

Do coalitions lead to higher fiscal deficits? A regression discontinuity approach

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Abstract

This paper studies the causal effect of the type of government on fiscal deficits in a panel of Spanish Municipalities. We follow a regression discontinuity design using the variation provided by the fact that the probability of a local government to be a single party-majority changes discontinuously when a party obtains the last seat that allows them to have more than fifty per cent of the seats of the municipality council. We find that majority governments run budgets with a surplus two percentage points greater than that of coalition governments. In addition, we show that lower deficits are driven mainly by majority governments' capacity to raise more revenues. Majority governments also tend to spend more than coalition governments, but this result is more inconsistent and always of a lower magnitude than their higher revenues. These findings are robust to several model specifications

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1. Introduction

Budget deficits are a common phenomenon in industrialized economies. However, it is widely believed that this phenomenon cannot be fully explained by economic variables and that budget deficits are also the result of political causes (Volkerink and De Haan 2001). Therefore, there has been research studying the impact of variables such as the electoral system (Grilli et al. 1991), budget procedures (Hallerberg et al. 2007), the number of parties with parliamentary representation (Volkerink and de Haan 2001), or the ideology of the government (Carlsen 1997) on deficits.

Among these political determinants of deficits, the type of government has been one of the most recurring suspects. Theoretical models predict that when several actors are part of the policy decision-making process, the result would be biased towards overspending (Weingast et al. 1981). However, and despite these theoretical expectations, empirical evidence on this issue is not conclusive.

This paper makes the argument that much of the inconclusiveness of empirical evidence is related to a misspecification of empirical models. We try to take a step further in this area by analysing fiscal and electoral data of Spanish municipalities for the period 2004-2011. Using a regression discontinuity design, we control for the fact that the type of government can be endogenous to previous fiscal outcomes. This type of design allows us to compare those governments that reach a majority with coalition or minority governments. This gives us the possibility of drawing more precise causal links.

The paper proceeds as follows. The next section provides an overview of the current state of the art and the limitations we find in it. Sections 3 and 4 present the

Spanish case, the data, and the research design. In section 5 we show the empirical analyses and explain the results. Finally, section 6 concludes.

2. Budget deficits and coalition governments

The relation between fiscal outcomes and the type of government has attracted the attention of a large theoretical and empirical literature. In the theoretical public choice literature, it is normally expected that coalition governments will lead to higher public expenditure and deficits. This claim owes much to Weingast et al. (1981) and Shepsle and Weingast (1981) seminal formalisation of the common-pool problem. According to their theoretical model, Weingast et al. (1981) suggest that when public policy decisions are made with the agreement of several decision-makers (as in coalition governments and minority governments that need parliamentary supports), all actors have incentives to pursue their policy agenda and overspend. Each actor internalizes the (electoral) benefits of expenditure in those policies that provide them votes. However, the costs of financing them are shared among all decision making actors, so that parties in government only internalize the cost the fraction of the cost that their constituents will have to pay (Scartascini and Crain 2001). This leads to the 'law of $1/n$ '. Assuming that public programs are financed by general taxes, each party favours a level of expenditure for her constituency, such that the marginal benefit equals $1/n$ of its marginal costs, where n equals the number of actors (Weingast et al. 1981). As a consequence, the more actors involved, the higher the expenditure and deficits.

This theoretical argument suggests that in a coalition government, where several parties are part of the decision making process, spending will be larger, causing greater deficits and public debt. These straightforward theoretical predictions have, nonetheless,

found mixed empirical results. The results depend dramatically on the data availability, the operationalization of the variables, and the statistical models employed.

The usual approach is based on Roubini and Sachs' (1989a) seminal article. These authors created a political dispersion index for 15 OECD countries with four categories -one party majority government, coalition government with two or three coalition partners, coalition government with four or more coalition partners and minority governments-, and, with an OLS analysis, concluded that more fragmented governments lead to higher deficits. Since this first empirical contribution, a large body of research has provided similar results, concluding that fragmented governments, in a variety of forms, solve the common pool problem, causing more public spending, higher deficits, and less fiscal adjustments (Roubini and Sachs 1989b, Edin and Ohlsson 1991, Borrelli and Royed 1995 Franzese 2000, Balassone and Giordano 2001, Woo 2003, Tavares 2004, or Bawn and Rosenbluth 2006, among others). However, other research has been critical with this literature, describing its results as inconsistent and not robust to slight changes of the model (de Haan and Sturm 1997). This line of research refutes the view that more unified governments are less prone to deficits (Alt and Lowry, 1994) or that divided governments systematically run budget deficits (de Haan and Sturm, 1994, 1997; de Haan et al. 1999).

Our argument is that the mixed findings have more to do with three limitations of empirical analyses¹. First, much of this research analyses the effect of political variables on deficit and debt outcomes. However, deficits are the compound result of

¹ Other research has tried to explain the inconclusiveness of the empirical results by focusing on the specific conditions under which fragmented governments yield more deficits and unbalanced fiscal outcomes. These studies take into account variables such as the number of ministers with spending powers (Perotti and Kontopoulos 2002) or the number of changes in the government (Grilli et al. 1991) to draw a causal relation between fragmentation and fiscal outcomes. In this regard, Falcó-Gimeno and Jurado (2011) show that minority governments only produce more deficits, when the opposition is not concentrated in a single party that anticipates having to deal on their own with the burden of increased debt in case it reaches office in the future.

the level of government's revenues and expenditures. If traditional models are right, we would expect that coalition governments will be more prone to run deficits due to increases in expenditure expansion. However, deficits might also be caused due to lower levels of taxation. The outcome (budget deficit) will be the same, but the mechanism (and the implications) will be quite different.

Second, research tends to rely on country-level data. However, given that elections do not take place every year, analyses tend to draw on few country-level observations. Only recently, the literature has turned to analyse the political determinants of budget deficits by using data at the sub-national level. Ashworth and Heyndels (2005), -for the case of Flemish municipalities-, Le Maux et al. (2011), -for the case of French Departments-, Borge (2005) -for Norwegian municipalities-, and Baskaran (2013) -for the German Länder- find that coalition governments are associated with more spending. However, Schaltegger and Feld (2009), who analyse Swiss Cantons, provide less clear-cut results and only find an effect of the size of the cabinet on fiscal outcomes, regardless of being formed by a coalition. Focusing on subnational governments seems a promising path that allows increasing the sample size of the analyses avoiding also omitted country-level variable biases. The problem is that, although the pool of observations is larger, over-time variation in the coalition variables tends to be limited in these studies. Consequently, there could remain unobserved factors that influence both public expenditures and government fragmentation simultaneously that are not adequately taken into account (Baskaran 2013).

Third, and most importantly, the lack of concluding findings in this field can be a result of methodological problems in much of the existing research. All previous research predominantly draws upon time-series-cross-sectional approaches, usually including country fixed effects to control for unobserved heterogeneity at the unit level

in the generation of deficits. Apart from the limitations of fixed effects when the variables of interest are time-invariant or display sluggish trends, the main problem of estimating the effect of the type of government (single party/coalition) on fiscal outcomes is that the type of government is not randomly selected, and, in fact, it can be endogenous to fiscal behaviour. It is reasonable to think that those political units where governments spend more may be more likely to end up having majority governments. If a party is able to take the advantage of the electoral benefits of spending, it will be able to gain full control over the executive. On the other hand, one could also argue that more diverse societies, where the needs of different groups with different interests can only be satisfied through more diverse spending policies will also be more likely to elect coalition governments. Likewise, deficits are more likely in times of economic recession, when, at the same time, coalition governments might be more likely if citizens punish big parties for the bad economic outcomes and vote for smaller parties.

All these possible correlations between the majority status of the government and fiscal outcomes indicate that the type of government could be endogenous to fiscal behaviour. Thus, to trace a causal relation between these two variables, and given that we cannot randomize the executive type, our research design should take these caveats into account. Persson et al. (2007) resort to instrumental variable models to account for the endogeneity of type of government. This would be a promising approach, provided that the instrument is not correlated with the dependent variables. However, Persson et al. (2007) use the electoral rule as an instrument of the type of executive. This might not be the best approach, as electoral systems might correlate themselves with fiscal outcomes (Iversen and Soskice 2006), and countries might select themselves into electoral rules based on unobservables that are shaped by fiscal variables (Garmann

2012). Not accounting for this potential correlation with the instrumental variable could introduce other biases in our estimations.

Given that valid instruments that fulfill all necessary conditions are rarely found, quasi-experimental research strategies seem to be in order (Imbens and Lemieux 2008). In this paper, we try to overcome all these limitations studying fiscal outcomes of Spanish municipalities with a regression discontinuity design. We take advantage from the fact that the type of government discontinuously changes when the most voted party wins 50%+1 of the total seats. Just below that threshold, the ruling party has to agree with other parties in a legislative or government coalition to pass legislation and the budget. Just above that threshold, the ruling party can form a majority government and will not need the support of other parties to pass the budget. With a regression discontinuity design (RDD) we compare those governments close to the threshold on both sides of it. In addition, around this 50%+1 seats threshold we can expect that the majority status of the governments is close to random. Governments will be, in average, similar in the other relevant correlates to explain fiscal outcomes and will only differ in their treatment status (being a majority government or not). This allows us to analyze a variety of fiscal results in a large pool of observations, taking into account the potential endogeneity of the type of government to the dependent variable.

3. The Spanish case

To study the impact of majority/coalition executives on budget deficits, we use a panel of 3,121 Spanish municipalities for the period 2004-2011. This covers all Spanish municipalities with more than 1,000 inhabitants, and two complete electoral terms: 2004-2007 (elections take place in May 2003), and 2008-2011 (elections take place in

May 2003). The total number of observations is 5,719 (for a few municipalities we only have fiscal data for one electoral term)

The panel contains annual data for all local expenditures and revenues. As the political data are invariant between elections, we aggregate the annual data of each variable to have the mean value over the electoral term. All our fiscal data are taken from the original source of the Ministry of Public Administrations, and electoral data are taken from the Ministry of Internal Affairs.

The Spanish case is particularly useful for our research goals due to two reasons. First, although Spanish municipalities receive a relevant share of their revenues through transfers from national and regional governments, they have taxing powers over several areas, such as economic activities, real estate assets, and vehicle taxes. In addition, they have relevant spending powers, particularly in areas such as social care, security, environment protection, waste collection, and water supply. This spending amounts to around a 14% of total state expenditures. Apart from this broad spending and revenue capacity, Spanish local governments also have the right to borrow (both short- and long-term credits) and, until recently, no balanced budget rules². Thus, municipalities have room to increase/decrease their expenditure or raise/lower their taxes. In addition, the period of our analyses coincides with the peak and outburst of the housing bubble in Spain. As much of the local revenues come from taxes and fees linked with construction, we can analyze both the behavior of local governments during a period of growth and fiscal period, and a period of fiscal adjustment and consolidation. According to the Spanish Central Bank, the total debt Spanish of local governments remained

² Local governments did have limitations on their total debt capacity. The Legislative Decree RDL 2/2007 established some budgetary principles as a result of the EU Stability and Growth Pact, which proclaimed fiscal stability. In practice, however, the government could not ex ante avoid the generation of budget deficits, and could only exceptionally sanction local governments with unsustainable levels of debt accumulation.

almost stable over the first electoral term of our analysis, while it almost doubled during the second electoral term- increasing from 2.8 % of total national GDP to 4.21 %³. This provides a more generalizing scope to the results.

With regards to local elections, the electoral calendar is fixed. Elections take place in May every four years. The municipality forms a single district, and councilors are allocated to parties with the D'Hondt rule. In addition, parties need to win at least a 5% of the total vote to gain representation. Finally, local governments cannot call an early in advance. This means that if no party reaches a majority of councilors, there has necessarily to be a coalition (in the legislative or with parties joining the government) to promote legislation, and to pass the budget. This allows us to consider as a coalition all municipalities where the ruling party does not hold at least 50% + 1 of the total number of councilors.

4. Empirical Strategy

As mentioned above, estimating the effect of the type of government on fiscal variables is not straightforward due to endogeneity: if an incumbent runs high deficits this may affect the probability of the next government being a majority government if voters have a preference for short-run expansionary policies, or it may decrease it otherwise. A standard OLS approach using a measure of fiscal deficits as the dependent variable would not be valid because it would yield biased coefficient estimates.

One way to deal with endogeneity in this context is to look at elections in which the government obtained the majority by a small margin, or did not obtain it by a similarly small margin. The idea is that elections in which a very small number of votes determined whether the government would be a majority are very similar to those in

³ <http://www.bde.es/webbde/es/estadis/infoest/a1108.pdf>

which the winner of the election fell a little short of obtaining enough votes to rule on its own. In these cases, whether a municipality enjoys a majority or a coalition government can be considered a random event. Therefore, if we compare the outcome of interest (e.g. fiscal deficits) in municipalities in which the mayor ruled on its own by small margin (treatment group) with similar municipalities in which a majority government could not be formed (control group), we would be able to identify the causal effect of the type of government on fiscal deficits.

In this paper we follow this approach and make use of a regression discontinuity design (Imbens and Lemieux, 2008, Lee and Card, 2008). A RDD takes advantage of the fact that the probability of receiving the treatment changes discontinuously at a certain cut-off point of the assignment variable. Most of the previous papers studying the effect of political variables using RDD use the percentage of votes as their assignment variable, and obtaining 50 per cent of the vote share as the cut-off point (e.g. Pettersson-Lidbom, 2008). In our case this is not the best approach as majority governments sometimes are formed with parties that obtain less than 50% of the votes. Particularly in a setting like the Spanish one, which uses the D'Hondt rule to allocate seats and in which parties obtaining less than 5% of the seats are excluded from obtaining representation. Both features imply that the winning party can in fact have less than 50% of the vote share and still have more than 50% of the seats, which makes the vote share an inadequate assignment variable.

Therefore, we focus on the number of local seats (councilors). The treatment status of a municipality is given by having a majority government, and having a majority government is a discontinuous function of the number of seats in the municipality council obtained by the party. A natural choice for the assignment variable would, therefore, be the seat share of the winning party (Garmann, 2012). If a party

obtains more than one half of the seats it will form a single-party majority government, while if it obtains less, it will form a coalition or a minority government that will still need the support of other parties to pass legislation (in other words, a legislative coalition). Note, however, that given that municipalities only elect an odd number of seats and given that this number depends on the size of the municipality, the jump in the probability of having a majority does not happen exactly at 50%, but at a different point depending on the number of seats to be elected⁴. Instead, we use the seat margin, which is the number of seats by which the incumbent party is above the minimum needed to form a majority government. We compute this variable in the following way

$$\text{Seat margin} = \text{Incumbent Seats} - \text{int}(\text{Total Seats}/2),$$

where incumbent seats is the number of seats obtained by the winning party, and $\text{int}(\text{total seats}/2)$ is the smallest integer number that is larger or equal than half of the seat count. The seat margin would, for example, take value zero if the major party obtains the minimum number of seats needed to form a majority government. It would take value -1 if the winning party would have needed one more seat to form a single party majority government and it would take value 1 if the winning party had one extra seat above the minimum needed to form the majority. The probability of a municipality belonging to the treatment group (having a majority government) is then a discontinuous function of the seat margin, with the discontinuity occurring exactly at

⁴ For example, in a municipality that elects 9 seats, there is a discontinuous jump in the probability of having a majority, which goes from 0 to 1 when the number of seats of a party goes from 4 to 5. Similarly, in a municipality that elects 13 seats, the discontinuous jump occurs when the number of seats goes from 6 to 7, and in one that elects 7 representatives the kink in the probability occurs when the number of seats goes from 3 to 4. If one chooses fifty percent of the seats as the rule that determines whether a municipality receives the treatment, many municipalities would not be in a close range of the threshold despite being a majority or a minority by a very small margin. For example, in small municipalities that elect only three representatives, all the parties that won or lost by a small margin would have either two thirds of the seats (if a majority government was formed) or one third of the seats (if a coalition government was formed). Similarly in a municipality that elects five representatives, the smallest majority would have three fifths of the seats, while the largest single party minority would have at most two thirds. This prevents us from using the percentage of seats as the variable that determines if a municipality belongs to the treatment.

zero. Our identification strategy, thus, consists on comparing fiscal deficits of municipalities in which the seat margin is zero with those in which is exactly minus one.

A potential problem for this identification strategy is that the sample includes municipalities of very different sizes. In small municipalities relatively more votes are needed to obtain an additional seat compared to larger municipalities. This implies that two municipalities for which the assignment variable is minus one (or zero) may actually have different probabilities of receiving the treatment. If the size of the municipalities was randomly distributed around the cutoff point this would not be a problem for the RDD. Smaller municipalities, however, are more likely to enjoy single-party majority governments because the numbers of councilors allocated is lower. To avoid this problem and to ensure that the treatment and the control group are balanced on both sides of the cut-off point, we only include in our sample all Spanish municipalities that have more than 1,000 inhabitants, which according to the Spanish law, allocate nine seats in the local assembly. In addition, we follow a within-unit approach and condition all the estimations on a set of individual FE terms (for a similar strategy see Pettersson-Lidbom, 2012, and Garmann, 2012). Our approach, therefore, consists on estimating a set of regressions of the following type:

$$Y_i = \alpha + \beta_0 T_{it} + f(\textit{seat margin}_{it}) + \theta X_{it} + \lambda_i + \gamma_t + \varepsilon_{it} \quad [1]$$

Where Y is the average fiscal deficit or surplus in percentage terms for municipality i in term t . T is the treatment status of the observation and takes value 1 if the municipality has a majority government during the electoral term and zero otherwise. The seat margin is our assignment variable, and as explained above, is centered around zero. The function $f(\textit{seat margin}_{it})$ represents the relationship between

the assignment variable and fiscal deficit, and we allow it to be flexible. X_{it} is a vector of controls that includes the size of the municipality council and a set of incumbent party dummies. λ_i and γ_t are, respectively, the individual FE effects terms and the electoral term dummy that captures shocks that are common across municipalities in each electoral term. Finally, ε_{it} is the error term.

The coefficient of interest is β_0 , which represent the marginal impact of having a majority government, at the cut-point. As the deficit variable is defined as revenues minus expenditures divided by total revenues, a positive coefficient would imply that majority governments run higher surpluses or smaller deficits.

The inclusion in the model of the seat margin corrects for selection bias due to selection on observables not included in the model. Strictly speaking the inclusion of additional controls is not needed for identification if the assignment variable enters as a covariate. We include them in the model, however, for robustness and to gain efficiency. Although our main results report up to the fourth order polynomial, the Akaike information criterion (AIC) generally shows that a simple linear term tends to be the most preferable specification. Therefore, in the robustness checks we only include the first order polynomials⁵. We also report results of regressions estimated both with and without controls.

All the specifications include errors that are clustered at the municipality level. To avoid regressions to be influenced by outliers, we eliminate from the estimation sample municipalities with values of the dependent variable above 100 per cent in

⁵ The magnitude of the coefficients does not change relevantly with the inclusion of higher order polynomials.

absolute value. We also dropped from the sample municipalities in which the incumbent party obtained an abnormally low or high vote share⁶.

Finally, it is worth noting that a potential concern of the RDD design just described is that it would only be valid if there is no endogenous selection into the treatment. Table 1 shows that there are many more municipalities that enjoy majority governments compared to those that enjoy minority governments. Similarly, in the histogram presented in Figure 1 we can see that there are many more municipalities that have incumbents with exactly the minimum number of seats to form a majority (value of seat margin equal to zero) compared to the number of municipalities whose incumbent was exactly 1 seat short. This could be evidence of endogenous selection into the treatment if there was vote-buying of the last seat, or if there was electoral manipulation. Both of them are difficult to imagine in our setting, and there is no evidence of such behavior in Spanish elections. In the Spanish system the sharp change in the density at the threshold has, instead, an exogenous explanation: the D'Hondt rule. De Córdoba and Penadés (2009) show that although this is a proportional electoral rule, it maximizes the minimum number of seats for a given share of votes. This favors the formation of majorities to give stability to the government and is exogenous to the players in each election. As a result, there will be a concentration of majority governments around the 40%-50% vote share (which tends to be range of vote share obtained by incumbent parties).

5. Results

⁶ The D'Hondt system allows for very small parties to become incumbents due to the coalition game. As very small parties are fundamentally different than big national level parties, we prefer to eliminate them from the sample. This cases represent less than 1% of the sample. The overall results do not change when smaller parties are included although the precision of some the estimates worsens.

We start our discussion of the results with Tables 2 and 3. Table 2 shows the summary statistics of the variables of the analysis. It can be seen that the mean deficit in the sample is 1.09%, caused by local governments spending in average 1,085 euros per capita and having revenues of 1,056 euros per capita. Table 3 presents the results separately for the treatment and the control group and analyses if the differences are significant. We do this for whole sample, but also for a more homogeneous subsample of municipalities around the discontinuity threshold (those where the incumbents obtained a percentage of votes between 40% and 60%). Columns 1 and 2 in table 3 show that the average term deficit is almost similar for both the treatment and the control observations. A t-test of the difference in means yields no statistically significant differences between the two groups. When the more homogeneous treatment and controls groups are used, majorities seem to run higher surpluses, although the difference is still statistically insignificant.

Given the heterogeneity across municipalities in the treatment and control groups, we cannot interpret the fact that the mean deficit is similar in both groups as the lack of a causal effect of majorities on fiscal deficits. The heterogeneity is illustrated by the summary statistics of some the variables included in table 3. In columns 1 and 2 we can see that there is a statistically significant difference in the average size of the municipality council across the treatment and control groups, and also in the incumbent party dummy. Columns 4 and 5 show similar differences for the smaller sub-sample.

To avoid these concerns, in table 4 we present the results of the regression model of equation [1], which deals with heterogeneity by including a set of fixed effects. The first four columns of this table estimate the model for the whole sample of municipalities while columns 5 to 8 estimate the model on a restricted subsample around the discontinuity threshold. In each column we run the model using a different

polynomial order of the control function. For the sake of robustness, Panel A shows the results of the model without including additional controls, while Panel B shows the results of the regressions including all the controls.

Columns 1 to 4 on Panel A show that the coefficient of the variable that captures the treatment status (having a majority government) is positive and significant across all specifications and is robust to the use of a different polynomial order on the assignment variable. The coefficient has a value between 1.2 and 1.7. This implies that municipalities that are able to form a majority government after the election have surpluses that are 1 to 2 percentage points higher than those of similar municipalities in which the executive is a coalition or a minority government. The first four columns of Panel B show that adding additional controls increases the efficiency of the estimates but does not alter the magnitude of the coefficients.

To further test the robustness of the results, in columns 5 to 8 of Table 4 we run the same specifications as in columns 1 to 4 but restricting the sample to the subgroup of municipalities with incumbent vote shares within a 10% bandwidth of 50% of the votes. The rationale for this test is that our assignment variable –the marginal number of seats- does not capture well how far the incumbent has been from losing or from obtaining a majority. One reason is that when the number of municipality seats is small we can have majors that form a majority government with exactly the minimum number of seats, that obtained very high electoral support or much lower electoral support and similarly we can have majors with a small number of seats with both high or small electoral support. In these cases, the seat margin would not be a good indicator of how far the major was from losing or obtaining the majority. Columns 5 to 8 of Table 4 deal with this problem by restricting the analysis to incumbents with similar support. In these columns the coefficient is always positive and significant at the 1 per cent level,

confirming that majorities have a positive causal effect on local finances. In this subsample the effect is even larger: municipalities that enjoy majority governments have deficits that are between 2 and 3 percentage points lower than municipalities in which the government has to negotiate with other parties.

Table 5 presents additional robustness checks. In columns 1 and 2 of Table 5 we estimate the model on subsamples of municipalities of similar size. A potential problem of our empirical strategy is that, by D'Hondt rule, size affects the probability of having a majority government and, possibly, the likelihood of incurring in higher deficits because larger municipalities are responsible a wider array of policy areas. This is unlikely to be a problem in our case because of the use of within variation. In addition, as we showed in Table 3, the results do not change when we control for size. However, a specification that is free from this problem is presented in columns 1 and 2 of table 5, in which we estimate the effect for subsamples of municipalities of the same size. The first column runs the analysis in the smallest municipalities of our sample. As these municipalities only elect a small number of councillors, the probability of having a majority government is higher (small parties tend to be excluded from the seat allocation, even when they surpass the 5% threshold). The results show that splitting the sample by municipality size does not affect the significance of the treatment variable. Although the coefficient is larger among the more homogenous sample of smaller municipalities, that results of the general model are not driven by differences in size of the local assembly.

Columns 3 to 5 of Table 5 estimate the model by party, which avoids the related problem of the party dummy not being balanced across treatment and control groups and, in addition, allows checking if there are heterogeneous effects across parties. The coefficient of the treatment variable is again very significant across specifications and

has similar magnitude than in the specifications of table 4. According to these columns the difference in terms of deficit between having a majority or a minority government, is larger for the conservative party than for the socialist party, and is larger for smaller parties than for the two main parties. However, in all cases, we find that a majority government is more likely to have a budget surplus than a coalition government.

A final set of robustness checks is presented in table 6, which shows the results of different falsification tests. In each column we use different values of the assignment variable to construct arbitrary discontinuity thresholds not related to a change in the type of government of the municipality⁷. In the first four columns of table 6 we estimate the model using only observations in the control group. In columns 4 to 8 we repeat the same exercise using only observations in the treatment group. As each of the thresholds in this table is “false” we should not expect to see any effect of the treatment on the dependent variable if what we were capturing on our model was truly the effect of the type of government on deficit. The results of this test are consistent with this explanation because in none of the placebo regressions the coefficient of the treatment variable turns out statistically significant. In addition the coefficients are erratic and unstable across specifications, changing both in signs and magnitudes.

Overall, the results of the different estimations of the model show that the type of government has a strong causal effect on the way the local governments run their budgets. Depending on the specification we find that majority governments run surpluses that are 1 to 3 points larger than those of minorities. If we take into account that the average surplus for the municipalities in our sample is around 1%, these results

⁷ We allow for the assignment variable to have at least 3 values on each side of each threshold to be able to estimate the effects at each arbitrary discontinuity.

indicate that majorities lead to surpluses that are two to four times larger than those of minorities.

Finally, in Tables 7 and 8 we investigate the mechanism through which the differences happen. To this end we estimate the same model as in previous tables but using total revenues per capita and total expenditures per capita as the dependent variables. These models allow us to check whether the higher surpluses or smaller deficits run by majorities happen through an increase in taxes, through a reduction of expenditures or through an alternative combination. Table 7 finds a very significant positive effect of majorities on revenues per capita. The coefficient of the treatment variable has a value between 47 and 58 which means that majorities are able to increase revenues by approximately 4 or 5 per cent. On the other hand, Table 8 shows that expenditures also increase when the government is a majority, although not as much (between 1 and 3 per cent), and in this case the coefficient is not significant in some of the specifications. Combined, the results of Tables 7 and 8 show that the mechanism through which majorities are able to run higher surpluses is through increasing revenues in a higher proportion than expenditures.

This result is consistent with theories that argue that the fact that coalitions have to negotiate to reach an agreement that is satisfactory to all the members of the coalition leads to either lower taxes or higher expenditures, which in the end increases deficits or reduces surpluses. However, it would to some extent contradict Weingast et al.'s (1981) argument. Coalition governments do not result in targeting expenditures to more constituencies, increasing the aggregate spending. On the contrary, coalition governments are characterised by not being able to agree on raising more revenues. This goes, as Perotti and Kontopoulos (2002) already indicated, against the conventional view on coalitions as big spenders (Jones 1997). Coalition governments seem more

reluctant to face the costs of increasing taxes, even at the expense of not being able to target as much expenditure as they would prefer to their electoral constituency.

6. Conclusion

This paper has used a regression discontinuity design to study whether coalition governments lead to more budget deficits. Using data from Spanish municipalities for the period 2004-2011, the results confirm the main hypothesis of the paper, giving support to a large theoretical literature. Our estimation shows that majority governments run budgets with a surplus of, in average, 2 percentage points more than coalition governments. These are differences of a very relevant magnitude and robust to several model specifications.

In addition, we have also explored which is the mechanism that leads to lower deficits. Contrary to common expectations, we do not find evidence that majority governments spend less than coalition governments. In fact, our results show that, if something, majority governments tend to spend more than coalition governments. This result, however, is not robust to the inclusion of control variables in the model. The explanation to lower deficits is on the revenue side of the budget. Majority governments raise, in average, 50 euros per capita more than coalition governments. This is around a 5% of the total average local revenues per capita.

The research design used for this paper and the results open up new paths for future research. First, we have shown that single party majority governments run smaller deficits than coalition governments. In this paper we have defined as coalitions all governments where the decision-making needs the support of more than one party. This includes both coalitions within the executive and legislative coalitions (where the

governments is formed by just one party, but it needs the support of other parties to pass legislation and, specifically, the budget). The data we have used does not allow us to differentiate between both types. Future research should look into this with more detail and analyse the extent to which the type of coalition matters. This would allow revisiting Edin and Ohlsson's (1991) results, which argued that it is legislative coalitions, and not government coalitions, the ones that lead to higher deficits. In a similar vein, we have drawn a distinction between single party governments and coalition governments without considering the number of parties that form the coalition. If the law of $1/N$ is true, we should expect that coalitions formed by a high number of parties should spend more than coalitions with only two party members. In addition, more research on fiscal outcomes, opening the black box of deficits, and exploring the effect of political variables on both expenditure and revenues will provide us a more complete explanation of the effect of government characteristics on fiscal outcomes.

The results of the paper can also be extended by analysing differences in budget deficits within and between terms. The analyses provided here are drawn from mean electoral term deficits. A more complete explanation would show whether both types of governments behave differently over the whole term, or just on certain years. It can well be that coalition governments only run higher deficits in electoral years, while the rest of the term they could yield balanced budgets. It will also be necessary to analyse in depth the differences in the behaviour of both types of government between terms. As we have described above, the period 2004-2007 was characterised by economic growth, while the period 2008-2011 is a time of crisis. Disentangling whether both types of governments respond differently to the contextual conditions would enrich our explanation.

Finally, in this paper we have dealt with aggregate revenues and expenditures. We have not considered the possibility that coalition governments lead not to a general increase in spending, but to an expansion in certain types of expenditures. By analyzing patterns of expenditure and revenues in different areas, we can shed light on whether coalition governments agree are able to agree on specific types of spending or whether each party uses the budget to target their own constituency. We believe that the regression discontinuity design that we have implemented here can assist us in responding these questions, and contribute to a better understanding of the political determinants of budget deficits.

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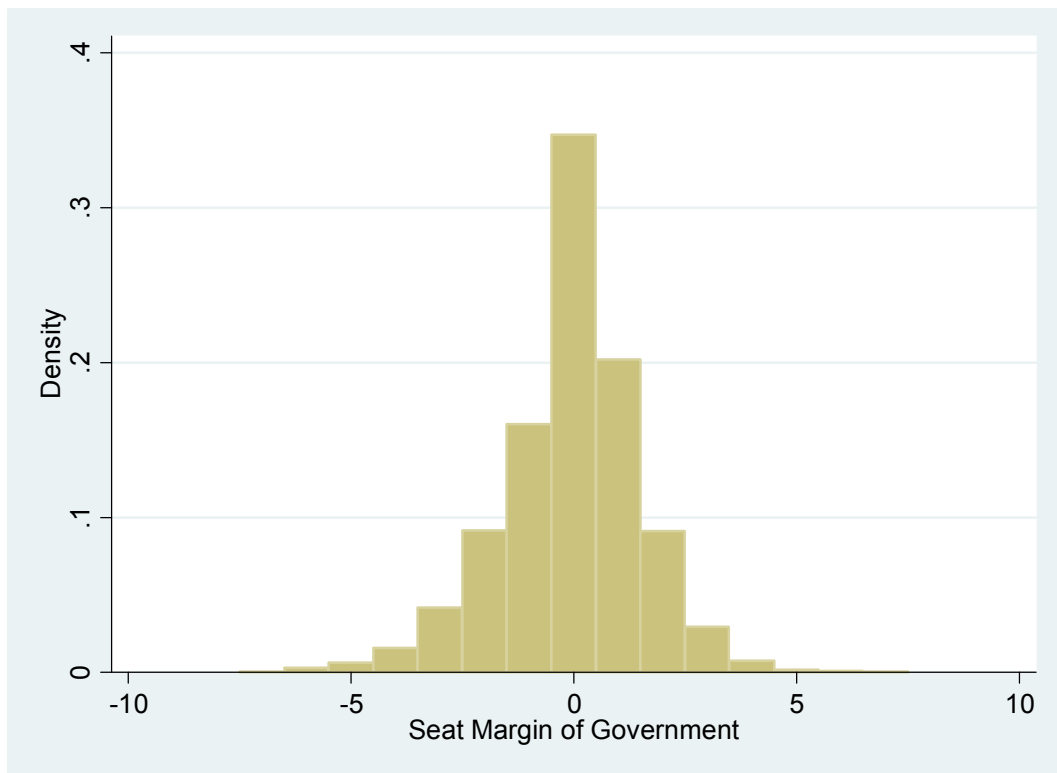
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Figure 1 Histogram plot. Seat Margin. Full sample.



Tables

Table 1. Distribution of treatment and control groups				
	All municipalities		Winner vote share (40%-60%)	
	Majority Government	Minority Government	Majority Government	Minority Government
1st term (2003-2007)	65.72%	34.28%	75.12%	24.88%
2nd term	60.65%	39.35%	72.03%	27.97%
(2007-2011)				
Total	63.11%	36.89%	73.52%	26.48%

Table 2. Summary Statistics. Full Sample.

Variable	Obs	Mean	Std. Dev.	Min	Max
Surplus	5719	1.090	7.555	-78.088	46.355
Revenues	5719	1085.041	470.874	264.878	6176.120
Expenditures	5719	1056.432	451.069	238.868	5778.261
Assignment Variable	5719	-0.198	1.623	-7	7
Local assembly size	5719	12.913	4.564	9	57
PP government	5719	0.320	0.466	0	1
PSOE government	5719	0.428	0.495	0	1

Table 3. Summary statistics by treatment and control

Variable	All municipalities			Winner vote share (40%-60%)		
	Minority Government	Majority Government	Difference	Minority Government	Majority Government	Difference
Surplus	1.100	1.090	0.0058	0.863	1.110	-0.2543
Revenues	1084.546	1099.459	-14.91	1040.091	1080.930	-40.84**
Expenditures	1068.383	1068.383	-10.46	1019.514	1050.190	-30.67**
Assignment Variable	-1.892	0.819	2.71***	-1.121	0.340	-1.461***
Local assembly size	13.710	12.972	1.637***	13.428	12.470	.95755***
PP government	0.210	0.382	-.1714***	0.232	0.393	-.1609***
PSOE government	0.423	0.431	-0.0084	0.494	0.432	0.0625***

Table 4: Surplus (RD)								
	1	2	3	4	5	6	7	8
	All observations	All observations	All observations	All observations	Bandwidth : ± 10%	Bandwidth : ± 10%	Bandwidth : ± 10%	Bandwidth : ± 10%
Majority Government	1.4265**	1.3577**	1.3784**	1.3563**	2.5423***	2.6912***	2.6893***	3.0834***
	[0.566]	[0.570]	[0.658]	[0.681]	[0.842]	[0.924]	[0.947]	[1.110]
Controls	NO	NO	NO	NO	NO	NO	NO	NO
AIC	34846.33	34843.57	34845.56	34847.48	34809.62	34809.76	34811.73	34813.69
R-squared	0.116	0.117	0.117	0.117	0.119	0.119	0.119	0.119
Majority Government	1.5299***	1.4858***	1.4507**	1.4353**	2.4048***	2.6325***	2.6264***	3.1758***
	[0.564]	[0.568]	[0.656]	[0.682]	[0.838]	[0.919]	[0.944]	[1.106]
Controls	YES	YES	YES	YES	YES	YES	YES	YES
AIC	20522.35	20524.06	20526.06	20527.27	20502.4	20503.7	20505.7	20506.14
R-squared	0.123	0.123	0.123	0.123	0.125	0.126	0.126	0.126
Polyn. order	1	2	3	4	1	2	3	4

Table 5: Robustness checks: Effects by municipality size and party

	Small municip. (9 seats)	Big municip. (>10 seats.)	PP government	PSOE government	Other government
Majority Government	5.2989**	2.0809**	3.3878**	2.4060*	4.7625***
	[2.586]	[0.922]	[1.653]	[1.281]	[1.788]
Controls	YES	YES	YES	YES	YES
Bandwidth	10%	10%	10%	10%	10%
Observations	961	2589	1238	1572	740
R-squared	0.069	0.138	0.181	0.189	0.09
Number of municipalities	708	1754	940	1194	586
Robust standard errors (clustered by municipality) in brackets					
*** p<0.01, ** p<0.05, * p<0.1					

Table 6: Falsification tests. Dependent variable: Surplus								
	1	2	3	4	5	6	7	8
	Full sample	Full sample	Full sample	Full sample	Bandwidth: \pm 10%	Bandwidth: \pm 10%	Bandwidth: \pm 10%	Bandwidth: \pm 10%
	Control observations	Control observations	Treatment observations	Treatment observations	Control observations	Control observations	Treatment observations	Treatment observations
	Treatment =seat margin> 3	Treatment =seat margin> 4	Treatment =seat margin>3	Treatment =seat margin>4	Treatment =seat margin> 3	Treatment =seat margin> 4	Treatment =seat margin>3	Treatment =seat margin>4
Placebo	-0.4174 [0.504]	-0.1451 [1.441]	-1.0207 [1.533]	2.0316 [2.803]	-4.1994 [5.636]	-4.0621 [4.113]	1.001 [2.471]	-0.4002 [2.921]
Controls	NO	NO	NO	NO	NO	NO	NO	NO
R-squared	0.1	0.1	0.13	0.13	0.12	0.12	0.12	0.12
Placebo	0.6329 [1.586]	0.1651 [1.437]	-1.0097 [1.621]	1.9665 [2.842]	-2.5671 [3.318]	1.3958 [2.263]	2.2611 [2.555]	0.2285 [3.591]
Controls	YES	YES	YES	YES	YES	YES	YES	YES
R-squared	0.11	0.11	0.13	0.13	0.15	0.15	0.13	0.13
Polyn. order	1	1	1	1	1	1	1	1
Observations	2110	2110	3609	3609	940	940	2610	2610
Number of municipalities	1544	1544	2379	2379	823	823	1947	1947
Robust standard errors(clustered by municipality) in brackets								
*** p<0.01, ** p<0.05, * p<0.1								

Table 7: Revenues (RD)								
	-1	-2	-3	-4	-5	-6	-7	-8
	All observations	All observations	All observations	All observations	Bandwidth: ± 10%	Bandwidth: ± 10%	Bandwidth: ± 10%	Bandwidth: ± 10%
Majority Government	46.3104*** [16.210]	44.3141*** [16.050]	52.1641*** [18.584]	52.6200*** [18.575]	58.6948*** [18.646]	50.7607** [20.623]	49.4032** [21.524]	48.3238* [26.458]
Controls	NO	NO	NO	NO	NO	NO	NO	NO
AIC	73350.59	73347.83	73348.14	73350.1	73268.91	73269.74	73270.92	73272.84
R-squared	0.336	0.336	0.336	0.336	0.4	0.4	0.4	0.4
Majority Government	50.9931*** [15.909]	49.9869*** [15.649]	55.4287*** [18.223]	56.0146*** [18.233]	55.3292*** [18.754]	49.5695** [20.634]	48.1939** [21.646]	51.6774* [26.361]
Controls	YES	YES	YES	YES	YES	YES	YES	YES
AIC	43304.23	43304.86	43306.58	43308.57	43265.56	43266.83	43268.54	43270.43
R-squared	0.344	0.344	0.344	0.344	0.407	0.407	0.407	0.408
Polyn order	1	2	3	4	1	2	3	4
Observations	5719	5719	5719	5719	3550	3550	3550	3550
Number of municipalities	3121	3121	3121	3121	2419	2419	2419	2419
Robust standard errors (clustered by municipality) in brackets								
*** p<0.01, ** p<0.05, * p<0.1								

Table 8: Expenditures (RD)

	-1	-2	-3	-4	-5	-6	-7	-8
	All observations	All observations	All observations	All observations	Bandwidth: \pm 10%	Bandwidth: \pm 10%	Bandwidth: \pm 10%	Bandwidth: \pm 10%
Majority Government	22.6853*	22.1866	30.9776*	31.8579**	21.9021	12.1218	11.0311	9.6477
	[13.581]	[13.560]	[15.793]	[16.116]	[16.640]	[18.499]	[19.352]	[24.605]
Controls	NO	NO	NO	NO	NO	NO	NO	NO
AIC	71683.47	71685.07	71684.24	71686.03	71639.85	71641.83	71641.9	71643.68
R-squared	0.483	0.483	0.483	0.483	0.567	0.567	0.567	0.567
Majority Government	26.0732*	26.1759*	33.3928**	34.2555**	20.4756	12.0637	10.9308	11.9954
	[13.437]	[13.354]	[15.587]	[15.891]	[16.730]	[18.539]	[19.425]	[24.480]
Controls	YES	YES	YES	YES	YES	YES	YES	YES
AIC	42052.54	42051.58	42053.32	42055.3	42031.28	42031.06	42032.78	42034.77
R-squared	0.487	0.487	0.487	0.487	0.57	0.57	0.57	0.57
Polyn order	1	2	3	4	1	2	3	4
Observations	5719	5719	5719	5719	3550	3550	3550	3550
Number of municipalities	3121	3121	3121	3121	2419	2419	2419	2419
Robust standard errors (clustered by municipality) in brackets								
*** p<0.01, ** p<0.05, * p<0.1								