Betrayed by the Elites: How Corruption Amplifies the Political Effects of Recessions

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ABSTRACT: We investigate whether corruption amplifies the political effects of economic crises. Using Spanish municipal-level data and a difference-in-difference strategy, we find that local unemployment shocks experienced during the Great Recession (2008-2015) increased political fragmentation. This effect was four times larger in municipalities exposed to malfeasance than in municipalities without a history of political corruption. We bolster this evidence by showing that, conditional on province and population-strata fixed effects, there is no evidence of differential pre-trends. We also find that the interaction of unemployment and corruption harms the two traditional main parties and benefits especially the new party on the left (*Podemos*).

Keywords: Accountability, Corruption, Political Fragmentation, Economic Crisis

1. Introduction

Besides its devastating effects on the economy, the Great Recession fueled political turmoil in many Western European countries. Elections held during the first stages of the crisis saw large vote losses for incumbent parties (Kriesi, 2014). However, the Great Recession also contributed to the disintegration of party systems (Hernández and Kriesi, 2016). Mainstream parties shrank, smaller parties grew, and new parties emerged. As a result, party political fragmentation substantially increased and unstable coalition politics became the norm. The consequences have been visible in many countries and go from difficulties in forming government to the inability to pass budgets in time and to implement reforms (Mian et al., 2014).

Previous literature has shown that there are institutional and socio-demographic factors that affect party political fragmentation. For instance, the electoral formula and magnitude of electoral districts (Lijphart, 1990; Ordeshook and Shvetsova, 1994) and the level of socioeconomic heterogeneity (Geys, 2006; Riera, 2020) have been shown to be determinants of political fragmentation. Some recent papers have also documented the effects of economic crises on political fragmentation, either by looking directly at measures of party system fragmentation (Bértoa and Weber, 2019) or by studying the effect of crises on the rise of challenger parties (Hobolt and Tilley, 2016). This paper also examines this issue, by focusing on a new mechanism: we study whether the effects of crises on political fragmentation are conditioned by previous misbehavior of politicians, as proxied by past corruption scandals. Our contention is that a corruption surge affecting mainstream parties may lead voters to increase their punishment of traditional parties because of the crisis and to look for alternative parties, boosting political fragmentation. One reason for this voting behavior may be the reduction in trust in mainstream political parties caused by the accumulation of evidence regarding malfeasance. A complementary

story refers to the ability of voters to connect the evidence of malfeasance with the causes leading to the crisis.

In this paper, we use municipal data for Spain to estimate the political effects of the local unemployment shocks experienced during the Great Recession. Our main purpose is to study if the increase in political fragmentation caused by the economic crisis also has political roots. Concretely, we want to know if having experienced a local corruption scandal during the previous boom conditions the political effects of the unemployment shock.[1] Our main outcome is the change in a standard political fragmentation index (the effective number of parties) between the last national election of the boom period (that of 2008) and the first national election held after the end of the recession (that of 2015). In order to provide some light on what caused the increase in political fragmentation, we also estimate the effect of the unemployment shock on the vote for the two main national parties combined, on the vote for individual parties (incumbent and main opposition parties, and also non-mainstream parties, both old and new), and on turnout.

We rely on a novel database, which includes information on all local corruption scandals that broke out in Spain since the start of the boom, and high-quality administrative data on municipal unemployment for the same period. Our empirical strategy is a generalized difference-in-difference analysis, which we validate by performing pre-trend placebo tests.[2]

Our results are striking. We do find that the increase in political fragmentation between the 2008 and 2015 national elections was larger in places hit harder by the crisis.

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[1] Unemployment and corruption are the two political problems that worry Spaniards the most. According to a survey by the *Centro de Investigaciones Sociológicas*, these two items were cited among the three largest problems of the country by 79.8% and 38.8% of respondents in December 2015 (the month the national election took place), respectively.

[2] Ajzenman (2020) uses a similar empirical strategy to estimate the causal effect of local political corruption on student cheating in Mexico.

Moreover, and more relevant for the aim of the paper, we also find that the history of corruption substantially affects the political consequences of the economic crisis. In municipalities without a history of corruption, an increase of one standard deviation in the unemployment shock increased fragmentation by 4.2% of a standard deviation of the outcome variable. In the case of municipalities exposed to corruption, this number goes up to 19%. Thus, the effect of the unemployment shock on fragmentation is around four times larger in places exposed to corruption. We also find that the interaction of unemployment and corruption harms the two traditional main parties: the *PP* (*Partido Popular* or the People's Party) and the *PSOE* (*Partido Socialista Obrero Español* or the Spanish Socialist Workers' Party). Both new parties on the left (*Podemos*) and right (*Ciudadanos*) benefited from this, although the effects are larger and only significant for *Podemos*.

The paper contributes to four different literatures. First, our paper shares obvious links with the vast literature on economic voting (e.g., Lewis-Beck and Stegmaier, 2007). Following the suggestion of Margalit (2019), we add to this literature by expanding the set of outcomes that can be affected by economic voting and by exploring the conditions under which we might observe a response. Some papers have already considered the possibility that trust on institutions and politicians has an effect on the intensity of economic voting (see, e.g., Duch and Stevenson, 2010) but none has looked explicitly at the effect of past corruption scandals. Also, methodologically, our paper follows the lead of some recent papers that estimate the effects of localized economic shocks (Healy and Lenz, 2017; Hall et al., 2017) rather than individual perceptions of the economy.

Second, our results add to the literature that studies the political effects of the Great Recession (e.g., Kriesi, 2014; Hernández and Kriesi, 2016) and specifically to the papers that look at the effect of the crisis on party system fragmentation and/or on the rise of

challenger parties (Bértoa and Weber, 2019; Hobolt and Tilley, 2016). Our approach is complementary to the one used in this line of research, which relies mostly on cross-country data.

Third, our paper contributes to a recent, but fast-growing, strand of literature studying the impact of economic shocks on political polarization (Mian et al., 2014; Funke et al., 2016; Fetzer, 2019; Dal Bó et al., 2020), and on the rise of populism (Algan et al., 2017; Guiso et al., 2018a and 2018b; Adler and Ansell, 2020). However, our story here is less about which specific type of party people want than about the causes of the political changes brought about by the Great Recession. Nevertheless, we also provide some results for specific new parties, thus adding to the literature on the determinants of their vote.[3]

Finally, our paper is germane to the literature on the impact of corruption on electoral outcomes (e.g., Ferraz and Finan, 2008; Costas-Pérez et al., 2012). Some papers have examined the moderating effect of the economic context, showing that voter's punishment to corrupt politicians is stronger in bad times (Klansja and Tucker, 2013; Zechmeister and Zizumbo-Colunga, 2013). Notice, however, that we focus on a different question: we look at how the past experience with local corruption (i.e., during the previous boom) influences the electoral response to the economic crisis at the national elections. For this to happen, the effects of past local corruption should be persistent and spill over to higher layer elections. We provide several arguments in the paper as why this might be the case.

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[3] Other papers that have focused on the emergence of new parties in Spain during the crisis are Fernández-Albertos (2015), Cordero and Orriols (2016), and Rodon and Hierro (2016). None of them provides a quantitative account of the drivers of party fragmentation in Spain.

The rest of the paper is organized as follows. Section two provides the institutional details needed to understand the interest of the Spanish case and also the context of our empirical analysis. Section three develops the main hypothesis we test herein. Section four lays out the empirical specification and the data. Section five presents the results. The last section concludes.

2. The crisis in Spain

Spain is a good context to test our hypothesis. The crisis was especially acute and long-lasting. It was also followed by a political crisis, involving the collapse of trust in democratic institutions, and the fallout of the two mainstream parties and the emergence of new parties. The crisis was also accompanied by a surge in political scandals related to the previous boom period. In this section, we provide a brief description of the economic and political context surrounding the Spanish crisis.

2.1 Economic and political crises

Economic crisis. Spain was heavily affected by the Great Recession, which was first felt in 2007. By the first quarter of 2008 unemployment had started to rise, and by the third quarter of that same year the country's GDP had begun to fall. GDP dropped by 3.9% in 2009 and, while it recovered temporarily from 2010 to the second quarter of 2011, then dropped again in the period 2011-13 by more than 5%. Spain's unemployment rate grew from 8% in 2007 to 27% in 2013, with only Greece among its EU partners suffering a higher unemployment rate. The rise in the unemployment rate between the 2008 and 2015 elections was 12.03 p.p.

During the first dip of the recession, the reaction of the government was to minimize it, blaming the global financial crisis, and telling people that the impact would be short lived. The second dip of the recession made evident that this was not the case. As a result,

despite the rise in unemployment during the first year of the crisis (in 2008), the stronger reaction against the government and the political elites took some time to occur. [4]

Political crisis. In Spain, the bulk of the political and economic response to the crisis was handled at the national level. For this reason, in this paper we focus on national parliamentary elections, which are perceived as the most important in the country. These elections are also the ones that saw a dramatic increase in fragmentation following the crisis, while this was not the case for local elections.[5]

Parliamentary elections are held every four years. Parties present closed lists and voters choose the party they want to support, their votes being allocated to seats using the d'Hondt rule with a threshold. Parliament comprises 350 seats and the electoral districts are the provinces. Representatives subsequently elect the prime minister by simple majority and the prime minister, in turn, decides the composition of the government. Although Spain is a multi-party system, traditionally there have been two main parties, the *PP* and the *PSOE*. The *PSOE* was the incumbent during the first dip of the recession; and was reelected in the 2008 election. The *PP* got in the national government after the 2011 election, just after the second dip of the recession started; this was the party in charge of implementing the fiscal adjustment and reform packages. The reduction in the vote share obtained by these two parties has been considerable: from 82% in the 2008 national election to 73% in 2011 and to 52% in 2015. Until these elections, Spain had only had absolute majority governments or minority governments with the support of regionally based parties. Traditionally, a decline in support for the incumbent party was matched by an increase in support for the main opposition party. This still happened in

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[4] The possibility that a double-dip crisis is more politically destabilizing, and also that the political impact is larger in the second dip has already been pointed out by other authors (see, e.g., Hernández and Kriesi, 2014).

[5] The fragmentation index for parliamentary (local) elections was 2.26 (2.58) in 2007 and 3.60 (2.86) in 2015.

the 2011 election, but not in the 2015 election, when both mainstream parties suffered a substantial vote loss.

The political landscape in the 2015 election was different due to the emergence of two new political parties: *Podemos* and *Ciudadanos. Podemos* was created in reaction to a wave of discontent manifest in the 15-M movement. This movement (which began on May 15, 2011) organized demonstrations and occupied public spaces to protest against the austerity measures passed in response to the economic crisis and against political corruption. The party first stood for a national election in 2015, winning 69 seats and a vote share of 21%. Meanwhile, *Ciudadanos* had been founded earlier, in 2006, in Catalonia, and had first stood at the 2008 national election (but failed to win a single seat). They opted not to stand at the 2011 election, but in 2015 they won 40 seats and a vote share of 14%. Political fragmentation, measured as the effective number of parties, increased from 2.7 before the crisis to 3.3 in the 2011 election and 5.4 in the 2015 election.

2.2. Political corruption

The housing boom that preceded the crisis was associated with a huge number of corruption scandals. According to Costas-Pérez et al. (2012), nearly 500 municipalities were affected by instances of corruption prior to the crisis. However, during the crisis, opportunities for corruption were curtailed with the collapse of the housing market. Yet, the public, the media, and the judiciary remained especially sensitive to corruption throughout the crisis years. As a result, more than 300 additional scandals (many of them associated with instances of corruption perpetrated during the boom) were reported during the crisis. Most of these scandals involved local politicians accepting bribes in exchange for amendments to municipal land use plans and building permits (Fundación Alternativas, 2007).

During the boom years, it was generally thought that the electoral punishment of corrupt politicians in Spain was quite mild (Fundación Alternativas, 2007; Riera et al., 2013). However, the crisis gave rise to considerable debate about the possible adverse effects of corruption on the legitimacy of democracy and trust. For example, in 2010 a prominent think-tank entitled its annual report "The erosion of confidence and well-being. Against citizens' disaffection" (Fundación Alternativas, 2010). The report warned of the possible long-term effects of corruption on trust in government and the legitimacy of democracy. According to Eurobarometer data, Spain, together with Greece, was the European country that recorded the sharpest fall in satisfaction with democracy during the crisis (Armingeon and Guthmann, 2014). Recent research substantiates this story, showing that fragmentation (of the city council) is a powerful mediator of the long-run effects of corruption on trust (Solé-Ollé and Sorribas-Navarro, 2018).

Figure 1:
Concern about corruption over time
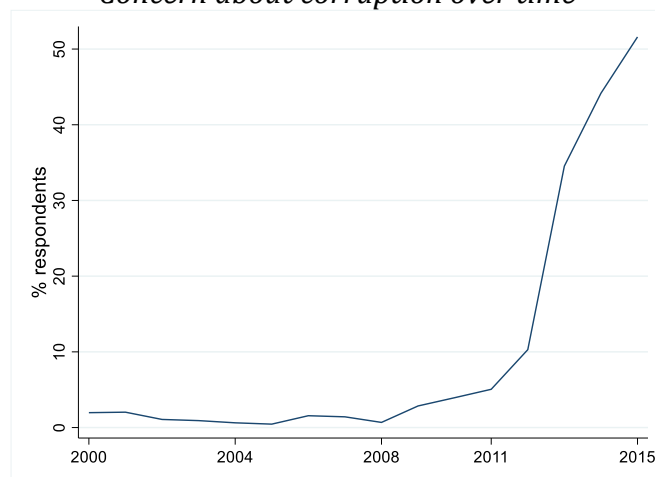
Notes: Data from barometer surveys conducted by the *Centro de Investigaciones Sociológicas* (CIS). Share of respondents that identify corruption as being among Spain's three main problems.

As Figure 1 shows, 50% of the population mentioned corruption among Spain's three main problems in 2015, according to a survey conducted by the *Centro de Investigaciones Sociológicas*. Interestingly, until 2009, corruption had been perceived as a problem by no

more than 1% of the population. This means that concerns about corruption experienced a sharp upturn in a very brief period of time, a period that coincided with the onset of the economic crisis.

3. Theory

3.1. Economic voting and political fragmentation

The effects of economic shocks on political fragmentation will depend on voting behavior, which in turn can be conditioned by the economic and political scenario. Voters might react to economic hardship in different ways. First, as posited by the economic voting literature, the most natural way for voters to express a grievance is by voting the incumbent out of office (Lewis-Beck and Paldam, 2000; Lewis-Beck and Stegmaier, 2007; Duch and Stevenson, 2008). The existing empirical evidence suggests that, in normal circumstances, this is followed by a concomitant increase in support for the main opposition party. Circumstances during the Great Recession, however, were far from normal. On the one hand, the severity of the situation suggests that the reaction by voters should have been quite strong, especially after it became evident that the crisis was not overcome (Hernández and Kriesi, 2014). On the other hand, voters might have reacted in a less traditional way in this case. The reason is that voters might end up believing that none of the mainstream parties is capable of addressing the problem. This was especially true in countries where all mainstream parties participated in governments that had the responsibility in dealing with the crisis or in the generation of the preceding boom [6]

In such a situation, once you voted against one of the two mainstream parties, it is hard to vote in its favor again in the next election. Therefore, although the punishment of

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[6] This was the case in Spain, since one mainstream party was the incumbent during the first dip of the crisis while the other was the incumbent during the second dip. Also, both mainstream parties had some responsibility in the generation of the housing bubble that preceded the crisis.

the incumbent might result at the start of the crisis in a reward for the main opposition party, this result might be overturned in future elections, as voters might opt to support other non-mainstream parties (Hernández and Kriesi, 2016; Hobolt and Tilley, 2016). There is a growing literature providing evidence that, in situations of severe crisis, voters may turn to less established political parties, because they are not seen as being responsible for the situation and/or because they propose new solutions that are different to the mainstream response to the crisis.[7] This shift towards non-mainstream parties will lead to an increase in political fragmentation.

Of course, for this to happen, there should also be viable alternatives for which to vote (besides the mainstream parties).[8] This was maybe not the case during the first stages of a crisis if old non-mainstream parties are not trusted by voters and if new parties need time to emerge. In such a situation, voters may react to the discontent with mainstream parties in other ways. For instance, instead of voting for new parties they may simply abstain. Notice, however, that the literature on the effects of economic crises on turnout does not provide any clear prediction on the direction of this effect. Some authors do find that unemployment fosters voter abstention (e.g., Rowe, 2015; Häusermann et al., 2017, Rowe, 2015) while others show that unemployment has a mobilizing effect during economic crisis (Burden and Wichowsky, 2014). In our case, it is also unclear how turnout will evolve over time, as we move from the first to the second dip of the crisis. One possibility is that the first election might saw an important mobilization against the

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[7] See evidence of the effects of economic crises on the rise of populist parties in Europe (Algan et al., 2017; Guiso et al., 2018a and 2018b), of immigration on the vote for extreme-right parties (Halla et al., 2017), of globalization on polarization in the US and on the vote for extreme parties in Europe (Funke et al., 2016; Autor et al., 2020; Dippel et al., 2021), and of austerity on the vote for far-right parties (Galofré-Vilà et al., 2020; Dal Bó et al., 2020).

[8] There is an extensive literature that has studied the determinants of the emergence of new parties. This literature points to the relevance of the electoral institutions, clevanges, social, political and estructural factors (Tavits, 2006), and the elasticity of voters (Lago and Martínez, 2011), among other factors.

incumbent that ends up benefiting the main opposition party. This extra mobilization might vanish in the second election as voters become disenchanted. Another possibility is that the emergence of new parties has also a mobilizing effect, bringing back to the poll stations some of those disenchanted voters. Furthermore, it is not obvious how changes in turnout will impact political fragmentation.

3.2. The amplifying effect of political corruption

A common theme in the literature on economic voting is the heterogeneity of the effects. For example, low levels of trust in political parties and government institutions might diminish the intensity of economic voting (Duch, 2001). Lack of trust in political parties means that voters expect a relatively high level of shirking or rent-seeking from public officials and a low level of policy effectiveness. This means that, in low-trust contexts, voters tend to believe that rent-seeking by politicians cannot be controlled through the threat of electoral defeat (Przeworski et al., 2000). They expect that replacing politicians that performed poorly will not improve things because all parties are basically the same. Of course, this may apply to established or mainstream parties but not to new parties that emerge during crises trying to convince voters that they are different. This is why in low-trust contexts we may observe low or high economic voting but high fragmentation.

The exposition to corruption scandals in the years previous to the crisis may have had an impact on the level of trust in politicians and government institutions at the beginning of the crisis. Voters in places exposed to corruption scandals in the past might be less inclined to believe that a bad incumbent can be replaced successfully by choosing a candidate from another mainstream party. This is the first reason why we expect that, when a municipality is hit by an adverse economic shock, the turn towards non-mainstream parties will be larger if it has been previously exposed to political corruption. Thus, because of this, political fragmentation will increase.

Another reason that might explain the role of corruption as a moderator of economic voting is the ability of voters to use corruption scandals as an indicator of the responsibility in the generation of the crisis. The booms that precede most deep crises are characterized by a surge of private fraud, state capture by economic interests, and public corruption. There is abundant anecdotal evidence of the role of this type of behavior in the generation of the Great Depression (Galbraith, 1955) and also in the more recent recession (Mian et al., 2010 and 2013). Moreover, Herrera et al. (2020) show that crises might originate in political booms, that is, in artificially generated booms that boost the popularity of the incumbent. All of this is particularly true in Spain, where the crisis was related to the growth and burst of the housing bubble. Both mainstream parties were involved in the design of policies related to the real estate sector. Both had run regional and local governments, and so were responsible for the expansive land use policies and of the lax lending standards of saving banks (Fernández-Villaverde et al., 2013), and ultimately for the recession that followed.

However, since the crisis also had a global origin, voters had a hard time disentangling the influences of external forces and politicians' performance. Local corruption scandals might have helped voters attribute responsibility to politicians (or to political parties). Corruption scandals might be interpreted as proof that the crisis was due to the greedy behavior of politicians rather than to bad luck. Moreover, if elections have a 'selection' function (Duch and Stevenson, 2010), corruption scandals might also reveal that some politicians (parties) did not do a good job during the boom and so are not the best suited to manage the crisis.

However, for this to happen, corruption must have two characteristics. First, voters must be able to associate it to political parties rather than to individual candidates. That is, in the case of local corruption scandals, the effects must spill over to co-partisans at

higher offices. There are a few papers showing that corruption has an effect on party brands (and on higher layer elections) in addition to the specific candidates involved in the scandals (Daniele et al., 2020). This might also be the case in Spain, since some of the most prominent corruption scandals started at the local level but eventually affected regional and national politicians of the same party. Also, it has been commonplace that the two mainstream parties use the local corruption scandals affecting the competitor as a political weapon, and irrespective of whether they can be substantiated or not. Recent work by Dziuda and Howell (2019) shows that this type of behavior might end up hurting all parties.

Second, the effects of corruption scandals on the levels of political trust should be persistent. There are several motives why this can happen. For example, Solé-Ollé and Sorribas-Navarro (2018) show that trust in local politicians at the end of the boom was lower in Spanish municipalities with corruption scandals irrespective of whether the scandals broke at the beginning or at the end of the period.[9] The authors suggest this is partly because attitudes themselves are persistent, and partly because corruption scandals trigger other changes (e.g., fragmentation and gridlock of local government) that also contribute to keep levels of trust low.

4. Empirical design

4.1. Unit of analysis

We study the effects on political fragmentation of the unemployment shock and of the history of corruption at the local level. Given the heterogeneous spatial nature of the crisis, we expect its effects to be spatially differentiated. Although the earlier economic

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[9] Ajzenman (2020) shows persistent effects (more than one year) of political corruption on student school cheating in Mexico. Aassve et al. (2019) show even more persistent effects (twenty years) of corruption on trust in politicians in Italy.

voting literature focused more on voters' perceptions of the economic situation (Kiewiet and Lewis-Beck, 2011), more recent studies show that local economic shocks are equally important (Healy and Lenz, 2017). There is also evidence that voters' knowledge about the government's macroeconomic performance is determined by the economic conditions of people considered similar to them and who live in close vicinity. For example, Ansolabehere et al. (2014) show that US voters rely on information about the situation of the state economy to evaluate the performance of the federal government. More recently, Alt et al. (2021) show that the evaluation of the state of the economy is determined by the employment situation of relatives and co-workers who live or work nearby. In the case of corruption, we can also expect voters to be both better informed and more concerned about scandals occurring nearby. In light of these insights, we examine the effects of local unemployment shocks and local corruption scandals.

Our main analysis uses municipal data while controlling for province fixed effects. In Spain, there are around 3,000 municipalities with more than 1,000 inhabitants (the ones constituting our sample) and 50 provinces, which coincide with the electoral districts used at the national parliamentary elections. We believe the municipality is the right unit to study the effects of corruption, since the cases in our database refer to accusations made against local politicians. In the case of the unemployment shock, information at the level of the municipality is especially relevant as it informs us about the effect of the crisis on neighbors, relatives, and friends. However, the municipality might not capture the full effects of shocks to employment prospects, which may operate at the local labor market (LLM) level. For this reason, we also present some results using LLMs.

4.2. Empirical specification

Baseline equation and identification. We estimate the impact of the unemployment shock experienced during the Great Recession on political fragmentation (and other political outcomes) using the following 'generalized' difference-in-difference specification:

$$\Delta Fragmentation_i = \alpha \, \Delta Unemployed_i + X_i'\gamma + \lambda_j + \lambda_k + \varepsilon_i, \qquad (1)$$

where $\Delta Fragmentation_i$ is the increase in political fragmentation in municipality i during the recession period (i.e., from the last national election held during the boom, in 2008, to the first national election held after the end of the recession, in 2015), and $\Delta Unemployed_i$ is the increase in unemployment in the same period. The vector X_i includes control variables in levels measured as of 2008 (or earlier) and λ_j and λ_k are province and population strata fixed effects. The α coefficient captures the effect of an increase in the treatment intensity (i.e., an increase in unemployment) on fragmentation.[10]

In terms of identification, the fundamental challenge is that places subject to larger unemployment shocks might have been on different trends prior to the Great Recession. In fact, pre-trend analyses in a 'pure' difference-in-difference estimation (i.e., without the fixed effects and controls) reveal that the parallel trend assumption does not hold: the evolution of fragmentation before the crisis in places experiencing larger unemployment shocks was different than in places hit by milder shocks. To deal with this issue, we consider the generalized difference-in-differences specification given by (1), which adds population-strata and province fixed effects, and a number of controls.

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[10] Note that we are implicitly assuming linearity of the treatment effect. In the robustness section, we provide evidence in support of this assumption.

We define five population strata: less than 5 thousand inhabitants, from 5 to 10, from 10 to 20, from 20 to 50, and more than 50 thousand. The fixed effects account for the fact that both the economic impact of the crisis and the extent of the corruption epidemics were spatially clustered and might have had quite a distinct effect on urban and rural municipalities. For instance, some provinces are more heavily specialized in construction and/or in industrial sectors that supply to that sector. Also, provinces capture quite well the extent of provincial media markets and spatial differences in cultural and social traits. Moreover, the difference in the price of a seat from one province to another may have an effect on the probability of success of small parties and, thus, on their decision to stand and on their campaigning effort. The same applies to population size, because some of the drivers of political discontent are more prevalent in large cities (e.g., the real estate crisis). Therefore, we identify the effects of the rise in unemployment by relying solely on within-province and within-population strata variation. The identification assumption is that, *conditional on the fixed effects*, the unemployment shock is exogenous to changes in fragmentation. Pre-trend placebo tests in this generalized framework reveal that, once the fixed effects are included, political fragmentation evolved in a similar way in the past in places hit by high vs. low shocks during the Great Recession.[11]

We also add a bunch of pre-treatment covariates in levels included in X_i. These comprise political (fragmentation, voter turnout, and parties' vote shares at the 2008 election), socio-demographic (the mean age of the population, and percentages of people with college education and of immigrants), and economic variables (the unemployment

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[11] Note that, in our framework, we think of the unemployment shock as the treatment, while corruption serves as a moderator. However, we also show that there are parallel trends for corruption, i.e., fragmentation in corrupt and non-corrupt municipalities evolved similarly before the shock. See Figure 5.

rate, housing prices, and municipal expenditures). These covariates account for the possibility that the aggregate effects of the crisis have different effects depending on the individual traits of voters and/or the economic environment in each municipality. They also control for the determinants of political fragmentation identified by the existing literature. The inclusion of the different sets of controls in levels does not affect at all our results.

That there are no differential pre-trends in the pre-treatment years, and that the results are so robust to a number of controls, bolsters the validity of the empirical approach. Notice, however, that it is still possible that there are post-treatment differential trends. Of course, this is untestable, but we perform a number of robustness checks to assess whether this could drive the results. Specifically, we expand equation (1) to control for changes brought about by the crisis that could be correlated with the unemployment shock: the changes in housing prices, municipal expenditures, population size, and share of immigrants (all measured from 2008 to 2015). The crisis generated an important wealth loss on homeowners, which may be captured by the drop experienced by housing prices. The crisis also generated a collapse in municipal revenues as local budgets were funded disproportionately with construction-related revenues (Solé-Ollé and Viladecans-Marsal, 2019). This led to the implementation of harsh austerity measures and a reduction of public spending. Controlling for the drop in in municipal expenditures therefore serves as a way to partly account for the austerity measures.[12] Finally, municipalities hit harder by the crisis might also have experienced a larger drop in

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[12] Admittedly, this is an imperfect measure of austerity as it captures only municipal austerity programs and we know that the most stringent consolidation measures happened at the regional level (Zabalza, 2021). Notice, however, that we also control for provincial fixed effects in the regression, which should already account for regional differences in austerity policies. Finally, note that, if our results still capture some additional economic factor in addition to unemployment, it is possible to re-interpret the "unemployment shock" as a proxy for a more general "economic shock".

housing prices, and more outmigration or at least a slowdown of immigration flows.

Heterogeneity. To study whether the effect of the unemployment shock on fragmentation is amplified by the prior experience of corruption we estimate the following equation:

$$\Delta Fragmentation_i = \beta \Delta Unemployed_i + \delta\,\Delta Unemployed_i * Corruption_i +$$

$$+ \mu\,Corruption_i + X_i'\gamma + \lambda_j + \lambda_k + \varepsilon_i, \qquad (2)$$

where $Corruption_i$ is a dummy variable equal to one if municipality *i* experienced at least one corruption scandal related to a local politician belonging to a mainstream party (i.e., either the *PSOE* or the *PP*) during the boom years (i.e., 1999-2007). We think these are the cases that fit better the story that the increase in the punishment of mainstream parties because of the crisis was related to a prior history of corruption. Note that some of these municipalities may have also experienced a corruption scandal in the crisis (2008-2015). In the robustness section, we report the results obtained when controlling for a dummy which identifies those municipalities that experienced a corruption scandal during the crisis (both on its own and interacted the unemployment shock) or when excluding them from the sample.

Regarding interpretation, notice that the β coefficient in equation (2) measures the impact of the unemployment shock on fragmentation in places that did not have an experience with corruption, while $\beta + \delta$ is a measure of the impact of the unemployment shock in places that did have that experience. Testing whether the coefficient on the interaction term, δ, is different from zero tells us whether the impact of the unemployment shock was larger in places hit by corruption.[13]

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[13] Although this is the main purpose of the paper, the results from the estimation of equation (2) also allow us to recover other interesting parameters. Provided that $\Delta Unemployed_i$ is demeaned, the coefficient μ can be interpreted as the impact of corruption in a municipality hit by the mean unemployment shock. Also, the marginal effect $\mu + \delta$ can be interpreted as the impact of

In terms of identification, the estimation of equation (2) poses the same challenges than equation (1). In particular, fragmentation should not evolve differently in corrupt and non-corrupt municipalities before 2008. We show that fragmentation in these two types of municipalities did indeed follow the same evolution over time. This also happens for the interaction between the unemployment shock and corruption. Among municipalities without a history of corruption, the evolution of fragmentation (during and before the boom) is similar irrespective of the size of the unemployment shock. The same happens in the case of corrupt municipalities.

However, the estimation of the interaction coefficient δ faces one added difficulty. Even if the effects of the unemployment shocks in non-corrupt and corrupt municipalities (i.e., β and $\beta + \delta$, respectively) are well identified, it is not clear that the difference between them (i.e., δ) tells us only about the effect of corruption on the response to the unemployment shock. Since corruption might be correlated with other confounders, the different sensitivity to the economic shocks might be generated by other factors rather than the exposition to corruption scandals. However, note that our fixed effects capture the variation in omitted factors that are likely to be homogeneous over municipalities of similar size in the same province (e.g., family types or social capital). In addition, we assess the robustness of our results to adding interactions between the unemployment shock and possible confounders of corruption: political fragmentation, electoral volatility, turnout, and a left-right ideology index, all of them computed as historical averages (i.e., over all the elections prior to the boom). These political variables account for the possibility that corruption might be higher in places with historically low turnout, with right-leaning voters, and with low electoral competition (see Solé-Ollé and Sorribas-

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corruption in a municipality that experienced an unemployment shock of one p.p. above the mean.

Navarro, 2018, for evidence). In an even more demanding specification, we control for a full set of interactions between the unemployment shock and provincial fixed effects, thus estimating the interaction effect using only within-province variation.

Another issue regarding the estimation of the interaction effect is that it is meaningful to the extent that municipalities with and without corruption scandal histories experience two distributions of unemployment changes that overlap. If those distributions do not overlap, then the differential effect between the two types of municipalities would rely on extrapolating the effect beyond the distribution of unemployment changes. Figure A1 displays the distributions of the unemployment shocks for municipalities with and without corruption, revealing that there is a common support in the two distributions.

Estimation and inference. The above equations are estimated by ordinary least squares. To avoid our results being influenced by a myriad of small municipalities, we drop those with fewer than 1,000 residents. We also exclude from our analysis municipalities from two regions (the Basque Country and Catalonia) that have always had a completely different political scenario. In these regions there are important regional and nationalist parties, and the two main national parties, the *PP* and the *PSOE*, have historically obtained a substantially lower vote share.[14] As a robustness check, we show the results when these regions are included. Additionally, we weight our observations by voting population (as of the 2008 census) to ensure our results reflect the effects on the average Spanish voter. The results without population weights would inform us about the effects for the average municipality, but not necessarily for the average voter. We perform robustness analyses

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[14] For example, in the 2008 national election, the *PP* and the *PSOE* got a combined 51.9% vote share in Catalonia, and a 56.7% in the Basque Country. Remember that the vote share obtained by these two parties at that election for the whole Spain was 82%.

to show that the results do not depend neither on the specific sample used nor on the weights scheme. We cluster the standard errors at the province level.

4.3. Data description and sources

Political outcomes. The main political outcome studied is a fragmentation index (*Fragmentation*) computed using vote data from national elections at the municipality level. As a measure of fragmentation, we use the effective number of parties, a standard measure of fractionalization in the literature (Laakso and Taagepera, 1979).[15] Figure 2 shows the evolution of this index across municipalities between 2000 and 2015, depending on whether they have been exposed to corruption (panel a) or not (panel b). Several trends should be highlighted. First, the graphs show a small increase in fragmentation between the 2008 and 2011 elections, and a large spike between the 2011 and 2015 elections. This increase is larger in municipalities exposed to corruption. Second, this increase ran parallel to the increase in unemployment. The unemployment rate jumped from around 5% in 2008 to close to 12% in 2011 and at around 13% in 2015.[16] It followed a similar pattern in both groups of municipalities. Finally, neither unemployment nor fragmentation changed much between the 2000 and 2008 elections.

We also study the effects on the vote for the two mainstream parties together (%*Vote main parties*) and also the vote for specific parties, either the two main parties (%*Vote incumbent*, %*Vote challenger*) or each of the non-mainstream parties, either the new parties (*Podemos* or *Ciudadanos*) or the old ones (*Izquierda Unida*, the former

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[15] This index corresponds to the inverse of the Herfindahl–Hirschman Index and is computed as *Fragmentation* = $1/\sum_k (\#Votes\ Party\ k/\#Votes)^2$. The distribution of the fragmentation index for the 2008 and 2015 elections can be seen in Figure A2. The results are very similar when considering *Fragmentation** = $1 - \sum_k (\#Votes\ Party\ k/\#Votes)^2$.

[16] Here we report the unemployment rate that we use in our empirical analysis, computed as the ratio between the number of unemployed people and the working age population. This number is smaller than the official unemployment rate, which is computed as a ratio over the number of people actively searching for a job. This information is not available at the local level.

communist party, and other minor parties grouped together). Finally, we also look at the effects on turnout. The data on votes to parties at national elections at the municipality level are from the Spanish Ministry of Home Office.[17]

Figure 2:
Unemployment and fragmentation over time

a) Corruption= 1   b) Corruption=0
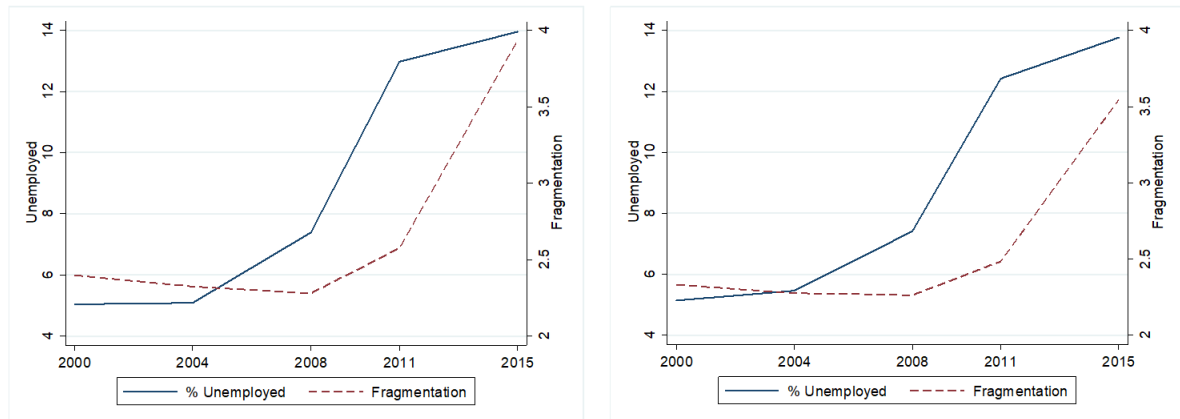
Notes: %Unemployed = #Unemployed over working age population; Fragmentation = 'Effective number of parties'. Both variables are computed as the mean across municipalities in our sample.

Unemployment. The unemployment rate is measured as the number of unemployed individuals in the municipality averaged over the 12 months of the year, over the working age population. The unemployment shock ($\Delta\%Unemployed$) is computed as the difference in the unemployment rate between the election years, i.e., from 2008 to 2015. The source of this variable is the Spanish Ministry of Employment. The quality of these data is very high on international standards. Notice that we are working with administrative data with census characteristics, something that contrasts with many indicators used in the literature which are based on estimates of economic activity and are thus prone to measurement error (see Healy and Lenz, 2017, for a further discussion of the advantages of using this type of data).

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[17] See Table A1 in the Online Appendix for the summary statistics of all variables.

Corruption. To measure the history of corruption we use a dummy variable (*Corruption*) which is equal to one if the municipality experienced (at least) one local corruption scandal prior to the crisis (i.e., from 1999 to 2007) that affected one of the main parties (*PSOE* or *PP*).[18] The source of these data is an updated version of the database employed by Solé-Ollé and Sorribas-Navarro (2018). The authors started with a hand-coded list of corruption scandals compiled by the Spanish think-tank *Fundación Alternativas* in 2007 and extended it with internet-guided searches. For this project, we updated and improved this database using *Factiva*.[19] We screened the period from January 1995 to January 2015 using as our keywords 'corruption' and the names of all Spanish municipalities. Almost no news items were found for the period prior to the 1999 election. We then implemented a machine learning algorithm to identify the news items referring to corruption scandals. In our sample, around 16% of the municipalities had a corruption scandal. Notice that we are measuring corruption as revealed by the media, which might differ from its actual incidence. However, provided that voters learn about corruption from the media, this is precisely what could influence their behavior (Costas-Pérez et al., 2012).

Another advantage of our data is that we have information regarding the moment of publication of the first news story and also regarding the period of time in which corruption activities presumably took place. This means that we are able to divide corruption cases into scandals that broke out during the boom and scandals that—even though might refer to episodes that happened in the boom—broke out during the crisis.

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[18] We exclude from the control group those municipalities that experienced a corruption scandal that did not affect one of the two main parties. We show that the results are similar when considering corruption scandals affecting any party and not only the *PSOE* or the *PP*.

[19] Our database contains scandals published in national, regional, and local newspapers.

Control variables. Data for the socio-demographic variables *Mean Age* and *%Immigrants* are from the local registry data. The information comes from the Spanish National Institute of Statistics (*INE*). *%College educated* comes from census data. The last census before the treatment period begins (2008) was the 2001, so this variable refers to that year. *Housing prices* is measured as the selling price of new houses, in thousands of euros per square meter. The information comes from a database from the Spanish Property Registry. *Expenditures* are municipal current expenditures measured in thousand euros per capita and is obtained from the Ministry of Finance. Finally, in some specifications we include as additional controls interactions between unemployment and possible confounders of corruption. Specifically, we consider historical fragmentation, turnout, electoral volatility, and ideology, computed as averages using data for elections prior to treatment (that is, from 1983 to 2004). The volatility measure is the Pedersen index (Pedersen, 1979), computed by multiplying by ½ the sum of the absolute value of the change in vote shares of all the parties in two consecutive elections. The ideology variable has been computed as the weighted average of the ideological placement of each party, the weights being the parties' vote shares at the national legislative elections.[20]

5. Results j

5.1 The effect of unemployment on political fragmentation

As a first step, we estimate the average effect of the local unemployment shock experienced during the period 2008-15 on the change in fragmentation during this period, without taking into account the history of corruption of each municipality.[21] We estimate the generalized difference-in-difference specification given by equation (1),

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which includes province and population strata fixed effects, and also pre-treatment political, socio-demographic, and economic controls: fragmentation, vote shares and turnout at the 2008 election, mean age, education level, share of immigrants, initial unemployment rate, housing prices, and local spending per capita.

Column (1) of Table 1 reports the results of this estimation. An increase of one p.p. in the unemployment rate led to an increase of 0.018 in the fragmentation index. This implies that a one standard deviation of the unemployment shock (2.50 p.p.) increased the fragmentation index by 0.045 (=0.018 x 2.50), or 8.3% of a standard deviation of the dependent variable (which is 0.54). The effect is statistically significant at the 1% level.[22]
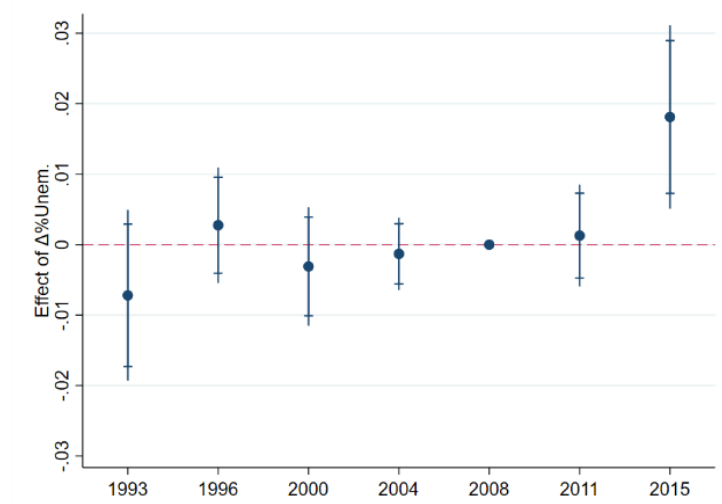
Table 1:
The impact of the unemployment shock on fragmentation:
The amplifying effect of corruption

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Pre-trend analysis			
	2015	2015	2015	1993	1996	2000	2004
Δ% Unemployed × Corruption	--.--	--.--	0.032*** (0.011)	-0.003 (0.012)	0.005 (0.007)	0.003 (0.007)	0.002 (0.003)
Δ%Unemployed	0.018*** (0.006)	0.019*** (0.006)	0.009 (0.006)	-0.006 (0.006)	0.001 (0.004)	-0.004 (0.004)	-0.002 (0.003)
Corruption	--.--	0.056*** (0.018)	0.053** (0.020)	-0.001 (0.035)	0.001 (0.017)	-0.002 (0.016)	-0.006 (0.011)
R^2	0.785	0.787	0.790	0.648	0.563	0.559	0.457
Observations	2228	2228	2228	2222	2226	2228	2228

Notes: (1) Sample=Spanish municipalities with more than 1,000 residents in 2008, excluding Catalonia and the Basque Country. (2) The dependent variable is the increase in *Fragmentation* from 2008 to 2015. *Fragmentation* = 'Effective Number of Parties', computed with the vote shares of all the parties running at the elections. (3) *Δ%Unemployed*= Increase in the unemployment rate during the period 2008-2015. (4) *Corruption* =dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* from 1999 to 2007. (5) OLS estimation weighted by voting population; controls are province and population strata fixed effects, political (fragmentation, parties vote shares, and turnout), socio-demographic (mean age of the population, percentages of educated people, share of immigrants), and economic (unemployment rate, local spending pc, housing prices) variables in the base year (2008). (6) S.e., clustered at the province level shown in parentheses, * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

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[22] We omit the coefficients for all control variables from the table for the sake of simplicity, but they are available in Table A2. Most of the socio-economic variables are statistically significant and the results are meaningful: for example, we find that the increase in the fragmentation index is higher where there are more unemployed, educated, and young people.

Figure 3:
The impact of the unemployment shock on fragmentation

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to the year indicated in the x-axis. (2) Δ%*Unemployed* = increase in the unemployment rate during the crisis (2008-2015). (3) The sample and control variables are the same as in Table 1, column (1). (4) S.e. clustered at the province level, 95% and 90% confidence intervals reported.

Figure 3 shows the estimates for several pre-trend placebo tests. For each year, we use the increase in fragmentation between that year and 2008 as dependent variable. Besides of this, we are estimating exactly the same specification as before, including the fixed effects and controls already described. All the coefficients are very close to zero and statistically insignificant, which indicates that—both during and before the boom— fragmentation was on the same path in municipalities that were hit by small and by large unemployment shocks during the recession. The graph clearly shows that the unemployment shock only had a significant and meaningful effect on fragmentation in the 2015 election.

Notice that the inclusion of the province' and population strata fixed effects is crucial to get rid of the pre-trends in political fragmentation. These fixed effects may account for important confounders of the unemployment shocks that are constant across municipalities belonging to the same province or that are similar in size. Figure A3

displays the same graph obtained when relying on a 'pure' differences-in-difference specification, that is, excluding the fixed effects and the controls from the specification. This graph does show evidence of non-negligible pre-trends: larger unemployment shocks are associated with larger initial values of fragmentation (relative to its 2008 value). Figure A4 displays the same analysis when controlling for the fixed effects but not for the other controls. The results are similar to the ones discussed in the main text, clearly suggesting an absence of pre-trends. The coefficients for the elections held during the crisis are, however, a bit less precisely estimated than when we add the whole set of controls. For this reason, we keep reporting the full specification, with both fixed effects and controls, in the rest of the paper.

## 5.2 Heterogeneity: The amplifying effect of corruption

The remaining columns in Table 1 show the results of estimating equation (2). Column (2) adds only corruption. Column (3) also includes its interaction with the unemployment shock (which is demeaned so we can interpret the corruption coefficient as the marginal effect at the mean value of the unemployment shock). Columns (4)-(7) show pre-trend placebo tests.

The results reveal that an increase of one p.p. in the unemployment shock led to a mild and non-significant increase of 0.009 in the fragmentation index if the municipality had not experienced a corruption scandal in the past. This implies that an increase of one standard deviation of the unemployment shock increased fragmentation by 4.2% (0.009x 2.50/0.54) of a standard deviation of the outcome variable. By contrast, the unemployment shock increased the fragmentation index by 0.041 (= 0.032 + 0.009) if the municipality had been exposed to corruption. In terms of standard deviations, this represents a 19% effect. Thus, the effect of the unemployment shock on fragmentation is around four times larger in places exposed to corruption. Note that all pre-trend placebo

tests are close to zero and insignificant, not only for the unemployment shock, but also for the interaction term. These results are represented graphically in Figure 4, which plots the estimated effect of unemployment in the presence of corruption, in the absence (panel *i*) of it, and the difference between the two (panel *ii*).

Figure 4:
The impact of the unemployment shock on fragmentation:
The amplifying effect of corruption

i) Effect of $\Delta\%Unemployed$ for corrupt (blue) and non-corrupt (green) municipalities
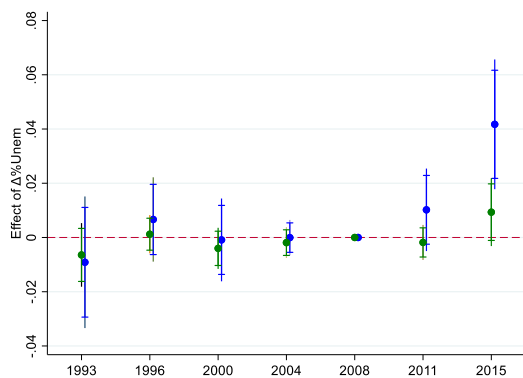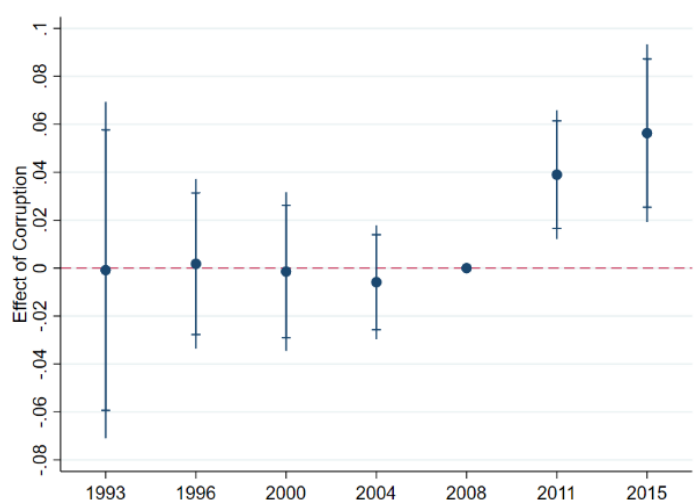
ii) Differential effect
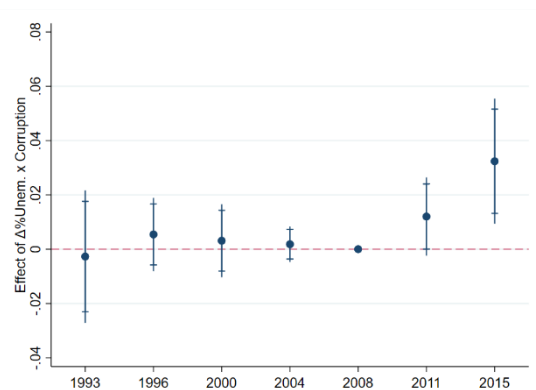
Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to the year indicated in the x-axis. (2) *Corruption* = dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* from 1999 to 2007; $\Delta\%Unemployed$ = Increase in the unemployment rate during the crisis (2008-2015). (3) The sample and control variables are the same as in Table 1, column (3). (4) S.e. clustered at the province level, 95% and 90% confidence intervals reported.

The results in Table 1 also reveal that corruption had a direct impact on fragmentation. The coefficient on *Corruption* is 0.053 and significant at the 5% level. This represents 9.8% of the standard deviation of the dependent variable. Figure 5 represents graphically the estimated effects of corruption. This graph also reveals an absence of pre-trends: fragmentation was on the same path before the crisis in municipalities hit vs. not hit by a corruption scandal.

The results presented so far include the full set of covariates described in Section 4. In Section 5.4, we study the sensitivity of the estimated effects to the control variables, by adding controls sequentially to the regressions, and provide a number of robustness

checks. Before proceeding to those analyses, in the next subsection we provide some

additional results.

Figure 5:
The impact of corruption on fragmentation

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to the year indicated in the x-axis. (2) *Corruption* =dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* from 1999 to 2007; $\Delta\%Unemployed$ = Increase in the unemployment rate during the crisis (2008-2015). (3) The control variables and sample are the same as in Table 1, column (2). (4) S.e. clustered at the province level, 95% and 90% confidence intervals reported.

5.3 Additional results

Effect on main parties and on the incumbent. In Table 2 we report the effect of the

unemployment shock, corruption, and their interaction on the vote share of the two main

parties (*PSOE* and *PP*) in the 2015 election.

The first two columns show the effects on the sum of votes for these two parties.

The results mirror those of the fragmentation index. Unemployment seems to have mildly

reduced the vote for the main parties in the absence of corruption, but this effect is not

significant. However, in the presence of corruption, unemployment significantly harmed

the main parties, which lost votes by around 0.4 p.p. Finally, corruption significantly

reduced the combined vote share of the *PP* and the *PSOE*. The coefficient indicates a drop

of 1.2 p.p., which is equivalent to 12,1% of the standard deviation of this variable.

Table 2:
The impact of the unemployment shock and corruption on the vote for the main parties

	(1)	(2)	(3)	(4)	(5)	(6)
	Δ% *Vote Main Parties*		Δ% *Vote Incumbent (PP)*		Δ% *Vote Challenger (PSOE)*	
Δ% *Unemployed × Corruption*	--.--	-0.371* (0.215)	--.--	-0.199 (0.124)	--.--	-0.171 (0.127)
Δ%*Unemployed*	-0.130 (0.124)	-0.024 (0.121)	-0.062 (0.069)	-0.005 (0.073)	-0.068 (0.076)	-0.019 (0.076)
Corruption	-1.262*** (0.293)	-1.227*** (0.304)	-0.567*** (0.172)	-0.548*** (0.169)	-0.695** (0.282)	-0.679** (0.290)
R²	0.852	0.853	0.878	0.878	0.761	0.761
Observations	2228	2228	2228	2228	2228	2228

Notes: (1) The dependent variable is the increase in the vote share of the main parties; *Δ%Vote Main Parties* is the increase in the combined vote share of the *PP* and the *PSOE* from 2008 to 2015. (2) See notes in Table 1 for the definition of the sample, the controls included in the regressions, and the s.e. reported.

The next four columns of Table 2 show the effects for the two main parties

separately. Notice that the *PP* was the incumbent in this election. What is striking in these

results is that the effects are very similar in size for both parties, suggesting that both

paid a price for taking on government responsibilities at some point during the crisis.

Corruption significantly reduced the vote shares of both parties. It seems that the

unemployment shock and its interaction also did, although these effects are not

statistically significant at conventional levels. This indicates that the vote loss of the that

party that was the incumbent (the *PP*) did not represent a vote gain for the main

opposition party (the *PSOE*). One explanation for these results, that is consistent with the

increase of the fragmentation index, is that these votes went mostly to the new parties.

Hence, these results evidence that the increase in fragmentation is due to the fact that

this election did not follow a traditional economic voting behavior, where the main

opposition party capitalizes from the losses of the incumbent in a situation of economic crises.

Figures A5 and A6 represent these results graphically and display the pre-trend analysis. Overall, we see no significant pre-trend in unemployment, corruption, or their interaction.

Effect on non-mainstream parties and turnout. Table 3 presents the results for non-mainstream parties and for turnout. The unemployment shock led to an increase in the vote for *Podemos* but did not affect much the vote for *Ciudadanos*. In the absence of corruption, the effect of the unemployment shock is close to zero and non-significant for both parties. The interaction coefficient is positive for both parties but larger and only significant for *Podemos*. The estimates imply that, in places with a history of corruption, a one standard deviation rise in the unemployment shock increased the vote share of *Podemos* by 0.70 p.p., or around a 10% of the standard deviation of this variable. Both parties benefited from corruption scandals affecting mainstream parties. In a municipality with the mean unemployment shock, corruption increased the vote share of *Podemos* by 0.79 p.p., and that of *Ciudadanos* by 0.34 p.p., which represent a 11.5% and a 7.8% of the standard deviation of these variables, respectively. These results are consistent with what we know about *Podemos* and *Ciudadanos*. *Podemos* is a left-wing party with a clear anti-elite rhetoric: *Podemos* blamed the elites both for corruption and for the generation of the crisis that hit on the lower class. *Ciudadanos* also had an anti-corruption agenda but was a reformist party and was quite well considered by the economic elites of the country. It makes therefore sense that both parties reaped some electoral benefits out of the corruption scandals of the main parties, but it also makes sense that only in the case of *Podemos* the effects of the unemployment shock and corruption reinforce each other. Clearly, of the two parties, the behavior of *Podemos* is

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Table 3:
The impact of the unemployment shock and corruption on the vote for non-mainstream parties and on turnout

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Δ% Vote New Parties				Δ% Vote Old Parties				Δ% Turnout	
	Podemos		Ciudadanos		Izquierda Unida		Other parties			
Δ% Unemployed ×Corruption	--.--	0.266** (0.123)	--.--	0.087 (0.090)	--.--	-0.033 (0.047)	--.--	0.013 (0.060)	--.--	-0.034 (0.051)
Δ%Unemployed	0.089 (0.096)	0.013 (0.096)	-0.025 (0.074)	-0.050 (0.067)	0.041 (0.038)	0.051 (0.042)	-0.004 (0.052)	-0.007 (0.049)	0.022 (0.042)	0.032 (0.043)
Corruption	0.817*** (0.260)	0.792*** (0.244)	0.351* (0.201)	0.343* (0.198)	-0.121 (0.105)	-0.111 (0.102)	0.242* (0.137)	0.241* (0.138)	0.022 (0.155)	0.025 (0.152)
R^2	0.793	0.794	0.854	0.854	0.437	0.437	0.847	0.847	0.655	0.655
Observations	2228	2228	2228	2228	1983	1983	2228	2228	2228	2228

Notes: (1) *New Parties* = Parties running for the first time at the 2015 elections; *Old Parties*=parties already running before 2015; (2) See notes in Table 1 for the definition of the sample, the controls included in the regressions, and the s.e. reported.

the one that is more in line with one of the mechanisms that could explain the link between the corruption and the intensity of economic punishment at the polls: the one suggesting that corruption helps voters attribute responsibility for the generation of the crisis to the main parties.

Finally, we do not find significant effects on the vote for old (non-mainstream) parties or on turnout. All parties, especially *Izquierda Unida*, had been around for a while, and had participated in coalition governments (at the local and regional level) with mainstream parties, meaning that voters might not have considered them as a genuine alternative to the mainstream parties. In the case on turnout, the coefficients for the unemployment shock, corruption, and their interaction are close to zero and non-significant. This might at first sight be surprising, given the potentially demobilizing effect of crisis on turnout. Remember, however, that the predictions of the literature regarding this effect are varied. Notice also that, after the appearance of the new parties, many people that would have opted to abstain, had now a viable alternative for which to vote.

Effect on the 2011 election. Throughout the paper, we focus on the 2015 election, which was the first one after the end of the recession. As explained, despite the high rise in unemployment during the first year of the crisis (in 2008), the stronger reaction against the government and the political elites in general took some time to take place. This is reflected in the fact that, in the first election after the beginning of the crisis, that of 2011, there were no new parties in the political landscape (*Podemos* was not founded until 2014, and *Ciudadanos* was mostly confined to Catalonia and did not run).

Table 4:
The impact of the unemployment shock and corruption at the 2011 election

	(1)	(2)	(3)	(4)	(5)	(6)
	ΔFragmentation		Δ% Vote Main Parties	Δ% Vote Incumbent (*PSOE*)	Δ%Vote Challenger (*PP*)	ΔTurnout
Δ%Unemployed.×Corruption	--.--	-0.001	-0.008	-0.020	0.012	-0.030
	--.--	(0.009)	(0.181)	(0.120)	(0.122)	(0.055)
Δ%Unemployed	0.000	0.000	-0.005	-0.219***	0.214***	0.108***
	(0.004)	(0.004)	(0.065)	(0.065)	(0.069)	(0.034)
Corruption	0.039***	0.039**	-0.575**	-0.270	-0.305	-0.196*
	(0.013)	(0.015)	(0.267)	(0.220)	(0.295)	(0.110)
R^2	0.843	0.843	0.830	0.565	0.806	0.456
Observations	2228	2228	2228	2228	2228	2,228

Notes: (1) The dependent variables are: i) in columns (1) to (3) the increase in *Fragmentation* from 2008 to 2011; in column (4) the increase in the vote share of the main parties; %Vote Main is the combined vote share of the *PP* and the *PSOE* from 2008 to 2011*;* in column (5) the increase in the vote share of the incumbent (*PSOE*) from 2008 to 2011; in column (6) the increase in the vote share of the main challenger (*PP*) from 2008 to 2011. (2) Δ%*Unemployed*= Increase in the unemployment rate during the period 2008-2011. (3) See notes in Table 1 for the definition of the sample, the controls included in the regressions, and the s.e. reported.

Here we study what happened in the 2011 election. We follow the same empirical strategy, with the only difference that we consider unemployment growth from 2008 to 2011 (instead of 2015) as the treatment variable. The results are laid out on Table 4. The first two columns consider the fragmentation index as the outcome. We do not see any effect of the unemployment shock on fragmentation in the 2011 election. The point estimate is very close to zero and non-significant. Corruption, by contrast, did increase fragmentation in 2011. Having been exposed to a corruption scandal increased the fragmentation index by 0.039 units in the municipality with the average unemployment shock, i.e., an effect similar to that on the 2015 election. There was no interaction between unemployment shock and corruption in this election. Figure A7 displays graphically these results and the associated pre-treatment placebo tests. We can see that there are also no pre-trends in this specification.

In column (3), we consider the effect on the two main parties' combined vote share. The results mirror those for fragmentation: corruption reduces the vote share of the main parties, while unemployment does not have any effect. In columns (4) and (5), we show

the effects on the incumbent (the *PSOE*) and the main challenger (the *PP*) separately. Both parties seem to have been punished for corruption, but the effects are not significant. Regarding the unemployment shock, it reduced the vote for the incumbent and increased it by a similar amount for the challenger. Finally, column (6) shows the results for voter turnout. Unlike in 2015, when turnout was not affected by unemployment or corruption, we do find significant effects for 2011. Specifically, corruption reduced turnout while unemployment increased it, with no significant interaction between the two.

In line with Hernández and Kriesi (2016), these results suggest that this election followed a more traditional economic voting pattern: voters reacted to the unemployment shock by punishing the incumbent and favoring the "traditional" opposition party, which may have also obtained votes coming from abstention . This in contrast with the effects for 2015, in which the vote loss of the incumbent (the *PP* in this case) did not represent a vote gain for the main opposition party (the *PSOE*). Corruption, on the other hand, reduced votes for the two main parties and *reduced* turnout, which can be explained by the absence of viable alternatives to vote for.

5.4 Robustness checks

We examine the sensitivity of the estimated effects to: (i) adding control variables sequentially, (ii) controlling for changes brought about by the crisis that could be correlated with unemployment, (iii) controlling for corruption scandals breaking out during the crisis (2008-2015) and dropping municipalities that did not have a corruption scandal during the boom but had it during the crisis, (iv) allowing for non-linearities in the unemployment effect, (v) considering the intensity of corruption, by estimating separate coefficients for having had a corruption scandal in one versus the two terms of the boom period, (vi) considering an alternative definition of corruption scandals (all corruption scandals instead of only those belonging to the *PP* or the *PSOE)* and the

inclusion of the Basque Country and Catalonia, (vii) using different samples (excluding small or large municipalities) or weighting schemes (or no weighting), (viii) using local labor markets (LLM) instead of municipalities as the unit of observation. These results are displayed in Appendix B.

6. Conclusion

In this paper, we investigate whether corruption amplifies the political effects of economic crises. Through a difference-in-difference analysis using municipal-level data from Spain, we do find evidence in favor of this hypothesis. Our analysis shows, first, that the unemployment shock causes an increase in political fragmentation. Second, that the impact of the unemployment shock on political fragmentation is substantially larger in places that have been exposed to local corruption. And third, that local corruption has a direct impact on fragmentation in national elections, indicating that there are spillovers from the behavior of local politicians to their party at a higher-tier election.

We find similar effects when we look at the effect on the vote for the two mainstream parties combined. In the case of the new parties, the strongest effects are on *Podemos*, the left-wing party that emerged from the protest movements of the 15-M. Although *Ciudadanos*, a liberal reformist party that was quite successful in the 2015 elections, also reaped some benefits out of the corruption scandals affecting mainstream parties, only for *Podemos* did corruption clearly amplify the effect of the unemployment shock. This is consistent with the idea that corruption helped voters to attribute responsibility of the generation of the crisis to the political elites of the country.

Interestingly, we find that the effects were somewhat different for the first election after the crisis, that of 2011: neither the unemployment shock, nor its interaction with corruption, increased fragmentation in that election. Why did strong new parties take some time to emerge? Our hypothesis is that, in the 2011 election, dissatisfied voters who

wanted to punish the incumbent (the *PSOE*) turned to the main traditional opposition party (the *PP*). This is consistent with our 2011 election results. When seeing that the economic situation did not improve much under the *PP* either, voters turned to new parties. It is also possible that supply-side explanations, such as the organizational costs of creating a new party, played a role too. An interesting avenue for future research is to study what may explain the timing of political changes across countries—for example, studying whether factors like the electoral system, or the penetration of social media, can accelerate or delay these changes.

References

Aassve, A., Daniele, G., and Le Moglie, M. (2019): "Never forget the first time: the persistent effects of corruption and the rise of populism in Italy." Mimeo.

Adler, D. and Ansell, B. (2020): "Housing and populism." *West European Politics* 43(2), 344-365.

Ajzenman, N. (2020): "The Power of Example: Corruption Spurs Corruption." *American Economic Journal: Applied Economics*, forthcoming.

Algan, Y., Guriev, S., and Papaiaonnou, E. (2017): "The European trust crisis and the rise of populism." *Brookings Papers on Economic Activity* 48(2), 309-400.

Alt, J.E., Jensen, A., Larreguy, H.A., Lassen, D.D., and Marshall, J. (2021): "Diffusing political concerns: How unemployment information passed between social ties influences Danish voters." *Jorunal of Politics,* forthcoming.

Ansolabehere, S., Meredith, M., and Snowberg, E. (2014): "Mecro-economic voting: local information and micro-perceptions of the macro-economy." *Economics & Politics* 26 (3), 380-410

Armingeon, K. and Guthmann, K. (2014): "Democracy in crisis? The declining support for national democracy in European countries, 2007–2011." *European Journal of Political Research* 53 (3), 423-442

Autor, D., Dorn, D., Hason, G., and Majlesi, K. (2020): "Importing political polarization? The electoral consequences of rising trade exposure." *American Economic Review*, forthcoming.

Bértoa, F. and Weber, T. (2019): "Restrained change: party systems in times of economic crisis", *Journal of Politics* 81 (1), 233-245.

Burden, B.C. and Wichowsky, A. (2014): "Economic discontent as a mobilizer: Unemployment and voter turnout." *Journal of Politics* 76 (4), 887-898.

Cordero, G. and Orriols, Ll. (2016): "The breakdown of the Spanish two-party system: The upsurge of *Podemos* and *Ciudadanos* in the 2015 General Election." *South European Society & Politics* 21(4), 469-492.

Costas-Pérez, E., Solé-Ollé, A., and Sorribas-Navarro, P. (2012): "Corruption, voter information, and accountability." *European Journal of Political Economy* 28(4), 469-484.

Dal Bó, E., Finan, F., Folke, O., Persson, T., and Rickne, J. (2020): "Economic and Social Outsiders but Political Insiders: Sweden's Radical Right." Mimeo.

Daniele, G., Galletta, S., and Geys, B. (2020): "Abandon ship? Party brands and politicians' responses to a political scandal." *Journal of Public Economics*, forthcoming.

Dippel, C., Gold, R., Heblich, S., and Pinto, R. (2021): "The Effect of Trade on Workers and Voters." *Economic Journal,* forthcoming.

Duch, R. M. and Stevenson, R.T. (2008): *The Economic Vote: How Political and Economic Institutions Condition Election Results*. Cambridge: Cambridge University Press.

Duch, R. M. and Stevenson, R.T. (2010): "The Global Economy, Competency, and the Economic Vote." *Journal of Politics* 72(1), 102-123.

Duch, R.M. (2001): "A developmental model of heterogeneous economic voting in New Democracies." *American Political Science Review* 95(4), 895-910.

Dziuda, W. and Howell, W. (2019): "Political scandal: a theory." Processed, Harris School of Public Policy, U. of Chicago, Chicago.

Fernández-Albertos, J. (2015): *Los votantes de Podemos. Del partido de los indignados al partido de los excluidos.* Madrid, Libros La Catarata.

Fernández-Villaverde, J., Garicano, L., and Santos, T. (2013): "Political credit cycles: the case of the Euro Zone." *Journal of Economic Perspectives* 27(3), 145-166.

Ferraz, C. and Finan, F. (2008): "Exposing corrupt politicians: the effects of Brazil's publicly released audits on electoral outcomes." *Quarterly Journal of Economics* 123 (2), 703-745.

Fetzer, T. (2019): "Did austerity cause Brexit?" *American Economic Review*, 109(11), 3849-86.

Fundación Alternativas (2007): *Urbanismo y democracia. Alternativas para evitar la corrupció*n, Madrid.

Fundación Alternativas (2010): *Democracy in Spain* 2010. *The erosion of confidence and well-being. Against citizens' disaffection*, Madrid.

Funke, M., Schularick, M., and Trebesch, Ch. (2016): "Going to extremes: politics after financial crises, 1870-2014." *European Economic Review* 88, 227-260.

Galbraith, J.K. (1955): *The Great Crash, 1929.* Boston, Houghton Mifflin.

Galofré-Vilà, G., Meissner, Ch., McKee, M., and Stuckler, D. (2020): "Austerity and the rise of the Nazi party." *Journal of Economic History*, forthcoming.

Geys, B. (2006): "District magnitude, social heterogeneity and local party system fragmentation." *Party Politics* 12(2): 281-297.

Guiso, L., Herrera, H., Morelli, M., and Sonno, T. (2018a): "Global crisis and populism: the role of the Eurozone institutions." *Economic Policy*, forthcoming.

Guiso, L., Herrera, H., Morelli, M., and Sonno, T. (2018b): "Populism: demand and supply.", mimeo.

Hall, A., Karandikar, N., and Yoder, J. (2017): "Economic distress and voting: evidence from the subprime mortgage crisis." Processed, Stanford U.

Halla, M., Wagner, A.F., and Zweimüller, J. (2017): "Immigration and voting for the far right." *Journal of the European Economic Association* 15(6), 1341-1385.

Häusermann, S., Kurer, T., and Wüest, B. (2017): "Participation in hard times: How constrained government depresses turnout among the highly educated." *West European Politics* 41(2), 448-471.

Healy, A. and Lenz, G.S. (2017): "Presidential voting and the local economy: Evidence from two population-based datasets*." Journal of Politics* 79(4).

Hernández, E. and Kriesi, T. (2016): "The electoral consequences of the financial and economic crisis in Europe." *European Journal of Political Research*, 55 (2): 203-24.

Herrera, H., Ordoñez, G., and Trebesch, C. (2020): "Political booms, financial crises". *Journal of Political Economy*, forthcoming.

Hobolt, S.B. and Tilley, J. (2016): "Fleeing the center: The rise of challenger parties in the aftermath of the euro crisis." *West European Politics* 39(5), 971-991.

Kiewiet, D. R. and Lewis-Beck, M.S. (2011): "No man is an island: Self-interest, the public interest, and sociotropic voting." *Critical Review* 23(3), 303–31.

Klansja, M. and Tucker, J. (2013): "The economy, corruption, and the vote: evidence from experiments in Sweden and Moldova." *Electoral Studies* 32(3), 536-543.

Kriesi, H. (2014): "The political consequences of the economic crisis in Europe: electoral punishment and popular protest," pp. 297-333 in *Mass politics in tough times. Opinions, votes, and protest in the Great Recession*, edited by Nancy Bermeo and Larry Bartels, Oxford U Press.

Laakso, M., and Taagepera, R. (1979). ""Effective" number of parties: a measure with application to West Europe." *Comparative Political Studies*, 12(1), 3-27.

Lago, I., and Martínez, F. (2011). Why new parties?. *Party Politics*, 17(1), 3-20.

Lewis-Beck, M. S. and Paldam, M. (2000): "Economic Voting: An Introduction." *Electoral Studies* 19(2-3),113–121.

Lewis-Beck, M. S. and Stegmaier, M. (2007): "Economic models of voting." In *The Oxford Handbook of Political Behavior*, edited by Russell J. Dalton and Hans-Dieter Klingemann, Oxford U Press.

Lijphart, A. 1990. "The Political Consequences of Electoral Laws, 1945–85." *American American Political Science Review*, 84(2), 481-496.

Margalit, Y. (2019): "Economic shocks and political preferences." *Annual Review of Political Science* 22(1), 277-295.

Mian, A., Sufi, A., and Trebbi, F. (2010): "The political economy of the US mortgage default crisis." *American Economic Review* 100(5), 1967-98.

Mian, A., Sufi, A., and Trebbi, F. (2013): "The political economy of the US mortgage expansion." *Quarterly Journal of Political Science* 8(4), 373-408.

Mian, A., Sufi, A., and Trebbi, F. (2014): "Resolving debt overhang: Political constraints in the aftermath of financial crises." *American Economic Journal: Macroeconomics* 6(2), 1-28.

Ordeshook, P. and Shvetsova, O. (1994): "Ethnic heterogeneity, district magnitude, and the number of parties." *American Journal of Political Science* 38(1), 100-123.

Pedersen, M. (1979): "The dynamics of European party systems: changing patterns of electoral volatility." *European Journal of Political Research* 7(1), 1-26. Przeworski, A., Stokes, S.C., and Manin, B. (2000): *Democracy, Accountability, and Repre-sentation*, Cambride Univ. Press.

Riera, P., (2020): "Socioeconomic heterogeneity and party system fragmentation." *Journal of Elections, Public Opinion and Parties,* DOI: 10.1080/17457289.2020. 1784181.

Riera, P., Barberá, P., Gómez, R., Mayoral, J.A., and Montero, J.R. (2013): "The electoral consequences of corruption scandals in Spain." *Crime, Law & Social Change* 60(5) 515-534.

Rodon, T., and Hierro, M.J. (2016): "New forces shake up the Spanish party system: the 2015 local and regional elections." *South European Society and Politics* 21(3), 339-357.

Rowe, K. T. (2015): "Making voice count: Economic voting and the number of parties." *Party Politics* 21(5), 803-812.

Sanz, C., Solé-Ollé, A. and Sorribas-Navarro, P (2021): "Replication Data for Comparative Political Studies Dataverse." DOI: https://doi.org/10.7910/DVN/HHGS1I.

Solé-Ollé, A. and Sorribas-Navarro, P. (2018): "Trust no more? On the lasting effects of corruption scandals." *European Journal of Political Economy*, 55, 185-203.

Solé-Ollé, A. and Viladecans-Marsal, E. (2019): "Housing booms and local spending." *Journal of Urban Economics*, 113, September.

Tavits, M. (2006). Party system change: testing a model of new party entry. *Party Politics*, 12(1), 99-119.

Zabalza, A. (2021): "The Provision of Public Services under Conditions of Financial Stress: Evidence from Spanish Autonomous Communities", *Hacienda Pública Española / Review of Public Economics,* 236(1), 65-104

Zechmeister, E. J., & Zizumbo-Colunga, D. (2013). "The varying political toll of concerns about corruption in good versus bad economic times." *Comparative Political Studies*, 46(10), 1190-1218.

Online Appendix A: Additional Figures and Tables

Figure A1:
Distribution of the unemployment shock, by corruption
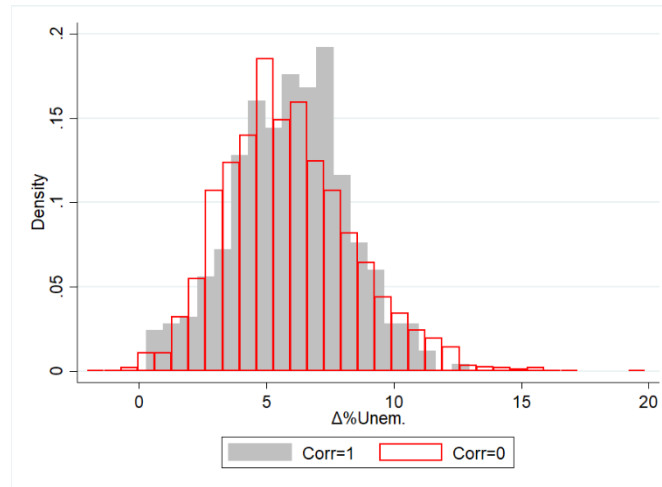
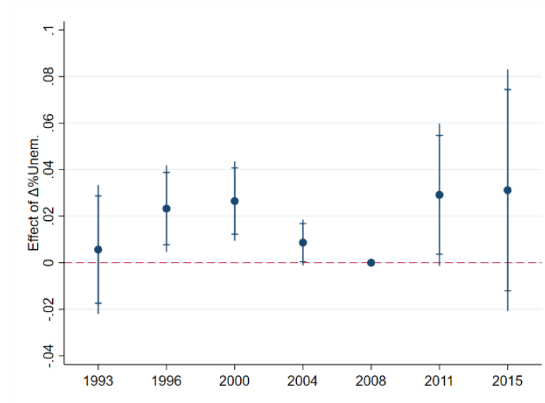Notes: (1) Δ%*Unemployed* = Increase in the unemployment rate during the crisis (2008-2015). (2) *Corruption* = dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* from 1999 to 2007.

Figure A2:
*Distribution of the fragmentation index, by year*
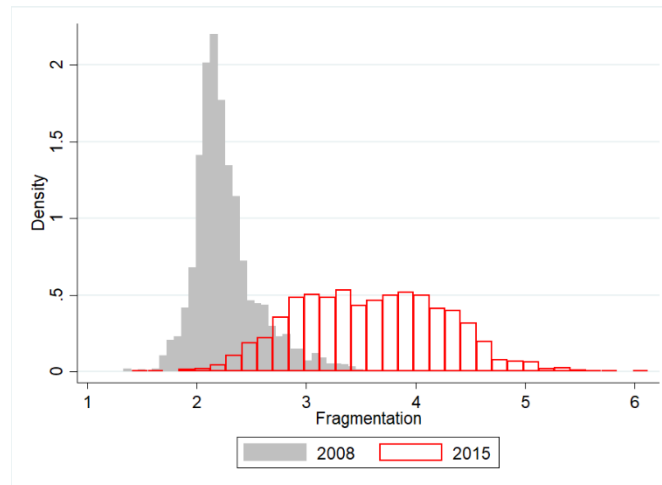
Notes: (1) *Fragmentation* defined as the effective number of parties (see text).

Figure A3:

The impact of the unemployment shock on fragmentation: Pure DinD

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to the year indicated in the x-axis. (2) Δ%*Unemployed* = Increase in the unemployment rate during the crisis (2008-2015). (3) No fixed effects or controls included. (4) S.e. clustered at the province level, 95% and 90% confidence intervals reported.

Figure A4:

The impact of the unemployment shock on fragmentation: Controlling for province and population-strata fixed effects
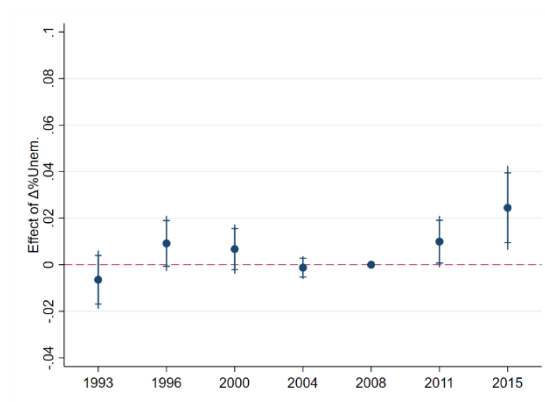
Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to the year indicated in the x-axis. (2) Δ%*Unemployed* = Increase in the unemployment rate during the crisis (2008-2015). (3) The control variables are province and population strata fixed effects. (4) S.e. clustered at the province level, 95% and 90% confidence intervals reported.

Figure A5*: Pre-trend analysis for the main parties:*
The impact of the unemployment shock and corruption

a) Δ% Vote Main Parties
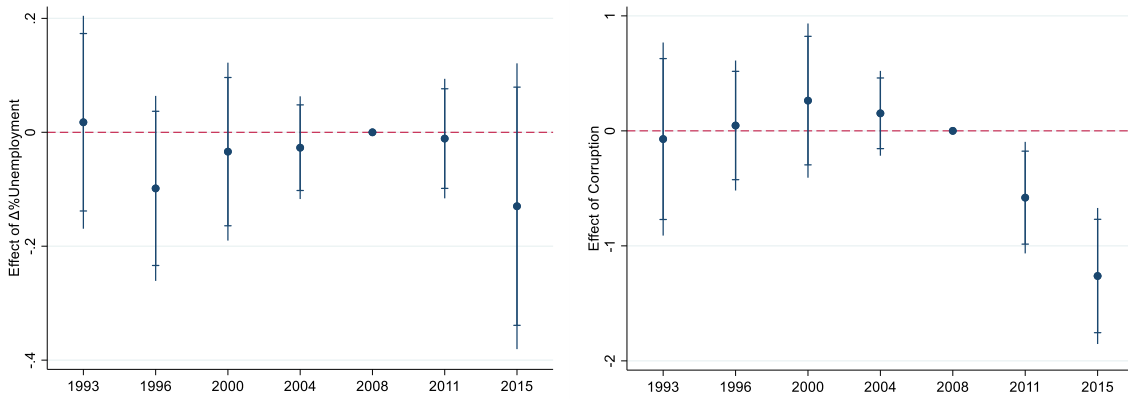
b) Δ% Vote PP

c) Δ% Vote PSOE

Notes: (1) The dependent variable is the increase in the vote share for a given party from 2008 to the year indicated in the x-axis. (2) Δ%*Unemployed* = increase in the unemployment rate during the crisis (2008-2015). (3) The sample and control variables are the same as in Table 2, columns (1), (3) and (5). (4) S.e. clustered at the province level, 95% and 90% confidence intervals reported.

Figure A6: *Pre-trend analysis for the main parties:*
The amplifying effect of corruption

i) Effect of Δ%*Unemployed* if *Corruption*=1	i) Effect of Δ%*Unemployed* if *Corruption*=0	iii) Differential effect

a) Δ% Vote Main Parties

b) Δ% Vote PP

c) Δ% Vote PSOE
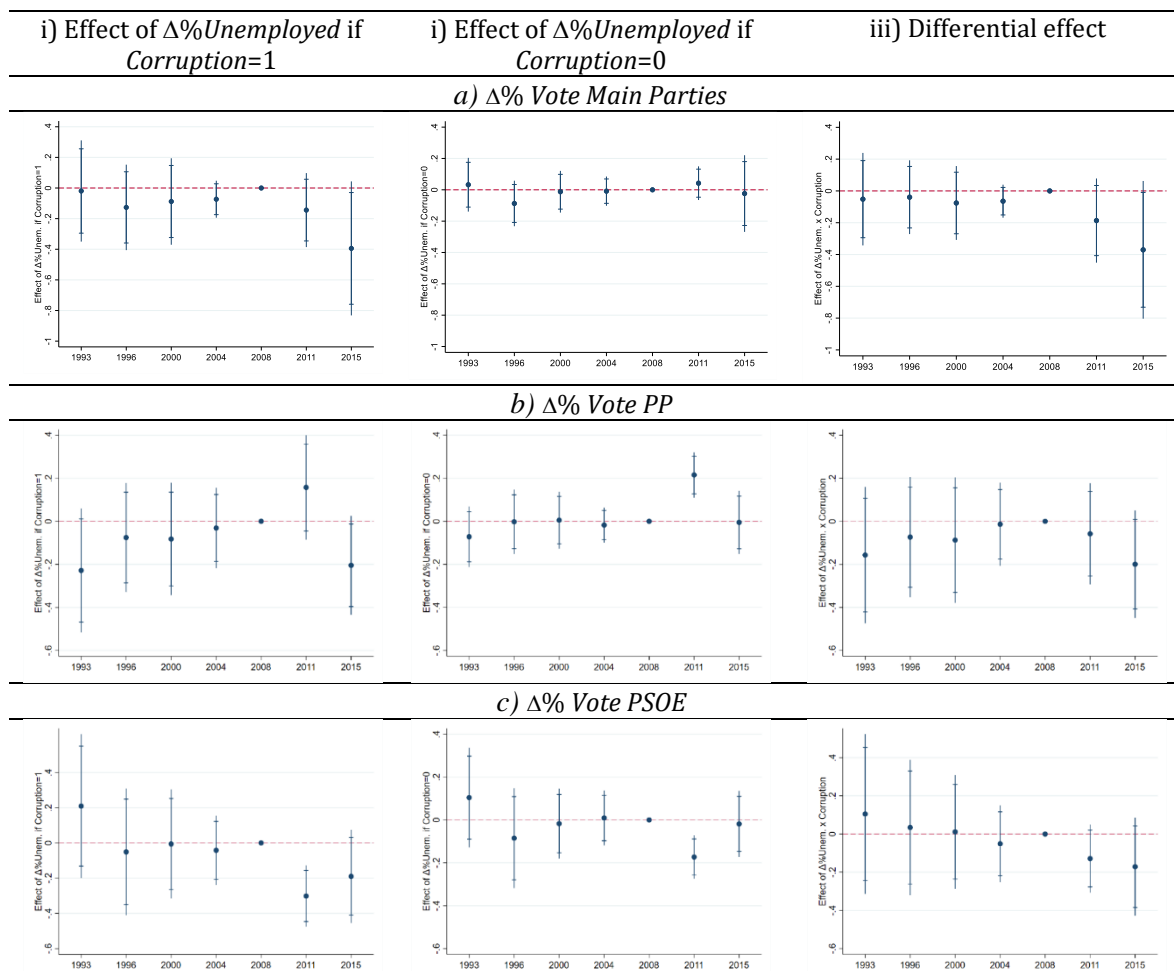
Notes: (1) The dependent variable is the increase in the vote share for the main parties (*PP*+*PSOE*) (panel *a*)) and for each party (panels *b*) and *c*)) from 2008 to the year indicated in the x-axis. (2) *Corruption* = dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* from 1999 to 2007; Δ%*Unemployed* = Increase in the unemployment rate during the crisis (2008-2015). (3) The sample and control variables are the same as in Table 2, columns (2), (4) and (6). (4) S.e. clustered at the province level, 95% and 90% confidence intervals reported.

Figure A7:
The impact of the unemployment shock and corruption on fragmentation at the 2011 election

i) Effect of Δ%*Unemployed*

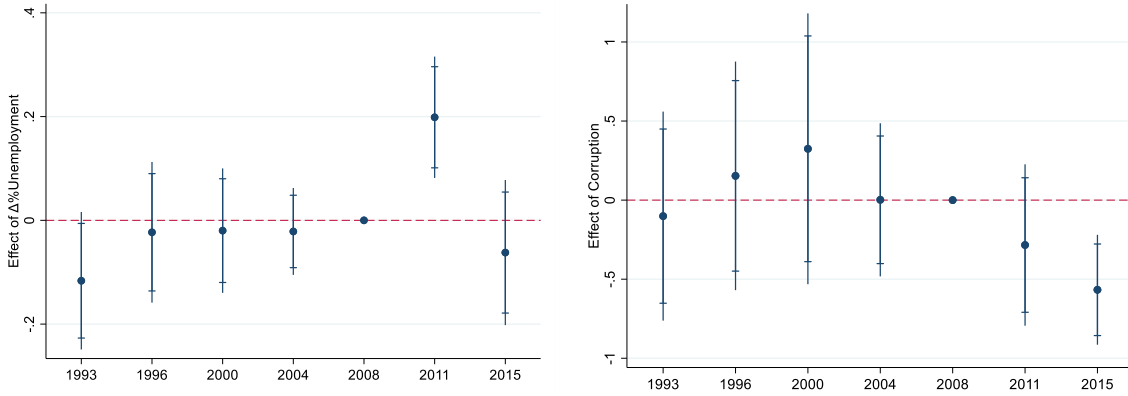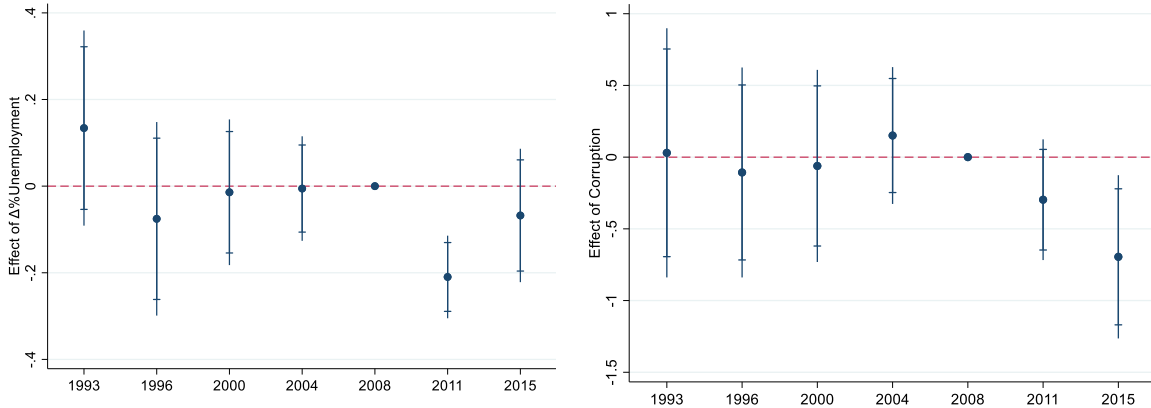#### ii) Effect of *Corruption*

iii) Differential effect
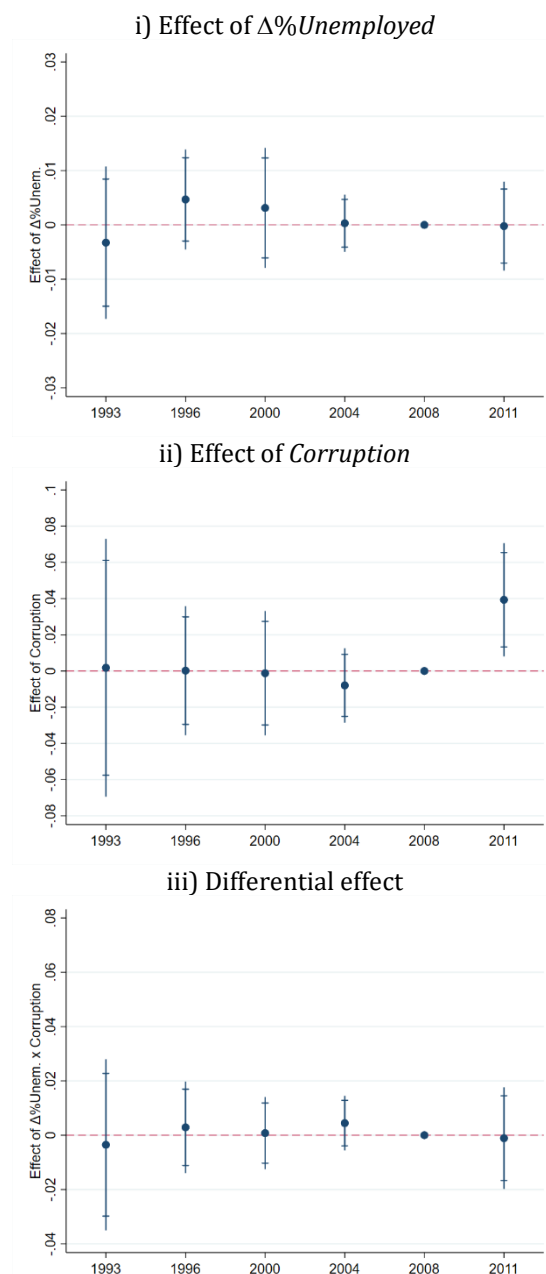

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to the year indicated in the x-axis. (2) Δ%*Unemployed* = Increase in the unemployment rate during the crisis (2008-2011); *Corruption* = dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* from 1999 to 2007. (3) Panel i) corresponds to equation (1); Panels ii) and iii) correspond to equation (2). (4) The control variables and sample are the same as in Table 4. (5) S.e. clustered at the province level, 95% and 90% confidence intervals reported.

Table A1:
Summary statistics

	Mean	Min	Max	S.D.	Obs.
a) 2015 Election					
ΔFragmentation	1.342	-0.597	2.736	0.539	2228
Δ%Vote Main Parties	-25.885	-50.737	8.551	10.353	2228
Δ%Vote PP	-9.159	-29.316	20.170	7.426	2228
Δ%Vote PSOE	-16.726	-35.079	3.224	5.858	2228
Δ%Vote Podemos	16.196	2.894	41.940	6.835	2228
Δ%Vote Ciudadanos	11.154	0.861	31.745	4.855	2228
Δ%Vote Izquierda Unida	0.763	-22.699	13.127	2.071	1983
Δ%Turnout	-4.407	-18.974	34.160	3.321	2228
b) 2011 Election					
ΔFragmentation	0.234	-1.275	1.876	0.335	2228
Δ%Vote Main	-6.546	-33.422	18.935	5.989	2228
Δ%Vote PSOE	-13.011	-31.433	8.096	3.834	2228
Δ% Vote PP	6.465	-14.737	30.358	5.011	2228
c) Treatments					
Δ%Unemployed (2015-2008)	5.938	-2.024	19.881	2.504	2228
Δ%Unemployed (2011-2008)	5.103	-3.480	14.071	2.134	2228
Corruption	0.158	0.000	1.000	0.365	2228
d) Socio-demographics controls					
Mean age (2008)	42.668	30.887	59.359	4.805	2228
%College educated (2001)	34.260	9.380	66.400	8.429	2228
%Immigrants (2008)	8.446	0.000	76.936	8.991	2228
e) Economics controls					
%Unemployed (2008)	7.852	1.462	22.699	3.123	2228
Local spending p.c. (2009)	0.765	0.008	114.729	2.433	2228
Housing prices (2008)	1.361	0.116	4.385	0.557	2228
f) Base-year political controls					
Fragmentation (2008)	2.265	1.334	3.517	0.292	2228
%Vote PSOE (2008)	46.444	8.432	85.636	10.889	2228
%Vote PP (2008)	44.535	7.461	86.034	11.416	2228
%Vote Izquierda Unida (2008)	3.337	0.000	55.361	3.965	2228
%Vote Regional Parties (2008)	1.939	0.000	50.000	5.764	2228
%Turnout (2008)	79.206	36.842	93.624	5.776	2228

Table A2:
The impact of the unemployment shock on fragmentation: All coefficients reported

	(1)	(2)	(3)
Δ% Unemployed ×Corruption	--.--	--.--	0.032***
			(0.011)
Δ%Unemployed	0.018***	0.019***	0.009
	(0.006)	(0.006)	(0.006)
Corruption	--.--	0.056***	0.053**
		(0.018)	(0.020)
Fragmentation (2008)	0.524***	0.529***	0.510***
	(0.181)	(0.183)	(0.175)
%Votes PSOE (2008)	0.039***	0.039***	0.039***
	(0.011)	(0.011)	(0.011)
%Votes PP (2008)	0.031***	0.031***	0.031***
	(0.011)	(0.010)	(0.011)
%Votes Izquierda Unida (2008)	0.029***	0.029***	0.029***
	(0.010)	(0.009)	(0.010)
%Votes Regional Parties (2008)	0.017*	0.017*	0.016*
	(0.009)	(0.009)	(0.009)
%Turnout (2008)	-0.021***	-0.021***	-0.020***
	(0.004)	(0.004)	(0.004)
Mean age (2008)	-0.049***	-0.049***	-0.049***
	(0.005)	(0.005)	(0.005)
%College Educated (2008)	0.008**	0.008**	0.008**
	(0.003)	(0.003)	(0.003)
%Immigrants (2008)	-0.003	-0.004	-0.003
	(0.002)	(0.002)	(0.002)
%Unemployed (2008)	0.011*	0.011*	0.013**
	(0.006)	(0.006)	(0.006)
Local spending p.c. (2008)	0.003***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)
Housing Prices (2008)	0.091**	0.086***	0.090***
	(0.034)	(0.030)	(0.031)
R²	0.785	0.787	0.790
Observations	2,228	2,228	2,228

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to 2015. (2). See notes in Table 1 for the definition of the sample, the controls included in the regressions, and the s.e. reported.

Online Appendix B: Robustness checks

First, the results presented in the main analysis include the full set of covariates described in Section 4. In Figure B1, we examine the sensitivity of the estimated effects to the control variables, by adding controls sequentially to the regressions. The figure plots the estimated effect of the unemployment shock on fragmentation for those municipalities that experienced a local corruption scandal in the past, for those that did not, and the difference between them. Each line in the graphs corresponds to a regression that controls for a different set of control variables. In the first regression we only include provincial and population-strata fixed effects. In the second, third, and fourth regressions we add political, socio-demographic, and economic controls, sequentially (hence, the estimates from the fourth regression correspond to the ones displayed in column (3) of Table 1). In the fifth and sixth regressions, we include the historical political variables, and then their interaction with the unemployment shock. Finally, in the seventh regression, we include an interaction of unemployment growth and corruption with the provincial fixed effects.[1] The estimated coefficients are remarkably stable across specifications, revealing that they do not depend on which specific set of controls is included.

Second, Table B1 reports the results when we control for changes brought about by the crisis that could be correlated with unemployment: the changes in housing prices, local public spending, population size, and share of immigrants (all measured from 2008 to 2015). We introduce all these variables both on their own and interacted with the unemployment shock. The effect of the unemployment shock and its interaction with previous corruption remain unchanged when these controls are included.

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[1] In this regression we can only identify the effect of the interaction. Thus, we only plot the difference in the effect of the unemployment growth on the fragmentation index, depending on whether the municipality experienced a local corruption scandal in the past or not.

Third, the main results rely on data on corruption scandals that broke out during the boom (1999-2007). In Table B2, we show that these results are robust to controlling for corruption scandals breaking out during the crisis (2008-2015) (columns (2) and (5)) and to dropping municipalities that did not have a corruption scandal during the boom but had it during the crisis (columns (3) and (6)).

Fourth, Table B3 reports the results when we allow for non-linearities in the unemployment effect. We present results using three dummies for each tercile of the unemployment shock. In column (2), we can see that experiencing a medium-size unemployment shock (relative to a small shock, which is the omitted category) increases the fragmentation index by 0.056, while suffering from a large shock does so by 0.100 (significant at the 1% level). In column (4), we see that there is also a positive and significant interaction of unemployment and corruption under a non-linear specification.

Fifth, Table B4 shows the results when considering the intensity of corruption, by estimating separate coefficients for having had a corruption scandal in one versus the two terms of the boom period (1999-2007). Overall, we see that most of the effect of corruption is driven by having a corruption scandal at any term, while the interaction effect is stronger for cases in the second term.

Sixth, Table B5 explores an alternative definition of corruption scandals and the inclusion of the Basque Country and Catalonia. Column (2) shows that the results are similar when considering all corruption scandals instead of only those belonging to the *PP* or the *PSOE*. Column (3) shows that the results remain similar when adding observations from the Basque Country.[2] Columns (4) reveals, by contrast, that the results are different in Catalonia. There are

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[2] Note that, for the results including the Basque Country and Catalonia, we use the definition of corruption from column (2) (corruption considering scandals involving any party). The

two potential explanations for this finding. First, as explained in Section 2, the political landscape has always been different in Catalonia (and the Basque Country). For example, fragmentation was already significantly higher in 2008 than in the rest of Spain: 3.39 vs. 2.33. Second, the independentist movement that started around 2010 may have displaced the political focus and affected voting patterns.

Seventh, Tables B6 and B7 report the results obtained with different samples (excluding small or large municipalities) or with different weighting schemes (or no weighting). In all of these cases the results remain very similar to the baseline.

And eighth, Table B8 reports results using local labor markets (LLM). We include at the same time unemployment shocks for the municipality and for the rest of the LLM. Similarly, we introduce the corruption dummy for the municipality and a variable that measures the share of the rest of municipalities in the LLM with corruption. The results indicate that unemployment in the rest of the LLM mildly increased fragmentation. Corruption in the rest of the LLM does not have an effect on fragmentation. One possible interpretation is that individuals are more directly affected by corruption that happens in their own municipality and use corruption in neighboring municipalities as a yardstick.[3] Importantly, our baseline coefficients, which capture the effects of the municipal unemployment shock, corruption, and their interaction,

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baseline corruption definition (corruption scandals involving the *PP* and the *PSOE*) is not appropriate for these regions given that these two parties only obtain around half the vote share in them.

[3] There are two reasons why individuals may be more affected or outraged by corruption that happens in their own municipality: the corrupt politicians are those that they have elected at the municipal elections, and the divested money comes from the municipal budget, which is partially financed with municipal taxes.

barely change when adding the rest-of-LLM variables, as can be gathered from comparing the
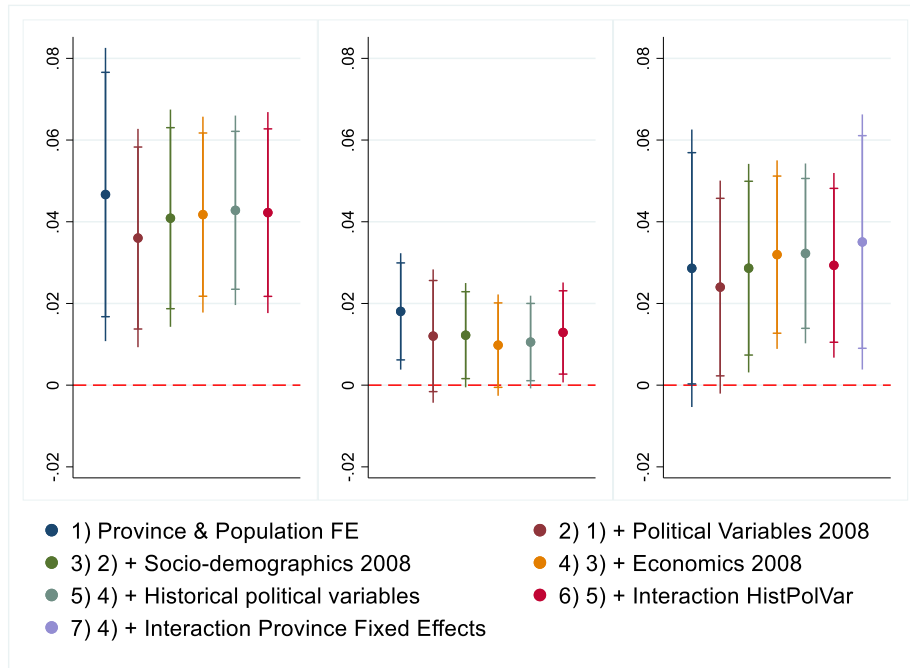
coefficients in columns (1) and (2).

Figure B1:

The impact of the unemployment shock on fragmentation: robustness

i) Effect of Δ%*Unemployed* if *Corruption* = 1
ii) Effect of Δ%*Unemployed* if *Corruption* = 0
iii) Differential effect

- 1) Province & Population FE
- 2) 1) + Political Variables 2008
- 3) 2) + Socio-demographics 2008
- 4) 3) + Economics 2008
- 5) 4) + Historical political variables
- 6) 5) + Interaction HistPolVar
- 7) 4) + Interaction Province Fixed Effects

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to 2015. (2) *Corruption* = dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* from 1999 to 2007; Δ%*Unemployed* = increase in the unemployment rate during the crisis (2008-2015). (3) Controls included in the different regressions: 1) provincial and population strata fixed effects; 2) controls in 1) + Political variables in the base year (2008) (fragmentation index, turnout, parties' votes shares); 3) controls in 2) + Socio-demographics controls at the base year (mean age of the population, percentages of educated people, share of immigrants); 4) controls in 3) + economic controls at t0 (unemployment rate, municipal expenditure, housing prices); 5) controls in 4) + historical political variables (fragmentation, volatility, ideology and turnout); 6) controls in 5) + Interaction of Δ%Unem. with the historical political variables; 7) controls in 4) + Interaction of Δ%Unem. and Corruption with the provincial fixed effects. (4) S.e., clustered at the province level, 95% and 90% confidence intervals reported.

Table B1:
The impact of the unemployment shock and corruption on fragmentation:
Robustness to post-treatment controls

	(1)	(2)	(3)	(4)	(5)
Δ% Unemployed × Corruption	0.029** (0.011)	0.035*** (0.012)	0.034*** (0.011)	0.025** (0.011)	0.027** (0.011)
Δ%Unemployed	-0.002 (0.008)	0.008 (0.007)	0.011* (0.006)	0.008 (0.006)	-0.002 (0.008)
Corruption	0.054*** (0.020)	0.058*** (0.020)	0.049** (0.020)	0.048** (0.018)	0.047*** (0.016)
R^2	0.786	0.803	0.791	0.796	0.808
Observations	2,149	2,021	2,228	2,228	1,952
ΔHousing Prices	YES	NO	NO	NO	YES
ΔPublic Spending	NO	YES	NO	NO	YES
Δ%Immigrants	NO	NO	YES	NO	YES
ΔPopulation	NO	NO	NO	YES	YES

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to 2015 (2). See notes in Table 1 for the definition of the sample, the controls included in the regressions, and the s.e. reported. (3) Additional controls included: increases in housing prices, local current expenditures per capita, share of immigrants and population size (increases computed from 2008 to 2015), and their interactions with Δ%*Unemployed*.

Table B2:
The impact of the unemployment shock on fragmentation:
Robustness to post-treatment corruption

	(1)	(2)	(3)	(4)	(5)	(6)
Δ% Unemployed ×Corruption	--.--	--.--	--.--	0.032*** (0.011)	0.032*** (0.011)	0.030** (0.011)
Δ%Unemployed	0.019*** (0.006)	0.019*** (0.007)	0.020*** (0.007)	0.009 (0.006)	0.009 (0.006)	0.012* (0.006)
Corruption	0.056*** (0.018)	0.054*** (0.020)	0.051** (0.023)	0.053** (0.020)	0.049** (0.021)	0.045* (0.025)
R^2	0.787	0.787	0.790	0.790	0.790	0.792
Observations	2,228	2,228	2,093	2,228	2,228	2,093
Control for Corrup.(crisis)	NO	YES	NO	NO	YES	NO
Drop Corruption (crisis)	NO	NO	YES	NO	NO	YES

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to 2015 (2). Columns (2) and (5) control for the corruption scandals reported during the crisis, and (5) also for the interaction with Δ%*Unemployed*. Columns (3) and (6) drop municipalities that did not have a corruption scandal during the boom but had it during the crisis. (3) See notes in Table 1 for the definition of the sample, the controls included in the regressions, and the s.e. reported.

Table B3:

The impact of the unemployment shock on fragmentation:
Robustness to possible non-linearities

	(1)	(2)	(3)	(4)
Δ% *Unemployed* × *Corruption*	--.--	--.--	0.032*** (0.011)	--.--
Δ% *Unemployed* (High) × *Corruption*	--.--	--.--	--.--	0.126** (0.055)
Δ% *Unemployed* (Med) × *Corruption*	--.--	--.--	--.--	0.150** (0.060)
Δ%*Unemployed*	0.018*** (0.006)	--.--	0.009 (0.006)	--.--
Δ%*Unemployed* (High)	--.--	0.100*** (0.032)	--.--	0.061* (0.031)
Δ%*Unemployed* (Med)	--.--	0.056 (0.039)	--.--	0.003 (0.029)
Corruption	--.--	--.--	0.053** (0.020)	-0.047 (0.045)
R^2	0.785	0.786	0.790	0.790
Observations	2,228	2,228	2,228	2,228

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to 2015. (2) Δ%*Unemployed*(High) is a dummy variable equal to one the unemployment shock that municipality i experienced during the crisis is in the first tercile of the unemployment shock distribution; Δ%*Unemployed*(Med) is a dummy variable equal to one the unemployment shock that municipality i experienced during the crisis is in the second tercile of the unemployment shock distribution. (3) See notes in Table 1 for the definition of the sample, the controls included in the regressions, and the s.e. reported.

Table B4:
The impact of the unemployment shock on fragmentation:
Robustness to considering the intensity of corruption

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ% *Un* × *Corruption*		0.032***						
		(0.011)						
Corruption	0.056***	0.053**						
	(0.018)	(0.020)						
Δ% *Un* × *# terms Cor*				0.023***				
				(0.008)				
# terms Corruption			0.033*	0.032*				
			(0.017)	(0.017)				
Δ% *Un* × *Cor 1 term*						0.027**		
						(0.013)		
Δ% *Un* × *Cor 2 terms*						0.044**		
						(0.017)		
Corruption 1 term					0.054***	0.054**		
					(0.020)	(0.020)		
Corruption 2 terms					0.062*	0.060		
					(0.036)	(0.037)		
Δ% *Un×Cor(1999-2003)*								0.010
								(0.015)
Δ% *Un×Cor(2003-2007)*								0.041**
								(0.019)
Δ% *Un×Cor(1999-2007)*								0.043**
								(0.017)
Corruption(1999-2003)							0.060*	0.064**
							(0.032)	(0.024)
Corruption(2003-2007)							0.050**	0.055**
							(0.023)	(0.027)
Corruption(1999-2007)							0.062*	0.055
							(0.036)	(0.036)
Δ%*Unemployed*	0.019***	0.009	0.019***	0.010	0.019***	0.009	0.018***	0.009
	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)
R-squared	0.787	0.790	0.786	0.790	0.787	0.790	0.787	0.791
Observations	2,228	2,228	2,228	2,228	2,228	2,228	2,228	2,228

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to 2015. (2) *Corruption* =dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* from 1999 to 2007; *# terms Corruption* = number of terms of office (0, 1 or 2) that the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* from 1999 to 2007; *Corruption 1 term*= dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* only in one term of office from 1999 to 2007; *Corruption 2 terms*= dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* only in the two terms of office from 1999 to 2007; *Corruption(1999-2003)*= dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* only in one term of office from 1999 to 2003; *Corruption(2003-2007)*= dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* only in one term of office from 2003 to 2007; *Corruption(1999-2007)*= dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* in the two terms of office from 1999 to 2007. (3) See notes in Table 1 for the definition of the sample, the controls included in the regressions, and the s.e. reported.

Table B5:
The impact of the unemployment shock on fragmentation:
Inclusion of all corruption scandals and the Basque Country and Catalonia

	(1)	(2)	(3)	(4)
	Corruption *PP & PSOE*	All corruption scandals		
			(2) + BC	(3)+ Cat
Δ% Unemployed × Corruption	0.032*** (0.011)	0.041*** (0.012)	0.041** (0.014)	0.017 (0.016)
Δ%Unemployed	0.009 (0.006)	0.004 (0.007)	0.007 (0.007)	0.019** (0.010)
Corruption	0.053** (0.020)	0.055** (0.023)	0.084** (0.032)	0.099*** (0.028)
R²	0.790	0.783	0.742	0.732
Observations	2,228	2,344	2,486	2,885

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to 2015. (2) Column (1): *Corruption* =dummy equal to one if the municipality has experienced at least one corruption scandal affecting either the *PP* or the *PSOE* from 1999 to 2007. Columns (2), (3) and (4): *Corruption* =dummy equal to one if the municipality has experienced at least one corruption scandal affecting any political party from 1999 to 2007. (3) See notes in Table 1 for the definition of the sample, the controls included in the regressions, and the s.e. reported.

Table B6:
The impact of the unemployment shock on fragmentation:
Robustness to different samples

	(1)	(2)	(3)	(4)
	Pop.>1,000	All	Pop.>1,000 & Pop.<50,000	Pop.>1,000 & Pop.<500,000
Δ% Unemployed × Corruption	0.032*** (0.011)	0.033*** (0.012)	0.024** (0.012)	0.032** (0.013)
Δ%Unemployed	0.009 (0.006)	0.008 (0.005)	0.010* (0.006)	0.008 (0.006)
Corruption	0.053** (0.020)	0.053** (0.020)	0.039 (0.026)	0.043* (0.022)
R²	0.790	0.784	0.756	0.754
Observations	2,228	4,026	2,150	2,198

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to 2015. (2) See notes in Table 1 for the definition of the sample, the controls included in the regressions, and the s.e. reported.

Table B7:
The impact of the unemployment shock on fragmentation:
Robustness to different weights

	(1)	(2)	(3)	(4)	(5)
	Voting Pop. 2000	Average Voting Pop.	Population 2000	Average Population	No Weights
Δ% Unemployed ×Corruption	0.032*** (0.011)	0.032*** (0.011)	0.032*** (0.012)	0.032*** (0.012)	0.027** (0.010)
Δ%Unemployed	0.009 (0.006)	0.010 (0.006)	0.008 (0.007)	0.009 (0.006)	0.007 (0.004)
Corruption	0.053** (0.020)	0.054** (0.020)	0.052** (0.020)	0.054** (0.020)	0.057** (0.023)
R²	0.790	0.791	0.777	0.781	0.724
Observations	2,228	2,228	2,228	2,227	2,228

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to 2015. (2) See notes in Table 1 for the definition of the sample, the controls included in the regressions, and the s.e. reported.

Table B8:
The impact of the unemployment shock on fragmentation:
Local labor markets

	(1)	(2)
Δ%Unemployed. ×Corruption	0.032*** (0.011)	0.031*** (0.011)
Δ%Unemployed (LLM) × Corruption (LLM)	--.--	0.009 (0.029)
Δ%Unemployed	0.009 (0.006)	0.006 (0.005)
Δ%Unemployed (LLM)	--.--	0.009* (0.005)
Corruption	0.053** (0.020)	0.058*** (0.018)
Corruption (LLM)	--.--	0.009 (0.055)
R²	0.790	0.792
Observations	2,228	2,217

Notes: (1) The dependent variable is the increase in *Fragmentation* from 2008 to 2015. (2) LLM refers to the unemployment shock or corruption that affected the rest of municipalities in the same LLM. LLMs defined following Boix and Galletto (2004), using commuting data from the 2001 Population Census. There is a total of 806 LLMs. (3) See notes in Table 1 for the definition of the sample, the controls included in the regressions, and the s.e. reported.

References

Boix, R. and Galletto, V. (2004): *Identificación de Sistemas Locales de Trabajo y Distritos Industriales en España.* Ministerio de Industria, Turismo y Comercio.