Local Political Power and Housing Bubble in Spain

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ABSTRACT: This paper provides empirical evidence of the role of local politicians in the development of the housing bubble in Spain. It intends to determine empirically whether different political ideologies matter and whether municipalities run by different political parties show housing bubbles of different intensity. We work with all municipalities over 25,000 inhabitants. We measure political ideology according to the political party to which the mayor of a municipality belongs. The housing bubble is proxied by the stock of unsold new dwellings. The results suggest an association between the local political ideology and existing unsold new dwellings. Municipalities governed by right-wing mayors have a higher number and share of unsold new dwellings than those governed by centre-left and left-wing mayors.

JEL Classification: O18; D72.

Keywords: empty dwellings; housing bubble; local power.

Política Local y Burbuja Inmobiliaria en España

RESUMEN: Este trabajo proporciona evidencia empírica sobre el papel de los políticos locales en el desarrollo de la burbuja inmobiliaria en España. Pretende estudiar, desde una perspectiva empírica, si la ideología política es relevante, de manera que los municipios dirigidos por diferentes partidos políticos presentan burbujas de distinta intensidad. En el trabajo se incluyen todos los municipios de más de 25.000 habitantes. La ideología política es aproximada por el partido político al que pertenece el alcalde de cada municipio. La burbuja inmobiliaria, por su parte, se aproxima por el *stock* de viviendas nuevas pendientes de venta. Los resultados sugieren que existe una asociación entre la ideología política del municipio y las viviendas nuevas pendientes de venta existente. Los municipios gobernados por alcaldes de derecha tienen un mayor volumen (y proporción) de

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viviendas nuevas en venta que los municipios gobernados por alcaldes de izquierda y centro-izquierda.

Clasificación JEL: O18; D72.

Palabras clave: viviendas vacías; burbuja inmobiliaria; partidos políticos locales.

1.   Introduction

The Spanish housing market has experienced a major downturn in Europe, beginning in 2008 with the onset of the international financial crisis. Prior to this time, Spain was Europe's largest user of capital markets to fund mortgages. Around 30% of mortgages made use of residential mortgage-back securities and the rest was covered by bonds. The crunch on international credit led to a dramatic fall in mortgage availability (Ball, 2010). The scale of the correction reflects the impact of one of the biggest housing market booms in Europe. House prices increased by a multiple of 2.2 tin real terms between 1996 and 2006 in Spain; house building rose to record heights, with an annual average of 600,000 new dwellings built in the period 2000-2006, reaching a peak of 760,169 in 2006. Housing investment was 8% of GDP, while household debt reached 125% of personal disposable income in 2007, mostly related to mortgages.

The problems of the Spanish residential market remain amongst the worst in Europe. Two issues are the major economic consequences of the bursting of the Spanish housing bubble[1]. The first is the fall in house prices from their peak in 2008. By the first term of 2014, house prices had decreased 29.6%[2] and it was still uncertain whether the market would start to level off in 2014 in some regions, although there were signals that this might be the case. Clearly, there have been locational (by region and municipality) and dwelling-type variations around this average national figure. This has been due to differences in both local speeds of adjustment and the amount of house price change generated by changing relationships between local demand and supply. Spain's diverse geography strongly highlights such differences (Altuzarra and Esteban, 2010; Ball, 2011; García Montalvo, 2013).

The second major economic consequence of the housing bubble burst is the substantial number of unsold properties that remain in the hands of property developers and mainly the banking system, which have proved difficult to dispose of. Some of these unsold new properties are holiday dwellings, but many are potential residences[3]. For some years, when foreclosing on developers, banks had the incentive to

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[1]   There are other relevant impacts of the housing bubble of different nature in Spain. One is the massive amount of house building which has raised serious concerns about the environmental degradation that has been produced. Another important effect of the housing bubble is evictions which had a major social impact in Spain. However, this article will not deal with these issues.

[2]   Ministry of Public Works statistics (*http://www.fomento.gob.es/MFOM/LANG_CASTELLANO/ ATENCION_CIUDADANO/INFORMACION_ESTADISTICA/*).

[3]   The Ministry of Public Works estimates that more than 500,000 dwellings remained unsold in 2013 (*http://www.fomento.gob.es/NR/rdonlyres/88A7D54A-A73E-4C1C-9956-2A0DC1D0D399/122300/ SVN_12.pdf*).

hold unsold dwellings on their books rather than discounting them heavily through sales, because that forced them to write the losses into their books (Ball, 2010, 2011). This behaviour accounts for the slow decline in house prices until 2012, when the reform programme of the financial sector set up by the government forced banks to start releasing the unsold stock onto the market at significantly lower prices (Esteban and Altuzarra, 2014). Differences also exist among townships regarding the amount of unsold new properties that they have held in the housing stock since the bubble burst.

Research has recently started to examine the role that local governments may have played in the development of the housing bubble in Spain. This line of research is still in its embryonic stages, especially from the empirical viewpoint, but it has the potential to have significant implications for the social and political debate on housing issues. The motivation for the study of the relationship between local political powers and the housing bubble follows from the observation of the different views that local powers have regarding land use and housing policies. When it comes to local elections, political parties have differed widely on the land use and housing measures that they propose. These differences may well explain, at least to some extent, the differences in the size of the housing bubbles in Spanish municipalities.

The aim of this paper then is to provide empirical evidence concerning the role of local political ideology in the development of the housing bubble in Spain. More precisely, it attempts to determine empirically whether different political ideologies matter and whether as a result municipalities run by different political parties show housing bubbles of different intensity.

The rest of the paper is structured as follows. Section 2 provides a literature review. Section 3 looks at the role of local authorities in the housing market in Spain. Section 4 presents the database and the methodology used. Section 5 addresses the results, discussed in greater depth in Section 6. Section 7 summarizes the main conclusions.

2. Literature Review

The literature has discussed many factors (i.e. housing demand, real gross disposable income of households, employment rate, number of households, etc.) that may lead to the formation of a housing bubble (Himmelberg *et al.,* 2005; García Montalvo, 2006; Esteban and Altuzarra, 2008; Fraser *et al.,* 2008; Carballo-Cruz, 2011; Mayer, 2011; Glaeser *et al.,* 2013). However, one factor which has scarcely been examined is the role that local political parties may play. The study of the relationship between local powers and a housing boom may be particularly important in countries such as Spain, where the financial problems faced by municipalities in carrying out their activities have often encouraged them to develop the housing sector as a way of raising financial resources, at the same time leading, in some cases, to mismanagement and corruption.

Among the small number of studies that have pointed to the role of local political parties in the making of the housing bubble in Spain is that of Garcia (2010), who states that municipalities have suffered from a shortage of financial resources and as a result local governments have found in urban development a way of increasing their resources through land management and new housing taxes. Similarly, Sabal (2005) argues that «many local governments own considerable tracts of land that are released for development only when demand pressures reach the point where they can be sold at high «speculative» prices, more with a view to replenishing government coffers than for long-term planning proposes» (p. 7). Leal Maldonado (2010) and Fariña and Naredo (2010) go further and tend to ascribe the main political responsibility to the conservative party (Partido Popular) because it was a conservative government that approved the Land Use Act[4] in 1998 which eased the production of developable land for residential construction by municipalities and moreover, in their opinion, conservative local authorities tend to be closer to developers' and builders' interests.

To the best of our knowledge, even fewer studies have focused on the relationship between housing bubbles and the role of local powers in Spain from an empirical point of view. García Montalvo (2010) studies the effect of land use regulations on housing prices during the Spanish housing boom and concludes that land availability does not have any statistically significant explanatory power for the growth rate of prices at the municipal level. Yet this study does not deal with the effect of land availability on the intensity of housing construction in different municipalities, which appears to be an important element in explaining the formation of the housing bubble: it is not only the rise in prices but also the amount of new dwellings put onto the market that finally affects the scope of the correction needed in the market, as noted by Glaeser *et al.* (2008).

Solé-Ollé and Viladecans-Marsal (2013a), study the effect of parties on housing prices in Spain during the boom period and conclude that prices grew more in areas under left-wing parties. However, the study does not analyse the role played by other variables in these outcomes (such as demand variables) and more importantly, the study does not cover the period of market correction after the bursting of the bubble. In Solé-Ollé and Viladecans-Marsal (2012, 2013b), it is shown that a left-wing local government would allow approximately 65% less land to be developed than a right-wing government facing a similar competitive election.

Our study is framed in the same line of research as the latter empirical studies. Two main issues make this study different from previous empirical research. First, the time period considered in this study is longer. It covers the years during which the housing bubble developed and the years immediately after the housing bust. Second, the boom-bust process is proxied taking into account the number and share of unsold new homes.

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[4] Law 6/1998 (13 April) on Land Regime and Valuation (Ley 6/1998, de 13 de abril, sobre régimen del suelo y valoraciones).

3. The Role of Local Authorities in the Housing Market in Spain

Spain is a federal country with a multi-level government structure (Tosics, 2010; González Pérez, 2007). Since the 1978 Constitution, Spain has tended to lean towards decentralization and the distribution of powers between regions and municipalities[5]. At the local level, there are 8,109 municipalities. In each local authority, there is a municipal council composed of councillors elected from party lists by universal suffrage for a four-year term and a local government council which is the main executive body. The mayor is the head of the executive body and is appointed by and within the councillors and chairs the municipal council. The competences of the municipalities vary depending on their size.

Local authorities may affect the housing market through different kinds of intervention (Iglesias Gonzalez, 2005). The most relevant one is the intervention in the land market primarily through urban land use planning regulations[6]. Urban development and spatial planning are within the remit of the regions and central government cannot legislate on them. However, generally speaking, all regional planning instruments are derived from the culture of urban planning generated by the 1956 Land Use Act and must obviously be in compliance with the applicable central Land Use Act at all times. Thus, in fact, there are many common characteristics among them (Fariña and Naredo, 2010; González Pérez, 2007).

The urban planning process is a hierarchical one (Esteban and Altuzarra, 2014). At the regional level, there are Territorial Plans which cover the entire region but local governments have competence in urban planning (General Urban Plan, GUP) concerning the municipalities, always following the general guidelines of the Territorial Plans. The GUP covers at least one municipality and its main objective is to provide integrated urban development throughout the municipal territory and to classify different zones of land use. Thus, building land has been made available in the Spanish planning system via a zoning process that classifies and periodically reclassifies land into zones of urban, developable and protected uses. In addition, the GUP preconfigures the uses, intensities of use, design of the communications systems and other structural elements. Developers have to implement infrastructure works themselves and it can take several years to win planning approval depending on the functioning of the municipality[7].

Despite variations, since the late 1990s local governments have responded generally in Spain to the land release incentives that local government finance, urban policy concerns and economic and social issues gave them. These incentives, together

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[5] There are 17 Autonomous Communities and 2 Autonomous Cities in Spain.
[6] Local authorities may also intervene in the production of public housing but these interventions have not been very relevant in the Spanish case.
[7] The 2007 Land Use Act has introduced important changes in these processes, but will not be discussed here.

with favourable macroeconomic conditions, helped to boost house building to high levels (Ball, 2011; United Nations, 2008).

An important element in the local government decision-making process over residential land availability, as noted before, was the fact that real estate was a major source of municipal income during the boom period. The construction boom generated substantial local public income from the taxes on construction activities, property sales and other local taxes based on property values.

Income was also substantial from sales of land appropriated during the zoning processes. In Spain, developers must give 5-15% of their land to the municipality to be used for public purposes (roads, schools, etc.) but it could also be sold on the free market if local governments wished. This was a powerful incentive to zone residential land for development because local governments gained revenue when they did so [8]. Moreover, many municipalities sold land they already owned (empty or otherwise) in good locations to developers. One might say that local authorities speculated on the land market «in the public interest». This increased expending capacity was used in different ways by different municipalities and on many occasions led to significant additions to urban infrastructure facilities and local public services.

A second element that propelled the rezoning of land has to do with increasing the provision of social housing in the municipality. Land Use regulations specified that a percentage [9] of all new dwellings in a certain development area should be subsidized. Thus, many local authorities actively supported new residential developments on the free market because this would in turn increase the stock of subsidized housing for lower-income inhabitants. In fact, on many occasions, land obtained through the planning process was also used for that purpose.

Economic and employment concerns were also behind the support of many local authorities for housing development activities. Construction is a labour-intensive activity and was seen as a solution to secular unemployment problems in many regions. Moreover, residential construction, mainly in the second and retirement housing sector, was seen as a driver to consolidate tourism in many places, especially in many coastal municipalities.

Unfortunately, one cannot dismiss the role of corruption at the local level in Spain, where, as Solé-Ollé and Viladecans-Marsal (2013b) note, «powerful land-related interests found it very easy to bribe local politicians in exchange for amendments to local land-use plans» (p. 44). A report by Fundación Alternativas (2007) concluded that corruption in urban development is a widespread practice in Spain [10].

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[8] The new 2007 Land Use Act establishes that municipally acquired land has to be sold for subsidized housing, thus diminishing income incentives for local authorities.

[9] The actual figure varies from region to region.

[10] Between January 1996 and November 2009, politicians in 814 municipalities were engaged in allegedly corrupt acts. Before 1999, this number was small but it started to rise as the housing boom intensified.

Even though many factors could lead local authorities of different political colours to follow a similar strategy of actively supporting housing construction activities, there are still significant differences in their views on how land use and housing policies should be implemented. These differences are observed in the electoral programmes that political parties present for the local municipal elections. As Sole-Ollé and Viladecans-Marsal (2013a) state after reviewing the electoral memorandum, «the main left-wing parties (PSOE and IU) in Spain are illustrative of the emphasis placed on restricting urban growth» (p. 44) while «the main right-wing party (PP) does not include any specific proposal related to the containment of urban growth» (p. 45). This different approach by political parties may have had an influence on the formation of the housing bubble in Spain.

4. Data and Methodology

4.1. Data

The empirical study has been performed using information provided by three main sources of information: the Census of Population and Housing 2011, the Ministry of Public Works and the Ministry of Finance and Public Administration. The data refer mainly to different types of dwelling (main, second and empty dwellings), house prices and the electoral lists to which the mayors of the Spanish municipalities of over 25,000 inhabitants belong. The total number of municipalities of this size in Spain is 281. We work with this subset of municipalities due to the limitations imposed by the data: data on the evolution of housing prices supplied by the Ministry of Work are not available at a higher level of territorial disaggregation. In our study, Ceuta was excluded due to the lack of availability of the necessary data for the purpose of this work.

4.1.1. Data on housing

The Spanish Census of Population and Housing (CPH) is undertaken every 10 years. The CPH collects information on the characteristics of the population and housing for the whole of Spain and also disaggregated by autonomous region, province and municipality. We worked with the last census held in 2011.

Table 1 summarizes the characteristics of our sample. In the municipalities we studied, there are 29,169,632 people, 62.3% of the total population. There are 11,317,371 main dwellings, representing 62.6% of total main dwellings. The proportion of secondary dwellings in our sample is 35.8% of the total of this type of dwelling. The percentage of empty dwellings contained in our sample is 52.4% of the total number of empty dwellings in Spain.

Table 1. Population and Housing in Spain and in the municipalities of over 25,000 inhabitants

	Spain	*Municipalities of more than 25.000 inhabitants*	*Percentage*
Population	46,815,916	29,169,632	62.3
Total dwellings	25,288,623	14,439,801	57.1
Main dwellings	18,083,692	11,317,371	62.6
Secondary dwellings	3,681,565	1,317,750	35.8
Empty dwellings	3,443,365	1,804,680	52.4
Empty dwellings-Total dwellings ratio	13.6%	12.5%	

Source: Census of Population and Housing 2011 and own calculations.

Regarding secondary dwellings it is worth mentioning two issues. First, approximately one third of secondary dwellings are located in municipalities with fewer than 5,000 inhabitants. This phenomenon is not exactly the result of massive construction in the last decade but relates to cultural and family reasons. Less than 15% of construction occurred during the gestation period of the housing bubble (see Table 2). Secondary dwellings located in these small municipalities are often the result of family ties between generations that left rural areas in previous decades and those that remain living there, rather than a strictly economic interest arising from a favourable situation.

Table 2. Secondary dwellings by municipality size and age

Municipalities size (inhabitants)	*Number of secondary dwellings*	*%*	*% accumulated*	*% dwellings built between 1990-2011*
Less than 5,000	1,224,955	33.3	33.3	15.9
From 5,001 to 20,000	874,270	23.7	57.0	22.4
From 20,001 to 50,000	616,425	16.7	73.8	23.8
From 50,001 to 100,000	425,090	11.5	85.3	24.9
From 100,001 to 500,000	361,270	9.8	95.1	31.4
More than 500,000	179,560	4.9	100.0	32.8
Total	**3,681,565**			**30.1**

Source: Census of Population and Housing 2011 and own calculations.

The CPH-2011 registers information about the stock of empty dwellings. It is not possible to distinguish existing empty dwellings from unsold new dwellings, with the latter being more relevant to the objectives of this work. The Ministry of Economics

and Competitiveness provides data on the stock of unsold empty dwellings at the level of autonomous region and province; however, there is no disaggregated data at the municipal level[11]. For this reason, we use the number of new dwellings as a proxy for the stock of unsold new dwellings.

4.1.2. Housing prices

The Ministry of Public Works provides quarterly information on the evolution of dwelling prices per square metre. This information is only available for municipalities over 25,000 inhabitants since the first quarter of 2005.

4.1.3. Political parties

The Ministry of Finance and Public Administration provides information on the political party of the mayors elected in each of the Spanish municipalities from 1979 to 2011. We have worked with electoral databases from 1995 to 2003, that is, with terms of office for the periods 1995-1999, 1999-2003 and 2003-2007. These periods correspond to those years in which the political decisions concerning land zoning/rezoning and the licensing of construction that led to the development of the housing bubble were adopted.

As noted before, political parties have different views on some of the major issues concerning the design and implementation of housing policies. On the basis of these differences, we have classified political parties to which elected mayors belong into four categories according to the traditional left-right political spectrum. The first category (left wing) includes mayors belonging to Izquierda Unida (IU) and other small left-wing regionalist and nationalist parties. The second category (centre-left wing) contains the main left-wing party in Spain (Partido Socialista Obrero Español —PSOE—) and other centre-left regionalist parties. The third category (centre-right wing) comprises centre-right nationalist and regionalist parties and most independent parties. Finally, the fourth category includes the main right-wing party in Spain (Partido Popular —PP—).

It is worth noting that during the term of office 1995-1999, 40.6% of the municipalities with over 25,000 inhabitants had a right-wing mayor, 16% a centre-right mayor, 3.8% a centre-left mayor and 36.6% a left-wing mayor. During two consecutive terms of office (1995-1999 and 1999-2003) these percentages were 25.3%, 10.7%, 31.7 and 3.2%, respectively. The percentage of municipalities with right-

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[11] To determine whether the stock of empty dwellings is a correct proxy for the stock of unsold new dwellings, we calculated the correlation between these two variables in the year 2011. The correlation between these two variables at the level of autonomous region was 0.96 for all Spanish municipalities and 0.94 for the municipalities in our sample. At the provincial level, these correlations were 0.76 and 0.87, respectively. We believe, therefore, that the variable provided by the CPH-2011 for municipalities with more than 25,000 inhabitants, used in this paper, is a suitable proxy.

wing mayors in at least two out of the three terms of office (1995-1999, 1999-2003 and 2003-2007) was 33.4%. This figure was 12.1%, 44.8% and 4.6% for centre-right, centre-left and left-wing parties, respectively.

4.2. Methodology

We estimated two ordinary least squares (OLS) regressions with heteroscedasticity-robust standard error models, each with two dependent variables and one independent variable. Subsequently, we ran a full model including a large set of control variables [12]. The two OLS regressions are estimated as follows:

$$\log emptytH_i = \alpha_0 + \alpha_1 PolParties_{1995\text{-}1999\ i} + \alpha_2 X_i + \varepsilon_i \qquad (1)$$

$$share\ vacantH_i = \alpha_0 + \alpha_1 PolParties_{1995\text{-}1999\ i} + \alpha_2 X_i + \varepsilon_i \qquad (2)$$

where *logemptyH$_i$* is the log of the number of empty dwellings; *shareemptyH$_i$* is the percentage of empty dwellings over the total housing stock in each municipality; *PolParties* [13] $_{1995\text{-}1999}$ is a proxy for political ideology expressed by the political party to which mayors belong during the two consecutive terms of office 1995-1999 and 1999-2003; *X$_i$* is a vector of control variables.

We use a robust standard error model after testing for heteroscedasticity by applying the Breusch-Pagan/Cook-Weisberg heteroscedasticity test (Breusch and Pagan, 1979; Cook and Weisberg, 1983). The results of this test suggest the presence of heteroscedasticity in our OLS regression model and consequently the use of robust standard errors is recommended. Multicollinearity is checked using a variance inflation factor (VIF). The results show that multicollinearity is not a problem in our estimations as the highest VIF value is considerably below the limit of 10 (Chatterjee and Hadi, 2012). The Ramsey test is applied to test for omitted variables. Finally, we

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[12] One of the major assumptions of OLS regression is that the independent variables are not correlated with the error term. The problem of correlation may occur for different reasons. First, it may arise because of omitted variable bias, which makes it difficult for the model to represent a *causal relationship* between the explanatory variable and the dependent variable. Second, it may occur when there is *reverse causality*. To be sure that our model does not have reverse causality, we would need an explanatory variable which is not related to other variables (observed or unobserved) in the model. This is the problem of unobserved heterogeneity. In our case, as in Sole and Villadecans (2011), «it might well be the case that pro-growth residents are concentrated in certain municipalities of the urban area and so tend to vote for right-leaning parties. It might also be the case that places affected by municipality-specific demand shocks during the period analyzed turn to the right in order to facilitate the development projects being implemented». If that is the case, the results of our estimates may contain some bias. Even though there are some econometric methods usually applied to deal with endogeneity (use of instrumental variables or regression discontinuity design), the reality is that none of them are without drawbacks. Given the data available, the instrumental variables approach could be the most feasible; however, there is growing concerns about the validity of instrumental variable approaches (Imbens, 2009) as good instruments are hard to find in general terms and specifically in our case.

[13] The sub-indices correspond to the first year of each term of office.

check for misspecification errors in our models and the results show that there are no misspecification problems.

4.2.1. Dependent variables

The first dependent variable is the log of the number of empty dwellings in the year 2011 (*logemptyH$_i$*). This variable is intended to be a proxy for one consequence of the housing bubble in each municipality. This variable, as noted before, computes the number of empty dwellings, which includes both existing empty dwellings and new unsold dwellings according to the Census of 2011. Given that this Census was undertaken after the development of the housing bubble, this variable approximates the number of empty dwellings at the peak of the housing market boom.

The second dependent variable is the share of empty dwellings in each municipality (*shareemptyH$_i$*). The information provided by this variable complements that offered by the previous variable. While the variable *logemptyH$_i$* captures the characteristics of municipalities in which the highest (lowest) number of empty dwellings is concentrated, the variable *shareemptyH$_i$* captures the characteristics of municipalities with the highest (lowest) percentage of empty dwellings as a percentage of their housing stock. Thus, we can determine whether municipalities in which more empty properties are concentrated (i. e. municipalities with large housing stock) are those with the highest percentage of empty dwellings, or whether, on the contrary, this nexus does not occur.

4.2.2. Independent variable

The independent variable is the political party to which the mayor of the municipality belongs during two consecutive terms of office, i. e. 1995-1999 and 1999-2003, when the housing bubble started and developed and when the most relevant decisions concerning housing issues were taken. This variable is used as a proxy for municipality ideology. This variable consists of five categories which have been built according to the classification of parties shown in Section 4.1:

— It takes the value 1 when the political party to which the mayor belonged was right wing during the two terms of office. This is our reference category.
— It takes the value 2 when the political party to which the mayor belonged was centre right during the two terms of office.
— It takes the value 3 when the political party to which the mayor belonged was centre left during the two terms of office.
— It takes the value 4 when the political party to which the mayor belonged was left wing during the two terms of office.
— It takes the value 5 when there was alternation between political parties.

To test whether the political ideology of a municipality and the decisions taken in the next term of office (2003-2007) have a positive association with the conse-

quences of the housing bubble, we have constructed a new independent variable (*Pol-Party*$_{1995\text{-}1999\text{-}2003}$). This variable also consists of five categories:

— It takes the value 1 when the political party to which the mayor belonged was right wing during at least two terms of office. This is our reference category.
— It takes the value 2 when the political party to which the mayor belonged was centre right during at least two terms of office.
— It takes the value 3 when the political party to which the mayor belonged was centre left during at least two terms of office.
— It takes the value 4 when the political party to which the mayor belonged was left wing during at least two terms of office.
— It takes the value 5 when there was alternation between political parties.

4.2.3.   Control variables

Our estimations contain a vector X of control variables which include:

— 16 dummies for the autonomous regions (Regions$_i$). These are fixed effects, one for each region. This variable captures in the most accurate way the specificities of each area, including whether municipalities are located near coastal areas or not.
— The maximum house price increase during the period 2005q1-2013q1 (*HP-growth$_i$*). This variable attempts to determine whether municipalities with the highest house prices increases in the pre-boom period are those with the largest amount or percentage of empty dwellings, or whether, on the contrary, this association does not hold.
— The log of the population in the year 2001 (*logpopul$_i$*).
— The percentage of the population with a post-compulsory education. This variable is used as a proxy for the income of the municipality. It would be expected that the higher the percentage of population with post-compulsory education, the higher the income and the lower the presence of empty dwellings.
— We include a set of dummies to control for the specificities of municipalities. The first takes the value 1 if the municipality is a capital city at the provincial level and 0 otherwise. The second dummy takes the value 1 if the municipality is a vacation destination according to Exceltur[14] and 0 otherwise. The third takes the value 1 if the municipality is on the coast but is not considered a vacation destination and 0 otherwise.
— The log of the extension of the municipality measured in square kilometres. This is used as a proxy for the availability of land in each municipality for building new dwellings.

Tables 3 and 4 display some descriptive statistics for the categorical and continuous variables respectively.

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[14]   EXCELTUR is a non-profit association formed by 25 of the most important companies throughout the tourism value chain.

Table 3. Statistics of categorical variables

Variable	Proportion	Std. Err.
*PolParties*₁₉₉₅₋₁₉₉₉		
Right wing	0.2527	0.0259
Centre-right	0.1067	0.0184
Centre-left	0.3167	0.0278
Leftt wing	0.0320	0.0105
Alternancy	0.2918	0.0271
*PolParties*₁₉₉₅₋₁₉₉₉₋₂₀₀₃		
Right wing	0.3345	0.0282
Centre-right wing	0.1209	0.0195
Centre-left wing	0.448	0.0297
Leftt wing	0.046	0.0125
Alternancy	0.0498	0.0130
Geographical location		
Capital city of province	0.1814	0.0230
Vacational coast	0.0782	0.0160
Non vocational coast	0.4128	0.0294
Regions		
Andalusia	0.1720	0.0226
Aragon	0.0143	0.0071
Asturias	0.0215	0.0087
Balearics	0.0323	0.0106
Canary Islands	0.0609	0.0143
Cantabria	0.0143	0.0071
Castile-Leon	0.0466	0.0126
Castile-La Mancha	0.0466	0.0126
Catalonia	0.1649	0.0223
Valencia Community	0.1434	0.0210
Extremadura	0.0215	0.0087
Galicia	0.0573	0.0139
Madrid	0.0932	0.0174
Murcia	0.0502	0.0131
Navarre	0.0072	0.0051
Basque Country	0.0502	0.0131
Rioja	0.0036	0.0036

Table 4.   Statistics of continuous variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Log empty dwellings 2011	280	8.247	0.917	5.796	11.9384
Share of empty dwellings over total stock 2011	280	0.132	0.051	0.019	0.36
Maximum house price increase	280	0.394	0.168	0.049	1.2574
Log population 2001	280	10.881	0.846	9.800	14.8997
Post compulsory studies (in % over total population)	280	38.528	9.938	19.7	68.4
Logextension	280	4.334	1.343	0.693	7.467

5.   Results

We report two sets of four estimates each. The first set of estimates refers to the terms of office 1995-1999 and 1999-2003 (Models 1-4). The second set of estimates refers to the terms of office 1995-1999, 1999-2003 and 2003-2007 (Models 5-8).

Table 5 presents the estimates when the dependent variable is the *log of the number of empty dwellings in 2011* (logemptyH_i) without and with controls (Models 1 and 2 respectively) and when the dependent variable is *percentage of empty dwellings over the total housing stock* in each municipality (shareemptyH_i) without and with controls (Models 3 and 4 respectively).

Model 1 (without controls) shows that municipalities governed by mayors belonging to parties other than the right-wing party have negative and statistically significant coefficients. This means that those municipalities have a lower number of empty dwellings than municipalities run by right-wing mayors. When controls are included (Model 2), the sign of the coefficients remains negative for all the categories of our independent variable. Moreover, the statistical significance holds for municipalities governed by centre-left and left-wing mayors, meaning that those municipalities present a lower number of empty dwellings than municipalities with right-wing mayors.

The control variable *for regions* (Regions$_i$) is statistically significant. The autonomous regions with the highest coefficients are Galicia (1.131), Valencia (1.075), Castile-Leon (0.927) and Murcia (0.911). These communities were governed by the right-wing party throughout the period considered. It should be noted that these regions do not correspond exactly to the most densely populated regions of Spain. The most populous regions were Madrid, Catalonia, Andalusia and Valencia.

Table 5. Results. Terms of office 1995-1999 and 1999-2003 [15]

Dependent variable	Model 1	Model 2	Model 3	Model 4
	logemptyH	*logemptyH*	*shareemptyH*	*shareemptyH*
Political Parties				
Centre-Right	–0.719 *** (0.213)	–0.166 (0.149)	–3.391 ** (1.169)	*–0.708 (1.472)*
Centre-Left	–0.642 *** (8.141)	–0.225 *** (0.075)	–3.134 *** (0.697)	*–1.486 ** (0.699)*
Left wing	–1.383 *** (0.265)	–0.664 *** (0.141)	–6.091 *** (1.439)	*–3.921 *** (0.995)*
Alternancy	–0.453 *** (0.148)	–0.082 (0.076)	–1.025 (0.811)	*–0.122 (0.705)*
Regions				
House price increase		–0.197 (189)		*3.783 ** (1.473)*
Logpopulation		0.779 *** (0.039)		*–1.173 *** (0.311)*
Post-studies		–0.008 * (0.004)		*–0.050 (0.035)*
Capital city		0.243 *** (0.092)		*1.049 (0.846)*
Vacation_coast		0.375 ** (0.154)		*–0.609 (1.542)*
Nonvacation_coast		–0.041 (0.099)		*–1.240 (0.908)*
Logextension		00.092 *** (0.026)		*0.540 *** (0.198)*
Intercept	8.696 *** (0.115)	–0.856 * (0.496)	15.008 *** (0.510)	*19.670 *** (4.011)*
R-squared	0.117	0.813		*0.544*
N	280	280	280	*280*
aic	723.406	329.158	1702.715	*1540.678*
bic	741.598	427.201	1720.907	*1638.720*
Ramsey test Prob > F		2.09 0.102		*0.77 0.510*

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[15]   We have also estimated the three models using as independent variable the political party of the mayor according to the results of the 1995, 1999 and 2003 elections individually. Coefficients and statistical significance were similar. The results are available from the authors upon request.

Table 5.   *(continue)*

Dependent variable	Model 1	Model 2	Model 3	Model 4
	logemptyH	*logemptyH*	*shareemptyH*	*shareemptyH*
VIF test (all scores < 10)				
Mean	1.36	2.69	1.36	*2.69*
Linktest				
_hat: $t (p > |t|)$	1.000 (5.31)	0.935 (0.404)	1 (2.705)	*0.888 (0.309)*
_hatsq: $t (p > |t|)$	−8.15e-07 (0.323)	0.003 (0.023)	−1.2e-08 (0.105)	*0.004 (0.012)*

Legend: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Heterokedaticity results for the OLS Models without robust stardard errors: Model 2 (6.40; prob > chi² 0.0114); Model 4 (15.59; prob > chi² 0.001). Dummies for the Autonomous Communities are included as controls, though results are not displayed.

The variable *maximum house price increase between 2005q1-2013q1* (*HP-growth$_i$*) has a negative but not statistically significant coefficient.

The coefficient of the variable *log of the population in the year 2001* (*logpopul2001$_i$*) is positive and statistically significant. The most densely populated municipalities tend to have a larger number of empty dwellings.

The coefficient for the *percentage of the population with a post-compulsory education* is negative and statistically significant. This finding could be interpreted as indicating that in high-income municipalities housing demand was higher than in low-income ones. In addition, it is also likely that this demand came to a large extent from the wealthier population (from and outside the municipality) as these places are potentially more attractive.

The dummies for municipalities that are capital cities at the provincial level and for those that are vacation destinations exhibit positive and statistically significant coefficients. This result was expected as these places are usually more attractive for housing demand and developers and builders took advantage of the increasing demand. The coefficient for municipalities located on the coast but which are not vacation destinations is not statistically significant.

The variable *log of the extension* of the municipality is positively associated with a large number of empty dwellings. The value of the coefficient is 0.093 and it is statistically significant. As this variable is used as a proxy for the availability of land to be developed for housing, this finding could be interpreted as meaning that municipalities with more land available experienced higher housing development, which resulted in a larger number of empty dwellings when the bubble burst.

Model 3 presents the estimation results when the dependent variable is the *percentage of empty dwellings over the total housing stock* in each municipality (*shareemptyH$_i$*) without controls and shows that municipalities governed during the two terms of office by mayors not belonging to right-wing parties have a lower proportion

of empty dwellings in their housing stock than municipalities run by right-wing mayors. When controls are included (Model 4), the sign of the coefficients stills holds although statistical significance only remains, as in Model 2, for municipalities governed by left and centre-left mayors.

The variable for *regions* (Regions$_i$) is statistically significant. Again, the autonomous regions with the highest ratios are Murcia (9.176), Galicia (9.754) and Castile-Leon (8.474). In general, it can be observed that regions in which the largest numbers of empty dwellings are concentrated in turn have the highest proportion of empty dwellings.

The variable *maximum house price increase between 2005q1-2013q1* (*HP-growth$_i$*) has a positive coefficient and is statistically significant. This result was expected as the expectation of higher house prices causes the offer of new dwellings to be higher since builders and developers obtain higher financial benefits.

The coefficient of the variable *log of the population in the year 2001* (*logpopul2001$_i$*) has a negative and statistically significant sign. This result suggests that the most populous municipalities are not those with the highest proportion of empty dwellings. The percentage of empty dwellings decreases by 1.2% when the population of the municipality increases by 1%.

The extension of the municipality has a positive and statistically significant coefficient (0.548). This finding means there is a positive association between the land available in the town and the percentage of empty dwellings in its housing stock.

The remaining control variables are statistically insignificant in this model.

6. Could the Development of the Housing Bubble have been Prevented?

A logical question that arises in light of the previous results is whether the development of the housing bubble could have been prevented once it started. To provide a better answer to this question, we have estimated Models 5-8 with the same dependent variable but with an independent variable that covers a longer period of time. The independent variable for these new estimations is *PolParties*$_{1995-1999-2003}$, which incorporates an additional term of office, i. e. 2003-2007.

The results are presented in Table 6. It can be noted that the values of the coefficients and their statistical significance remain quite similar to those presented in the previous set of estimations. This might be interpreted as follows: once the housing bubble started and developed during the terms of office 1995-1999 and 1999-2003, the association between a municipality's political ideology (measured by the mayor's political party) and the consequences of the housing bubble (measured both as the log of the number of empty dwellings and as the percentage of empty dwellings over the total housing stock of the town) remained unchanged. The political ideology of the municipality did or could do little to stop the con-

sequences of the bubble. These results are in line with those of Solé-Ollé and Viladecans-Marsal (2012, 2013b), who conclude that a left-wing local government would allow less land to be developed than a right-wing government facing a similar competitive election.

Table 6. Results. Terms of office 1995-1999, 1999-2003 and 2003-2007

Dependent variable	Model 5	Model 6	Model 7	Model 8
	logemptyH	logemptyH	shareemptyH	shareemptyH
Political Parties				
Centre-Right	–0.685 ** (0.199) *	–0.162 (0.147)	–3.129 *** (1.130) *	–0.462 (1.420)
Centre-Left	–0.443 ** (0.119) *	–0.148 ** (0.065)	–2.123 *** (0.639)	–0.794 * (0.615)
Left wing	–0.937 ** (0.285) *	–0.582 ** (0.119) *	–4.407 *** (1.418)	–3.484 ** (0.957) *
Alternancy	–0.483 * (0.274)	–0.092 (0.189)	–1.749 (2.187)	–0.049 (1.870)
House price increase		–0.132 (186)		4.276 ** (1.517) *
Logpopulation		0.772 ** (0.039) *		–1.235 ** (0.310) *
Post-studies		–0.007 * (0.004)		–0.044 * (0.035)
Capital city		0.292 ** (0.089) *		1.481 ** (0.845)
Vacation_coast		0.418 ** (0.152) *		–0.294 (1.512)
Nonvacation_coast		–0.0007 (0.095)		–0.870 * (0.893)
Logextension		0.099 ** (0.025) *		0.615 ** (0.196) *
Intercept	8.589 ** (0.099) *	–0.931 * (0.476)	14.781 *** (0.489)	19.160 ** (3.971) *
R-squared	0.089	0.812		0.544
N	280	280	280	280
aic	732.011	330.202	1711.721	1543.582
bic	750.203	428.244	1729.913	1641.624
Ramsey test Prob > F		2.29 0.178		0.61 0.607

Table 6.   *(continue)*

Dependent variable	Model 5	Model 6	Model 7	Model 8
	logemptyH	*logemptyH*	*shareemptyH*	*shareemptyH*
VIF test (all scores <10)				
Mean	1.17	2.62	1.17	*2.62*
Linktest				
_hat: t $(p > |t|)$	0.999 (10.781)	0.901 (0.405)	0.999 (4.481)	*0.954 (0.313)*
_hatsq: t $(p > |t|)$	−1.17e-06 (0.654)	0.005 (0.023)	2.75e-08 (0.170)	*0.002 (0.012)*

Legend: * $p < 0.5$; ** $p < 0.01$; *** $p < 0.001$. Heterokedaticity results for the OLS Models without stardard errors: Model 6 (6.99; prob > chi² 0.0082); Model 8 (1571; prob > chi² 0.0001). Dummies for the Autonomous Communities are included as controls, though results are not displayed.

7. Conclusions

The Spanish housing market has experienced one of the major bubbles and bursts in Europe. Research on housing bubbles and busts has been approached from different perspectives using various theoretical frameworks. Most of these studies have addressed this issue focusing on the behaviour of the fundamentals of the housing market. However, very few empirical studies have focused on the relationship between the consequences of housing bubbles and the role of local political parties.

The aim of this paper is to provide empirical evidence on the role of political ideology in some of the consequences of the housing bubble in Spain. We approximate the political ideology of a municipality by the political party to which the mayor of a given municipality belonged. The consequences of the housing bubble in Spain has been characterized considering the stock of unsold dwellings measured in absolute value and in percentage over the total housing stock of each municipality.

We have estimated three OLS models with heteroscedasticity-robust standard errors. We use two dependent variables (the log of the number of empty dwellings and the percentage of empty dwellings over the total housing stock), one main independent variable (political party of the mayor of the municipality during two terms of office) and a set of control variables.

The results show that there is an association between a municipality's political ideology in terms of the mayor's political party and some consequences of the housing bubble in Spain. Municipalities governed by left and centre-left mayors have a lower number and percentage of empty dwellings than municipalities the mayors of which belong to right-wing parties. However, the coefficients for municipalities with mayors belonging to right-wing parties and for municipalities with power alternating between parties are statistically insignificant.

More research should be done in the future once the adjustment of the housing market has been concluded in all municipalities to gain a better understanding of the relationship between the variables under study.

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