 observations, given the issues related to coalition incumbents, we find essential to follow the terms of individual leaders in office only for the cases of single-party governments.

In columns (9) and (10) of Table 3, results indicate an even stronger connection running from the variables capital/composition non-election to re-election prospects. More precisely, we observe that an increase of 1 percentage point in capital non-election (composition non-election) improves the probability of re-election by about 20.8 (4.2) percentage points. Once again, the variable revenues is insignificantly related to re-election prospects, whereas the variable surplus loses its significance.³⁵

Concluding, the results of all robustness tests reported in Tables 2 and 3 indicate that our basic results concerning the impact of public investment on an incumbent's re-election chances are robust to a wide variety of different specifications performed in this section. More specifically, all our results suggest that public investment in the non-election years is rewarded by voters whereas its change, or its level, in the election year does not affect the re-election probability. Moreover, in all specifications the level of revenues in the non-election period as well as the electoral deviation of revenues does not seem to affect re-election prospects. Finally, regarding the impact of deficits there is some very weak evidence for a

³⁵ However, we should bear in mind that the low number of observations does not allow us a safe inference. For instance, although our results for public investment are not sensitive to the inclusion of specific countries, the significance of the coefficient on surplus is particularly affected by the inclusion of Norway in the estimations.

negative impact of deficits on re-election prospects in the non-election years whereas there is mixed evidence about how the change in deficit in the election period affects voting behaviour. Nevertheless, as in Brender and Drazen (2008), we find that in all specifications deficit creation is not rewarded by voters in developed established democracies.

4. The Voting Function

Following previous studies in this area, we have so far examined the impact of fiscal and economic performance on the probability of re-election using binary models (see, among others, Brender (2003); Brender and Drazen (2008); Buti et al. (2010)). Although an important strand of the literature examines the impact of fiscal and economic performance of the vote share received by the incumbent (see, e.g., Peltzman (1992); Chappell and Veiga (2000); Jones et al. (2012)) we chose the binary model as our basic specification in order to be able to compare our results to the literature closest to our paper (see Brender and Drazen (2008)). This set up allowed us to concentrate our attention on the determinants of the probability that the incumbent will be re-elected. Many theoretical models with office motivated politicians assume that incumbents maximize their re-election probability rather than their popularity (see Rogoff (1990); Shi and Svensson (2006); Katsimi and Sarantides (2012)). In the single party government framework assumed in these papers, a rise in the vote share is equivalent to a rise in the re-election probability. However, in the case of coalition governments, the incumbent party may manage to win a larger share of votes compared to previous elections without being able to remain in power due to changes in the others parties' numbers of seats.³⁶ Thus, the binary framework may disregard important information regarding voters' behaviour because, although incumbents can lose votes from one election to another, they can still in some cases get re-elected. The significant advantage of the voting function is its sensitivity to changes in popular support for incumbents (see Veiga (2013)).

Hence, our final step in this study is to investigate the effect of electoral and pre-electoral policies on the vote share of the incumbent. Our dependent variable is the ratio of the number of votes obtained by the incumbent party (or parties in case of coalition incumbents) to the total number of valid votes in the current election. Alternatively, though, we follow only the vote share received by the party of the chief executive in power.³⁷ The

³⁶ In our sample, we have 13 cases where the party of the chief executive gets a larger share of votes, whereas the popularity of the other parties that comprise the coalition government moves the opposite direction. However, in only 3 of these cases (Ireland 1987 and Sweden 1982, 1983) the chief executive was replaced.

³⁷ For the second definition of the dependent variable we have two observations less than for the first definition, because in France the UDR, which was the main incumbent party after the election in 1973, was dissolved in 1976 and did not participate in the election of 1978. Moreover, in Portugal we cannot follow the vote share of the main incumbent party in the

homogeneity of the latter definition can reflect a clearer relationship between fiscal and economic performance with the vote share. Additionally to the control variables we used in the previous specifications, we follow common studies, and we include the vote share obtained by the incumbent party (or parties in case of coalition incumbents) in the previous election.

A drawback of this specification is that the vote share variable is bounded between 0 and 1 and therefore it does not satisfy the classic assumptions of the linear regression model. If we simply use a linear estimation method, the estimated vote shares are not constrained to lie within this interval. However, a simple logistic transformation of the dependent solves this problem, making the dependent variable range from negative infinity to positive infinity, eliminating predictions outside the allowable range (see, e.g., Veiga (2013)). Therefore, we estimate the following equation:

$$\log\left(\frac{\textit{vote share}}{1 - \textit{vote share}}\right) = X\beta + \varepsilon \quad (1)$$

In order to apply this transformation in our estimated equation, we choose to employ two econometric models. First, we consider the fractional logit estimator, as proposed by Papke and Wooldridge (2008). This is a quasi-maximum likelihood method that yields consistent estimates when the dependent variable is bounded between 0 and 1. Second, we use the logistic transformation of the dependent variable in the Ordinary Least Squares estimator including country fixed effects so that to control for factors that remain constant over time.

Estimation results for equation (1) are shown in Table 4. It is worth noting that when we estimate the vote function for the main incumbent party, our results indicate a stronger effect of fiscal and economic performance on the vote share (see the right hand side of Table 4). Indeed, as expected, voters seem to consider the main incumbent party as more responsible for economic policies and react to its decisions more consistently.

For our main variables of interest, capital and composition results are in line with those depicted in the binary specification of the previous section. More specifically, variables capital deviation and composition deviation are insignificantly related to the vote share in all estimations. For the variable capital non-election, especially when related to the main incumbent party, we get a robust positive effect. In columns (5) and (7), the results indicate

election of 1983 because the Social Democratic Party contested together in the election of 1980 with the Democratic and Social Centre and the People's Monarchist Party.

that an increase in capital non-election increases the vote share of the main incumbent party in the pooled and the fixed effect estimation by 1.1 and 1.6 percentage points, respectively. Hence, as expected, average pre-electoral public investment expenditures enhance the popularity of the main incumbent party in the next elections. For the variable composition non-election we get some weak evidence that it is positively related to the vote share of the incumbent.

Table 4 here

Regarding the impact of the remaining fiscal variables on the vote share of the incumbent, revenues are insignificantly related to the dependent variable in all but one estimation in Table 4. These results are consistent with our previous findings using the binary model, where government revenues did not display any relation to the probability of re-election. Moreover, the coefficient of surplus deviation and surplus non-election is statistically insignificant in columns (1)-(4). On the contrary, when the dependent variable is the vote share of the incumbent party, surplus deviation has a statistically significant effect on the vote share in most cases [see columns (5), (6) and (7)]. More specifically, an increase of one percentage point in the deviation of the budget deficit from the average of the previous years of the term, reduces the vote share of the main incumbent part between 0.36 and 0.48 percentage points.

Regarding the set of control variables included in our specifications, we observe that the coefficient for the variable vote share_{t-1} is positive and statistically significant, indicating that governments that received a higher percentage of votes in the previous election, tend to perform better in the subsequent elections (see, among others, Veiga (2013)). With respect to the macroeconomic conditions, although in our previous results the inflation rate was the most important determinant of the probability of re-election, in the voting function this holds for the growth rate of output. Moreover, when we include fixed effects in the estimations, the growth rate of output has a larger effect where we follow the number of votes obtained by the incumbent party (or parties in case of coalition incumbents) in comparison to the specification where we follow only the vote share of the main incumbent party. More specifically, as can be seen in columns (3)-(4) of Table 4, an increase of one percentage point in the average growth rate of output during the term in office enhances the popularity of government parties in the next elections by around 1.8 percentage points. The same variable in columns (7)-(8) of Table 4 increases the popularity of the main incumbent party by around

1.2 percentage points. Regarding the inflation rate and the unemployment rate during the term in office, both variables are statistically significant and have the expected signs when related to the vote share of the main incumbent party in columns (5)–(6). However, when we include fixed effects in the estimations in columns (7) and (8) their statistical significance disappears.

As far as the variable new democracy is concerned, our results contradict the positive impact of 'young' democracy on the re-election chances of the incumbent suggested by the estimation of our binary model in Tables 1 and 2. A possible explanation is that the incumbent parties in 'new democracies' are less established, in comparison to the parties in old democracies, leading to narrower support bases among the electorate. Moving to the variables that capture the ideological orientation/fragmentation of the incumbent, the results do not indicate any robust effect on the vote share of the incumbent. On the contrary, the variable coalition is statistically significant and has a positive sign when related to the vote share of the government party (parties) in columns (1)-(2), though this result disappears when we include fixed effects in the estimations in columns (3)-(4). Nonetheless, when we follow the main incumbent party, results in columns (7)-(8) indicate that its popularity tends to erode in the subsequent elections when it is part of a coalition government. Finally, consistent with our findings in the binary model, we find that the efforts of the European countries in the pre-EMU era to comply with the Maastricht criteria were detrimental to the popularity of the government party (parties) in power.

5. Conclusions

This paper investigates whether electoral manipulation of the level and the composition of fiscal policy could affect re-election prospects. We find evidence that in developed countries that are established democracies, re-election prospects of the incumbent improve with the level of capital spending in the non-election years. On the contrary, a rise in public investment in the election year does not have significant effects on voting behaviour or re-election prospects. These results remain valid if we exclude endogenous elections, if we allow for different definitions of the election year and if we include only single party incumbents. Moreover, they hold for leader re-election as well as party re-election, and are found when estimating both a binary model as well as a voting function.

Voters preferences for capital spending in the years preceding elections in contrast to their indifference about public investment in the election year seems consistent with

Rogoff's (1990) assumption of low visibility of capital spending (e.g., infrastructure) around elections. Capital expenditures are mostly long-term projects that will increase voters' utility upon completion. Capital spending during the non-election years allows for a sufficient period in order for this spending to be observed by voters. This may not hold for public investment in the election year. Our results may reflect this timing characteristic of the visibility of capital spending.

Katsimi and Sarantides (2012) find evidence suggesting that in developed, established democracies public investment falls in the election period. They argue that in the framework of a moral hazard-based political budget cycle model with rational expectations and information asymmetries between voters and policymakers (see, e.g., Persson and Tabellini (2000); Shi and Svensson (2006)) the incumbent has an incentive to shift away from less 'visible' capital expenditure towards more 'visible' fiscal items in order to signal his competence to the electorate. Voters cannot be fooled and they fully expect this behaviour. Our results imply that this type of electoral manipulation will not be punished by voters.

Regarding the political cost of deficit, we obtain similar results to Brender and Drazen (2008) and Alesina et al. (2012) that voters in developed countries do not reward deficit creation. This is consistent with the empirical studies that find no evidence of deficit cycles in these countries (see Katsimi and Sarantides (2012) and Brender and Drazen (2013)). In fact, our results suggest that a 'fiscal irresponsible' behaviour of governments in developed established democracies leading to budget cycles, would not improve their vote share or their re-election prospects. More than that, we find that in some cases decreasing deficits could be an efficient re-election strategy.

Finally, we find that, in line with existing literature, voters dislike inflation whereas there is some rather weak evidence for unemployment aversion. A high illiteracy rate seems to favour the incumbent under all specifications. A possible explanation is that the low level of voters' education may restrict the sources of information they use to those that can be influenced by the incumbent. The impact of a 'young' democracy on the re-election chances of the incumbent is not clear since our results from the estimation of the binary model contradict those obtained by estimating a voting function. In the first period after the transition to a democratic regime, the less-developed democratic structure may imply a lower level of political competition that favours the incumbent but at the same time the incumbent parties may be less established, in comparison to the parties in old democracies, leading to narrower support bases among the electorate.

We also find a decrease in the popularity of governments in the period before the adoption of the Euro, which is reflected both in a fall in the re-election probability and in the vote share. Moreover, although government turnover seems to be the same for left, right or centre governments, ideological fragmented governments seem to face lower re-election chances.

The main implication of our paper is that in developed, established democracies increasing revenue in order to finance public investment and a high capital/current expenditure ratio in the non-election years can increase the incumbent's vote share and improve the probability of re-election. In contrast, voters do not seem to reward capital spending in the election years when deficit decreasing policies may be more efficient in gaining re-election.

References

- Ai, C. & Norton, E. (2003). Interaction terms in logit and probit models, *Economics Letters*, 80(1), 123-129.
- Aidt, S., Veiga, J. & Veiga, G. (2011). Election Results and Opportunistic Policies: A New Test of the Rational Political Business Cycle Model, *Public Choice*, 148 (1-2), 21-44.
- Akhmedov, A. & Zhuravskaya, E. (2004). Opportunistic political cycles: test in a young democracy setting. *Quarterly Journal of Economics*, 119 (4), 1301-1338.
- Alesina, A. (1987). Macroeconomic policy in a two-party system as a repeated game. *Quarterly Journal of Economics*, 102(3), 651-678.
- Alesina, A., Carloni, D., & Lecce, G. (2012). The Electoral Consequences of Large Fiscal Adjustments, NBER Chapters, in: *Fiscal Policy after the Financial Crisis* National Bureau of Economic Research, Inc.
- Alesina, A., Perotti R., & Tavares J. (1998). The Political Economy of Fiscal Adjustments, *Brookings Papers on Economic Activity*, 28(1), 197-248.
- Alesina, A. & Rosenthal H. (1995). *Partisan Politics, Divided Government and the Economy*, Cambridge, UK: Cambridge University Press.
- Alesina, A., Roubini, N., & Cohen G. D. (1997). *Political cycles and the macroeconomy*. Cambridge, MA: MIT Press.
- Alesina, A. & Tabellini G. (1990). A Positive Theory of Fiscal Deficits and Government Debt in a Democracy, *Review of Economic Studies*, 57(3), 403-414.
- Armingeon, K., Gerber, M., Leimgruber, P. & Beyeler, M. (2008): *The comparative political data set 1960-2006*. Berne: institute of political science, University of Berne.
- Barro, R., & Lee, J. (2010): *A New Data Set of Educational Attainment in the World, 1950-2010*, NBER Working Paper No. 15902.
- Besley, T. & Case, A. (1995). Does electoral accountability affect economic policy choices? *Quarterly Journal of Economics*, 110(3), 769-798.
- Besley, T. & Prat, A. (2006). Handcuffs for the Grabbing Hand? Media Capture and Government Accountability, *American Economic Review*, 96 (3), 720-736.
- Bleaney, M., Gemmell N. & Kneller, R. (2001). Testing the endogenous growth model: public expenditure, taxation, and growth over the long run, *Canadian Journal of Economics*, 34(1), 36-57.
- Brender, A. (2003). The Effect of Fiscal Performance on Local Government Election Results in Israel: 1989-1998, *Journal of Public Economics*, 87 (9-10), 2187-2205.
- Brender, A. & Drazen A. (2005). Political budget cycles in new versus established democracies. *Journal of Monetary Economics*, 52(7), 1271-1295.

- Brender, A. & Drazen A. (2008). How do budget deficits and economic growth affect reelection prospects? Evidence from a large panel of countries. *American Economic Review*, 98(5), 2203-2220.
- Brender, A. & Drazen A. (2013). Elections, Leaders, and the Composition of Government Spending, *Journal of Public Economics*, 97, 18-31.
- Buti, M., Turrini, A., Van den Noord, P. & Biroli, P. (2010). Reforms and re-elections in OECD countries, *Economic Policy*, 25(1), 61-116.
- Chamberlain, G. (1980). Analysis of Covariance with Qualitative Data, *Review of Economic Studies*, 47 (1), 225-238.
- Chappell, H. & Keech, W. (2000). The Unemployment Consequences of Partisan Monetary Policy, *Southern Economic Journal*, 55(1), 107-22.
- Chappell, H. & Veiga L. (1988). Economics and Elections in Western Europe: 1960-97, *Electoral Studies*, 19(2-3), 183-198.
- Drazen, A. & Eslava, M. (2010). Electoral Manipulation via Voter-Friendly Spending: Theory and Evidence, *Journal of Development Economics*, 92(1), 39-52.
- Efthyvoulou, G. (2012). Political budget cycles in the European Union and the impact of political pressures. *Public Choice*, 153(3), 295-327.
- Gemmell, N., Kneller, R. & Sanz, I. (2007). Tax composition and economic growth in OECD countries, Mimeo.
- Goodhart, C. & Bhansali, J. (1970). Political Economy, *Political Studies*, 18(1), 43-106.
- Hadi, A. (1992). Identifying Multiple Outliers in Multivariate Data. *Journal of the Royal Statistical Society, Series B*, 54(3), 761-771.
- Heckelman, J. C. & Berument, H. (1998). Political business cycles and endogenous elections. *Southern Economic Journal*, 64(4), 987-1000.
- Henderson, D. & Kumbhakar, S. (2006). Public and Private Capital Productivity Puzzle: A Nonparametric Approach, *Southern Economic Journal*, 73(1), 219-232.
- Henisz, J. (2000). The Institutional Environment for Economic Growth. *Economics and Politics*, 12(1), 1-31.
- Hibbs, D. A. (1977). Political parties and macroeconomic policy. *American Political Science Review*, 71(4), 467-487.
- Hodler, R, S. Loertscher S., & Rohner D. (2010). Inefficient Policies and Incumbency Advantage, *Journal of Public Economics*, 94(9-10), 761-767.

- Jones, M., Meloni, O. & Tommasi, M. (2012). Voters as Fiscal Liberals: Incentives and Accountability in Federal Systems, *Economics and Politics*, 24(2), 135-156.
- Katsimi, M. & Sarantides, V. (2012). Do elections affect the composition of fiscal policy in developed, established democracies, *Public Choice*, 151(1), 325-362.
- Keefer, P. (2007). Clientelism, Credibility, and the Policy Choices of Young Democracies, *American Journal of Political Science* 51(4), 804–821.
- Keefer, P. (2012). Database on Political Institutions: changes and variable definitions, The World Bank.
- Khemani, S. (2004). Political cycles in a developing economy: effect of elections in the Indian states. *Journal of Development Economics*, 73(1), 125-154.
- Klomp, J. & De Haan, J. (2013). Do political budget cycles really exist?, *Applied Economics*, 45(3), 329-341.
- Kramer, G. (1971). Short-Term Fluctuations in U.S. Voting Behavior, 1896–1964. *American Political Science Review* 65(1), 131-143.
- Kneller, R., Bleaney, M. & Gemmell N. (1999). Fiscal policy and growth: evidence from OECD countries. *Journal of Public Economics*, 74(2), 171-90.
- Lewis-Beck, M. & Paldam, M. (2000). Economic Voting: An Introduction, *Electoral Studies* 19 (2-3), 113-121.
- Milesi-Ferretti, G.M. & Spolaore, E. (1994). How Cynical can an incumbent be? Strategic policy in a model of government spending. *Journal of Public Economics*, 55(1), 121-140.
- Milligan, K., Moretti, E., & Oreopoulos, P. (2004). Does education improve citizenship? Evidence from the U.S and the U.K., *Journal of Public Economics*, 88 (3), 1667–1695.
- Mueller, J. (1970). Presidential Popularity from Truman to Johnson, *American Political Science Review*, 64(1), 18-33.
- Nannestad, P. & Paldam, M. (1994). The VP-function: a survey of the literature on vote and popularity functions after 25 years. *Public Choice*, 79 (3-4), 213–245.
- Nordhaus, W. D. (1975). The political business cycle. *Review of Economic Studies*, 42(2), 169-190.
- Norpoth, H., Lewis-Beck, M.S., Lafay, J.-D. (Eds.), 1991. *Economics and Politics: The Calculus of Support*. University of Michigan Press, Ann Arbor, MI.
- Paldam, M. (1981). A preliminary survey of the theories and findings on vote and popularity functions, *European Journal of Political Research*, 9(2), 181-199.
- Papke, L. & Wooldridge, M., (2008). Panel data methods for fractional response variables with an application to test pass rates, *Journal of Econometrics*, 145(1-2), 121-133.

- Pande, R. (2011). Can Informed Voters Enforce Better Governance? Experiments in Low-Income Democracies, *Annual Review of Economics*, 3(1), 215-237.
- Paul, S., Sahni, B. & Biswal, B. (2004). Public Infrastructure and the Productive Performance of Canadian Manufacturing Industries, *Southern Economic Journal*, 70(4), 998-1011.
- Peltzman, S. (1992). Voters as fiscal conservatives. *The Quarterly Journal of Economics*, 107(2), 327-361.
- Persson, T. & Svensson, L. (1989). Why a Stubborn Conservative would Run a Deficit: Policy with Time Consistent Preferences, *Quarterly Journal of Economics*, 104(2), 325-345.
- Persson, T. & Tabellini, G. (2000). *Political economics: Explaining Economic Policy*, MIT Press, Cambridge, MA.
- Perotti, R., & Kontopoulos, Y. (2002). Fragmented Fiscal Policy. *Journal of Public Economics*, 86(2), 191-222.
- Potrafke, N. (2011). Does government ideology influence budget composition? Empirical evidence from OECD countries, *Economics of Governance*, 12 (2), 101-134.
- Prior, P. (2006). The Incumbent in the Living Room: The Rise of Television and the Incumbency Advantage in U.S. House Elections. *Journal of Politics*, 68(3), 657-673.
- Rogoff, K. (1990). Equilibrium political budget cycles. *American Economic Review*, 80(1), 21-36.
- Roubini, N. & Sachs J. (1989). Government Spending and Budget Deficits in the Industrial Economies, NBER Working Papers 2919.
- Sakurai, S. & Menezes-Filho, N. (2008). Fiscal policy and reelection in Brazilian municipalities. *Public Choice*, 137(1), 301-314.
- Schuknecht, L. (1996). Political business cycles and fiscal policies in developing countries. *Kyklos*, 49(2), 155-170.
- Schuknecht, L. (2000). Fiscal policy cycles and public expenditure in developing countries. *Public Choice*, 102(1-2), 115-130.
- Shi, M., & Svensson J. (2003). Political Budget Cycles: A Review of Recent Developments, *Nordic Journal of Political Economy*, 29, 67-76.
- Shi, M., & Svensson J. (2006). Political budget cycles: do they differ across countries and why? *Journal of Public Economics*, 90(8-9), 1367-1389.
- Veiga, L. (2013). Voting functions in the EU-15, *Public Choice*, 157(3-4), 411-428.
- Veiga, L. & Veiga, F. (2007). Does opportunism pay off?, *Economics Letters*, 96(2), 177-182.

Vergne, C. (2009). Democracy, elections and allocation of public expenditures in developing countries. *European Journal of Political Economy*, 25(1), 63-77.

Appendix A. Data sources and descriptive statistics

Variable	Obs.	Mean	Std.dev.	Min	Max	Source
leader re-election	106	0.547	0.500	0	1	"World Statesmen" encyclopedia, (WSe)"Inter-Parliamentary Union(IPU)" database
party re-election	115	0.617	0.488	0	1	WSe and IPU
votes share	105	0.447	0.085	0.160	0.711	IPU
vote share (main party)	104	0.359	0.091	0.160	0.588	IPU
capital	106	2.608	1.389	0.320	6.744	Global Development Network Growth Database (GDNGD)
capital term (L)	106	2.673	1.345	0.416	6.734	GDNGD
capital deviation (L)	106	-0.093	0.371	-1.266	0.985	GDNGD
capital non-election (L)	100	2.707	1.383	0.430	6.987	GDNGD
capital deviation (L adjusted)	100	-0.103	0.432	-1.129	1.344	GDNGD
capital non-election (L adjusted)	100	2.707	1.383	0.430	6.987	GDNGD
capital deviation (P)	115	-0.068	0.386	-1.266	0.985	GDNGD
capital non-election (P)	115	2.690	1.333	0.416	6.734	GDNGD
composition	106	7.872	4.398	1.300	25.300	GDNGD
composition term (L)	106	8.183	4.374	1.800	25.900	GDNGD
composition deviation (L)	106	-0.442	1.022	-3.400	3.400	GDNGD
composition non-election (L)	106	8.316	4.397	1.700	26.300	GDNGD
composition deviation (L adjusted)	100	-0.513	1.238	-4.700	3.400	GDNGD
composition non-election (L adjusted)	100	8.374	4.499	1.700	26.300	GDNGD
composition deviation (P)	115	-0.451	1.047	-3.400	3.400	GDNGD
composition non-election (P)	115	8.729	4.947	1.700	26.500	GDNGD
surplus	106	-4.144	4.365	-21.317	5.308	GDNGD
surplus term (L)	106	-4.122	3.929	-14.565	4.874	GDNGD
surplus deviation (L)	106	-0.058	2.491	-9.002	6.390	GDNGD
surplus non-election (L)	106	-4.086	3.972	-12.935	5.403	GDNGD
surplus deviation (L adjusted)	100	0.028	2.701	-9.127	6.390	GDNGD
surplus non-election (L adjusted)	100	0.028	2.701	-9.127	6.390	GDNGD
surplus deviation (P)	115	-0.182	2.566	-9.002	6.390	GDNGD
surplus non-election (P)	115	-4.042	3.844	-12.935	5.403	GDNGD
revenues	106	33.051	8.913	9.633	51.004	GDNGD
revenues term (L)	106	33.018	8.875	10.249	51.520	GDNGD
revenues deviation (L)	106	0.038	1.730	-8.483	5.144	GDNGD
revenues non-election (L)	106	33.014	8.923	10.557	51.692	GDNGD
revenues deviation (L adjusted)	100	0.162	2.022	-11.079	5.144	GDNGD
revenues non-election (L adjusted)	100	33.035	8.969	10.557	52.016	GDNGD
revenues deviation (P)	115	0.104	1.705	-8.483	5.144	GDNGD
revenues non-election (P)	115	32.462	9.306	9.799	51.692	GDNGD
growth	106	2.989	2.472	-6.244	11.680	World Bank Development indicators (WDI)
growth term (L)	106	2.683	1.556	-1.019	8.832	WDI
growth term (P)	115	2.800	1.549	-1.019	8.832	WDI
inflation	106	6.613	5.185	-0.136	25.106	WDI
inflation term (L)	106	7.246	5.146	0.284	24.318	WDI

inflation term (P)	115	7.285	5.178	0.373	24.318	WDI
unemployment	106	7.603	4.326	0.670	22.776	OECD Labour Force Statistics
unemployment term (L)	106	7.379	4.242	0.479	23.095	OECD Labour Force Statistics
unemployment term (P)	115	6.584	3.778	0.502	18.455	OECD Labour Force Statistics
new democracy (L)	106	0.075	0.265	0	1	Polity IV project
new democracy (P)	115	0.087	0.283	0	1	Polity IV project
illiteracy	106	4.398	6.260	0.100	34.300	Barro and Lee (2010)
illiteracy term (L)	106	4.472	6.399	0.100	34.300	Barro and Lee (2010)
illiteracy term (P)	115	4.556	6.629	0.100	34.300	Barro and Lee (2010)
left (L)	106	0.302	0.461	0	1	Armingeon, K., et. al. (2008). Comparative Political Data Set I (CPD I)
left (P)	115	0.304	0.462	0	1	CPD I
centre (L)	106	0.321	0.469	0	1	CPD I
centre (P)	115	0.322	0.469	0	1	CPD I
fragmentation (L)	106	0.113	0.318	0	1	CPD I
fragmentation (P)	115	0.096	0.295	0	1	CPD I
fragmentation (L)	106	0.321	0.469	0	1	CPD I
fragmentation (P)	115	0.322	0.469	0	1	CPD I
coalition (L)	106	0.500	0.502	0	1	CPD I
coalition (P)	115	0.470	0.501	0	1	CPD I
EU (L)	106	0.142	0.350	0	1	Wikipedia
EU (P)	115	0.139	0.348	0	1	Wikipedia

Notes: L refers to leader's term in office, L adjusted refers to the adjusted definition we apply in section 3.2. to follow leader's term in office, and P refers to the adjusted definition we apply in section 3.4 to follow a party's term in office.

Appendix B. Pairwise correlation Matrix

N=106	capital term	capital deviation	capital non-election	composition term	composition deviation	composition non-election	surplus term	surplus deviation	surplus non-election	revenues term	revenues deviation	revenues non-election	growth term	inflation term	unemployment term	coalition	new democracy	illiteracy term	left	centre	fragmentation	EU	
capital term	1.00																						
capital deviation	0.10	1.00																					
capital non-election	1.00	0.02	1.00																				
composition term	0.77	0.16	0.77	1.00																			
composition deviation	0.03	0.79	-0.04	-0.04	1.00																		
composition non-election	0.77	0.11	0.76	1.00	-0.11	1.00																	
surplus term	-0.33	-0.08	-0.32	-0.14	-0.07	-0.13	1.00																
surplus deviation	-0.13	-0.22	-0.11	-0.16	0.11	-0.17	0.04	1.00															
surplus non-election	-0.30	-0.04	-0.30	-0.11	-0.09	-0.10	0.98	-0.15	1.00														
revenues term	0.33	-0.12	0.34	-0.20	0.03	-0.20	0.01	0.07	0.00	1.00													
revenues deviation	0.04	0.25	0.02	0.10	0.02	0.10	-0.01	0.35	-0.07	-0.04	1.00												
revenues non-election	0.32	-0.14	0.33	-0.21	0.03	-0.21	0.01	0.05	0.01	1.00	-0.10	1.00											
growth term	0.03	-0.15	0.05	0.14	-0.04	0.14	0.26	0.33	0.18	-0.11	0.11	-0.11	1.00										
inflation term	0.35	0.29	0.32	0.44	0.06	0.44	-0.39	-0.25	-0.33	-0.22	0.17	-0.23	-0.17	1.00									
unemployment term	-0.10	-0.07	-0.10	-0.25	0.05	-0.25	-0.33	0.17	-0.36	-0.01	-0.12	-0.01	-0.02	-0.18	1.00								
coalition	0.16	-0.11	0.16	0.00	-0.07	0.01	0.04	0.07	0.03	0.37	0.08	0.36	0.01	-0.22	-0.10	1.00							
new democracy	0.39	0.15	0.38	0.36	0.02	0.36	-0.32	-0.17	-0.27	-0.08	-0.01	-0.08	-0.09	0.50	0.18	-0.21	1.00						
illiteracy term	0.32	0.10	0.32	0.28	0.02	0.28	-0.28	-0.03	-0.27	-0.06	0.15	-0.06	-0.04	0.37	0.43	-0.22	0.69	1.00					
left	-0.07	0.02	-0.07	-0.04	0.00	-0.04	0.08	-0.04	0.09	0.00	0.00	0.00	-0.06	0.03	-0.02	-0.45	0.12	0.09	1.00				
centre	0.13	-0.08	0.13	-0.03	-0.04	-0.03	-0.14	0.13	-0.16	0.18	0.00	0.18	0.04	-0.16	0.03	0.40	-0.12	-0.06	-0.45	1.00			
fragmentation	-0.01	-0.06	-0.01	-0.09	-0.11	-0.08	0.05	-0.19	0.09	0.20	0.00	0.20	-0.07	0.06	-0.03	0.30	0.01	-0.02	-0.23	-0.25	1.00		
EU	0.03	-0.04	0.03	-0.03	0.11	-0.04	-0.05	0.25	-0.10	0.10	-0.06	0.10	-0.04	-0.24	0.31	0.08	-0.12	0.16	0.03	0.01	0.03	1.00	

Table 1. The effect of public investment and other determinants on the probability of re-election

	(1)	(2)	(3)	(4)
fiscal variable:	capital	capital	composition	composition
growth term	0.050 (0.050)	0.001 (0.064)	0.052 (0.050)	0.012 (0.061)
inflation term	-0.058*** (0.021)	-0.059*** (0.021)	-0.060*** (0.022)	-0.063*** (0.022)
unemployment term	-0.009 (0.024)	-0.007 (0.026)	-0.009 (0.024)	-0.007 (0.027)
new democracy (0/1)	0.291* (0.148)	0.304 (0.191)	0.324** (0.140)	0.364** (0.162)
illiteracy term	0.020* (0.012)	0.019 (0.015)	0.020* (0.012)	0.021 (0.015)
left (0/1)	0.068 (0.141)	0.098 (0.153)	0.059 (0.142)	0.087 (0.153)
centre (0/1)	-0.200 (0.136)	-0.177 (0.136)	-0.196 (0.137)	-0.182 (0.136)
fragmentation (0/1)	-0.487*** (0.094)	-0.439*** (0.122)	-0.486*** (0.092)	-0.434*** (0.112)
coalition (0/1)	-0.027 (0.174)	-0.076 (0.182)	-0.035 (0.177)	-0.080 (0.188)
EU (0/1)	-0.385*** (0.147)	-0.486*** (0.123)	-0.389*** (0.147)	-0.484*** (0.118)
fiscal variable term¹	0.076 (0.051)	-	0.019 (0.016)	-
surplus term	0.026* (0.016)	-	0.021 (0.016)	-
revenues term	0.001 (0.007)	-	0.007 (0.006)	-
fiscal variable deviation²	-	-0.151 (0.271)	-	-0.045 (0.082)
fiscal variable non-election³	-	0.138*** (0.055)	-	0.030* (0.017)
surplus deviation	-	0.077* (0.045)	-	0.075** (0.037)
surplus non-election	-	0.039** (0.018)	-	0.026 (0.018)
revenues deviation	-	-0.001 (0.047)	-	-0.003 (0.037)
revenues non-election	-	-0.003 (0.006)	-	0.008 (0.006)
N	106	106	106	106
pseudo R ²	0.253	0.294	0.251	0.286
Log likelihood	-54.524	-51.515	-54.699	-52.116
L-R test (p-value)	0.31	0.41	0.28	0.32
Corrected predications (%)	73.58	78.30	74.53	78.30

Notes: Logit estimate coefficients for continuous variable are marginal probability effects computed at sample means. For dummy variables, indicated by (0/1), the marginal effect shows the change in the dependent variable when the value of the dummy variable changes from 0 to 1. In parentheses we report standard errors that are robust to both heteroskedasticity and possible autocorrelation within countries. *** denotes significance at the 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

¹ **fiscal variable term:** the average of the fiscal variable (% of GDP) during the leader's current term in office (excluding the election year of previous elections, but including the election year of current elections).

² **fiscal variable deviation:** the change in the fiscal variable (% of GDP) in the election year relative to the average of the previous years of the term (excluding the election year of previous elections).

³ **fiscal variable non-election:** the average of the fiscal variable (% of GDP) during the leader's term in office preceding the election year (excluding the election year of previous elections).

Table 2. Election year effects on the probability of re-election

	(1)	(2)
growth	0.023 (0.022)	0.025 (0.022)
inflation	-0.044** (0.020)	-0.044** (0.020)
unemployment	-0.006 (0.019)	-0.006 (0.019)
new democracy (0/1)	0.289** (0.136)	0.323** (0.139)
illiteracy	0.020* (0.012)	0.021 (0.014)
left (0/1)	0.128 (0.122)	0.122 (0.120)
centre (0/1)	-0.139 (0.149)	-0.135 (0.152)
fragmentation (0/1)	-0.491*** (0.109)	-0.491*** (0.102)
coalition (0/1)	-0.003 (0.191)	-0.005 (0.194)
EU (0/1)	-0.409*** (0.149)	-0.409*** (0.151)
capital	0.073 (0.060)	-
composition	-	0.016 (0.017)
surplus	0.047*** (0.014)	0.041*** (0.012)
revenues	0.003 (0.006)	0.008 (0.006)
N	106	106
pseudo R ²	0.255	0.251
Log likelihood	-54.363	-54.648
L-R test (p-value)	0.28	0.26
Corrected predications (%)	77.36	77.36

Notes: All variables are measured as the value in the last year of the term, the election year. Logit estimate coefficients for continuous variable are marginal probability effects computed at sample mean. For dummy variables, indicated by (0/1), the marginal effect shows the change in the dependent variable when the value of the dummy variable changes from 0 to 1. In parentheses we report standard errors that are robust to both heteroskedasticity and possible autocorrelation within countries. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

Table 3. The effect of public investment and other determinants on the probability of re-election: Robustness checks

fiscal variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	capital	composition	Capital	Composition	capital	composition	capital	composition	capital	composition
	Fixed effects		Predetermined election		Adjusted specification		Party re-election		Single party incumbents	
fiscal variable deviation¹	0.700 (1.528)	0.301 (0.743)	0.168 (0.244)	0.033 (0.087)	-0.074 (0.228)	-0.029 (0.065)	0.067 (0.260)	-0.001 (0.073)	-0.108 (0.321)	0.011 (0.086)
fiscal variable non-election²	2.141*** (0.772)	0.603* (0.370)	0.119* (0.074)	0.037 (0.025)	0.124** (0.057)	0.027* (0.016)	0.117** (0.050)	0.036** (0.015)	0.208** (0.085)	0.042** (0.017)
surplus deviation	0.630** (0.303)	0.486* (0.261)	0.018 (0.040)	0.012 (0.034)	0.059 (0.040)	0.056* (0.033)	0.055 (0.038)	0.048* (0.028)	0.023 (0.046)	-0.008 (0.038)
surplus non-election	0.317*** (0.116)	0.145 (0.139)	0.005 (0.024)	0.006 (0.023)	0.030 (0.018)	0.020 (0.018)	-0.006 (0.015)	-0.013 (0.015)	0.031 (0.024)	0.007 (0.024)
revenues deviation	-0.421 (0.355)	-0.214 (0.321)	-0.032 (0.057)	-0.014 (0.050)	0.015 (0.038)	0.014 (0.029)	-0.064 (0.052)	-0.053 (0.043)	0.047 (0.049)	0.064 (0.040)
revenues non-election	0.145 (0.135)	0.302 (0.224)	0.002 (0.009)	0.010 (0.010)	-0.001 (0.007)	0.008 (0.007)	-0.009 (0.007)	-0.000 (0.007)	-0.006 (0.010)	0.008 (0.008)
N	98	98	62	62	100	100	115	115	52	52
pseudo R ²	0.493	0.500	0.297	0.292	0.276	0.270	0.305	0.307	0.271	0.249
Log likelihood	-19.624	-19.348	-30.177	-30.386	-49.960	-50.369	-53.169	-53.004	-25.248	-26.012
L-R test (p-value)	-	-	0.99	0.99	0.48	0.41	0.20	0.21	0.99	0.99
Corrected predications (%)	-	-	75.81	75.81	75.00	77.00	82.61	83.48	78.85	78.85

Notes: Also included in every specification, but not reported: growth term, inflation term, unemployment term, new democracy, illiteracy term, left, centre, fragmentation, coalition, EU. In columns (1) and (2) we report logit coefficients. In columns (3) to (10) logit estimate coefficients are marginal probability effects computed at sample means. In parentheses we report standard errors that are robust to both heteroskedasticity and possible autocorrelation within countries. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

¹ **fiscal variable deviation:** the change in the fiscal variable in the election year relative to the average of the previous years of the term (excluding the election year of previous elections). We adjust our calculations, when necessary, in columns (5)-(6) in order to adjust for the timing of elections as specified in section 3.3, and in columns (7)-(8) in order to follow the terms of parties as specified in section 3.4.

² **fiscal variable non-election:** the average in the fiscal variable during the leader's term in office preceding the election year (excluding the election year of previous elections). We adjust our calculations, when necessary, in columns (5)-(6) in order to adjust for the timing of elections as specified in section 3.3, and in columns (7)-(8) in order to follow the terms of parties as specified in section 3.4.

Table 4. The effect of public investment and other determinants on the vote share of the incumbent

	Vote share of party (parties) in government				Vote share of the main government party			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
fiscal variable:	capital	composition	capital	composition	capital	composition	capital	composition
vote share _{t-1}	0.542*** (0.081)	0.547*** (0.083)	0.361*** (0.115)	0.360*** (0.114)	0.511*** (0.108)	0.529*** (0.107)	0.328 (0.204)	0.340* (0.196)
growth term	0.662 (0.475)	0.689 (0.469)	1.808*** (0.537)	1.796*** (0.532)	0.695* (0.415)	0.736* (0.426)	1.192* (0.574)	1.108* (0.552)
inflation term	-0.187 (0.140)	-0.190 (0.138)	0.357** (0.169)	0.366** (0.184)	-0.227* (0.118)	-0.218* (0.119)	0.020 (0.158)	0.022 (0.156)
unemployment term	-0.264 (0.174)	-0.247 (0.185)	0.337 (0.253)	0.321 (0.253)	-0.313*** (0.108)	-0.302** (0.122)	0.059 (0.284)	0.003 (0.283)
new democracy (0/1)	-0.066*** (0.022)	-0.063*** (0.022)	-0.080** (0.036)	-0.079** (0.033)	-0.081*** (0.018)	-0.077*** (0.021)	-0.090** (0.043)	-0.081* (0.044)
illiteracy term	0.274** (0.119)	0.276** (0.121)	0.262 (0.366)	0.255 (0.334)	0.349*** (0.085)	0.353*** (0.085)	0.364 (0.371)	0.314 (0.365)
left (0/1)	0.027* (0.015)	0.026* (0.015)	0.011 (0.025)	0.010 (0.026)	0.029* (0.016)	0.028* (0.017)	0.028 (0.025)	0.027 (0.024)
centre (0/1)	0.018* (0.011)	0.019* (0.011)	0.006 (0.028)	0.006 (0.029)	-0.012 (0.014)	-0.010 (0.014)	-0.008 (0.035)	-0.007 (0.037)
fragmentation (0/1)	0.024* (0.014)	0.023 (0.014)	0.032 (0.030)	0.031 (0.029)	-0.022 (0.028)	-0.022 (0.029)	-0.014 (0.050)	-0.015 (0.049)
coalition (0/1)	0.034** (0.015)	0.032** (0.015)	0.029 (0.021)	0.027 (0.022)	-0.018 (0.013)	-0.018 (0.013)	-0.038* (0.019)	-0.041** (0.0180)
EU (0/1)	-0.048** (0.020)	-0.048** (0.020)	-0.045* (0.025)	-0.047* (0.025)	-0.050*** (0.019)	-0.049*** (0.019)	-0.041* (0.024)	-0.046* (0.024)
fiscal variable deviation ¹	0.593 (1.071)	0.151 (0.394)	-0.548 (1.713)	-0.327 (0.720)	1.291 (1.029)	0.446 (0.388)	2.162 (1.708)	0.468 (0.706)
fiscal variable non-election ²	1.163** (0.465)	0.303* (0.161)	0.201 (0.940)	-0.134 (0.340)	1.123*** (0.432)	0.258* (0.143)	1.608** (0.732)	0.069 (0.311)
surplus deviation	0.117 (0.187)	0.059 (0.190)	0.116 (0.297)	0.152 (0.305)	0.470** (0.194)	0.356* (0.203)	0.477* (0.267)	0.352 (0.291)
surplus non-election	-0.087 (0.169)	-0.158 (0.163)	-0.034 (0.2380)	-0.015 (0.252)	-0.220 (0.144)	-0.286** (0.140)	-0.034 (0.280)	-0.079 (0.273)
revenues deviation	-0.078 (0.357)	-0.030 (0.315)	0.219 (0.527)	0.234 (0.468)	-0.358 (0.231)	-0.256 (0.224)	-0.241 (0.374)	0.047 (0.290)
revenues non-election	-0.077 (0.064)	0.015 (0.075)	0.235 (0.213)	0.214 (0.166)	-0.163** (0.076)	-0.075 (0.088)	-0.177 (0.201)	-0.119 (0.199)
N	106	106	106	106	104	104	104	104
R ²	-	-	0.417	0.418	-	-	0.563	0.552

Notes: Fractional logit estimator implemented through Bernoulli Quasi-Maximum Likelihood estimation in columns (1)-(2) and (5)-(6). Logistic Transformation of the dependent variable and including country Fixed Effects in columns (3)-(4) and (7)-(8). Estimated coefficients for continuous variable are marginal effects computed at sample mean. For dummy variables, indicated by (0/1), the marginal effect shows the change in the dependent variable when the value of the dummy variable changes from 0 to 1. In parenthesis we report standard errors that are robust to heteroskedasticity and within country correlation *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level.

¹ **fiscal variable deviation:** the change in the fiscal variable in the election year relative to the average of the previous years of the term (excluding the election year of previous elections).

² **fiscal variable non-election:** the average in the fiscal variable during the leader's term in the office preceding the election year (excluding the election year of previous elections).