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Essays on the Political Economy of Government Fragmentation

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PhD in Economics | Marc Puigmulé-Solà

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A la meva mare,
el puntal del meu món.

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This thesis is yours, at least as much as it is mine.

Contents

Chapter 1

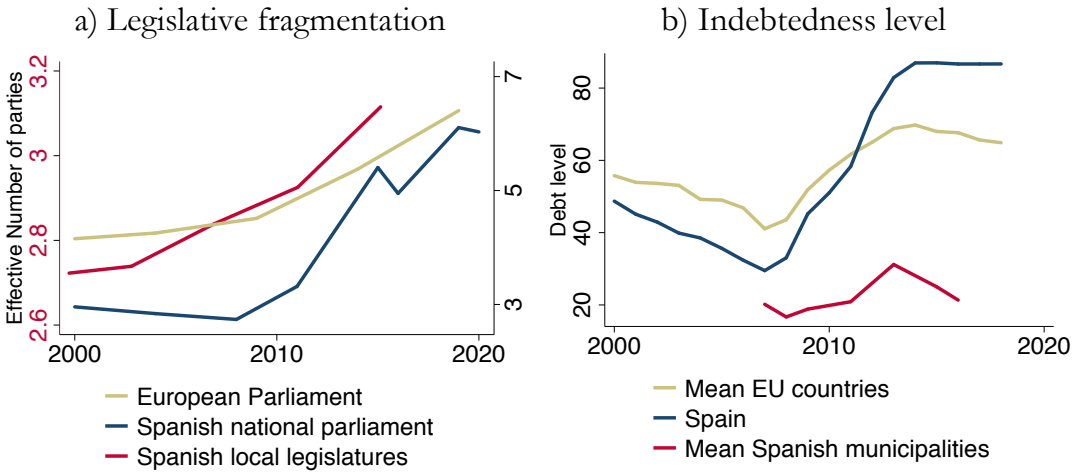
Introduction

Advanced democracies find themselves embroiled in political turmoil. Fragmented executives are the order of the day and single-party governments are now the exception across the European Union. This growing phenomenon of fragmented governments is a consequence of increasing polarisation within legislatures and political turbulence is evident at all levels of government from the local to the supranational. Some (of the many) recent and illustrative examples of how this growth in political fragmentation is affecting government formation include the 171 days of coalition negotiations following the German elections and the 225 days of discussions after the Dutch went to the ballot boxes, both in 2017, and the eventual formation in 2019 of Spain's first coalition government after the electorate was summoned to the polls twice in just one year.

Economic crises trigger disillusionment with traditional politics which, combined with growing problems of corruption, immigration and globalisation, generate the perfect storm, polarising voters and resulting in the emergence of new parties at both extremes of the ideological spectrum (see Mian *et al.*, 2014; Sanz *et al.*, 2020 and Guiso *et al.*, 2019; among others). The direct consequences of this political fragmentation are an increase in political gridlock and a further weakening of governments, precisely when reform is most needed (Funke *et al.*, 2016): Indeed, the more fragmented the legislature, the more difficult it becomes to strike any sort of agreement (Tsebelis, 1995a). Today, many governments face problems reaching agreements on such key public policies as austerity plans, reforms, immigration and, even, the actions to be taken in the fight against the economic fallout triggered by the COVID-19 pandemic. All this means that it is vital that we seek to understand the impact of political fragmentation on a government's ability to address crucial matters affecting the economy.

Figure 1.1 compares this contemporary rise in political fragmentation with the impact of the economic crisis after 2008.[1] Unsurprisingly, both circumstances impact all levels of governance in the multi-level systems operated under federalism and by the EU, in which each tier of government enjoys autonomy and its own competences.

Figure 1.1 Political fragmentation and indebtedness levels



Note: Political fragmentation is computed as the *Effective Number of Parties* (ENP) considering seats for the European parliament and votes for the Spanish parliament and the average across local legislatures. The local axis is marked in red given that the ENP level is lower in local legislatures. Indebtedness level for Spain is computed as the debt-over-GDP-ratio and as the mean of this value for the EU countries. For Spanish municipalities, it is computed as the ratio between debt and total revenues.

Two of the main challenges shaping the political agenda in the 21st century have been the fight against the rent extraction and corruption associated with the extraordinary economic expansion at the beginning of the century, and the implementation of fiscal consolidation measures following the impact of the great economic crises. In other words, two challenges that are guaranteed to fuel political fragmentation. Moreover, if political fragmentation, in turn, enhances corruption or slows recovery from economic crisis, countries can find themselves trapped in a vicious circle with no obvious way out.

[1] Political fragmentation is measured as the effective number of parties in the legislatures and the impact of the economic crisis by levels of indebtedness.

Corruption poses a severe threat to democracy, slowing economic growth (Mauro, 1995), spurring inequality (Gupta *et al.*, 2002), eroding trust in government (Solé-Ollé & Sorribas-Navarro, 2018) and undermining democratic legitimacy (Kostadinova, 2009). According to the periodical survey conducted by the *Centro de Investigaciones Sociológicas*, corruption has been one of the main political problems worrying Spaniards since 2013. These concerns peaked in November 2014 when 63.8% of respondents identified corruption as one of the three main problems in Spain, all the more remarkable given that in September 2001 corruption was mentioned by just 2% of respondents. Arguing that fragmented governments tend to be more corrupt than majority regimes, the Spanish national government proposed an electoral reform in 2014, seeking to ensure that the party receiving most votes would automatically be assigned the mayoralty, without any need for further inter-party alliances. However, the premise was loudly questioned, with anecdotal evidence being offered in support of both sides but no robust empirical demonstration could be provided. The reform would eventually be shelved.

There is, however, evidence that the presence of fragmented governments is not without its consequences. Among others, such governments tend to generate larger deficits (Edin & Ohlsson, 1991) and to face marked problems implementing complex policies (Köthenbürger *et al.*, 2014). Interestingly, in contrast with an extensive literature on the relationship between political fragmentation and fiscal policy, very few studies to date have focused on the effects on political corruption. And, most of this literature comprises theoretical papers or cross-country analyses, the predictions of which point in different directions: On the one hand, fragmented governments may be less corrupt, because of the mutual control exercised by the different parties in power; on the other, fragmented governments may forge corrupt deals to form or sustain a coalition.

In Roubini and Sachs' seminal paper (1989), political fragmentation is considered a relevant determinant of government spending and budget deficits. The authors empirically documented the "common pool problem" prediction, according to which spending increases as the number of agents involved in fiscal decisions increases (Weingast *et al.*, 1981 and Shepsle & Weingast, 1981). Later, there has been an extensive empirical literature supporting this relation between political fragmentation and public expenditure. However, few studies analyse this relationship in a situation such

as the one we face today, where tight fiscal rules limit deficits and debt issuance. In these common scenarios of fiscal consolidation, it is essential we understand how political fragmentation affects the strategies implemented to rebalance the budget.

Agreements to implement strict fiscal rules or far-reaching economic reforms are not only affected by intra-governmental fragmentation but also by inter-governmental fragmentation, i.e., when different tiers of government share responsibilities over the same population (e.g. multi-level governance systems, as typified by federalism or as operated by the EU). Coordination problems of this type came under the media spotlight during the discussion and implementation of austerity plans following the 2008 economic crisis. Political disputes broke out at all levels of governance with the implementation of unpopular measures, as the different tiers engaged in the "blame game". Yet, to guarantee accountability in these circumstances, clarity of responsibility must be upheld.

By drawing on sub-national data, this thesis contributes to the literature by providing causal evidence of the effects of political fragmentation on two major issues: corruption and fiscal consolidation. More specifically, the second chapter of this thesis fills a gap in the literature by detailing causal evidence of the effect of government fragmentation on political corruption. The third chapter contributes to the literature on political fragmentation by analysing its effects on fiscal consolidation in a situation characterised by tight fiscal rules. The fourth chapter reviews existing literature on the electoral effects of fiscal adjustments and accountability in multi-level governments and undertakes an analysis of the electoral costs attributable to the implementation of two alternative fiscal adjustments at the local and national levels respectively.

The three studies presented here are based on Spanish municipal data. Spain makes an interesting case study because of the impact that the housing boom and the subsequent crises had on its economy. Moreover, Spain's three tiers of government operate a proportional electoral system, resulting in a not insignificant number of fragmented legislatures and governments. At the same time, in recent years, Spain's traditional political ecosystem has broadened considerably. This increase in political fragmentation, evident across all tiers of governance, is in line with developments in other advanced democracies. As such, this thesis can be related to existing empirical studies that estimate the

causal effects of political fragmentation on public finances using sub-national data (see, for example, Pettersson-Lidbom, 2012). Sub-national analyses facilitate the causal interpretation of a single determinant because all governments are subject to the same institutional, cultural and socio-economic framework. Therefore, Spanish municipalities present an optimal setting in which to answer the questions posed here and should provide causal evidence that can be extrapolated to other countries and levels of governance.

In order to obtain a causal interpretation of the results, this thesis adopts three different methodologies: namely, matching, regression discontinuity design (RDD) and differences-in-differences (DiD). Matching is, today, quite a common methodology in the applied political science literature (see, for example, Ho *et al.*, 2007). The technique involves preprocessing data by pairing control and treated units so that the final observations considered in the parametric analysis constitute the best counterfactuals possible. Some authors specifically advocate the properties of exact matching (see, for example, Iacus *et al.*, 2012), and this is the type of matching used in the second chapter of the thesis. Specifically, the methodology applied combines matching with RDD, so that matched units are only those that sort around a cut-off. This combination of matching and RDD offers an optimal solution when RDD is not directly feasible due to the lack of balance in relevant variables at the cut-off (Keele *et al.,* 2015). The third chapter follows an RDD adaptation of the "close-race" strategy (see Lee *et al.*, 2004; Lee, 2008; Pettersson-Lidbom, 2012) to proportional systems (see Folke, 2014). The reasoning underpinning this methodology is that elections decided by a narrow margin of votes are, in practice, very similar. Finally, the fourth chapter of the thesis uses DiD to estimate the effect of policy implantation on the evolution of the incumbent share of votes between two consecutive elections. It compares municipalities affected by the policy with those unaffected by it on the premise that, in the absence of the policy, incumbents in both groups would have experienced a similar evolution in their vote shares.

In short, this thesis seeks to form part of the Political Economy literature concerned with studying the effects of institutions on policy outcomes. The influential work of both Acemoglu and Robinson (2012) and Fukuyama (2014) has shown how institutions can be instrumental in determining a society's destiny. Indeed, 'good' institutions can be considered crucial for ensuring

economic and democratic success and, so, the need is apparent to identify just what it is that makes an institution 'good'. Among the many dimensions that characterise institutions, this thesis relates most closely to the Public Choice literature (influenced, above all, by the work of James Buchanan and Gordon Tullock), which concerns itself with the study of the political behaviour that links economics to political science. This thesis has also been strongly influenced by the outstanding work of Alberto Alesina[2] on the political economy of fiscal policy and budget deficits, and the fascinating literature relating corruption, institutions and accountability (Aidt, 2009; Lederman *et al.*, 2005, among others).

This thesis is structured in five chapters. Following on from this first introductory chapter, the next three are dedicated to separate studies that contribute to the different branches of the literature discussed above. Below, brief outlines of the main goals and most important results of each of these three studies are provided. The fifth and final chapter brings together these findings and highlights the principal outcomes and reflects on the main policy implications to be derived.

The second chapter of this thesis examines the relation between government fragmentation and political corruption and it does so by drawing on data for Spanish municipalities for the period 1999-2007. This period witnessed a major surge in local political corruption scandals related to local zoning decisions. The chapter focuses specifically on close elections and compares municipalities that are identical in terms of their political and socio-economic traits, though differentiated by government type (majority vs. non-majority). The results indicate that the presence of fragmentation is not associated with a greater probability of corruption. In a second step, the chapter analyses different types of non-majority governments, considering specifically the ideological distance between the parties supporting the government. Here, the results suggest that if the sole objective were to favour those governments associated with lower probabilities of corruption, policies should seek to promote the presence of pivotal political parties.

The third chapter studies the effects of political fragmentation on the way in

[2] Probably the most cited author in this thesis. Sadly, Alberto Alesina passed away while I was writing these lines, and I wanted to highlight my admiration for his work and the influence he has had on this thesis.

which fiscal consolidation is implemented in a situation characterised by the presence of Fiscal Rules that limit deficits and new debt. By analysing the intra-term variation (2011-2014) of the main budgetary aggregates, the results show that political fragmentation has a relevant impact on fiscal consolidation and the resulting size of the budget. Increasing the political fragmentation of a legislature shifts the focus of fiscal consolidation from expenditure reductions to an increase in revenues. This means the resulting budget increases as the number of parties in the legislature expands. The effect of increasing legislature fragmentation is apparent even when this increase does not affect the majority status of the government.

The fourth chapter investigates the political accountability of fiscal adjustments and it does so by analysing the electoral cost of two alternative fiscal adjustments in Spain's multi-level governance system. By measuring the evolution of the share of votes before and after the implementation of an increase in taxes, the study provides causal evidence that voters punish the application of the fiscal adjustment. Using two tax increases introduced by local and national governments respectively, clarity of responsibility is studied in this multi-level setting. The results indicate that the electorate is able to determine quite clearly where responsibilities lie and to punish the respective incumbents accordingly.

Chapter 2

Government fragmentation and political corruption

2.1.- INTRODUCTION

Corruption has devastating economic and political effects. There is evidence that corruption reduces economic growth (Mauro, 1995), spurs inflation (Al-Marhubi, 2000) and inequality (Gupta *et al*., 2002), and undermines trust in government (Solé-Ollé and Sorribas, 2018) and democratic legitimacy (Kostadinova, 2009). Given the seriousness of these threats, there is much interest in knowing how a good institutional design can help to mitigate the problem.

The existing literature shows that corruption decreases with democracy: competitive elections, the presence of a free press and an independent judiciary do seem to mitigate corruption (e.g., Lederman *et al*, 2005; Boix and Adsera, 2003). Separation of powers (Alt and Lassen, 2008) and federalism (Fisman and Gatti, 2002) might also alleviate corruption. There are also some results regarding the effects of electoral systems. For instance, majoritarian systems are usually associated with less corruption than proportional systems (Persson *et al*., 2003). Also, proportional systems using open lists are said to generate more corruption than those with closed lists (Carey and Shugart, 1995; Kunicova and Rose-Ackerman, 2005). District magnitude might also play an important role within proportional systems. Countries with large electoral districts tend to have less corruption in closed-list systems than those with large districts (Persson *et al*., 2003). On the contrary, under open-list systems, corruption increases with district magnitude (Chang and Golden, 2006). According to some authors, however, the evidence regarding the effects of institutions on corruption is far from conclusive, meaning that additional research on this issue is needed (see Golden and Mahdavi, 2015).

This study[3] contributes to this literature by analysing whether government fragmentation has an effect on political corruption. Proportional systems generate fragmented legislatures and different government typologies: majorities and non-majorities. This is a highly relevant question, given that coalition governments are ubiquitous in European countries. According to Muller and Strøm (2000) around 40% of the EU executives formed in the period 1950-1999 were coalitions. Moreover, last years have been characterised by the rise of new parties polarising the political sphere. There is evidence that fragmented governments behave differently than the majority ones in a variety of settings. For example, non-majority governments tend to generate larger budget deficits (see Edin & Ohlsson, 1991 and Volkerink & Haan, 2001), although some authors suggest that this might depend on the ability of parties to make credible promises to their partners (Bäck & Lindvall, 2014). Non-majorities are also said to be vulnerable to legislative gridlock and so to have problems in reaching agreements on complex policies (Köthenbürger *et al.*, 2014). However, recent studies content this view by showing that coalitions are quite able to implement ambitious reform programs (see Knotz & Lindvall, 2015).

In contrast with the large literature on the relationship between fragmentation and fiscal policy, there are very few papers focusing on the effects on political corruption. On the theory side, there are some papers that analyse the relationship between non-majority governments and accountability (e.g., Diermeier & Merlo, 2004; Myerson, 1993; Kiss 2009). This literature is, however, not conclusive regarding the expected direction of this relationship. On the empirical side, using country data, Tavits (2007) finds that single-party governments are negatively correlated with corruption perceptions, whereas Vega-Alavedra (2015) finds that coalition governments are less corrupt.

To the best of our knowledge, there is no study providing causal evidence on the effect of government fragmentation on corruption. This study uses local government data to fill this lacuna. This type of data has proved to be very useful to study the effects of political institutions (e.g., Pettersson-Lidbom, 2012; Köthenbürger *et al.*, 2014). The reason there are no papers yet using this type of data to study the effects of coalitions on political corruption might be that most countries with electoral PR systems (and so with non-majority

[3] This study is co-authored with Albert Solé-Ollé and Pilar Sorribas-Navarro.

governments) are advanced democracies with low levels of corruption (e.g., the Nordic countries). Thus, they do not provide the setting needed to identify the effect of fragmentation on corruption.

The country of study in this chapter, Spain, is a good setting to analyse the relationship between government fragmentation and political corruption at the local level. On the one hand, the PR electoral system generates a high level of fragmentation and a large number of non-majority governments (around 40% in the period under study). On the other hand, during the housing boom (2002-2007), there has been a large number of corruption episodes related to zoning regulations, which in Spain are responsibility of local governments. Moreover, there has been a recent debate on the need to reform the local electoral law. In August 2014, the national government presented a reform proposing that the most voted party should be automatically assigned the mayoralty without the need of further inter-party alliances. The main argument used to defend this proposal was that non-majority governments tend to be more corrupt than majorities, due to the deals reached during the coalition bargaining process. Several commentators questioned this premise, by arguing that, on the contrary, coalitions are probably less prone to corruption due to the fact that they allow for the mutual control of different partner parties.[4] The case-based evidence is inconclusive regarding the validity of any of these views since it is quite easy to find both non-majorities and majorities among the most prominent corruption episodes.[5] Therefore, a more careful analysis is needed in order to establish whether non-majorities do actually increase corruption.

To identify the effect of non-majorities on corruption, this analysis proceeds in two steps. First, the attention is restricted to close-elections non-majorities and majorities that are those located in a neighbourhood of the seat cut-off that determines government type. In the more basic approximation, this neighbourhood is defined as the cut-off plus (or less) the marginal seat. In this case, a majority government occurs when the winning party (the one getting more seats at local elections) obtains just the minimum number of seats needed to have a majority in the legislature, and so to secure the mayoralty. Conversely, a non-majority government occurs when the most voted party

[4] See "In praise of political fragmentation", by Víctor Lapuente (*El País*, 19/05/2015).
[5] See "Data contradicts the arguments used by the PP to defend the local electoral reform." (*El País* 30/8/2014).

obtains one seat less than the number needed to form a majority government, meaning that with all probability no party holds a majority of seats in the council.

Second, the analysis compares majorities and non-majorities that are identical in terms of relevant political traits (i.e., legislature size, mayor's ideology or party, and the number of opposition and local parties). To carry out this analysis, we rely on a 'matching framework' (see Keele *et al.*, 2015) which is justified by the need to deal with covariate imbalance around the cut-off, which renders a traditional 'regression discontinuity' design inapplicable.[6] However, the analysis is able to show that, by imposing an exact match on these political characteristics, it is possible to balance the treated and control samples across a broad range of additional political, socio-economic, budgetary and geographical variables (measured prior to the treatment) that are potentially correlated with the propensity and opportunities to engage in political corruption. This enhances the confidence that the only difference between our treated (non-majority) and control (majority) units is the type of government (i.e., majority v. non-majority).

The findings in this study allow rejecting the hypothesis that non-majority governments are generally more corrupt than the majority ones. These results suggest that the effect derived from an increase in mutual control by the different government partners might be counteracting the tendency to use corrupt deals either to win the mayoralty or to keep the government coalition alive. Moreover, this study also finds that some non-majority governments – those with a pivotal party, which are the ones able to enter agreements with both ideological blocs– are less corrupt. This result is at odds with some theoretical predictions, which suggest that these parties are in a better situation to extract rents from the main parties. This finding is more consistent with a story in which coalition partners are more willing to denounce corruption when they have other coalitional agreement options. Mutual control might, therefore, be more effective when the fates of the different parties supporting the government are not unfailingly tied. Finally, it is tested that this result is

[6] Note that, in this case, covariate imbalance is not caused by electoral manipulation or by any other type of behavioral sorting but by the mechanics of the rule used to convert votes into seats and by the higher fragmentation of the left party bloc. See section 4 for a detailed explanation.

not a consequences of fewer incentives to leak information about corruption in such fragmented governments.

The rest of this chapter is organized as follows. Section 2 discusses the arguments that justify why non-majority governments could be more corrupt (or not) than the majority ones. Section 3 describes the Spanish institutional setting; its local political system and the origin and magnitude of political corruption. Section 4 describes the empirical strategy. Results are presented in Section 5, and Section 6 concludes with a summary and the main findings.

2.2.- GOVERNMENT FRAGMENTATION AND ACCOUNTABILITY

This section summarizes the main predictions that can explain why government fragmentation (i.e., non-majority v. majority status) could affect accountability and hence, corruption. The arguments are organized in two groups according to whether they predict a reduction or an increase in accountability. There are arguments in both ways. Thus, in the end, it is an empirical question of whether government fragmentation affects corruption.

2.2.1.- Government fragmentation reduces accountability

For incumbents to behave in the interest of citizens, they need to feel that, if they misbehave, there is a real chance of being replaced after the coming election (see Wittman, 1983). In a two-party system this requires that voters do not have any special attachment to one of the parties; the higher the proportion of independent or swing voters the stiffer electoral competition will be and the lower the amount of rents (Polo, 1998). There is empirical evidence that more competitive elections lead to lower levels of corruption (Finan & Ferraz, 2011; Svaleryd & Vlachos, 2009). Note, however, that this evidence comes either from presidential-type systems or from countries with very stable coalitions.

Things might be different in multiparty systems with variable coalitions. Some authors suggest that the level of accountability will be reduced when there is a high level of uncertainty regarding the identity of the parties that will get into the government (Diermeier & Merlo, 2004). The reason is that in this setting, even when the increase in the rent level obtained by one party leads to a vote

reduction, the party might not end up being excluded from the government. It is because of this that parties may not be worried too much about voters' reaction to corruption (Aytimur, 2012).

Some results in the literature suggest that the outcomes in terms of corruption depend on the ideological differences between the parties. The work by Aytimur (2012) shows that the high-corruption outcome commented above is more probable when there is some pivotal party that is able to get into all possible coalitions. For this party, the probability of getting into the government is completely detached from its electoral results (provided it obtains at least one seat) and so it does not have any incentive to abandon its corrupt deals. Additionally, the ability of pivotal parties to shift party blocs means that they do not have very intense policy preferences, which means that they are more willing to enter coalition agreements based on corrupt deals.

The accountability models discussed above imply that voters are able to observe the rents extracted by each party. This might be difficult in practice. Citizens' ability to assign responsibility depends on the extent to which the politicians responsible for the decisions can be identified (see Powell, 2000). In a non-majority government, it is more difficult for the voter to determine precisely which party is responsible for government outcomes. Because of this, it might be more difficult for voters to hold politicians accountable (i.e., to decide whether they should be ousted from the office). Knowing that, parties in a coalition government might not face strong incentives to avoid taking part in corruption deals.

To our knowledge, there is no empirical evidence available to support this claim directly. However, there are papers showing that government fragmentation reduces the intensity of economic voting (Powell and Whitten, 1993) and the response of voters to fiscal choices (Lowry *et al.*, 1998; Bosch and Solé-Ollé, 2007). The only paper focusing on the relationship between clarity of responsibility and corruption is the one by Tavits (2007). The negative correlation between majority status and corruption found in that paper is consistent with this idea, although it might also be due to any of the other mechanisms discussed in this section.

2.2.2.- Government fragmentation enhances accountability

Myerson (1993) shows that proportional electoral systems might be more effective in controlling corruption than plurality ones. In this model, parties belong to two different party blocs located along a single-issue dimension (e.g., left and right). There is the same number of parties on each of the two blocs, and at least one party in each side is 'corrupt'. Plurality rule is only partly effective to control corruption: in some of the Nash equilibria corrupt parties get no votes, but in others, they do due to voter's coordination problems. Eventually, a corrupt party might end up heading a majority government.

The proportional rule is defined as a situation where the seat shares of the parties are perfectly proportional to their vote shares. In the model, there is no uncertainty regarding government formation, which depends entirely on policy preferences. This means that government formation is based on which of the two groups of parties (i.e., left or right) gets more seats. Under these assumptions, voters have no reason to vote for a corrupt party. Therefore, according to Myerson's model, multi-party coalition governments arising from proportional electoral rules might be even less corrupt than single-party governments arising from plurality systems.

The work by Kiss (2009) also finds that –in some situations– coalition governments might be held as accountable as single-party governments and so they might not end up capturing more rents. Kiss (2009) uses a retrospective voting model in order to compare the effect of future elections on rents captured by single-party v. coalition governments. He concludes that political rents will not necessarily be higher in coalition governments if there is a viable electoral alternative –i.e. if the incumbent can, in fact, be replaced by another government in the case voters are fed up by its corruption practices. These works suggest that natural coalitions, which are those based on ideological proximity, will not be necessarily more prone to corruption than majority governments.

A different reason why non-majority governments might be more accountable is the increase in the higher intensity of mutual party control. In a non-majority government, there are more (and diverse) eyes watching the decisions of the government than in a majority one. In a coalition government, the different partner parties continuously cooperate and negotiate. This procedure

entails the sharing of the relevant information and provides many opportunities for mutual monitoring of activities. Coalition governments have different tools –e.g., coalition agreements, portfolio allocation, allocation of watchdog roles to some of the members- to ensure individual parties do not act solely in their own interest (see Strøm *et al.*, 2010, for a review of these instruments). Some of these instruments are even present in the case of minority governments; for instance, some sort of agreement might have to be reached for the mayor to get elected during the investiture, and a majority in the legislature may be able to force the disclosure of relevant information, block cabinet initiatives and, eventually, depose the government. This is not the case of majority governments where important decisions requiring the approval of the legislature will succeed without the need for support from other parties. Moreover, non-majority governments are sometimes based on pre-specified agreements and, in any case, on trust between the partner parties. Inappropriate political decisions could trigger the dissolution of a non-majority government.

However, there are also reasons that suggest that the incentives to denounce a corruption scandal might be low in some types of non-majorities. For instance, some coalition governments might be politically costly to break (see e.g. Kunicova & Rose-Ackerman, 2005). The denouncing party might have to renounce to implement his program, give up its office perks, and will have to face the responsibility of his acts in the next elections. Therefore, some parties might have more incentives to bring to light the corrupt deals of its coalition partners than others. This might happen in particular in the case of pivotal parties since they do have the ability to shift partners in a future election, so they do not have to respect any previous deal with a corrupt party. For pivotal parties, it might also be easier to vote against the initiatives of the government in the legislature. This might be difficult for partners belonging to the same ideological block, since for them it might be electorally costly to join the opposition in a vote against a government initiative. In this view, the effectiveness of mutual control exercised by the different parties represented in the legislature does not depend only on whether they have the means to exercise this control (i.e., on whether they are present in the cabinet) but also on whether they are willing to use them.

2.3. INSTITUTIONAL FRAMEWORK

Spain is organized in three tiers of government: national government, seventeen regions (the so-called autonomous communities) and over eight thousand municipalities. Municipalities have competences on traditional responsibilities assigned to the local public sector such as urban planning, environmental services, public transport and welfare, with the exception of education, which is a regional responsibility. This expenditure is approximately financed 2/3 with their own revenues and 1/3 by intergovernmental transfers. Municipalities also have the possibility to use debt, which is restricted to the funding of capital spending and subject to different types of limits.

2.3.1.- Local politics

Spain is an excellent setting to study the relationship between the type of government and political corruption at the local level. Local councils are the analogues of national or regional parliaments. The proportional electoral system is applied at the three tiers of government with minor differences (e.g., regarding district size, minimum thresholds, and parliament size). The number of seats to be elected in each municipality grows with population size.[7] Hence, both majority and non-majority governments are usual at the national, regional and local level. Cabinet positions are also similar to ministries due to the substantial degree of local spending autonomy and of the important local regulatory functions (e.g., zoning). Finally, local elections take place simultaneously in all municipalities, and national parties are present in the vast majority of them, although local parties also run in many places.

2.3.2.- Government formation and fragmentation

The formation of local governments in Spain is based on three steps: local elections, party negotiation and the election of the mayor in the council. First of all, citizens cast their votes and then seats are distributed among parties using the d'Hondt rule. Then, if no party obtains a majority of the seats, a negotiation period between the parties starts. Finally, the mayor has to be elected by an absolute majority of the legislature. If no candidate reaches a

[7] Up to 100 inhabitants 3 seats, from 101 to 250: 5; 251 to 1,000: 7; 1,001 to 2.000: 9; 2,001 to 5,000: 11; 5,001 to 10,000: 13; 10,001 to 20,000: 17; 20,001 to 50,000: 21; 50,001 to 100,000: 25 and over 100,001 a seat more per each 100,000 residents or fraction, adding one more when the result is an even number.

majority of seats, the most voted candidate at the local elections (in terms of votes) becomes the mayor automatically. The mayor then allocates the cabinet positions.

Spain presents an important proportion of non-majority governments. During the 1999-2003 and 2003-2007 electoral terms approximately 40% of municipalities had a non-majority government. The natural pattern of local coalitions in Spain is based on ideology. On the one hand, the national socialist party (i.e., PSOE: 'Partido Socialista Obrero Español') and the former-communist party (i.e., IU: Izquierda Unida) share a history of continuous agreements since 1979 –the first local elections after the restoration of democracy. After the 1999 local elections, PSOE and IU established an explicit national-level agreement to give mutual support to their candidates with greater chances of becoming mayors. Something similar happened on the right-wing side, where the main national party (i.e., PP: 'Partido Popular') used to close deals with other smaller right-wing parties (mostly regionally-based). So, during the years of our analysis (1999-2007), the ideological dimension was the dominant driver of coalition formation at national and regional levels (see Stefuriuc, 2009). Another key determinant of coalition formation is vertical alignment: when two parties enter a coalition at the national and/or regional level, there is a high probability that they will also enter a coalition at the local level. Since most regional coalition depends on ideology, this means that local coalitions will also depend on ideology. However, this pattern also applies in several cases of a centrist party helps a left or right-wing party win the presidency of the regional government.

When an ideologically connected coalition like that one was not feasible (i.e., the seats of the politically-connected parties do not exceed the majority threshold), one would expect the bargaining process to be more difficult. This might well increase the probability of using less conventional ways to close the government formation deal, and corruption might arise as a consequence. There are many regional parties that do not support the regional president and a myriad of local parties that can eventually play a key role in government formation. These parties do not have an identifiable position on the left-right ideological axis and do not have to respect any deal with a party ruling at a higher layer. Hence, in a non-majority situation where no ideological block has a majority of the seats, these parties might obtain an important bargaining power. They are placed in a pivotal position, thus being able to sustain a

government of indistinctive ideology.

Non-majority governments are quite stable, but this does not necessarily mean that the city council is always easily governed. It is important to note that local elections cannot be held before the end of the term. A disagreement between the parties backing the mayor has to be resolved either with those parties exiting the cabinet or with a motion of no confidence. Note, however, that for the mayor to be replaced, an alternative candidate should be able to get the support of an absolute majority of the council. These institutional traits might influence the incentives to reach a government formation agreement with a given party in the first place, and also the incentives to control the activities of this party during the term and of, eventually, breaking up the government.

2.3.3.- Political corruption in Spain

Most corruption cases occurring in Spain in the last two decades refer to political corruption and are related to zoning regulations (see Villoria & Jimenez, 2012). Between 1997 and 2007 Spain experimented a housing boom of an unseen magnitude. On average, housing prices and housing construction more than doubled during this period. The main instrument of land use regulation, town planning is in the hands of municipalities. The stringency of these regulations, coupled with the huge shift in housing demand, generated enormous rents, providing incentives for corrupt deals between developers and local politicians (Ades & Di Tella, 1999; Solé-Ollé & Viladecans-Marsal, 2012). A large number of corruption scandals in Spain are related to local politicians or changing land uses (i.e. allowing building in previously forbidden areas, increasing construction densities or designing new areas to be developed; see Fundación Alternativas, 2007) and those related to questionable contracts between developers and local authorities (see Transparency International, 2007).

Local scandals started to break up before the 2003 local elections and reached the maximum intensity before the 2007 ones, coinciding with the peak of the housing boom.[8] Scandals continued to pop up after the bust of the housing bubble, although in many cases they refer to episodes of corruption that occurred during prior terms of office. During all these years, there has been an

[8] The number of cases prior to 1999 were just 49. In the 1999-2003 term, there were 269 corruption cases and 277 for the period 2003-2007 (see Costas *et al.*, 2012).

intense debate regarding the possible causes and consequences of corruption (see Fundación Alternativas, 2007). There have also been some proposals regarding how to fix the problem, that range from an improvement of the efficiency of the judiciary to the protection of the independence of the media (see Fundación Alternativas, 2010). There have also been some proposals related to the reform of the electoral system. At the local level, the reform proposed by the government aimed at facilitating government formation by assigning the mayoralty to the most voted party (or in some proposals to a party exceeding a given vote share threshold). The argument used by the government was that those coalitions should be blamed for the rampant corruption observed. This premise was contested by all the remaining political parties and by many commentators and experts.

2.4.- EMPIRICAL ANALYSIS

2.4.1.- Hypotheses

The main hypothesis aims to test whether non-majority governments (defined as those in which the mayor's party does not have a majority of the seats in the legislature) do really have a higher probability of being embroiled in a corruption episode during a given term of office than majority governments (defined as those where the mayor's party held a majority of the seats). With this purpose, the estimation equation is:

$$Corruption_{it} = \alpha + \beta * Non\text{-}majority_{it} + \gamma * X_{it} + \lambda_{jt} + u_{it} \qquad (1)$$

where $Corruption_{it}$ is a dummy variable coded 1 if there was a corruption episode in municipality *i* during the term of office *t*, $Non\ majority_{it}$ is a dummy variable coded 1 if there is a non-majority government municipality *i* during the term of office *t,* X_{it} is a matrix of political, demographic and economic variables (possibly unbalanced in the unmatched close election sample), λ_{jt} are region× term-of-office fixed effects and u_{it} is the error term.[9] As discussed in section two, there are some theories that suggest that non-majorities are more corrupt and other theories that suggest just the contrary.

[9] The next section discusses the identification assumption behind the empirical strategy, which is basically based on estimating this equation on a restricted sub-sample of more comparable non-majority and majority governments.

A second hypothesis to test is that it is just a particular type of non-majority governments that might have a greater chance of being corrupt. Recall from the discussion in section two that Myerson's (1993) result in the superiority of non-majority governments rested on the assumption that coalition formation was based on the similarity of policy preferences. Therefore, in that model, all coalitions were formed between parties belonging to the same bloc. Also, section two discusses the results of some papers suggesting that the worst outcomes in terms of corruption were expected in situations where there is a pivotal party (see Aytimur, 2012). However, there is also the possibility that pivotal parties have stronger incentives to monitor and/or denounce corruption. The following regression is used to test this hypothesis:

$$\begin{aligned} Corruption_{it} = \alpha &+ \beta * Natural\ non\text{-}majority_{it} + \\ &+ \rho * Non\text{-}natural\ non\text{-}majority_{it} + \\ &+ \delta * Pivotal\ non\text{-}majority_{it} + \\ &+ \mu * Local\ non\text{-}majority_{it} + \gamma * X_{it} + \lambda_{jt} + u_{it} \end{aligned} \quad (2)$$

where $Natural\ non\text{-}majority_{it}$ is a dummy variable coded 1 if the non-majority government is sustained by a majority of legislature seats belonging to the same ideological block.[10] This type of non-majority government might be more corrupt than a majority government (due to diffusion of responsibilities), equally corrupt (if the coalition is stable so there is a clearly identified opposition), or less corrupt than a majority government (if there is more mutual control). The dummy $Non\text{-}natural\ non\text{-}majority_{it}$ is coded 1 if the winning party needs a party from an opposite ideological block to reach a majority of seats. This type of non-majority government might be more corrupt than a majority government (if the agreement is based on special deals) or less corrupt than a majority government (if the mutual control between coalition partners increases given their ideological distance). The dummy $Pivotal\ non\text{-}majority_{it}$ is coded 1 if none of the ideological blocks has a majority of seats and a pivotal party (i.e., a centrist party that could sustain a majority of indistinctive ideology) is needed to support the government. This type of non-majority is expected to be more corrupt than

[10] See ideological classification procedure and the full list of political parties' classification in table A.5.

the other types if this party is able to extract special deals in exchange of support for the government (and also given its lower concerns about the electoral effects of corruption), or less corrupt if the ability of the pivotal party to deal with the opposition increases its incentives to blow the whistle. The dummy $Local\ non\text{-}majority_{it}$ is coded 1 if a local party is needed to form the government. A party is labelled as local if it is a party of local scope and that cannot be classified as left, right or centrist. This group is included as a separate category due to our inability to classify these parties according to ideology. Given the mix of cases (some local parties might be natural coalition partners while others could probably be qualified as pivotal parties), there is not a clear idea of what to expect in this case.

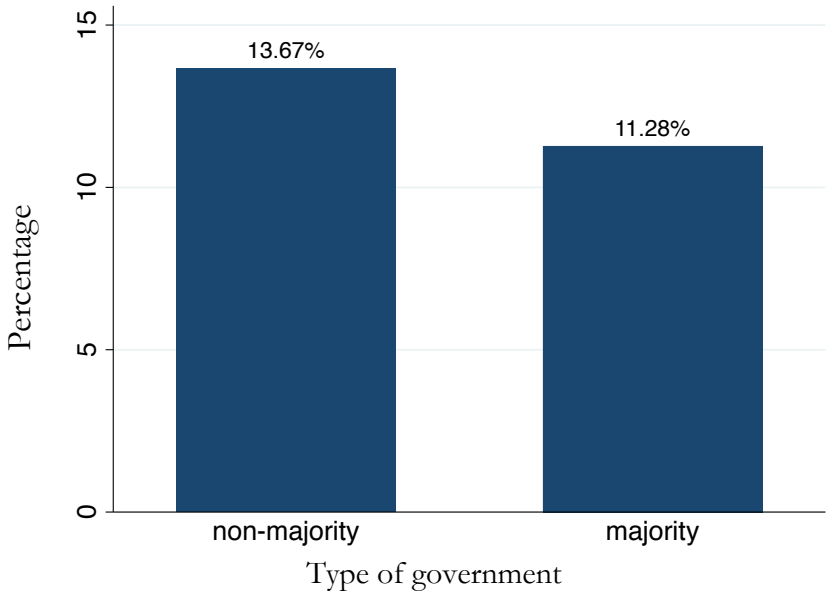
2.4.2.- Identification Strategy

Equation (1) introduced in the previous section aims at comparing two groups of municipalities, those with a non-majority government (*treated*) and those with a majority government (*control*). In order to claim that the effect on corruption has a causal interpretation, these groups should be identical in every possible dimension, with the exception of the treatment status. If this was the case, one could proceed by just comparing the percentages of corrupt municipalities in non-majority and majority local governments. Figure 2.1 below presents such an exercise and shows that there is a statistically significant difference between the proportion of corrupt municipalities in the two groups: non-majority governments have a probability 2.39 percentage points higher of having a corruption scandal that majority governments (2.39 =13.67 -11.28 or an increase around 20% in the incidence of corruption, i.e., 21.19%=2.39%/11.28%).

However, this difference cannot be interpreted as evidence that non-majority governments engender corruption. The reason is that the treatment status (being governed by a non-majority) is not random and so might be correlated with many factors that are difficult to measure. For example, non-majorities are more prevalent in urban areas or along the coast, which is also where the housing boom was more intense (and so the opportunities of corruption). Of course, these and other influences might be captured by the region per term dummies or by covariate adjustment, but it is unclear whether it is possible to account for all possible omitted factors. Another concern would be that the measure of corruption it is only able to detect corruption episodes released to the press. Therefore, differences between government types on the press

attention or incentives to leak corrupt information could distort the results. The results section provides evidence that such situations do not affect the measure of corruption used in the analysis.

Figure 2.1 - Share of corrupt municipalities



Difference= 2.39, std.error= 1.19, pvalue=0.045

Notes: Average share of corrupt municipalities by government type considering all municipalities in the full sample.

The identification strategy used in this study helps to isolate most of these influences. It restricts the attention to non-majorities and majorities located in a neighbourhood of the seat cut-off that determines the government type. Provided that this neighbourhood is not too wide the non-majorities and majorities should be more comparable. Then, it compares any non-majority government in that sample with majority governments that are identical with respect to relevant political characteristics. Moreover, one also expects that municipalities that have identical governments (in terms of those political characteristics) would also be very similar in terms of any other political or socio-economic characteristic that might be correlated with corruption. There are many works in political science and sociology suggesting that socio-economic characteristics might influence the evolution of party systems and of government type (see e.g. Lipset & Rokkan, 1967; Stoll, 2013; Geys, 2006). Extrapolating, this means that it is natural to expect that if one picks several

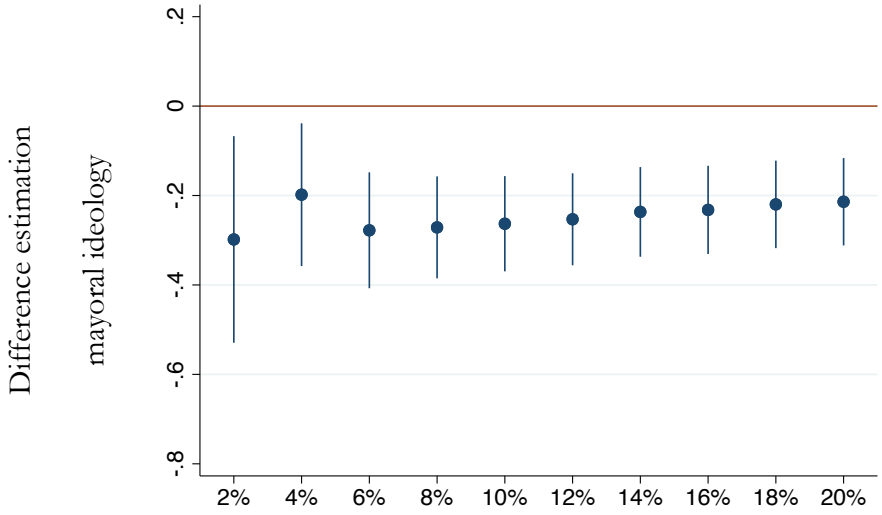
times two identical localities in terms of government type (e.g., size, ideology and fragmentation) they should be, on average, identical in terms of socio-economic characteristics.

The procedure used in this analysis resembles a traditional 'regression discontinuity design' (RDD) in that it also relays on the distance to the cut-off for our estimation. However, the identification strategy is different from an RDD. The causal effect is not estimated at the vote cut-off; it is estimated using the observations on a neighbourhood of that cut-off and after 'matching' treated and control units belonging to that neighbourhood. The reason to employ this procedure is the lack of balance of some important political variables at the vote cut-off, which render a traditional RDD inapplicable. This solution has been proposed by Keele *et al.* (2015) to deal with population sorting across the border in the context of a geographical regression discontinuity design. In the Spanish case, the imbalance is due to the mechanical effects generated by the rule used to convert votes into seats. Even though there is continuity on the share of votes obtained by the winning party (Table A2.1), the so-called 'd'Hondt' rule is known to provide an extra benefit to the winning party in terms of seats.

Figure A2.2 in the Appendix plot the density function for the number of seats of the winning party (the party with more seats); the figure clearly shows that there is a higher density of municipalities with + 1 seat (majorities) than with - 1 seat (non-majorities). Along the same lines, the bottom figure in Table A2.2 plots the McCrary test (McCrary, 2008) for the share of votes that the most winning party should lose/won in order to lose (get) the majority of seats (below there is a description how this variable has been computed). The plot shows the same discontinuity at the threshold for votes. This fact coupled with the higher share of right-wing mayors and the higher fragmentation of the left-wing bloc contributes to generating an imbalance in the ideology of the mayor. That is, there are more left-wing mayors among non-majority than among majority governments. This imbalance is evident when defining closeness in terms of seats (see Table 2.1 below) but also when looking at the continuity of these variables using the distance in votes to the cut-off (Table A2.1). Figure 2.2 shows that this imbalance is persistent irrespectively of the considered distance to the majority cut-off and the inclusion of local polynomials (panels and b).

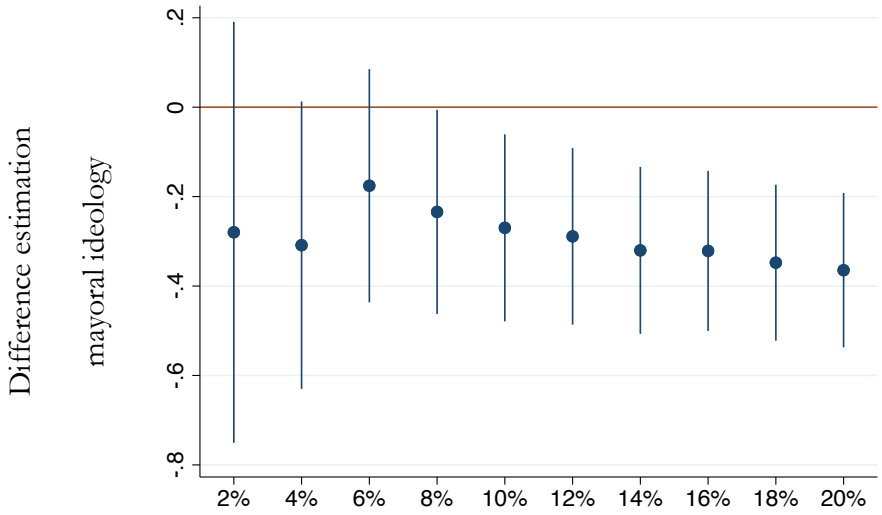
Figure 2.2 – Mayoral ideology discontinuity

Panel (a): difference in means



Bandwidth for the share of votes distance to the majority cut-off

Panel (b): controlling for a local polynomial



Bandwidth for the share of votes distance to the majority cut-off

Notes: The dependent variable is the mayoral ideology, a dummy variable that equals 1 if the mayor belongs to a right-wing party and -1 for a left-wing one. Number of observations in the regressions: 2% 284; 4% 583; 6% 869; 8% 1,113 10% 1,273; 12% 1,383; 14% 1,470; 16% 1,525; 18% 1,550; 20% 1,557.

Close elections. The definition of close elections is based on different approaches –and so to set the width of the neighbourhood around the cut-off – to provide robustness to the results. The first approach consists of defining this neighbourhood as the cut-off plus (or less) the marginal seat. In this case, a majority government occurs when the winning party (the one getting more seats at local elections) obtains just the minimum number of seats needed to have a majority in the legislature, and so to secure the mayoralty. Conversely, a non-majority government occurs when the most voted party obtains one seat less than the number needed to form a majority government.

The second approach consists on defining the neighbourhood in terms of the vote distance to the cut-off, that is, in terms of the vote share that the winning party has to win (or loss) to win/loss the marginal seat. The calculation of the forcing variable (*vote distance to the cut-off*) is not straightforward, given the existence of a proportional system and the use of d'Hondt rule to convert votes into seats.[11] To make it as simple and intuitive as possible, it is computed as the share of votes that the winning party has to lose (win) in order to move from a majority to a non-majority government (from a non-majority to a majority government), assuming that the incumbent has a negative (positive) popularity shock.[12] Table A2.4 in the Appendix explains how this *vote distance to the cut-off* has been computed.

Note that with this first step, the sample is restricted to close elections, meaning that the differences in the popularity of the mayor are much lower than in the original sample. This is important since the incumbent's popularity is probably a key determinant of corruption. Going one step beyond, one could also expect that these non-majority and majority samples are now also much more similar in other dimensions. This is however, only partly true.

Table 2.1 shows the difference between the treated and controls in the original[13] and in the close-election samples based on the marginal seat for several relevant political variables. The first three columns of Table 2.1 indicate that non-majorities are more frequent in big cities (that have larger

[11] The forcing variable is computed using a methodology similar to Curto-Grau *et al.* (2018).
[12] Municipalities with only two parties are excluded in the whole analysis. In this case, there can be no change in treatment status. There would always be a majority government.
[13] This simple considers the municipalities in the two periods (1999-2003) and (2003-2007) with a population larger than 2,000 inhabitants, a more tan two parties running at the elections and a left-wing or right-wing mayoral party.

legislature sizes), have more left-wing mayors, and have more fragmented legislatures (more parties in the opposition block and centrist parties). Columns (4) to (6) show that some of these differences have disappeared when considering close elections (historical turnout and number of seats of the opposition bloc) or have been reduced (legislature size, number of centrist parties or turnout) but others remain (ideology).

Table 2.2 presents the differences for a bunch of socio-economic, budget and geographic variables. The full sample, columns (1) to (3), indicates that municipalities presenting non-majority governments are, on average, really different than municipalities with a majority one. Considering the close elections sample, columns (4) to (6), some of these big differences between municipalities presenting majorities and non-majorities governments are reduced. However, others remain. Non-majorities present a lower share of the elderly population, higher economic indicators such as income or vehicles per capita, larger budget characteristics such as current revenues, expenditure and debt burden and a higher increase on previous housing prices.

Table 2.1 - Differences in means of political traits between treated (non-majority) and control (majority) group

	(i) Full sample			(ii) Close elections: +1/-1 seats		
	Treated	Control	Diff. (s.d.)	Treated	Control	Diff. (s.d.)
(a) Political variables used in the matching						
Total number of seats	14.716	13.614	1.102***	13.664	13.264	0.400**
			(0.151)			(0.193)
Mayor's ideology	-0.313	-0.028	-0.285***	-0.37	-0.123	-0.247***
			(0.035)			(0.051)
# *Parties in the opposition block*	1.447	1.308	0.139***	1.31	1.296	0.014
			(0.023)			(0.031)
# *Centrist parties*	0.602	0.256	0.346***	0.456	0.296	0.160***
			(0.024)			(0.031)
(b) Other political variables						
Turnout	0.713	0.733	-0.020***	0.734	0.748	-0.014***
			(0.003)			(0.004)
Historical turnout	0.73	0.738	-0.008***	0.748	0.753	-0.005
			(0.003)			(0.004)
Observations	1,178	2,084	3,262	590	871	1,461

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, p<0.1

Table 2.2 - Differences in means of socio-economic traits between treated (non-majority) and control (majority) group

	(i) Full sample			(ii) Close elections: +1/-1 seats		
	Treated	Control	Diff. (s.d.)	Treated	Control	Diff.(s.d.)
(a) Demographic variables						
Population	15.511	12.619	2.891**	10.805	10.931	-0.126
			(1.242)			(1.298)
Population growth	15.977	9.893	6.084***	14.498	12.318	2.180
			(1.514)			(2.069)
Education level	36.326	34.555	1.771***	35.088	34.374	0.714
			(0.310)			(0.434)
Population under 16 *years*	16.683	16.463	0.220*	16.885	16.976	-0.091
			(0.120)			(0.171)
Population over 65 *years*	17.128	18.848	-1.720***	17.87	18.514	-0.644**
			(0.210)			(0.296)
(b) Economic variables						
Income p.c.	0.964	0.935	0.029***	0.944	0.926	0.018**
			(0.005)			(0.007)
% Vacation homes	15.241	14.907	0.334	15.843	15.974	-0.131
			(0.518)			(0.767)
Vehicles p.c.	0.507	0.477	0.030***	0.493	0.478	0.015**
			(0.005)			(0.008)
Property value p.c.	16.753	14.022	2.731***	15.429	14.532	0.897
			(0.527)			(0.784)
(c) Budget variables						
Current expenditure p.c.	399.339	367.630	31.709***	373.941	357.212	16.729*
			(5.982)			(8.563)
Non-financial expenditure p.c.	575.135	561.559	13.576	560.643	539.623	21.020
			(9.108)			(13.317)
Current revenues p.c.	504.169	463.484	40.685***	465.328	442.025	23.303*
			(8.594)			(11.976)
Debt burden	0.083	0.072	0.011***	0.076	0.070	0.006*
			(0.003)			(0.004)
(d) Housing boom						
Housing construction growth	23.264	20.156	3.108***	22.769	21.268	1.501
			(1.181)			(1.046)
Housing price growth	175.573	164.052	11.521***	171.398	164.104	7.294**
			(2.340)			(3.327)
(e) Geographical variables						
Coast	0.198	0.159	0.039***	0.131	0.123	0.008
			(0.014)			(0.018)
Urban area	0.429	0.322	0.107***	0.337	0.301	0.036
			(0.018)			(0.025)
Observations	1,178	2,084	3,262	590	871	1,461

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, p<0.1

Matching. The fact that there are still some imbalances is the reason why, the second step of the methodology performs an exact match[14] between the treated and control municipalities included in the close-election sample on a set of political characteristics. The matching procedure pairs municipalities, for each term of office, according to legislature size, the ideology of the mayor, the number of parties of the opposition block and the number of centrist parties. Since all these variables are discrete, what our exact matching is doing is to compare each treated unit with a counterfactual unit computed as the average of the non-treated municipalities that are identical concerning all the traits of that treated municipality. For example, if our treated municipality is a non-majority government with a population between 2,000 and 5,000 inhabitants (so with 11 seats in the legislature), a left-wing mayor, two parties in the opposition and one centrist party, this municipality is compared with the average of the set of all majority governments that have exactly the same set of characteristics. The only difference between these municipalities is that the treated one is ruled by a non-majority (the winning party obtained 5 seats) and the control one by a majority (6 seats).

Now, Table 2.3 shows that there is no difference in the political variables. This is, of course, the result of the matching in the case of the variables used in the procedure. Note, however, that there are also no differences in the other political variables. Furthermore, more importantly, all the differences between non-majorities and majorities in terms of socio-economic, budget and geographical variables (Table 2.4) have now disappeared. Therefore, our matching procedure ensures that the treated and control units are identical not only in terms of political characteristics but in terms of any other plausible variable that may be correlated with corruption and with the non-majority status.

[14] Matching has become quite a popular methodology within the applied political science literature (see e.g. Ho *et al.*, 2007). Some authors advocated the good properties of exact matching (see e.g. Iacus *et al.*, 2012).

Table 2.3 - Differences in means of political traits after the matching

	(iii) Close elections (+1 /-1 seat) + Matching		
	Treated	Control	Diff. (s.d.)
(a) Political variables used in the matching			
Total number of seats	13.576	13.574	0.002
			(0.228)
Mayor's ideology	-0.406	-0.406	-0.000
			(0.056)
# *Parties in the opposition block*	1.288	1.288	0.000
			(0.035)
# *Centrist parties*	0.392	0.392	0.000
			(0.035)
(b) Other political variables			
Turnout	0.734	0.739	-0.005
			(0.005)
Historical turnout	0.749	0.748	0.001
			(0.004)
Observations	556	781	1,337

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, p<0.1

Additionally, the analysis performed several variations to the approach. First, it was repeated using the vote distance variable. The matching is redone for different values of this variable and following Keele *et al.* (2015) the chosen value corresponds to the lowest value possible value of this variable compatible with maximizing the proportion of units in the neighbourhood for which it is able to find a match. This value is around five per cent. All the additional political and socioeconomic variables are also balanced in this case (results are available upon request). Second, the matching is repeated using a finer breakdown for the ideological variable; the party of the mayor (instead of the ideological bloc). This produced a larger drop in the number of units and threatens the external validity of the approach. The two samples are balanced, but this provides no clear gain since they were already balanced previously.[15]

[15] The results of the estimation are very similar in both cases. The matching is repeated also using the number of seats in the opposition and the number of seats of centrist parties. The results did not change. All these results are available upon request.

Table 2.4 - Differences in means of socio-economic traits after the matching

	(iii) Close elections (+1, -1 seat) + Matching		
	Treated	Control	Diff. (s.d.)
(a) Demographic variables			
Population	10.470	10.157	0.312
			(1.317)
Population growth	14.231	12.637	1.594
			(2.342)
Education level	35.015	34.794	0.221
			(0.486)
Population under 16 *years*	16.903	17.041	-0.138
			(0.195)
Population over 65 *years*	17.916	18.235	-0.319
			(0.349)
(b) Economic variables			
Income p.c.	0.941	0.924	0.017
			-0.018
% Vacation homes	15.59	16.256	-0.666
			(0.947)
Vehicles p.c.	0.491	0.477	0.014
			(0.009)
Property value p.c.	14.902	14.408	0.494
			(0.729)
(c) Budget variables			
Current expenditure p.c.	369.953	365.098	4.855
			(11.586)
Total expenditure p.c.	556.682	543.539	13.143
			(16.984)
Current revenues p.c.	458.963	454.556	4.407
			(15.989)
Debt burden	0.076	0.071	0.005
			(0.004)
(d) Housing boom			
Housing construction growth	22.395	22.259	0.136
			(1.258)
Housing price growth	169.818	164.236	5.582
			(3.870)
(e) Geographical variables			
Coast	0.126	0.155	-0.029
			(0.026)
Urban area	0.331	0.326	0.005
			(0.031)
Observations	556	781	1,337

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, p<0.1

Estimation. The equations presented in the previous section are estimated by OLS using the close-elections sample and weighting each observation to estimate the ATT (the average treatment effect on the treated).[16] So, in practice, the matching is only used to pre-process the sample before the estimation, as has been suggested by Ho *et al.* (2007). Then, in order to improve efficiency, some regressions include the set of socio-economic variables for which there were significant differences between the two groups in the un-matched sample. In addition to this, some specifications also include province per term fixed effects, which help to control for influences common to geographically close municipalities during a given period (i.e., the intensity of the housing boom, common political shocks).

2.4.3.- Data

Period and sample. The analysis uses data of two consecutive terms of office, 1999-2003 and 2004-2007. This period of time coincides with the housing boom and covers the majority of the corruption episodes related to zoning regulations. The sample is restricted considering some municipality characteristics:

First, due to data availability, the analysis is restricted to municipalities with more than 2,000 inhabitants. This is not a big problem since the vast majority of corruption episodes are in fact concentrated in municipalities larger than this threshold.

Second, municipalities with less than two parties running in the elections are also excluded since the resulting government would always be a majority one. Less than 8% of municipalities have only one or two parties running in the local elections.

Third, due to the identification strategy, the sample does not include municipalities with a mayoral party identified as local or pivotal since it would not be possible to match these municipalities. Only around 5% of governments present such characteristic.

[16] Weights consider the ratio between treated and control units before the matching. Weights are defined as w=1 for treated observations. Control units receive a weight such that they keep the unweighted ratio between treated and control units in the whole matched sample for each subgroup of exact-matched observations.

Finally, the analysis considers municipalities experiencing corruption scandals for the first time given that previous corruption scandals are expected to influence future government behaviour.

Corruption. The analysis uses an extensive database on corruption scandals related to land use regulation for the period 1999-2007. This database was used for the first time in Costas-Pérez *et al.* (2012), who coded the information included in a report by the Fundación Alternativas (2007), a Spanish think tank. A municipality is defined as affected by a corruption scandal if at least one news story about the case was published in national and local newspapers during the whole period. The database provides information not just about corruption scandals (i.e., timing of the publication of news stories) but also about the timing of the episode of corruption (i.e., when exactly the corrupt deal took place). Thanks to this information it is able to identify the corruption episodes that affected a municipality during a given term-of-office. So, a local government is defined as corrupt at term t if there was at least a corruption episode assigned to that term of office (and that could turn into a scandal either during this term or in the future). This aspect of the definition is very important for the purposes of the analysis since it is crucial to be able to match the exact government responsible for the corruption episode. Scandals would not be an appropriate measure of corruption if they occur in future terms (after the corrupt government was replaced).

Electoral outcomes. The Spanish Ministry of Interior provides information on the vote share and seats' distribution for the 1999 and 2003 local elections, as well as the party of the mayor, so it is possible to identify government types. If the party of the mayor obtained at least $(n/2)$ +1 seats (with n = legislature size), the government is defined as a majority one. Otherwise, the government is defined as a non-majority one. This information is used to restrict the sample to close local elections: if the number of seats of the most voted party, in terms of seats, obtained exactly $(n/2)$ +1 seats it is a close-elections majority; if the most voted party obtained exactly $(n/2)$ -1 seats it is a close-elections non-majority.

This information is also used to classify the non-majority governments. Those governments where the mayoral ideological block holds a majority of seats are labelled as natural non-majorities. Pivotal (local) non-majorities are those governments where there is not an ideological majority, and a centrist (local) party has the ability to form a coalition with another party/parties. Non-

natural non-majorities are those governments where the mayoral ideological block does not hold a majority of seats and an ideologically opposed party is needed to reach a seat majority. To implement these definitions, all the parties are classified into three blocs: left-wing, right-wing, and centre (see Table A2.5 in the Appendix for the classification procedure explanation and a list of parties classified in the different blocs).

The other political variables used to classify the governments are the mayor's ideology, the number of parties of the opposition block and the number of centre parties. The definition of all these variables used the same classification indicated above.

Other variables. The empirical analysis controls for a comprehensive set of demographic, economic, budgetary and geographical variables potentially related to the opportunities of corruption and with the treatment status. These variables are used to validate the methodology, i.e., to check whether treated and control units are similar after the implementation of the matching on political characteristics.

In the case of demography, the controls account for population size, population growth (between 1995 and 1999), education level and share of the population over 65 and less than 16 years. The economic situation is controlled through income p.c., % of vacation homes, vehicles p.c., and property value p.c. The potential intensity of the housing boom is estimated by changes in the housing prices and housing construction between 1986 and 1994. Budget variables (computed at 1999) are current expenditure p.c., total non-financial expenditure p.c., current revenues p.c. and debt burden. Geographical variables account for the coasted or urban area situation of the municipality. See Tables A2.2 and A2.3 in the Appendix for definitions and sources.

2.5.- RESULTS

By using the matched sample, the equation (1) is estimated by OLS to determine the effect of non-majority governments on corruption. Table 2.5 reports the baseline results. Table 2.6 reports the effect of the different non-majority government types on corruption; equation (2).

2.5.1.- Baseline results

Table 2.5 reports the baseline results. The first three columns report the results when defining the seat-based distance to the cut-off. The last three columns report the results when using a vote distance of five per cent. Columns (1) and (4) correspond to the simplest specification, where no control is included. Columns (2) and (5) control for province per term fixed effects in order to control for shocks common to spatially close municipalities. Columns (3) and (6) control for the political variables used to perform the matching and the set of socio-economic, budgetary and geographical characteristics. These different specifications allow corroborating that the results are robust to the inclusion of a comprehensive set of control variables. All the results point in the same direction: there are no statistically significant differences between the two types of governments. So the hypothesis that non-majority governments are more corrupt than the majority ones is rejected.

Table 2.5 - Effects of non-majority governments on corruption

	+1 v. -1 seats			+ 5% v. -5% votes		
	(1)	(2)	(3)	(4)	(5)	(6)
Non-majority	-0.003	-0.011	-0.007	0.004	0.006	0.009
	(0.019)	(0.019)	(0.018)	(0.030)	(0.030)	(0.028)
No. of municipalities	1,337	1,337	1,337	556	556	556
Province x time FE	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes

Notes: Results correspond to the matched close elections samples. +1 v. -1 seats: close elections defined as situations in which the winning party (in terms of seats) obtained the seats needed to secure a majority of the council ($^1/_2$+1) or fell short of one seat to obtain that majority ($^1/_2$-1). +5% v. -5% close elections defined as situations in which the winning party could lose between 0 and 5% of the votes and still secure a majority of seats in the legislature or should get between 5 and 0% additional vote share to secure a majority of seats. Controls are the control variables corresponding to the political, demographic and economic variables defined in table A1. The parentheses correspond to robust standard errors. *** p<0.01, ** p<0.05, p<0.1

2.5.2.- Non-majority types

Table 2.6 reports the results of estimating equation (2), which splits the treatment variable between natural, non-natural, pivotal and local non-majority governments. This table is structured in the same way as Table 3. The estimated coefficient for natural, non-natural and local non-majorities are small, and they are not statistically significant. The coefficient for pivotal non-majorities is negative, statistically significant and quantitatively meaningful. Taking into account that the average share of corrupt municipalities in the majority group (the base category) is around 10% a coefficient of -0.05 indicates that the probability of corruption of a pivotal non-majority is about half the probability of a majority government (5 percentage points lower). The results are robust to the inclusion of province per time fixed effects and to the inclusion of a comprehensive set of control variables.

Table 2.6 - Effects of non-majority governments types on corruption

	+1 v. -1 seats		
	(1)	(2)	(3)
Natural non-majority	0.005	-0.009	-0.001
	(0.021)	(0.022)	(0.021)
Non-natural non-majority	-0.025	-0.032	-0.011
	(0.044)	(0.047)	(0.046)
Pivotal non-majority	-0.100***	-0.057***	-0.052**
	(0.015)	(0.018)	(0.026)
Local non-majority	0.015	0.012	-0.009
	(0.037)	(0.037)	(0.039)
No. of municipalities	1,337	1,337	1,337
Province x time FE	No	Yes	Yes
Controls	No	No	Yes

Notes: see Table 2.5. *Natural non-majority* if the mayor is supported by a party belonging to the same ideological bloc; *Non-natural non-majority,* the mayor is supported by a party belonging to the opposite same ideological block (Left-right). *Pivotal non-majority,* the mayor is supported by a pivotal party. *Local non-majority* the mayor is supported by a local party.

2.5.3.- Corruption or disclosure?

A possible concern with this measure of corruption is that it is only able to detect that corruption has taken place if the episode has been released later on by the press (either during the term of in the future). The concerns lay on the possibility that in non-majority governments there are more incentives to leak information about corruption to the press; or that the press has more incentives to dig into these cases because incumbents are weaker (see e.g. Latham, 2015). If this was the case, it could be that the non-majority governments' status has a positive effect on corruption not because the government is more corrupt but because there is a higher propensity to release that information. To deal with this concern, a robustness check is carried out relying on the differential timing of episodes and scandals. In the estimation equation, the dependent variable is a dummy coded 1 if the scandal broke out during the term of occurrence of the corruption episode and 0 if it broke out in future terms, and the explanatory variable is the non-majority status. The results are reported in Table 2.7 and show that the non-majoritarian status does not have any effect on whether the scandal broke out sooner or later. The coefficient is not statistically significant; the point estimated is also very small, taking into account that the share of corruption episodes that break out before the elections that follow the case is around 90%. So there is no evidence supporting the idea that non-majorities are more corrupt just because the press follow them with more attention.[17]

Table 2.7 - Effects of non-majority governments on scandal breakout

	Unmatched			+1 vs. -1 seats		
	(1)	(2)	(3)	(4)	(5)	(6)
Non-majority	-0.029	-0.036	-0.009	0.014	-0.046	-0.008
	(0.069)	(0.089)	(0.012)	(0.102)	(0.110)	(0.140)
No. of municipalities	156	156	156	127	127	127
Province x time FE	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes

Notes: see Table 2.5. The dependent variable is a dummy variable that equals1 if the scandal is published the same term-of-office that happens; 0 if the scandal is published in a different term of office from when it happened. Columns 1 to 3 correspond to the close elections unmatched sample. Columns 4 to 6 to the close elections matched one.

[17] The exercise is repeated to look if this result also holds when looking at particular types of non-majorities. None of the coefficients was statistically significant. These results are available upon request.

2.6.- CONCLUSIONS

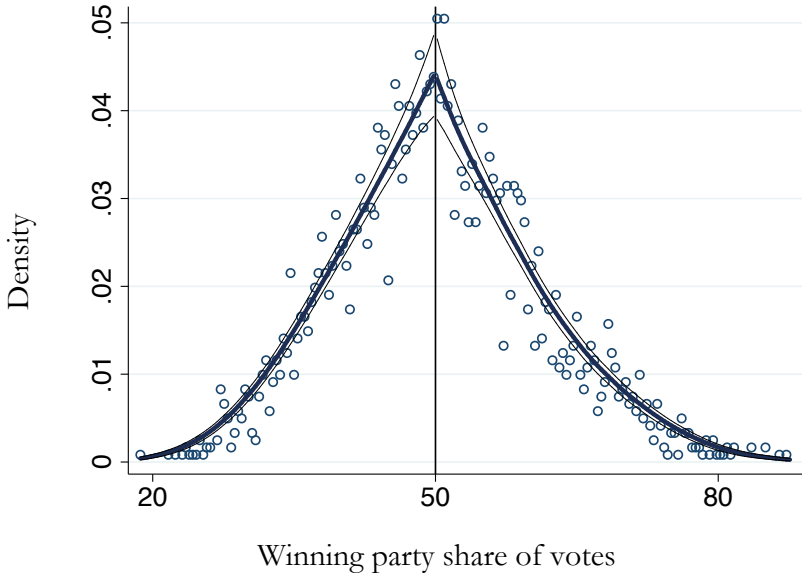
This chapter studies whether government fragmentation (i.e., non-majority vs majority) has an effect on corruption using Spanish municipalities' data for the period 1999-2007. In order to identify the causal effect of the government type on the probability of being corrupted, comparisons must be made between two municipalities that are nearly identical, but one is governed by a non-majority government (*treated)* and the other by a majority one (*control*). Therefore, the empirical strategy is based on comparing close-election non-majorities and majorities that are identical in several relevant political characteristics (both have the same legislature size, the same mayor's ideology and the same number of opposition and centrist parties). This procedure not only guarantees that the two groups are identical with respect to these characteristics (in fact, this happens just by design), it also shows that identical governments also imply municipalities that are identical with respect to other characteristics that might be both correlated with corruption opportunities and incentives and with the non-majority government status.

The baseline results allow rejecting the somewhat extended idea that non-majority governments are more corrupt than majorities because of the deals arrived at during the coalition formation stage. Moreover, although the analysis does not find that non-majorities are less corrupt in general than majorities, it does find that a specific type of non-majoritarian government, the one that contains a pivotal party (i.e., a party that is able to enter agreements with the opposition) is, in fact, less prone to be engaged in corruption. This result is consistent with a story in which coalition partners are more willing to denounce corruption when they have other agreement options.

APPENDIX

Figures

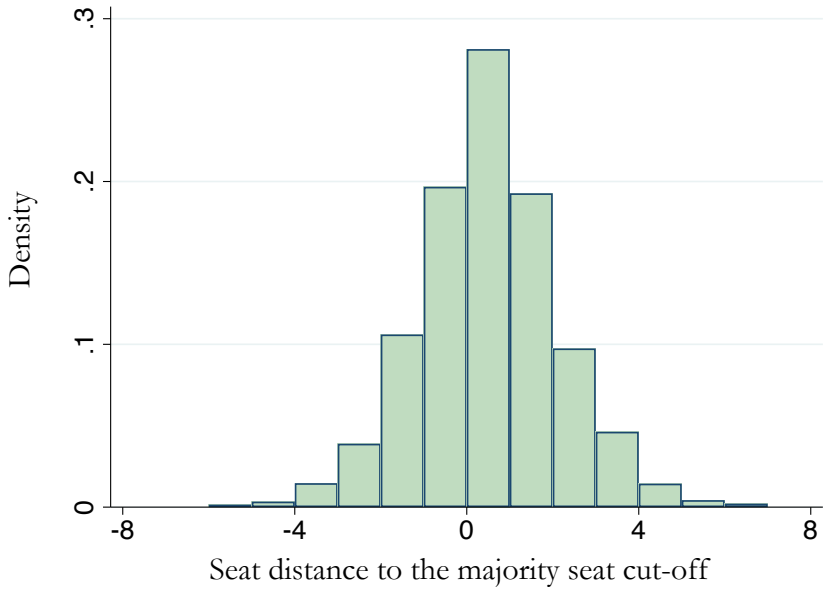
Figure A2.1 – Continuity of the winning party share of votes



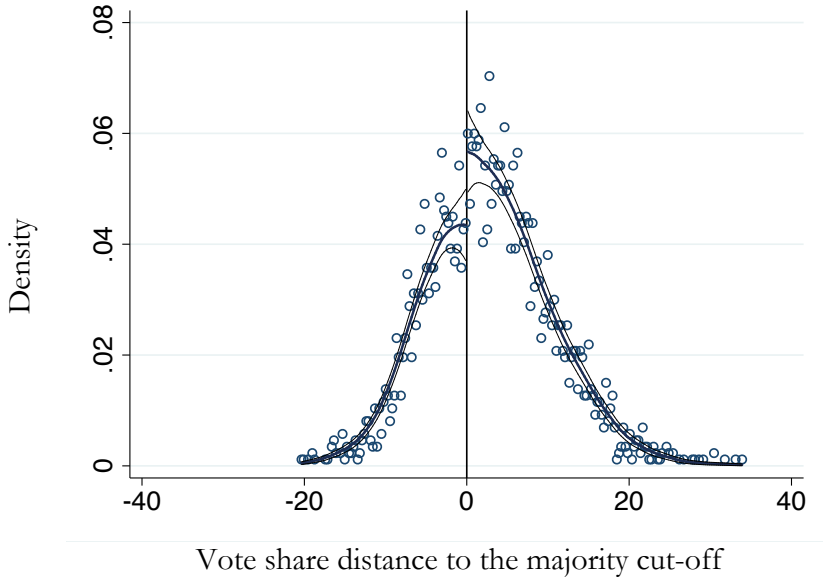
Notes: The figure shows the histogram for the share of votes (percentage) of the winning party (the party with more votes).

Figure A2.2 – Majority discontinuity due to the d'Hondt rule

Panel (a): Histogram for the winning party seat distance to the majority cut-off



Panel (b): Histogram for the winning party votes distance to the cut-off



Notes: The figure in the top panel shows the histogram corresponding to the seat distance to the majority seat cut-off. The figure in the bottom panel provides the histogram for the vote share distance to the majority cut-off.

Tables

Table A2.1: RDD political variables imbalance tests

	coeff (s.d.)
Total number of seats	-0.012
	(0.345)
Mayor's ideology	-0.346***
	(0.087)
# *Parties in the opposition block*	-0.132**
	(0.053)
# *Centrist parties*	0.087*
	(0.051)
Turnout	-0.013*
	(0.007)
Historical turnout	-0.007
	(0.007)

Notes: Coefficients at the *vote distance to the cut-off*; the share of votes needed for the winning party to lose/gain the majority of seats in the local legislature. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, p<0.1.

Table A2.2 - Data sources. Political variables

Variable	Description	Source	Mean(s.d)
Corruption	Dummy variable coded 1 for municipalities with at least one corruption scandal during a given term of office.	Fundación Alternativas, "el Mundo" and Factiva.	0.986 (0.298)
Non-majority	Dummy variable coded 1 for municipalities where winning party does not obtain more than the half of the seats.		0.416 (0.493)
Legislature size	N. of seats to be elected in the legislature at 1999 and 2003 local elections.		13.574 (3.481)
Mayor's ideology	Dummy variable coded -1 if mayoral party belongs to the left-wing, 1 if right-wing and 0 if it is a centrist party.	Spanish Ministry of Interior.	-0.406 (0.914)
# Parties opposition block	N. of parties with representation in the legislature not aligned with the mayor's ideology.		1.288 (0.516)
# Centrist parties	N. of parties with representation in the legislature without a clear ideology. Mostly local parties.		0.392 (0.541)
Turnout	Share of votes over the total census at 1999 and 2003 local elections.		73.742 (8.228)
Historical turnout	Mean turnout for the 1987, 1991 and 1995 local elections.		74.838 (7.444)

Notes: Mean and standard deviation (in parentheses) for the close elections matched sample.

Table A2.3 - Data sources. Socio-economic variables

Variable	Description	Source	Mean (s.d)
Population	Municipality's population at 1999 and 2003.	Padrón Municipal, Spanish Statistical Office (INE)	10.288 (20.370)
Population growth	Municipality share of population growth between 1995 and 1999		13.299 (38.315)
Education level	Municipality share of the population with post-compulsory education in 2001.	Census of population and houses 2001; INE.	34.886 (8.029)
Population under 16 years	Municipality share of population under 16 years old in 1999	Padrón Municipal; INE.	16.983 (3.192)
Population over 65 years.	Municipality share of the population over 65 years old in 1999		18.102 (5.657)
Income per capita	Combines information on occupancy, activity and professional situation in 2001 at municipality level.	Census 2001;INE.	0.931 (0.136)
% Vacation homes	Share of vacation homes over the total in 2001 at each municipality.	Spanish Economic Yearbook 1999; "La Caixa".	15.979 (14.131)
Vehicles pc.	Num. of motorized vehicles per capita in 1999 at each municipality.		0.482 (0.144)
Property tax base pc.	Municipality value of property tax base per capita, in thousands in 1999.	Cadaster register	14.613 (11.607)
Current expenditure p.c.	Chapters I to IV. in 1999 (€ per capita).	Ministry of Finance and Public Function	367.139 (145.965)
Non-financial expenditure p.c.	Chapters I to VII. in 1999 (€ per capita).		549.064 (229.041)
Current revenues p.c.	Chapters I to V. in 1999 (€ per capita).		456.409 (202.109)
Debt burden	Share chapters III and IX over total revenues in 1999 (€ per capita).		7.318 (6.6002)
Housing construction growth	New houses between 1986 and 1994 over the 1986 housing stock.		22.315 (18.443)
Housing price growth	Medium price per square meter increase from 1986 to 1994 over the 1986 mean price.		166.557 (61.608)
Coast	Dummy variable coded 1 for municipalities with coast.	Alarcos research group	0.142 (0.349)
Urban area	Dummy variable coded 1 for municipalities in urban areas.		0.328 (0.469)

Notes: Mean and standard deviation (in parentheses) for the close elections matched sample.

Table A2.4: Computing the vote distance to the cut-off.

Explanation:

The forcing variable for our RDD is based on Curto-Grau *et al (*2018*). vote distance to the cut-off*, is computed as the ratio between the minimum number of votes needed for the winning party to lose/gain the majority of seats in the local council. The computation of this measure is not straightforward and requires a consideration of the specific allocation system used to assign votes to seats, in this case, the d'Hondt rule. Under this rule, the votes for each party are divided by 1, 2, 3, 4, …, N, where N is the number of seats to be assigned. The resulting quotas or comparison numbers are ranked, and N seats are allocated using this ranking.

An algebraic procedure computes the *vote distance to the cut-off* for each of the municipalities in the sample. Our procedure works by subtracting votes from the most voted party if it holds a majority government, or adding votes if it holds a non-majority government. The assumption is that these votes go or come from abstention. Alternative computations of this variable consider that these votes go (or come) from abstention and from other parties, proportionally to their votes' share. Given that the analysis is restricted to close election cases –i.e., cases where the seat margin is –1 or +1- the margin of victory just measure: a) the vote share that the incumbent party has to lose in order to lose the last seat gained and transform from a majority to a non-majority government; b) the vote share that the incumbent party has to win in order to win an additional seat and transform from a non-majority to a majority government.

Notation and definitions:

v_I: votes for the most voted party (incumbent, *I*) and any other (*O*) party, respectively.
s_I: seats for parties *I*.
$c_I(s_I)=v_I/s_I$: comparison number for the seat *s* won by party *I*.
$c_I(s_I+1)=v_I/(s_I+1)$: comparison number for the next seat to be gained by party *I*.
$c_I^{min}(s_I)=v_I/s_I$: comparison number for the last seat won by party *I*.
$c_O^{max}(s_O+1)$: largest comparison number for the next seat to be gained by any other party different from *I*

Table A2.4: Continues

Formulation:

If the incumbent party holds a majority government and has to lose the last seat, once the popularity shock happens, its comparison number for the last seat won has to be smaller than the largest comparison number of the next seat to be gained by any other party. The condition for party *I* to lose a seat is:

$$c_I^{min*}(s_I) < c_O^{max}(s_O+1)$$

where $c_I^{min*}(s_I)$ is the smallest comparison number for the last seat originally gained by party *I* once *v* votes have been substracted.

Thus,

$$v = [(c_I^{min}(s_I) - c_O^{max}(s_O+1))\, s_I] + 1$$

If the incumbent party holds a non-majority government and, thus, has to win a seat, once the popularity shock happens, its comparison number for the next seat to be won has to be larger than the smallest comparison number of the last seat gained by any other party. The condition for party *I* to win a seat is:

$$c_I^{max*}(s_{I+1}) > c_O^{min}(s_O)$$

where $c_I^{max*}(s_{I+1})$ is the comparison number for the next seat to be won by party *I* once *x* votes have been added:

Thus,

$$x = [(c_O^{min}(s_O) - c_I^{max}(s_{I+1}))\, s_{I+1}] + 1$$

Table A2.5 - Classification of political parties

1999-2003 electoral term		
right-wing parties	*left-wing parties*	*centrist parties*
Asamblea Majorera	Amaiur	Coalición Galega
Coalicion Canaria	Andecha Astur	Conceju Nacionaliegu Cantabru
Convergencia i Unió	Aralar	Convergència Balear
Extremadura Unida	Bildu	Convergencia Democratas de Navarra
Falange Española	Bloc Nacionalista Valencià	Democràcia Galega
Geroa Bai	Bloque Nacionalista Galego	Estado Nacional Europeo
Partido Aragonés	Candidatura Unitat Popular	Eusko Alkartasuna
Partido Nacionalista Canario	Chunta Aragonesista	Grupo Independiente Liberal
Partido de Ley Natural	Coalicion Extremeña	Nueva Región
Partido Nacionalista Vasco	Converxencia Nacionalista Galega	Partido de Castilla y León
Partido Popular	Esquerra Republicana de Catalunya	Partido de el Bierzo
Partido Regionalista de Cantabria	Euskal Herritarrok	Partido Regionalista Manchego
Partido Regionalista de Guadarajara	Frente Popular Galega	Partido Riojano
Unidad Alavesa	Herri Batasuna	Partiu Asturianista
Unio Mallorquina	Izquierda Unida	Tierra Comunera-Partido Nacionalista Castellano
Unio Valenciana	los Verdes-Grupo Verde	Unidad Regionalista de Castilla y Leon
Union del Pueblo Balear	Movimiento Comunista País Valenciano	Union del Pueblo Leones
Unión del Pueblo Navarro	Nación Andaluza	Union del Pueblo Zamorano
	Nafarroa Bai	Unión del Pueblo Salmantino
	Partido Andalucista	Unión pra ale Progresso de Cantabria
	Partido Comunista de España	Union Regionalista Almeriense
	Partido Humanista	Unión Renovadora Asturiana
	Partido Socialista Mallorquín	Zamora Unida
	Partido Socialista Obrero Español	Zamoranos por Zamora
	Socialistas Independientes de Extremadura	

Table A2.5 – Continues

2003-2007 electoral term		
right-wing parties	*left-wing parties*	*centrist parties*
Asamblea Majorera	Amaiur	conceju nacionaliegu cantabru
Coalición Canaria	Andecha Astur	convergencia democratas de navarra
Convergencia i Unio	Aralar	estado nacional europeo
Extremadura Unida	Bildu	eusko alkartasuna
Falange Española	Bloc Nacionalista Valencià	grupo independiente liberal
Geroa Bai	Bloque Nacionalista Galego	nueva region
Partido Aragonés	Candidatura Unitat Popular	partido de castilla y león
Partido Canario Nacionalista	Chunta Aragonesista	partido de el bierzo
Partido Nacionalista Canario	Coalicion Extremeña	partido riojano
Partido Nacionalista Vasco	Converxencia Nacionalista Galega	partiu asturianista
Partido Popular	Esquerra Republicana de Catalunya	tierra comunera
Unio Mallorquina	Euskal Herritarrok	unidad cantabra
Unio Valenciana	Frente Popular Galega	unidad regionalista de castilla y leon
Union del Pueblo Balear	Herri Batasuna	union del pueblo leones
Unión del Pueblo Navarro	Izquierda Unida	unión del pueblo salmantino
	los Verdes-Grupo Verde	union regionalista almeriense
	Movimiento Comunista País Valenciano	unión renovadora asturiana
	Nacion Andaluza	zamora unida
	Nafarroa Bai	
	Partido Andalucista	
	Partido Comunista de España	
	Partido Humanista	
	Partido Regionalista de Cantabria	
	Partido Socialista Mallorquín	
	Partido Socialista Obrero Español	
	Socialistas Independientes de Extremadura	

Table A2.5 - Continues

All parties have been classified based on their ideology among ring-wing, left-wing, centrist or local parties.

The classification strategy is based on three steps:

1) Post-electoral agreements between parties at the national and regional level.

2) Check for vertical congruence of those agreements at the local level. If there is vertical congruence over 2/3 of the cases the party keeps the ideology set at (1), otherwise the party is defined as pivotal.

3) Local parties have their own category

Chapter 3

Political fragmentation and fiscal consolidation under fiscal rules

3.1.- INTRODUCTION

Multiparty legislatures and executives are, nowadays, quite common in democracies and are present at different levels of governance. From the seminal paper by Roubini and Sachs (1989), political fragmentation (e.g. the number of parties in the legislature or the executive) is pointed out to be a relevant determinant of government's expenditure and of the deficit. The "common pool resource" problem suggests that the larger the number of agents involved in fiscal decisions, the larger becomes total spending and the deficit (Weingast *et al.*, 1981 and Shepsle & Weingast, 1981). The empirical literature supports this hypothesis finding a positive correlation between political fragmentation and these budgetary outcomes (Perotti & Kontopoulos, 2002; Volkerink & De Haan, 2001; and Ashworth *et al.*, 2005, among others).

For the last decades, fiscal consolidation has been a point of inconvenience in governments' agendas. Fiscal consolidation is commonly understood as a process leading to a long-lasting reduction in a government's primary budget deficit. The primary budget can be reduced as a result of a spending reduction, an increase in revenues or a combination of both. The literature on fiscal consolidation has been principally focused on its economic impact and effectiveness, reaching conclusive evidence. This literature has found that the size, composition and duration of fiscal consolidation processes are crucial elements determining their success. Successful fiscal consolidations are associated with a restrain in primary spending and a long-lasting

implementation processes (Alesina & Perotti, 1995; Alesina et al., 1998; McDermott & Wescott, 1996, among others).

This paper aims to contribute to the literature that studies the effects of political fragmentation and fiscal consolidation by identifying the causal effects of political fragmentation on fiscal consolidation implementation in a situation with tight fiscal rules (i.e. when neither deficits nor debt issuance are feasible). The literature on the effects of political fragmentation on fiscal consolidation in such a scenario is scarce. This is in contrast to the fact that this is becoming the standard framework for many regional and local governments.[18] This paper focuses on Spanish local governments during the period 2011-2015, which was characterised by tight fiscal rules on municipalities enforced by the Spanish national government in the midst of the fiscal consolidation package agreed upon with the EU. Therefore, this paper also relates to the existing empirical literature that estimates causal effects of political fragmentation on public finances using sub-national data.[19] Cross-country studies are problematic due to the substantial degree of heterogeneity across the units involved. Sub-national analyses facilitate the causal interpretation of a single determinant because all governments are subject to the same institutional, cultural and socio-economic framework.

In this paper, political fragmentation is defined as the number of political parties with representation (at least one seat) in the legislature or the executive. The identification strategy used is based on a Regression in Discontinuity Design (RDD), which exploits the quasi-random entrance of a third party into the legislature. The identification assumption is that municipalities close enough to the threshold that determines a third-party entrance into the legislature are equal in all respects, except for the number of parties represented (i.e. 2 vs. 3 parties). Therefore, observable differences in fiscal consolidation strategies can be attributed to the differences in political

[18] For example, after 2020, German states will not be allowed to present deficits, and a transitional phase of budget consolidation started in 2011. Alternative Balanced Budget Rules for local governments are present in other countries such as Finland, Italy, Lithuania, Poland, Portugal, Bulgaria, Belgium (Flemish municipalities), among others.

[19] For example, Pettersson-Lidbom (2012) using statutory council size thresholds in Finland and Sweden finds a negative relationship between legislature size and budget size. Spending and revenues decrease by 0.5 per cent for each additional council member. Cervellati *et al.* (2017) finds that in situations of tight budget constraints, an increase in government fragmentation decreases both revenues and spending.

fragmentation. In a complementary sample, an increase in political fragmentation is extended from the third-party entrance to any extra-party entrance (i.e. the fourth, fifth, and so on, in terms of share of votes) into the legislature.

The methodology used is related to recent studies adapting the "close-race" strategy to proportional systems.[20] In this paper, treated municipalities are those where the third-party, in terms of share of votes, barely obtained the first seat that grants party representation in the legislature, whereas control municipalities remain with only two parties represented but a third party was very close to obtain its first seat. Thus, the threshold is the third-party representation; the minimum share of votes that (would) grant a seat for the third-party in each municipality legislature. This value is not predetermined and depends jointly on the share of votes of all the parties running in elections in each municipality and the electoral rule used to transfer votes into seats. The forcing variable is based on the calculation of the extra votes' share that a third party would need to lose or to gain in the local elections in order to lose or obtain the first seat in the legislature. In other words, how far (in terms of share of votes) the third-party was to obtaining the first seat in every municipality legislature.

The entrance of an extra party into the legislature directly increases political fragmentation: legislative fragmentation increases by one party. Moreover, the entrance of a third party can affect executive fragmentation indirectly. In a situation with two parties, the resulting executive is always a majority government (one of the parties has a majority of seats on the legislature). The entrance of a third party leads to the possible emergence of non-majority governments. The reshuffling of seats between more parties affects the probability of having a single-party government, which decreases as the number of parties with representation in the legislature increases. Therefore, treated municipalities could be divided into two alternative treatments: the first group would only be affected by an increase in legislative fragmentation while the second group would also be affected by a change in executive fragmentation. By comparing differences between these two different treatments, this paper resolves if the political fragmentation effect is driven by an increase in fragmentation in the legislature and/or the executive. If both

[20] See Folke; 2014 for the seminal paper or Curto-Grau *et al.*, 2018, for the Spanish case.

treatment effects were significant but not statistically different from each other, this would indicate that the effect of political fragmentation on fiscal consolidation is solely due to legislative fragmentation. However, if treatment coefficients were statistically different and significant, executive fragmentation would play a role in the implementation of fiscal consolidation.

The setting used, the local governments throughout Spain during the period 2011-2015, offers an optimal framework to analyse the effect of political fragmentation on fiscal consolidation. Spanish municipalities demonstrated a considerable degree of political fragmentation in the legislature (more than 50% of the legislatures presented at least three parties) and in the executive (around 30% of non-majority governments in the period analysed). By 2011, municipalities presented heterogeneous debt and deficit levels. Due to a Balanced Budget Rule (BBR), municipalities were subject to fiscal consolidation pressures, and tight borrowing constraints, limiting deficits and debt. Although a first BBR was established in 2007, its effective enforcement has not been salient since 2011 with the introduction of a constitutional amendment imposing a balanced budget requirement, and the fiscal consolidation package agreed upon with the EU. Besides the difficulty in determining the timing of the effective application of the BBR in every municipality before 2011, the initial period of the BBR (2007-2011) coincided with the implementation of expansive policies targeting local governments with transfers and a postponement of stabilisation. The overlap in the implementation of these two policies complicates the analysis of the 2007-2011 electoral term. Thus, this electoral term cannot be used as a counterfactual regarding municipalities' fiscal behaviour compared to the 2011-2015 electoral term. Therefore, this paper is only tangentially linked to the literature on fiscal rules (FR). The analysis uses the FR framework to analyse the causality of political fragmentation in such a scenario. However, the characteristics of the local Spanish setting are not suitable for a causal analysis on the effect of the Spanish BBR.

Specifically, this study addresses the following questions: First, it analyses the effect of a third-party entrance into the legislature (i.e., increases political fragmentation) on fiscal consolidation. Second, the paper considers the financial position of local government. The indebtedness level is, presumably, a major determinant in the fiscal consolidation decision, and in its intensity and possibilities of success. Therefore, the paper continues with a

heterogeneous analysis that studies whether the effect of political fragmentation is conditioned by the severity of the initial financial situation. In the last step, the paper analyses whether the political fragmentation effect is driven by legislative fragmentation or its indirect effect on executive fragmentation.

The results show that, on average, local councils do implement fiscal consolidation measures. This fiscal consolidation generates an improvement in the current balance irrespective of political fragmentation. However, political fragmentation affects the composition of the fiscal consolidation package. Legislatures formed by two parties focus on expenditure cuts. Legislatures with higher political fragmentation shift the focus from expenditure cuts to an increase in revenue. Consequently, political fragmentation has a positive impact on the size of the budget. With regard to the financial position of a municipality, the paper shows that it affects the type of consolidation strategy implemented. When initial debt levels are high, fiscal consolidation is based on expenditure cuts irrespective of the level of political fragmentation. Thus, only when indebtedness is low, political fragmentation does have an impact on the type of instrument used for consolidation. Finally, with regard to the mechanism; the effect of political fragmentation comes from its direct effect on the fragmentation of the legislature. For instance, the entrance of an extra party modifies the behaviour of the legislature even if the government remains strong (i.e., a single party in the executive that holds a majority of seats in the legislature).

The political fragmentation effect documented in this paper could be explained by several mechanisms: The quality and magnitude of the legislative debate may increase when the number of parties in the legislature increases. Notably, the debate would be more extensive when "new" parties broaden ideological diversity within the legislature. An increase in the political debate may also increase media attention. In this regard, above and beyond the local and regional media network, the amount of information released and received by voters also increases with the number of parties represented given that party representation provides economic resources that local parties can utilise for communication purposes. At the local level, there is a widespread political communicative strategy to periodically distribute free propaganda with local political information. Party representation also affects party participation in upcoming electoral campaigns. It grants electoral participation in local

electoral debates, local media, public advertisement and street propaganda. As a result, an increase in political fragmentation today positively correlates with electoral competition tomorrow. All these mechanisms could also explain the predominance of the legislative fragmentation over the executive one. Even if an increase in political fragmentation in the legislature would not affect the executive fragmentation, the executive may modify present behaviour anticipating future electoral competition.

The rest of this chapter is organised as follows: Section 2 discusses the related literature; Section 3 contextualises the institutional setting; Section 4 describes the research strategy and data used; Section 5 presents the results; and, Section 6 offers conclusions.

3.2.- POLITICAL FRAGMENTATION AND FISCAL CONSOLIDATION

This section discusses the potential effects of political fragmentation on the size and type of fiscal consolidation implemented in a situation with tight fiscal rules that limits deficits and new debt.[21] However, before presenting the different arguments, some clarification of terms is needed given that political fragmentation can be defined in different ways. On the one hand, it can indicate the number of parties represented (i.e., that have at least one seat) in the legislature –*legislative fragmentation*. On the other, it can refer to the number of parties in the government –*executive fragmentation*-.

A non-fragmented executive is a majority government (formed by a single party that holds a majority of seats in the legislature), and a fragmented executive is a non-majority government (no party holds a majority of seats in the legislature and, presumably, more than one party share executive responsibilities).

3.2.1.- Political fragmentation and fiscal behaviour

The political fragmentation literature has already highlighted the role of political fragmentation on fiscal behaviour from the seminal paper of Roubini and Sachs (1989). It documented the theoretical prediction -named as the

[21] This section deliberately omits the literature on other triggering determinants of budgetary consolidation, composition, effectiveness and consequences, which go beyond the scope of the current analysis.

"common pool" problem- suggesting that spending becomes larger when the number of agents involved in fiscal decisions increase (Weingast et al., 1981 and Shepsle & Weingast, 1981). Similarly, fragmented governments tend to incur on larger deficits (see Edin & Ohlsson, 1991 for a re-examination of Roubini & Sachs, 1989 results) while governments with a large majority in the parliament have lower deficits (Volkerink & Haan, 2001). The findings indicate that governments presenting several parties may have more difficulties in both drafting and approving the budget.

Furthermore, fragmented governments demonstrate having more problems in reaching agreements on complex policies or structural reforms (Köthenbürger *et al.*, 2014). Empirical literature supports this hypothesis finding a positive correlation between political fragmentation and public expenditure (see, among others, Perotti & Kontopoulos, 2002 and Volkerink & De Haan, 2001 using a panel analysis -70s to 90s -for some OECD countries or Bawn & Rosenbluth, 2006 using a panel of 17 European countries).

However, in a situation with Fiscal Rules (FR), when consolidation is in need, increasing expenditure and running deficits may not be feasible. FR has the purpose of promoting economic responsibility and debt sustainability through long-lasting constraints on fiscal policy (Azzimonti *et al.* 2016). Under the enforcement of a FR, one can expect legislatures to pursue fiscal consolidation irrespective of their political fragmentation. Thus, these budgetary rules can mitigate the common pool problem derived from political fragmentation, and thus correct distorted incentives and limit pressures for overspending (Martin & Vanberg, 2013). FR could reduce party influence and create incentives to neutralise spending demands from coalition partners. They could facilitate agreements, given that many decisions (e.g., the issue of new debt or increasing expenditure) are not feasible anymore. In such situations, fiscal consolidation must be based either on expenditures cuts and/or tax increases. An outstanding example of this FR mitigation effect is the Netherlands: In that setting coalitions decide in advance the deficit level for the following years thanks to a well-established FR. Once the deficit level is published, the survival of the coalition is linked to the fulfilment of this agreement.[22]

[22] For further information regarding the Netherland case and the coalition's bargaining see http://www.senedd.assembly.wales/documents/s31859/BPBP10%20%20CPB%20Netherlands%20Bureau%20for%20Economic%20Policy%20Analysis.pdf"

Cervellati *et al.* (2017), using Italian municipalities, shows that if a FR creates tight budget constraints, an increase in political fragmentation decreases both revenues and spending. There is also evidence for local governments in Italy that when FR are relaxed, deficits are likely to increase (Grembi *et al.*, 2016).

There are alternative ways to implement fiscal consolidation. Capital expenditure cuts are a recurrent measure in fiscal consolidation processes. The reason would be that capital-spending reduction is more straightforward than current spending one. Some capital cuts may be less visible to voters (e.g. infrastructure maintenance) than transfers, salary cuts or tax increases, and their political cost may be lower. However, there is also evidence that capital cuts are associated with less-lasting adjustments (Perotti, 1996).

Regarding the current side of the budget, successful fiscal adjustments are those that emphasise spending restraint (especially on the wage bill and on transfers) since these situations are associated with overall larger consolidation (Alesina & Perotti, 1995; Alesina *et al.*, 1998; McDermott & Wescott, 1996). However, the political cost of fiscal consolidation on the current side of the budget is less clear. It is uncertain whether voters do prefer a tax increase or a current expenditure reduction. Consequently, the government choice between expenditures cuts and/or tax increases may be determined by its beliefs on their political costs and the government strength with respect to the legislature during the budgetary negotiation and approval.

In the baseline analysis, this present study identifies whether political fragmentation affects the size and the expenditure/revenues choice when fiscal consolidation is implemented.

3.2.2.- Legislative and executive fragmentation

The executive (government) is responsible for the budget drafting, but it has to be approved by the legislature (city council or parliament). If the government holds a majority of seats in the legislature, the budget approval should not be a significant problem. However, when no party holds a majority in the legislature, inter-party negotiations are essential to get a budget passed. When parties negotiate, there are often trade-offs between individual interests (e.g. more spending in a specific area) and the mutual benefit of fiscal

consolidation (see Köthenbürger *et al.*, 2014). The bargaining costs is higher when there are more parties involved, i.e. when political fragmentation is higher. Moreover, in this situation, parties can exercise their veto power when faced with unsatisfactory agreements. The larger the number of veto-players, the more difficult the agreement becomes (Tsebelis, 1995).

In fragmented legislatures, parties have the incentive to distance themselves from unpopular and costly budgetary decisions. Difficulties in reaching agreements in complex situations could also be aggravated, which further delays stabilisation (Alesina & Drazen; 1989). Thus, budget stabilisation is more likely to appear when executive fragmentation is low. That is, when the government is strong -majority government- (Alesina *et al.* 2006). When a government holds strong electoral support and popularity, this may facilitate the implementation of unpopular measures. Moreover, as mentioned, the budgetary approval is easier for majority governments in proportional systems since the executive ruling party can pass the budget without the need for obtaining further support.

However, even when the executive is not fragmented, and the government is strong, fragmented legislatures can affect budgetary decisions by increasing contestation – for example, the quality and magnitude of the debates alongside the amount of information released and received by voters- affecting the government future electoral perspectives. If this is the case, legislative fragmentation will have a similar effect irrespectively of executive fragmentation. Folke (2014) provides evidence that the entrance of a green or anti-immigration party into the legislature affects local policies. In an illustrative example, the paper presents the Karlsborg (a Swedish municipality) case where the entrance into the legislature of an anti-immigration party reduced the number of refugees received in that municipality, even when the entrance of the party did not affect the executive composition.

This section explains if or why one could expect alternative fiscal consolidation strategies depending on both legislative and executive fragmentation. This study examines which of the former two types of political fragmentation determines the effect on fiscal consolidation documented on the baseline result.

3.2.3.- The severity of the initial financial situation

The economic environment in which the adjustments are undertaken can affect fiscal consolidation. Beyond fiscal rules, a severe financial scenario can force fiscal consolidation, given that delaying its implementation becomes too costly (Drazen & Grilli, 1993; Azzimonti *et al.*, 2016). Government's financial position can affect the probability and the successfulness of fiscal consolidation (Von Hagen & Strauch, 2001; Lambertini & Tavares, 2005). Large deficits or high levels of debt affect public finances sustainability and exert pressure to correct this situation. Hence, the severity of prevailing conditions has an impact on the fiscal consolidation size and efforts (Ahrend *et al.*; 2006). In this regard, the distortive effect of political fragmentation on fiscal consolidation is likely to disappear when financial conditions are extremely severe (Lassen 2010). Moreover, the national government surveillance and enforcement of fiscal consolidation is expected to increase as the economic conditions worsen, and thus, limit the effect of political fragmentation.

This study tests the effect of the initial financial situation by performing a heterogeneous analysis on the effect of political fragmentation on fiscal consolidation conditional on the municipality indebtedness level at the beginning of the consolidation period.

3.3.- INSTITUTIONAL BACKGROUND

Municipalities are the lowest level of the three tiers of government in Spain, below the national government and seventeen regions (the so-called autonomous communities). There are over eight thousand municipalities, although most of them are quite small. Municipalities have competences on traditional responsibilities assigned to the local public sector such as urban planning, environmental services, public transport and welfare, except for education, which is a regional responsibility. Roughly two-thirds of revenues come from the municipality itself while one-third comes from intergovernmental transfers. Municipalities can also borrow, but this is restricted and subject to some limits. These limits tend to be loosely enforced during good times but can become tight in periods when the national government is itself committed to a fiscal consolidation process.

3.3.1.- Local politics

Local elections take place simultaneously in all municipalities every four years. A proportional system based on the d'Hondt rule with a 5% vote share threshold is used to convert votes into seats.[23] The number of elected councillors in each municipality grows with population size.[24] Local councils are similar to national or regional parliaments, and cabinet positions are similar to ministries due to the local spending and regulatory autonomy. Although there are some independent parties at the local level, national and regional parties have local delegations in the vast majority of municipalities running at the local elections.

3.3.2.- Government formation

The formation of local governments in Spain is based on three steps: local elections, party negotiation and the council's election of the mayor. First, citizens cast their votes and seats are distributed among parties. Then, if no party obtains a majority of the seats, there is a period of negotiation between the parties. Finally, an absolute majority of the local legislature elects the mayor. If no candidate reaches a majority of seats, the candidate with the most votes in the local elections automatically becomes the mayor. Afterwards, the mayor is responsible for distributing the cabinet positions.

3.3.3.- Government fragmentation

The combination of the numerous parties running in elections, the proportional electoral system used, and the process for forming the government together generate an outstanding amount of fragmented executives in Spain. Over 30% of local executives in the period under analysis were non-majority governments. Non-majority governments can be coalitions – made up of more than one party, or minorities – made up of a single-party government without a majority of seats in the legislature. Information regarding whether a non-majority government was a coalition or a minority government, is not available. There is information regarding the mayoral political party and the number of seats obtained in the legislature. However,

[23] Central, Regional and Local government layers use this system with minor differences (e.g., regarding district size, minimum thresholds, and parliament size).
[24] Up to 100 inhabitants 3 seats, from 101 to 250: 5; 251 to 1,000: 7; 1,001 to 2.000: 9; 2,001 to 5,000: 11; 5,001 to 10,000: 13; 10,001 to 20,000: 17; 20,001 to 50,000: 21; 50,001 to 100,000: 25 and over 100,001 a Seat more per each 100,000 residents or fraction, adding one more when the result is an even number.

there is no information about other political parties that had supported his nomination or that have become part of the executive. For the scope of this study, this limitation is not essential given that in both non-majority governments a single party cannot pass a vote without the need for obtaining further support (in the form of a yes vote or abstention).

3.3.4.- Local governments' financial situation during the great recession

The local governments resulting from the elections in 2007 came about during a period of strong economic growth. Very soon, though, they were forced to deal with an unexpected financial crisis, which had a massive impact on municipalities' finances. During the housing boom, municipalities received an essential inflow of construction-related revenues. As the crisis sank in, those inflows on current revenues dried up, causing unbalanced budgets and creating significant and unexpected budget deficits. On average, revenues from indirect taxes were reduced by approximately 75% between 2008-2015-.[25] The collapse of construction-related revenues was not the only impact on municipal finances. Local entities also faced unexpected reductions from national government general transfers. These transfers are related to national government expected revenues. The drop in national government revenues translated to a reduction of local governments current transfers.

Even though the national government approved the General Law on Budgetary Stability (2007-2011) to prevent budgetary deviations before the crisis hit, the first reaction, in line to other OECD countries, was the implementation of expansive policies postponing stabilisation. The national government's actions to help local governments were the following: on the one hand, besides the general transfers, municipalities received targeted transfers accounting for more than 50.000 million € to reactivate the local economy. For instance, the "*Plan Español para el Estímulo de la Economía y el Empleo; Plan E*"[26] or the "*Plan de Economia Sostenible - Fondo Estatal para el Empleo*

[25] This number is computed with the sample of local Spanish entities used in this paper. The average level of revenues per capita from indirect taxes was around 90€/pc in 2008 and 20€/pc in 2015. Construction-related revenues are (by far) the major component of indirect taxes.

[26] This was a compilation of economic, financial and fiscal measures that the Government applied to recover the path of growth and job creation. It involved mobilisation of public resources unprecedented to date. At the local level, outstands the creation of the Public Investment Fund for an amount of 8,000 million euros, intending to create 200,000 jobs.

y la Sostenibilidad local" [27]. On the other hand, in April 2009, the national government created the first of many liquidity mechanisms to allow the reorganisation of local governments' debt. The debt payments associated with these new mechanisms were postponed to January 2011. Therefore, the use of expansionary measures and the delay of stabilisation characterised the first part of the crisis until 2011.

After 2011, the room for developing expansive policies was small. The financial situation worsened, and policies were reversed, changing from expansive to contractionary to promote fiscal consolidation. On September 2011, the national government passed the Balanced Budget Constitutional Amendment. It replaced the previous General Law on Budgetary Stability (2007-2011). This law linked budgetary objectives to the economic cycle and imposed a balanced budget. In 2012, the national government also implemented an expenditure rule. The expenditure rule set a limit to the growth of municipal expenditures that could not grow above the GDP growth rate. Extra revenues must be devoted to paying off debts or saving. Even though the expenditure rule was approved in 2012, the rule was virtually not binding until 2016 when local finances improved. [28] Before 2016, the compliance with the annual deficit and the intense fiscal consolidation process imposed a public spending reduction much more demanding that the expenditure rule.

Therefore, in 2011, municipalities with heavy financial constraints inevitability faced the need to implement critical budgetary adjustments. Consolidation pressures and enforcement on municipalities increased as part of the national government fiscal consolidation program agreed with the EU. There was much heterogeneity in municipalities' debt levels. Many local entities (mostly small ones) had even not debt at all, while some municipalities presented high debt per capita levels threating their fiscal sustainability (Figure A1 shows the debt distribution for the municipalities included in the analysis). In order to help municipalities, on July 2011, the national government approved a liquidity mechanism (Credit line for the cancellation of local entities debts with

[27] The objective was to increase public investment in the local area through the financing of actions generating employment in new planning, and immediate execution works responsibility of the municipalities, to be carried out from the beginning of 2010.

[28] See www.airef.es/wp-content/uploads/2015/11/Documento-divulgativo-Regla-de-Gasto.pdf

companies and self-employees) to refinance part of municipalities' debts. The continuous inability of many local entities to face debts led to the creation of a further financing mechanism in 2012 (the Fund of Payment to Suppliers) that has a second and third phase for 2013 and 2014. The application to these liquidity mechanisms required the Ministerial approval of a Monitored Adjustment Plan increasing national government control and surveillance on local finances.

To sum up, the crisis had two different periods (2007-2011 & 2011-2015). The first part was characterised by expansionary policies and a delay of fiscal consolidation. The second part was predominated by the enforcement of financial rules and fiscal consolidation. The timeline and the summary of all the measures are presented in Figure A2.

3.4.- EMPIRICAL ANALYSIS

Fiscal consolidation is analysed by looking at the intra-term evolution (2011-2015) of the primary budgetary aggregates. As explained in the introduction, the 2007-2011 electoral term is not suitable for analysing the political fragmentation effect on fiscal consolidation under the tight fiscal constraints. This is due to the fact that this term was characterised by the uncertain timing of the BBR enforcement and the expansionary measures that affected municipalities heterogeneously. As a result, it is not the proper setting for analysis within the scope of this paper nor is it an adequate counterfactual for the 2011-2015 term.

The outcome variables are primary aggregates on the current side of the budget (i.e. current expenditures and current revenues). The reason is that these basic aggregates cover the bulk of the budget and, at the same time, they are the basis of the major important budgetary balances used to define the fiscal position of an administration. However, the study also considers the capital side of the budget (i.e. capital expenditures and revenues) in order to guarantee that an effect found on the current side of the budget is not compensated with the reverse behaviour on the capital one.

3.4.1.- RDD and PR systems

The causal effect of political fragmentation on fiscal consolidation cannot be directly identified using the whole pool of municipalities. This estimation

would be biased due to endogeneity problems, given that political fragmentation is not random as the number of parties represented in a legislature is the result of many local characteristics. Among these local characteristics there are some key determinants for the scope of this study like the political scene, the financial situation and the ability or opportunities to undertake fiscal consolidation. Therefore, to provide causal identification, this analysis compares municipalities that are similar in all possible dimensions but political fragmentation. Some previous studies solve this problem adopting the "close-race" RDD framework (see Lee, 2008; Pettersson-Lidbom, 2012; Gerber & Hopkins, 2011 or Folke, 2014, among others). The baseline reasoning of this methodology is that elections decided by a narrow margin of votes are, in practice, very similar.

The use of this methodology in proportional representation (PR) systems is not straightforward. On a seminal paper, Folke (2014) adapted the RDD methodology to a PR system (see Curto-Grau *et al.* 2018 for the Spanish case or Fiva & Halse, 2016 for Norway). This paper follows these references defining the treatment as the third-party entrance into the legislature computing the forcing variable as the distance -in terms of vote share- to the representation threshold in each municipality. That is, the calculation of the share of votes that the third-party must lose or gain at the local elections in order to lose or obtain representation –the first seat. This measure is not straightforward since it depends on the votes' distribution between the different parties. Table A3.1 and Table A3.2 in the Appendix present a detailed explanation of how the forcing variable is calculated and numerical examples.

The third-party entrance into the legislature is as good as random in the neighbouring area around the threshold. The methodology exploits this element to analyse the effect of an extra-party entrance (increasing political fragmentation) into the legislature. It compares those municipalities where a third-party reached this threshold by a very narrow electoral margin with those municipalities where the third-party did not reach it by a very narrow electoral margin. That is, it exploits the fact that the entrance of a third-party can be considered as random. The reason to focus on the third-party entrance is the following: in a two-party situation, the resulting executive is always a majority government (one of the parties has a majority of seats in the legislature).

Above the threshold, the entrance of a third party leads to the possible emergence of non-majority (fragmented) executives.

Thus, the entrance of the third-party can affect fiscal consolidation via two channels. First, there is the direct (mechanical) effect on the fragmentation of the legislature (an increase of one party represented at the legislature), and second, there is a possible indirect effect on executive fragmentation (the possibility of non-majority governments). Therefore, treated municipalities could be divided into two alternative treatments: the first group would be municipalities only affected by an increase in legislative fragmentation whether the second group would be composed by municipalities also be affected by a change in executive fragmentation. The identification strategy, by comparing differences between these two different treatments, can disaggregate the effect of political fragmentation on fiscal consolidation by both the legislative and executive fragmentation: 1) If both treatment coefficients were significant but not statistically different from each other, this would indicate that the political fragmentation effect on fiscal consolidation is solely due to legislative fragmentation. 2) However, if both treatment coefficients were significant and statistically different from each other, executive fragmentation would have an additional role in fiscal consolidation implementation in addition to the legislative fragmentation. 3) Finally, if only the coefficient for those treated municipalities affected by the indirect effect was statistically significant; this would mean that political fragmentation affects fiscal consolidation only when the executive is fragmented.

However, the fragmentation effect due to the entrance of one extra-party decreases with the number of parties already represented in the legislature. In relative terms, moving from 2 to 3 parties produces a 50% increase on political fragmentation, from 3 to 4 a 33% increase, and so on. Moreover, the expected magnitude of the extra-party-entrance effect on executive fragmentation (indirect effect) also decreases with the number of parties already represented in the legislature and the total size of the legislature. Table A3.3 shows the effect of the entrance of one extra-party into the legislature on executive fragmentation by the size of the legislature. Thus, the main sample used in this paper is restricted to a third-party entrance and to legislatures up to 13 seats size (municipalities with a population of up to ten thousand inhabitants), where the increase of one extra party in the legislature has a meaningful impact on both legislative and executive fragmentation. In legislatures with a size of

more than 13 seats, average legislative fragmentation is already high, and a third party is represented in most of the municipalities. The inclusion of municipalities with a size of more than 13 seats would suppose an unbalanced increase of treated municipalities with a large population. As far as external validity is concerned, municipalities with a size up to 13 seats represent more than 90% of Spanish municipalities. Complementarily, the analysis also uses an alternative expanded sample to consider the entrance of any additional party (a third, fourth or fifth party in terms of share of votes).

3.4.2.- Equation specification

Political fragmentation is defined in terms of the number of parties. The methodology is constructed to produce and ad-doc increase in one party in the legislature above the threshold defined as an increase in political fragmentation. The first part of the results section is devoted to graphically and empirically demonstrating the discontinuities in the legislative and executive fragmentation at the threshold. Therefore, the RDD equation used defines the treatment as the third-party entrance into the legislature (an increase on political fragmentation).

Baseline equation

The use of RDD design allows the identification of Local Average Treatment Effects (LATE) (see Lee & Lemieux, 2010). To do so, the following equation model is used:

$$\Delta Y_i^{2011-15} = \beta_1 * 3rd\ party_i + \beta_2 * FV_i + \beta_3 * 3rd\ party_i * FV_i + \lambda_j + u_i \quad (1)$$

where $\Delta Y_i^{2011-15}$ is the intra-term variation of different budgetary outcomes (e.g. current revenues, current expenditure, etc.) for municipality *i*, $3rd\ party_i$ is a dummy variable coded as 1 if the third-party obtained representation in municipality *i* during the term of office and 0 otherwise (treatment) *,* FV_i is the forcing variable (vote share distance to the third-party representation threshold), λ_j are province fixed effects that control for influences common to municipalities in the same province during the period (i.e., the intensity of the housing boom, common political shocks) and u_i is the error term. The coefficient of interest is β_1 that captures the effect of a third-party entrance (i.e. an increase in political fragmentation) on fiscal consolidation.

The estimations use the optimal bandwidth for the different dependent variables computed following Calonico *et al.*, (2014). Several bandwidths fall close to 3%. Consequently, the analysis also considers this value to compare results across different outcomes. Results are robust to the variation of this bandwidth (e.g., to 2,5 and 3,5 respectively). Estimations include robust standard errors.

Heterogeneous effects

The second step of the analysis considers potential heterogeneous effects due to differences in the initial financial situation. Following Becker *et al.*, (2013), we estimate a Heterogeneous Local Average Treatment Effect (HLATE) interacting the treatment with the initial financial situation. The initial financial situation is defined as the debt per capita computed the year that local elections took place (that is; on December 31st 2011) since the previous government was responsible for the 2011 budget.

The analysis uses the recommendations by Hainmueller *et al.*, (2019) to solve two potential problems of multiplicative models: the assumption of a linear interaction effect that imposes a constant effect of the variable that might condition the outcome, and the common support problem that could bring to excessive extrapolation. In this regard, the heterogeneous analysis divides the debt per capita in 2011 into three bins; zero debt, low and high debt levels and the estimates are computed considering the median of each bin. Therefore, the marginal effect can vary in each bin accounting for possible non-linear effects of initial debt levels on fiscal consolidation. Moreover, at the median of every debt per capita bin level (zero, low and high) there is a reasonable mass of both treated and control observations that guarantees the common support on the computation of the marginal effects. Computations close to the extreme of the debt per capita variable are problematic since there are fewer observations.

Legislative vs. executive fragmentation

On the next step, the analysis disaggregates the effect of political fragmentation. It examines whether it is the fragmentation of the legislature or of the executive that drives the effect of political fragmentation on fiscal consolidation. In the third-party-entrance sample, the treated observations are

divided into two categories. The first category, named "*majority*", considers those municipalities where the third-party got representation, but the executive remained as a majority government. The second category, named "*non-majority*", groups those municipalities in which the entrance of the third-party resulted to a change on executive fragmentation; shifting from a majority to a non-majority government. Therefore, the "*majority category*" is only affected by the direct effect of legislative fragmentation while "*non-majority category*" is affected by both the direct effect and the indirect effect of executive fragmentation. The equation used is the following:

$$\Delta\, Y_i^{2011-15} = \beta_1 * 3rd\ party_i * majority_i + \beta_2 * 3rd\ party_i * non\ majority_i + \beta_3 * FV_i + \beta_3 * 3rd\ party_i * FV_i + \lambda_j + u_i \quad (2)$$

where $3rd\ party_i * majority_i$ is a dummy variable coded 1 if the third-party obtained representation in municipality *i* during the term of office and the executive remained a majority government and 0 otherwise. Similarly, $3rd\ party_i * non\ majority_i$ is a dummy variable coded 1 if the third-party obtained representation in municipality *i* during the term of office and the executive shifted to a non-majority government and 0 otherwise. A test of differences is performed on the majority and non-majority coefficients: If it cannot be rejected that β_1 is equal to β_2, the political fragmentation effect can be attributed only to legislative fragmentation indicating that the indirect effect of executive fragmentation is insignificant. If β_1 is statistically different to β_2, both legislative and executive fragmentation affects fiscal consolidation implementation.

3.4.3.- Econometrics

This section discusses the assumptions required to validate the RDD identification design and describes the tests performed to guarantee their fulfilment. The first part of the results sections provides the results of the tests and empirical demonstrations.

First, a significant discontinuity of legislative and executive fragmentation should exist due to the entrance of a third party. At the threshold, there is an ad-hoc jump of one party represented in the legislature (direct effect). The entrance of an extra party also increases the probability of non-majority governments (indirect effect). Second, the forcing variable must be continuous

around the threshold, indicating that there is no manipulation or sorting around the threshold. The continuity of the forcing variable is formally proved using the McCrary test (McCrary, 2008). Third, the only variable with a discontinuity at the threshold must be the one associated with the treatment. The rest of the covariates have to be continuous around the threshold. Otherwise, all other covariates with a discontinuity at the threshold could explain part of the treatment effect. The identification strategy is based on the idea that close to the threshold, observations are identical in all the dimensions except for the cause of the treatment.

A potential concert for the identification strategy is that the third-party could be systematically the same (e.g. a green party or a communist one). In such a situation, the coefficient could not be interpreted as the political fragmentation effect given that the coefficient would identify the "specific-party" entrance effect. This is not the case in our setting. In the local Spanish setting, there is vast heterogeneity in the party label, ideology and geographical scope of the third-party. Table A3.4 in the appendix shows the parties identified as the third-party in all municipalities included in the sample used in the analysis. Twenty-nine different party labels occupy the third party position. This value is indeed much larger considering that all local parties (223 observations) are grouped in just one. The party identified as the third-party in more occasions accounts for just 20% of total observations. Third parties are also heterogeneous regarding their ideology and geographical scope. Left-wing parties suppose less than 54% of total observations. There is a similar percentage of national parties since, in Spain; there are strong regional parties with an outstanding hegemony in their constituencies. Local parties are also important in many municipalities presenting a wide range of ideologies and motivations.

Regarding the heterogeneous effects, two additional assumptions have to be satisfied (see Becker *et al.*, 2013): First, the source of heterogeneity (debt per capita) has to be continuous at the threshold. Second, the interaction variable's assignment has to be random conditional on the forcing variable. That is, heterogeneous indebted governments should not differ in unobserved factors that could influence the outcomes variables. This condition is complicated given that debt levels are likely correlated to some political and socio-economic variables. Those municipalities with zero debt are presumably different from those experiencing significant levels of debt. If this were the

case, it would be a problem for the heterogeneous analysis. To overcome this issue, the heterogeneous analysis interacts the treatment with the local population at 2011 –since the population is highly correlated with initial debt levels- in order to (partially) wash out this heterogeneity. Additionally, the analysis guarantees that debt per capita is continuous at the threshold within each of the three debt level subgroups (zero, low, high).

3.4.4.- Data

Sample. This paper uses the Spanish local governments for the period 2011-2015, where the economic crises had a massive impact on municipalities' finances. The Spanish case presents a large number of governments subjected to various initial levels of debt, deficit and fragmentation levels due to the proportional system applied. This variation allows us to address optimally the causal effect of fragmentation on governments' effectiveness to pursue fiscal consolidation. The empirical analysis focuses on the 2011-2015 term-of-office, where the fiscal consolidation pressure became salient and inevitable.

The main sample is restricted to a third party entrance and legislatures up to 13 seats size (municipalities with a population up to ten thousand inhabitants). Complementary, the analysis uses an alternative sample considering the entrance of any additional party (a third, fourth or fifth party in terms of share of votes).

Electoral outcomes. The Spanish Ministry of Interior provides information on electoral results: the number of votes obtained by the parties running at the elections in every municipality and the number of seats obtained, the number of blank and null votes and the total number of seats in the legislature. Additionally, it provides information on the party label of the mayor elected by the legislature. However, there is no information regarding the rest of the executive composition.

Measures of fiscal consolidation: Budgetary outcomes tested. The Ministry of Finance and Public Function publishes the municipalities' yearly budgetary accounts. This study uses intra-term variations of traditional budgetary aggregates such as current expenditure, current revenues, capital revenues and capital expenditure. These basic aggregates cover the bulk of the budget and, at the same time, they are the basis of the major budget balances used to define the fiscal position of an administration. For comparability, the

analysis considers them in per capita terms. Intra-term variations are constructed by their magnitudes differences between 2014 and 2011. Results are not affected if other year-differences (i.e. 2010-2014 or 2011-2015) are considered.

Local debt per capita levels. The Ministry of Finance and Public Function publish the municipalities' outstanding debt every December 31st. They are transformed in per capita terms for comparability.

Forcing variable. The forcing variable is the extra-party margin, computed as the votes needed for the marginal party to obtain or lose representation -the first seat- expressed as a percentage of valid votes at the local elections. An algebraic formula computes it based on the application of the d'Hondt method. It considers that votes lost or won by the marginal party do not affect the rest of the parties' votes. Intuitively, the method works as if one gives votes to the marginal party with no representation until it obtains the first seat (the party that lose it remain represented so that the total number of parties with representation increases). Alternatively, taking votes to a marginal party with one seat until it loses it (and the party obtaining it was already represented). Tables A3.1 and A3.2 in the Appendix provide a detailed explanation of the forcing variable computation and include numerical examples.

Table A3.5 in the Appendix displays the definition, descriptive statistics and sources from variables used in the analysis.

3.5.- RESULTS

This section starts focusing on the threshold: the treatment effect and the RDD assumptions of the forcing variable. Then, it continues by analysing the effect of the treatment on the outcome variables using the equations described in the previous section.

3.5.1.- Discontinuities at the threshold

First, Figure 3.1 presents a graphical analysis of the treatment at the threshold; the estimation of the third-party entrance effect on both legislative and executive political fragmentation. The graphical analysis follows the standard RDD procedure. The forcing variable is divided in bins using a bandwidth of

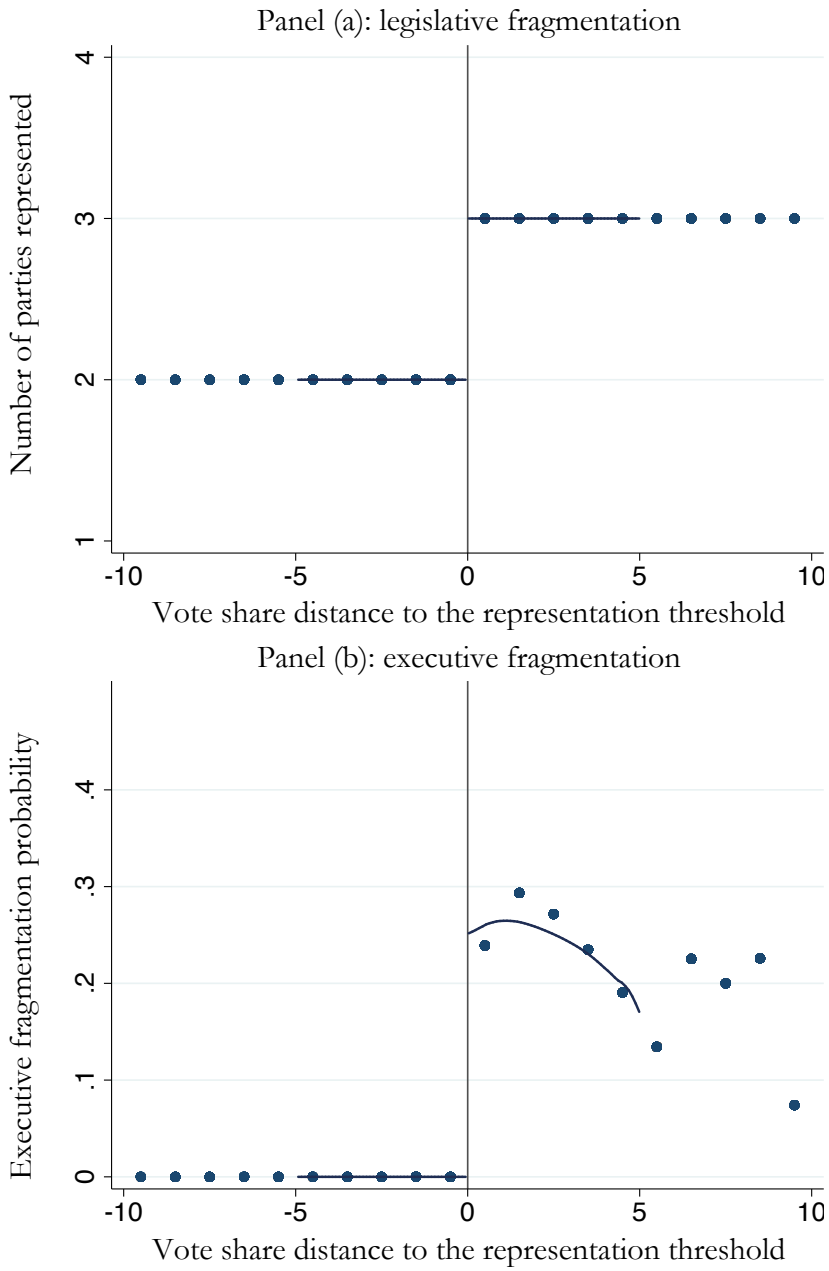
1% bin size, and the plot reflects the binned averages of the number parties represented and fragmented executives by distance to the third-party representation threshold. Panel (a) shows the mechanical increases of one party with representation in the legislature. The number of parties jumps from 2 to 3 at the threshold; when a third party enters into the legislature. As mentioned, this is a consequence of the forcing variable ad-hoc construction. Panel (b) shows the change in executive fragmentation due to the entrance of a third party. Below the threshold –where only two parties have representation in the legislature- the resulting executive is always a majority government (one of the parties has a majority of seats in the legislature). Above the threshold, the entrance of a third party leads to the possible emergence of non-majority (fragmented) executives. The likelihood of having a non-majority government jumps from zero to around 25% at the threshold.

Figure A3.3 in the appendix replicates those graphs for the alternative sample (any extra-party entrance). Again, there is an increase of one party represented in the legislature at the threshold. Legislative fragmentation jumps from an average of ≈2.8 to ≈3.8 parties. This entrance of one extra party into the legislature increases the probability of fragmented executives; the likelihood of non-majority governments goes from ≈35% to ≈47%.

Empirically, Table 3.1 presents the effect of party entrance on executive fragmentation (indirect effect) for the third-party-entrance sample. The dependent variable is a dummy variable equal to 1 for non-majority governments. Given the construction of the forcing variable, baseline refers to the value just below the threshold where, in a two parties situation, the probability of a non-majority government is zero and there are only majority governments. Column (1) presents the results considering all observations in the sample using a polynomial of third order for the forcing variable. Additionally, column (2) restricts the sample to the observations within the predefined 3% bandwidth at each side of the threshold with a first order polynomial. The third-party coefficient in columns 1 and 2 are highly statistically significant with a magnitude around 0.25. This indicates that the entrance of a third party has a highly significant effect of around 25% increase on the likelihood of fragmented executives. Both regressions present a high F-statistic validating the effect of party entrance (increasing legislative fragmentation) on executive fragmentation. Table A3.6 replicates Table 3.1

regressions for the alternative any extra-party-entrance sample. Again, the entrance of an extra party into the legislature has a highly significant effect on the likelihood of fragmented executives.

Figure 3.1 - Political fragmentation at the threshold



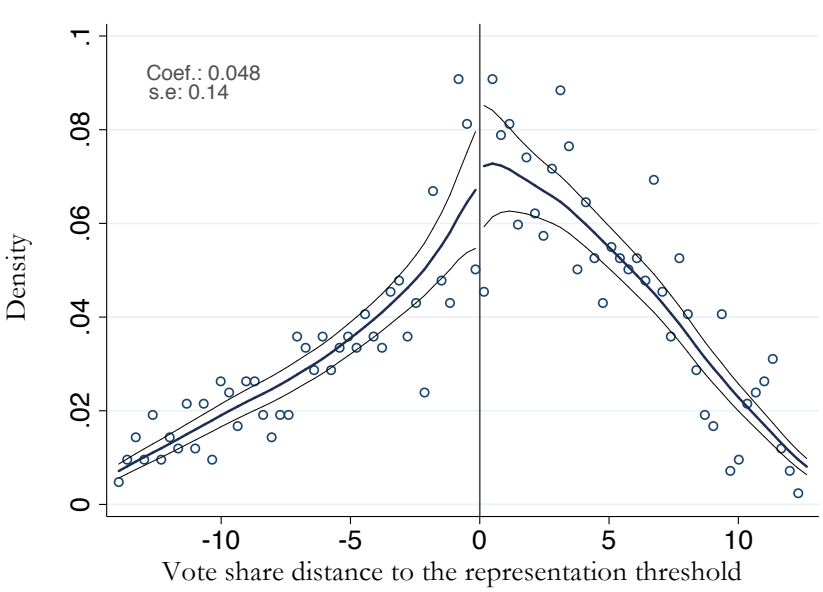
Notes: The graphs correspond to the third-party-entrance sample. Dotes are binned averages of 1% bin size. The solid line represents the predicted value of a local polynomial considering a 5% bandwidth.

Table 3.1 – The effect of the third-party entrance into the legislature on executive fragmentation

	(1)	(2)
3rd-party	0.276***	0.248***
	(0.057)	(0.056)
Observations	1,274	465
Pol. order	3	1
Bandwidth	100%	3%
F-Stat	53.54	48.44

Notes: The dependent variable is a dummy variable equal to 1 for non-majority governments (executive fragmentation) after the 2011 local elections. *3rd-party* is a dummy that equals to one if a third-party in term of votes- obtained representation. Given the construction of the forcing variable, baseline refers to the value just below the threshold where, in a two parties situation, the probability of a non-majority government is zero and there are only majority governments. Column (1) uses a polynomial of order 3 of the forcing variable; column (2) uses a 3% bandwidth and a 1st order polynomial. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, p<0.1

Figure 3.2 - Continuity of the forcing variable at the third-party representation threshold



Notes: The graph corresponds to the third-party-entrance sample. Dots for the McCrary graph are bin averages of the density of the forcing variable -vote share distance to the representation threshold-.

Second, the absence of manipulation in the forcing variable –the continuity of this variable at the threshold- is tested using the formal test proposed by McCrary (2008). Figure 3.2 shows the result for the main sample and the Figure A3.4 replicates the analysis for the alternative any extra-party-entrance sample. In both cases, the forcing variable is continuous, with no signs of manipulation.

Third, another requirement for the identification validity is the covariates smoothness at the cut-off. Table 3.2 shows that there is no discontinuity around the threshold for possible confounders. The table includes political, socio-economic and budgetary characteristics before the period under analysis. The first column reports the magnitude of the estimated differences at the threshold. Columns 5 and 6 report the mean value in a range of 0.5% of the forcing variable at each side of the threshold. None of the confounders presents a statistical difference at the threshold supporting the identification strategy principle that the only difference between municipalities close enough to the threshold is their political fragmentation. Table 3.2 also includes the probability of non-majority governments in past elections (2007 local elections) for this 2011 threshold. There is no significant difference in previous government fragmentation. Thus, the political fragmentation effect analysed is not influenced or a result of past political fragmentation. At the threshold, political fragmentation is random and could not be predicted or expected.

Fourth, the requirements for the heterogeneous specification are validated graphically in Figure 3.3. The x-axis is divided into bins of 0.25% bin size. The dots correspond to the binned average of debt per capita in 2011. The graph at the top (i) considers all observations in the sample. It illustrates that there is no discontinuity of debt levels at the threshold. The medium (ii) and bottom (iii) graphs restrict the sample to low and high indebted municipalities, respectively. The graph corresponding to the zero indebted municipalities is omitted because debt values for all municipalities are zero by construction. There is no discontinuity of debt per capita (in 2011) around the threshold even when the sample is restricted to different levels of debt. Figure A3.5 in the appendix illustrates and reach the same conclusion for the alternative any extra-party-entrance sample. However, these results do not imply that

municipalities in different debt per capita groups are similar in all the other characteristics.

Table 3.2 - Continuity of the covariates at the third-party representation threshold

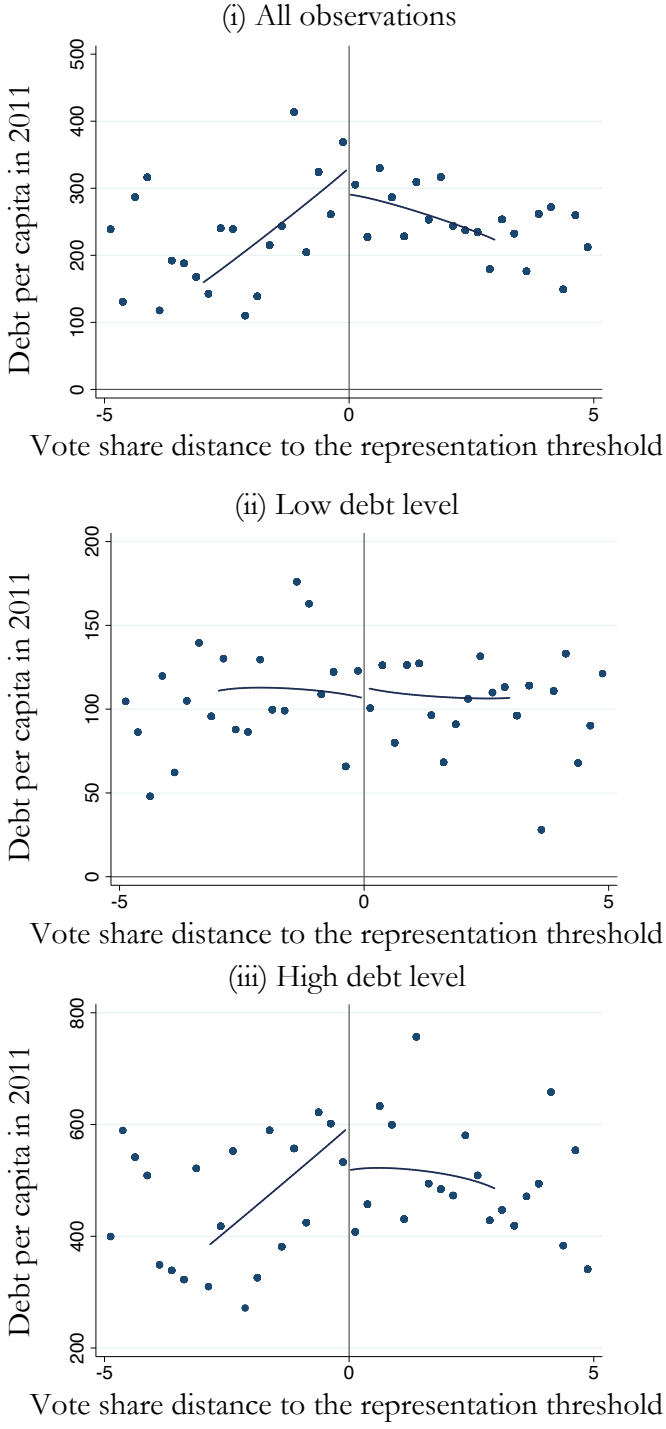
Variable	Difference. Coef.	p-value	Bandwidth	Observations	Mean value threshold 0.5% below	Mean value threshold 0.5% above
# Seats	0.218	0.513	2.387	782	11.021	11.253
# Parties running	-0.008	0.857	3.464	1,053	4.691	4.540
Turnout	-0.019	0.148	2.953	919	0.760	0.735
Margin of victory	0.024	0.167	2.831	893	0.170	0.190
Mayoral ideology	0.041	0.516	3.520	1,063	0.298	0.310
3rd-party alignment	0.051	0.431	4.091	628	0.237	0.220
Coalition 2007	-0.041	0.413	2.153	724	0.426	0.402
Population	-36.144	0.888	2.585	833	4,173	4,228
% vacation homes	0.035	0.954	4.283	1,209	19.672	19.406
Education	-0.494	0.688	4.138	1,183	57.242	57.186
Youth pop.	0.518	0.327	2.275	871	14.433	15.239
Elderly pop.	-0.519	0.597	2.460	798	20.281	19.249
Coast	-0.025	0.648	2.702	860	0.159	0.103
Current rev.	-9.439	0.732	3.326	1,014	835.508	832.794
Current exp.	-37.615	0.289	2.827	893	754.041	741.282
Capital rev.	-17.569	0.683	3.068	937	194.574	154.015
Capital exp.	6.353	0.882	2.691	861	223.171	217.036
Debt p.c.	19.572	0.790	2.883	906	335.976	334.767
Primary deficit	8.431	0.555	2.814	890	-66.433	-41.032
Gross savings	16.788	0.281	3.162	1,092	81-367	91.512

Notes: Estimates obtained using a local linear regression using the optimal bandwidth h* based on the procedure proposed by Calonico, Cattaneo, and Titiunik (2014). Columns 5 and 6 report the mean value in a range of 0.5% of the forcing variable that corresponds to 97 observations below and 87 observations above the threshold.*** p<0.01,** p<0.05,* p<0.1.

3.5.2.- Baseline results: The effect of political fragmentation on fiscal consolidation

This section starts by presenting a graphical analysis of the baseline results of this paper. Figure 3.4 shows the effect of party entrance into the legislature on fiscal consolidation (analysed as the intra-term variation of the current budgetary aggregates). It illustrates current expenditures (graphs on the left) and revenues (graphs on the right) intra-term variation for the two samples analysed. Panel (a) shows the effect of a third-party entrance. The third-party entrance modifies fiscal consolidation implementation resulting in an increase in both expenditures and revenues with respect to the two-party situations. The current expenditure increase magnitude is around 40 euros per capita. This value is similar to the expected reduction at the left of the threshold when only two parties are represented. Therefore, what the entrance of the third-party does is to neutralise the expected reduction on current expenditures. On the revenues side, the entrance of the third-party supposes an expected increase of around 20 euros per capita. The effect of the entrance of any extra party into the legislature is represented in panel (b). The entrance of an extra party into the legislature results in an expected increase of around 30 euros per capita in both current expenditures and revenues. Results are robust to different bandwidth selections (see Figure A3.6 in the appendix).

Figure 3.3 - Continuity of the municipalities' debt level at the third-party representation threshold.



Notes: The graphs correspond to the third-party sample. Dotes are bin averages of 0.25% bin size of debt per capita in 2011. The solid line represents the predicted values of the local polynomial considering a 3% bandwidth on each side of the third-party representation threshold. Zero debt level subgroup is omitted because debt values for all municipalities on each side of the threshold are zero by construction.

Figure 3.4 - The effect of party entrance into the legislature on fiscal consolidation

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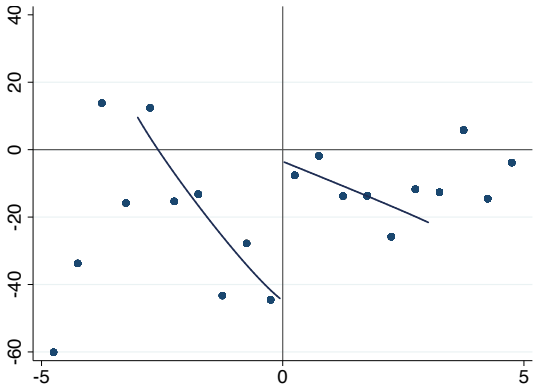
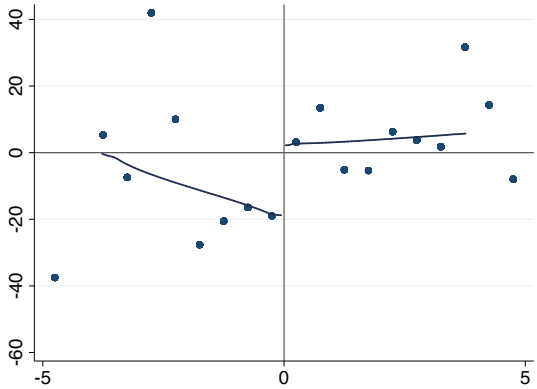
Panel (a): third-party entrance

i) Δ current expenditures



Vote share distance to the representation threshold

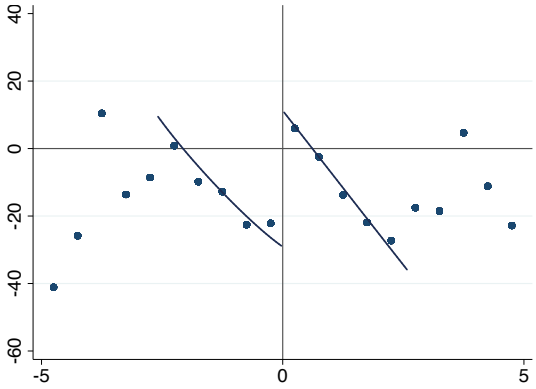
ii) Δ current revenues



Vote share distance to the representation threshold

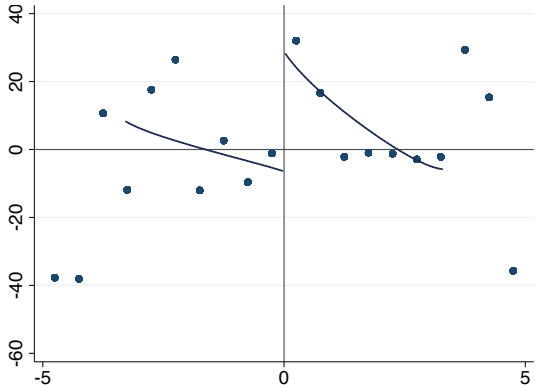
Panel (b): any extra-party entrance

i) Δ current expenditures



Vote share distance to the representation threshold

ii) Δ current revenues



Vote share distance to the representation threshold

Notes: Average effect of the third-party (any extra-party) entrance into the legislature on the intra-term (2011-2014) variation of current expenditures and revenues (€ per capita). Dots are bin averages of a 0.5% bin size. Solid lines represent the predicted values of a local linear polynomial on each side of the threshold for the optimal bandwidth h* based on the procedure proposed by Calonico, Cattaneo, and Titiunik (2014).

Empirically, Table 3.3 reports the results on the effect of the third-party entrance on fiscal consolidation for different specifications. Table A3.7 in the appendix reports analogue results for the alternative sample. Columns (1) and (4) use the whole pool of observation in the sample with a third order polynomial on the forcing variable. Columns (2) and (5) restrict the sample to the optimal bandwidth (it is a different value for expenditures and revenues variations) and a first order polynomial. Finally, columns (3) and (6) use the 3% bandwidth predefined for comparability and include province fixed effects that control for influences common to municipalities in the same province during the period (i.e., the intensity of the housing boom, common political shocks).

Table 3.3 - Average effect of increasing political fragmentation (third-party entrance) on fiscal consolidation.

	Δ current expenditures			Δ current revenues		
	(1)	(2)	(3)	(4)	(5)	(6)
3rd-party.	29.831	44.470**	54.101***	24.720	18.813	41.733*
	(18.676)	(18.036)	(17.370)	(25.642)	(22.223)	(23.845)
constant	-36.454***	-48.170***	-	-18.418	-16.921	-
	(13.726)	(13.993)		(19.164)	(17.149)	
Observations	1,274	468	465	1,274	584	465
Pol. order	3	1	1	3	1	1
Bandwidth	100%	h*	3%	100%	h*	3%
Prov. FE	no	no	yes	no	no	yes

Notes: The dependent variable is computed as the (2011-2014) intra-term differences. Current expenditures variation in columns (1), (2) and (3) and current revenues variation in columns (4), (5) and (6). *3rd-party is a* dummy that equal to one if the third-party -in term of votes- obtained representation. It indicates the overall effect of an increase of one party into the legislature; moving from 2 to 3 parties. Given the construction of the forcing variable, *constant* refers to the expected value just at the left side of the third-party representation threshold. Columns (1) and (4) use polynomial of order 3 of the forcing variable; columns (2) and (5) use a polynomial of order one and the optimal bandwidth h* based on the procedure proposed by Calonico, Cattaneo, and Titiunik (2014); columns (3) and (6) use a 3% bandwidth and include province fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, p<0.1.

The treatment effect on current expenditures is a robust increase of between 30 to 55 euros per capita. However, the treatment effect on current revenues is less clear. It indicates an increase in a range magnitude between 20 and 40

euros per capita. These results are confirmed in Table A3.7 where the expected effect of an additional party in the legislature turns in a statistically significant increase on both current expenditures (30-40 euros per capita) and revenues (30-35 euros per capita). At the left of the threshold, when political fragmentation is lower, the results indicate a robust reduction on current expenditures (35-45 euros per capita). Therefore, less politically fragmented legislatures reduce current expenditures by a –around- 5.5% (considering 2011 mean values reported in Table A3.5). This reduction on current expenditure is higher at the third-party-entrance sample. Where given the construction of the forcing variable, the left of the threshold corresponds exclusively to no fragmented (majority) executives. Increasing political fragmentation increases current expenditures (around 6% increase with respect to 2011 level). This effect is similar to the expected reduction for lower political fragmented legislatures indicating that the increase in political fragmentation neutralizes expenditure reduction. However, more politically fragmented legislatures compensate the no-reduction of current expenditures with an increase in current revenues. The effect of the third-party entrance on current revenues is an increase of around 40€ per capita (a around 4.8%. increase). Same conclusions arise when the analysis is performed on the any extra-party-entrance sample. Coefficient magnitudes are lower but highly significant (see Table A3.7).

Overall results indicate that legislatures do respect fiscal rules and undertake fiscal consolidation (an improvement on the current balance). However, political fragmentation affects fiscal consolidation implementation. Increasing political fragmentation offsets current expenditures reduction while increases current revenues. In consequence, political fragmentation has a measurable effect on the resultant budget size after the fiscal consolidation. The budget size is larger when political fragmentation increases.

However, results reflect that the effect of the third-party entrance on current expenditures is higher than the entrance of any other extra party. This is in line with the fact that the effect of one party increase on political fragmentation is perceptually lower when the number of parties already represented is larger; moving from 2 to 3 parties produces a 50% increase on political fragmentation, from 3 to 4 a 33% increase (and so on). In order to study this issue, Table 3.4 and Figure 3.5 show the effect of political fragmentation on current expenditures (panel a) and revenue (panel b) by party entrance.

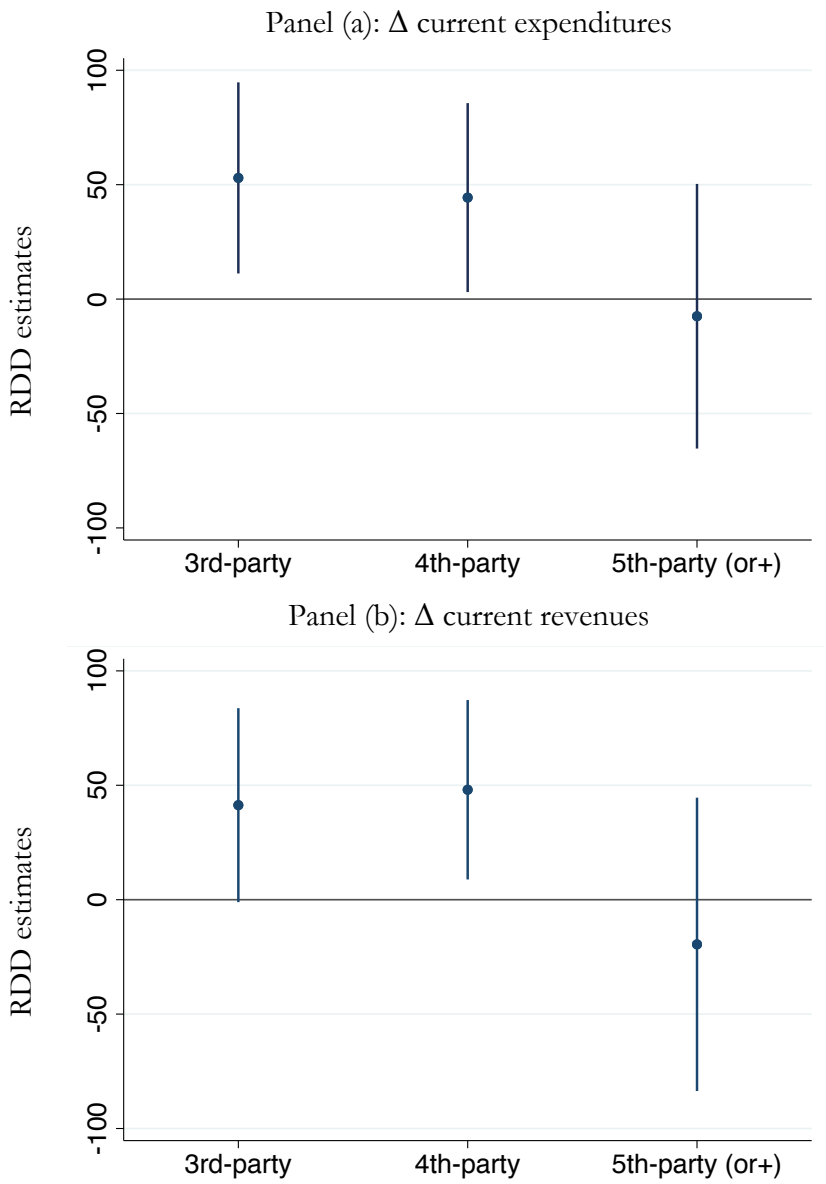
Municipalities are aggregated according to its marginal party (the party closest to the representation threshold). For example, it compares those municipalities where a fourth party got representation (treated) with those where the fourth party did not (control) –and thus; there are only three parties in the legislature. Results confirm that the political fragmentation effect is decreasing with the number of parties. The effect is especially large and statistically significant when the marginal-party is the third or fourth to enter into the legislature but becomes insignificant when legislatures are already highly politically fragmented. Expenditures increase by 65 euros per capita when the third-party is represented or 45 euros per capita when it is the fourth-party (with respect to their respective control groups). There is also an increase in revenue when the third-party (around 40 euros per capita) or the forth-party (around 48 euros per capita) obtains representation.

Table 3.4 - Average effect of increasing political fragmentation on current expenditures by party entrance.

	Δ current expenditures			Δ current revenues		
	(1) 3rd-party	(2) 4th-party	(3) 5th-party or +	(4) 3rd-party	(5) 4th-party	(6) 5th-party or +
extra-party	65.477***	44.992**	-7.495	41.319*	48.043**	-19.514
	(22.129)	(20.512)	(30.507)	(24.158)	(22.332)	(36.394)
constant	-52.324***	-20.672	-7.723	-26.609	-5.815	42.199
	(15.852)	(15.226)	(20.966)	(16.858)	(17.193)	(24.245)
Observations	362	319	148	478	384	171
Pol. order	1	1	1	1	1	1
Bandwidth	h*	h*	h*	h*	h*	h*

Notes: See Table 3.3. *extra party* is a dummy that equal to one if the marginal party obtained representation. Given the construction of the forcing variable, *constant* refers to the value just below the threshold.

Figure 3.5 - The effect of political fragmentation on fiscal consolidation by party entrance



Notes: Dots are the RDD estimates for the party entrance effect on current expenditures; intra-term (2011-2014) variation of current expenditures and revenues (€ per capita). Current expenditures variation is computed as the term variation of expenditures per capita between 2011-2014. Bars correspond to the 95% confidence intervals.

So far, the analysis proves that political fragmentation does affect legislatures' behaviour on current budget aggregates. However, fiscal consolidation is also likely to affect the capital side of the budget. Table A3.8 presents the effect of political fragmentation on capital aggregates. Panel (a) reports the coefficient results for the third-party entrance and panel (b) the any extra-party-entrance one. Columns specifications are the same as described for Table 3.3 in the baseline results. Results point that an increase in political fragmentation does not affect the magnitude of fiscal consolidation on capital aggregates. Legislatures decrease capital revenues and expenditures irrespectively of their political fragmentation. Therefore, the political fragmentation effect on current aggregates is not compensated at the capital side of the budget. The magnitude of the capital expenditures reduction is highly remarkable; between 80 to 120 euros per capita reduction that supposes around 32-48% decrease with respect to 2011 levels. As expected from the literature, capital spending is the fastest way to reduce deficits. The consequent decrease in capital revenues is correlated to both the conditional nature of capital transfers (if a public investment is cancelled, a conditional transfer to finance it too) and upper-levels transfer cuts.

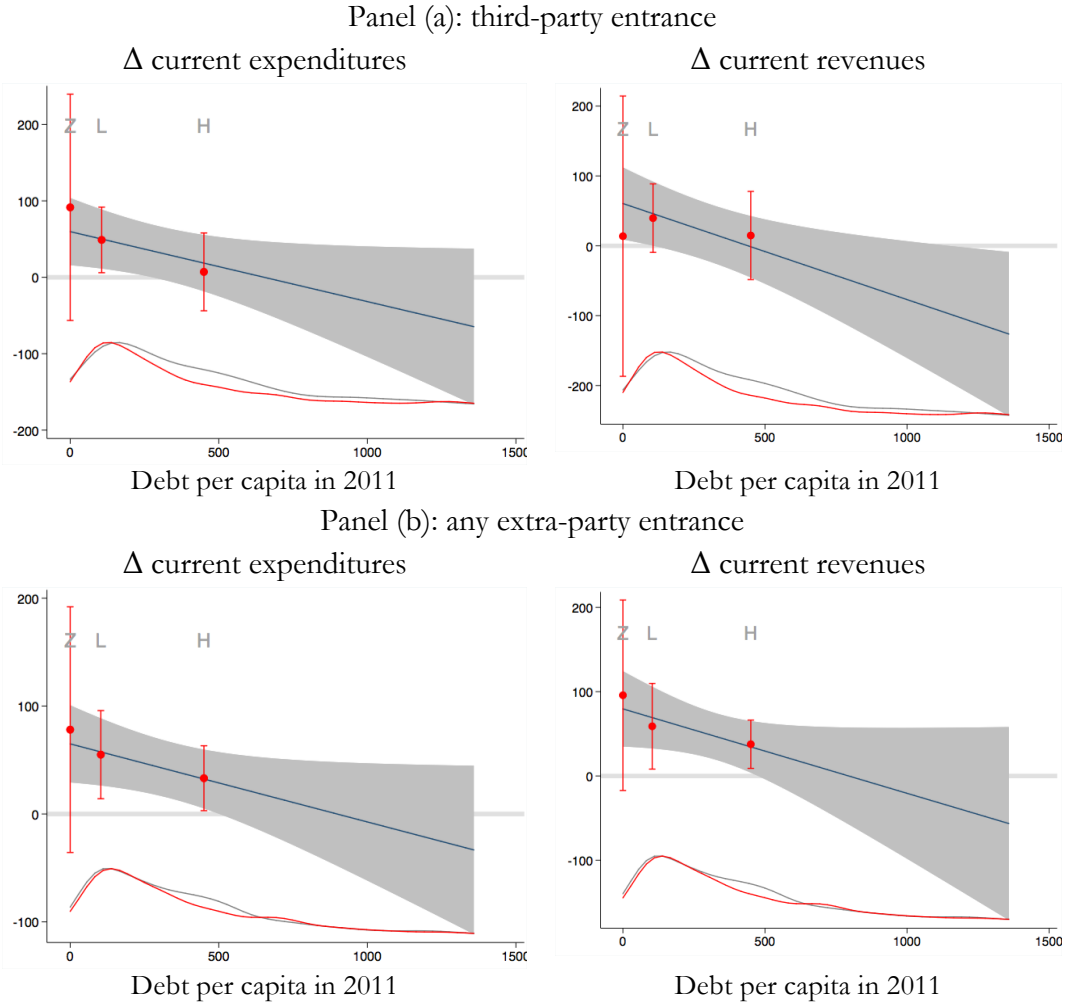
3.5.3.- Heterogeneous results: The role of the initial financial situation on the political fragmentation effect on fiscal consolidation

The analysis is extended to consider the effect of political fragmentation on current aggregates conditional on the severity of the initial financial situation (proxied by the debt per capita in 2011). Municipalities are grouped in three different subgroups considering their debt level; municipalities with zero debt and those with a low or high debt level respectively (see Figure A3.1).

Figure 3.6 represents the marginal effects of increasing political fragmentation in the three indebtedness subgroups for the third-party –panel (a)- and any extra-party –panel (b)- entrance samples. The baseline is the current expenditure decrease by approximately 45€ per capita when political fragmentation is low. The conclusion is that the effect of political fragmentation on current expenditures is offset when initial debt levels were high. This indicates that a difficult financial situation leaves no room for an alternative solution: current expenditures reduction cannot be avoided even if an increase in revenue. The effect of political fragmentation on current revenues is positive (mostly when municipalities presented some debt). This result supports the previous finding that, on average, increasing political

fragmentation shifts the focus of fiscal consolidation towards the revenues side of the budget.

Figure 3.6 - The marginal effect of political fragmentation on fiscal consolidation conditional on the initial financial situation.



Notes: Estimates include province fixed effects and population in 2011. Current expenditures and revenue variation is computed as the term variation (2011-2014) in euros per capita. Initial financial situation is defined by the debt per capita level in 2011. Observations are divided in three groups; zero (Z) debt; low (L) and high (H) debt level. The division between low and high is determined by the median among all observation with a debt level in 2011 different from zero. Red dots correspond to the coefficient values computed at the median in every debt subgroup. Bars correspond to the 95% confidence intervals. The solid blue line and grey area represent the predicted linear effect and 95% confidence interval. The grey and red curves at the bottom correspond to the treated and control observations density respectively.

In the same line, Table 3.5 reports the expected effects for the different specifications described for Table 3.3. These results confirm that the effect of political fragmentation on current expenditures is mainly significant when the initial debt was low. The effect on current revenues is present when initial debt levels were low or high. Therefore, only when economic conditions were not extremely severe, politically fragmented legislatures could shift from expenditure reduction to a revenue increase. The interpretation of these results is puzzling given that this effect could be influenced by other circumstances rather than the political fragmentation effect: Although the BBR was enforced to all municipalities, national government pressure may be stronger in municipalities under severe fiscal circumstances. The results for those municipalities presenting zero debt are noisy, and it is not possible to extract a definite conclusion.

Table 3.5 - Average effect of political fragmentation on fiscal consolidation conditional on the initial financial situation

		Δ current expenditures			Δ current revenues		
		(1)	(2)	(3)	(4)	(5)	(6)
third-party	*high debt*	52.181**	33.329	20.064	75.610*	69.037*	68.159*
		(26.016)	(30.583)	(27.340)	(40.503)	(40.018)	(41.369)
	low debt	56.245**	54.563*	53.268*	76.205*	59.632	90.268**
		(27.123)	(31.812)	(27.816)	(41.363)	(40.450)	(41.972)
	zero debt	73.676	78.220	76.368	102.575*	77.183	93.010
		(45.094)	(50.704)	(46.447)	(58.233)	(55.996)	(56.945)
Observations		1,274	468	465	1,274	584	465
Pol. order		3	1	1	3	1	1
Bandwidth		100%	h*	3%	100%	h*	3%
Prov. FE		no	no	yes	no	no	yes
Control		yes	yes	yes	yes	yes	yes

Notes: See Table 3.3. Initial debt level's categories are dummy variables that equal to one if a) *zero debt* level if debt capita in 2011 was zero, b) *low debt* level if debt per capita in 2011 was below than the median of those municipalities with some debt and c) *high deb*t if was above. Control includes population in 2011.

3.5.3.- Legislative vs. executive fragmentation

On the next step, the analysis disaggregates the effect of political fragmentation. Table 3.6 examines whether it is the fragmentation of the legislature or of the executive that drives the effect of political fragmentation on fiscal consolidation. Using the third-party-entrance sample, treatment is divided in two; *majority* if the entrance of the third-party did not modify the majority status of the executive (only legislative fragmentation effect) and *non-majority* if the entrance of the third-party led to a fragmented executive (legislative + executive fragmentation effect). In order to guarantee the validity of the estimates, the covariates smoothness at the threshold for both treatments is verified. Tables A3.9 and A3.10 presents the results. For the two subsamples, no covariates present any relevant discontinuity at the threshold.

The Table 3.6 includes a test of differences between both treatment coefficients. If it cannot be rejected that *3rd-party*majority* is equal to *3rd-party*non-majority*, the political fragmentation effect can be attributed only to legislative fragmentation indicating that the indirect effect of executive fragmentation is insignificant. If *3rd-party*non-majority* is statistically different from *3rd-party*majority*, both legislative and executive fragmentation affect fiscal consolidation implementation. Results indicate that there is no difference between the *3rd-party*majority* and *3rd-party*non-majority*. Therefore, the political fragmentation effect on fiscal consolidation documented in this paper is a result of the legislative fragmentation; the direct effect on legislative fragmentation prevails over the indirect effect on executive fragmentation.

Table 3.6 – Legislative vs. executive fragmentation effect on fiscal consolidation.

	Δ current expenditures			Δ current revenues		
	(1)	(2)	(3)	(4)	(5)	(6)
*3rd-party * majority*	27.867	38.010**	52.914***	22.479	15.694	39.892
	(19.761)	(19.213)	(18.938)	(27.416)	(23.663)	(25.727)
*3rd-party * non-majority*	30.696	63.285**	58.617**	29.106	26.869	48.652
	(31.088)	(26.786)	(25.980)	(39.784)	(33.194)	(36.939)
constant	-36.454***	-48.170***	-	-18.418	-16.921	-
	(13,748)	(14.023)		(19.194)	(17.179)	
T-test pv.	-0.928	-0.338	-0.832	-0.868	-0.733	-0.816
Observations	1,274	468	465	1,274	584	465
Pol. order	3	1	1	3	1	1
Bandwidth	100%	h*	3%	100%	h*	3%
Prov. FE	no	no	yes	no	no	yes

Notes: See Table 3.3. *3rd-party* is a dummy equal to one if a third-party obtained representation; *majority* is a dummy equal to one if the executive remains as a majority government; *non-majority* is a dummy equal to one if the executive is a non-majority government. Given the construction of the forcing variable, *constant* refers to the value just below the threshold: 2 parties represented with a non-fragmented executive (majority government). T-test pv. corresponds to the p-value of the test between *3rd-party* coefficients (*3rd-party*majority=3rd-party*non-majority*).

Previous results showed that the entrance of an extra party into the legislature modifies fiscal consolidation implementation even when the party entrance does not affect executive fragmentation. However, the effect of the extra party entrance may be different conditional on executive fragmentation: That is, an extra-party entrance in a legislature with an already fragmented executive may be different from the party entrance effect when the executive was (and remain) non-fragmented. For example, when moving from 3 to 4 parties, the fourth-party effect may be different if it enters in a legislature under a fragmented executive or a non-fragmented one. In this line, the next step studies if the executive fragmentation affects the magnitude of the legislative effect. In order to do that, the any extra-party-entrance sample is divided into two subsamples considering municipalities' executive fragmentation (majority and non-majority governments). The treatment effect evaluated inside each of the subsamples isolates the direct effect (legislative fragmentation) keeping

constant the executive fragmentation. One has to be cautious that municipalities with fragmented and non-fragmented executives may also differ in other relevant aspects. However; within each subsample, the causal effect of legislative fragmentation can be evaluated (conditional on executive fragmentation). Therefore, one can interpret the treatment effect of legislative fragmentation within each subsample, but coefficient cannot be directly compared between subsamples.

Table 3.7 shows the effect of legislative fragmentation conditional on executive fragmentation. Panel (a) uses the non-fragmented executive subsample and panel (b) the fragmented executives one. The organization of the column specifications is the same to previous tables. The results show that legislative fragmentation affects fiscal consolidation implementation in the presence of a majority government (when the executive is not fragmented). The interpretation of this result is not straightforward; even though a majority government can implement fiscal consolidation measures without the need for any further support, consolidation strategies are modified when the executive faces more contested legislatures. Magnitude values are similar to the political fragmentation effect found in Table 3.3. However, once the executive is already fragmented, increasing legislative fragmentation does not have a significant effect on fiscal consolidation.

Table 3.7 – The effect of legislative fragmentation conditional on executive fragmentation.

	Δ current expenditures			Δ current revenues		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel (a): non-fragmented executives -majorities-						
extra-party.	39.518**	53.149***	40.302**	45.590**	40.818*	31.605
	(17.262)	(18.356)	(15.695)	(23.059)	(22.148)	(21.694)
constant	-17.807	-25.930**	-	4.056	-1.805	-
	(11.504)	(12.956)		(15.829)	(15.614)	
Observations	1,396	476	580	1,396	579	580
Panel (b): fragmented executives -non-majorities-						
extra-party.	-3.514	12.568	-3.712	6.357	24.104	17.413
	(20.491)	(18.832)	(18.025)	(26.396)	(23.716)	(21.538)
constant	-2.895	-19.736	-	19.934	-8.280	-
	(14.389)	(13.487)		(20.142)	(17.528)	
Observations	602	306	340	602	279	340
Pol. order	3	1	1	3	1	1
Bandwidth	100%	h*	3%	100%	h*	3%
Prov. FE	no	no	yes	no	no	yes

Notes: See Table 3.3. Panel (a) uses the subsample of non-fragmented executives; majority governments. Panel (b) uses the subsample of fragmented executives; non-majority governments.

3.5.4.- Robustness checks: extra party Alignment and executive Ideology

The central question of the paper is how political fragmentation affects fiscal consolidation. However, the political fragmentation effect could be impacted by other political characteristics, among them, political ideology. This section examines two alternative situations where political ideology could affect fiscal consolidation.

First, it analyses the situation of the extra party being aligned with the winning party, which is the party obtaining more votes in each legislature. The effect on fiscal consolidation of an extra party with a similar ideology to the winning party may be lower than the entrance of a party with an opposite ideology. In absolute terms, it means an identical increase of one party in the legislature. However, the bargaining cost of forming an executive or supporting a proposition may be lower if both parties share a similar ideology. The third-

party alignment is computed with respect to the winning party instead of the mayoral party given that the third-party ideology could affect mayoral ideology but rarely the winning party ideology. For example, the entrance of a left-wing third-party is likely to increase the likelihood of a left-wing mayor. When the winning party holds a majority of seats in the legislature, it will undoubtedly become the mayoral party. However, if the winning party does not hold a majority of seats, an alternative majority in the legislature could end up controlling the executive. This type of agreement is usually based on ideology. Therefore, the variable *aligned* is a dummy variable that takes value 1 if the third-party (in terms of share of votes) belongs to the same political ideology as the winning party (in terms of share of votes). A broad ideological classification of all Spanish parties occupying the marginal party position is reported in Table A3.4 in the appendix.

Second, it studies the executive ideology; left and right-wing executives are likely to differ on fiscal consolidation opinions and strategies. Moreover, left and right-wing executives may respond differently to the entrance of an extra party into the legislature. The executive ideology is derived from mayoral ideology. In our setting, the ideology of all parties forming the executive is unknown. However, there is information regarding the mayoral party. This is not an essential limitation since the mayoral party is the only party in majority governments. Moreover, in non-majority governments, the mayoral party supposes the most important party in the executive (even if the executive is shared with other parties). Mayoral party ideology is again determined using the classification of Table A3.4 in the appendix. In the analysis, mayoral ideology is introduced using the dummy variable *right* that takes value 1 if the mayoral party is a right-wing party and it takes value 0 if the mayoral party is a left-wing party. Mayoral parties classified as centre ideology are excluded in this analysis. They are mostly local parties, and they suppose a small portion of mayors.

Table 3.2 presented the covariates continuity at the threshold for some political, socio-economic and budgetary characteristics including the two variables analysed in this section; *aligned* and *right* (in Table 3.2 *right* variable is named *mayoral ideology* but its interpretation, in the terms that concerns here, is the same). However, the continuity of these covariates in the threshold is a necessary but not a sufficient condition to discard the explanatory power of these characteristics. For example; increasing political fragmentation could

only affect the fiscal consolidation behaviour of a legislature if the third-party is not ideologically aligned or it could be that only left-wing mayors modify their behaviour when the legislature becomes more fragmented. Therefore, the respective analyses include an interaction between *third-party* and the ideology variable (*aligned* or *right*) to allow for a different behaviour at any side of the threshold.

Table 3.8 reports the results for the third-party alignment. The interaction coefficient between *3rd-party* and *aligned* is not significant for all specifications considered. This indicates that the political fragmentation effect documented in this study is not affected by the third-party ideology. The effect of political fragmentation (*3rd-party*) remains significant when controlling for province fixed effects, and coefficient values are similar to those reported in Table 3.3. The entrance of an extra party into the legislature has a positive effect on both expenditures and revenues. Therefore, increasing legislative fragmentation modifies fiscal consolidation irrespectively of the ideological alignment of the extra party. However, when extrapolating this conclusion to other settings, it should be borne in mind that this study is based on local legislatures, where ideology is perhaps a less determining factor when reaching agreements.

Table 3.9 checks if fiscal consolidation differs when an executive with a different ideology face more fragmented legislatures. The interaction coefficient between *3rd-party* and *right* is not significant for all specifications considered. This means that right-wing executives do not behave differently than left-wing ones when they are affected by an increase in political fragmentation. Again, the effect of political fragmentation (*3rd-party*) remains significant, and coefficient values are in line to those reported in Table 3.3. Therefore, the effect of political fragmentation on fiscal consolidation does not depend on executive ideology. Ideology does seem to have a role in fiscal consolidation (irrespectively of political fragmentation); the coefficients for the *right* variable are slightly significant for current expenditures.

Table 3.8 - Political fragmentation and third-party alignment

	Δ current expenditures			Δ current revenues		
	(1)	(2)	(3)	(4)	(5)	(6)
*3rd-party*aligned*	23.642	17.537	-12.607	-14.289	1.266	-33.222
	(44.736)	(40.900)	(39.026)	(57.510)	(51.722)	(50.287)
3rd-party	27.432	40.672*	57.363***	27.812	18.118	50.487*
	(21.454)	(21.064)	(20.533)	(30.184)	(25.750)	(28.533)
aligned	-4.868	-1.520	16.640	19.800	16.539	20.770
	(33.208)	(30.347)	(29.180)	(45.326)	(40.706)	(41.013)
constant	-37.040**	-47.864***	-	-23.632	-20.614	-
	(15.849)	(16.625)		(22.124)	(19.657)	
Observations	1,274	468	465	1,274	584	465
Pol. order	3	1	1	3	1	1
Bandwidth	100%	h*	3%	100%	h*	3%
Prov. FE	no	no	yes	no	no	yes

Notes: See Table 3.3. *3rd-party* is a dummy equal to one if the third-party obtained representation, *aligned* is a dummy equal to one if the third-party belongs to the same ideology as the winning party in the municipality. Given the construction of the forcing variable, *constant* refers to the value just below the threshold.

Table 3.9 - Political fragmentation and executive ideology

	Δ current expenditures			Δ current revenues		
	(1)	(2)	(3)	(4)	(5)	(6)
*3rd-party*right*	5.283	-46.743	-42.214	10.480	-11.316	-68.812
	(37.993)	(35.805)	(34.953)	(51.061)	(43.458)	(48.773)
3rd-party	29.905	70.581**	74.907***	15.792	21.665	79.354**
	(29.689)	(27.700)	(26.996)	(38.792)	(33.519)	(36.820)
right	23.708	54.836**	43.685*	23.286	8.368	51.938
	(27.555)	(27.212)	(26.429)	(40.275)	(35.488)	(39.169)
constant	-54.311**	-83.291***	-	-32.076	-26.024	-
	(21.799)	(21.345)		(33.087)	(29.224)	
Observations	1,158	433	434	1,158	601	434
Pol. order	3	1	1	3	1	1
Bandwidth	100%	h*	3%	100%	h*	3%
Prov. FE	no	no	yes	no	no	yes

Notes: See Table 3.3. *3rd-party* is a dummy equal to one if the third-party obtained representation, *right* is a dummy equal to one if the mayoral party is a right-wing party; zero if left-wing (centre and local parties are not included in the analysis). Given the construction of our forcing variable, *constant* refers to the value just below the threshold.

3.6.- CONCLUSION

This chapter studies the causal effect of political fragmentation on fiscal consolidation when a fiscal rule limits deficits and debt issuance. This situation is not anecdotal, and it is becoming a standard setting for many local and regional governments in advanced democracies. Fiscal consolidation is analysed, considering the intra-term evolution of the major budgetary aggregates (current expenditures and revenues). The results show that, on average, local councils do implement fiscal consolidation measures. However, political fragmentation affects the composition of the fiscal consolidation package.

Low fragmented legislatures prioritise a reduction on current expenditures while increasing political fragmentation shift the focus on an increase in revenue. As a result, political fragmentation has an essential effect on budget size. It is bigger if the number of parties in the legislature increases. This marginal effect of political fragmentation is significant and sizeable when overall fragmentation is not very large. When legislatures are already highly politically fragmented (i.e. presenting more than four parties) increasing political fragmentation (e.g. the entrance of the fifth party) does not affect fiscal consolidation implementation.

In line with previous literature, this study also supports the idea that fiscal consolidation tends to prioritise capital-spending cuts (irrespectively of political fragmentation levels). It is a fast way to reduce expenditure and could be less politically costly in the short-run since its effects are not as salient as salary or transfer cuts. In our setting, capital cuts are also a consequence of upper-levels capital transfers' reduction.

Regarding the financial position of a municipality, this study shows that it affects the type of consolidation strategy implemented. The financial position of a municipality is determined by its debt per capita at the beginning of the consolidation process. Municipalities are classified into three groups considering their relative debt level: zero, low and high. The results show that the effect of political fragmentation on current expenditures is offset when municipalities presented severe initial financial difficulties (high debt levels). When initial debt levels are high, fiscal consolidation is based on expenditure cuts irrespectively on the level of political fragmentation. Thus, only when

indebtedness is low, political fragmentation does have an impact on the type of instrument used for consolidation. One needs to be cautious when comparing municipalities across debt levels. Indebtedness correlates with other socio-economic variables, and therefore, municipalities presenting different debt levels are potentially different in other dimensions. The analysis deals with this issue by controlling for population size (population is a great explanatory variable for debt and other socio-economic variables). However, some differences may remain. Fortunately, covariates are continuous at the threshold within debt levels. Therefore, heterogeneous results can be interpreted as the causal effect of political fragmentation on fiscal consolidation conditional on the initial debt level.

The empirical analysis is able to analyse the mechanisms of political fragmentation; it disaggregates the effect of increasing political fragmentation by its direct effect -legislative fragmentation- and its indirect effect -executive fragmentation-. Results show that increasing legislative fragmentation modifies fiscal consolidation implementation even when the executive remains non-fragmented (majority government). A majority government can implement fiscal consolidation measures without the need for further agreement with other parties. Therefore, other mechanisms may explain this result: The quality and magnitude of the legislative debate may increase when the number of parties in the legislature increases. Notably, the debate would be more extensive when "new" parties broaden ideological diversity within the legislature. An increase in the political debate may also increase media attention. In this regard, above and beyond the local and regional media network, the amount of information released and received by voters also increases with the number of parties represented given that party representation provides economic resources that local parties can utilise for communication purposes. At the local level, there is a widespread political communicative strategy to periodically distribute free propaganda with local political information. Party representation also affects party participation in upcoming electoral campaigns. It grants electoral participation in local electoral debates, local media, public advertisement and street propaganda. Therefore, an increase in political fragmentation today positively correlates with electoral competition tomorrow. All these mechanisms could also explain the predominance of the legislative fragmentation over the executive one. Even if an increase in political fragmentation in the legislature would not affect the executive fragmentation, the executive may modify present

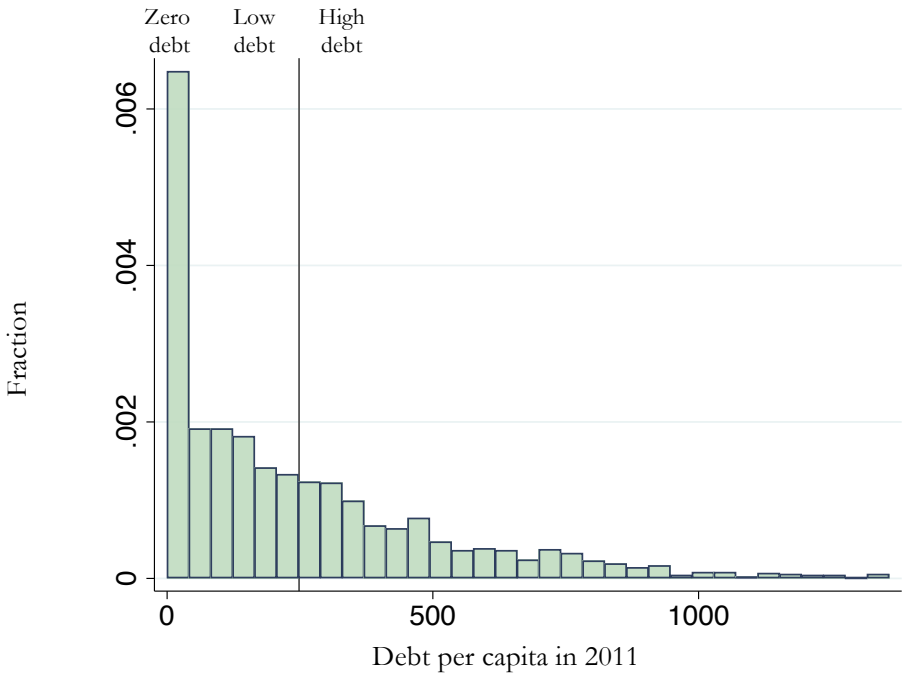
behaviour anticipating future electoral competition. In addition, this study finds that the legislative fragmentation effect disappears when the extra party enters into a legislature already presenting a fragmented executive. Further analysis would be needed to explain these mechanisms accurately.

Finally, this chapter studies the potential combined effect of ideology with political fragmentation. The robustness of the political fragmentation effect documented in the study is confirmed given that its effect is not conditioned by the ideological alignment of the extra party or the executive ideology.

APPENDIX

Figures

Figure A3.1 - Municipalities debt distribution in 2011



Notes: Spanish municipalities' debt per capita in 2011. Vertical blue line corresponds to the median debt level for those municipalities with some debt (computed excluding municipalities with zero debt per capita in 2011). Municipalities are grouped in three debt level: zero debt, low debt (below the median), high debt (above the median).

Figure A3.2 - Economic measures (2007-2015)

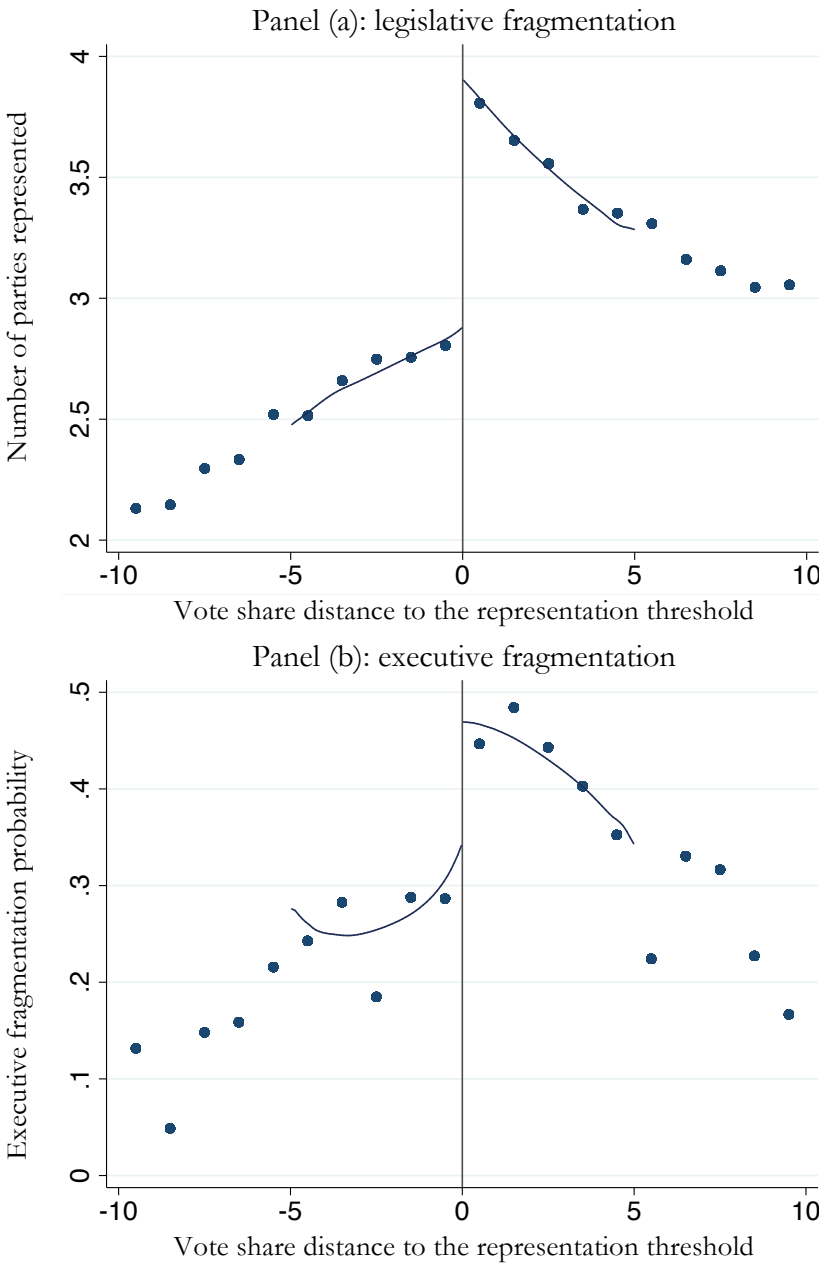
YEAR		Fiscal Rules	Expansionary measures	Liquidity mechanisms
2007	Local elections	(2007-2011) General Law on Budgetary Stability		
2008	General elections			
2009			(2009) *Plan Español para el Estímulo y la Ocupación*.	(2009) Authorization for extraordinary debt operations.
2010			(2010) *Fondo estatal para el empleo y la sostenibilidad local*.	
2011	Local elections General elections	(2011-now) Balanced Budget Constitutional amendment		
2012		(2012-now) Expenditure Rule		(2012) 1st Suppliers Payment Fund.
2013				(2013) 2n Suppliers Payment Fund.
2014				(2014) 3rd Suppliers Payment Fund.
2015	Local elections General elections			

Figure A3.2 - Continues

General Law on Budgetary Stability (2007-2011)	The objective was to guarantee the financial sustainability of public administrations, strengthen confidence in the stability of the Spanish economy and strengthen Spain's commitment to the European Union in terms of budgetary stability. It established fiscal rules, which limited to the structural deficit and public debt.
Plan Español para el Estímulo y la Ocupación (2009)	It was a compilation of economic, financial and fiscal measures aimed to recover the path of growth and job creation. It involved mobilisation of public resources unprecedented to date. At the local level, outstands the creation of the Public Investment Fund for an amount of 8,000 million euros, intending to create 200,000 jobs.
Authorization for extraordinary debt operations (2009)	Extraordinary and urgent measures to facilitate Local Entities the recovery of outstanding debts to companies and self-employed. Local entities that have liquidated the financial year 2008 with negative cash balance for overheads or those who have past due and payable obligations to be applied to the budget to execute a bank debt operation subject to the approval of a sanitation plan.
Fondo estatal para el empleo y la sostenibilidad local (2010)	The objective was to increase public investment in the local area through the financing of actions generating employment in new planning, and immediate execution works responsibility of the municipalities, to be carried out from the beginning of 2010
Balanced Budget Constitutional amendment (2011-now)	The reform of article 135 of the Constitution sought to guarantee the principle of budgetary stability by linking all Public Administrations, reinforcing Spain's commitment to the European Union and guaranteeing economic and social sustainability.
Expenditure Rule (2012-now)	The expenditure rule set a limit to the growth of municipal expenditures The expenditure annual variation of all administrations may not exceed the reference rate of medium-term GDP growth of the Spanish economy.
Suppliers Payment Fund (2012/3/4)	Three financing mechanism to alleviate the accumulated delays in the payment of the obligations that local entities had contracted with their suppliers. It involves a long-term debt operation and the obligation to approve an adjustment plan.

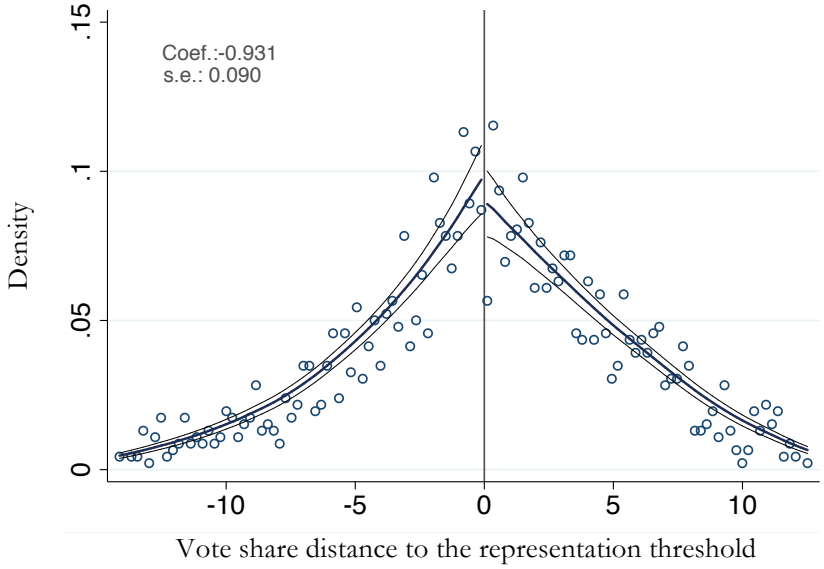
Note: Economic measures implemented by the national government affecting Spanish municipalities between 2007-2011

Figure A3.3 - Political fragmentation at the threshold



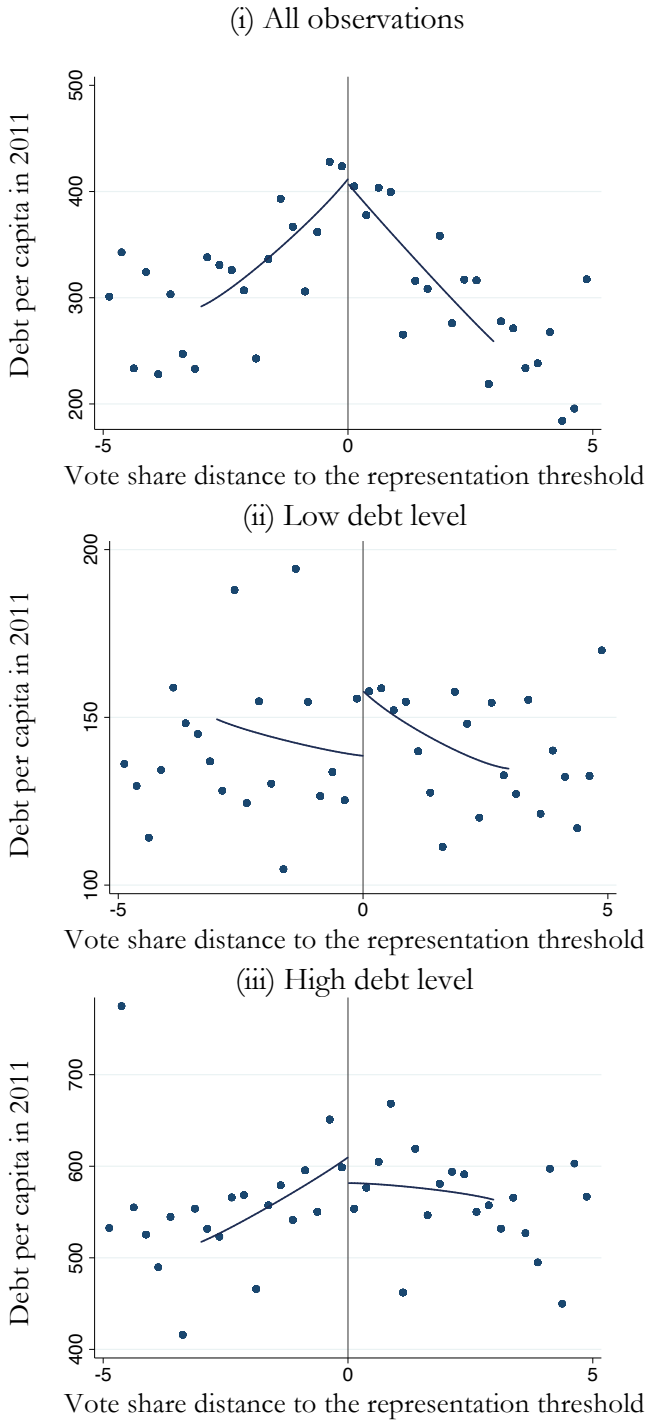
Notes: The graphs correspond to the third-party-entrance sample. Dotes are binned averages of 1% bin size. The solid line represents the predicted value of a local polynomial considering a 5% bandwidth.

Figure A3.4 - Continuity of the forcing variable at the third-party representation threshold



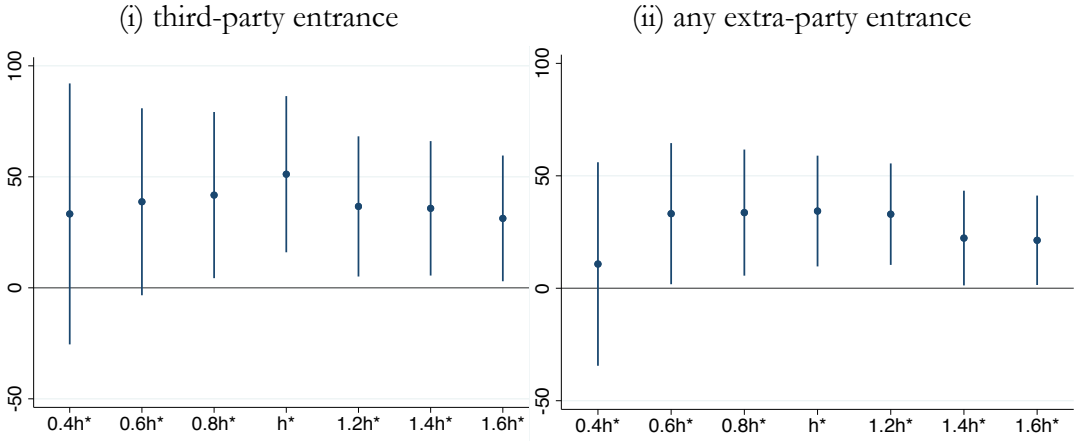
Notes: The graph corresponds to the any extra-party-entrance sample. Dots for the McCrary graph are bin averages of the density of the forcing variable -votes' share distance to representation threshold-.

Figure A3.5 - Continuity of the municipalities' debt level at the any extra-party representation threshold.



Notes: The graphs correspond to the any extra-party-entrance sample. Dotes are bin averages of 0.25% bin size of debt per capita in 2011. The solid line represents the predicted values of the local polynomial considering a 3% bandwidth on each side of the third-party representation threshold. Zero debt level subgroup is omitted because debt values for all municipalities on each side of the threshold are zero by construction.

Figure A3.6 - Average effect of political fragmentation on current expenditures by bandwidth selection. RDD estimates



Notes: Average effect of the third-party (any extra-party) entrance into the legislature on the intra-term variation of current expenditures. Dots are RDD estimates. Bars correspond to the 95% confidence intervals. h* is the optimal bandwidth for each variable based on the procedure proposed by Calonico, Cattaneo, and Titiunik (2014).

Tables

Table A3.1 - Forcing variable computation

Forcing variable. The running variable used is the extra-party vote share distance to the representation threshold (obtaining the first seat). It is constructed as follows:

1- Last and next corresponding numbers (cn) of every party -*Last cn* (votes *i*/#seats *i*) and *Next cn* (votes *i*/#seats *i+1*)-. Corresponding numbers are used to distribute seats within parties. Following d'Hodnt Rule, every party number of votes of is divided by 1, 2, 3…n (being "n" the total number of seats to be elected) to construct the corresponding numbers. Seats are awarded in descending order throw the largest cn. *Last cn* will be the smaller *cn* awarded with a seat while *Next cn* will be the biggest one not awarded.

2- Vote distance to representation threshold for parties with no representation

$$v_i + x > min\, Last_{cn}$$

v_i is the number of votes obtained by *party i*, *x* is the number of extra votes needed for *party i* to obtain the first seat (*party z* with the minimum *last cn* would lose it). *Party z* must have more than 1 seat otherwise the number of parties in the city council would not change. The number of parties in the city council would change from 2 to 3.

3- Vote distance to representation threshold for parties with representation

$$v_j - y < maxNext_{cn}$$

y is the number of votes that *party j* should lose to lost the only seat it has (*party z* with the biggest *next cn* would obtain it). *Party j* must have only 1 seat otherwise the number of parties in the city council would not change. *Party z* has at least 1 seat otherwise the number of parties in the city council would not change. The number of parties in the city council would change from 3 to 2.

4- The forcing variable is *x*/*valid votes* (the share of valid votes that party *i* would need to obtain representation) and *y*/*valid votes* (the share of valid votes that *party j* must lose to lose its representation).

5- In every municipality, the forcing variable is the minimum value between both measures. Therefore it only considers the party closest to the threshold in every municipality.

Table A3.2 - Forcing variable numerical examples

Treated observation

Party	#votes	#seats	Last cn (votes/seats)	Next cn (votes/seats+1)	+/- votes*	# Votes*	Seat distribution*
1st-party	1351	9	150.11	135.1		1351	10
2n-party	214	1	214	107		214	1
3rd-party	140	1	140		5	135	0
Valid votes	1705	Forcing variable: (extra votes/valid votes)*100					0.293

This municipality is considered as a treated observation because the third-party obtained representation (1 seat in the legislature). The third-party obtained 5 votes more than the minimum amount that would have granted him the first seat (135 votes). With 5 votes less (130), this last seat would have been granted to the first-party (135.1>135). These 5 votes suppose a 0.293% votes share to the representation threshold.

Control observation

Party	#votes	#seats	Last cn (votes/seats)	Next cn (votes/seats+1)	+/- votes*	# Votes*	Seat distribution*
1st-party	1069	6	178.17			1069	5
2n-party	896	5	179.2			896	5
3rd-party	177	0	-		2	179	1
Valid votes	2142	Forcing variable: (extra votes/valid votes)*100					-0.093

This municipality is considered as a control observation because the third-party did not obtain representation (0 seats in the legislature). The third-party obtained 2 votes less than the minimum amount that would have granted it the first seat (179 votes). With 2 votes more, it would have obtained 1 seat at expenses to the first-party (179>178.17). These -2 votes suppose a -0.093% votes share to the representation threshold.

Table A3.3 – The effect of any extra-party entrance (legislative fragmentation) on executive fragmentation by municipality size.

	up to 7 seats	up to 9 seats	up to 11 seats	up to 13 seats	up to 17 seats	up to 21 seats	all
extra-party	0.242**	0.239***	0.218***	0.112**	0.093*	0.048	0.056
	(0.117)	(0.074)	(0.055)	(0.055)	(0.056)	(0.051)	(0.047)
Observations	261	620	1,091	1,143	1,238	1,322	1,530
Polynomial order	1	1	1	1	1	1	1
Bandwidth	3.58	4.46	4.3	3.15	2.39	2.38	2.61
F-Stat	7.173	16.19	16.33	20.97	18.38	16.64	13.14

Notes: The sample used is the any extra-party-entrance. Municipality size represented by the number of seats in the legislature: Up to 100 inhabitants 3 seats, from 101 to 250: 5; 251 to 1,000: 7; 1,001 to 2.000: 9; 2,001 to 5,000: 11; 5,001 to 10,000: 13; 10,001 to 20,000: 17; 20,001 to 50,000: 21; 50,001 to 100,000: 25 and over 100,001 a Seat more per each 100,000 residents or fraction, adding one more when the result is an even number. Estimates obtained using a local linear regression using the optimal bandwidth based on the procedure proposed by Calonico, Cattaneo and Titiunik (2014). 4) *** p<0.01 ** p<0.05, * p<0.1.

Table A3.4 – Ideological and geographical classification of Spanish parties running at the 2011 local elections (3rd-parties).

Party name	Ideology	Geographical scope	Observations
Izquierda Unida	left	national	256
Local parties	undefined	local	223
Partido Socialista Obrero Español	left	national	218
Partido Popular	right	national	190
Bloque Nacionalista Gallego	left	regional	102
Partido Aragonés	center	regional	48
Unión del Pueblo Leonés	left	regional	33
Bloc Nacionalista Valencià	left	regional	30
Partido Andalucista	center	regional	28
Partido de Castilla y León	center	regional	26
Esquerra Republicana de Catalunya	left	regional	23
Partido Riojano	center	regional	23
Chunta Aragonesista	left	regional	15
Convergència i Unió	right	regional	13
Unión Progreso Y Democracia	center	national	9
Falange Española	far-right	national	8
Partido Regionalista Cántabro	right	regional	5
Unión Pueblo Zamorano	center	regional	5
Socialistas Independientes de Extremadura	left	regional	3
Partido Animalista	center	national	3
Coalición canaria	right	regional	2
Extremadura Unida	right	regional	1
Coalición extremeña	left	regional	2
Unión Centrista	center	regional	2
Unidad Regionalista Catsilla y león	center	regional	1
Los Verdes	left	national	1
Partido del Bierzo	center	regional	1
Partido Socialista Mallorquín	left	regional	1
Unidad Castellana	right	regional	1

Note: 3rd-parties correspond to the parties occupying the marginal party position for the third-party-entrance sample. The 3rd-party -with respect to the share of votes- in every municipality.

Table A3.5 - Descriptive statistics

	Description	Mean	Std. Dev.	Min	Max	Obs.	Source
Political variables							
Majority governments	Dummy variable coded 1 if mayoral party holds more than half of the seats, 0 otherwise.	0.625	0.484	0	1	923	Ministry of Interior
Extra-party	Dummy variable coded 1 if the marginal party obtained representation, 0 otherwise.	0.499	0.500	0	1	923	
3rd Party	Dummy variable coded 1 if the 3rd-party obtained representation, 0 otherwise.	0.546	0.498	0	1	414	
# seats	Number of seats to be elected (2011 local elections) at each municipality.	10.484	2.088	7	13	923	
# parties running	Number of parties running (2011 local elections) at each municipality.	4.281	1.235	3	11	923	
# parties representation	Number of parties with -at least- 1 seat (after 2011 local elections) at each municipality.	3.275	0.980	2	8	923	
Turnout	Turnout votes/census in % (2011 local elections) at each municipality.	0.764	0.092	0.392	0.967	923	
Margin of victory	Vote share distance between the first and second party at each municipality.	0.189	0.141	0	0.678	923	
Mayoral ideology	Dummy variable code 1 if the mayor resulting after 2011 local elections was from a left-wing party; 0 otherwise	0.323	0.468	0	1	923	Puigmule-Solà, Solé-Ollé & Sorribas-Navarro (2018)
Coalition 2007	Dummy variable coded 1 if there was a non-majority government after 2007 local elections, 0 otherwise.	0.426	0.495	0	1	923	Ministry of Interior
Socio-demographic variables							
Population	Population in 2011 at each municipality	3565.978	2616.511	241	10465	923	Municipal register National Statistics Institute (INE)
% Vacation homes	Share of vacation homes over the total in 2001 at each municipality.	20.468	15.082	0	78.075	923	Census 2001;INE.
Education level	Share of population with post-compulsory education in 2001 at each municipality.	56.539	9.677	0	76.744	923	Census of population and houses 2011; INE.
Youth population	Share of population under 16 years in 2011 at each municipality.	14.376	4.758	2.878	28.398	923	Padrón Municipal; INE.
Elderly population	Share of population over 65 years in 2011 at each municipality.	21.185	8.572	3.707	52.703	923	
Coast	Dummy variable code 1 if it is a coastal municipality; 0 otherwise	0.084	0.277	0	1	923	Own computation

Table A3.5 continues

	Description	Mean	Std. Dev.	Min	Max	Obs.	Source
Economic variables (in 2011)							
Current revenues	Chapters I to V. in € per capita	827.053	303.824	306.630	2806.926	923	
Current expenditures	Chapters I to IV. in € per capita	742.910	264.397	243.189	2620.588	923	
Capital revenues	Chapters VI and VII. in € per capita	196.859	285.465	0	2789.244	923	
Capital expenditures	Chapters VI and VII. in € per capita	247.904	306.850	0	2832.757	923	
Debt per capita	Debt per capita (in €) in 2011.	286.761	282.461	0	1358.335	923	
Primary deficit	Exp. Chapters (I, II, IV, V, VI, VII) - Rev Chapters (I to VII). In € per capita	-44.764	100.041	-951.775	446.269	923	
Gross savings	Current Exp. Chapters (I to IV) - Curr. Rev Chapters (I to V). In € per capita	84.143	112.557	-388.868	1857.157	923	
Personnel exp.	Chapter I expenditures in € per capita	339.029	141.913	74.984	1320.751	923	*Ministry of Finance and Public Function*
Goods and services exp.	Chapter II expenditures in € per capita	333.772	143.880	81.117	1501.552	923	
Interests exp.	Chapter III expenditures in € per capita	11.665	12.178	0	151.714	923	
Transfers exp.	Chapter IV expenditures in € per capita	58.444	60.860	0	620.606	923	
Direct taxes rev.	Chapter I revenues in € per capita	289.984	174.892	57.598	2053.695	923	
Indirect taxes rev.	Chapter II revenues in € per capita	30.648	44.256	0	543.210	923	
Other taxes rev.	Chapter III revenues in € per capita	176.216	132.110	3.889	1836.763	923	
Transfers rev.	Chapter IV revenues in € per capita	303.211	127.824	113.591	1229.098	923	
Property rev.	Chapter V revenues in € per capita	26.993	50.440	0	498.006	923	

Note: Table constructed using the predefined bandwidth of 3% and the sample considering any extra-party entrance on municipalities electing a maximum of 13 seats.

Table A3.6 – The effect of one extra-party into the legislature on executive fragmentation

	(1)	(2)
extra-party	0.169***	0.138**
	(0.063)	(0.061)
constant	0.323***	0.345***
	(0.040)	(0.041)
Observations	2,000	923
Pol. order	3	1
Bandwidth	100%	3%
F-Stat	28.25	14.41

Notes: The dependent variable is a dummy variable equal to 1 for non-majority governments (executive fragmentation) after the 2011 local elections The extra-party dummy equals to one if an extra party obtained representation. Columns (1) uses a polynomial of order 3 of the forcing variable, columns (2) uses a 3% bandwidth and a 1st order polynomial. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, p<0.1

Table A3.7 - Average effect of increasing political fragmentation (any extra-party entrance) on fiscal consolidation.

	Δ current expenditures			Δ current revenues		
	(1)	(2)	(3)	(4)	(5)	(6)
extra-party	28.910**	42.669***	31.516***	34.861**	29.302*	34.850**
	(13.354)	(13.512)	(11.748)	(17.090)	(15.382)	(15.186)
constant	-19.985**	-31.310***	-	-1.358	-5.090	-
	(9.126)	(9.729)		(12.630)	(11.547)	
Observations	2,000	833	923	2,000	1,006	923
Pol. order	3	1	1	3	1	1
Bandwidth	100%	h*	3%	100%	h*	3%
Prov. FE	no	no	yes	no	no	yes

Notes: *extra-party*. Indicates the overall effect of an increase of one party in the legislature: (dummy equal to one if the marginal-party -in term of votes- obtained representation). Values correspond to 2011-2014 intra-term differences. Columns (1) and (4) use polynomial of order 3 of the forcing variable, Columns (2) and (5) use a polynomial of order one and the optimal bandwidth h* based on the procedure proposed by Calonico, Cattaneo, and Titiunik (2014), Columns (3) and (6) use a 3% bandwidth and include province fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, p<0.1.

Table A3.8 - Average effect of increasing political fragmentation on capital aggregates

	Δ current expenditures			Δ current revenues		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel (a): third-party entrance						
3rd-party	-10.856	-0.677	-6.438	-15.611	4.334	-20.100
	(53.677)	(51.143)	(47.500)	(49.881)	(40.633)	(44.426)
constant	-124.324***	-118.812***	-	-119.075***	-117.247***	-
	(31.935)	(32.215)		(29.737)	(28.252)	
Observations	1,274	468	465	1,274	584	465
Panel (b): any extra-party entrance						
extra-party	3.743	8.255	8.529	2.920	15.745	1.526
	(44.599)	(43.211)	(39.015)	(42.073)	(37.645)	(37.213)
constant	-79.160**	-85.623**	-	-85.067**	-99.079***	-
	(34.374)	(36.949)		(33.292)	(31.417)	
Observations	2,000	833	923	2,000	1,006	923
Pol. order	3	1	1	3	1	1
Bandwidth	100%	h*	3%	100%	h*	3%
Prov. FE	no	no	yes	no	no	yes

Notes: See Table 3. Panel a show the effect a third-party entrance. *3rd-party* is a dummy that equal to one if the third-party obtained representation. Given the construction of the forcing variable, *constant* refers to the value just below the threshold where only two parties are represented. Panel b shows the effect of any extra party entrance. *extra-party* is a dummy that equal to one if the marginal party –the party closest to the representation threshold in term of votes- obtained representation.

Table A3.9 - Continuity of the covariates at the third-party representation threshold when the third-party does not affect executive fragmentation (3rd-party*majority).

Variable	Difference. Coef.	p-value	Bandwidth	Observations	Mean value threshold 0.5% below	0.5% above
# Seats	1.265	0.109	3.816	501	11.684	5.000
# Parties running	0.188	0.482	4.771	598	3.921	4.226
Turnout	-0.014	0.423	5.061	626	0.790	0.759
Mayoral ideology	0.014	0.770	4.284	551	0.368	0.323
3rd-party alignment	0.064	0.419	3.855	505	0.237	0.258
Coalition 2007	0.015	0.900	4.013	523	0.184	0.226
Population	4908.235	0.319	5.728	694	10019.390	14343.840
% vacation homes	0.460	0.708	4.161	539	23.015	22.403
Education level	-0.801	0.767	4.554	577	54.832	54.460
Youth population	0.162	0.623	2.908	388	12.915	13.465
Elderly population	-0.693	0.478	2.471	335	22.867	21.534
Coast	-0.090	0.115	3.861	505	0.211	0.032
Current revenues	-59.699	0.311	3.272	434	829.033	824.554
Current expenditures	-21.851	0.715	3.903	508	757.547	728.946
Debt per capita	-47.556	0.397	2.959	392	303.667	246.318
Primary deficit	-8.289	0.817	4.555	577	-57.674	-32.633
Gross savings	30.291	0.296	4.925	612	71.485	95.608

Notes: Estimates obtained using a local linear regression using the optimal bandwidth h* based on the procedure proposed by Calonico, Cattaneo, and Titiunik (2014). Columns 5 and 6 report the mean value in a range of 0.5% of the forcing variable that corresponds to 38 observations below and 31 observations above the threshold. *** p<0.01, ** p<0.05, * p<0.1.

Table A3.10 - Continuity of the covariates at the third-party representation threshold when the third-party affects executive fragmentation (3rd-party*non-majority).

					Mean value threshold	
Variable	Difference. Coef.	p-value	Bandwidth	Observations	0.5% below	0.5% above
# Seats	-0.386	0.977	3.197	294	4.515	4.427
# Parties running	-0.061	0.776	5.827	452	3.921	3.800
Turnout	-0.023	0.381	2.393	229	0.790	0.768
Mayoral ideology	-0.149	0.210	2.806	263	0.368	0.200
3rd-party alignment	0.022	0.835	4.217	367	0.237	0.100
Coalition 2007	0.313	0.102	3.098	286	0.184	0.600
Population	-3955.001	0.256	4.503	383	10019.390	5644.900
% vacation homes	1.368	0.896	3.043	278	23.015	21.203
Education level	6.119**	0.040	2.409	231	54.832	58.693
Youth population	1.196	0.341	2.311	224	12.915	14.239
Elderly population	-3.998	0.201	2.199	219	22.867	19.906
Coast	-0.045	0.911	3.465	318	0.211	0.200
Current revenues	-67.946	0.338	4.450	378	829.033	797.645
Current expenditures	-57.565	0.476	4.370	375	757.547	730.695
Debt per capita	-39.624	0.597	3.695	333	303.667	262.344
Primary deficit	59.563	0.140	2.463	233	-57.674	4.476
Gross savings	11.586	0.834	3.251	302	71.485	66.950

Notes: Estimates obtained using a local linear regression using the optimal bandwidth h* based on the procedure proposed by Calonico, Cattaneo, and Titiunik (2014). Columns 5 and 6 report the mean value in a range of 0.5% of the forcing variable that corresponds to 38 observations below and 20 observations above the threshold. *** p<0.01, ** p<0.05, * p<0.1.

Chapter 4

The Political Accountability of Fiscal Adjustment in Multi-Level Governments.

4.1- INTRODUCTION

Fiscal adjustment represents one of the major puzzles in governments' programmes. Since the hit of the Great Recession, fiscal adjustment has become one of the most controversial elements of political action. Fiscal adjustment measures can take the form of expenditure cuts or tax increases (new taxes or modification of the existing ones) with the objective to reduce the public deficit or debt. The existing literature on fiscal adjustment has been mainly focused on its economic impact and effectiveness, reaching clear conclusions regarding the traits that lead to its success.[29] However, the evidence in the literature is mixed with regards to the electoral effects of fiscal adjustment.

The first evidence in this research area supported the idea that voters are "fiscal conservatives" (Peltzman, 1992 and Alesina *et al.*, 1998). Running on deficits and accumulated debt may lead to voters' discontentment. Consequently, voters punish governments that show fiscal profligacy (Brender & Drazen, 2008) and fiscal adjustments do reduce incumbent electoral support (Alesina *et al.*, 2011). On the contrary, incumbents can even improve electoral results if fiscal adjustments are based on spending cuts (Alesina *et al.*, 1998). However, these results contrast with the base idea that poor economic performance is associated with voters' punishment of incumbent

[29] This literature has found that the size, composition and duration of fiscal consolidation processes are crucial elements determining their success. Successful fiscal consolidations are associated with a restrain in primary spending and a long-lasting implementation (Alesina & Perotti, 1995; Alesina *et al.*, 1998; McDermott & Wescott, 1996, among others)

governments.[30] Moreover, there is evidence that fiscal consolidation programs are more likely to end when elections are approaching (Mulas-Granados, 2003b; Buti & Van Den Noord, 2003 and European Commission, 2003).[31] This evidence suggests that incumbents consider spending cuts or tax increases to be politically costly, resulting in a reduction in their support in the coming elections. Therefore, fiscal cuts would be correlated to electoral uncertainty (Pierson, 2001).

In conclusion, there is no conclusive evidence regarding the electoral consequences of fiscal adjustments. One of the explanations of this result is the difficulty in analysing voters' reaction to fiscal policies due to endogeneity or reverse causality. Endogeneity appears when incumbents promoting fiscal adjustments are only those with strong electoral support and popularity. Thus, only those governments less likely to be penalized by the electorate would implement severe fiscal adjustments. [32] Reverse causality occurs when incumbents make use of fiscal policy to improve re-election probabilities.[33] Usually, fiscal adjustment packages are made of a broad range of measures targeting different budgetary items. Therefore, the evaluation of a single measure is complicated. Moreover, fiscal adjustments need to be salient and clearly attributed to governmental decisions so that voters can evaluate government performance and use this information in the ballot box.

Voters' reaction to fiscal adjustments becomes more complicated in multi-level governments (MLGs).[34] In federal or decentralized countries, political accountability is affected because there are different governments sharing fiscal policy responsibilities across the same population. Therefore, MLGs may affect the clarity of responsibility –that is, the capability to attribute credit or blame to a government for its actual actions- and so weaken political accountability. MLGs can affect the clarity of responsibility in two alternative

[30] See Lewis-Beck & Paldam (2000) for a review on the economic voting literature.
[31] These works also demonstrate that taxes decreased, and public transfers and consumption increased when governments felt the pressure of facing their electorates again.
[32] For example Arias & Stasavage (2019) find no effect of expenditure cuts on incumbent turnover, but they argue that it could be due to the fact that "leaders only adopt austerity when they can survive it"
[33] There is no conclusive evidence of political business cycles or pre-electoral fiscal manipulation (Alt & Chrystal, 1983; Clark & Hallerberg, 2000 and Brender & Drazen, 2008).
[34] Stepherson (2013) compiles and examines uses and focuses of MLG literature.

directions:[35] On one hand, MLGs can enhance accountability by multiplying people's possibilities of participating in politics. When voters are closer to the government deciding on them, their participation in public affairs and the control and surveillance of the government become easier. On the other hand, the piling on of several layers of government over the local one –as, e.g., state, federal or even supranational institutions- may blur the clarity of responsibility. MLGs may decrease political accountability given that the cost of information acquisition increase, and that attribution of policy responsibility gets complicated, all of this inducing voters' fatigue. (Harlow & Rawlings, 2006 and Papadopoulos, 2010).

This chapter relates the existing literature on the electoral effects of fiscal adjustments and the accountability in MLGs by empirically quantifying the effect of fiscal adjustment on election results in an MLG setting. This study provides the causal effect of fiscal adjustments on electoral results and identifies whether voters penalise or reward incumbents implementing fiscal adjustments based on tax increases and their ability to assign responsibilities in an MLG. The setting used is the local Spanish governments for the period 2011-2015. Therefore, this study also relates to the literature providing causal effects using sub-national data.[36] All levels of governance in Spain were forced to promote fiscal consolidation in the period under analysis as it is documented in the previous chapter 3. In this line, both the local and national governments applied fiscal adjustments affecting the property tax. In Spain, responsibilities regarding this tax are shared between the local and the federal governments: while local governments have the power of setting the tax rate, the federal government is responsible for the basic regulation of the tax and for property assessments. During the crisis, and given the political cost of performing assessments in a period of declining housing prices, the national government enacted a property tax rate increase that had to be compulsorily implemented by a subset of municipalities. This was one of a broad set of measures included in the "royal decree of urgent measures in budgetary, tax and financial matters for the correction of the public deficit". Another group of municipalities was allowed to voluntarily apply a common linear increase over the property tax base. This second measure aimed to promote cadastre

[35] For a complete list, see Downs (1999) that theoretically explores the relationship of accountability and federalism.

[36] In sub-national analyses, all governments are subject to the same institutional, cultural and socio-economic framework facilitating the causal interpretation of a single determinant.

flexibility in order to adjust property values to market values. It was introduced in a law "by which adopt various tax measures targeted to the consolidation of public finances and boosting economic activity". As a consequence, both policies resulted in an increase in property tax liability in some of the treated municipalities. The timing and characteristics of these policies provide an optimal setting to implement an identification strategy based on a Differences-in-Differences (DID) technique comparing voters electoral behaviour on treated and no-treated municipalities over time.

The Spanish setting proposed presents some key characteristics for the analysis implemented that suppose a relevant contribution to the previous literature: First of all, the fiscal adjustment is carried out through the property tax. The property tax is a pillar fiscal tool for local governments in most advanced democracies (Norregaard, 2013) with high salience and unpopularity (Cabral & Hoxby, 2012). Moreover, the media broadly covered the introduction of the local fiscal adjustments, thus enhancing voters' information about it.[37] Secondly, the analysis deals with the concerns about endogeneity or reverse causality because local incumbents were not the ones deciding the policy but merely implementing it. Besides, treatment criteria were based on the vintage of past property value reassessments, which in principle, are not correlated with mayoral popularity at the moment of fiscal adjustment. Thirdly, the presence of two alternative adjustments measures and governance layers enables an extensive analysis of voters' ability to determine the government's actual responsibilities in MLGs. Furthermore, local and national elections had a similar timing; 2011 and 2015 (although not on the same day). The ruling-national party (as well as most of the national parties) ran at the local election in more than the 80% of the municipalities analysed. Regarding the external validity, the result of the effect of fiscal adjustment on election results must be placed in the context of an intense fiscal consolidation program characterised by the presence of several measures.

In the baseline analysis, this chapter looks at voters' reaction to fiscal

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[37] https://www.abc.es/economia/abci-valor-catastral-subida-201112310000_noticia.html; https://www.20minutos.es/noticia/1264407/0/subida-impuestos/irpf-ibi/2012-2013/; http://www.rtve.es/noticias/20111230/gobierno-sube-irpf-ibi-forma-temporal-progresiva-para-2012-2013/486057.shtml; https://www.elconfidencial.com/economia/2014-10-01/hacienda-elevara-el-valor-catastral-de-7-4-millones-de-inmuebles-a-peticion-municipios_219941, among others.

adjustments by comparing the evolution of the local incumbent's vote share of the treated municipalities (those affected by one of the policies) and their respective control group. The analysis continues by determining voters' ability to hold governments responsible for the actions they actually carried out in an MLG framework. Local incumbents were only responsible for one of the policies implemented while the other was nationally planned and mandated. If the attribution of responsibility was clear, voters would only punish the local incumbent when she is actually responsible for the fiscal adjustment. Incumbents in municipalities with a nationally imposed adjustment should remain unaffected. Instead, in these places, voters should exclusively punish the national-ruling party at the local or national elections. In addition, the study also performs an heterogeneous analysis considering party affiliation. It studies if those local parties belonging to the national-ruling party are more affected when nationally planned adjustments are imposed at the local level.

This study provides empirical evidence that the electorate responds to the implementation of a fiscal adjustment by punishing the incumbent responsible for its implementation. The local incumbent' vote share is reduced when she is deemed responsible for the fiscal adjustment. Voters punish (the vote share decreases by ≈1.5%) those local incumbents that carry out fiscal adjustments resulting in an increase on tax liability. This study also provides empirical evidence that governments can be held accountable for their actual actions in an MLG. Clarity of responsibility remains high in such situations, and voters are able to identify governments' performance and attribute credit or blame for their policies. The local incumbent not belonging to the national ruling party remains unaffected in municipalities affected by a nationally mandated fiscal adjustment, suggesting that voters understand that local incumbents cannot avoid the application of the measure. However, voters identify that the national ruling party is responsible for the fiscal adjustment. Therefore, voters react by punishing the local representation of the national-ruling party at the local elections (resulting in a reduction of ≈2% on the vote share). Moreover, the vote share for the national-ruling party is also reduced at the national elections in those municipalities affected by the nationally mandated fiscal adjustment (≈1%).

The rest of this chapter is organised as follows: Section 2 discusses the theoretical framework and presents the hypotheses analysed; Section 3 contextualises the institutional setting and the fiscal adjustment under study;

Section 4 sets up the empirical analysis and describes the data used. Section 5 presents and discusses the results; and, Section 6 offers conclusions.

4.2.- THEORETICAL FRAMEWORK

This section provides insights on the expected effects of fiscal adjustments on political accountability in a multi-level government framework. The last subsection discusses the characteristics of the setting studied and states the hypotheses tested in this analysis.

However, before presenting the different arguments, it is worthwhile to provide some clarification of terms. There is not one single definition of fiscal adjustment. However, it would be commonly understood as a fiscal policy leading to a reduction in the government's primary budget deficit. Fiscal adjustments can focus on a reduction in expenditures, an increase in revenues or on both simultaneously. Regarding MLGs, they correspond to a single political system where more than one government shares responsibilities across the same population. Usually, governance levels are distributed between local, regional and national/federal governments. Governments in each level have an independently elected executive and legislative body, and they are autonomous in exercising the competences that they have attributed. The electoral accountability of fiscal adjustments on each governmental level is measured by quantifying the effect of fiscal adjustment on election results.

4.2.1.- The political accountability of fiscal adjustments

There is not a conclusive answer on whether voters punish or reward the implementation of fiscal adjustments. One reason could be that this type of analysis can suffer from reverse causality and endogeneity problems. Reverse causality will appear if the incumbent's choice of the implementation of a fiscal adjustment is determined by considering its electoral risk. In such situations, only governments that are less likely to be removed from office would implement fiscal adjustments. Endogeneity relates to the idea of political cycles, given that incumbents can actually use fiscal policy to improve re-election probabilities. Even though there is no conclusive evidence of political business cycles or pre-electoral fiscal manipulation (Alt & Chrystal, 1983; Clark & Hallerberg, 2000 and Brender & Drazen, 2008), there is some

evidence that the proximity of elections does affect the probability of termination of a fiscal adjustment program (Buti & Van den Noord, 2003).

The main line of reasoning concerning the political accountability of fiscal adjustments is that voters are fiscally conservative (Peltzman, 1992) and as a result fiscal adjustments are not punished. Alesina *et al.* (2011) find no evidence that government turnover is affected by fiscal adjustments implementation using a panel consisting of 19 OECD countries from 1975 to 2008. On the contrary, incumbents can improve electoral results when fiscal adjustments are based on spending cuts (Alesina *et al.*, 1998). Similarly, Brender (2003) shows that voters rewarded fiscally responsible local incumbents by increasing their re-election probability in Israel. Thus, some incumbents even gain votes in periods of austerity when they can take credit (e.g. right-wing parties in a sample of 18 countries; Giger & Nelson, 2011). Therefore, this branch of the literature would conclude that fiscal adjustments are, in no sense, electorally risky.

This statement contrasts two alternative ideas: the generally accepted premise that fiscal cuts have an electoral risk (Pierson, 2001) and the literature on economic voting, which suggests that governments are electorally punished for poor economic performance. Therefore, spending cuts or tax increases would be politically costly, resulting in a reduction of incumbent support in the coming elections. This thesis is supported by findings in Hübscher *et al.*, (2018) using a survey experiment in Spain, Portugal, Italy, the UK and Germany. They show that voters' present discontentment about government action and a lower intention to vote for the incumbent party in reaction to fiscal adjustments even in those countries with outstanding deficits. In line with this idea, incumbent re-election probabilities decrease after the implementation of fiscal adjustments in the EU (Mulas-Granados, 2004).

The property tax is considered a pillar fiscal tool for local governments in most advanced democracies (Norregaard, 2013) with high unpopularity due to its salience and difficulty to avoid (Cabral and Hoxby, 2012). Therefore, one could also expect that adjustment that rely on this tax will have electoral effects. The work by Alpino (2018) shows that this is the case: Electoral promises to reduce property tax in Italy increased the incumbent electoral support decisively. Along the same lines, incumbents facing tight electoral competition are likely to substitute salient taxes as the property tax with less

salience ones as user charges or personal income tax surcharges (see Bracco *et al.*, 2013, and Bordignon & Piazza, 2010). Such behaviour indicates that incumbents' expect the electoral costs of the property tax to be higher than those of alternative taxes. For the Spanish case, Bosch and Solé-Ollé (2007) show that increasing the property tax rate more than what neighbouring municipalities do has electoral costs. These results support the idea that the electorate is interested in the information concerning salient taxes and use this information when casting their vote.

4.2.2.- Fiscal adjustment in Multi-level Governments

Political accountability requires clarity of responsibility. This means that it is important that voters have the possibility of identifying governmental responsibilities in order to be able to attribute credit or blame for their actual actions. Clarity of responsibility is affected in MLGs, although it is not certain in which direction. In MLGs, there are more independent and elected governments. Therefore, clarity of responsibility may increase in MLGs because governments are closer to voters (Lockwood, 2005). The involvement of local governments, which are closer to the voters, should raise the importance of local matters and accentuate political accountability. Closer governments deciding on local matters may enhance voters' interest in politics and make participation easier: more democracy leads to more accountability (Smith, 2007). However, the presence of diverse levels of governance in an MLG decreases the clarity of responsibility given that policy attribution becomes complicated. In a single-government system, responsibility is directly identified in a single government. MLGs disperse authoritative decision making across multiple levels, and voters find it harder to allocate credit or blame accurately. In a centralised and unique governmental system, policy responsibility is directly identified. MLGs disperse authoritative decision making across multiple levels (Hooghe & Marks, 2001). Therefore, with decentralisation, voters may find it harder to allocate credit or blame accurately.

Moreover, actions from any level of governance affect other levels' economic outcomes, and each government would have the incentive to blame others for negative outcomes and take credit for the positive ones. As a consequence, MLGs might lead to an "accountability deficit" (Harlow & Rawlings, 2006;

Papadopoulos, 2010 and Devarajan *et al.*, 2007). Considering the salience of some fiscal adjustments and their cost to the electorate, one would expect the electoral punishment to be larger when the outcomes can be directly attributed to the incumbent government. In such situations, the incumbent governments may not be able to disguise from the measures they have taken. However, blame may be reduced in an open economy or a federal system (e.g. US or EU) because the electorate may think that governments have little ability to avoid the application of certain measures (Mosley, 2000 and Kayser & Peress, 2012)

The empirical literature on economic voting in MLGs demonstrates that multilevel institutions undermine the clarity of responsibility within the political system. Anderson (2006) identifies that economic voting is weaker in an MLG such as Canada. It diminishes the clarity of responsibility among national governments for national economic conditions. Additionally, lower-level economic evaluations do not affect higher levels' incumbent support in elections. Only informed voters overcome this situation and reduce upper-level incumbents' support. However, even when voters are able to assign the responsibility of a policy outcome to both federal and provincial governments, voters do not use this issue in their vote decision (Cutler, 2004).

4.3.3.- The setting and hypotheses tested

This chapter offers a relevant contribution providing causal results on the electoral effects of fiscal adjustment in a setting not affected by some of the drawbacks of previous literature: First, the analysis is performed at the sub-national level considering the Spanish local governments. In such a setting, all governments are subject to the same institutional, cultural and socio-economic framework. This is not the case for studies done across countries. Second, the fiscal adjustments affected the property tax, a highly salience and unpopular tax (Norregaard, 2013 and Cabral & Hoxby, 2012) and received outstanding media attention. Third, there are lower concerns about endogeneity and reverse causality: Local incumbents were not those designing the fiscal adjustment but simply implementing it. Moreover, the applicability of the measure was based on property value reassessments that are not correlated with mayoral popularity, the margin of victory or re-election probabilities. A concern regarding the causal evaluation of a tax increase on electoral results is that extra revenues could be used to increase expenditures resulting in an

endogeneity problem. In the setting considered, the presence of fiscal rules solves this problem, given that extra revenues must be compulsory targeted to reduce deficits or debt. Fourth, this study measures the effect of fiscal adjustment on election results considering the evolution of the vote share between the elections held just before and after the implementation of the fiscal adjustment. Therefore, the analysis is able to accurately capture the electoral punishment or reward due to the application of the fiscal adjustment.

In these lines, this chapter analyses the electoral accountability of fiscal adjustments testing the following hypotheses:

H1a: Local incumbents responsible for fiscal adjustments lose electoral support

H1b: Local incumbents in municipalities affected by a nationally imposed fiscal adjustment do not lose electoral support

Moreover, the analysis is able to empirically assess the degree of political accountability in MLGs because it uses two alternatives fiscal adjustments attributed to different levels of governance. Therefore, it enables extensive analysis of voters' ability to determine the government's actual responsibilities in MLGs. The local incumbent determines the implementation of one of the measures. Thus, the electorate can directly attribute its responsibility. The other measure is nationally planned and mandated, and the local incumbents must compulsorily implement it. In such a situation, if there is a clear distribution of responsibilities, the electorate should attribute responsibility to the national-ruling party. If this is the case, voters can punish/reward the national-ruling party in distinctive ways: at the local elections or the national ones. Therefore, the setting under analysis is optimal given that local and national elections had a similar timing; 2011 and 2015 (although not on the same day). Moreover, the national ruling party (as well as most of the other national parties) participated at the local elections in a majority of the municipalities in the period analysed. Nationally based parties have a presence in most municipalities through a local section of the party. The party structure is hierarchized from the national, regional to the local level. The local sections have some autonomy to decide on local policies and municipal agreements. This degree of autonomy varies depending on the political party.

The analysis regarding the electoral accountability in MLG systems tests the following hypotheses:

Local elections

H2.a: The local representation of the national-ruling party loses electoral support at the local elections in those municipalities affected by the nationally mandated fiscal adjustment.

H2.b: Those local incumbents belonging to the national-ruling party in municipalities affected by the nationally mandated fiscal adjustment do lose electoral support at the local elections.

National elections

H3.a: The local incumbent party does not lose electoral support at the national elections in those municipalities affected by the nationally mandated fiscal adjustment.

H3.b: The national-ruling party loses electoral support at the national elections in those municipalities affected by the nationally mandated fiscal adjustment.

4.3.- INSTITUTIONAL BACKGROUND

4.3.1.- Spanish institutional and electoral setting

Local governments

Spain multi-level governance system is based on three basic levels: National, regional (seventeen so-called autonomous communities) and local (around eight thousand municipalities). Municipalities are the lowest level and have competences on traditional responsibilities assigned to the local public sector such as urban planning, environmental services, public transport and welfare, except for education, which is a regional responsibility. Local revenues come by 1/3 from intergovernmental transfers and 2/3 by own revenues. Property tax is the primary source of municipalities' own revenues. During the housing boom, revenues from construction-related taxes became very important. However, these resources vanished during the crisis, and this had a massive impact on municipalities' finances. Transfer revenues were also affected to

some extent. Revenues from local taxes, and specially from the property tax, were much more stable.

Elections

Local elections take place simultaneously in all municipalities (usually in May) every four years. A proportional system based on the d'Hondt rule with a 5% vote share threshold is used to convert votes into seats. The number of elected councillors in each municipality grows with population size, and national parties are present in the vast majority of municipalities although local parties also run in many places. The timing of the local elections included in this analysis is the following: 2007, 2011 and 2015.

General elections take place (usually) every four years. Although not on the same day, in 2011 and 2015 coincided both local and general elections. The timing of the general elections included in this analysis is the following: 2008, 2011 and 2015.

4.3.2.- The Spanish property tax

The property tax ('Impuesto sobre Bienes Inmuebles' or IBI) is a decentralised tax framed in the local tax system of Spain. All municipalities mandatorily levy it. The property tax levies the value of ownership and other property rights that fall on real estate located in the municipality that collects the tribute. Property tax supposes the primary source of own revenues for local entities since 1990 when it was introduced. The management of the property tax is shared between the national and the local administrations. The national government is responsible for the tax legislation giving local autonomy to set the tax rate (inside a legally predefined range) and to collect the tax revenues.

As a fundamental characteristic, the central government, through the cadastre office is responsible for the classification of the assets and for the assessment of their value. Collective valuation procedures are used periodically to assess the cadastral values of urban real estate in a municipality. Reassessments should be done every five to ten year. In practice, a significant share of municipalities presents reassessments that are older than ten years.

The cadastre reassessment procedure implies that, over the years, the cadastral values of a municipality are out-dated to the market values. The central government overcame this issue by implementing an updating coefficient. The economic crises implied that those municipalities with a reassessment during the housing boom presented over market values while those municipalities with reassessments before presented below market values. As a consequence, a uniform updating coefficient was no longer optimal.

4.3.3.- The application of local fiscal adjustments in Spain 2011-2015

In 2008, the economic crises hit public finances increasing deficits and public debt. It affected all levels of governance from the national to the local level. Governments path to financial recovery was long and needed extreme measures. In the case of Spain, the national government imposed a process of fiscal consolidation by 2011 due to the substantial deviation of the budgetary balance with respect to the committed stability objectives. That year, the national government passed a new balanced budget constitutional amendment, an expenditure rule and other measures of urgent nature for budgetary correction.

Concerning the local governments, the set of urgent measures aimed to ensure that the financial situation of the local corporations did not jeopardise the achievement of the public deficit reduction. Therefore, the national government promoted fiscal adjustments with the objective to guarantee an increase in local revenues. Previous chapter 3 discusses and finds empirical support that municipalities performed intensive fiscal consolidation processes on the capital and the current side of the budget in the period 2011-2015. This study focuses on two fiscal adjustments affecting the primary source of revenues for local governments; the property tax. Concretely, the national government first established a transitory and exceptional policy during fiscal years 2012 and 2013. It consisted of an increase in the tax rate for the property tax (*nationally imposed tax rate increase)*. It was one of a broad set of measures included in the "royal decree of urgent measures in budgetary, tax and financial matters for the correction of the public deficit". Second, from 2014 on, the national government also promoted a new policy to allow some municipalities the voluntary adjustment of their property tax base by updating coefficients (*Local voluntary tax base increase*). This second measure aimed to

promote cadastre flexibility in order to adjust property values to market values. It was introduced in a law "by which adopt various tax measures targeted to the consolidation of public finances and boosting economic activity".

The presence of the balanced-budget constitutional amendment and the expenditure rule guaranties that extra revenue coming from property tax fiscal adjustments were devoted to paying off debts or saving. Besides, municipalities presenting severe financial situations needing the assistance of liquidity mechanisms required the approval of a monitored adjustment plan increasing national government control and surveillance on local finances.

The nationally imposed tax rate increase

This transitory and exceptional measure applied during fiscal years 2012 and 2013. It imposed an increase in the tax rate of the property tax. The magnitude of the tax rate increase was determined considering the year of the previous tax base reassessment. It resulted to a 10% tax rate increase for those municipalities with a cadastre value reassessment before 2002, a 6% increase for reassessments between 2003 and 2005 and a 4% increase for reassessment between 2009 and 2012. Municipalities with a reassessment implemented between 2006 and 2008 were not affected. Figure 4.1 visually summarise the magnitudes of the fiscal adjustment.

The local voluntary tax base increase

In 2013, the national government approved a new system for property tax base updating coefficients that was not uniform across municipalities. The rate of updating to be applied also depended on the year of the last property value's reassessment. Some municipalities could implement these coefficients from 2014 on. Municipalities with a reassessment before 2004 could apply a positive coefficient (increase of the tax base). Those with the last reassessment from 2006 to 2009 could apply a negative coefficient (decrease of the tax base). Finally, the rest of the municipalities were not affected and were not eligible to apply these measures. Figure 4.1 visually summarise this policy. One of the key issues of this policy is that the application of these coefficients was voluntary. Therefore, local incumbents in eligible municipalities were those finally deciding on the application the property tax base update and so on the ensuing fiscal adjustment. This chapter focuses on the application of the tax

base increase. 2,158 municipalities were eligible for the implementation of this tax base increase. Among them, 1,205 (the 55,84%) of the municipalities decided to implement it (treated municipalities). Therefore, the control group is the subsample of municipalities' where the local incumbent decided not to apply the update. Figure 4.1 summarise how the fiscal adjustments affected the tax base depending on the year of the last cadastre reassessment.

Figure 4.1 - Summary of the fiscal adjustments

Nationally imposed tax rate increase 2012		*Local voluntary tax base increase* 2014	
Year of the last cadastre reassessment	Increase on the tax rate	Year of the last cadastre reassessment	Coefficient on the tax base
1984 – 2002	10%	1984-1987	1.13
2003-2005	6%	1988-1989	1.12
2006-2008	none	1990	1.11
2009-2012	4%	1991-1993	none
		1994 - 2002	1.1
		2003	1.06
		2004-2005	none
		2006	0.85
		2007	0.8
		2008	0.73
		2009-2014	none

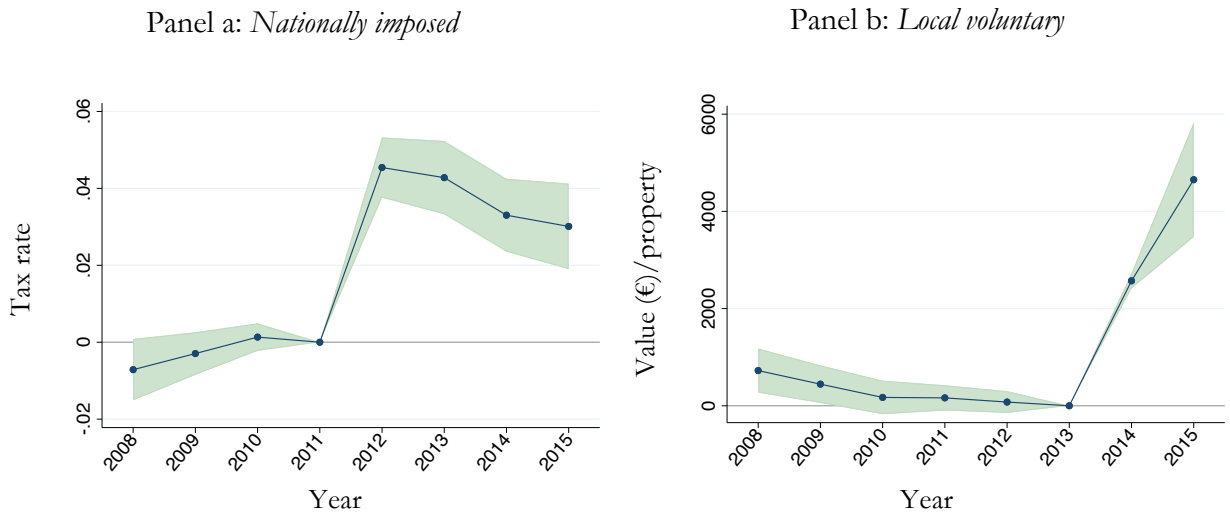
4.3.4.- The effects of the fiscal adjustments on the tax liability

Figure 4.2 graphically represents the average effect of each type of fiscal adjustment on the target variable, i.e. on the taxable base and on the tax rate, respectively. The figure shows that the tax rate and the taxable base increased substantially in the treated municipalities.

Figure 4.3 shows that the implementation of the fiscal adjustments (resulting to a remarkable increase on the tax rate and taxable base) produced a boost on the property tax liability in treated municipalities. Panel (a) plots the results of

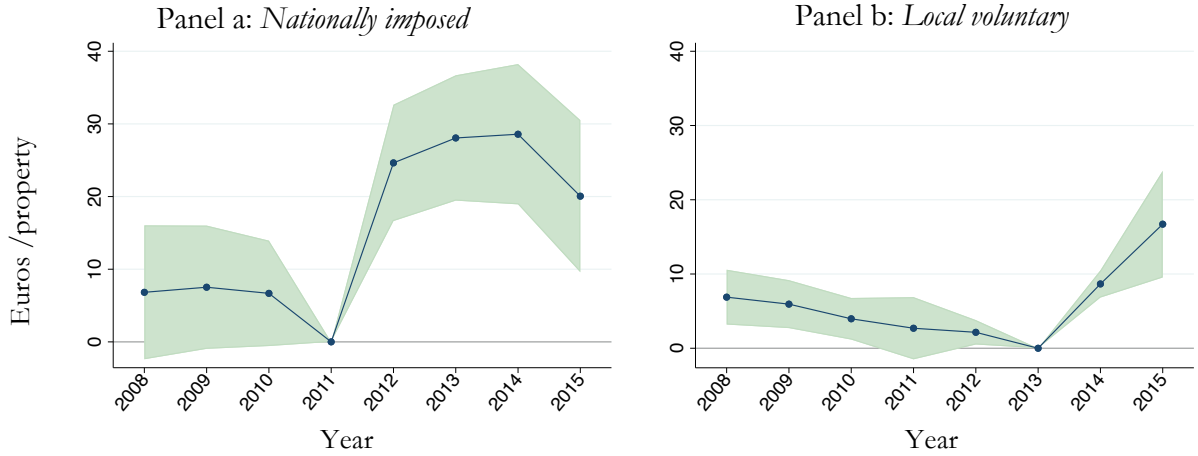
the nationally imposed adjustment and panel (b) the local voluntary one. The electorate that owns a property in the treated municipalities experienced a rise on the tax liability.

Figure 4.2 - The effect of the fiscal adjustments on the property tax base and tax rate.



Note: This figure provides yearly difference between treated and control groups. The shaded area corresponds to the 95% confidence intervals.

Figure 4.3 - The effect of the fiscal adjustments on the tax liability



Note: This figure provides yearly difference between treated and control groups. The shaded area corresponds to the 95% confidence intervals.

Table 4.1 shows these results empirically. Columns 1 and 2 present the results for the local voluntary adjustments and Columns 3 and 4 for the nationally imposed one. Columns 2 and 4 include province per time fixed effects, although the results are not affected much by this choice. The effect of the policy is important and statistically significant. It results in an average increase of 14 euros for the local voluntary adjustments and of 20 euros for the nationally imposed one. Considering that the average amount of the property tax quota was around 160 euros in 2011, the fiscal adjustment supposes a ≈9% increase on the tax liability for the treated municipalities affected by the local voluntary adjustments and ≈12.5% for the nationally imposed one.

Table 4.1 – Fiscal adjustments average effect on tax liability

	Local voluntary		*Nationally imposed*	
	(1)	(2)	(3)	(4)
Treated	14.017***	14.019***	19.903***	16.811***
	(4.208)	(4.263)	(5.257)	(5.606)
Observations	6,473	6,473	2,034	2,034
Prov*time FE	No	Yes	No	Yes

Notes: The dependent variable is the mean tax liability per urban unit. *treated* refers to the municipalities affected by the corresponding fiscal adjustment. Columns 2 and 4 include province x time fixed effects. The estimations include 2,158 municipalities (953 control and 1,205 treated) in panel (a) and 678 municipalities (493 control and 185 treated) in panel (b) for three consecutive local elections (2007-2011-2015). The parentheses correspond to robust standard errors. *** p<0.01, ** p<0.05, p<0.1.

It is important to place the magnitude of the increase on property tax revenues in the whole consolidation process that was being carried out by the Spanish municipalities in this period. In order to provide some context, it is worth to remind that the previous chapter 3 showed that the reduction on current expenditures was –around- 40 euros per capita. However, due to the high salience of the property tax, any increase on tax liability is able to affect the electorate behaviour.

4.4.- EMPIRICAL ANALYSIS

The Spanish setting used in this study offers an optimal framework to analyse the effect of fiscal adjustment on election results in MLG systems.

First, the fiscal adjustments analysed were salient enough and supposed a non-deniable cost to the electorate. They affected the property tax resulting in an increase of the tax liability. The property tax is a pillar fiscal tool for local governments in most advanced democracies (Norregaard, 2013) but, at the same time, it is politically unpopular due to its high salience (Cabral & Hoxby, 2012). This is also the case in Spain. In this particular situation, the media broadly covered the introduction of local fiscal adjustments facilitating voters' information. Therefore, the citizens affected by an increase of a salient increase in the tax liability are expected to react when casting their vote. Moreover, the design of the treatment criteria implied that the fiscal adjustments were only applied in some treated municipalities. This treatment criterion enables the possible implementation of a DID strategy.

Second, the presence of two different adjustments and governance levels facilitate an extensive analysis of voters' ability to determine the government's real responsibilities. That is, allows us to study whether clarity of responsibility remains in a situation where more than one government share fiscal responsibilities across the same population. Both types of fiscal adjustment increased the local tax liability, but the local incumbent was only responsible for the application of one of them. The other adjustment was nationally planned and compulsory implemented at the local level. In such situations, only local incumbents actually responsible for the fiscal adjustments should be punished/rewarded at the ballot box. Local incumbents should not be affected in those municipalities implementing the nationally planned and mandated adjustment. In these municipalities, voters may decide to punish the local representation of the national-ruling party instead. As an alternative, voters might punish the national ruling party at the general elections instead.

Third, the analysis deals with potential concerns of endogeneity or reverse causality. Regarding the former, incumbents promoting fiscal adjustments could be precisely those with strong electoral support and popularity. Regarding the latter, incumbents might make use of fiscal policy to improve re-election probabilities. The treatment criteria for the fiscal adjustments

analysed were based on property value reassessment timing, which is not correlated with mayoral popularity, the margin of victory or the probabilities of re-election. One of the adjustments completely neutralises endogeneity and reverse causality concerns because the adjustment was a mandate from the national to the local government. Therefore, local incumbents are not those deciding the policy but merely implementing it. The second adjustment partially neutralise these concerns. Even tough the treatment possibility was based on the reassessment timing; the final treatment was a local responsibility.

Finally, the local representations of Spanish national parties are present in the majority of municipalities. The local section of the national ruling party ran in more than the 80% of municipalities in the elections analysed and local, and general elections had a similar timing; 2011 and 2015. The heterogeneous analysis exploits these characteristics and investigates if voters' reaction affects the national-ruling party at the local or national elections. Additionally, voters' behaviour can be evaluated to check if voters consider local fiscal adjustments exclusively when they vote at the local elections, or they use this information when voting at the national ones.

4.4.1.- Equation specification

This study aims to evaluate the effect of fiscal adjustment on election results in an MLG system. The electoral cost is measured as the evolution of the incumbent vote share between 2011 and 2015 elections (before and after the implementation of the fiscal adjustments).[38] The estimations rely on a difference-in-difference method considering differences with respect to the 2011 elections. This method controls for differences between municipalities concerning observable and non-observable time unvarying characteristics that could be related both to the application of the policy and the electoral outcomes. Thus, the estimated equation is:

[38] There are alternative ways to measure political accountability: government termination, incumbent re-election, government popularity and the time evolution in the incumbent's vote share. The share of votes measure is the only one able to capture even small effects on the electorate responses and it is based on actual voters' behaviour rather than opinions or beliefs.

$$share\ of\ votes_i^t = \alpha + \sum_{t \neq 2011} \beta^t \cdot Year_i^t \cdot Treat_i + Year^t + \eta_i + \upsilon_i$$

where $share\ of\ votes_i^t$ is the share of votes in a municipality i at the election t for the alternative depending variables (local incumbent, national-ruling party or the local representation of the national-ruling party). $Treat_i$ is a dummy that takes value 1 if the municipality i was affected by a fiscal adjustment and 0 otherwise. $Year_i^t$ is a year dummy that equals 1 if the election took place in t={2007/8, 2015} so $Year^t$ capture time fixed effects. η_i are municipality fixed effects. Finally, β^t capture the parameters of interest; the differences due to the treatment on the share of votes in 2007 and 2015 elections with respect to 2011.

The specification defines 2011 as the base year since 2011 elections were last elections prior to the implementation of the fiscal adjustments. Therefore, the estimation outputs are expressed relative to 2011 electoral results. β^{2015} corresponds to the electoral consequences due to the application of the fiscal adjustment (difference 2011-2015). β^{2007} , corresponds to the differences for 2011-2007 between treated and control municipalities and can be used to verify the parallel trend assumption and as a placebo regression.

Control and treated groups are different for the nationally imposed and the local voluntary fiscal adjustment. They are determined in the following way:

Nationally imposed tax rate increase: the treated group correspond to the municipalities where the last property value reassessment carried out during the period 2003-2005. The control group correspond to the municipalities where the last reassessment carried out during 2006-2008. The analysis excludes municipalities affected by the other fiscal adjustment and municipalities with a new reassessment between 2011-2015.

Local voluntary tax base increase: This sample considers the municipalities where the last property value reassessment was carried out before 2005. Municipalities with a reassessment after 2005 could apply for a tax base reduction. However, this study does not analyse the effects of this measure. Therefore, treated municipalities are those with the last reassessment before 2005, where the local incumbent voluntary decided to implement the tax base

increase. Control municipalities are those eligible municipalities where the local incumbent decided not to apply the fiscal adjustments. Municipalities with a new reassessment during 2014 or 2015 are excluded.

4.4.2.- Econometrics and Comparison group validation

This section discusses the assumptions required to validate the DiD identification design and describes the tests performed to guarantee their fulfilment.

First of all, DiD estimation accounts for any time unvarying characteristics that may affect both the applicability of the measures and electoral results. The central assumption for a valid DiD estimation is that in the absence of the policy, both groups would have experienced similar trends in the outcomes. One can expect this assumption to be valid if previously to the treatment the control and treated municipalities experienced a similar trend on the variables affected by the fiscal adjustment and on the electoral results (*parallel trends assumption*). Figure 4.2 graphically represents the trend on policy-affected variables for both fiscal adjustments (panel (a) for the tax rate - *nationally imposed tax rate increase-* and panel (b) for tax base - *Local voluntary tax base increase* -). Figure 4.3 graphically represents the trend in tax liability. Previous to the treatment, there are no differences in the trends regarding these variables between treated and control group in the nationally imposed tax increase sample. Moreover, there are no differences in 2011 for the local voluntary tax increase sample. However, in this second case, it seems that there was a slight difference at the beginning of the period considered. In order to account for these possible trend differences, the analysis controls for lags in the tax liability before the treatment (2007/8 and 2011) in an additional specification. The inclusion of these tax liability lags in the equation does not affect the results.

The DiD equation analysed allows to verify the parallel trends on the electoral results by analysing the coefficient β^{2007}. This coefficient reports the differences on the electoral results between treated and control municipalities from the 2007-2011 elections (before the treatment implementation). Along the same lines, this coefficient can be interpreted as a placebo regression. The results show that there were no statistically significant differences on the electoral results between treated and control municipalities in the elections

before 2011. The only slightly significant difference appears on the national-ruling party results at the national in those municipalities affected by the nationally imposed fiscal adjustment. The inclusion of province per time fixed effects (explained below) eliminates this difference.

Secondly, a possible concern would be that the potential extra revenues coming from the policy application could be used to increase current expenditure. An increase on current expenditures may have and effect on the incumbent's electoral support at the next elections. Therefore, this situation could blur the causal interpretation of the results and induce endogeneity problems. As it is discussed in section 4.3.3, the enforcement of fiscal rules and monitored adjustment plans made this situation infeasible since extra revenues resulting from the fiscal adjustments must be addressed to deficit and debt reduction. Figure A4.1 in the appendix shows yearly differences between the treated and control municipalities for current expenditure per capita. As expected, there are no differences in current expenditures after the fiscal adjustment implementation. Therefore, treated municipalities did not use the extra revenues obtained due to the fiscal adjustment to increase expenditure.

Thirdly, this section tests that treated municipalities did not modify other local taxes to compensate the increase in the property tax. Municipalities have competences on a set of local taxes: the local business tax, the vehicle tax, the capital gains from urban land tax and the construction tax. A modification of theses taxes by treated municipalities would blur the interpretation of this chapter results. Figure A4.2 plots evolution of the tax rates of the main local taxes in treated and control municipalities for the tax rates evolution (2011-2015). The analysis focuses on the tax rates (given that the tax base cannot be modified). There are no statistically significant differences in the evolution of the rest of the local taxes. These results indicate that the electoral accountability identified in this chapter corresponds to the changes in the property tax. Given the intensive fiscal consolidation process carried out for Spanish municipalities sin this period, a decrease in local taxes was not expected.

Fourthly, this section test that treated and control group are not affected by a geographical pattern of the prior cadastral reassessment process. Remember that the year of the previous cadastral reassessment is used to determine the

treatment. Therefore, geographical clustering of the treated observations could affect the causal interpretation of the results in the analysis. Ordinary cadastral reassessments are not expected to follow a geographical pattern. However, it appears as a plausible concern since the cadastre office has used a geographical implementation on the extraordinary cadastral regularisation carried out since 2012. If ordinary cadastre reassessments were implemented based on the geographical location of the municipality, our treated and control group would be concentrated in specific provinces or regions. This concentration would not be optimal since many local characteristics (such as, demographic, economic or political) might depend on the geographical location of the municipality within Spain (even though, the municipality fixed effects would capture those time unvarying characteristics).

Figure A4.3 maps the share of treated municipalities in every Spanish province. Panel (a) shows the percentage of treated municipalities within every Spanish province considering the local voluntary measure sample and panel (b) for the nationally imposed one. There is not a clear geographical pattern in any of the two fiscal adjustment treatments analysed. Consistent with this result, when we include time per province fixed effects in some of the regressions, results remain unaltered. The interaction between time and province fixed effects accounts for time differences at the province level. These controls do not limit the probability that some local characteristics could vary over time. However, the province level is the lowest possible level of control. Moreover, it is reasonable that in the event of an economic shock, municipalities in the same province are affected similarly.

Finally, the analysis adds controls regarding some socio-demographic characteristics defining the type of electorate in every municipality (values considered before the treatment implementation) in order to capture common trends on electoral behaviour driven by specific groups. These controls include the share of population with post-compulsory education, the share of the population over 65 years old, the share of rental and vacation homes.

4.4.3.- Data

Sample. This study uses the universe of Spanish municipalities for the period 2007-2015. Three local elections and three general elections were held in this

period; 2007-2011-2015 local elections and 2008-2011-2015 general elections. In the period 2011-2015, two fiscal adjustments were implemented at the local level affecting the property tax; the primary source of own local revenues.

Electoral outcomes. The Spanish Ministry of Interior provides information on electoral results for the national and local elections: the number of votes obtained by the parties running at the elections in every municipality, the number of blank and null votes. Additionally, the Spanish Ministry of Interior provides information on the party label of the mayor elected by the legislature. The electoral cost is measured as the evolution of the incumbent vote share between 2011 and 2015 elections (before and after the implementation of the fiscal adjustments). The differences between 2011-2007 (2011-2008 for general elections) are used to guarantee that there were no differences in the electoral results between the treated and control group before the implementation of the fiscal adjustments. The analysis considers the electoral accountability of four alternative political agents: the local incumbent, the national-ruling party at the national elections, the national-ruling party local representation at the local elections and the local incumbent party label at the national elections.

Cadastral and budgetary data. The Cadastre agency provides yearly information regarding reassessments, property tax rates, taxable base, units and property tax revenues at the municipality level. Due to data availability, the analysis of these variables considers the period (2007-2015). The Ministry of Finance and Public Function publishes the municipalities' yearly budgetary accounts.

Treatment. The set of municipalities affected by the nationally imposed increase on the property tax rate was established in the Law RD 20/2011 (article 8) "Royal decree of urgent measures in budgetary, tax and financial matters for the correction of the public deficit". The criteria defining which municipalities could implement the voluntary increase on property tax base was established in the Law 22/13 "The National budget for the year 2014" (article 73) and the list of affected municipalities was publish in the ministerial order HAP/2308/2013.

Socio-demographic controls. The Spanish National Institute of Statistics (INE) provides information at the municipality level for the educational level, the share of people over 65 years, the share of rental and vacation homes.

Table A4.1 in the appendix describes the variables and their sources. Descriptive statistics for the two samples used in the analysis are displayed at Tables A4.2 and A4.3.

4.5.- RESULTS

This section starts by quantifying the effect of fiscal adjustment on election results (hypotheses 1). It continues by the results regarding the electoral accountability of fiscal adjustments in an MLG system (hypotheses 2 and 3). Third, a robustness check is performed in order to confirm the results of hypotheses 2 and 3. Finally, a second robustness check is conducted to guarantee that the increase on property tax is not compensated by a decrease on other local taxes rates.

4.5.1.- The electoral accountability of fiscal adjustments

Section 4.3.4 proves that fiscal adjustments had a relevant impact on tax liability. Given the property tax salience and unpopularity, the extra cost suffered by the electorate is expected to produce a reaction on their voting behaviour. This section tests the hypotheses 1, predicting that (*H1a*) local incumbents responsible for the implementation of fiscal adjustments lose electoral support, whereas (*H1b*) local incumbents in municipalities affected by a nationally imposed fiscal adjustment do not lose electoral support. Hypothesis (*H1a*) is tested using the local voluntary tax base increase, and hypothesis (*H1b*) uses the other fiscal adjustment treatment –an increase in the tax rate- that was nationally imposed and, therefore the local incumbent may not be seen as responsible for its application.

Table 4.2 displays the electoral responses (at the local elections) to the application of the fiscal adjustments. Columns 1, 2 and 3 report the results for the *H1a* and columns 4, 5 and 6 the results for the *H1b*. Voters react to the implementation of the fiscal adjustment by punishing the local incumbent at the local elections only when she is actually responsible for the implementation of the fiscal adjustment. On average, the local incumbent share of votes decrease by –around- 1/1.5 percentage points in treated municipalities. Considering that the average share of votes for the incumbent party was –around- 50%, it supposes a vote lose of 2/3 %. This reduction is

not especially large but neither it is negligible. It is in line with the expected effect on an average increase on the property tax found in Bosch & Solé-Ollé (2007).[39] As expected, local incumbents in municipalities affected by a nationally imposed fiscal adjustment are not held responsible at the local elections, and their electoral results do not differ with respect to control municipalities. Finally, there are no differences with respect to the 2007 local elections, something that validates the parallel trends assumption. These results are robust to the inclusion of province per time fixed effects (columns 2 and 5) and to the inclusion of tax liability lags and socio-demographic per time controls (columns 3 and 6). The inclusion of theses controls increases the significance of the coefficients.

Table 4.2 – The electoral accountability of fiscal adjustments

	H1a - Local voluntary			*H1b- Nationally imposed*		
	(1)	(2)	(3)	(4)	(5)	(6)
2015-2011 treated	-1.095*	-1.521**	-1.299**	0.497	0.820	1.157
	(0.576)	(0.605)	(0.580)	(1.082)	(1.147)	(1.144)
2007-2011 treated	0.585	-0.190	0.766	0.306	0.198	0.421
	(0.515)	(0.534)	(0.520)	(0.956)	(1.030)	(1.049)
No. of periods	3	3	3	3	3	3
No. of municipalities	2,158	2,158	2,158	678	678	678
Province x time FE	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes

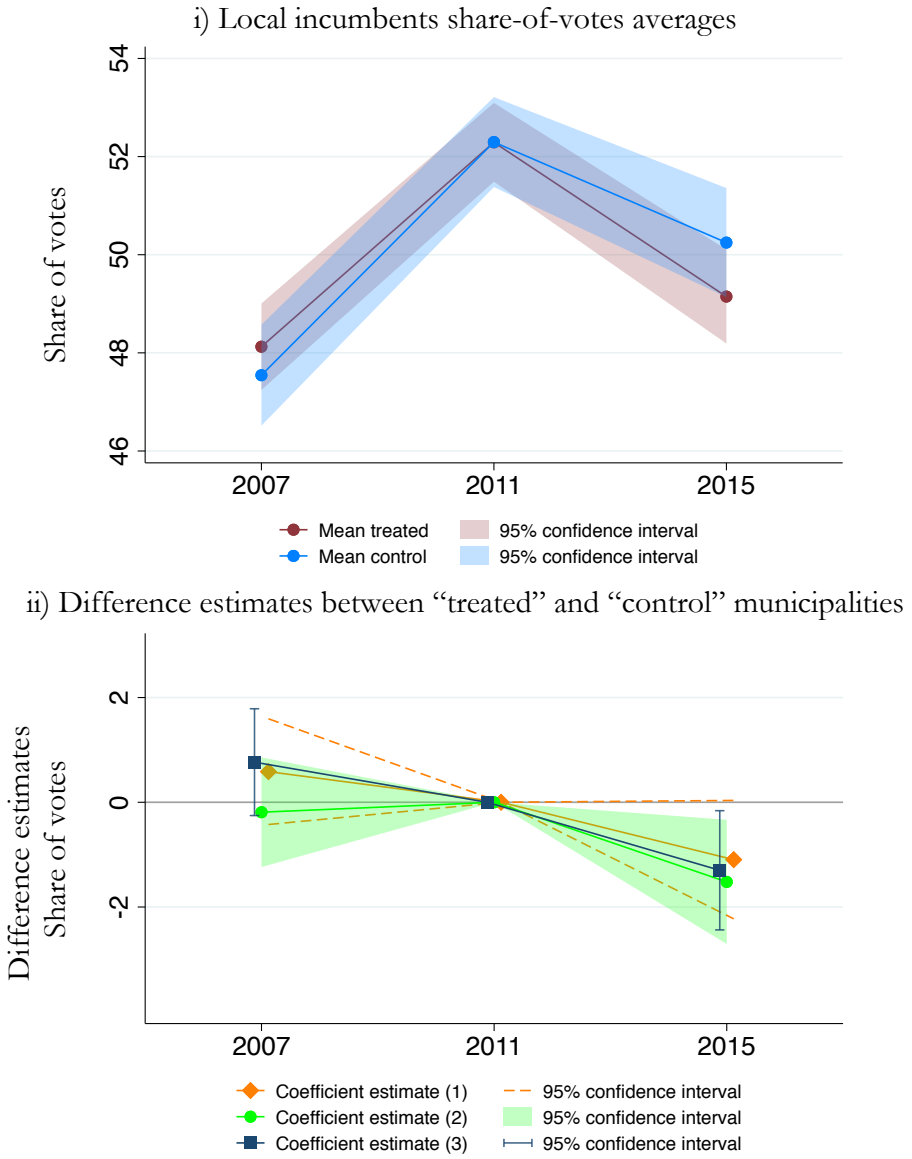
Notes: The dependent variable is the share of votes at the local elections for the local incumbent party (in office for the 2011-2015 electoral term). For the "Local voluntary" sample *treated* refers to the municipalities where the local incumbent implemented the fiscal adjustment. In the "Nationally imposed" sample *treated* refers to the municipalities affected by the compulsory fiscal adjustment. Columns 3 and 6 include controls regarding the tax liability before the treatment period (2007 and 2011) and some socio-demographic controls x time fixed effects (educational level, share of elderly population, share of rental and vacation homes). The parentheses correspond to robust standard errors. *** p<0.01, ** p<0.05, p<0.1.

Figure 4.4 shows (*H1a*) results graphically. The figure in the top panel shows the evolution of the local incumbent share of votes at the local elections for the treated and control groups and the figure in the bottom panel provides the

[39] They found that the government in an average municipality would lose 1.26% of its votes. However, this result is obtained in a situation where extra revenues could be used to increase expenditure. Therefore, the comparison of the results is not straightforward.

incumbent share of votes differences between treated and control municipalities (β^{2015} estimates and 95% confidence intervals) for the three specifications in columns (1), (2) and (3).

Figure 4.4 - The electoral accountability of fiscal adjustments (*H1a).*



Notes: These figures correspond to the (H1a) results. The figure in the top panel shows the evolution of the local incumbent share of votes on the local elections for the treated and control groups. The figure in the bottom panel provides β^{2015} estimates and 95% confidence intervals resulting from implementing equation (1). The coefficient estimates (2) include province per time fixed effects and the estimates (3) further include tax liability previous evolution an a set of socio-demographic variables per term effects. The number of observations for each group is: 1,205 for the treated group and 953 for the control group.

4.5.2.- Fiscal adjustment in multi level governance systems

The previous section demonstrates that the electorate responds to the implementation of fiscal adjustments by punishing the incumbent government at the next elections. On the next step, the analysis continues by examining the electoral accountability when the clarity of responsibility is questioned; in multi-level governance systems. The analysis considers two governance levels, local and national. The application of a nationally mandated fiscal adjustment on municipalities may affect the electoral results at both local and national elections. In the whole period under analysis the national ruling party was the main right-wing party; "Partido Popular".

Electoral accountability at the local elections

For this purpose, the focus first turns on the electorate responses at the local elections when the fiscal adjustment is nationally mandated. Therefore, when the national government is responsible for the fiscal adjustment and the local incumbent is not. Previous results for hypothesis *H1b* show that local incumbents affected by a nationally imposed fiscal adjusted are not punished at the local election. This section focuses on the electoral effects of such a situation for the local representation of the national-ruling party; this is hypotheses *H2.a.* The possibility to punish the national ruling party at the local level is not limited to the presence of a mayor affiliated to the national ruling party. If voters are able to identify that the national ruling party is responsible for the fiscal adjustments, they may decide to punish its local representation.

Table 4.3 displays the electoral perspectives of the local representation of the national ruling party (at the local elections) after the application of the nationally imposed fiscal adjustment. The analysis adds an interaction treatment and mayoral position accounting for a different behaviour if the local representation of the national party occupied the mayoral position Voters react to the implementation of the fiscal adjustment by punishing the local representation of the national-ruling party at the local elections. Clarity of responsibility remains, and the electorate responses seem to focus on the local representation of the national-ruling party (irrespectively of its mayoral position). The results suggest a reduction of –around- 1.5/2 percentage points in those municipalities affected by the nationally imposed fiscal adjustment. However, even though the coefficient sign remains, the coefficient turns no

significant after the inclusion of a set of controls in columns (3). As expected, there are no differences with respect to 2007 local elections validating the parallel trend assumption.

Table 4.3 – The electoral effects of a nationally mandated fiscal adjustment at the local elections:
H2a local representation of the national-ruling party

	(1)	(2)	(3)
*2015-2011 treated * mayor*	0.041	1.424	1.769
	(1.875)	(1.970)	(1.948)
2015-2011 treated	-2.073*	-1.606*	-1.346
	(1.199)	(-1.113)	(1.227)
*2007-2011 treated * mayor*	-0.853	-0.169	-0.464
	(1.805)	(1.840)	(1.848)
2007-2011 treated	0.051	0.173	0.511
	(1.207)	(1.180)	(1.169)
No. of periods	3	3	3
No. of municipalities	666	666	666
Province x time FE	No	Yes	Yes
Controls	No	No	Yes

Notes: The dependent variable is the share of votes at the local elections for the local representation of the national-ruling party. *treated* refers to the municipalities affected by the nationally imposed fiscal adjustment. *mayor* is a dummy variable considering the mayoral position of the local representation of the national-ruling party. Column 3 also includes controls regarding the tax liability before the treatment period (2007 and 2011) and some socio-demographic controls x time fixed effects (educational level, share of elderly population, share of rental and vacation homes). The parentheses correspond to robust standard errors. *** p<0.01, ** p<0.05, p<0.1

Second, the analysis continues by testing hypothesis *H2.b*. The idea is that among local incumbents, those belonging to the national ruling party do lose electoral support. These local incumbents are not responsible for the fiscal adjustment implementation but they may be affected by their party affiliation. The hypothesis *H1b* tested that on average; local incumbents are not affected when nationally mandated adjustments are implemented. However, it is

plausible that there are heterogeneous effects regarding the party alignment[40] with the national ruling party.

Table 4.4 – The electoral effects of a nationally mandated fiscal adjustment at the local elections:
H2b local incumbents aligned with the national ruling party

	(1)	(2)	(3)
*2015-2011 treated * aligned*	-4.244**	-4.005*	-4.028*
	(2.102)	(2.218)	(2.220)
2015-2011 treated	2.507*	2.865*	2.851*
	(1.475)	(1.510)	(1.510)
*2007-2011 treated * aligned*	-2.028	-2.176	-2.206
	(1.862)	(1.986)	(1.988)
2007-2011 treated	1.227	1.380	1.519
	(1.291)	(1.388)	(1.401)
No. of periods	3	3	3
No. of municipalities	678	678	678
Province x time FE	No	Yes	Yes
Controls	No	No	Yes

Notes: The dependent variable is the share of votes at the local elections for the local incumbent party (in office for the 2011-2015 electoral term). *treated* refers to the municipalities affected by the nationally imposed fiscal adjustment. *aligned* is a dummy variable considering the mayoral alignment with the national-ruling party. Column 3 includes controls regarding the tax liability before the treatment period (2007 and 2011) and some socio-demographic characteristics*term controls (educational level, share of elderly population, share of rental and vacation homes). The parentheses correspond to robust standard errors. *** p<0.01, ** p<0.05, p<0.1

Table 4.4 shows the evolution of the share of votes for the local incumbent considering its alignment with the national ruling party (the political party responsible for the fiscal adjustment implementation). Voters do punish local incumbents aligned with the national ruling party when the fiscal adjustment is nationally mandated. These results go in the same line that the results provided in Table 4.3. Interestingly, unaligned local incumbents seem to

[40] This analysis considers that a local incumbent is aligned with the national ruling party if it was running at the local elections using the "Partido Popular" party label. Given that there is no turnover regarding the national ruling party in the period, there are no changes on the local incumbents alignment in the elections considered.

increase electoral support due to this measure. An increase on the electoral support could be due to the fact that they benefit from the fiscal consequences of the adjustment without the burden of its responsibility. This would indicate, again, that either local incumbents are able to distance themselves from the measure responsibility or that the electorate has a clear distribution of the responsibilities. Local incumbents aligned with the national ruling party do suffer the electoral cost of the fiscal adjustment implementation. The parallel trend assumption regarding electoral results is validated (explain where in the table this is validated). All results are robust to the inclusion of controls.

Electoral accountability at the national elections

The analysis continues by analysing the electoral responses at the national elections when the nationally mandated fiscal adjustment is implemented. The analysis evaluates the share of votes' evolution at the national elections for the local incumbent party label and the national-ruling party. Along the same lines as the previous analysis in this subsection, the local incumbent may not be seen as responsible for the implementation of the fiscal adjustment. Once again, if clarity of responsibility remains in MLG systems, voters might decide to penalise the national-ruling party at the national elections. However, this situation requires: first that the electorate identifies the national-ruling party as the one responsible for the fiscal adjustment. Second, that the electorate considers an increase on a local tax not just a local matter and, therefore uses this information when voting at the national elections.

Table 4.5 offers the electoral responses (at the national elections) to the application of the nationally imposed fiscal adjustment. Columns 1, 2 and 3 report the evolution on the share of votes for the local incumbent party and columns 4, 5 and 6 the results for the national ruling party. Similarly to the results in Table 4.2, the electorate does not punish the local incumbent party label in treated municipalities. Therefore, voters are able to identify that the local incumbent was not responsible for the fiscal adjustment implementation. Again, clarity of responsibility remains, and the electoral responses do affect the national-ruling party. Voters react to the implementation of the fiscal adjustment by punishing the national-ruling party at the national elections. The results suggest a reduction of –around- 0.6/1 percentage point in those municipalities affected by the nationally imposed fiscal adjustment. The inclusion of province per time fixed effects eliminates previous differences on

the national-ruling party results and the effect after the fiscal adjustment implementation remains.

Table 4.5 – The electoral effects of a nationally mandated fiscal adjustment at the national elections

	H3a - local incumbent party			*H3b -national-ruling party*		
	(1)	(2)	(3)	(4)	(5)	(6)
2015-2011 treated	-0.702	-0.215	0.430	-1.044**	-0.653*	-0.638*
	(0.702)	(0.667)	(0.669)	(0.488)	(0.391)	(0.386)
2008-2011 treated	0.044	-0.749	-0.529	0.877**	0.272	0.198
	(0.883)	(0.867)	(0.913)	(0.426)	(0.338)	(0.340)
No. of periods	3	3	3	3	3	3
No. of municipalities	659	659	659	678	678	678
Province x time FE	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes

Notes: The dependent variable is the share of votes at the national elections for the local incumbent party label (in office for the 2011-2015 electoral term) and the national ruling party respectively. *treated* refers to the municipalities affected by the nationally imposed fiscal adjustment. Columns 3 and 6 include controls regarding the tax liability before the treatment period (2008 and 2011) and some socio-demographic controls x time fixed effects (educational level, share of elderly population, share of rental and vacation homes). The parentheses correspond to robust standard errors. *** p<0.01, ** p<0.05, p<0.1

Therefore, electoral accountability remains in MLG systems. The electorate is able to identify responsibilities when fiscal adjustments are implemented. If the fiscal adjustment is planned and mandated for the national government, the electorate punishes the national-ruling party at the local and national elections. However, it seems daring to draw conclusions when comparing the magnitude of the electoral punishing between the local and national elections. The results indicate that the reduction of the vote share is larger at the local elections. However, this could be due to the fact that the local elections were held before the national ones (local elections were on May and national elections on December). Therefore, the electorate might consider a double penalty unnecessary. Another explanation could be that, given that the fiscal adjustment hit a local tax, part of the electorate does not consider this information when voting at the national elections.

4.5.3.-Robustness check: party label or ideology?

The previous section shows that the share of votes for the national-ruling party at the local and national elections is reduced in those municipalities where it is responsible for the implementation of fiscal adjustments.

Given that there is not alternation regarding the national-ruling party in the period analysed, some further analysis is needed. The Popular Party (PP), the main right-wing national party, was ruling at the national level from 2011until 2018. Therefore, the lack of alternation may questions previous results. The electoral response documented in this study could be due to a general reduction on the share for votes for right-wing parties when fiscal adjustments are implemented. Therefore, this section aims to confirm that previous results correspond to the electorate punishing the national-ruling party instead of a broader right-wing discontent.

Table 4.6 shows the evolution of the share of votes for the right-wing parties (all but the PP) at the local and national elections when the nationally imposed adjustment is implemented. The measure considers the sum of all the other right-wing parties together. None of the parties considered should be seen as responsible for the implementation of the fiscal adjustment. Therefore, in order to validate previous results, there should not be differences in treated municipalities regarding these parties share of votes. Columns 1, 2 and 3 report the evolution on the share of votes considering the results for the local elections and columns 4, 5 and 6 the results for the national ones. As expected, the rest of the right-wing parties do not suffer any additional electoral punishment in treated municipalities after the application of the nationally imposed fiscal adjustment. Therefore, these results validate previous section outcomes. Only the party actually responsible for the implementation of fiscal adjustments is affected at the elections: the national-ruling party. Clarity of responsibility remains in MLG systems, also among parties belonging to the same political ideology.

Table 4.6 – Right-wing parties (national-ruling party not included)

	Local elections			*National elections*		
	(1)	(2)	(3)	(4)	(5)	(6)
2015-2011 treated	0.044	0.120	0.109	0.013	0.387	-0.085
	(0.301)	(0.236)	(0.224)	(0.423)	(0.288)	(0.264)
2007/8-2011 treated	0.053	0.096	-0.022	-0.941***	-0.264*	-0.060
	(0.389)	(0.365)	(0.371)	(0.272)	(0.150)	(0.154)
No. of periods	3	3	3	3	3	3
No. of municipalities	660	660	660	678	678	678
Province x time FE	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes

Notes: The dependent variable is the share of votes at the local and at the national elections for the sum of the right-wing parties (except the PP). *treated* refers to the municipalities affected by the nationally imposed fiscal adjustment. Column 3 and 6 further include controls regarding the tax liability before the treatment period (2007/8 and 2011) and some socio-demographic controls x term fixed effects (educational level, share of elderly population, share of rental and vacation homes). The estimations considering the local elections results include 660 municipalities 484 control and 176 treated) for three consecutive local elections (2007-2011-2015). The estimations considering the national elections results include 678 municipalities (493 control and 185 treated) for three consecutive national elections (2008-2011-2015). The parentheses correspond to robust standard errors. *** p<0.01, ** p<0.05, p<0.1

4.6.- CONCLUSION

This study provides empirical evidence of the effect of fiscal adjustment on election results when fiscal adjustments are implemented in a multi-level governance setting (two layers of governance; national and local). Specifically, this study analyses the implementation of fiscal adjustments leading to a tax increase on the property tax. This study relates the literature on the political accountability of fiscal adjustments and the literature on the clarity of responsibility in MLG. The electoral response of fiscal adjustments is estimated by a DID technique that relies on data on Spanish municipalities. The analysis uses the application of two fiscal adjustments (alternatively attributed to the local and national government) on property tax, a decentralised tax, affecting local governments in Spain during the 2011-2015 term-of-office. The effect of fiscal adjustment on election results is measured considering the evolution of the share of votes before and after the implementation of fiscal adjustments.

The previous literature does not provide conclusive answer on whether voters punish or reward the implementation of fiscal adjustments. This study proves that voters react to a fiscal adjustment (implemented though a tax increase) by punishing the local incumbent at the local elections. On average, the local incumbent share of votes decrease by –around- 1/1.5 percentage points in those municipalities where the local incumbent implemented the fiscal adjustment.

The study continues by examining the effect of fiscal adjustment on election results when the clarity of responsibility is questioned; that is, in multi-level governance systems. For that purpose, the analysis focuses on the electorate responses at the local elections when the fiscal adjustment is nationally mandated. In such a situation, the local incumbent may not be seen as responsible for the implementation of the tax increase. Accordingly, the results indicate that the electorate does not punish the local incumbent in treated municipalities when it is not aligned with the national ruling party. Therefore, voters identify that the local incumbent is not responsible for the fiscal adjustment implementation. Clarity of responsibility remains, and the electorate responses seem to focus on the local representation of the national-ruling party. Voters react to the implementation of the fiscal adjustment by punishing the local representation of the national-ruling party at the local elections.

The study continues by analysing the electorate responses at the national elections when this nationally mandated tax increase is implemented. Again, the electorate does not punish the local incumbent party label in treated municipalities indicating that voters understand that local incumbents have no ability to avoid the application of the measure. Consequently, the electorate reacts to the implementation of the tax increase by punishing the national-ruling party at the national elections. The magnitude of the punishment is higher at the local than at the national elections. However, it would be too risky to extract conclusions when comparing the magnitude of the electoral punishing between the local and national elections.

Robustness checks are conducted in order to confirm that previous results correspond to the electorate punishing the national-ruling party instead of a broader right-wing discontent due to the application of fiscal adjustments and

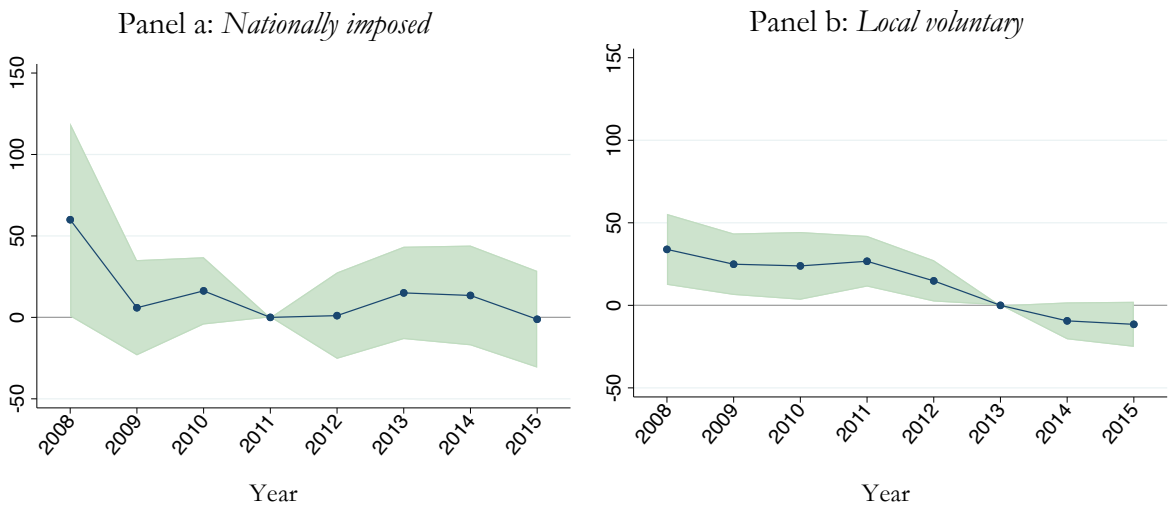
to control that the property tax increase is not compensated by changes on the rest of local taxes.

To sum up, fiscal adjustments lead to a reduction in the share of votes for the political party responsible for their application. Moreover, the electoral accountability remains in MLG systems and the electorate is able to accurately identify responsibilities when fiscal adjustments are implemented in such scenario.

APPENDIX

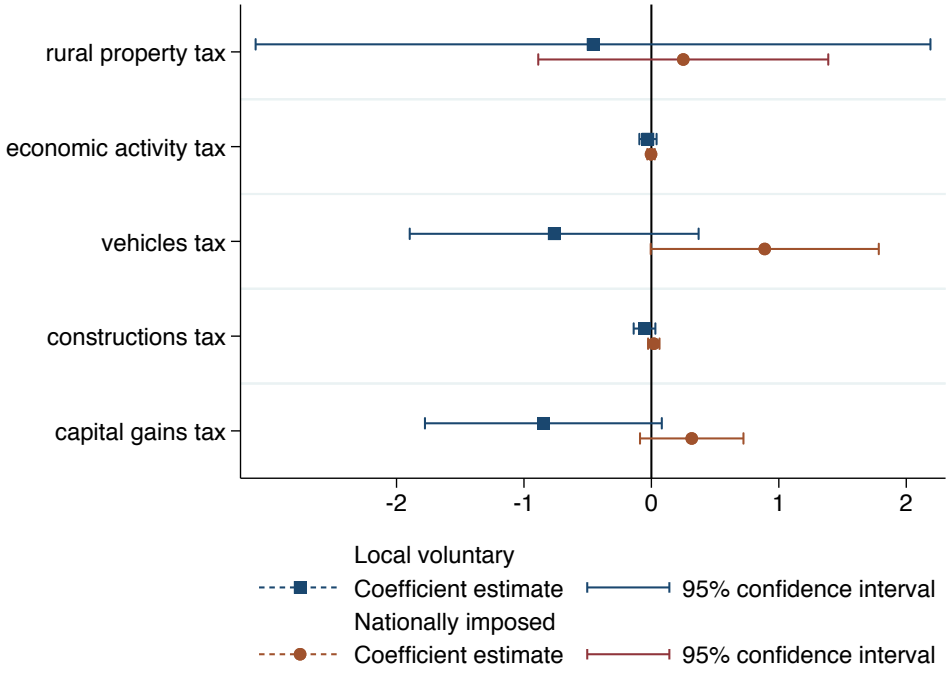
Figures

Figure A4.1 - Current expenditures before and after the fiscal adjustment implementation



Note: This Figure provides yearly difference between treated and control groups. The shaded area corresponds to the 95% confidence intervals.

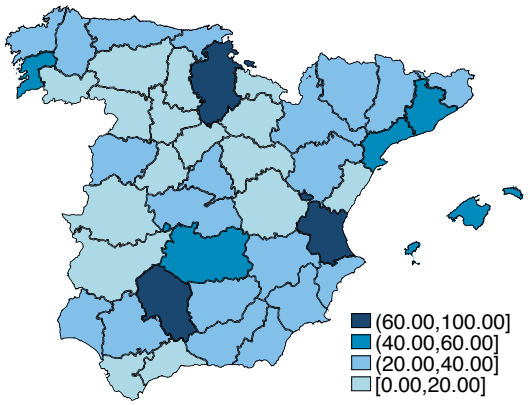
Figure A4.2 – Variation on other local taxes



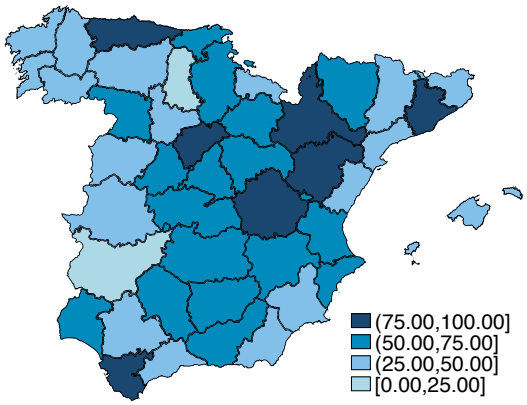
Notes: The dependent variables are the tax rate for the alternative local taxes. The coefficient estimates plotted correspond to the differences between treated and control groups on the tax rate evolution (2011-2015). Blue for the local voluntary sample and red for the nationally imposed one. "Rural property tax" is the property tax on rural properties. "Economic activity tax" levies the exercise of economic activities (business, professional and artistic) in the municipality. "Vehicles tax" levies the ownership of vehicles suitable for driving on public roads. "Construction tax" levies any construction, installation and work that requires obtaining the corresponding building or urban planning license. "Capital gains tax" levies the increase in the value of urban land at the time of a transmission.

Figure A4.3 - Treated municipalities geographical location

Panel a: *Nationally imposed*



Panel b: *Local voluntary*



Note: The maps plot the treatment intensity at the province level. The intensity is defined as the percentage of treated municipalities with respect to all municipalities (control + treated) considered in the analysis for every province.

Tables

Table A4.1 - Variable definitions and sources

	Description	Source
Political variables		
Mayoral party	Local incumbent party label after 2011 local elections	*Ministry of Interior*
Local incumbent, share of votes	Mayoral party share of votes at the local elections	
Local representation of the national ruling party, share of votes	Popular Party (PP) share of votes at the local elections.	
National party, share of votes	Popular Party (PP) share of votes at the general elections.	
Ideology	Dummy variable code 1 if the party is a right-wing party; code -1 if left-wing; 0 otherwise.	*Own codification (see table A2.5)*
Socio-demographic variables		
Population	Population in 2011.	*Municipal register National Statistics Institute (INE)*
Province	Geographical location of the municipality	
Education level	Share of population with post-compulsory education in 2011	Census of population and houses 2011; INE.
Elderly population	Share of population over 65 years in 2011	Padrón Municipal; INE.
% Vacation homes	Share of vacation homes over the total in 2001	Census 2001;INE.
% Rental homes	Share of rental homes over the total in 2011	Census 2011;INE.
Economic variables		
Cadastral reassessment	Year of the last cadastral reassessment	*Cadastre agency*
Property tax rate	Tax rate of the property tax.	
Property tax base	Value of the tax base; cadastral value (€ per urban unit).	
Property tax liability	Property tax liability in 2011 (€ per urban unit).	
Current revenues	Chapters I to V. in 2011 (€ per capita).	*Ministry of Finance and Public Function*

Note: variables at the municipality level

Table A4.2 - Descriptive statistics: local voluntary tax base increase sample

	Mean	Std. Dev.	Min	Max	Obs.
Political variables					
Local incumbent, share of votes	52.293	14.313	2.190	97.906	2,158
Local representation of the national ruling party, share of votes	40.673	19.361	0.870	97.906	1,916
Ideology	0.285	0.925	-1	1	2,158
Socio-demographic variables					
Population	9290.850	49530.980	252	1615448	2,158
Education level	35.784	9.392	0	70.27	2,158
Elderly population	24.423	8.569	3.651	54.848	2,158
% Vacation homes	24.202	18.257	0	88.58	2,158
% Rental homes	6.685	5.375	0	40.7	2,158
Economic variables					
Cadastral reassessment	1994.51	5.629	1984	2011	2,158
Property tax rate	0.622	0.164	0.37	1.227	2,158
Property tax base	26334.750	16604.040	2276.017	140273	2,158
Property tax liability	157.633	115.766	10.493	1106.615	2,158
Current revenues	879.130	480.574	72.072	8620.965	2,158

Table A4.3 - Descriptive statistics: Nationally imposed tax rate increase sample.

	Mean	Std. Dev.	Min	Max	Obs.
Political variables					
Local incumbent, share of votes	53	12.850	15.196	87.661	678
Local representation of the national ruling party, share of votes	40.557	18.488	0.939	86.559	665
National party, share of votes at the national elections	48.895	13.941	7.470	83.962	678
Local incumbent party label, share of votes at the national elections	48.628	14.328	0.942	83.962	649
Ideology	0.114	0.977	-1	1	678
Socio-demographic variables					
Population	4707.295	13094.03	259	214918	678
Education level	34.449	9.377	2.78	76.19	678
Elderly population	24.751	8.324	5.646	54.848	678
% Vacation homes	21.866	16.551	0	84.47	678
% Rental homes	5.646	4.297	0	29.53	678
Economic variables					
Cadastral reassessment	2003.435	6.274	1985	2011	678
Property tax rate	0.562	0.132	0.2	1.03	678
Property tax base	39263.560	26135.990	3923.529	182918.000	678
Property tax liability	163.324	122.382	6.144	1078.388	678
Current revenues	871.247	372.850	382.736	4118.841	678

Chapter 5

Conclusions

This PhD thesis presents empirical evidence about the effects of political fragmentation on some of the main political challenges society has faced to date in the 21st century. For governments to behave in their citizens' best interests, they need to take responsibility for the actions they implement and offer satisfactory reasons for the policies they adopt. Therefore, it is crucial to guarantee that political fragmentation does not undermine their accountability. Specifically, this thesis has first analysed the effect of government fragmentation on political corruption by determining whether fragmented governments (non-majority) are more likely to find themselves embroiled in corruption scandals. Second, this thesis has examined the effect of political fragmentation (entry of one additional party in the legislature) on the implementation of fiscal consolidation. Finally, continuing with the study of fiscal consolidation, this thesis has analysed clarity of responsibility and the electoral effects of the implementation of fiscal adjustments in a multi-level governance setting.

The three studies in the thesis are based on Spanish municipal data. In this setting, all governments are subject to the same institutional, cultural and socio-economic framework, which favours the causal interpretation of the results obtained from the application of three alternative methodologies: matching, regression discontinuity design and differences-in-differences.

The second chapter of this thesis has examined the relation between government fragmentation and political corruption in the period 1999-2007. A matching procedure restricts the sample to majorities and non-majorities that are otherwise identical in a set of political variables. After matching, these municipalities are also similar in terms of a broad set of socio-economic traits that might correlate with corruption. In short, the only difference between the municipalities being compared is the government type (majority vs. non-majority). The results indicate that, in close elections (+/– 1 seat), the

presence of a fragmented government is not associated with a higher probability of corruption. This outcome sheds light on the political and media debate in 2014 when the national government specifically sought to promote the formation of majority governments to avoid corruption. Moreover, the analysis carried out in the second chapter actually detects that some fragmented governments are less likely to be corrupt than majority governments. Indeed, non-majority governments supported by a pivotal party – that is, parties able to enter into agreements with either ideological bloc – are less corrupt. This result is consistent with a narrative according to which coalition partners are more willing to denounce political corruption when they have other options when it comes to forming a pact. Thus, with regards to limiting corruption, policies should seek to promote the presence of more neutral political groups that can act as pivotal parties.

In an examination of the effects of political fragmentation on the way in which fiscal consolidation is implemented, the third chapter offers empirical evidence for a situation characterised by the presence of Fiscal Rules limiting deficits and new debt. This framework is becoming the standard setting for more and more local and regional governments in advanced democracies. By analysing the intra-term variation (2011-2014) of the main budgetary aggregates, the results show that political fragmentation has a relevant impact on fiscal consolidation and the resulting size of the budget. Increasing the political fragmentation of a legislature (in this chapter, the entry of one additional party) shifts the focus of fiscal consolidation from expenditure reductions to an increase in revenues. Thus, the resulting budget increases as the number of parties in the legislature expands. However, this effect is only significant when the overall fragmentation is not especially large. When legislatures already include more than four parties, the entry of one more party is not significant. Likewise, the fact of having to face financial difficulties also offsets the effect of increasing political fragmentation in a municipality. In times of economic problems, fiscal consolidation centres on expenditure cuts, irrespective of the level of political fragmentation. The results indicate that political fragmentation does not impact the effectiveness of fiscal consolidation, but that it does impact the approach adopted.

Interestingly, the effect of increasing legislature fragmentation is apparent even when this increase does not affect a government's majority status. Although a majority government can successfully ensure the passage of any measure

through the legislature, majority governments do modify the implementation of fiscal consolidation when legislature fragmentation increases. This result is indicative of the legislature's power to exercise control over the executive. While more work is needed to understand the mechanisms responsible for this change in executive behaviour, a number of hypotheses can be forwarded. An increase in the number of parties in the legislature may correlate with the intensity of political debate, both within the legislature and in the media. Moreover, when a party wins its first seat in a legislature, this comes with a series of benefits that are likely to affect its future electoral performance. For example, parties represented in the legislature receive economic resources that can be used for communication purposes. It is common practice for parties to distribute periodically free propaganda containing local political information. As well as additional funding, party representation guarantees participation in upcoming electoral debates, public advertisements and street propaganda.

Continuing with this examination of fiscal consolidation, the fourth chapter of this thesis has examined the political accountability of fiscal adjustments by analysing their electoral cost in Spain's system of multi-level governance. Political accountability in the case of fiscal adjustments may be weakened in multi-level governance systems as different tiers of government share fiscal responsibilities across the same population. These shared responsibilities may affect the clarity of responsibility and, hence, the electorate's ability to attribute credit or blame to a government for its actions. Moreover, each level of government has the incentive to blame the adverse economic outcomes on the performance of upper levels of government in that same system. By measuring the evolution of the incumbents' share of votes before and after the implementation of fiscal adjustments, the study provides causal evidence that voters punish the political party responsible for the application of fiscal adjustments (a tax increase in the cases studied here). The literature to date has been unable to provide a conclusive answer as to whether voters approve or disapprove of the application of fiscal adjustments and, so, this result represents a relevant contribution insofar as the setting considered overcomes some of the concerns of analyses of this kind, most notably problems of reverse causality and endogeneity.

The results also indicate that the clarity of responsibility for fiscal adjustments in a multi-level setting remains and that the electorate is able to attribute responsibilities accurately. The share of votes for the local incumbent fell

when the fiscal adjustment was decided locally, while the share of votes for the national ruling party fell at both local and general elections when the adjustment was nationally planned and mandated.

In short, this thesis has taken a broad focus on possible concerns associated with political fragmented and multi-level governments. The studies show that fragmented governments or legislatures represent neither increased risks of corruption (compared to majority governments) nor for fiscal consolidation (even if implemented differently). Moreover, the results are in line with the argument that political fragmentation does not diminish accountability. Accountability holds firm in multi-level governments, because of the persistence of clarity of responsibility in such systems of governance, with each tier of government being held responsible for its own actions. As a consequence, the benefits of increasing political fragmentation – insofar as voters can choose a party whose ideas are closer to their own political preferences – or decentralisation – with local governments being in a better position to address local problems – are not undermined by an objective malfunction of institutions of this type.

Faced by the very real threat of a new economic crisis at a time when new political parties are growing in strength and immigration and racism are central to most public debates, it is critical that we expand our understanding of the effects of political fragmentation and the behaviour of new parties as the role they play in public policy decision-making becomes more and more influential.

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