

---

# “Corruption and local politics: does it pay to be a crook?”

Juan-Luis Jiménez and Carmen García

---



Institut de Recerca en Economia Aplicada Regional i Pública  
*Research Institute of Applied Economics*

**Universitat de Barcelona**

Av. Diagonal, 690 • 08034 Barcelona

WEBSITE: [www.ub-irea.com](http://www.ub-irea.com) • CONTACT: [irea@ub.edu](mailto:irea@ub.edu)

The Research Institute of Applied Economics (IREA-UB) in Barcelona was founded in 2005, as a research institute in applied economics. Three consolidated research groups make up the institute: AQR, Riskcenter and GiM, and a large number of members are involved in the Institute. IREA-UB focuses on four priority lines of investigation: (i) the quantitative study of regional and urban economic activity and analysis of regional and local economic policies, (ii) study of public economic activity in markets, particularly in the fields of empirical evaluation of privatization, the regulation and competition in the markets of public services using state of industrial economy, (iii) risk analysis in finance and insurance, and (iv) the development of micro and macro econometrics applied for the analysis of economic activity, particularly for quantitative evaluation of public policies.

IREA Working Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. For that reason, IREA Working Papers may not be reproduced or distributed without the written consent of the author. A revised version may be available directly from the author.

Any opinions expressed here are those of the author(s) and not those of IREA-UB. Research published in this series may include views on policy, but the institute itself takes no institutional policy positions.

---

### *Abstract*

---

During the recent years of economic boom in Spain, political corruption at the local level boomed as well. In fact, it increased from 7 publicly denounced cases from 1999-2003 to at least 180 in the last legislative period (2007-2011). In this paper, we explore this phenomenon in two related ways: how it has affected voting results and political participation, and whether the wrongdoing of local politicians has undermined the voters' confidence in them. We constructed a socioeconomic municipality database that matched polling results and corruption cases and then estimated a voting-share equation by difference-in-difference and matching techniques. Our results confirm that the voters' attitude towards corruption is significantly different with respect to parties on the right or the left. In fact, after an imputation in a local corruption case, abstention increases by an average 1.8 percentage points, left-parties' voting share is reduced by approximately 2 percentage points, while right-parties' share increases approximately 3 points. However, if the imputed candidate stands for re-election again, right-parties voting share is reduced by 4.4 points, but right-wing corruption at superior levels also increases voting share.

***JEL classification:*** D02; D73; P16.

***Keywords:*** Voters' attitude; Political parties.

Juan Luis Jiménez, Universidad de Las Palmas de Gran Canaria. Departamento de Análisis Económico Aplicado. Despacho D. 2-12. Campus de Tafira. 35017. Las Palmas. E-mail: [jljimenez@daea.ulpgc.es](mailto:jljimenez@daea.ulpgc.es); tlf: +34 928458191

Carmen García, Universidad de Las Palmas de Gran Canaria.

### *Acknowledgements:*

---

The authors acknowledge comments and suggestions by Daniel Albalade, Javier Asensio, Joan-Ramón Borrell, Joan Calzada, Javier Campos, Xavier Fageda, Jordi Perdiguerro and Ancor Suárez. We also appreciate valuable collaboration by Christopher Méndez. All errors are ours. Juan Luis Jiménez also thanks the ACIISI Research Program (PROID20100209) for providing funding.

## 1. Introduction

Although no country in the world is free of corruption,<sup>1</sup> Spain is unique in this regard. During the first decade of the twenty-first century, the economic boom in Spain also increased political corruption, primarily at the local level. This is in contrast to the rest of the world, where it is expected that further development yields decreased corruption. In fact, corruption is becoming a popular position in this country (see, for example, the 15-M Movement against Spanish politicians and corruption), and no social strata are clean.<sup>2</sup>

But what is corruption? A simple definition of this term is “the misuse of entrusted power for private benefit”<sup>3</sup>, while the dictionary refers to moral decay and express, incontrovertible condemnation (Pellegrini, 2011).<sup>4</sup> Bribery, a clear example of corruption, involves the use of incentives to elicit a change in one’s course of action. Here, we can distinguish between political and bureaucratic corruption: In the former, a policy maker influences legislation in exchange for a side payment. The latter occurs when a public official fails to implement policy as it was intended.

The existing academic literature has primarily focused on the effects of corruption on economic growth, development, trade, and so forth. The majority of these articles use macro-indicators at the country level and discuss regional characteristics that influence economics in addition to corruption (see section 2).

Although the topic of corruption in established democracies has been under-researched, studies of local corruption have recently emerged in the literature. Two related papers by Fernández-Vázquez and Rivero (2010) and Costas-Pérez et al (forthcoming) analyse Spanish corruption at the local level, though the former focuses on one particular Spanish region, while the latter studies general effects of corruption and press dissemination on voters.

---

<sup>1</sup> Despite being one of the least corrupt democracies of the world, Sweden is also affected by local corruption (see Erlingsson et al, 2008).

<sup>2</sup> The Monarchy was affected by a case of corruption; the King’s son-in-law (Inaki Urdangarín, former international handball player) was involved in a money laundering scandal through his nonprofit foundation.

<sup>3</sup> See Transparency International.

<sup>4</sup> This author presents a more formal definition of this term as follows: “Corruption is the misuse of entrusted power for private gain; it is behavior which deviates from the formal duties of a given role because of private-regarding (personal, close family, private clique) pecuniary or status gains; or violate rules against the exercise of certain types of private regarding influence. This includes such behavior as bribery (use of a reward to pervert the judgment of a person in a position of trust); nepotism (bestowal of patronage by reason of ascriptive relationship rather than merit); and misappropriation (illegal appropriation of public resources for private-regarding uses)”. See Pellegrini (2011), Chapter 2, page 17. This definition improves ones by Nye (1967).

In this paper, we construct a Spanish municipality database that includes economic indicators, polling results and data on corruption cases, to test whether such cases affected voting in the period 1999-2011,<sup>5</sup> we estimate a voting-share equation by difference-in-difference and apply a matching estimator.

The relevance of this work is as follows: First, we examine voters' differing perceptions of corruption based on which party is corrupted (i.e., right-wing or left-wing) and evaluate the effects of these perceptions on abstention, often considered as an indicator of general disagreement. Second, our database includes not only local corruption cases but also provincial and regional cases. Third, we include data on three regional polls and are thus able to test the cumulative effects of voters' perceptions across time. Finally, we control for multiple accusations of corruption.

Next, section 2 includes a brief discussion of the literature on this topic. The detailed database and characteristics of Spanish local corruption are shown in section 3. A description of the effects of local corruption on voters is included in section 4, separated into effects on abstention (4.1) and right- or left-wing corruption (4.2). Our conclusions are presented in section 5.

## 2. Literature review

International and cross-sectional studies comprise the majority of the empirical literature on the sources of corruption (see Pellegrini and Gerlagh, 2008 for a survey). Accordingly, most use international indicators, such as those made by World Bank (Kaufmann et al, 1999 and 2003),<sup>6</sup> to test which factors affect the existence and persistence of corruption around the world.

For example, Manzetti and Wilson (2007) use macro data to make an empirical analysis of 14 countries around the world to explore the question of why corrupt governments maintain public support. The authors conclude that a negative relationship exists between strong democratic institutions and tolerance of corrupt governments. This is due to citizens perceiving the higher opportunity costs of clientelism associated with corrupt leadership.

---

<sup>5</sup> As we explain in section 2, the referenced papers use data from a foundation linked to the most important left-wing party in Spain.

<sup>6</sup> Kaufmann (1997) provides a summary of ideas about corruption.

At the national level, the literature includes more detailed analyses about the effects of corruption on electoral outcomes. Most of them are aligned with political and sociological issues, and no statistical approach was used.<sup>7</sup>

In the United States, Peters and Welch (1978) conclude that 75% of politicians who had been involved in a scandal (including those related to private life) were re-elected. After investigating the Clinton-Lewinsky case, Miller (1999) concludes that personal scandals have little influence on the vote.

Reed (1999) also concludes that 65% of corrupt politicians in Japan were re-elected and that the severity of "punishment" lessens with the passage of time. Lafay and Servais (2000) claim that the re-election of corrupt mayors is unlikely and that, in cases in which they were re-elected, the difference in votes was low or the opponent was very weak. Using data from Mexico, McCann and Domínguez (1998) argue that corruption is irrelevant to the probability of voting for the opposing party.

However, fewer papers focus on local corruption. Brazil's federal government audited a number of municipalities at random in 2003 to detect local cases of corruption. These audits were publicised before the 2004 elections so that voters knew whether the incumbents had been involved in corruption. In estimating voters' reactions to these audits, Ferraz and Finan (2008) found that corrupt incumbents' vote shares reduced in a range of 10 to 30 percent, depending, in part, upon the dissemination of the audits in local media.<sup>8</sup>

As we will show in the next section, several corruption scandals (not only at the local level) have occurred in Spain. In 1996, the most important left-wing party (*Partido Socialista Obrero Español*, or PSOE) lost the national vote due partially to corruption cases. In fact, national sociological data showed that corruption was ranked among the top 3 national problems in those years (see Caínzos and Jiménez, 2000).

Fernández-Vázquez and Rivero (2010) estimate the effect of corruption cases on local election results in a Spanish Region (Andalucía) in the period 2003-2007. Using data from 740 municipalities in this region, they attempt to determine the effect of accused incumbents on local voters' decisions. Their results support the idea that a party accused of corruption may, in fact,

---

<sup>7</sup> Caínzos and Jiménez (2004) include an interesting discussion of this question.

<sup>8</sup> A survey experiment was conducted by Winters and Weltz-Shapiro (2010) in Brazil. They found that voters tend to reject corrupt politicians when information about the corruption is delivered in a credible and accessible manner.

fare better than an honest one provided that the incumbent mayor is removed from office and a new candidate is chosen. As the authors state, “corruption is, unquestionably, an undesired value for voters unless they extract a direct benefit from it”.

In a paper very much related to this topic, Costas-Pérez et al (forthcoming) use data on local corruption in Spain to estimate the effect on electoral outcomes. Their data were provided by *Fundación Alternativas*, a Spanish think-tank that has close links with PSOE (the most important left-wing party in Spain). After ensuring that data contain no political bias due to their source, authors focus on the number of news reported on political scandals that have not necessarily been formally accused.

They estimate a voters' equation such that the dependent variable is the incumbent's vote share over the total number of votes or, in the case of coalitions, the sum of the total votes of the parties. Using data from two local elections in the period 1999-2007, their OLS and difference-in-difference analyses demonstrate that the average vote loss after a corruption scandal was approximately 4%, though this percentage increased to 14% if newspapers covered the scandal.

### 3. Political corruption in Spain and the database

After the period of transition to democracy in Spain, the importance of the two main parties - namely, *Partido Popular* (hereafter, PP) corresponding to the main right-wing party, and the party known as *Partido Socialista Obrero Español* (hereafter, PSOE) on behalf of the main left-wing party - has varied significantly over time.

If we analyse the voting results in national elections over time, we can observe a quite different pattern. In the elections of 1982, the two parties together attained 72.9% of the votes, not only due to the increased importance of PP but also because of the higher number of votes obtained by the main left-wing party (PSOE). After a slight decrease of 4 percentage points in 1986, the tendency has been the growth of the two-party system from a general perspective, reaching the highest point in the elections of 2008, with 83.3% of votes when including the vote-shares. Similar to local elections, in 2011, there was a decrease in vote-shares, reaching 72.4% of PP and PSOE.<sup>9</sup>

---

<sup>9</sup> Recent local elections took place in 1999, 2003, 2007 and 2011. National elections took place in 1996, 2000, 2004, 2008 and 2011.

The two-party system at the local level, considered to be the total of the vote share achieved by PP and PSOE, has increased between 1987 (36.6% and 20.1% of the votes, respectively, 50.7% of the total votes) and 2007, when the combined total of the two parties added up to 70.5% of the votes. However, this amount fell in the latest round of local elections that took place in 2011. The share of the two-party system declined, obtaining a total of 64.2% of the votes, returning to approximately the level reached by both parties in the 1991 elections. This is a process called *nationalisation* of the electoral results at the local level; although it is possible for local parties to run in the election, national parties obtain an increased share of the votes (Fernández-Vázquez and Rivero, 2010).

As we have discussed in section 1, our main purpose is to determine whether and to what extent local corruption is punished at the polls. We distinguish between the treatment received by the main right-wing and the main left-wing party at local elections. Because we have at our disposal a panel of data on different Spanish municipalities from 1999 to 2011, we intend to measure the sensitivity or, on the contrary, the insensitivity of voters to corruption cases from year to year.

As mentioned above, the database consists of a balanced panel of data from more than 3,200 Spanish municipalities from 1999 to 2011. We collect various socio-economic indicators, such as population, unemployment rate, number of bank offices, and so forth, at a local level. In terms of elections, we have registered the exact number of votes obtained by different parties standing for the local elections in each municipality. Likewise, we have considered the number of abstentions, the blank ballot-papers and the spoiled ballot-papers as well as the census of the municipality, the number of valid votes and the figure of voters.

The great importance of the data is constituted by the corruption variables. We first identified all municipalities in our sample that have experienced at least an allegation of corruption, using a binary variable. Next, we examined local corruption case by case, recording the implicated political party and the year the alleged corruption began in order to isolate cases of corruption that took place before elections and noting whether the candidate stood for the election after being implicated.

We must now clarify that we have compiled this database using various news sources published electronically and that the information has been checked by consulting two or more reliable sources. Following this principle, we define an alleged offence as *a case of corruption* only when the accused has already been imputed or impeached by a judge. However, we must distinguish



between accusation and guilt, the first lacking conclusive proof. Politicians are considered imputed but not guilty if their corruption cases were resolved during the period considered in our database.

Apart from corruption at the local level, we have also introduced the provincial and regional cases in which the different political parties have been involved. That is, we have considered the two immediate federal levels that may affect the results of elections in the municipalities. As in the local cases, we have recorded the party involved and the year the corruption ended.

Table 1 shows the number of corruption cases by level of government and political party. We can see how the two main political parties analysed in this paper take part in most of the corruption cases at the local level (higher than 80 percent). Nevertheless, the quantity of cases in which PP and PSOE are involved is quite similar. In total, we have identified 234 cases of alleged local corruption - 18 cases at the provincial level and 8 cases in the Spanish Autonomous Communities. Another noteworthy fact is that the number of cases of corruption offences has increased over time.

**Table 1. Number of corruption cases by level of government and political party**

	Local			Provincial			Regional		
	PP	PSOE	Others	PP	PSOE	Others	PP	PSOE	Others
1999-2003	2 (28.6)	2 (28.6)	3 (42.8)	0	0	0	0	0	0
2004-2007	21 (44.7)	16 (34)	10 (21.3)	1 (20)	4 (40)	0	2 (100)	0	0
2008-2011	79 (43.9)	70 (38.9)	31 (17.2)	2 (15.4)	8 (61.5)	3 (23.1)	1 (16.7)	4 (66.6)	1 (16.7)
<b>Total</b>	<b>102 (43.6)</b>	<b>88 (37.6)</b>	<b>44 (18.8)</b>	<b>3 (16.6)</b>	<b>12 (66.8)</b>	<b>3 (16.6)</b>	<b>3 (37.5)</b>	<b>4 (50)</b>	<b>1 (12.5)</b>

Source: Own elaboration.

Note: Corruption share in period among brackets.

If we analyse the corruption cases mentioned above by geographical location, it is clear that the majority of them are in the municipalities of the south of Spain. This difference, with respect to the other regions, is even greater in the period 2007-2011. However, the provincial and regional cases are distributed differently, with higher numbers in the north and the east, respectively. Table 2 shows the total number of cases and the percentage that corresponds to each zone and period.

**Table 2. Number of corruption cases by Geographical situation<sup>10</sup>**

<b>Location</b>	<b>1999-2003</b>	<b>2003-2007</b>	<b>2007-2011</b>	<b>Total</b>
<b>Local</b>				
North	1 (14.3)	6 (12.8)	31 (17.2)	<b>38 (16.2)</b>
South	5 (71.4)	22 (46.8)	61 (33.9)	<b>88 (37.6)</b>
East	0	11 (23.4)	48 (26.7)	<b>59 (25.3)</b>
Center	1 (14.3)	8 (17)	40 (22.2)	<b>49 (20.9)</b>
<b>Provincial</b>				
North	0	0	6 (46.1)	<b>6 (33.3)</b>
South	0	3 (60)	2 (15.4)	<b>5 (27.8)</b>
East	0	1 (20)	5 (38.5)	<b>6 (33.3)</b>
Center	0	1 (20)	0	<b>1 (5.6)</b>
<b>Regional</b>				
North	0	0	1 (16.67)	<b>1 (12.5)</b>
South	0	1 (50)	1 (16.67)	<b>2 (25)</b>
East	0	1 (50)	3 (50)	<b>4 (50)</b>
Center	0	0	1 (16.67)	<b>1 (12.5)</b>

Source: Own elaboration.

Note: Corruption share in period among brackets.

Additionally, our database allows us to classify the corruption cases by type. It is a gross division because multiple charges may be brought against a single politician, so one case might fit into different categories. However, as we studied each case in detail, we categorised them based on the most significant allegation of corruption.

In Table 3, we see that the right-wing party is involved in more cases of urban planning corruption, while the left-wing party has the same amount in embezzlement of funds. We must clarify that the difference in the total number of corruption cases between Tables 1 and 3 is due to the manner of counting the cases: in Table 3, we have not taken the involvement of a second party into account because our purpose is to broadly show the types of corruption.

<sup>10</sup> North includes Galicia, Asturias, País Vasco, Cantabria, La Rioja, Navarra and Castilla y León. South groups Andalucía, Canarias and autonomus municipalities of Ceuta and Melilla. East refers to Baleares, Murcia, Valencia, Aragón and Cataluña. Center includes Madrid, Extremadura and Castilla-La Mancha.

**Table 3. Number of corruption cases by type of corruption and political party<sup>11</sup>**

	PP	PSOE	Others
Urban Planning Corruption	36 (48.6)	24 (32.5)	14 (18.9)
Embezzlement of funds	20 (33.9)	24 (40.7)	15 (25.4)
Others	38 (46.9)	31 (38.3)	12 (18.4)
<b>Total</b>	<b>94 (43.9)</b>	<b>79 (36.9)</b>	<b>41 (19.2)</b>

Source: Own elaboration.

Note: Corruption share in period among brackets.

The variables used to estimate the equations in section 4 are as follows:

(i) *Corrupted<sub>i</sub>*: binary variable that takes the value 1 if there has been a case of corruption in the municipality *i* at any moment among the period 1999-2011. Source: Own elaboration (see previous paragraphs).

(ii) *Population(lagged)<sub>it</sub>*: the population of the municipality *i* at year *t* but lagged one year to show the year before elections. Source: *La Caixa* municipal database.

(iii) *Unemployment(lagged)<sub>it</sub>*: the unemployment rate in municipality *i* at year *t*. Lagged one year. Source: *La Caixa* municipal database.

(iv) *HHI<sub>it</sub>*: the Herfindahl-Hirschman index, measuring the concentration of vote share between political parties in the municipality *i* at year *t*. This variable allows us to measure the influence of the intensity of “competition” on the votes at each municipality. It is elaborated using polling data from *Ministerio del Interior*.

(v) *Share-PP<sub>it</sub>*: represents the share of votes of the main right-wing party (PP) in the municipality *i* at year *t*. We also use the share data lagged variable for previous local elections (four years before). This lagged variable allows us to control for historical voting behaviour in each municipality. It is elaborated using polling data from *Ministerio del Interior*.

(vi) *Share-PSOE<sub>it</sub>*: this variable represents the share of votes of the main left-wing party (PSOE) in the municipality *i* at year *t*. We also use the share data lagged variable for previous local elections

<sup>11</sup> Urban Planning Corruption includes cases of corruption related to the urban planning, the environment and similar irregularities. Embezzlement of funds refers to frauds, misuse of public funds, laundering and influence peddling, Others include the rest of the cases.

(four years before). We include it for the reason mentioned above. It is elaborated using polling data from *Ministerio del Interior*.

(vii)  $\%Abstentionblanksandnulls_{it}$ : the total of the percentage of abstentions, blank votes and null votes in municipality  $i$  at year  $t$ . We also use the lagged variable (previous local polling). Source: *Ministerio del Interior*.

(viii)  $Corruptionbefore2003_i$ : a binary variable that takes the value 1 if the case of local corruption at municipality  $i$  was brought before 2003 and 0 in all other cases.

(ix)  $Corruptionperiod2003-07_i$ : takes the value 1 if the case of local corruption at municipality  $i$  was brought between 2003 and 2007 and 0 if brought in the years prior to 2003.

(x)  $Corruptionperiod2007-11_i$ : takes the value 1 if the case of local corruption at municipality  $i$  was brought between 2007 and 2011 and 0 in the years prior to 2007.

(xi)  $Year_i$ : a variable indicating the year. We include it to control for potential time effects in the data pool.

(xii)  $Region_i$ : a dummy variable for municipality  $i$  in each Regional Community in Spain. It controls for potential fixed effects.

(xiii)  $Again_{it}$ : binary variable that takes the value 1 if the candidate stood for local elections again in the municipality  $i$  at year  $t$ , after having been imputed.

(xiv)  $AccusedProvincial_{it}$ : takes the value 1 if municipality  $i$  is in a province where there has been a case of corruption at this level, at year  $t$ , and 0 in all other cases.

(xv)  $AccusedRegional_{it}$ : takes the value 1 if municipality  $i$  is in a region where there has been a case of corruption at this level, at year  $t$ , and 0 in all other case. We include it to control for a regional effect on voters' decisions.

The descriptive statistics are included in Table 4. We distinguish between non-corrupted and corrupted municipalities, defining a corrupted municipality as one in which at least one allegation of local corruption has been made. We note that the average population in corrupted municipalities is 56,724 habitants, whereas the average population in non-corrupted places is 9,561.

Although the population density is remarkably higher in corrupted municipalities, the unemployment rate differs by only 0.3 percentage points between corrupted and non-corrupted municipalities (5.8% and 5.3%, respectively).

**Table 4. Descriptive statistics by municipality (1999, 2003, 2007)**

Variables	Mean		Std. Dev.		Minimum		Maximum	
	C	Non-C	C	Non-C	C	Non-C	C	Non-C
Population	56,724	9,561	223,701	39,139	968	159	3,132,463	1,595,110
Density of population	731	334	1,690	1232	6	1.6	17,257	21,844
Unemployment rate	5.8	5.3	2.5	2.6	0.7	0	19.3	23.2
Abstention share	30.5	25.2	9.9	9.3	4.5	0	54.4	71.1
Abstention, blank and no vote share	32.3	27.6	9.8	9.7	7	1.5	55.6	96.5
Share votes PP (*)	32.2	32.7	18.8	18.9	0.13	0.09	97	97
Share votes PSOE (*)	35.9	34.8	16.6	16.4	0.18	0.18	100	100
HHI	0.33	0.34	0.12	0.14	0	0	0.73	1
Maximum votes share	47.5	47.6	12.3	13.2	8.9	0.1	84.9	100

Source: Own elaboration.

Note: C: Corrupted municipality; Non-C: Non-corrupted municipality. (\*) Includes data on 2011.

Focusing on the results of local elections, the abstention rate is 30.5% in corrupted municipalities and 25.2% in non-corrupted. Furthermore, when we consider blank and invalid votes, the rate of abstention increases 1.8 percentage points in corrupted municipalities and 2.4 in non-corrupted. Another a priori result shown in Table 3 is that the average vote share of the main right-wing party (PP) is lower in corrupted than in non-corrupted municipalities, while the vote share of PSOE is lower in non-corrupted municipalities.

Finally, measured by the average Herfindahl-Hirschman index, the concentration of vote shares of political parties in local elections also seems to be greater in non-corrupted municipalities.

After having analysed the descriptive statistics of the variables and the cases of corruption by political party, period and geographical location, we estimate the effect of this local corruption in the following section.

## 4. Empirical strategy

As we have explained, our purpose in this paper is twofold: First, we wish to evaluate the effects of local corruption on voters' behaviour. Second, we intend to compute the changes in this behaviour across time and party.

At the time of the election, a voter has at least three options: to refrain from voting (abstention), to cast a blank or null vote, or to vote for a particular party. This last decision involves the additional choice of which party to vote for. We consider all of these questions in sections 4.2 and 4.3. Our primary goal is to determine whether there are structural factors that make a municipality more prone to corruption (section 4.1).

All estimations shown in the following sections use data from three local polls in the period 2003-2011. We employ two empirical instruments: Ordinary Least Squares (hereafter OLS) estimations using clustering options, and matching analysis. We intend to evaluate the effect of an accusation of local corruption (treatment group) on referred endogenous variables compared with those municipalities not affected by corruption in any year (our control group).

### 4.1. Which is more prone to corruption?

The first question we examine is whether characteristics of a municipality or the composition of local government affect its likelihood to be corrupted.

Due to the reduced number of cases of corruption in relation to total municipalities, we have implemented a Complementary Log-Log estimation of the endogenous variable. The equation we have estimated is the following ([1]):

$$\begin{aligned} \text{Corrupted}_i = & \beta_0 + \beta_1 \text{Population}(\text{lagged})_{it} + \beta_2 \text{Unemployment}(\text{lagged})_{it} + \\ & + \beta_4 \text{HHI}_{it} + \beta_5 \text{Share} - \text{PP}_{it} + \beta_6 \text{Share} - \text{PSOE}_{it} + \varepsilon_{it} \end{aligned} \quad [1]$$

We must note that all estimations have been clustered by province, to control for potential heterogeneous behaviour among different voters. The results are shown in Table 5.<sup>12</sup>

---

<sup>12</sup> All estimations have also been made including fixed effects by region. The results do not change substantially.

**Table 5. Complementary log-log model to predict the occurrence of corruption**

Explanatory variables	Endogenous variable					
	Accused in 2003	Accused in 2003	Accused in 2007	Accused in 2007	Accused in 2011	Accused in 2011
Population (lagged)	1.7e-6 (4e-7)***	1.6e-6 (4e-7)***	2.1e-6 (2.9e-7)***	2.3e-6 (5.3e-7)***	1e-6 (2e-7)***	1e-6 (3e-7)***
Unemployment rate (lagged)	0.2 (0.04)***	.2 (0.06)***	0.1 (0.05)**	0.1 (0.05)**	0.07 (0.02)**	0.05 (0.02)*
HHI concentration votes index	-4.1 (1.8)**		-3.1 (1.7)*		-1.2 (0.7)*	
Share-PP		1.5 (1.4)		0.9 (0.9)		1.1 (0.6)*
Share-PSOE		-3.5 (1.9)*		-2.7 (1.3)**		0.5 (0.5)
Constant	-6.2 (0.7)***	-6.9 (0.8)***	-4.2 (0.5)***	-4.6 (0.6)***	-3.4 (0.5)***	-4.2 (0.4)***
Observations	3253	3253	3253	3253	3315	3315
Non zero outcomes	7	7	42	42	168	168
Wald chi	41.37***	18.51***	57.89***	28.15***	17.27***	33.45***

Note 1: \*\*\* 1%, \*\* 5%, \*10% significance test. Robust standard errors shown in brackets.

Table 5 includes six estimations that consider different endogenous variables (for cases in 2003, 2007 and 2011) and different combinations of exogenous variables. Aside from 2011, all coefficients and significance remain constant.

The results show that municipalities with a case of local corruption have larger populations and higher unemployment rates in the year before elections. Two questions arise from this data.

The first question is the negative sign of the estimated coefficient of the local political votes concentration index. This implies that higher voter concentration leads to a reduced probability of corruption. Thus, coalition governments and other minority results are more prone to corruption than a mayor with an absolute majority.

The second is related to the role of the two main left-wing and right-wing parties in Spain. Interestingly, when using the share of these two parties by municipality, the variables have different signs; PP is positive in 2011, while PSOE is negative in 2003 and 2007, though the results are not significant.

#### 4.2. Corruption effects on abstention, blank and null votes

One of the major symptoms of general discomfort generated by corruption is the evasion of voting. This is harmful to democracies; encouraging citizens to vote is a main message in any electoral period. It is based on the idea that corruption has a negative impact on citizens' trust and willingness to comply with rules.

We have used this idea to estimate equation number [2]. The endogenous variable is the portion of the population that decides not to vote (abstention) or to vote blank and null. We explain abstention using the historical results of this variable based on municipality (the lagged variable), the binary variables of local corruption, the characteristics of the municipality and fixed effects by region and year. We include all municipalities in the three years considered, including the cluster option by province.

$$\begin{aligned} \%Abstention,blanksandnulls_{it} = & \beta_0 + \beta_1\%Abstention,blanksandnulls_{it-1} + \\ & + \beta_2Corruptionbefore2003_{it} + \beta_3Corruptionperiod2003 - 07_{it} + \\ & + \beta_4Corruptionperiod2007 - 11_{it} + \beta_5Year + \beta_6Population_{it-1} + \\ & + \beta_7Unemployment_{it-1} + \sum_{i=8}^{25} Region_i + \varepsilon_{it} \end{aligned} \quad [2]$$

Table 6 includes the results for the four models we have estimated. We present analyses for each year and the aggregated results. Models (1) to (3) estimate the effect of local corruption for each year, while the latter shows the aggregated effects since the time that local governments were accused.



**Table 6. Corruption effects on abstention, blanks and nulls votes**

Explanatory variables	(1)	(2)	(3)	(4)
% Abstention+blank+null (lagged)	0.6 (0.02)***	0.7 (0.05)***	0.6 (0.04)***	0.6 (0.03)***
Local corruption before 2003	0.005 (0.01)			0.024 (0.01)**
Local corruption before 2007		0.013 (0.006)**		0.018 (0.005)***
Local corruption before 2011			0.014 (0.004)***	0.013 (0.002)***
Year				-8e-5 (1e-3)
Population (lagged)	1e-8 (1e-8)	7e-8 (4e-8)*	5e-8 (3e-8)	5e-8 (3e-8)
Unemployment rate (lagged)	0.001 (7e-4)*	0.001 (0.0008)	0.001 (6e-4)*	2e-4 (6e-4)
Fixed effects by Region	YES	YES	YES	YES
Constant	0.07 (0.007)***	0.08 (0.01)***	0.05 (0.01)***	0.26 (3.02)
Observations	3241	3245	3304	9790
R <sup>2</sup>	0.63	0.66	0.68	0.58
F-statistic	(*)	(*)	(*)	(*)

Note 1: \*\*\* 1%, \*\* 5%, \*10% significance test. Robust standard errors shown in brackets.

Note 2: (\*) Due to the used of both fixed effects by region and cluster by province, Stata does not report the F statistic for conjoint significance.

Except in 2003, when the number of local corruption cases was too small compared with the total population, local corruption increases the general evasion of votes by 1.35 percentage points (1.3 in 2007 and 1.4 in 2011). If we consider the cumulative effect from the beginning of corruption (model 4), vote loss increases to an average of 1.8 percentage points.

Finally, a point to highlight is that this reduction in the percentage of valid polls increases over time. For instance, the cumulative percentage of loss reaches 2.4 percentage points in 2003, despite being the lower number of corruption cases.

### 4.3. Corruption effects on parties' vote share

In addition to estimating the general effect of local corruption cases on electoral performance (which has been analysed by Costas et al, forthcoming), a main goal of this paper is to determine whether voters have different perceptions of corruption based on party.

Based on the *nationalisation* effect, the share concentration of votes in Spain and the concentration of local corruption cases (see Table 1), we focus solely on the two main political parties: the main right-wing (PP), and the main left-wing (PSOE).

We therefore estimate a separate vote equation for each party. We consider local corruption cases of both parties while disregarding “clean” municipalities (i.e., cities where no corruption case exists) at all levels to minimise crossed or punish votes to the opposite party. We expect that the most dramatic effects occurred in local elections close to the date of imputation,<sup>13</sup> although we will also study cumulative effects.

The voter's equation is similar for both parties (see equations [3] and [4]). We attempt to explain the share of PSOE (equation [3]) and PP (equation [4]) based on the historical voting behaviour in the municipality (the lagged variable), the binary variables of corruption cases at the local, provincial and regional levels, characteristics of the municipality, fixed effects by region and year, and the binary variable to control the decision of accused to stand for election.

$$\begin{aligned}
 Share - PSOE_{it} = & \beta_0 + \beta_1 Share - PSOE_{it-1} + \beta_2 Corruptionbefore2003_{it} + \\
 & + \beta_3 Corruptionperiod2003 - 07_{it} + \beta_4 Corruptionperiod2007 - 11_{it} + \beta_5 Again + \\
 & + \beta_6 AccusedRegional + \beta_7 AccusedProvincial + \beta_8 Population_{it-1} + \\
 & + \beta_9 Unemployment_{it-1} + \beta_{10} Year + \sum_{i=11}^{28} Region_i + \varepsilon_{it}
 \end{aligned} \tag{3}$$

Table 7 includes the results for three specifications of equation [3].

<sup>13</sup> In a study of state-level corruption audits in Brazil, Pereira, Melo and Figueredo (2009) found that corruption allegations made immediately prior to an election reduce a mayor's probability of re-election, but allegations made public at a time prior to elections have no significant effect.

**Table 7. Effects of corruption on PSOE (left-wing party) vote share**

Explanatory variables	(1)	(2)	(3)
Share PSOE in previous elections	0.75 (0.02)***	0.74 (0.02)***	0.66 (0.01)***
Local corruption before 2003	-0.034 (0.017)*	-0.034 (0.017)*	-0.045 (0.01)***
Local corruption before 2007	-0.028 (0.012)**	-0.029 (0.012)**	-0.026 (0.01)**
Local corruption before 2011	0.001 (0.006)	0.002 (0.005)	0.002 (0.004)
Stand for again	0.008 (0.023)	0.008 (0.023)	0.003 (0.02)
Imputation at Regional level		0.02 (0.007)**	-0.008 (0.005)
Imputation at Provincial level		-0.006 (0.01)	-0.003 (0.007)
Unemployment rate (lagged)			-0.0005 (0.0005)
Population (lagged)			-1e-8 (1e-8)
Region effect	NO	NO	YES
Year effect	YES	YES	YES
Constant	0.049 (0.01)***	0.044 (0.01)***	0.11 (0.008)***
Observations	8825	8825	8825
R <sup>2</sup>	0.64	0.65	0.67
F-statistic	299.18***	258.81***	(*)

Note 1: \*\*\* 1%, \*\* 5%, \*10% significance test. Standard errors shown in brackets.

Note 2: (\*) Due to the used of both fixed effects by region and cluster by province, Stata does not report the F statistic for conjoint significance.

Overall, the results of the estimations lead to the following summary: those accused of local corruption produce a negative cumulative effect on PSOE's vote share of between 4.5 and 2.6 percentage points, depending upon the year and model considered. These data represent the years 2003 and 2007, but the coefficient for 2011 is not significant in any estimation.

These variables are significant in all cases except corruption at higher levels of government. Therefore, it appears that the vote share of PSOE is not influenced by actions at higher levels of government, but only local corruption is considered and punished. Considering that the mean

share vote data of PSOE is 35.9, an average reduction of 3.6 percentage points is close to 10% vote loss.

Finally, it appears that a “personal effect” on the vote does not exist. The variable “Stand for again” is not statistically significant, which implies that voters punish the party regardless of whether the corrupt official was removed from office.

Finally, we analyse the effects of local corruption on PP voters. Equation [4] is similar in structure to equation [3] but we have substituted the main right wing polling data.

$$\begin{aligned} \text{Share} - PP_{it} = & \beta_0 + \beta_1 \text{Share} - PP_{it-1} + \beta_2 \text{Corruptionbefore2003}_{it} + \\ & + \beta_3 \text{Corruptionperiod2003} - 07_{it} + \beta_4 \text{Corruptionperiod2007} - 11_{it} + \beta_5 \text{Again} + \\ & + \beta_6 \text{AccusedRegional} + \beta_7 \text{AccusedProvincial} + \beta_8 \text{Population}_{it-1} + \\ & + \beta_9 \text{Unemployment}_{it-1} + \beta_{10} \text{Year} + \sum_{i=11}^{28} \text{Region}_i + \varepsilon_{it} \end{aligned} \quad [4]$$

Table 8 includes estimated coefficients.<sup>14</sup>

<sup>14</sup> We also test the results of Tables 7 and 8 with a SURE estimation (abstention and vote equations simultaneously) and by considering only votes to given parties (i.e. not considering nulls, blanks and abstention). This analysis introduced no significant changes.

**Table 8. Effects of corruption on PP (Right-hand party) vote share**

Explanatory variables	(1)	(2)	(3)
Share-PP in previous elections	0.860 (0.02)***	0.86 (0.022)***	0.71 (0.01)***
Local corruption before 2003	0.016 (0.04)	0.017 (0.04)	0.039 (0.035)
Local corruption before 2007	0.039 (0.016)**	0.039 (0.016)**	0.026 (0.01)*
Local corruption before 2011	0.015 (0.007)*	0.014 (0.007)*	0.007 (0.005)
Stand for again	-0.045 (0.016)**	-0.046 (0.016)***	-0.041 (0.014)**
Imputation at Regional level		0.001 (0.01)	-0.02 (0.014)
Imputation at Provincial level		0.03 (0.007)***	0.024 (0.009)**
Unemployment rate (lagged)			-0.0005 (0.0004)
Population (lagged)			2e-8 (1e-8)**
Region effect	NO	NO	YES
Year effect	YES	YES	YES
Constant	0.07 (0.01)***	0.06 (0.01)***	0.09 (0.01)***
Observations	7622	7622	7622
R <sup>2</sup>	0.76	0.77	0.79
F-statistic	328.61***	269.26***	(*)

Note 1: \*\*\* 1%, \*\* 5%, \*10% significance test. Standard errors shown in brackets.

Note 2: (\*) Due to the used of both fixed effects by region and cluster by province, Stata does not report the F statistic for conjoint significance.

The most important fact to note in this table is that the signs of the coefficients of local corruption binary variables are positive. In general, the models points to an increase of vote share between 1.4 and 3.9 points, depending on the year and model considered. The data from 2003 are not statistically significant.

Moreover, if we take into account municipalities located in provinces in which a PP corruption case occurred, the positive impact on local vote share is higher (see coefficients of variables “Imputation at Provincial levels”).

Additionally, the variable “Stand for again” is statistically significant in all models and has a negative sign. This means that PP voters punish local corruption if the leader is not expelled from the party (or at least not considered for upcoming elections).

This outcome suggests that alleged local corruption cases are perceived differently by the two main groups of electorate. While left-wing voters punish corruption by approximately 10%, right-wing voters actually increase their vote share. The vote share only decreases when a case of local corruption occurs in a province with no other cases of corruption and if the leader does not run for re-election.

However, these estimations may be limited by two potential biases, as explained in Heckman et al (1997). The first occurs when the corruption affects a city for which there is no comparable unaffected city for comparison (and vice versa). The second is derived from different distributions of the vector of observable variables that affects our endogenous variable within the two groups of municipalities. To adjust for these biases, we implement a matching estimator.

Before implementing the matching estimator, we analyse the propensity score, or the individual probability of receiving the treatment given the observed covariates. We must ensure that the balancing properties of the propensity score are satisfied, meaning that observations with the same score values have the same distributions of observable characteristics, irrespective of treatment status.

Therefore, we consider the age of imputation of local corruption produced by each party as a treatment variable, depending on previous votes for the left- or right-wing party, the age of provincial or regional corruption of the party, and other variables such as the lagged unemployment rate, the lagged structure of the population and the HHI concentration of the votes index.

Once we have determined the propensity score, we estimate the Average Treatment on the Treated (ATT) through the Kernel matching estimator. We analyse the average effect on the votes obtained by PP or PSOE, in the local elections of 2003, 2007 and 2011. We use the variables

mentioned above but also add the variable *again*, which considers whether the candidate stood for local elections after having been imputed. The results are presented in Table 9.

**Table 9. Summary of results of Matching estimator**

Party	Average Treatment on Treated (ATT)
PP	0.040 (0.017)***
PSOE	-0.020 (0.011)***

Note: \*\*\* 1%, \*\* 5%, \*10% significance test. Standard deviation among brackets

These calculations support the results obtained in previous sections. Overall, the right-wing party PP increased its average vote share by approximately 4.0% in the elections of 2003, 2007 and 2011, despite having been involved in local corruption cases. Conversely, the left-wing party PSOE has been punished in the polls, as their votes decreased by approximately 2.0%, on average.

According to Winter and Weitz-Shapiro (2010), there are two main possible explanations as to why voters support corrupt politicians (as in the case of PP, or the modest effect of PSOE): the *information hypothesis* and the *tradeoff hypothesis*. The former suggests that voters support corrupt politicians when they lack information about a candidate's involvement in corruption upon which they could then act in the voting booth. However, as we have explained in the previous sections, all cases we considered have been publicised and formally accused, so this hypothesis does not fit.

The latter is understood by voters in the following way: they expect that benefits from a politician's actions in government will be greater than costs associated with corruption.<sup>15</sup> However, neither PP's nor PSOE's local corruption is different from the other (see Table 3), nor are there differences in the structural characteristics or singular behaviour between municipalities.

A third possible explanation is the "*loyalty hypothesis*". It is common knowledge that Spanish right-wing voters are more loyal and faithful than left-wing voters. Moreover, the main right-wing party in Spain has objected in recent years to judgment pressure around local corruption in municipalities governed by PP. However, the data presented in Table 1 describe a similar development for both PP and PSOE. PP's voters may therefore use this fact as an argument for

<sup>15</sup> These authors summarise this hypothesis in a more comprehensive Brazilian sentence: "rouba, mas faz" (he robs, but he gets things done).

party loyalty. Thus, rejecting the two previous hypotheses, the loyalty hypothesis may explain this phenomenon.

## 5. Conclusions

During the first decade of the XXIth century, the Spanish economic boom was equally matched by a boom in political corruption, mainly at local and regional level. In fact, the cases of (presumed) corruption increased from 7 in the 1999-2003 period to 180 in the last legislative period (2007-2011). For this reason, corruption is currently widely perceived as an important social problem in Spain.

Several empirical papers have already studied the economic and social effects of corruption, but most of them have focused on macroeconomic indicators and cross-country level analyses. More recently, a newer branch of the empirical literature has emerged to study the effects of corruption cases on voters' behaviour. These studies usually find modest effects on voters' attitudes in most countries, with the exception of Brazil (Ferraz and Finan, 2008) as the only documented case where corruption may significantly alter elections results at a widespread level.

To study this issue with Spanish data, we have built our own dataset of municipalities that includes detailed information on economic indicators, polling results and corruption cases. The latter include not only local cases, but also provincial and regional corruption cases.

We try to test whether wrongdoing by local politicians in the previous legislative period affects voters' decisions, during the elections that took place between 1999 and 2011. Our analysis does not only investigate the general effects (participation rates, null votes), but also whether there are different perceptions of corruption by voters depending on which party is (presumably) responsible for it, that is, right-wing vs. left-wing parties, respectively represented by the *Partido Popular* (PP) and the *Partido Socialista Obrero Español*, PSOE.

We estimate a voting-share equation by difference-in-difference techniques and apply a matching estimator to test our voters' behavioural hypotheses. Our results can be fitted into three general categories. The first one relates to the factors that convert a municipality more prone to corruption. Estimates show that the higher the unemployment rate and the lower the partisan concentration, the larger the probability that a case of (presumed) corruption appears in a municipality.



The second category is the effect of corruption on voters' turnover. In this case, local corruption shows a cumulative effect of vote-loss increase to an average of 1.8 percentage points, since 2003. Abstention increases around 1.5 percentage points due to (presumed) local corruption cases.

Finally, we disaggregated voters' attitude towards (presumed) corruption, and found that it substantially differs between right-wing and left-wing parties. In this regard, both difference-in-difference and matching analysis reaches to same conclusion: local corruption reduces the vote-share of PSOE about 2 percentage points, while PP's share does not only goes unpunished but increases (around 3 percentage points). These estimates seem to confirm that right-wing voters are more loyal to their parties than left-wing ones.

Thus, taking into account the overall weak effects of corruption on political parties' performances, it can be sadly concluded that it has paid to be a crook (at least in Spain) until now. Things should change in the future.

## References

- Becker, S. O. and Ichino, A. 2002. Estimation of the average treatment effects based on propensity scores. *The Stata Journal*, vol. 7(7), 1-19.
- Caínzos, M., and F. Jiménez. 2000. El impacto de los escándalos de corrupción sobre el voto en las elecciones generales de 1996, *Historia y Política*, 4: 93-132.
- Costas-Pérez, E., Solé-Ollé, A. and Sorribas-Navarro, P., forthcoming. Corruption scandals, voters reporting, and accountability. *Journal of the European Political Economy*.
- Elingsson, G. O., Bergh, A. and Sjölin, M., 2008. Public corruption in Swedish municipalities – trouble looming on the horizon? *Local Government Studies*, vol. 34(5), 595-608, November.
- Fernández-Vázquez, P. and Rivero, G., 2010. Electoral consequences of corruption charges in Andalucía (Spain), 2003-2007. *Mimeo*.
- Ferraz, C. and Finan, F., 2008. Exposing corrupt politicians: the effects of Brazil's publicly released audits on electoral outcomes. *The Quarterly Journal of Economics*. 123(2), 703-745.
- Heckman, J.J., Ichimura, H., Todd, P. 1997. Matching as an econometric evaluation estimator: evidence from evaluating a job training programme. *The Review of Economic Studies*; 64; 605-654.
- Ichino, A., Mealli, F. and Nannicini, T. 2008. From temporary help jobs to permanent employment: What can we learn from matching estimators and their sensitivity?. *Journal of Applied Econometrics*, vol. 23, 305-327.
- Jiménez, F., and M. Caínzos. 2004. La repercussion electoral de los escándalos políticos: alcance y condiciones. *Revista Española de Ciencias Políticas*, 10, 141-170.
- Kaufmann, D. 1997. Corruption, the facts. *Foreign Policy*, 107, 11-31.
- Kaufmann, D., Kraay, A., and Zoido-Lobaton, P. 1999. *Governance Matters*. World Bank working paper nº 2196. Washington D.C.
- Kaufmann, D., Kraay, A. and Mastruzzi, M. 2003. *Governance Matters III: governance indicators for 1996-2003*. World Bank working paper nº 3106. Washington D.C.
- Lafay, J.-D., and M. Servais. 2000. The influence of political scandals on popularity and votes, in M. S. Lewis-Beck, ed., *How France votes*. Nueva York: Chatham House.
- Manzetti, L. and Wilson, C.J., 2007. Why do corrupt governments maintain public support? *Comparative Political Studies*, 40(8), 949-970.
- McCann, J. A., and J. I. Domínguez. 1998. Mexicans react to electoral fraud and political corruption: an assessment of public opinion and voting behaviour, *Electoral Studies*, 17 (4): 483-503.

- Miller, A. H. 1999. Sex, politics and public opinion: what political science really learned from the Clinton-Lewinsky scandal, *PS: Political Science and Politics*, XXXII (4): 721-729.
- Nye, J.S. 1967. Corruption and political development: A cost-benefit analysis. *The American Political Science Review*, 61(2), 417-427.
- Pellegrini, L. 2011. *Corruption, development and the environment*. Springer
- Pellegrini, L. and Gerlagh, R. 2008. Causes of corruption: a survey of cross-country analyses and extended results. *Economics of Governance*, 9(3), 245-263.
- Pereiro, C., Melo, M.A., Figueiredo, C.M. 2009. The corruption-enhancing role of re-election incentives) Counterintuitive evidence from Brazil's audits reports. *Political Research Quarterly*, 62(4), 731-744.
- Peters, J. G., and S. Welch. 1978. Political corruption in America: a search for definitions and a theory. *American Political Science Review*, 72: 974-984.
- Reed, S. R. 1999. Punishing corruption: the response of the japanese electorate to scandals, in Oder Feldman, ed., *Political Psychology in Japan*. Commack, N. Nova Science Publishers.
- Winter, M. and R. Weitz-Shapiro. 2010. Lacking information or condoning corruption? Voters attitudes toward corruption in Brazil. APSA 2010 Annual Meeting Paper. Available at: <http://ssrn.com/abstract=1641615>.

---

## *Llista Document de Treball*

### *List Working Paper*

---

- WP 2012/12 “Corruption and local politics: does it pay to be a crook?” Jiménez, J.L. and García, C.
- WP 2012/11 “Not always sunny in paradise: prices and brand diversity in touristic areas supermarkets” Campos, J.; Jiménez, J.L. and Suárez-Alemán, A.
- WP 2012/10 “The institutional, economic and social determinants of local government transparency” Albalade, D.
- WP 2012/09 “The business excellence attraction composite index (BEACI). Design and application to the municipalities of the Barcelona province” Murillo, J.; Romani, J.; Suriñach, J.
- WP 2012/08 “Policy options for the promotion of electric vehicles: a review” Perdiguero, J. and Jiménez, J.L.
- WP 2012/07 “Price differences between domestic and international air markets: an empirical application to routes from Gran Canaria” Fageda, X.; Jiménez, J.L. and Díaz Santamaría, C.
- WP 2012/06 “Building a “quality in work” index in Spain” López-Tamayo, J.; Royuela, V. and Suriñach, J.
- WP 2012/05 “Mergers and difference-in-difference estimator: why firms do not increase prices?” Jiménez, J.L. and Perdiguero, J.
- WP 2012/04 “What attracts knowledge workers? The role of space, social connections, institutions, jobs and amenities” Miguélez, E. and Moreno, R.
- WP 2012/03 “What Drives the Urban Wage Premium? Evidence along the Wage Distribution” Matano, A. and Naticchioni, P.
- WP 2012/02 “Location Patterns of Creative Capital and Regional Disparities in Spain” Kerimoglu, E. and Karahasan, B.C.
- WP 2012/01 “The connection between distortion risk measures and ordered weighted averaging operators” Belles-Sampera, J.; Merigó, J.M.; Guillén, M. and Santolino, M.
- WP 2011/26 “Productivity and innovation spillovers: Micro evidence from Spain” Goya, E.; Vayá, E. and Suriñach, J.
- WP 2011/25 “The regional distribution of unemployment. What do micro-data tell us?” López-Bazo, E. and Motellón, E.
- WP 2011/24 “Vertical relations and local competition: an empirical approach” Perdiguero, J.
- WP 2011/23 “Air services on thin routes: Regional versus low-cost airlines” Fageda, X. and Flores-Fillol, R.
- WP 2011/22 “Measuring early childhood health: a composite index comparing Colombian departments” Osorio, A.M.; Bolancé, C. and Alcañiz, M.
- WP 2011/21 “A relational approach to the geography of innovation: a typology of regions” Moreno, R. and Miguélez, E.
- WP 2011/20 “Does Rigidity of Prices Hide Collusion?” Jiménez, J.L. and Perdiguero, J.
- WP 2011/19 “Factors affecting hospital admission and recovery stay duration of in-patient motor victims in Spain” Santolino, M.; Bolancé, C. and Alcañiz, M.
- WP 2011/18 “Why do municipalities cooperate to provide local public services? An empirical analysis” Bel, G.; Fageda, X. and Mur, M.
- WP 2011/17 “The “farthest” need the best. Human capital composition and development-specific economic growth” Manca, F.

- WP 2011/16 “Causality and contagion in peripheral EMU public debt markets: a dynamic approach” Gómez-Puig, M. and Sosvilla-Rivero, S.
- WP 2011/15 “The influence of decision-maker effort and case complexity on appealed rulings subject to multi-categorical selection” Santolino, M. and Söderberg, M.
- WP 2011/14 “Agglomeration, Inequality and Economic Growth” Castells, D. and Royuela, V.
- WP 2011/13 “A correlation sensitivity analysis of non-life underwriting risk in solvency capital requirement estimation” Bermúdez, L.; Ferri, A. and Guillén, M.
- WP 2011/12 “Assessing agglomeration economies in a spatial framework with endogenous regressors” Artis, M.J.; Miguélez, E. and Moreno, R.
- WP 2011/11 “Privatization, cooperation and costs of solid waste services in small towns” Bel, G; Fageda, X. and Mur, M.
- WP 2011/10 “Privatization and PPPS in transportation infrastructure: Network effects of increasing user fees” Albalade, D. and Bel, G.
- WP 2011/09 “Debating as a classroom tool for adapting learning outcomes to the European higher education area” Jiménez, J.L.; Perdiguero, J. and Suárez, A.
- WP 2011/08 “Influence of the claimant’s behavioural features on motor compensation outcomes” Ayuso, M; Bermúdez L. and Santolino, M.
- WP 2011/07 “Geography of talent and regional differences in Spain” Karahasan, B.C. and Kerimoglu E.
- WP 2011/06 “How Important to a City Are Tourists and Daytrippers? The Economic Impact of Tourism on The City of Barcelona” Murillo, J; Vayá, E; Romaní, J. and Suriñach, J.
- WP 2011/05 “Singling out individual inventors from patent data” Miguélez, E. and Gómez-Miguélez, I.
- WP 2011/04 “¿La sobreeducación de los padres afecta al rendimiento académico de sus hijos?” Nieto, S; Ramos, R.
- WP 2011/03 “The Transatlantic Productivity Gap: Is R&D the Main Culprit?” Ortega-Argilés, R.; Piva, M.; and Vivarelli, M.
- WP 2011/02 “The Spatial Distribution of Human Capital: Can It Really Be Explained by Regional Differences in Market Access?” Karahasan, B.C. and López-Bazo, E
- WP 2011/01 “I If you want me to stay, pay” . Claeys, P and Martire, F
- WP 2010/16 “Infrastructure and nation building: The regulation and financing of network transportation infrastructures in Spain (1720-2010)” Bel, G
- WP 2010/15 “Fiscal policy and economic stability: does PIGS stand for Procyclicality In Government Spending?” Maravalle, A ; Claeys, P.
- WP 2010/14 “Economic and social convergence in Colombia” Royuela, V; Adolfo García, G.
- WP 2010/13 “Symmetric or asymmetric gasoline prices? A meta-analysis approach” Perdiguero, J.
- WP 2010/12 “Ownership, Incentives and Hospitals” Fageda, X and Fiz, E.
- WP 2010/11 “Prediction of the economic cost of individual long-term care in the Spanish population” Bolancé, C; Alemany, R ; and Guillén M
- WP 2010/10 “On the Dynamics of Exports and FDI: The Spanish Internationalization Process” Martínez-Martín J.
- WP 2010/09 “Urban transport governance reform in Barcelona” Albalade, D ; Bel, G and Calzada, J.
- WP 2010/08 “Cómo (no) adaptar una asignatura al EEES: Lecciones desde la experiencia comparada en España” Florido C. ; Jiménez J.L. and Perdiguero J.

- WP 2010/07 “Price rivalry in airline markets: A study of a successful strategy of a network carrier against a low-cost carrier” Fageda, X ; Jiménez J.L. ; Perdigueró , J.
- WP 2010/06 “La reforma de la contratación en el mercado de trabajo: entre la flexibilidad y la seguridad” Royuela V. and Manuel Sanchis M.
- WP 2010/05 “Discrete distributions when modeling the disability severity score of motor victims” Boucher, J and Santolino, M
- WP 2010/04 “Does privatization spur regulation? Evidence from the regulatory reform of European airports . Bel, G. and Fageda, X.”
- WP 2010/03 “High-Speed Rail: Lessons for Policy Makers from Experiences Abroad”. Albalate, D ; and Bel, G.”
- WP 2010/02 “Speed limit laws in America: Economics, politics and geography”. Albalate, D ; and Bel, G.”
- WP 2010/01 “Research Networks and Inventors’ Mobility as Drivers of Innovation: Evidence from Europe” Miguélez, E. ; Moreno, R. ”
- WP 2009/26 ”Social Preferences and Transport Policy: The case of US speed limits” Albalate, D.
- WP 2009/25 ”Human Capital Spillovers Productivity and Regional Convergence in Spain” , Ramos, R ; Artis, M.; Suriñach, J.
- WP 2009/24 “Human Capital and Regional Wage Gaps” ,López-Bazo,E. Motellón E.
- WP 2009/23 “Is Private Production of Public Services Cheaper than Public Production? A meta-regression analysis of solid waste and water services” Bel, G.; Fageda, X.; Warner. M.E.
- WP 2009/22 “Institutional Determinants of Military Spending” Bel, G., Elias-Moreno, F.
- WP 2009/21 “Fiscal Regime Shifts in Portugal” Afonso, A., Claeys, P., Sousa, R.M.
- WP 2009/20 “Health care utilization among immigrants and native-born populations in 11 European countries. Results from the Survey of Health, Ageing and Retirement in Europe” Solé-Auró, A., Guillén, M., Crimmins, E.M.
- WP 2009/19 “La efectividad de las políticas activas de mercado de trabajo para luchar contra el paro. La experiencia de Cataluña” Ramos, R., Suriñach, J., Artís, M.
- WP 2009/18 “Is the Wage Curve Formal or Informal? Evidence for Colombia” Ramos, R., Duque, J.C., Suriñach, J.
- WP 2009/17 “General Equilibrium Long-Run Determinants for Spanish FDI: A Spatial Panel Data Approach” Martínez-Martín, J.
- WP 2009/16 “Scientists on the move: tracing scientists’ mobility and its spatial distribution” Miguélez, E.; Moreno, R.; Suriñach, J.
- WP 2009/15 “The First Privatization Policy in a Democracy: Selling State-Owned Enterprises in 1948-1950 Puerto Rico” Bel, G.
- WP 2009/14 “Appropriate IPRs, Human Capital Composition and Economic Growth” Manca, F.
- WP 2009/13 “Human Capital Composition and Economic Growth at a Regional Level” Manca, F.
- WP 2009/12 “Technology Catching-up and the Role of Institutions” Manca, F.
- WP 2009/11 “A missing spatial link in institutional quality” Claeys, P.; Manca, F.
- WP 2009/10 “Tourism and Exports as a means of Growth” Cortés-Jiménez, I.; Pulina, M.; Riera i Prunera, C.; Artís, M.

- WP 2009/09 “Evidence on the role of ownership structure on firms' innovative performance” Ortega-Argilés, R.; Moreno, R.
- WP 2009/08 “¿Por qué se privatizan servicios en los municipios (pequeños)? Evidencia empírica sobre residuos sólidos y agua” Bel, G.; Fageda, X.; Mur, M.
- WP 2009/07 “Empirical analysis of solid management waste costs: Some evidence from Galicia, Spain” Bel, G.; Fageda, X.
- WP 2009/06 “Intercontinental flights from European Airports: Towards hub concentration or not?” Bel, G.; Fageda, X.
- WP 2009/05 “Factors explaining urban transport systems in large European cities: A cross-sectional approach” Albalade, D.; Bel, G.
- WP 2009/04 “Regional economic growth and human capital: the role of overeducation” Ramos, R.; Suriñach, J.; Artís, M.
- WP 2009/03 “Regional heterogeneity in wage distributions. Evidence from Spain” Motellón, E.; López-Bazo, E.; El-Attar, M.
- WP 2009/02 “Modelling the disability severity score in motor insurance claims: an application to the Spanish case” Santolino, M.; Boucher, J.P.
- WP 2009/01 “Quality in work and aggregate productivity” Royuela, V.; Suriñach, J.
- WP 2008/16 “Intermunicipal cooperation and privatization of solid waste services among small municipalities in Spain” Bel, G.; Mur, M.
- WP 2008/15 “Similar problems, different solutions: Comparing refuse collection in the Netherlands and Spain” Bel, G.; Dijkgraaf, E.; Fageda, X.; Gradus, R.
- WP 2008/14 “Determinants of the decision to appeal against motor bodily injury settlements awarded by Spanish trial courts” Santolino, M.
- WP 2008/13 “Does social capital reinforce technological inputs in the creation of knowledge? Evidence from the Spanish regions” Miguélez, E.; Moreno, R.; Artís, M.
- WP 2008/12 “Testing the FTPL across government tiers” Claeys, P.; Ramos, R.; Suriñach, J.
- WP 2008/11 “Internet Banking in Europe: a comparative analysis” Arnaboldi, F.; Claeys, P.
- WP 2008/10 “Fiscal policy and interest rates: the role of financial and economic integration” Claeys, P.; Moreno, R.; Suriñach, J.
- WP 2008/09 “Health of Immigrants in European countries” Solé-Auró, A.; M.Crimmins, E.
- WP 2008/08 “The Role of Firm Size in Training Provision Decisions: evidence from Spain” Castany, L.
- WP 2008/07 “Forecasting the maximum compensation offer in the automobile BI claims negotiation process” Ayuso, M.; Santolino, M.
- WP 2008/06 “Prediction of individual automobile RBNS claim reserves in the context of Solvency II” Ayuso, M.; Santolino, M.
- WP 2008/05 “Panel Data Stochastic Convergence Analysis of the Mexican Regions” Carrion-i-Silvestre, J.L.; German-Soto, V.
- WP 2008/04 “Local privatization, intermunicipal cooperation, transaction costs and political interests: Evidence from Spain” Bel, G.; Fageda, X.
- WP 2008/03 “Choosing hybrid organizations for local services delivery: An empirical analysis of partial privatization” Bel, G.; Fageda, X.
- WP 2008/02 “Motorways, tolls and road safety. Evidence from European Panel Data” Albalade, D.; Bel, G.

- WP 2008/01 “Shaping urban traffic patterns through congestion charging: What factors drive success or failure?” Albalate, D.; Bel, G.
- WP 2007/19 “La distribución regional de la temporalidad en España. Análisis de sus determinantes” Motellón, E.
- WP 2007/18 “Regional returns to physical capital: are they conditioned by educational attainment?” López-Bazo, E.; Moreno, R.
- WP 2007/17 “Does human capital stimulate investment in physical capital? evidence from a cost system framework” López-Bazo, E.; Moreno, R.
- WP 2007/16 “Do innovation and human capital explain the productivity gap between small and large firms?” Castany, L.; López-Bazo, E.; Moreno, R.
- WP 2007/15 “Estimating the effects of fiscal policy under the budget constraint” Claeys, P.
- WP 2007/14 “Fiscal sustainability across government tiers: an assessment of soft budget constraints” Claeys, P.; Ramos, R.; Suriñach, J.
- WP 2007/13 “The institutional vs. the academic definition of the quality of work life. What is the focus of the European Commission?” Royuela, V.; López-Tamayo, J.; Suriñach, J.
- WP 2007/12 “Cambios en la distribución salarial en España, 1995-2002. Efectos a través del tipo de contrato” Motellón, E.; López-Bazo, E.; El-Attar, M.
- WP 2007/11 “EU-15 sovereign governments’ cost of borrowing after seven years of monetary union” Gómez-Puig, M.
- WP 2007/10 “Another Look at the Null of Stationary Real Exchange Rates: Panel Data with Structural Breaks and Cross-section Dependence” Syed A. Basher; Carrion-i-Silvestre, J.L.
- WP 2007/09 “Multicointegration, polynomial cointegration and I(2) cointegration with structural breaks. An application to the sustainability of the US external deficit” Berenguer-Rico, V.; Carrion-i-Silvestre, J.L.
- WP 2007/08 “Has concentration evolved similarly in manufacturing and services? A sensitivity analysis” Ruiz-Valenzuela, J.; Moreno-Serrano, R.; Vaya-Valcarce, E.
- WP 2007/07 “Defining housing market areas using commuting and migration algorithms. Catalonia (Spain) as an applied case study” Royuela, C.; Vargas, M.
- WP 2007/06 “Regulating Concessions of Toll Motorways, An Empirical Study on Fixed vs. Variable Term Contracts” Albalate, D.; Bel, G.
- WP 2007/05 “Decomposing differences in total factor productivity across firm size” Castany, L.; Lopez-Bazo, E.; Moreno, R.
- WP 2007/04 “Privatization and Regulation of Toll Motorways in Europe” Albalate, D.; Bel, G.; Fageda, X.
- WP 2007/03 “Is the influence of quality of life on urban growth non-stationary in space? A case study of Barcelona” Royuela, V.; Moreno, R.; Vayá, E.
- WP 2007/02 “Sustainability of EU fiscal policies. A panel test” Claeys, P.
- WP 2007/01 “Research networks and scientific production in Economics: The recent Spanish experience” Duque, J.C.; Ramos, R.; Royuela, V.
- WP 2006/10 “Term structure of interest rate. European financial integration” Fontanals-Albiol, H.; Ruiz-Dotras, E.; Bolancé-Losilla, C.
- WP 2006/09 “Patrones de publicación internacional (ssci) de los autores afiliados a universidades españolas, en el ámbito económico-empresarial (1994-2004)” Suriñach, J.; Duque, J.C.; Royuela, V.
- WP 2006/08 “Supervised regionalization methods: A survey” Duque, J.C.; Ramos, R.; Suriñach, J.



- WP 2006/07 “Against the mainstream: nazi privatization in 1930s germany” Bel, G.
- WP 2006/06 “Economía Urbana y Calidad de Vida. Una revisión del estado del conocimiento en España” Royuela, V.; Lambiri, D.; Biagi, B.
- WP 2006/05 “Calculation of the variance in surveys of the economic climate” Alcañiz, M.; Costa, A.; Guillén, M.; Luna, C.; Rovira, C.
- WP 2006/04 “Time-varying effects when analysing customer lifetime duration: application to the insurance market” Guillen, M.; Nielsen, J.P.; Scheike, T.; Perez-Marin, A.M.
- WP 2006/03 “Lowering blood alcohol content levels to save lives the european experience” Albalate, D.
- WP 2006/02 “An analysis of the determinants in economics and business publications by spanish universities between 1994 and 2004” Ramos, R.; Royuela, V.; Suriñach, J.
- WP 2006/01 “Job losses, outsourcing and relocation: empirical evidence using microdata” Artís, M.; Ramos, R.; Suriñach, J.



Institut de Recerca en Economia Aplicada Regional i Pública  
*Research Institute of Applied Economics*

**Universitat de Barcelona**

Av. Diagonal, 690 • 08034 Barcelona

**WEBSITE:** [www.ub.edu/irea/](http://www.ub.edu/irea/) • **CONTACT:** [irea@ub.edu](mailto:irea@ub.edu)